1044b UIC - EAST POPLAR OIL FIELD
ENFORCEMENT CASE SDWA 1431
Folder ID: 13550 2000 Privileged

Release in full

24 Well Files - Biere 1-22

Region 8
13550

HISTORY

WELL REPORT

MESA PETROLEUM COMPANY

NO. 1-22 BIERE

NW SW Section 22-28N-51E
Roosevelt County, Montana

John W. Graham, Jr.
Petroleum Geologist
Billings, Montana
May 1970

15 Poly Drive
Billings, Montana
July 16, 1970

Mesa Petroleum Company
P. O. Box 2009
Amarillo, Texas 79105

Gentlemen:

Commission Rules 223 and 224 require that a gas-oil ratio test and a bottom hole pressure survey be conducted and submitted to the Commission on Form No. 11 within a total of fifty days following completion of an oil or gas well.

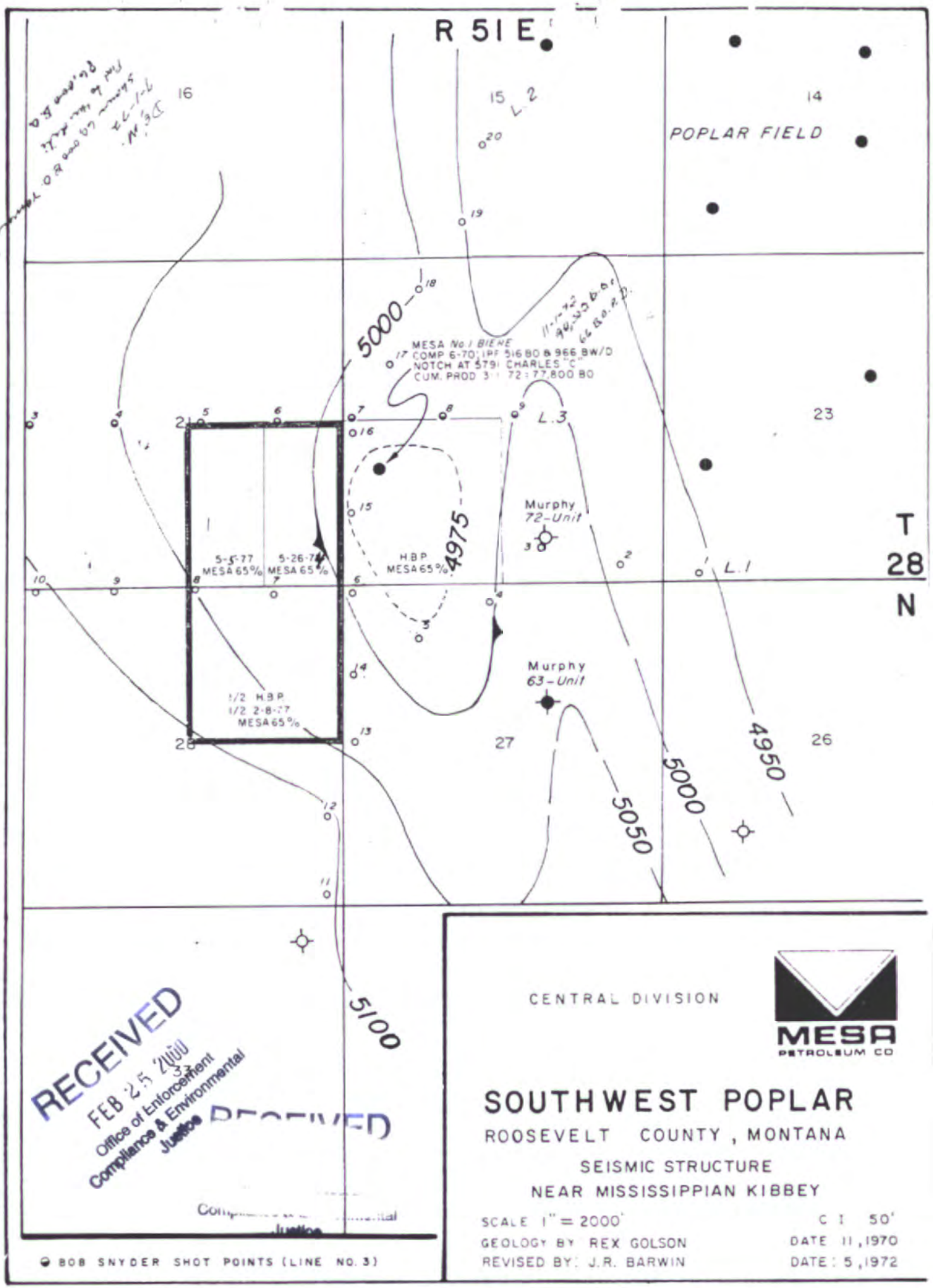
Our files indicate you have not conformed to Rules 223 and 224 with respect to your Biere No. 1-22 located in the C NW SW, Section 22, Township 28 North, Range 51 East, Roosevelt County, Montana.

Please conduct a gas-oil ratio test and a bottom hole pressure survey on the foregoing well and submit the results thereof on Commission Form No. 11 to our Billings office no later than July 31, 1970.

Yours very truly,

Judson D. Sweet
Petroleum Engineer

JDS/ia



RECEIVED
FEB 25 2000
Office of Enforcement
Compliance & Environmental
Justice

15 Poly Drive
Billings, Montana
July 16, 1970

Mesa Petroleum Company
P. O. Box 2009
Amarillo, Texas 79105

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Yours very truly,

Judson D. Sweet
Petroleum Engineer

JDS/ia

15 Poly Drive
Billings, Montana 59101
March 31, 1976

Amarco Resources Corporation
2413 First National Bank Bldg.
Dallas, Texas 75202

Re: Section 22-28N-51E., Roosevelt County.
Earthen pits.

Gentlemen:

The earthen pits on the above lease are full of salt water and the location is under water and oil. I understood last year that you were to clean up this lease, and it has not been done to date.

Effective this date, this lease is to be shut in and remain shut in until the necessary clean up has been done. Please notify Mr. Joe Simonson, 702 North Kendrick, Glendive, Montana 59330, Phone 406-365-3592, when the lease is ready for inspection.

Yours very truly,

Joe M. Simonson
Field Inspector

JMS/la

ENVIRONMENTAL
PROTECTION AGENCY

OCT 2 5 1998

MONTANA OFFICE

15 Poly Drive
Billings, Montana 59101
March 31, 1976

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2413 First National Bank Bldg.
Dallas, Texas 75202

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Field Inspector

Distributed
Sent file

15 Poly Drive
Billings, Montana 59101
March 31, 1976

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Yours very truly,

Joe M. Simonson
Field Inspector

Distributed
Final file

ID: 01-0-[illegible]

3-25-70
REVISED: 7-7-81

SNYDER-SOUTHWEST POPLAR PROSPECT
Roosevelt County, Montana

WELL: #1-22 Biere
Center NW¼ SW¼
Sec. 22-28N-51E

OPERATOR: Mesa Petroleum Co.

OWNERSHIP:	WI	NRI
Westdale Petroleum, Inc.	35.00000%	30.57030%
Hillin Oil Co.	21.66667%	18.92448%
Mesa Petroleum Co.	43.33333%	37.84897%

PVA 9/18/94

SPUD DATE 5-6-70 COMPLETION DATE 6-8-70

DATE OF 1ST PRODUCTION 6-7-70 RESULT Oil

T.D. 5845'

Revised to change ownership from Amarco to Westdale effective 10-1-80.

MESA
PETROLEUM CO.

OCT 1984
RECEIVED
OIL & GAS CONS. COMM.
STATE OF MONT.
BILLINGS

October 3, 1984

Montana Board of Oil & Gas Conservation
2535 St. Johns Ave.
Billings, MT 59102

Attention Donna Uvelac

Subject: Biere 1-22
NWSW Sec. 22, T28N, R51E
Roosevelt County, Montana
Poplar Field

Gentlemen:

Enclosed are three copies of the DST's ran on the subject well as requested. If you have any further questions regarding this matter, please call me.

Sincerely,

Randy Nordsven

Randy Nordsven
Regulatory Agent

ksp
Enclosures

Called
10-3-84

Mesa Petro
Called Puckette
will look for
Dist charts.

Rec'd
10-9-84

MESA
PETROLEUM CO.

OCT 1984
RECEIVED
OIL & GAS CONS. COMM.
STATE OF MONT.
BILLINGS

October 3, 1984

Montana Board of Oil & Gas Conservation
2535 St. Johns Ave.
Billings, MT 59102

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Sincerely,

Randy Nordsven

Randy Nordsven
Regulatory Agent

ksp
Enclosures

APR 12 1985

RES. ENGR.

APR 10 1985

MESA PETROLEUM CO.

AUTHORITY FOR EXPENDITURE

01-04-Engineering
Company/Div./Subsidiary/Dept

Mesa Petroleum Co.
Name of Operator

SUPPLEMENT #1

Budget Category: Abandonment-Supplement
I.D. Number: 01-04-MT-0399-0001-000-0684-16-85
County: Roosevelt State/Prov.: Montana
Pros./Lse./Prop Name: Snyder-Southwest Poplar Biere #1-22 & Biere A-1 (SWD)
Est. Compl. Date: Completed

AFE No. A4016 Well OR No.: 04-MT-399-01
Gross Amount: $7,100
Mesa's Net Amount: $3,077
Previous Appropriations: $30,100 gross
Starting Date: Completed
Budgeted Expenditure: Yes X No
Date Budgeted: 3rd Quarter 1984

Participants	W. I. %
Mesa Petroleum Co.	43.33333
Westdale Petroleum Inc.	35.00000
Hillin Petroleum Co.	21.66667

Participants	W. I. %

	Gross	Net
AFE Amount	30,100	13,043
Supplement #1 (24%)	7,100	3,077
Total	37,200	16,120

For:	Sub Acct. Codes	Item Description	Amount
AFE #A4016	146-1SU	Plugging Costs	$7,100

Supplement #1

RECORDED

Reason for Expenditure:

The subject wells were P & A in September of 1984. Additional costs were incurred when a strong water flow up the casing in the Biere 1-22 had to be killed with several attempts. These added costs resulted in overexpenditures of $7,100 gross.

Received
Office of Enforcement
FEB 25 2000
Compliance & Env. Justice

John C. Maxey, Jr. — Requested	Production Engineer — Title	4/1/85 — Date
Michael P. Houston — Approval	Supervisor-Production Engineering — Title	Date
Don A. Brown — Approval	Acting Manager-Engineering — Title	4/1/85 — Date
Dave A. Reed — Approval	Division Manager-Rocky Mountain Division — Title	4/9/85 — Date
J. P. Johnson — Approval	Vice President-Operations — Title	4/12/85 — Date
Approval	Title	4/10/85 — Date

CARL E. LAWRENCE, PRESIDENT
Name of Partner

Partner Approved — Title — Date

Copies to Corp Purchasing, Acctg & Div Mgr 4/17/85

RECEIVED
APR 19 1985

RSF - A. US

MESA PETROLEUM CO.

AUTHORITY FOR EXPENDITURE

RECEIVED AUG 12 1985 CENTRAL RECORDS

JUL 31 1985

RECEIVED JPJ

JUL 31 1985

01-04-Engineering
Company/Div./Subsidiary/Dept.

Mesa Petroleum Co.
Name of Operator

Budget Category Abandonment 8-12-85
I. D. Number 01-04-MT-0399-0001-000-0
County Roosevelt State/Prov. Montana
Pros./Lse./Prop. Name Snyder-Southwest Poplar Biere 1-22
Est. Compl. Date Monitoring for 30 days

A.F.E. No. A5042 Well OP No. MT-399-1
Gross Amount $110,000
Mesa's Net Amount $47,700
Previous Appropriations None
Starting Date 7/9/85
Budgeted Expenditure: Yes ____ No X
Date Budgeted ____

Participants	W. I. %	Participants	W. I. %
Mesa Petroleum Co.	43.33333	Mesa NRI	37.84897
Westdale Petroleum, Inc.	35.00000		
Hillin Oil Co.	21.66667		

For:	Sub Acct. Codes	Item Description	Amount
AFE #A5042		See attached cost estimate	

RECORDED 8/9 / [illegible]

Reason for Expenditure: The subject well was plugged September 17, 1984. During June of 1985, a water seepage around the plugged well was noticed. After digging a pit around the surface pipe on the subject well, a water influx of approximately 2 to 5 BWPD up the outside of the surface casing into the pit was found. An immediate attempt at killing the water seepage was initiated in a plan to drill a shallow relief well 25' NNE of the subject, and squeeze cmt from the shall relief well, through the Judith River formation at 700', over to the abandoned well. Using approximately 2000 sacks of cement, the Judith River was squeeze cemented in the vicinity of th subject well, and the water seepage on the subject well appears to have been stopped. At prese the subject well is being monitored, and the shallow relief well will be plugged if the inactiv on the subject well continues for 30 days.

John C. Maxey Jr. (Requested) John C. Maxey, Jr.	Production Engineer (Title)	7/29/85 (Date)
Michael P. Houston (Approval) Michael P. Houston	Supervisor-Production Engineering (Title)	7-30-85 (Date)
Don A. Brown (Approval) Don A. Brown	Acting Manager-Engineer (Title)	8/1/85 (Date)
Dave A. Reed (Approval)	Division Manager-Rocky Mountain Division (Title)	(Date)
David A. Reed (Approval) verbal app 8-8-85 BHC	(Title)	8-8-85 (Date)
J.P. Johnson (Approval) J.P. Johnson	Vice President-Operations (Title)	8/9/85 (Date)

Name of Partner

Partner-Approved ____ Title ____ Date ____

AC-12 Copies to Corp Purchasing, Acctg, & Div Mgr 8-14-85

AFE/COST ESTIMATE

MESA PETROLEUM CO.

01-04-Engineering
Co./Div./Subsid./Dept.

AFE # A5042

ID # 01-04-MT-0399-0001-000-0

Code General Account # _____

Exploratory _____ Development _____

LEASE, WELL NAME, AND LOCATION Biere 1-22, Rooselvelt County, Montana

DESCRIPTION Drill a shallow relief well adjacent to the Biere 1-22, squeeze cmt through the Judit River formation, and halt water migration up the outside of the surface csg on the Biere 1-22.

Sub Acct. Codes	ITEM DESCRIPTION	Dry Hole Cost	Completion Cost	Producer/ Other
X01	DRILLING—FOOTAGE Ft. At $ /Ft.	$	$	$
X02	DRILLING or COMPLETION RIG MI-RU, RD-MO			
	(A) DAY WORK 10(24 hr oper.) DAYS At $ 4,000 /DAY		40,000	
X03	(A) BOILER DAYS At $ /DAY			
	(B) CAMP & CATERING DAYS At $ /DAY			
	(C) OTHER DAYS At $ /DAY			
X04	CEMENTING SERVICES, CEMENT & ACCESSORIES		34,900	
X05	MUD, CHEMICALS, SERVICES & EQUIP. (A) MUD, CHEM., OIL		15,000	
	(B) WATER			
X06	LOGS, TESTING & MUD LOGGING UNIT logs		2,500	
X07	DRILL STEM TEST & RELATED TESTING EQUIPMENT			
X08	PERFORATING, ~~WELL STIMULATION SERVICES~~		2,000	
X09	LOCATION, ROADS, SURVEYS, AIRSTRIPS		2,000	
X10	CONTRACT LABOR, SUPERVISION, & ENGINEERING			
X11	RENTAL EQUIPMENT & TOOLS		3,000	
X12	ROCK BITS, HOLE OPENERS, REAMERS, STABILIZERS		1,000	
X13	HAULING & FREIGHT		500	
X14	MOBILIZATION - INSTALLATION (DRILLING PLATFORMS)			
X15	DEMOBILIZATION - DISMANTLING & SALVAGE (DRILLING PLATFORMS)			
X16	SUPPLYBOATS, CREWBOATS, BARGES, TUGS			
X17	FUEL, LUBES, POWER			
X18	SHOREBASE, OFFICE, DOCK FEE & CRANES			
X19	AIRCRAFT RENTALS—HELICOPTERS, FIXED WING			
X20	DIVERS AND RELATED EQUIPMENT			
X21	MISCELLANEOUS			
X23	MUD ENGINEER DAYS At $ /DAY			
X24	CONSULTING ENGINEER 10 DAYS At $ 400 /DAY		4,000	
X25	GEOLOGICAL CONSULTANT DAYS At $ /DAY			
X26	COMPANY LABOR & SUPERVISION			
X97	DRLG. & COMP. OVERHEAD DAYS At $ /DAY			
	Total Intangible Costs	$	$ 104,900	$
X41	BUOYS AND MARKERS	$	$	$
X42	Footage / Size / Weight / Grade / Cplg. / Price/Ft			
CASING AND TUBING	(A)			
	(B) 700 / 5 1/2 / 15.5 / / LTC / 7.30		5,100	
	(C)			
	(D)			
	(E)			
	(F)			
	(G)			
X43	WELL HEAD & GUIDE STRUCTURE			
X44	SUB-SURFACE WELL EQUIPMENT			
X45	SURFACE WELL EQUIPMENT			
X46	OTHER MAJOR EQUIPMENT			
	(A)			
	(B)			
	(C)			
X47	BUILDINGS			
~~X48~~	~~ELECTRICAL & INSTRUMENTATION EQUIPMENT~~			
X49	INSTALLATION, MATERIALS & SERVICES			
	Total Tangible Costs	$	$ 5,100	$
	Total Costs	$	$ 110,000	$

Prepared By JCMafey Title Prod Engr Date 7/29/85 Mesa WI Others WI

Mesa Approved _____ Title _____ Date _____

Mesa Approved _____ Title _____ Date _____

Mesa Approved _____ Title _____ Date _____

WI Approval-Company _____ By: _____ Title _____ Date _____

AC-13
Revised 5-83

15 Poly Drive
Billings, Montana
July 16, 1970

Mesa Petroleum Company
P. O. Box 2009
Amarillo, Texas 79105

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Yours very truly,

Judson D. Sweet
Petroleum Engineer

JDS/ia

To: T.L. McPherson

MESA

Add to Well History Date 6/22/89

Well Name: Bieri Well No: 1-22 Producing formation: P & A

County & State: Roosevelt Co. Montana Perforations:

Perforations: P & A Supervisor: F. Kershisnik

DWC: CWC:

On 6/20/89 I (Fred Kershisnik) met with Mr. L.M. Lockman on the abandoned location. There was "1" rotten ± 200 bbl. wooden tank with 8'x8'x8' building, 2 seperate piles of debri (junk), and a bolted tank, taken apart, and piled in his wheat field. All equipment looks to be of no value. Mr. Lockman sugested digging a hole and buring all of the "junk" on location, with about 3' of top cover so the land could be farmed. He also asked if we could supply him with aprox. 150# of annual rye grass to seed the disturbed area this fall. Estimated cost for work $2000.

To: T L McPherson

MESA

Add to Well History Date 7/13/89

Well Name: Bieri Well No: 1-22 Producing formation: P & A

County & State: Roosevelt County Montana Perforations:

Perforations: Supervisor:

DWC: $1681 CWC: $1681

On 6/22/89 we reclaimed the Bieri 1-22 location. All junk, including the wooden tank, was buried on location with 2' of cover on top. The land owner, Mr. L M. Lockman inspected the reclaimed location and was pleased with it. At that time it was determined that only 100# of annual rye grass seed for him to seed the affected area, so we left him with 100# of annual rye grass seed. I contacted Mr. L D. Hodges with Montana Oil & Gas Commission and told him the reclaimed location was ready for his inspection. A report of his inspection will follow.

Well Name: Biere 1-22

API No. 25-085-2104700

Location: 22 28N 51E

C NW SW

Latitude: 48.1631320

Longitude: 105.1259920

Status: P&A; 09-84

RECEIVED
FEB 25 2000
Office of Enforcement
Compliance & Environmental
Justice

PERMIT
APPLICATIONS

GEOLOGICAL DATA

Form No. 2

(SUBMIT IN TRIPLICATE)
TO

BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA
P.O. BOX 217 HELENA, MT 59624

Oil or Gas Wells

REPORT OF PRODUCTION

(TO BE MADE BY PRODUCER)

ARM 36.22.307
ARM 36.22.1217
ARM 36.22.1242

NOV 1984
RECEIVED
OIL & GAS CONS. COMM.
STATE OF MONT.
BILLINGS

BOARD USE ONLY	
	F L UNIT
	PROD
	CNTY

☐ 12 CHECK IF AMENDED REPORT

1 PRODUCER: Mesa Petroleum Co.
2 ADDRESS: P. O. Box 2009
3 CITY: Amarillo
4 STATE: Texas 5 ZIP: 79189
6 AGENT SIGNATURE: [signature]
7 FIELD NAME: Poplar
8 LEASE/UNIT NAME: Biere
9 COUNTY: Roosevelt
10 ☐ CHECK IF ADDRESS CHANGE
11 MONTH OF: October 1984

13 WELL CLASSIFICATION (CHECK ONE)
X OIL WELLS
☐ NATURAL GAS WELLS

14 LEASE STATUS
1 NO WELLS PRODUCED
☐ NO WELLS SHUT IN

WELL DESCRIPTION							PRODUCTION INFORMATION			
15 WELL NUMBER	16 API NO (LAST 8 DIGITS)	17 DAYS PRODUCED	18 SEC	19 TWP	20 RGE	DO NOT USE	21 PRODUCING FORMATION	22 BBLS OF OIL / COND	23 MCF GAS @ 14.73 PSIA	24 BBLS OF WATER
BIERE 1-22	08521047	0	22	28N	51E		Charles "C"	0	0	0
							PLUGGED AND ABANDONED 9-17-84			
							FINAL REPORT			

25 INVENTORY SUMMARY	BBLS OIL AND COND	MCF OF GAS	BBLS OF WATER
On Hand Start of Month	83		
Produced This Month	0	0	0
Sold This Month	0	0	
Spilled This Month	0		
Flared or Vented		0	
Used on Lease	0	0	
Injected	0	0	0
Surface Pits			0
Other	83 BS&W Tank Bottom	0	0

26 DISPOSITION INFORMATION		Bbls or MCF
BUYER	Getty	-0- Bbls.
TRANSPORTER	Getty	
BUYER		
TRANSPORTER		
BUYER		
TRANSPORTER		
BUYER		
TRANSPORTER		

NOTE: Separate production reports covering operations in each lease must be filed with the Helena office of the Board of Oil and Gas Conservation by the 20th day of each calendar month following the month covered by the report.

LOCATE WELL CORRECTLY

660' 1980'

(SUBMIT IN TRIPLICATE)
TO
OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

Form No. 4
(Gen. Rule 206.3 & 231)

RECEIVED JUL 1970 OIL & GAS CONS. COMM. BILLINGS, MONT.

LOG OF WELL

12

Company Mesa Petroleum Co. Lease Biere Well No. 1-22

Address Box 2009, Amarillo, Texas Field (or Area) Poplar

The well is located 1980 ft. from (S) line and 660 ft. from (W) line of Sec. 22

Sec. 22; T. 28N; R. 51E; County Roosevelt; Elevation 2086 KB 2074 GL (D.F., R.B. or G.L.)

Commenced drilling 5-6-70, 19__; Completed 6-8-70, 19__

The information given herewith is a complete and correct record of the well. The summary on this page is for the condition of the well at the above date.

Completed as oil (oil well, gas well, dry hole)

Signed [signature]

Title Production Superintendent

Date July 7, 1970

IMPORTANT ZONES OF POROSITY

(denote oil by O, gas by G, water by W; state formation if known)

From	698	to	876	Judith River	W	From	5516	to 5543	Charles "A" W
From	3200	to	3570	Dakota	W	From	5635	to 5678	Charles "B" W
From	4840	to	4992	Tyler	W	From	5788	to 5805	Charles "C" O & W
From	5155	to	5288	Kibbey Ss.	W	From		to	

CASING RECORD

Size Casing	Weight Per Ft.	Grade	Thread	Casing Set	From	To	Sacks of Cement	Cut and Pulled from
8 5/8	24	J	8	741			465	none
5 1/2	15	J	8	5845			675	none

TUBING RECORD

Size Tubing	Weight Per Ft.	Grade	Thread	Amount	Perforations
2 7/8	6.7	J	8	5767	5791

COMPLETION RECORD

Rotary tools were used from 0 to 5845

Cable tools were used from to

Total depth 5845 ft.; Plugged back to 5803 T.D.; Open hole from to

PERFORATIONS			ACIDIZED, SHOT, SAND, FRACED, CEMENTED			
Interval From	Interval To	Number and Size and Type	Interval From	Interval To	Amount of Material Used	Pressure
5791		Hydro-jet	5791		2000 gals 7 1/2% HCL	

(If P&A show plugs above)

INITIAL PRODUCTION

Well is producing from Charles "C" zone (pool) formation.

I. P. 516 barrels of oil per 24 hours flowing (pumping or flowing)

150 Mcf of gas per 24 hours.

966 barrels of water per 24 hours, or 65 % W.C.

(OVER)

Form No. 2
GENERAL RULES
201, 202, 213,
218, 219, 233.1

(SUBMIT IN QUADRUPLICATE)
TO
OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

RECEIVED
MAY 1970
OIL & GAS CONS. COMM.
STATE OF MONT.
BILLINGS

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE COMMISSION.

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill	X	Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

April 29, 1970

Following is a notice of intention to do work on land leased described as follows:

LEASE BIERE

MONTANA (State) ROOSEVELT (County) WILDCAT (Field)

Well No. 1-22 C NW SW (m. sec.) 28N (Township) 51E (Range) (Meridian)

The well is located 1980 ft. from S line and 660 ft. from W line of Sec. 22

LOCATE ACCURATELY ON PLAT ON BACK OF THIS FORM THE WELL LOCATION, AND SHOW LEASE BOUNDARY

The elevation of the derrick floor above the sea level is not available

READ CAREFULLY — DETAILS OF PLAN OF WORK — READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work, particularly all details results Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

It is proposed to drill a 12 1/4 inch hole to approximately 700 feet and set 8 5/8 inch casing and cement to GL. A 7 7/8 inch hole will be drilled to 5900 feet, total depth, using conventional mud and logged and tested. If well is considered economic, 4 1/2 inch casing will be run and cemented. If well is dry, it will be plugged according to the rules and regulations of the Montana Conservation Commission.

AMOUNT RECEIVED $75.00
DRILLING PERMIT NO. 55582
RECEIPT NO. 7982

CORES AND CUTTINGS TO BE DELIVERED TO COMMISSION FIELD OFFICE IN ACCORDANCE WITH RULE NO. 230.

Approved subject to conditions on reverse of form

Date 5-4-70

By [signature] District Office Agent [signature] Title

Company MESA PETROLEUM CO.

By [signature] J. L. Farrell

Title Prod. Supt.

Address Box 2009, Amarillo, Texas 7910[illegible]

COMMISSION USE ONLY
API WELL NUMBER
2 | 5 | 0815 | 21101417

NOTE:—Reports on this form to be submitted to the District Agent for Approval in Quadruplicate.

WHEN USED AS PERMIT TO DRILL, THIS EXPIRES 90 DAYS FROM DATE OF APPROVAL.

Form No. 2

GENERAL RULES
201, 202, 213,
216, 219, 233.1

(SUBMIT IN QUADRUPLICATE)

TO

OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE COMMISSION.

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	
		Report of Change of Operator	XX

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

April 12, 1972

Following is a {notice of intention to do work / report of work done} Notice of Change of Operator on land {owned / leased} described as follows:

LEASE Biere

MONTANA (State) Roosevelt (County) Poplar (Field)

Well No. 1-22 22 (m. sec.) 28N (Township) 51E (Range) (Meridian)

The well is located 1980 ft. from {N / S} line and 660 ft. from {E / W} line of Sec. 22

LOCATE ACCURATELY ON PLAT ON BACK OF THIS FORM THE WELL LOCATION, AND SHOW LEASE BOUNDARY

The elevation of the derrick floor above the sea level is 2086 KB

READ CAREFULLY **DETAILS OF PLAN OF WORK** READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work, particularly all details results Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

Effective April 1, 1972, the 1-22 Biere operated by Mr. John Snyder, Billings, Montana.

Approved subject to conditions on reverse of form

Date May 3, 1972

By Norman F. Beaudry, Administrator
~~District Office Agent~~ Title

Company Mesa Petroleum Co.

By [signature]

Title Operations Superintendent

Address Box 2009, Amarillo, Texas 79105

COMMISSION USE ONLY
API WELL NUMBER

NOTE:—Reports on this form to be submitted to the District Agent for Approval in Quadruplicate WHEN USED AS PERMIT TO DRILL, THIS EXPIRES 90 DAYS FROM DATE OF APPROVAL.

Form No. 2

GENERAL RULES
201, 202, 213,
216, 219, 233.1

(SUBMIT IN QUADRUPLICATE)

TO

OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE COMMISSION.

RECEIVED
AUG 1972
OIL & GAS CONS. COMM.
STATE OF MONT.
HELENA

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	
		REPORT OF CHANGE OF OPERATOR	XX

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

August 21, 1972

Following is a {~~notice of intention to do work~~ / ~~report of work done~~} on land {~~owned~~ / leased} described as follows:

Notice of Change of Operator

LEASE Biere

MONTANA (State) Roosevelt (County) Poplar (Field)

Well No. I-22 22 (m. sec.) 28N (Township) 5IE (Range) (Meridian)

The well is located 1980 ft. from {~~XXX~~ / S} line and 660 ft. from {~~XXX~~ / W} line of Sec. 22

LOCATE ACCURATELY ON PLAT ON BACK OF THIS FORM THE WELL LOCATION, AND SHOW LEASE BOUNDARY

The elevation of the derrick floor above the sea level is 2086' K.B.

READ CAREFULLY **DETAILS OF PLAN OF WORK** READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work, particularly all details results Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

Effective July I, 1972, the No. I-22 Biere operated by

AMARCO RESOURCES CORPORATION, 6II Midland Bank Building, Billings, Montana.

Approved subject to conditions on reverse of form

Date August 28, 1972

By Norman J. Beaudry, Adm.
~~District Office Agent~~ Title

Company John Snyder

By John Snyder

Title Operator

Address 6II Midland Bank Building
Billings, Montana 59IOI

COMMISSION USE ONLY
API WELL NUMBER
2 | 5

NOTE:—Reports on this form to be submitted to the District Agent for Approval in Quadruplicate

WHEN USED AS PERMIT TO DRILL THIS EXPIRES 90 DAYS FROM DATE OF APPROVAL.

Form No. 2

GENERAL RULES
201, 202, 213,
216, 219, 230,
231, 232

(SUBMIT IN QUADRUPLICATE)

TO

BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA

BILLINGS OR SHELBY

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE BOARD.

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	
		Report of Change of Operator	X

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

December 14, 1976

Following is a {notice of intention to do work / report of work done} on land {owned / leased} described as follows:

LEASE Biere

MONTANA (State) Roosevelt (County) Poplar (Field)

Well No. 1-22 22 (m. sec.) 28N (Township) 51E (Range) (Meridian)

The well is located 1980 ft. from {N / S} line and 660 ft. from {E / W} line of Sec. 22

LOCATE WELL SITE ACCURATELY ON PLAT ON BACK OF THIS FORM.

The elevation of the ground or K.B. above the sea level is 2086' KB.

READ CAREFULLY **DETAILS OF PLAN OF WORK** READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings, cementing points, and all other important proposed work, particularly all details of Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

Effective December 1, 1976, the No. 1-22 Biere will be operated by

MESA PETROLEUM CO., P.O. Box 2009, Amarillo, Texas 79105.

Approved subject to conditions on reverse of form

Date Dec 21-76

By Donald E. Ashdown [signature]
District Office Agent Title

Company Mesa Petroleum Co.

By S E Dobler S. E. Dobler

Title Supervisor, Drilling & Production

Address P.O. Box 2009
Amarillo, Texas 79105

BOARD USE ONLY
API WELL NUMBER

NOTE:—Reports on this form to be submitted to the appropriate District for approval

WHEN USED AS PERMIT TO DRILL, PERMIT EXPIRES 90 DAYS FROM DATE OF APPROVAL IF WELL NOT SPUDDED OR EXTENSION REQUESTED.

Form No. 2

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE BOARD.

(SUBMIT IN QUADRUPLICATE)
TO
BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

RECEIVED JUL 1984 OIL & GAS CONS. COMM. STATE OF MONT. BILLINGS

on weekly list 10-5-84

MAC 36-3.18(10)-S18020
MAC 36-3.18(10)-S18030
MAC 36-3.18(10)-S18140
MAC 36-3.18(10)-S18170
MAC 36-3.18(10)-S18200
MAC 36-3.18(10)-S18310
MAC 36-3.18(10)-S18330
MAC 36-3.18(14)-S18380

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well Producer	X	Report of Fracturing	

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

July 18, 1984

Following is a {notice of intention to do work} on land {owned} described as follows:

LEASE Biere

MONTANA (State) Roosevelt (County) Poplar (Field)

Well No. 1-22 CNWSW 22 (m. sec.) 28N (Township) 51E (Range) (Meridian)

The well is located 1980 ft. from {N (S)} line and 660 ft. from {E (W)} line of Sec. 22

LOCATE WELL SITE ACCURATELY ON PLAT ON BACK OF THIS FORM.

The elevation of the ground or K.B. above the sea level is 2086 KB

READ CAREFULLY **DETAILS OF PLAN OF WORK** READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings, cementing points, and all other important proposed work, particularly all details of Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

Subject well is currently uneconomic to produce, and Mesa Petroleum Co. is proposing to plug subject well as follows: Well drilled to TD of 5845'; 5 1/2" casing set at 5845'. Well perforated at 5791'. Propose to set cast iron bridge plug at 5750', spot 25 sxs cement plug above CIBP. Perforate 5 1/2" casing 50' below 8 5/8" surface casing set at 741'. Squeeze 5 1/2" production casing with 50 sxs cement, leaving 20 sxs cement inside 5 1/2" casing. Spot 10 sxs cement plug at surface, set dry hole marker.

LOCATION INSPECTED & APPROVED:

Approved subject to conditions on reverse of form

Date JUL 23 1984

By Elaine Hampton
District Office Agent Title

Company Mesa Petroleum Co.

By Randy Z. Nordoven

Title Regulatory Coordinator

Address P. O. Box 2009/Amarillo, Texas 79189

806-378-1000

BOARD USE ONLY
API WELL NUMBER
25 STATE COUNTY WELL

NOTE:—Reports on this form to be submitted to the appropriate District for approval

WHEN USED AS PERMIT TO DRILL, PERMIT EXPIRES 90 DAYS FROM DATE OF APPROVAL IF WELL NOT SPUDDED OR EXTENSION REQUESTED.

OVER

cc: MOGCC(0+4),CEN RCDS,ACCTG,WELL FILE,RZN,DENVER,PARTNERS

Locate well by footage measurement from legal subdivision (Section) line and nearest drilling or producible well, if any.

Form No. 2
File at
Billings
or Shelby

Rge.....

Form No. 2
File at
Billings
or Shelby

Locate
Well
Correctly

Twp.....

SCALE—1"=2000'

THE NOTICE OF INTENTION TO DRILL THIS WELL IS APPROVED SUBJECT TO THE FOLLOWING CONDITIONS:

1. Any person, before commencing the drilling of any oil or gas well or water source or injection well shall secure from the Board a drilling permit and shall pay to the Board the following amounts: for each well whose estimated depth is thirty-five hundred (3,500) feet or less, twenty-five dollars ($25.00); from thirty-five hundred and one (3,501) feet to seven thousand (7,000) feet, seventy-five dollars ($75.00); seven thousand and one (7,001) feet and deeper, one hundred fifty dollars ($150.00).

2. No well is to be spudded in unless the proper surety drilling bond has been posted and approved by the Board of Oil and Gas Conservation of the State of Montana.

3. Cable tool operators must construct an adequate sump to contain all mud and water bailed from the hole.

4. Surface or conductor casing must be properly cemented by an approved method and pressure tested to determine a tight bond with the surrounding formations in case an unexpected flow of oil, gas or water should be encountered, unless special permission has been granted for formation shut-off.

5. Any production casing must be cemented unless a formation shut-off or packer is approved by the Board. Sufficient cement must be used to protect the casing and all possible productive and fresh water bearing formations exposed in the process of drilling and not otherwise protected.

6. All production casing must be tested by bailing or pressure to determine if there is a tight bond with the surrounding formations or possible leaks in the casing. The results of the test must be reported on Form No. [illegible] to include the size, weight, thread and length of casing, amount of cement used, and date work is done. If test shows failure, the defect must be corrected before any drilling operations are resumed.

7. Any contemplated change in status of a well such as to plug and abandon, deepen, plug back, redrill, alter casing, etc. must be presented on Form No. 2 for approval by the Board prior to commencement of work.

8. A satisfactory drilling record must be kept for each tour, showing top and thickness of each and all formations drilled and all other information of value, one copy of which is to be kept at the rig while drilling is in progress for examination by any authorized agent of the Board.

9. All producing wells must be marked with name of the operator, number of the well and location, using reasonable precautions to preserve these markings at all times.

10. Delivery to the Board of two copies of all surveys, reports, analyses, logs, tests, samples and core descriptions, etc., as described in Rule 230 and one copy of all cementing records as furnished by the cementing company and described in Rule 234.

11. All work must be done in conformity with the regulations of the Board of Oil and Gas Conservation of the State of Montana, as contained in "General Rules and Regulations," and amendments thereto, as well as regulations prescribed in lieu thereof.

OK an w. list 10-5-84

Form No. 2

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE BOARD.

(SUBMIT IN QUADRUPLICATE)

TO

BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA

BILLINGS OR SHELBY

MAC 36-3.18(10)-S18020
MAC 36-3.18(10)-S18030
MAC 36-3.18(10)-S18140
MAC 36-3.18(10)-S18170
MAC 36-3.18(10)-S18200
MAC 36-3.18(10)-S18310
MAC 36-3.18(10)-S18330
MAC 36-3.18(14)-S18380

RECEIVED OCT 1984 OIL & GAS CONS. COMM. STATE OF MONT. BILLINGS

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment Producer	X
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

September 26, 1984

Following is a {notice of intention to do work / report of work done} on land {owned / leased} described as follows:

LEASE Biere

MONTANA (State) Roosevelt (County) Poplar (Field)

Well No. 1-22 C NW SW 22 (m. sec.) 28N (Township) 51E (Range) (Meridian)

The well is located 1980 ft. from {N / S} line and 660 ft. from {E / W} line of Sec. 22

LOCATE WELL SITE ACCURATELY ON PLAT ON BACK OF THIS FORM.

The elevation of the ground or K.B. above the sea level is 2086' KB

READ CAREFULLY **DETAILS OF PLAN OF WORK** READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings, cementing points, and all other important proposed work, particularly all details of Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

Subject well was plugged on 9/17/84 as follows: squeezed perfs at 5791' with 50 sxs cement. Top of cement at 5760'. Perforated tubing at 5750', spotted 30 sxs cement inside and outside of tubing from 5435' to 5750'. Perforated tubing from 993'-996' and pumped 50 sxs cement down tubing, pumped 85 sxs cement down 5-1/2" production casing. Pumped 220 sxs cement down 8-5/8" surface casing. Cut off casing 4' below ground level. Welded cap on 8-5/8" casing, dumped 10 sxs cement on top of cap. All casing and tubing was left in well.

LOCATION INSPECTED & APPROVED:

Approved subject to conditions on reverse of form

Date AUG - 5 1986

By Claire F. Haughey by
District Office Agent Title

Company Mesa Petroleum Co.

By Randy Z. Nordoven

Title Regulatory Agent

Address P.O. Box 2009, Amarillo, TX 79189

806-378-1000

BOARD USE ONLY
API WELL NUMBER

2	5	085	21047
STATE		COUNTY	WELL

NOTE:—Reports on this form to be submitted to the appropriate District for approval

WHEN USED AS PERMIT TO DRILL, PERMIT EXPIRES 90 DAYS FROM DATE OF APPROVAL IF WELL NOT SPUDDED OR EXTENSION REQUESTED.

OVER X 206

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE BOARD.

TO

BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA

BILLINGS OR SHELBY

SUNDRY NOTICES AND REPORT OF WELLS

ARM 36.22.307 ARM 36.22.1003
ARM 36.22.601 ARM 36.22.1004
ARM 36.22.602 ARM 36.22.1013
ARM 36.22.603 ARM 36.22.1301
ARM 36.22.604 ARM 36.22.1306
ARM 36.22.605 ARM 36.22.1309

Notice of Intention to Drill *		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	X
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

February 5, 19 91

Following is a {~~notice of intention to do work~~ report of work done} on land {owned ~~leased~~} described as follows:

LEASE TYPE ..... (Private, State, Federal, Indian) LEASE BIERE

MONTANA (State) ROOSEVELT (County) POPLAR (Field)

Well No. BIERE # A-1 (SWD) (m. sec.) SEC. 22 T28N R51E (Township) (Range) (Meridian)

The well is located 1750 ft. from {~~N~~ S} line and 140 ft. from {~~E~~ W} line of Sec. 22

* For notice of intention to drill, write the API* or the well name of another well on this lease if one exists

LOCATE WELL SITE ACCURATELY ON PLAT ON BACK OF THIS FORM.

The elevation of the ground or K.B. above the sea level is 2087'

READ CAREFULLY **DETAILS OF PLAN OF WORK** READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings, cementing points, and all other important proposed work, particularly all details of Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

Subject well was plugged and abandoned on September 15, 1984 by filling the 5½" casing and tubing with 250 sx Class "H" cement. Cut casing 4' below ground level and welded cap on casing. Well P&A 9/15/84

LOCATION INSPECTED & APPROVED

Approved subject to conditions on reverse of form

Date FEB 12 1991

By Floyd W. Podell, field supervisor
District Office Agent Title

Company MESA OPERATING LTD PARTNERSHIP

By Carolyn L. McKee

Title Sr. Regulatory Analyst

Address P.O. Box 2009, Amarillo, Texas 79189

BOARD USE ONLY
API WELL NUMBER

STATE	COUNTY	WELL
2 9	985	21649

NOTE:—Reports on this form to be submitted to the appropriate District for approval.
DRILLING PERMIT EXPIRES SIX MONTHS FROM DATE OF APPROVAL.

7. MUD PROGRAM

The No. 1-22 Biere was drilled with fresh water and native mud, with the addit of 50 barrels of diesel oil, to near the Piper Limestone, where a Chemical Gel Mud was mixed. A Chemical Gel mud was then maintained to total depth, with a water loss of less than 10 cc. while drilling the Charles Formation.

Water flows were first noticed while making a trip for a new bit at 3265 feet, immediately below the top of the Dakota Sandstone. A tight connection at 763 also indicated a possible water flow from the Judith River. Both formations are used for salt water disposal from the nearby East Poplar Field. By the ti the Otter-Upper Kibbey section from approximately 5000-5175 had been drilled, the water flow had become serious, and attempts to control the flow while circulating on bottom were unsuccessful. The Judith River, immediately below the surface casing, was squeeze cemented; however the water flow continued. With the rams closed, a 10.7-10.9 mud was mixed and the water flow finally stopped. The mud weight was kept in this range for the remainder of the well and no further problem was experienced with the water flow. Some damage occurred in the potential producing zone, the Charles C-2 Zone, as a result of the relativ heavy mud. It is believed the water flow was coming from both the Judith Rive and Dakota formations.

Mud costs are not yet available, but they will be much higher than normal due to the above mentioned water flow.

8. BIT RECORD

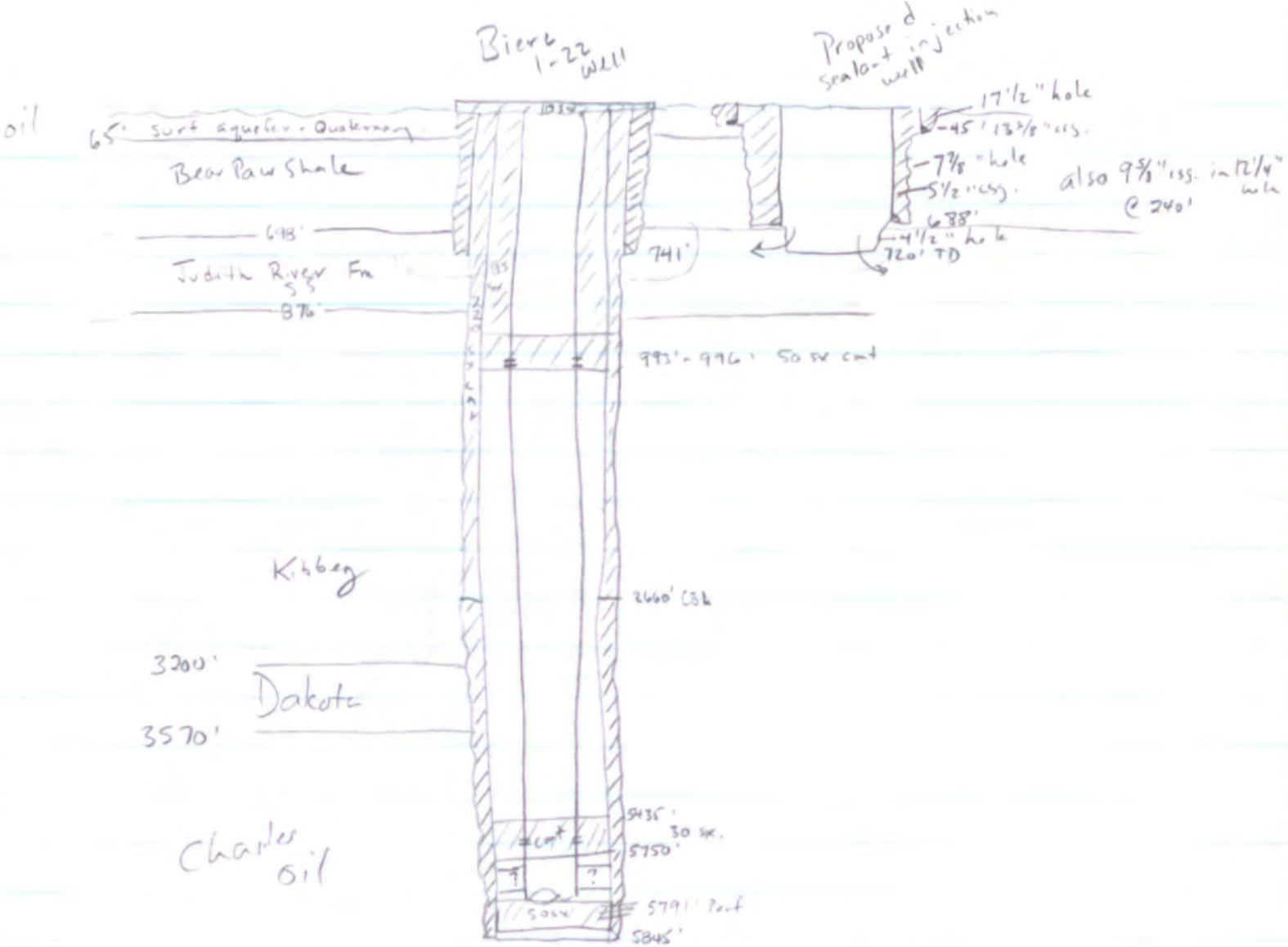
No.	Type	Make	Jet Size (32nds)			Depth Out	Feet	Hours	Deviation
1-S*	HTC	OSC3A	16	16	16 (RR)	745	705	8½	**
1	STC	SDS	14	14	14	3265	2520	21½	¼°
2	STC	SDT	14	14	16	3729	464	9½	Stuck pipe
3	HTC	OSC1G	14	14	16	4183	454	15½	
4	Sec	S4T	14	14	16	4512	329	15½	¼°
5	Sec	S88	14	14	16	4885***	373	23¼	Pull for DST
5	Sec	S88 RR	14	14	16	5175	290	20	
6	Sec	S6	14	16	16	5175	0	—	Cond. Hole
7	Sec	S88	14	16	16	5344	169	23½	1°
8	Sec	M4N	14	16	16	5518	174	21	
9	HTC	OWV	14	16	16	5686	168	20½	1¼°
10	Sec	M4N	14	16	16	5800	114	15½	
11	STC	VT	15	15	15	5845	45	5½	

* Bit 1-S was 12 1/4" in diameter; all other bits used were 7 7/8" diameter

** Other straight-hole surveys were taken as follow: ¼° at 222', ¼° at 426', ¼° at 673'.

*** 4885' Board = 4886.49' S.L.M. (no correction made)

RECEIVED
FEB 25 2
Office of Enforcement
Compliance & Environmental
Justice



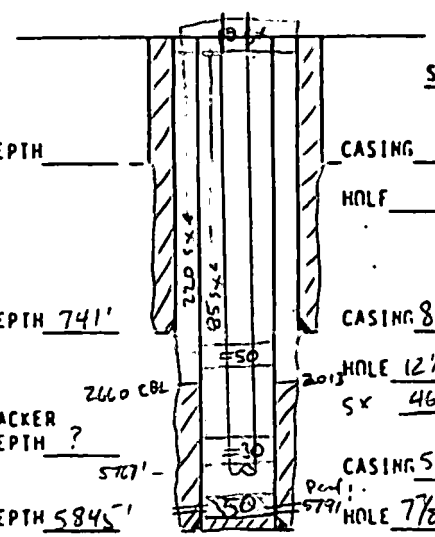
Better Well Pattern:

By N. Wiser 1-2-01

CANDIDATE WELL

Biere #1-22 Prod. well

{T28N R51E S22
1980' SL 660' WL}



698'
876' Judith River
3200'
3570' Dakota
4840'
4992' Tyler
5155'
5288' Kibby
5516'
5805' Charles 'A', 'B', 'C'

Drilled 5-6-70 → 6-8-70 Mesa Petroleum Co., Amarillo TX

DSTs: (1) 3-4-70 ? Tyler Fm: 4842' – 2486# = .513 psi/ft
4881' – 2495# = .511 psi/ft

(2) 5-19-70 Kibby Fm 5113' – 2514# = .492 "
5171' – 2553# = .494 "

(3) 5-24-70 Charles Fm 5753' – 2933# = .510 "
5796' – 2931# = .506 "

4-1-72 operated by Mr. John Snyder – Billings MT

7-1-72 operated by AMARCO Billings MT
↳ (earthen pits full of H_2O (salt) and under oil + water) – 3-31-76 ltr.

12-1-76 operated by Mesa Petroleum – Amarillo, TX

9-17-84 — — Tubing (2 7/8") cemented in! w/ perfs
P+A: (1) 50 sxs squeezed into perfs @ 5791'
TOC = 5760'

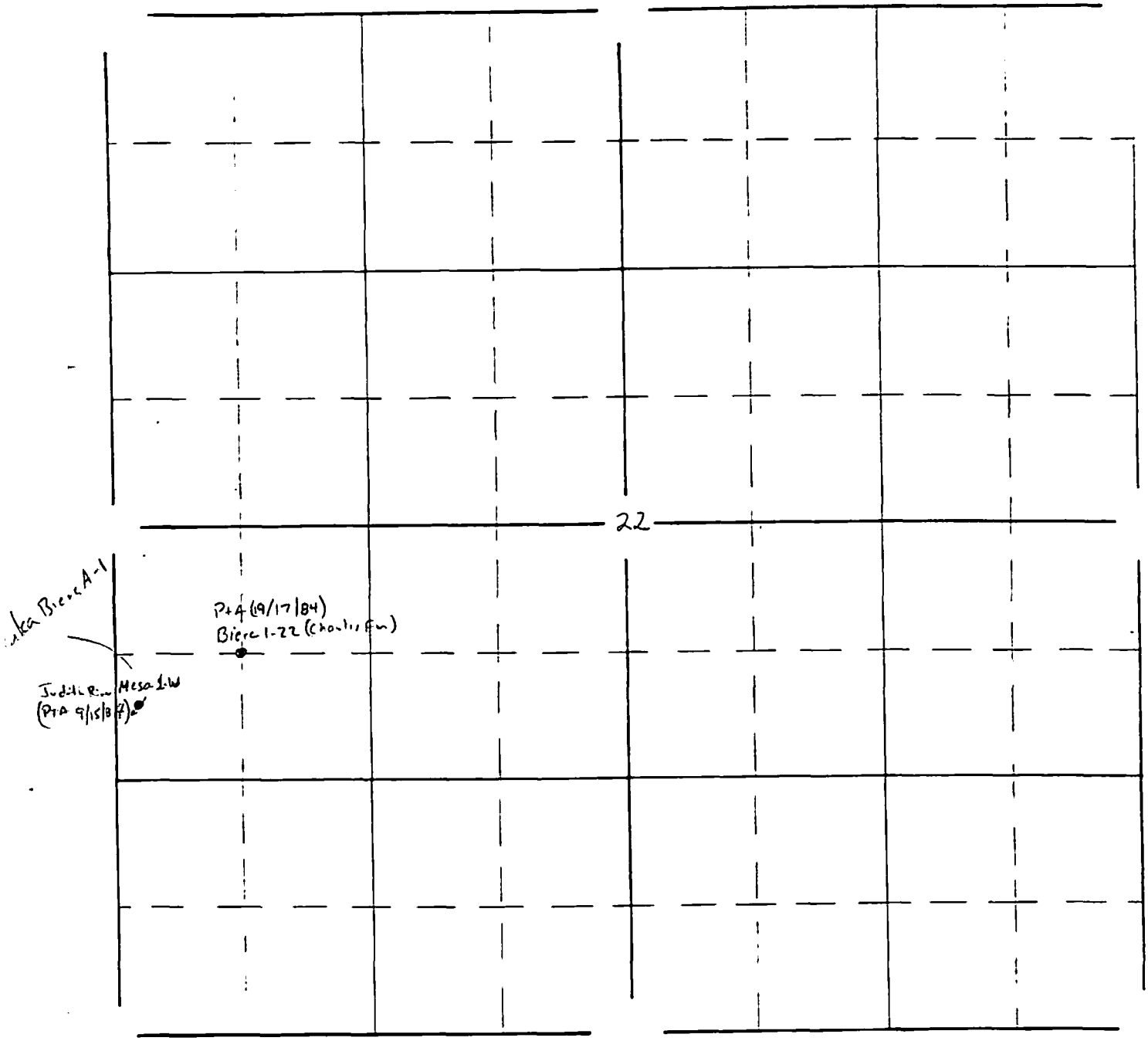
(2) 50 sx plug 5435' – 5750' (perf'd tubing)

(3) 50 sx plug 993' – 996' (perf'd tubing)

(4) 85 sx – sent down 5 1/2" x 2 7/8" annulus

(5) 220 sx – sent down 8 5/8" x 5 1/2" annulus

7-12-85 → 7-29-85 'Relief' well drilled + plugged



LEGEND

- Dry Hole
- Oil Well
- Gas Well
- Water Disposal Well
- Water Injection Well
- Abandoned Oil Well
- Abandoned Gas Well
- Abandoned Disposal Well
- Abandoned Injection Well

DATUM

OPERATOR: _____

LSE. NAME & NO. _____

LOCATION: T28N; R51E; S22

COUNTY: Roosevelt MT

DATE: _____

SCALE: 1" = 500'

Permit

Cem. Top ○ Sur. Ele.

Plug Int. U.S.D.W.

Plug Int. Inj. Zone

T. D.

WELL REPORT

MESA PETROLEUM COMPANY

NO. 1-22 BIERE

NW SW Section 22-28N-51E
Roosevelt County, Montana

1. GENERAL DATA

Elevations: 2074' G.L.; 2086' K.B.

Spudded: May 6, 1970 - 3:45 p.m.

Surface Casing: Ran 24 joints 8 5/8" casing (729.50'), cemented at 741' with 365 sacks 50-50 Posmix, 2% calcium chloride, 1/4# Flocele/sack, tailed-in with 100 sacks Regular Cement, 2% calcium chloride, 1/4# Flocele/sack, plug down 8:45 p.m., May 7.

Total Depth: 5845' Driller; 5845' Schlumberger (ceased drilling May 25)

Production Casing: Ran 175 joints used 5½" casing, cemented at 5845' (set in full tension), cemented with 675 sacks Halliburton Light Cement, 10# Gilsonite/sack for first 625 sacks, salt saturated, tailed-in with 50 sacks Class G Cement, 1% Latex, displaced with 138 barrels salt water, full returns, plug down 5:45 a.m., May 27.

Status: W.O.C. (May 28), will production test Charles C-2 Zone

Contractor: Calvert Drilling and Exploration Company - Rig 22
Tool Pusher - Elwood Erickson

2. FORMATION TOPS AND MARKERS (Laterolog-Gamma Ray)

Name	Depth	Datum
Cretaceous		
Base Judith River	878	+1208
Eagle	1140	+946
Niobrara	1990	+96
Greenhorn	2343	-257
Muddy Sandstone	2940	-854
Dakota Siltstone	3128	-1042
Dakota Sandstone	3200	-1114
Jurassic		
Morrison	3570?	-1484
Swift	3593	-1507
Vanguard	3920	-1834
Rierdon	4103	-2017
Piper Shale	4283	-2197
Piper Limestone	4361	-2275
Kline	4499	-2413
Triassic		
Spearfish	4604	-2518
Pennsylvanian		
Amsden	4708	-2622
Tyler	4840	-2754
Tyler Sandstone	4856	-4968

FORMATION TOPS AND MARKERS (Continued)

Mississippian		
Otter	4992	-2906
Kibbey Sandstone	5130	-3044
Kibbey Limestone	5287	-3201
Charles	5446	-3360
A-4 Zone	5502	-3416
6th Salt	5581	-3495
B-1 Zone	5634	-3548
B-2 Zone	5652	-3566
B-3 Zone	5672	-3586
B-4 Marker (Base Greenpoint Anhydrite)	5702	-3616
C-2 Zone	5788	-3702
(Total Depth)	5845	-3759

3. CORES - None

4. DRILL STEM TESTS

Three Drill Stem Tests were taken on the No. 1-22 Biere, and the results of these tests are given below. All tests are straight anchor open-hole tests made by the Halliburton Company. No water cushion was used.

Drill Stem Test No. 1, 4859-4885, (Tyler), ¼" top choke, ¾" bottom choke 15 minute Preflow with weak to strong blow in 7 minutes, 30 minutes ISI, Reopened tool for 60 minutes with fair blow, strong blow in 5 minutes continuing for remainder of flow period, 60 minute FSI, No gas or fluid to surface.

Pipe Recovery: 120' Very slightly Mud Cut and Oil-flecked Salt Water
1369' Oil-flecked Salt Water (12,000 ppm Chlorides)
1489' Total Fluid

Pressures: First Flow 72-201 Second Flow 201-601
Shut-in 2500-2486 Hydrostatic 2557-2543

Chamber Recovery: 13 psi, No Gas, Trace Oil, 2150 cc Salt Water

Remarks: BHT 216°F., MW 10.0, Vis 100+; Water flow throughout test--probably from Judith River. Charts indicated possible formation damage. Test was mechanically successful.

Drill Stem Test No. 2, 5135-5175, (Kibbey), ¼" top choke, ¾" bottom choke 15 minute First Flow Period with steady weak 1" blow, 90 minute First Shut-in Period, 15 minute Second Flow Period with weak steady 1" blow, 15 minute Second Shut-in Period, 120 minute Third Flow Period, steady weak 1" blow in 4 minutes, 2¾" blow in 40 minutes, 4" blow in 70 minutes that decreased slightly to end of flow period, 120 minute Final Shut-in Period, No gas or fluid to surface.

Pipe Recovery: 180' Slightly Oil and Gas Cut Drilling Mud
120' Slightly Water Cut and Oil and Gas Cut Drilling Mud
60' Slightly Mud Cut Water with Trace of Oil and Gas
559' Slightly Oil and Gas Cut Water
919' Total Fluid

Pressures: First Flow 86-115 Second Flow 143-186 Third Flow 195-387
First Shut-in 2600 Second Shut-in 2355 Third Shut-in 2514
Hydrostatic 2876-2731

Chamber Recovery: Trace Gas with 16 psi, 100 cc Black Oil, 2050 cc Water

Remarks: BHT 218°F. Sampler Water had chlorides of 76,000 PPM, as measured by mud engineer, which differed considerably from Halliburton's Rw and salinity measurements. Test was mechanically successful.

DRILL STEM TESTS (Continued)

Drill Stem Test No. 3, 5785-5800', (Charles C-2 Zone), ¼" top choke, ¾" bottom choke; 15 minute Preflow with weak to strong blow in 10 minutes, ISI 30 minutes, Reopened tool for 120 minutes, ½" weak blow initially increasing to strong blow in 20 minutes which continued for remainder of flow period, 90 minute FSI (blow died immediately when tool was shut-in). No Gas or Fluid to surface.

Pipe Recovery: 400' Clean Green Oil (4.5 bbls.) 41° at 60°F.
120' Mud Cut Oil (1.7 bbls.)--50%+ Oil
160' Gas-Oil-Mud Emulsion (.96 bbls.)
310' Water (1.86 bbls.)--gray, sulfurous, salty
990' Total Fluid (9.02 bbls.)

Pressures: Preflow 46-139 Main Flow 139-417 Shut-in 2954-2931
Hydrostatic 3414-3392

Chamber Recovery: 0.1 cu. ft. Gas with 50 psi, 800 cc Oil, 1400 cc. Water

Remarks: BHT 221°F., GOR 20:1; Schlumberger measured Rw of 0.04 at BHT, which differed appreciably from Halliburton Rw. Charts indicated considerable formation damage. Test was mechanically successful. 1040' Gas in DP.

5. SAMPLES

Samples were collected as follow: 30' samples from below surface casing to 4400'; 10' samples from 4400' to 5450'; and 5' samples below 5450'. Sample quality was generally fair except when experiencing strong water flow while drilling the Otter-Kibbey Sandstone section, and except where otherwise noted. Samples were examined from shows, but were not described, from 2900-3700'. Samples were examined and described below 4400'. All samples were delivered to the State of Montana Oil and Gas Conservation Commission, Poly Drive, Billings, Montana, for further processing and storage.

6. LOGS AND LOG INTERPRETATION

The following Schlumberger logs were run: Laterolog with Gamma Ray from 741-5840', Sidewall Neutron Porosity Log from 2800-3150' and 4600-5842', Microlaterolog from 2800-3114' and 4616-5844', and a Moveable Oil Plot from 4800-5840'. Mr. Erickson, Schlumberger Engineer, made the following calculations:

Depth Interval	Porosity	Water Saturation	Remarks
4761	13%	80%	Amsden; Rw = .04
4766	5%	93%	
5528	10%	72%	Charles; Rw = .04
5542-44	15%	42%	Shaley
5788-93	20%	31%	Charles C-2 Zone
5795	11%	36%	
5796-98	17%	34%	
5800-02	13%	45%	

The Moveable Oil Plot indicates the Charles C-2 Zone from 5788-5803' to be probably oil productive. No other zones are believed to have economic potential in the No. 1-22 Biere, although the MOP indicates that moveable oil is present in other Charles zones, and in the Kibbey, Otter, and Tyler (Heath) Formations. Most of these zones are argillaceous. Perhaps the most interesting zone is lower Otter interval 5086-5130. Samples were poor in this interval due to a strong water flow occurring at the time it was drilled. A re-examination of samples failed to find any oil shows. It should be noted that 5' of free oil was recovered on a DST of the Otter (from a higher stratigraphic interval) in the Murphy E.P.E. #63 (SW NE 27-28N-51E).

A Drilling Time Log (5" = 100' Vertical Scale) was plotted by the wellsite geologist from 4300-5845'. A copy of the Drilling Time Log is included in this report.

7. MUD PROGRAM

The No. 1-22 Biere was drilled with fresh water and native mud, with the addition of 50 barrels of diesel oil, to near the Piper Limestone, where a Chemical Gel Mud was mixed. A Chemical Gel mud was then maintained to total depth, with a water loss of less than 10 cc. while drilling the Charles Formation.

Water flows were first noticed while making a trip for a new bit at 3265 feet, immediately below the top of the Dakota Sandstone. A tight connection at 763 also indicated a possible water flow from the Judith River. Both formations are used for salt water disposal from the nearby East Poplar Field. By the time the Otter-Upper Kibbey section from approximately 5000-5175 had been drilled, the water flow had become serious, and attempts to control the flow while circulating on bottom were unsuccessful. The Judith River, immediately below the surface casing, was squeeze cemented; however the water flow continued. With the rams closed, a 10.7-10.9 mud was mixed and the water flow finally stopped. The mud weight was kept in this range for the remainder of the well and no further problem was experienced with the water flow. Some damage occurred in the potential producing zone, the Charles C-2 Zone, as a result of the relatively heavy mud. It is believed the water flow was coming from both the Judith River and Dakota formations.

Mud costs are not yet available, but they will be much higher than normal due to the above mentioned water flow.

8. BIT RECORD

No.	Type	Make	Jet Size (32nds)			Depth Out	Feet	Hours	Deviation
1-S*	HTC	OSC3A	16	16	16 (RR)	745	705	$8\frac{1}{4}$	**
1	STC	SDS	14	14	14	3265	2520	$21\frac{1}{2}$	$\frac{3}{4}^{\circ}$
2	STC	SDT	14	14	16	3729	464	$9\frac{1}{4}$	Stuck pipe
3	HTC	OSC1G	14	14	16	4183	454	$15\frac{1}{2}$	
4	Sec.	S4T	14	14	16	4512	329	$15\frac{1}{2}$	$\frac{1}{4}^{\circ}$
5	Sec	S88	14	14	16	4885***	373	$23\frac{3}{4}$	Pull for DST
5	Sec	S88 RR	14	14	16	5175	290	20	
6	Sec	S6	14	16	16	5175	0	--	Cond. Hole
7	Sec	S88	14	16	16	5344	169	$23\frac{1}{4}$	1°
8	Sec	M4N	14	16	16	5518	174	21	
9	HTC	OWV	14	16	16	5686	168	$20\frac{1}{2}$	$1\frac{1}{4}^{\circ}$
10	Sec	M4N	14	16	16	5800	114	$15\frac{1}{2}$	
11	STC	VT	15	15	15	5845	45	$5\frac{1}{4}$	

* Bit 1-S was 12 1/4" in diameter; all other bits used were 7 7/8" diameter bits.

** Other straight-hole surveys were taken as follow: $\frac{1}{2}^{\circ}$ at 222', $\frac{1}{2}^{\circ}$ at 426', $\frac{1}{4}^{\circ}$ at 673'.

*** 4885' Board = 4886.49' S.L.M. (no correction made)

SAMPLE DESCRIPTIONS

Sample descriptions begin at 4300 feet, above the Piper Limestone. Sample depths and tops are corrected for lag. Sample quality is fair, except where otherwise noted. Note: Samples were also examined from 2900-3700 feet, through the Muddy-Dakota sections, although lithology was not described. No shows were found in this interval. No Muddy sand was noted although the Laterolog indicates the presence of sandstone from 2938-2958. Samples were more representative through the Dakota-Lakota sections, especially in the Lakota, which contained much loose, medium grained, quartzose sand.

10-feet samples.

4300-4350 Shale, reddish brown, slightly calcareous, predominently subplaty. Samples are mostly greenish gray shale cavings and brown argillaceous limestone that is possibly from the Piper Limestone section. Sample quality is questionable.

4350-4359 Shale, as above, with interbedded Limestone, tan, grayish brown, crypto-microcrystalline, argillaceous, no visible porosity.

4359 Piper Limestone

4359-4385 Limestone, dark grayish brown, crypto-microcrystalline, argillaceous, no visible porosity. Stringers Shale, greenish gray, platy-subplaty.

4385-4415 Limestone, tan, brown, occasionally cream, crypto-microcrystalline, rarely pseudoolitic, usually earthy and argillaceous, no visible porosity. Stringers Shale, as above.

4415-4450 Shale, greenish gray, subplaty-platy. Shale, tan, brownish gray, calcareous-very calcareous--grading to argillaceous Limestone.

4450-4475 Shale, predominently greenish gray, tan, predominently subplaty. Interbedded Limestone, tan, brown, cryptocrystalline, rarely pseudoolitic-fragmental, argillaceous, no porosity.

4475-4500 Shale, greenish gray, some tan, predominently platy-subplaty.

4500-4600 No description--samples very poor due to inexperienced sample catcher. Samples consist entirely of coarse shale cavings.

4600-4620 Loose Sand, predominently clear, some orange, red, gray, tan, fine-coarse grained, predominently medium grained, subangular, locally subround, quartzose, questionable porosity. Shale, brownish red, reddish brown, greenish gray.

4620 Spearfish (Top possibly at 4603')

4620-4650 Shale, orange red, brownish red, very silty--grades to Siltstone. Much soft orange-red Shale washes out of samples.

4650-4695 Shale, as above, local white anhydrite inclusions, trace Anhydrite, white, pink.

4695-4706 Shale, as above, often grading to Siltstone, becoming more anhydritic.

4706 Amsden

4706-4750 Varicolored Shale, maroon, brownish red, reddish brown, locally waxy. Streaks Limestone, very light gray, off white, pink, lavender, purple, cryptocrystalline, no visible porosity.

4750-4760 Limestone, as above, becoming dolomitic in part with depth. Streaks Shale, as above. Samples mostly greenish gray shale cavings.

4760-4765 Shale, varicolored, mostly maroon, brownish red.

4765-4816 Limestone, off white, very light tan, locally with pink-red mottling, crypto-microcrystalline, poor intercrystalline porosity and "chalky" porosity. Trace Dolomite, pink-red, cryptocrystalline, no visible porosity. Trace varicolored Shale.

4816 or 4640 Tyler

4816-4855 Shale, maroon, brownish red, reddish brown, locally slightly silty. Samples 90% Amsden limestone.

4855-4870 Shale, as above, with trace Sandstone; red-light gray, fine grained, locally very fine or very fine-fine grained, subangular, locally argillaceous, quartzose, tight, no show. Trace loose fine grained, clear quartz Sand--cavings?

4870-4885 Sandstone, light red to very light gray with reddish cast, locally red, predominently fine grained, locally very fine-fine grained, subangular, little red argillaceous cement, quartzose (clear quartz), poor-fair porosity, often tight, 20-30% with pale yellow fluorescence and weak cut, no stain. Possible stringers brownish red shale.

4885-Circ. Samples $1\frac{1}{2}$ hrs. Sandstone, as above, with slight oil show as above. Ran DST 1, 4859-4884.

4885-4892 Sandstone, as above, with slight oil show, as above.

4892-4930 Sandstone and loose Sand, white, occasionally red, light red, fine-coarse grained, predominently medium-fine grained, subangular-subround, occasionally round (better rounded with depth), quartzose, fair porosity, in part with weak yellow fluorescence and weak fluorescent cut. Streaks Shale, brownish red, occasionally lavender, light brownish red, occasionally red, tan, green, usually nonsilty.

4930-4950 Sandstone and loose Sand, white, light gray, occasionally red, fine-medium grained, subangular-subround, questionable porosity, some clusters have weak yellow fluorescence and very weak fluorescent cut. Some Shale, as above.

4950-4962 As above, increase in loose fine grained Sand, as above, often red, becoming better rounded.

4962-Circ. Samples 1 hr. Sand, loose, predominently red, occasionally light gray, colorless, fine-coarse grained, predominently fine grained, subround-subangular, occasionally round, quartzose, occasionally in friable red-white clusters, no show. Little Shale, as above.

4962-4975 Shale and Sandstone, as above, usually loose.

4975-4996 Shale, varicolored, predominently greenish gray, gray, grayish green, also reddish brown, brownish red, green.

4996 Otter

4996-5060 Shale, as above, becoming more varicolored, including vivid green, maroon, pale green, green. Limestone, off white, cream, in part light tan with reddish cast or pink-red mottling, matrix, cryptocrystalline, locally soft and chalky, often dolomitic, no visible porosity.

5060-5085 Interbedded varicolored Shale and Limestone, as above; some Limestone is off white-light tan, crypto-very fine crystalline, hard, no porosity.

5085-5134 Varicolored Shale, as above, gray, green, maroon, brownish red, greenish gray, trace pale green; some Shale, red-very light gray mottled, slightly calcareous

5134? Kibbey Sandstone

5134-5157 Siltstone, brownish red, red-orange, very argillaceous--grading to very fine grained Sandstone, tight. Interbedded Shale, brownish red, maroon. Samples due to water flow.

5157-5161 Sandstone, white, very fine-fine grained, subangular, quartzose (clear quartz), poor-fair porosity, approximately 50% with strong yellow fluorescence, and weak streaming cut, no stain. Poor samples due to water flow--mostly gray shale cavings.

5161-5169 Interbedded Siltstone and Shale, as from 5134-57.

5169-5175 Sandstone, as above, with oil show as above. Possible streaks Shale and Siltstone, as above--very poor samples.

5175-Circ. Samples 3 hrs. As above. Poor samples--much gray shale cavings and some reddish colored shales from Otter. Much loose Sand, clear, trace red, fine-medium, subangular to round, quartzose, questionable porosity, no show. Ran DST 2, 5135-5175.

5175-5188 Shale, brownish red, brick red. Some red-orange very fine grained Sandstone. Samples mostly greenish gray shale cavings.

5188-5200 Sandstone, red-orange, few dark gray grains, very fine-fine grained, scattered medium grains, subround-subangular (larger grains are better rounded), slightly argillaceous to argillaceous, slightly calcareous, friable, fair porosity, no show.

5200-5205 Shale, reddish brown, brick red, as above.

5205-5222 Siltstone and very fine grained Sandstone, red-orange, locally with very fine-fine grains, argillaceous, slightly calcareous, tight, no show. Some gray shale cavings.

5222-5238 Sandstone, red-orange to orange, locally with few green grains, predominently fine grained, locally very fine-fine grained, subround to subangular, slightly argillaceous to argillaceous, calcareous, fair-poor porosity, no show

5238-5252 Siltstone, red-orange, calcareous, argillaceous, grades to very fine grained Sandstone, tight, no show. Varicolored Shale, predominently red-orange, brick red, slightly calcareous to calcareous--locally soft and marly, trace grayish green.

5252-5256 Sandstone, red-orange, very fine-fine grained, scattered medium grained, predominently subround, calcareous, argillaceous, poor porosity, no show.

5256-5270 Siltstone and very fine grained Sandstone, with varicolored Shale, as from 5238-52, predominently red-orange, brick red, trace pale green, grayish green, maroon. Some Sandstone, red-orange, orange, very fine-fine grained, subround-round, calcareous, fair porosity.

5270-5286 Siltstone-very fine grained Sandstone, as above, with interbedded varicolored Shale, as above.

5286 Kibbey Limestone

5286-5308 Dolomite, cream, light tan, crypto-microcrystalline, silty (grades to dolomitic Siltstone), poor porosity. Limestone, cream, light tan, locally with pink or red cast, cryptocrystalline, subchalky in part, few anhydrite inclusions, no visible porosity.

5308-5320 Siltstone, red-orange, slightly calcareous, argillaceous.

5320-5350 Varicolored Shale, predominently red-orange, silty--grading to Siltstone; some Shale, brownish red, pale green, grayish green, nonsilty.

5350-5390 Varicolored Shale, red-orange, brownish red, reddish brown, some lavender, green, grayish green. Trip for new bit at 5344.

5390-5425 Varicolored Shale, as above. Trace Limestone, cream, light tan, matrix, cryptocrystalline, dolomitic in part, hard, no porosity.

5425-5445 Varicolored Shale, as above. Trace Limestone, cream, off white, cryptocrystalline, hard and dense, no porosity.

5445 Charles

5445-5460 Limestone, very light gray, light tan, local pink-red mottling, cream, matrix, crypto-microcrystalline, no visible porosity, rare fragments with yellow fluorescence and weak streaming cut. Some varicolored Shale, as above, predominently red-orange.

5460-5470 Limestone, dolomitic, tan, light tan, matrix, cryptocrystalline, rare oolites, anhydritic, no visible porosity, trace with yellow fluorescence and weak streaming cut, no stain. Anhydrite, light brown, tan.

5470-5475 Limestone, light gray, tan, brown, fragmental to matrix, cryptocrystalline, rarely oolitic, slightly argillaceous, no visible porosity, trace with yellow fluorescence and weak streaming cut. Little Dolomitic Limestone, tan, microcrystalline, poor intercrystalline porosity, even yellow fluorescence and poor streaming cut.

5475-5490 Limestone, tan, light tan, light brownish gray, matrix, locally matrix with fragmental, subchalky, earthy, no visible porosity.

5490-5495 Limestone, dark brown, grayish brown, matrix, locally matrix with fragmental, cryptocrystalline, hard, dense, no visible porosity, trace with yellow fluorescence and weak fluorescent cut.

5495-5500 Limestone, as above. Anhydrite, white.

5500-5518 Limestone, grayish brown, brown, matrix, cryptocrystalline, hard, no porosity. Limestone, tan, light brownish gray, matrix, cryptocrystalline, subchalky, no porosity, trace with spotty fluorescence and weak cut.

5518-Circ. Samples 1 hr. As above.

5518-5548 Limestone, cream, light tan, matrix, locally matrix with fragmental, cryptocrystalline to locally microcrystalline, often subchalky and earthy, poor intercrystalline porosity, 10% with dull yellow fluorescence and weak fluorescent cut or weak streaming cut, no stain except in few chalky fragments. Interbedded Limestone, brown, dark brown, matrix, cryptocrystalline, locally anhydritic, hard, no porosity, trace with spotty fluorescence and slow streaming cut.

5548-5575 Anhydrite, tan, light gray, cream, white, locally brown, occasionally slightly calcareous or dolomitic; few stringers Limestone or Dolomite, cream, light tan, cryptocrystalline, subearthy, no porosity.

5575-5578 Dolomite, tan, cryptocrystalline, earthy, argillaceous, no visible porosity.

5578-5582 Anhydrite, white, light gray.

6th Salt

5582-5595 Salt, as indicated by drilling time--no salt in samples.

5595-5634 Anhydrite, white, light gray, tan, few salt casts; streaks and interbeds of Limestone, light tan, cream, matrix, cryptocrystalline, locally fragmental, scattered anhydrite inclusions, hard, no visible porosity, trace with weak fluorescence and fluorescent cut.

5634 B-1 Zone

5634-5643 Limestone, tan, light grayish brown, matrix with fine fragmental to matrix, crypto-microcrystalline, locally very fine granular, subchalky in part, poor intercrystalline porosity, 10-20% with spotty yellow-pale yellow fluorescence with weak cut; some Limestone, dark brown, matrix, cryptocrystalline, hard, anhydritic, no visible porosity, trace with spotty yellow fluorescence along possible fracture surfaces.

5643-Circ. Samples 2 hrs. As above.

5643-5653 Anhydrite, white, light gray, occasional dark brown calcareous streaks.

5653 B-2 Zone

5653-5666 Limestone, tan, light brownish gray, occasionally dark brown mottled, matrix, crypto-microcrystalline, hard and brittle to subchalky and earthy, styolitic, few anhydrite inclusions, poor to no porosity, 10-20% with spotty bright yellow fluorescence with weak cut, rarely with oil stain and weak streaming cut.

5666-5669 Limestone, dark brown, brown, matrix, cryptocrystalline, hard, brittle anhydritic, no porosity.

5669-Circ. Samples 2 hrs. Limestone, as from 5653-5669.

5669-5672 Limestone, as from 5666-5669.

5672 B-3 Zone

5672-5678 Dolomitic Limestone and Dolomite, tan-brown, cryptocrystalline, argillaceous, no visible porosity.

5678-5695 Anhydrite, predominently light gray, also white. Poor samples--trip for new bit at 5686.

5695-5703 Anhydrite, as above; interbedded Dolomite, brownish gray, cryptocrystalline, earthy, no visible porosity.

5703 B-4 Marker (Base Greenpoint Anhydrite)

5703-5715 Dolomite and Dolomitic Limestone, tan, grayish brown, matrix, crypto-microcrystalline, locally fine granular, subchalky and earthy in part, poor porosity, trace with weak fluorescence and weak fluorescent cut. Streaks Anhydrite, white, light gray, tan.

5715-5740 Limestone, brown, tan, cream, matrix, cryptocrystalline, locally fine fragmental, few chalky streaks but usually hard and brittle, locally anhydritic, poor-no porosity, trace to 10% with pale yellow fluorescence and weak fluorescent cut. Interbedded Anhydrite, predominently white, light gray.

5740-5755 Limestone, as above, predominently brown, tan, often slightly fragmental, hard, less often cream and subchalky, scattered weak oil show as above. Increase in Anhydrite, as above.

5755-5789 Limestone, brown, occasionally dark brown, tan, matrix to matrix with fine fragmental, cryptocrystalline, few cream subchalky streaks, scattered anhydrite inclusions, very poor or no porosity, 10-15% with yellow or pale yellow fluorescence and weak fluorescent cut. Few streaks Anhydrite, white, light gray, tan.

5789 C-2 Zone

5789-5800 Limestone, tan, light brownish gray, light brown, matrix, crypto-micro-crystalline, locally slightly fragmental, subchalky in part, poor to locally fair intercrystalline porosity, usually with yellow or dull yellow fluorescence (fluorescence becomes brighter after drying), fluorescent cut or slow streaming cut.

5800-Circ. Samples 2 hrs. Limestone, as above. Ran DST 3, ~~5785-5800.~~

5800-5803 Limestone, as above—very poor samples after DST.

5803-5810 Limestone, brown-tan, matrix, crypto-microcrystalline, hard, brittle, poor porosity, scattered yellow fluorescence (10%) with weak cut.

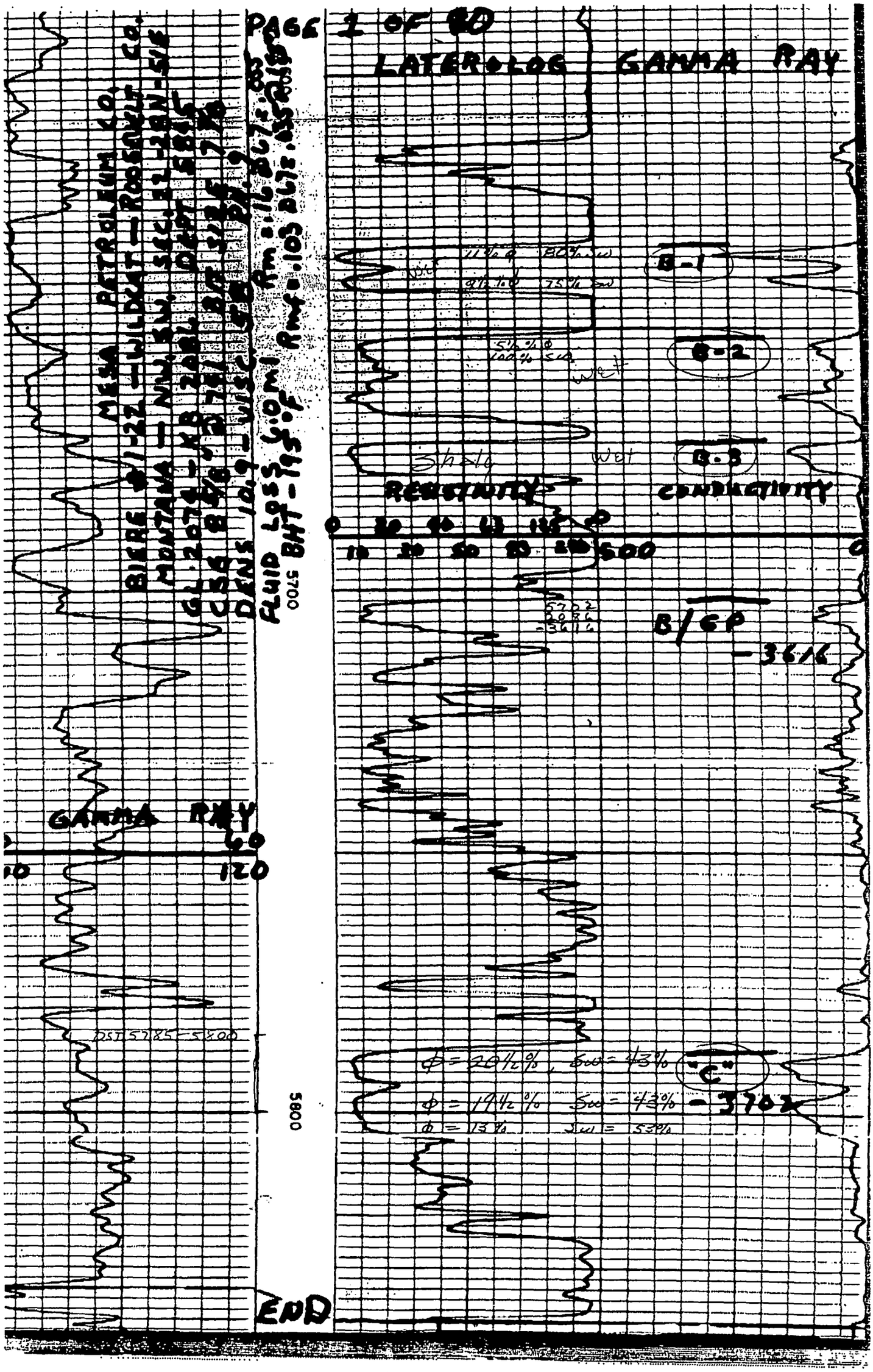
5810-5830 Limestone, tan, brown, dark brown, matrix to matrix with fragmental, crypto-microcrystalline, hard with few softer subchalky streaks, poor porosity, scattered (10%) fluorescence and weak cut as above.

5830-5845 Limestone, with slight oil show as above. Some brown oil in mud that has contaminated some of sample cuttings. Oil is believed to be contamination. Lost some mud while drilling below 5810.

5845-Circ. Samples 2 hrs. As above.

5845 = Driller's Total Depth

5845 = Schlumberger Total Depth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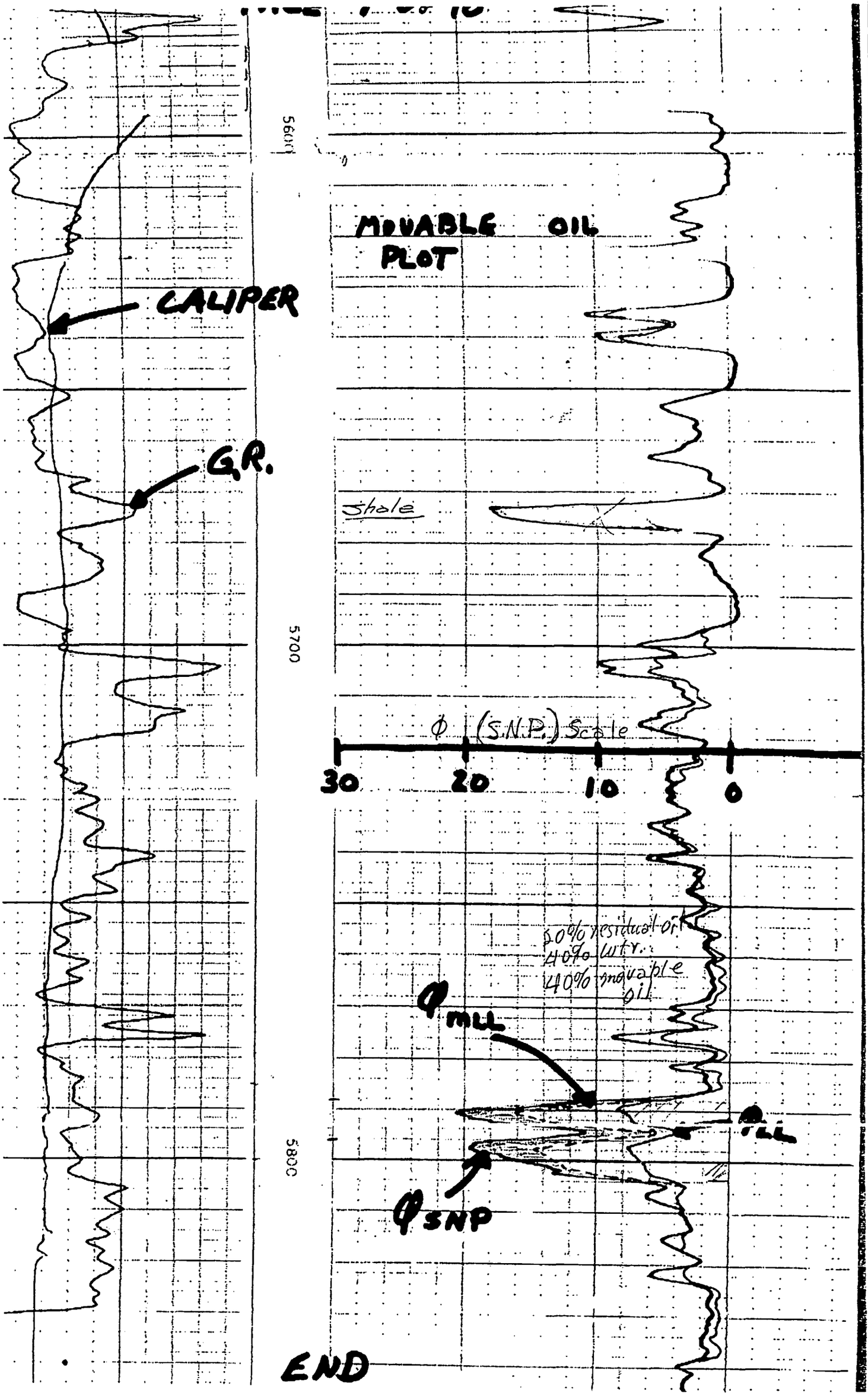
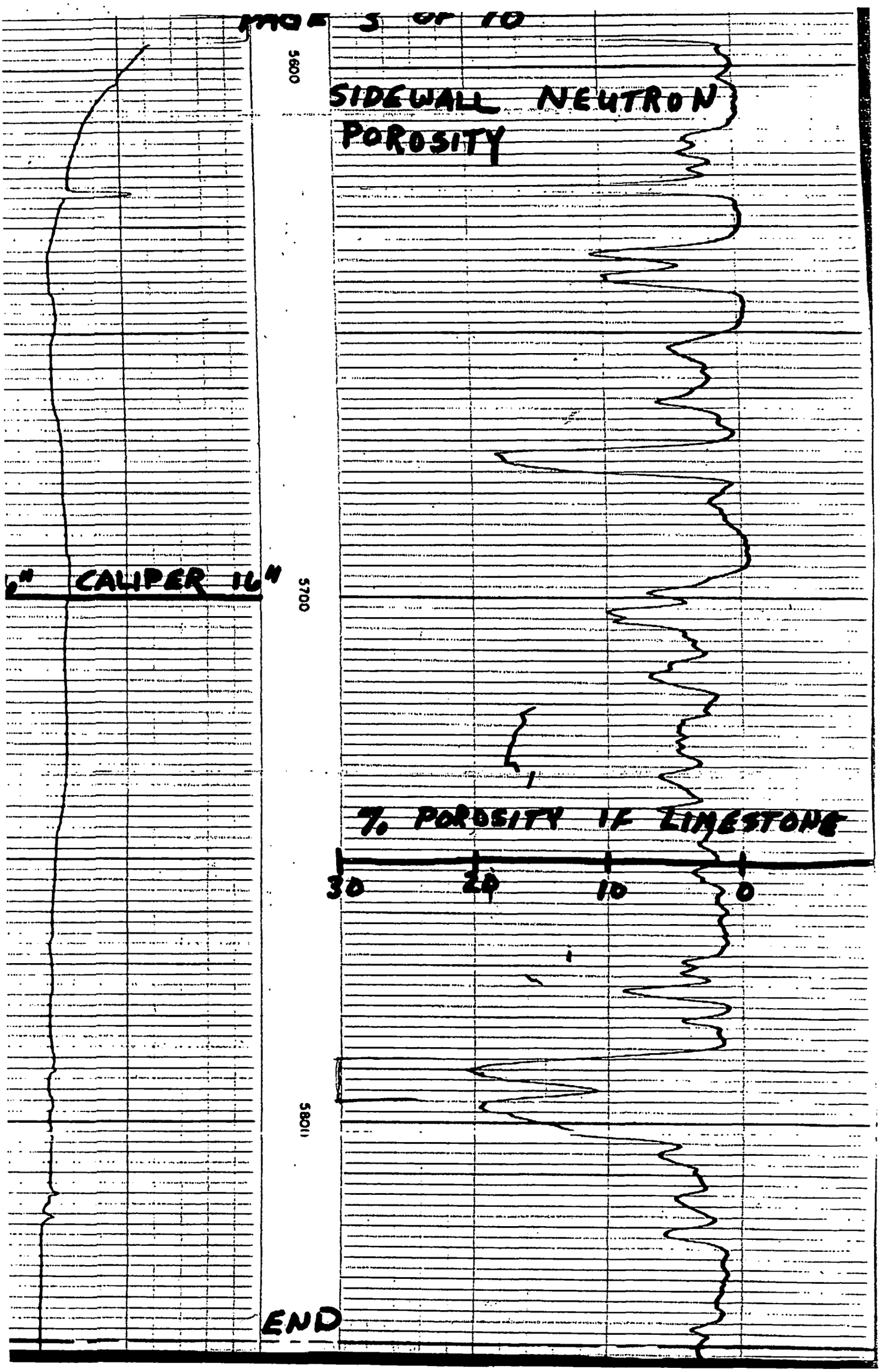
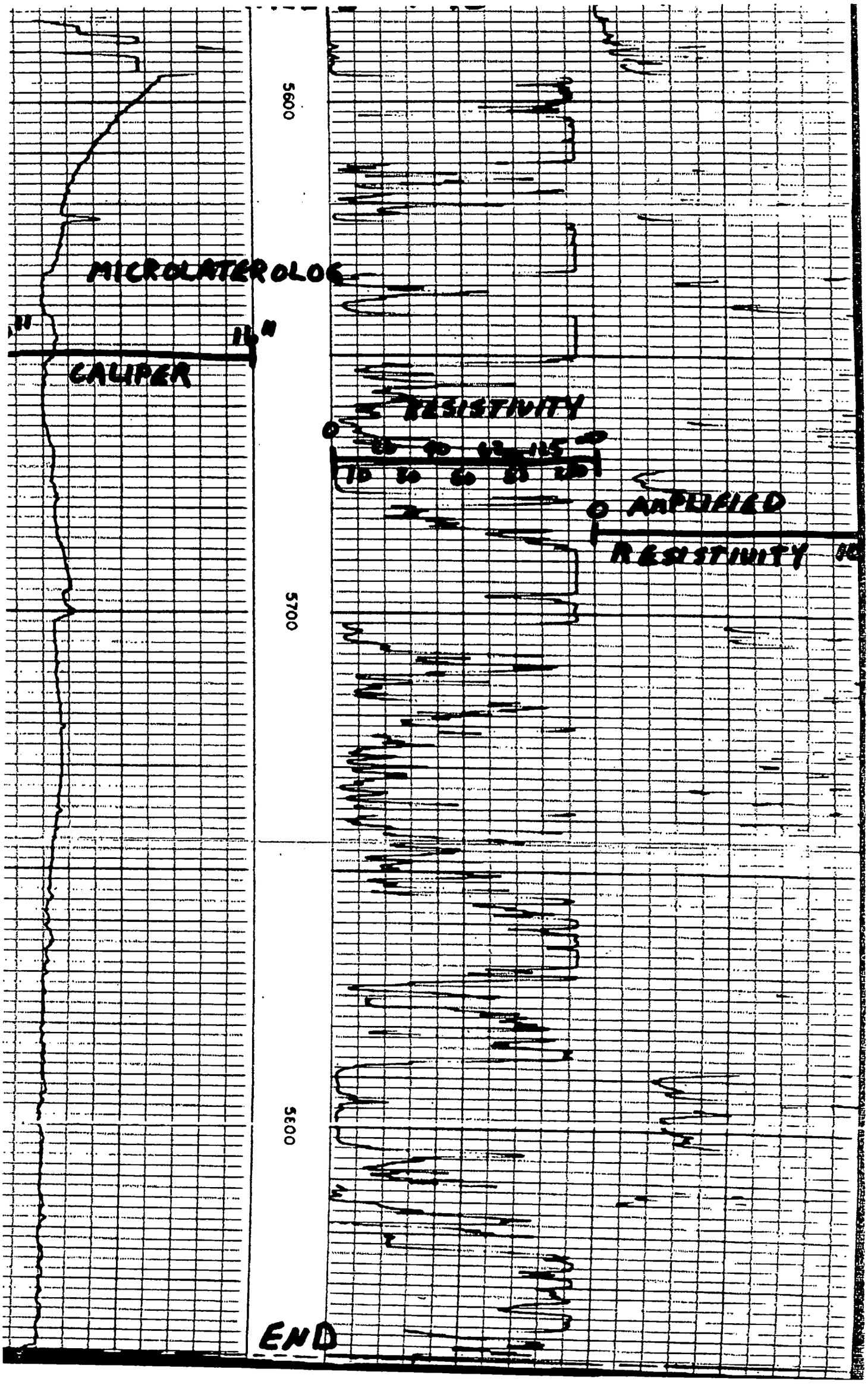
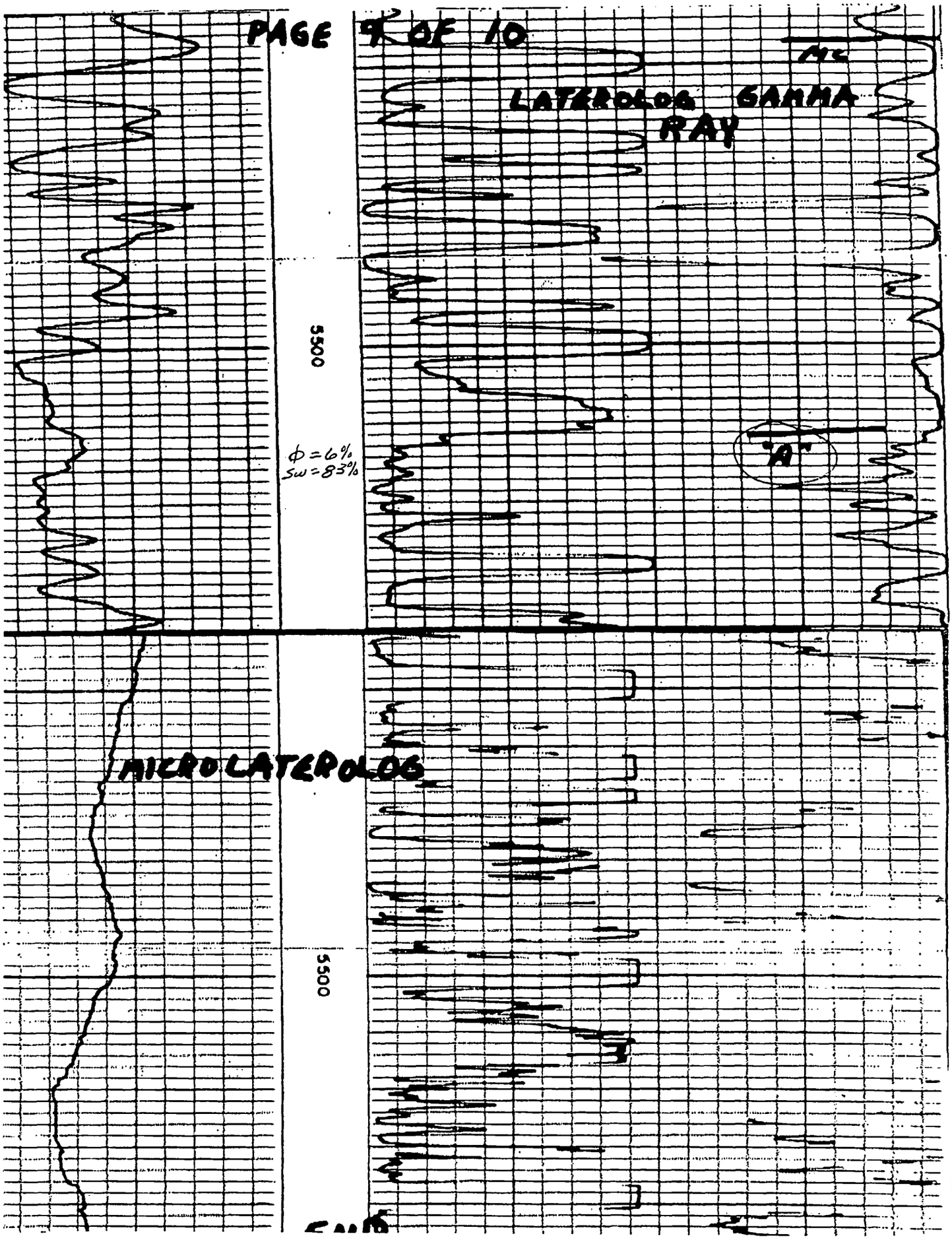
LATEROLOG GAMMA RAY
MESA PETROLEUM CO.
BIERE #1-22 — WILDCAT — ROOSEVELT CO.
MONTANA — NW, SW, SEC. 22-28N-51E
GL 2074 — KB 2086 DEPT 5845
CSG 8 5/8" @ 741 BIT SIZE 7 7/8
DENS 10.9 — VISC 52 PH 9
FLUID LOSS 6.0 ml Rm = .16 @ 67 = .085
BHT - 195°F Rmf = .103 @ 67 = .035 @ 195
5700
11% φ 80% Sw
9½% φ 75% Sw
B-1
5½% φ
100% Sw
wet
B-2
Shale
wet
B-3
RESISTIVITY
CONDUCTIVITY
0 20 40 60 80 100
10 20 50 80 200 500
0
5702
2086
-3616
B/GP
-3616
GAMMA RAY
60
10
120
DST 5785-5800
φ = 20½%, Sw = 43%
"C"
φ = 19½% Sw = 43%
-3702
φ = 13% Sw = 53%
5800
END

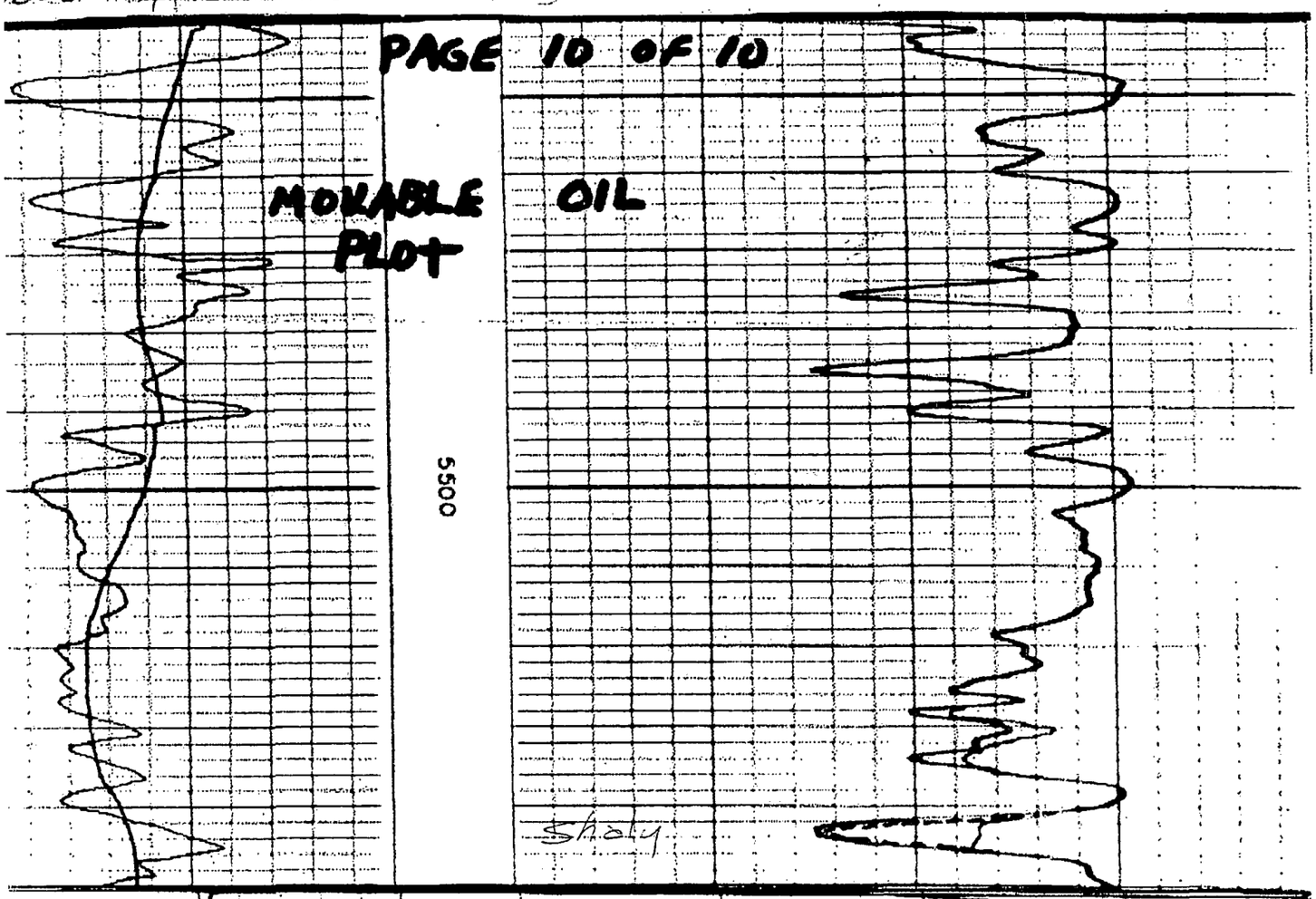

5600
5700
5800
CALIPER
G.R.
MOVABLE OIL PLOT
Shale
φ (S.N.P.) Scale
30
20
10
0
50% residual oil
40% wtr.
40% movable oil
φ MLL
φ LL
φ SNP
END

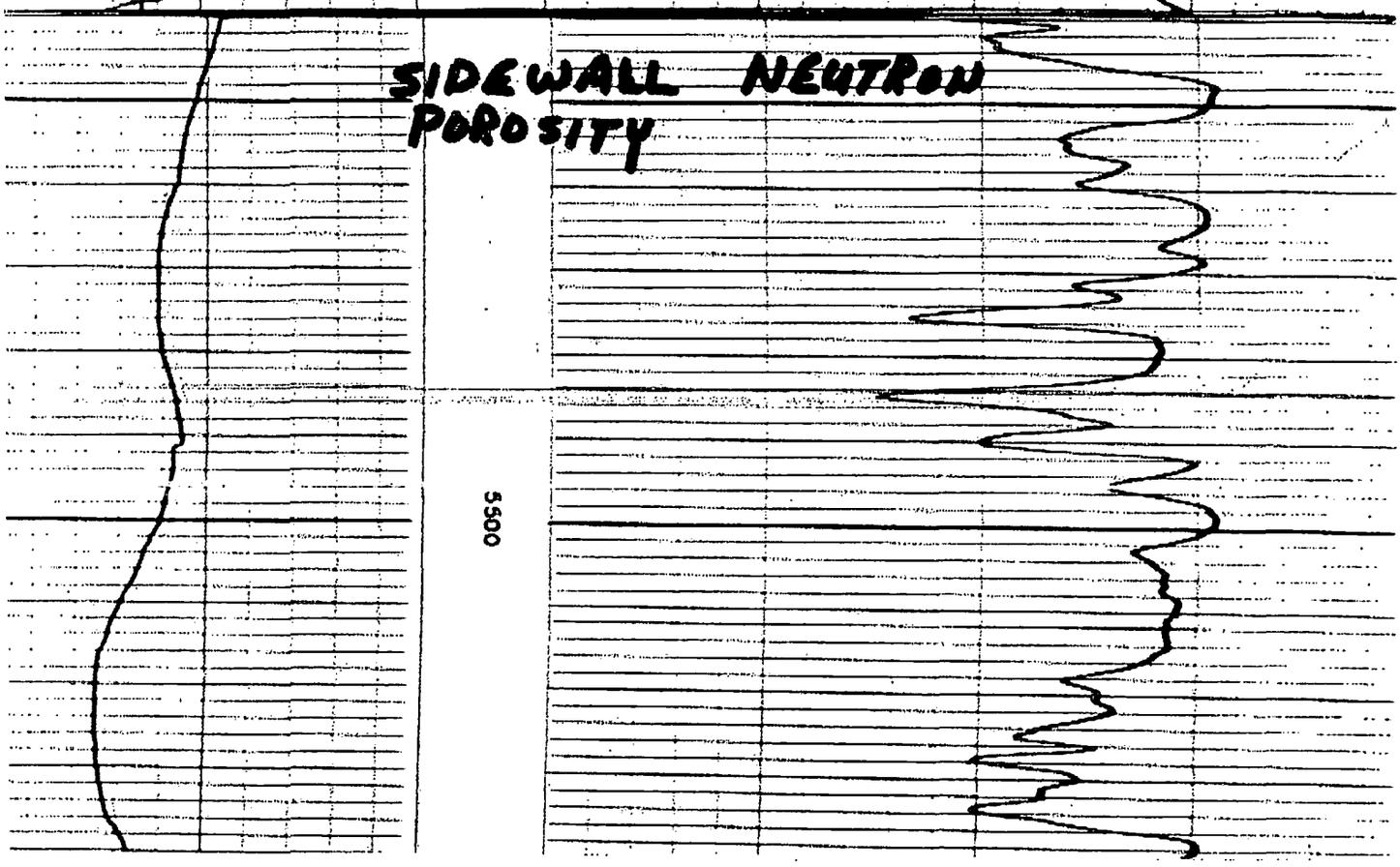

5600
SIDEWALL NEUTRON POROSITY
6" CALIPER 16"
5700
% POROSITY IF LIMESTONE
30
20
10
0
5800
END

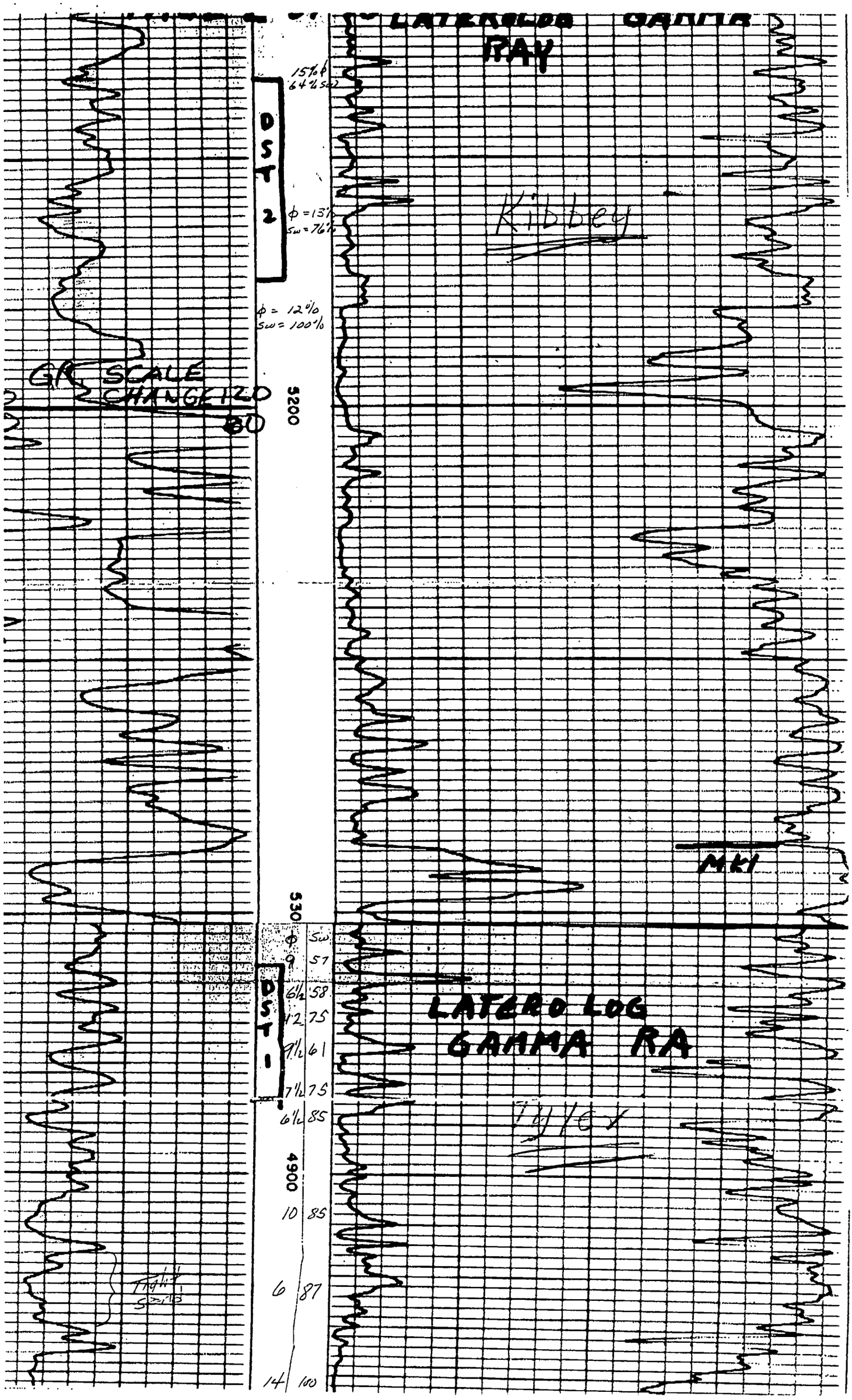

5600
MICROLATEROLOG
11"
11"
CALIPER
RESISTIVITY
0
AMPLIFIED
RESISTIVITY
5700
5800
END

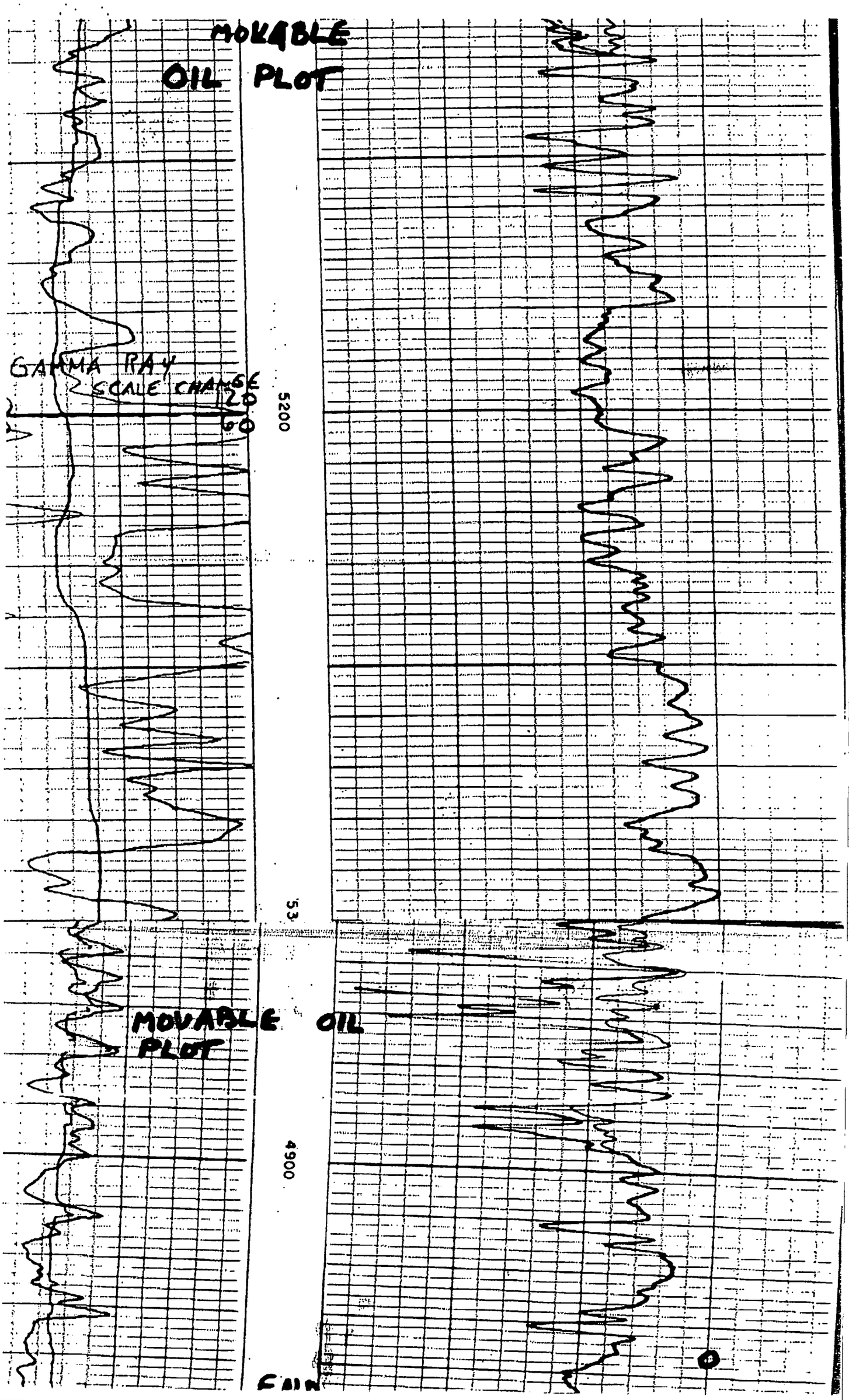

MC
LATEROLOG GAMMA RAY
5500
$\phi = 6\%$
$Sw = 83\%$
"A"
MICROLATEROLOG
5500

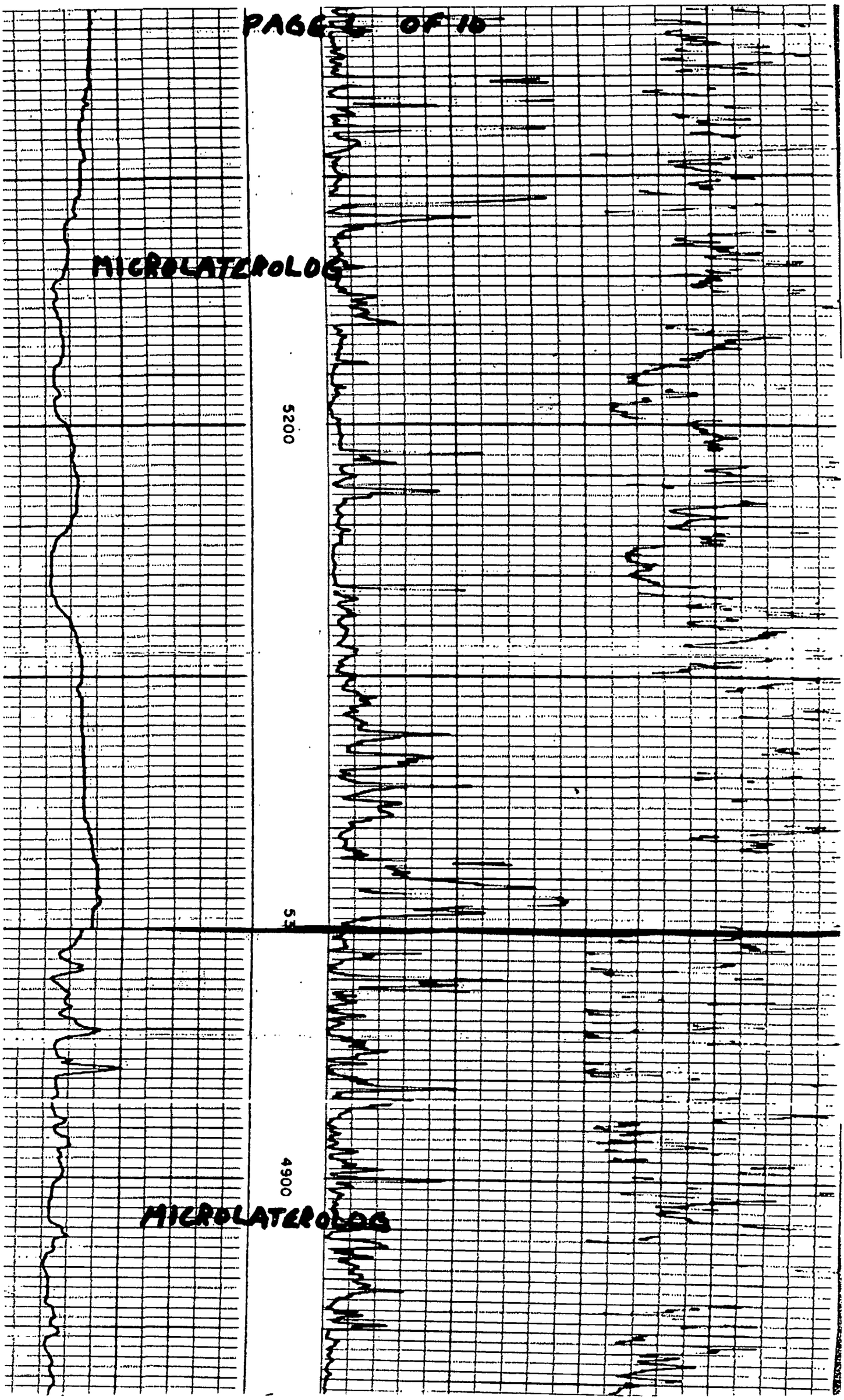
Rw=.04	φ	Rt	Sw	Rw	Rw=.05
4761	13	4	80		
66	5	21	93		
528	10	7	72		
5244	15	8	42		
788-93	20	8	31	.03	43% Sw
6795	11	23	36	.03	42%
6796-98	20	8	31	.03	42%
798-5800	17	9	34	.03	43%
800-04	13	10	45	.03	53%

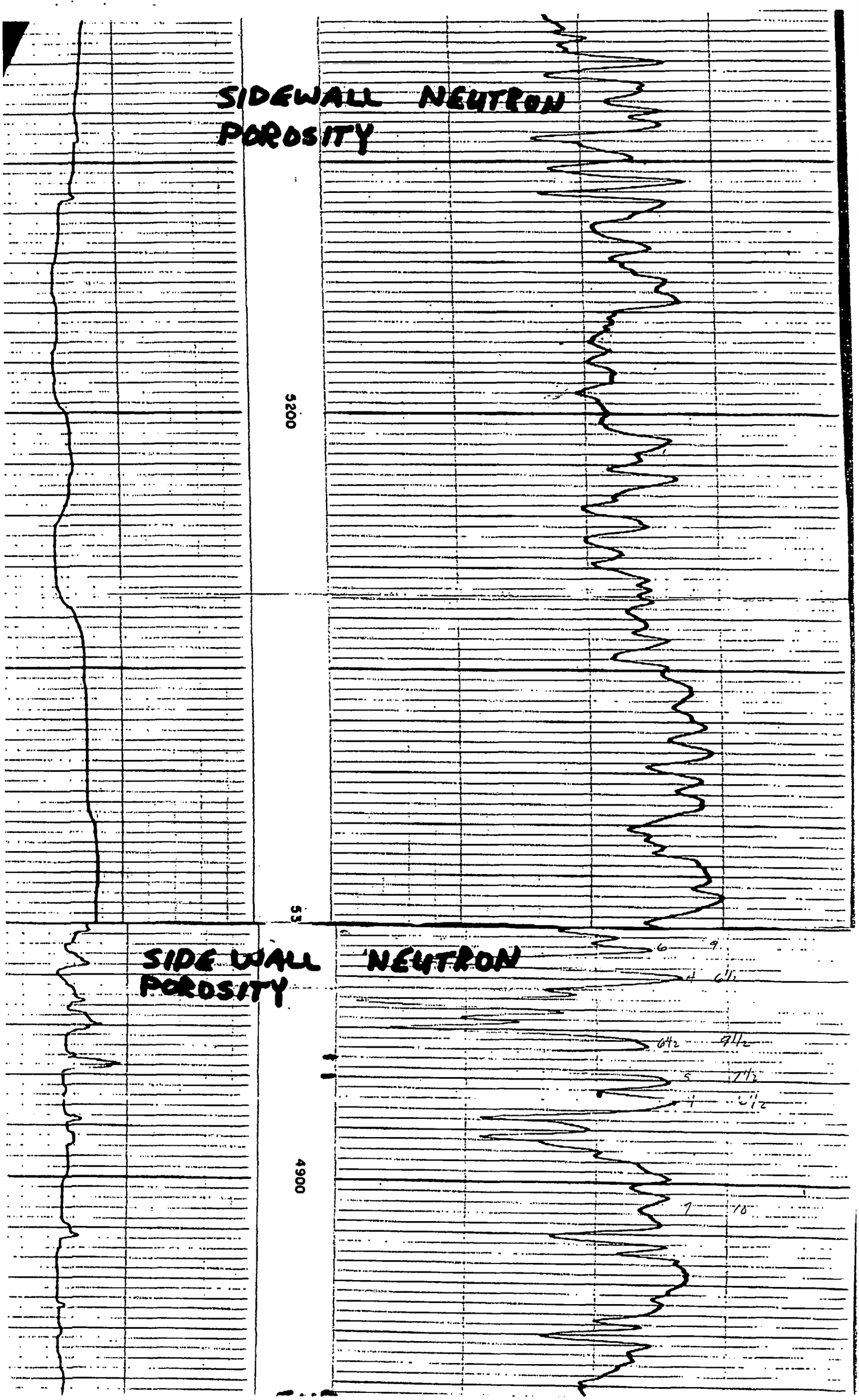





LATERALOG GAMMA RAY
15% φ
64% Sw
DST 2
φ = 13%
Sw = 76%
φ = 12%
Sw = 100%
GR SCALE CHANGE 120
60
5200
Kibbey
MKI
5300
φ Sw
9 57
6½ 58
12 75
9½ 61
7½ 75
6½ 85
DST 1
LATERO LOG
GAMMA RA
4900
10 85
6 87
14 100


MOVABLE
OIL PLOT
GAMMA RAY
SCALE CHANGE
20
60
5200
5300
MOVABLE OIL
PLOT
4900
FAIR

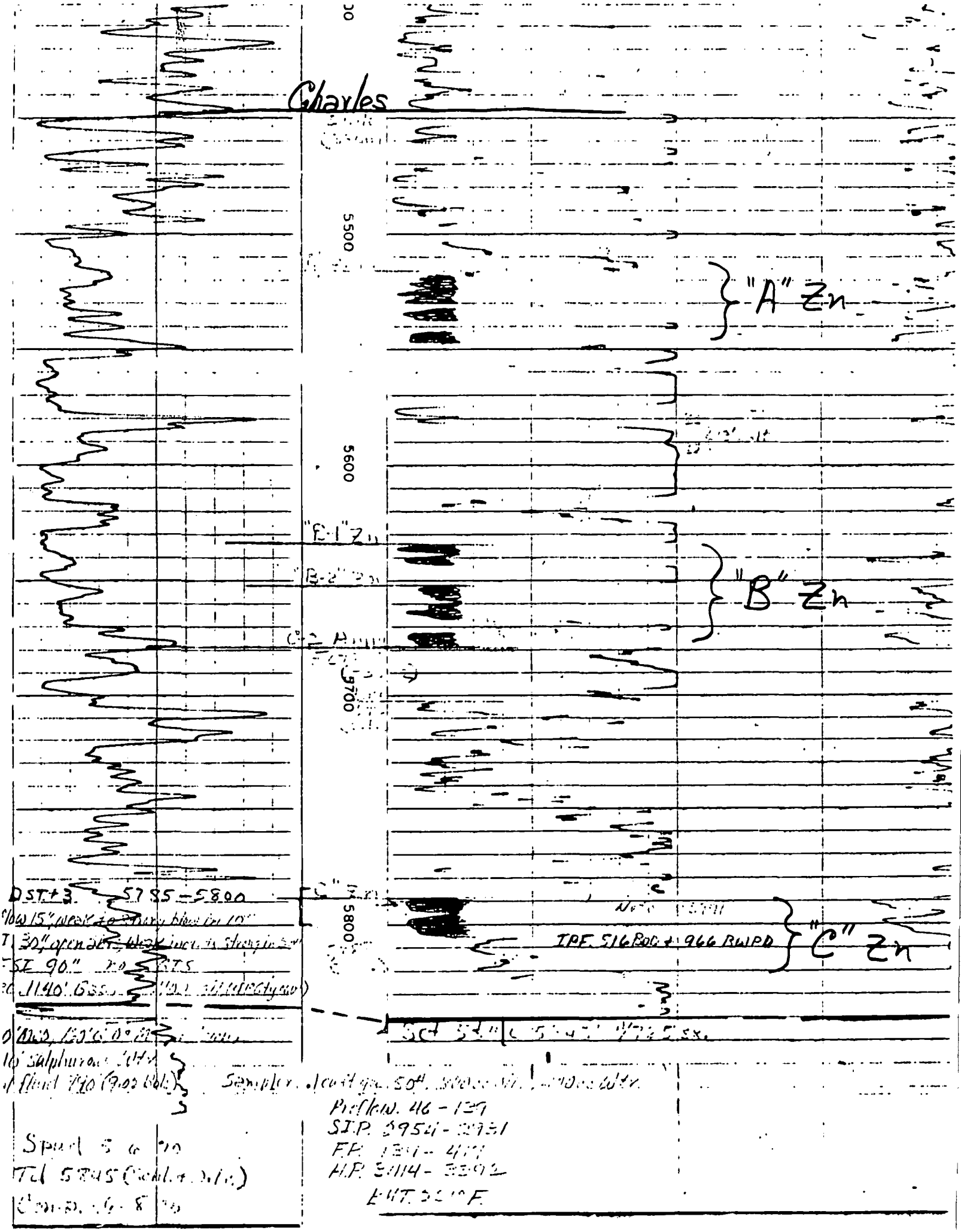

MICROLATEROLOG
5200
5
4900
MICROLATEROLOG


SIDEWALL NEUTRON POROSITY
5200
53
SIDE WALL NEUTRON POROSITY
4900

Poor Quality Source Document

The following document images have been scanned from the best available source copy.

To view the actual hard copy, contact the Region VIII Records Center at (303) 312-6473.


Charles
5500
5600
5700
5800
"A" Zn
"B" Zn
"C" Zn
"B-1" Zn
"B-2" Zn
DST+3 5785-5800
IPF 516 BOD + 966 BWPD
Preflow. 46 - 139
S.I.P. 2954 - 2931
H.P. 3114 - 3392
Spud 5 6 70
Td 5845

Locate well by footage measurement from legal subdivision (Section) line and nearest drilling or producible well, if any.

Form No. 2
File at
Billings
or Shelby

Rge.....

Form No. 2
File at
Billings
or Shelby

Locate
Well
Correctly

Twp.....

SCALE—1"=2000'

THE NOTICE OF INTENTION TO DRILL THIS WELL IS APPROVED SUBJECT TO THE FOLLOWING CONDITIONS:

1. Any person, before commencing the drilling of any oil or gas well or water source or injection well shall secure from the Board a drilling permit and shall pay to the Board the following amounts: for each well whose estimated depth is thirty-five hundred (3,500) feet or less, twenty-five dollars ($25.00); from thirty-five hundred and one (3,501) feet to seven thousand (7,000) feet, seventy-five dollars ($75.00); seven thousand and one (7,001) feet and deeper, one hundred fifty dollars ($150.00).

2. No well is to be spudded in unless the proper surety drilling bond has been posted and approved by the Board of Oil and Gas Conservation of the State of Montana.

3. Cable tool operators must construct an adequate sump to contain all mud and water bailed from the hole.

4. Surface or conductor casing must be properly cemented by an approved method and pressure tested to determine a tight bond with the surrounding formations in case an unexpected flow of oil, gas or water should be encountered, unless special permission has been granted for formation shut-off.

5. Any production casing must be cemented unless a formation shut-off or packer is approved by the Board. Sufficient cement must be used to protect the casing and all possible productive and fresh water bearing formations exposed in the process of drilling and not otherwise protected.

6. All production casing must be tested by bailing or pressure to determine if there is a tight bond with the surrounding formations or possible leaks in the casing. The results of the test must be reported on Form No. 2, said report to include the size, weight, thread and length of casing, amount of cement used, and date work is done. If test shows failure, the defect must be corrected before any drilling operations are resumed.

7. Any contemplated change in status of a well such as to plug and abandon, deepen, plug back, redrill, alter casing, etc. must be presented on Form No. 2 for approval by the Board prior to commencement of work.

8. A satisfactory drilling record must be kept for each tour, showing top and thickness of each and all formations drilled and all other information of value, one copy of which is to be kept at the rig while drilling is in progress for examination by any authorized agent of the Board.

9. All producing wells must be marked with name of the operator, number of the well and location, using reasonable precautions to preserve these markings at all times.

10. Delivery to the Board of two copies of all surveys, reports, analyses, logs, tests, samples and core descriptions, etc., as described in Rule 230 and one copy of all cementing records as furnished by the cementing company and described in Rule 234.

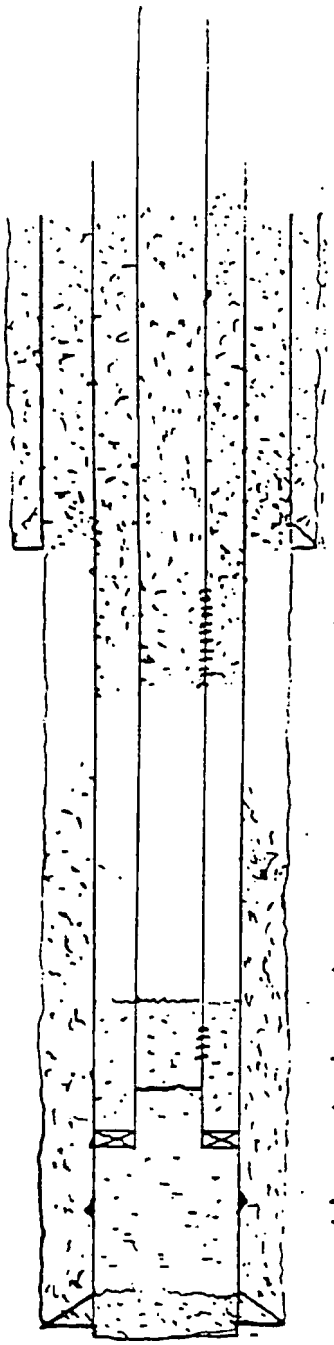
11. All work must be done in conformity with the regulations of the Board of Oil and Gas Conservation of the State of Montana, as contained in "General Rules and Regulations," and amendments thereto, as well as regulations prescribed in lieu thereof.

MESA PETROLEUM CO.

ONSHORE DIVISON

Subject _____

Prepared By _____ Date _____



Biere 1-22
1980' FS - 660' FWL
22 - 28N - 51E
Roosevelt Co, MT

Elev 2086 KB
2074 GL

SPUDDED @ 4 PM 5-6-70

24 jts 8 5/8" 24# @ 741' CMT/465 SXS
Perf 12 Holes 998'-996' - Pumped 30 SXS Class "H"
Pumped 85 SXS DN 5 1/2" Csg
Pumped 25 SXS DN 8 5/8" Csg
Pumped 20 SXS DN 2 7/8" TBG

698'-876' Judith River
3200'-3570 Dakota
4840'-4992' Tyler
5155'-5288' Kibby
5516'-5543 Charles "A"
5635'-5678' " "B"
5788-5805' " "C"

Toc Plug 5435'-5750' inside & outside of TBG (30 SXS "H")
Perf TBG - 4 Holes @ 5750'
Toc in TBG @ 5760' (50 SXS Class "H") Plug
PKR @ 5766.81' KB w/ 2 7/8" J-55 EUE 8RD 6.7# @ 5766'

Jet Notched @ 5791' w/2000 gal 7.5% HCl
PBTD 5803' KB
175 jts 15# J-55 STAC 5.5" @ 5845' KB CMT w/675 SXS

Received
Office of Enforcement

FEB 25 2001

Compliance & Env. Justice

RE1

Locate well by footage measurement from legal subdivision line, lease or property line and nearest drilling or producible well, if any.

Form No. 2
File at
Billings
or Shelby

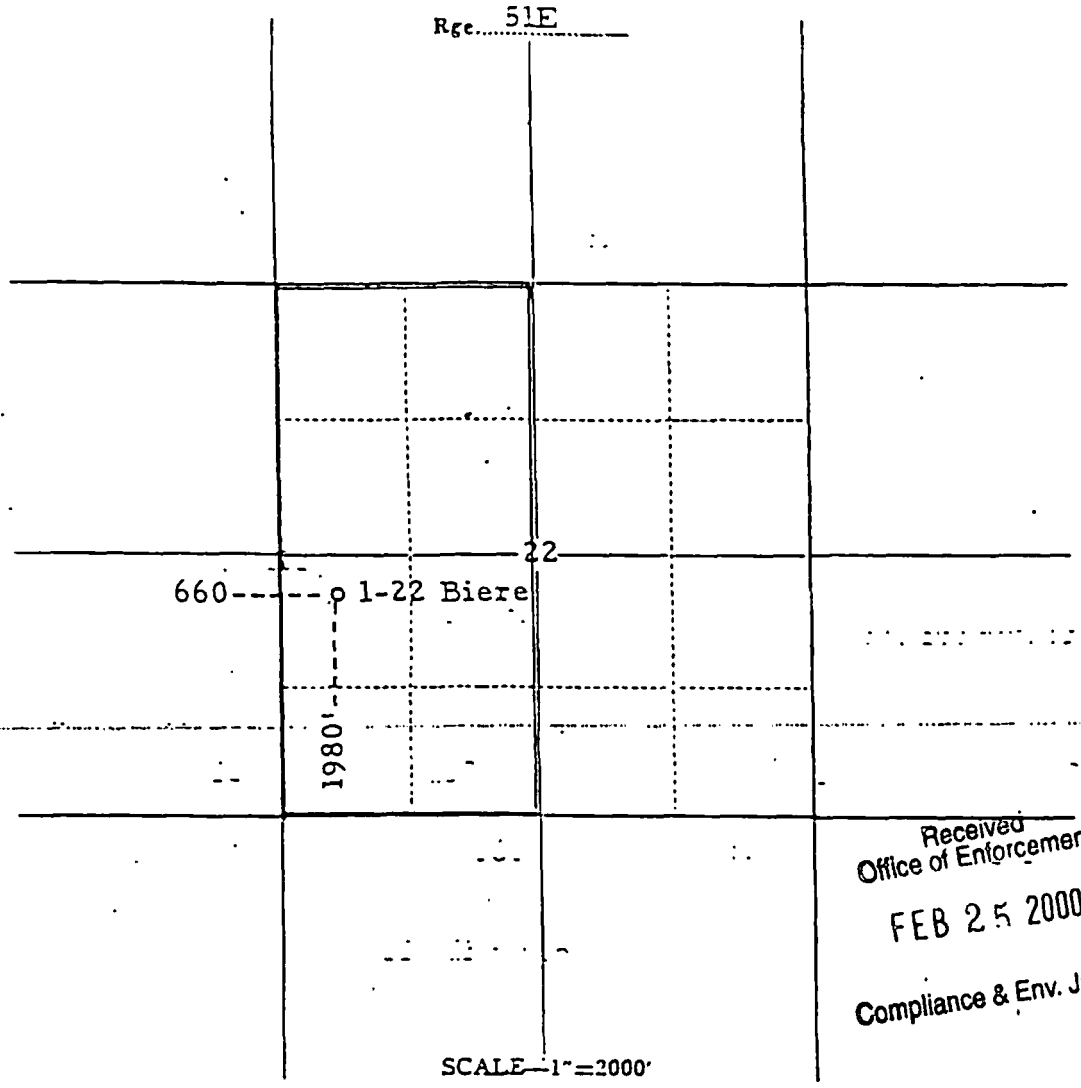
Rge. 51E

Form No. 2
File at
Billings
or Shelby

Locate
Well
Correctly

Locate
Lease
Boundary

Twp. 28N



Received
Office of Enforcement
FEB 25 2000
Compliance & Env. Justice

SCALE—1"=2000'

THE NOTICE OF INTENTION TO DRILL THIS WELL IS APPROVED SUBJECT TO THE FOLLOWING CONDITIONS:

1. Any person, before commencing the drilling of any oil or gas well, shall secure from the commission a drilling permit and shall pay to the commission therefor for the following amounts: for each well whose estimated depth is thirty-five hundred (3,500) feet or less, twenty-five dollars ($25.00); from thirty-five hundred and one (3,501) feet to seven thousand (7,000) feet, seventy-five dollars ($75.00); seven thousand (7,000) feet and deeper, one hundred fifty dollars ($150.00).
2. No well is to be spudded in unless the proper surety drilling bond has been posted and approved by the Oil and Gas Conservation Commission of the State of Montana.
3. Cable tool operators must construct an adequate sump to contain all mud and water bailed from the hole.
4. Surface or conductor casing must be properly cemented by an approved method to act as a tie in case an unexpected flow of oil, gas, or water should be encountered, unless special permission has been granted for formation shut-off.
5. Any contemplated change in status of a well such as to plug and abandon, deepen, plug back, redrill, alter casing, etc., must be presented on Sundry Notices and Report of Wells form for approval by agent prior to commencement of work.
6. All substantial showings of oil or gas must be tested for commercial possibilities before drilling ahead. Each such showing must be adequately protected by casing, mud or cement, as drilling progresses.
7. The production string must be cemented unless a formation shut-off or packer is approved by the agent. Sufficient cement must be used to protect the casing and possible productive formation exposed in the process of drilling not otherwise protected.
8. All production strings of casing must be tested by bailing or pressure to determine if there is a tight bond with the formation or possible leaks in the casing. The results of the test must be reported on Sundry Notices and Report of Wells form, said report to include the size, weight, thread and length of casing, amount of cement used, and date work is done. If test shows failure, the defect must be corrected before any drilling operations are resumed.
9. A satisfactory drilling record must be kept for each tour, showing top and thickness of each and all formations drilled and all other information of value, one copy of which is to be kept at the rig while drilling is in progress for examination when an agent visits the well.
10. All producing wells must be marked with name of the operator, number of the well, and location, using reasonable precautions to preserve these markings at all times.
11. Copies of all directional surveys, electrical logs, or tops from electrical log if electric survey is run, formation tests, and cementing record, as furnished by the cementing company, etc., must be filed with the State Inspector of the district together with four copies of the log, upon completion of the well.
12. All work must be done in conformity with the regulations of the Oil & Gas Conservation Commission of the State of Montana, as contained in "General Rules and Regulations," and amendments thereto, as well as regulations prescribed in lieu thereof.

COUNTY
FIELD or LOCATION
WELL
COMPANY

COMPANY MESA PETROLEUM CO.

WELL BIERE # 1-22

FIELD WILDCAT

COUNTY ROOSEVELT STATE MONTANA

LOCATION
NW SW

Sec. 22 Twp. 28 N Rge. 51E

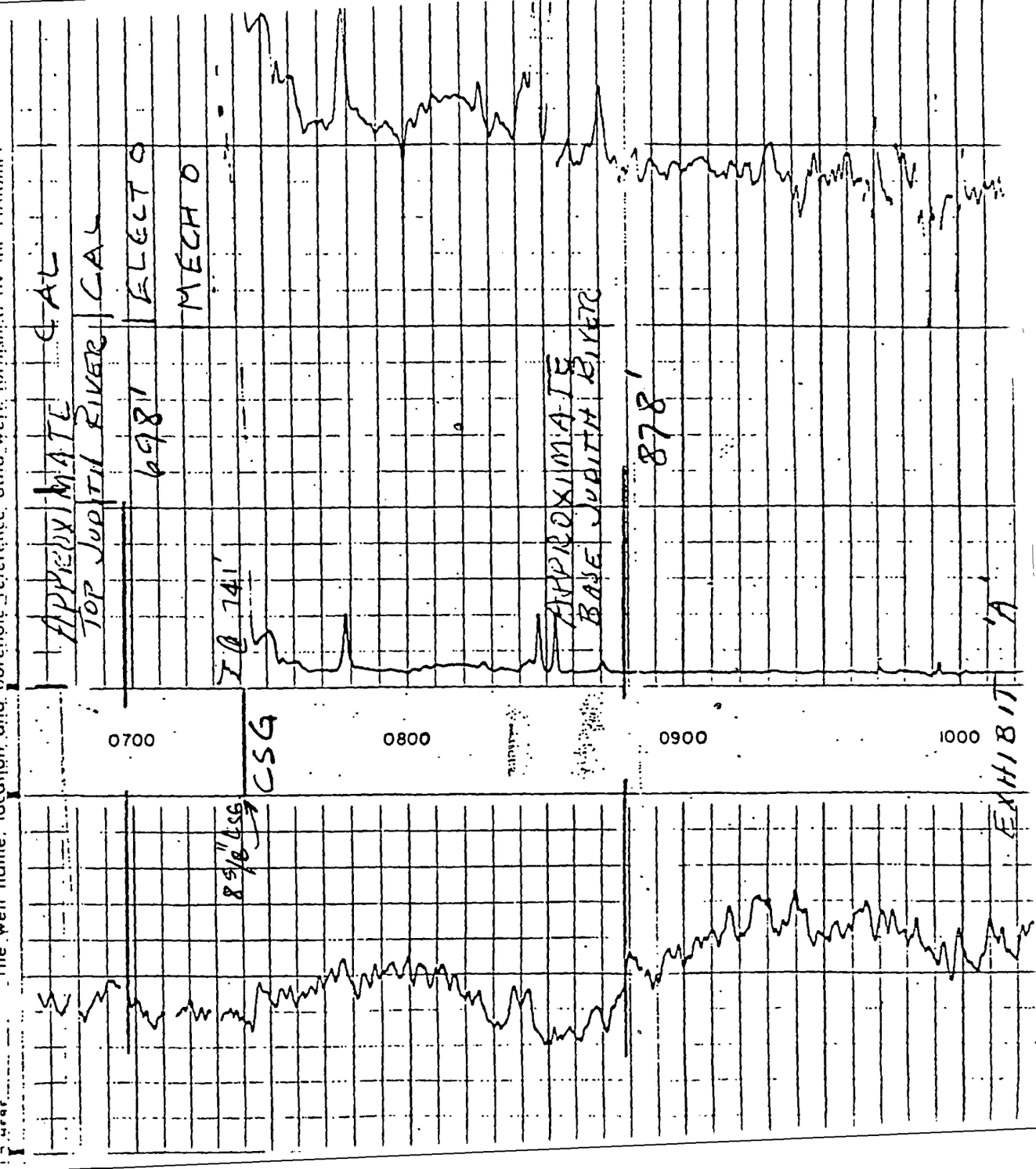
Other Services:
SNP
MLL
MOP

Permanent Datum: GL Elev. 2074
Log Measured From KB 1' Ft. Above Perm. Datum
Drilling Measured From KB

Elev.: K.B. 2086
D.F.
G.L. 2074

Date	5-25			
Run No.	ONE			
Depth—Driller	5845			
Depth—Logger	5845			
Btm. Log Interval	5840			
Top Log Interval	741			
Casing—Driller	8 5/8 @ 741	@	@	@
Casing—Logger	741			
Bit Size	7 7/8			
Type Fluid in Hole	SBM			
Dens. / Visc.	10.9 / 58			
pH / Fluid Loss	9 / 6.0 ml	ml	ml	ml
Source of Sample	FLOW LINE			
R_m @ Meas. Temp.	.116 @ 67 °F	@ °F	@ °F	@ °F
R_{mf} @ Meas. Temp.	.103 @ 67 °F	.035 @ 195 °F	@ °F	@ °F
R_{mc} @ Meas. Temp.	— @ — °F	@ °F	@ °F	@ °F
Source: R_{mf} / R_{mc}	M / —			
R_m @ BHT	.055 @ 195 °F	@ °F	@ °F	@ °F
Time Since Circ.	4 HRS			
Max. Rec. Temp.	195 °F	°F	°F	°F
Equip. / Location	5642 / VLSTN			
Recorded By	ERICKSON			

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



SCHLUMBERGER

CEMENT BOND LOG

COUNTY ROOSEVELT, MONT.
Field or LOCATION WILDCAT
WELL BIERE #1-22
COMPANY MESA PETROLEUM

COMPANY MESA PETROLEUM COMPANY

WELL BIERE #1-22

FIELD WILDCAT

COUNTY ROOSEVELT STATE MONTANA

LOCATION NW-SW 12

Sec. 22 Twp. 28N Rge. 51E

Other Services: PDC-N

Permanent Datum: GL, Elev. 2074
Log Measured From KB, 12 Ft. Above Perm. Datum
Drilling Measured From KB

Elev.: K.B. 2086
D.F. ----
G.L. 2074

RHS

Date	6/2/70	Type Drill Fluid	SBM
Run No.	ONE	Fluid Level	FULL
Depth — Driller		Max. Rec. Temp.	°F
Depth — Logger	5803	Est. Cement Top	2658
Btm. Log Interval	5795	Equip. Location	5641 WLSTN
Top Log Interval	2574	Recorded By	ST. AUBYN
Open Hole Size	7-7/8	Witnessed By	MR. TODD, FARRELL

CASING REC.	Size	Wt/Ft	Grade	Type Joint	Top	Bottom
Surface String	8-5/8				SURF	741
Prot. String						
Prod. String	5-1/2	15.5			SURF	5845
Liner						

PRIMARY CEMENTING DATA

STRING	Surface	1ST	2ND	2ND
Vol. of cement		50 SKS.	50 SKS.	625 SKS.
Type of cement		HAL-LT.	CLASS G.	HAL-LT.
Additive		SALT-SAT.	1 LATEX	SALT-SAT.
			.002-HR4	10#GILSONITE
Retarder				SACK
Wt. of slurry				
Water loss				
Type fluid in csg.				
Fluid wt.				

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

FOLD HERE

PRIMARY CEMENTING PROCEDURE	Hour — date	Hours from start of operation
Started pumping cement	0130 - 5/27/70	
Release pressure	0545 - 5/27/70	
Start Cement Bond Log	1100 - 6/2/70	

Equipment Data	
Type centralizers	
Logging speed	45 FPM
Sonde Type	SLS-D
Cartridge Type	SLC-A

RECEIVED
OFFICE OF ENFORCEMENT
OCT 19 1998
COMPLIANCE & ENVIRONMENTAL JUSTICE

FOLD HERE

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

PRIMARY CEMENTING PROCEDURE

	Hour — date	Hours from start of operation
Started pumping cement	0430 - 5/27/70	
Release pressure	0545 - 5/27/70	
Start Cement Bond Log	1100 - 6/2/70	
Finish Cement Bond Log	1200 - 6/2/70	

Preceding fluid _____ Volume _____ bbls.
Cement pumped _____ bbls./minute

Pipe reciprocated during Pumping: Yes _____ No _____
Pipe reciprocated after plug down: Yes _____ min., No _____

Equipment Data

Type centralizers	
Logging speed	45 FPM
Sonde Type	SLS-D
Cartridge Type	SLC-A
Cartridge No.	28

SQUEEZE JOB DETAIL

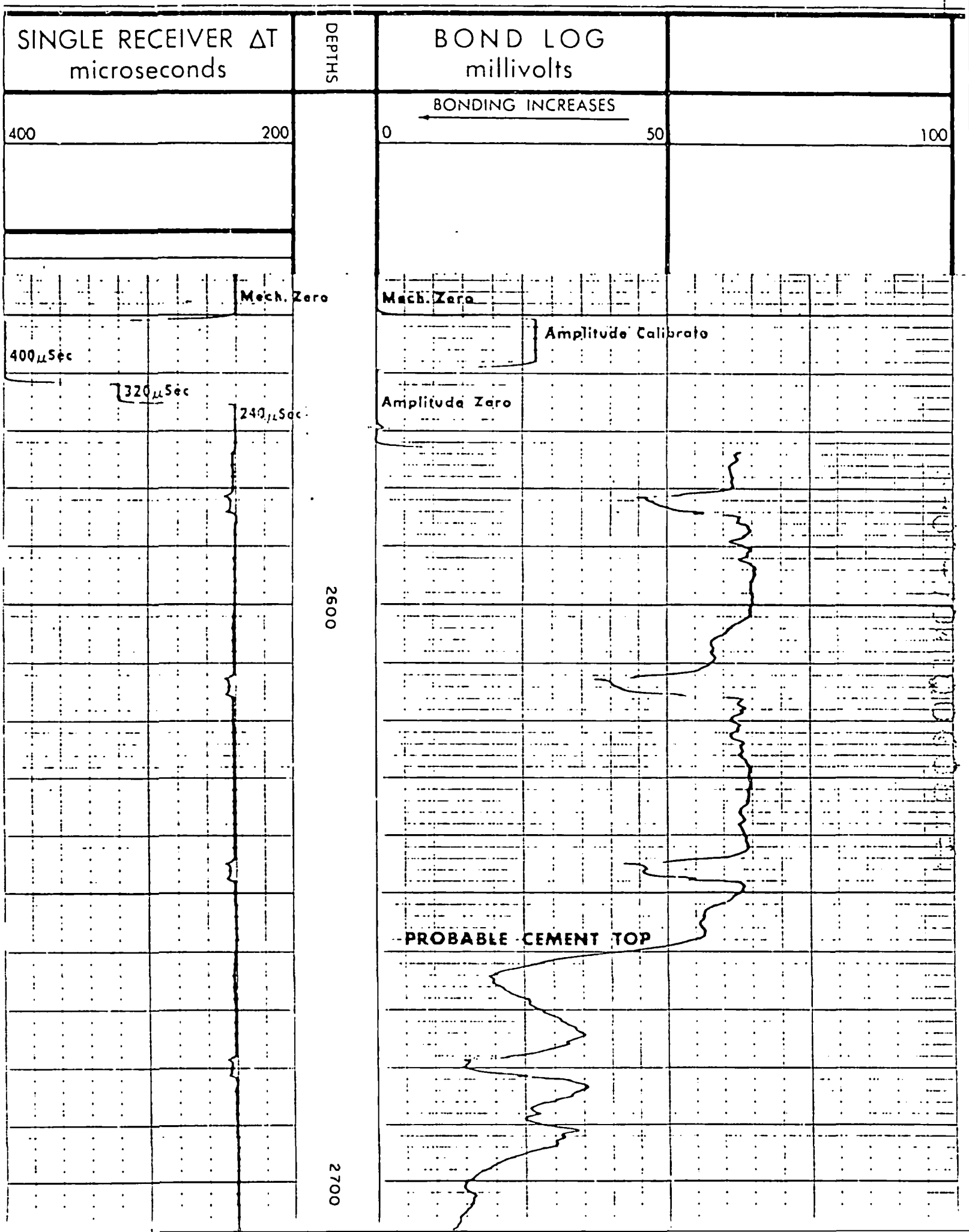
Squeeze number	1	2	3	4
Date				
Depth interval				
Type cement				
Volume of cement				
Additive				
Retarder				
Weight of slurry				
Preceding fluid				
Breakdown pressure				
Max. pressure-stage 1				
" " " 2				
" " " 3				
Final maximum pressure				
Started pumping cement				
Released pressure				
Start CBL				
Finish CBL				

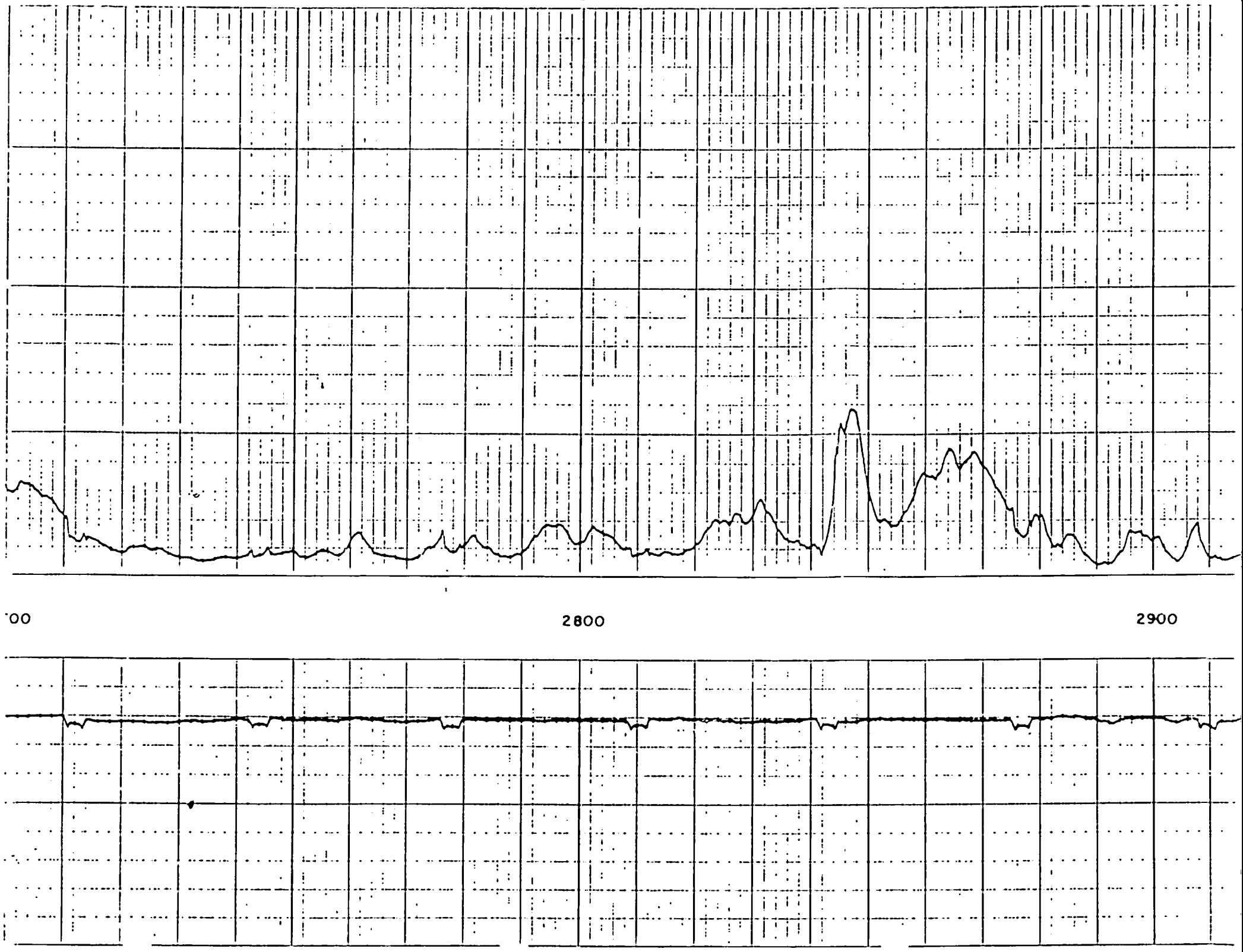
AVERAGE WELL DRIFT:
° from to ; ° from to ; ° from to

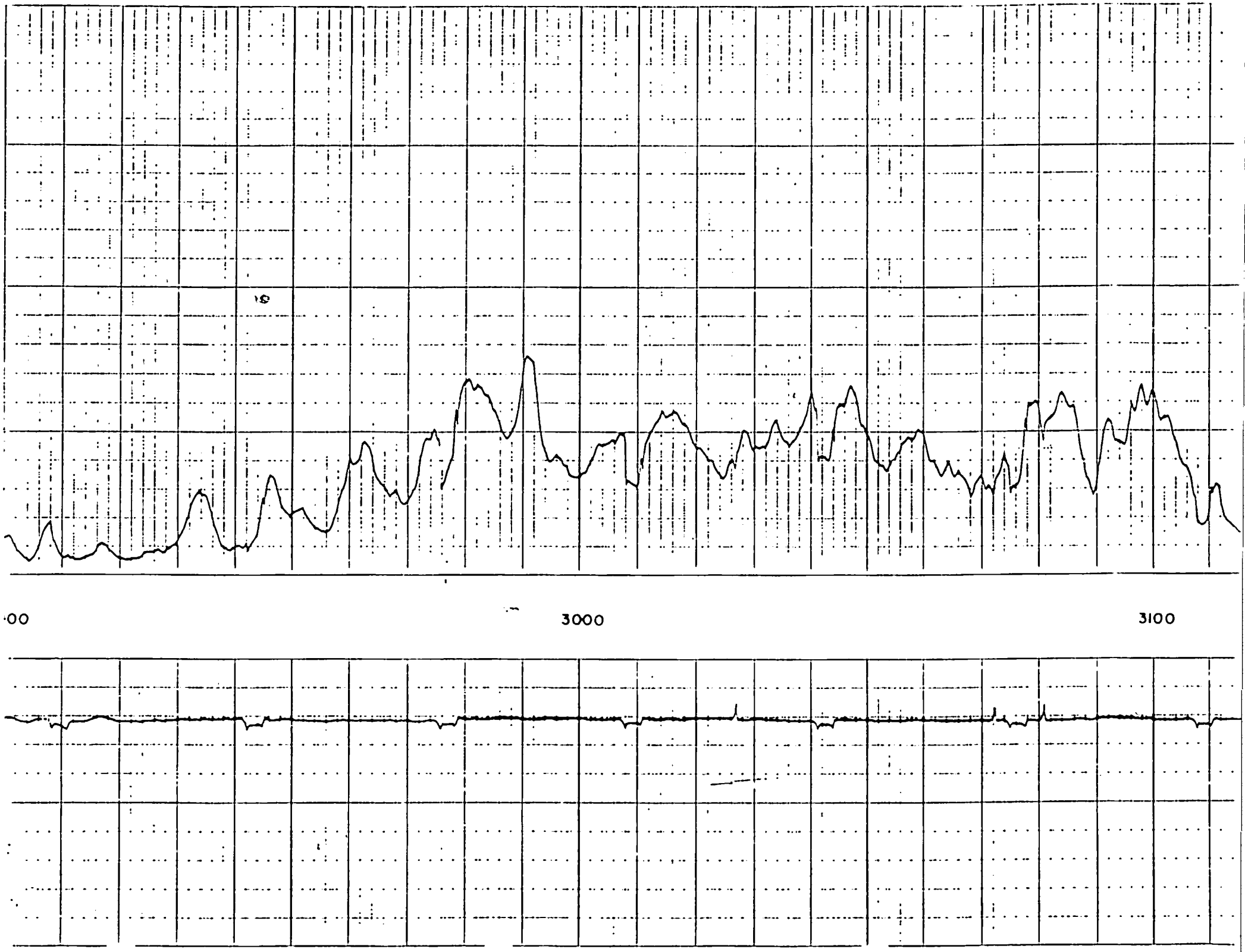
Centralizer Depths	Scratcher Depths

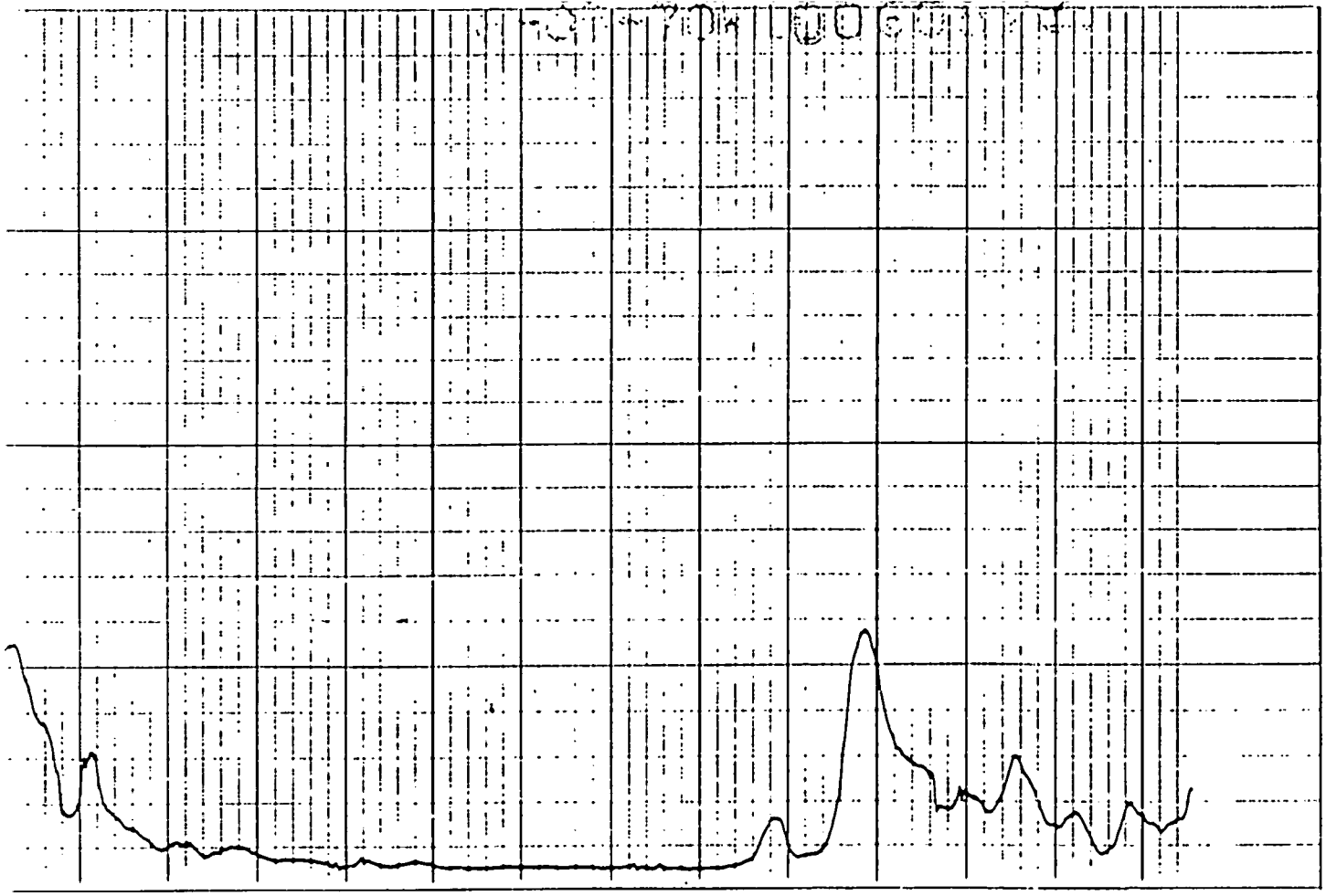
REMARKS
I.D. 06082

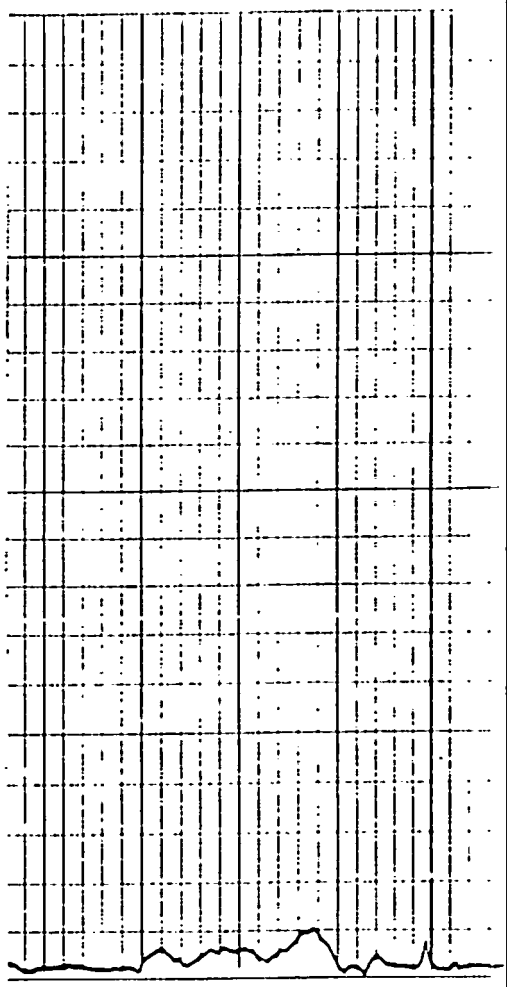
6-05-70 WL 00 6082


SINGLE RECEIVER ΔT
microseconds
DEPTHS
BOND LOG
millivolts
BONDING INCREASES
400
200
0
50
100
Mech. Zero
Mech. Zero
Amplitude Calibrate
400μSec
320μSec
240μSec
Amplitude Zero
2600
PROBABLE CEMENT TOP
2700


'00
2800
2900

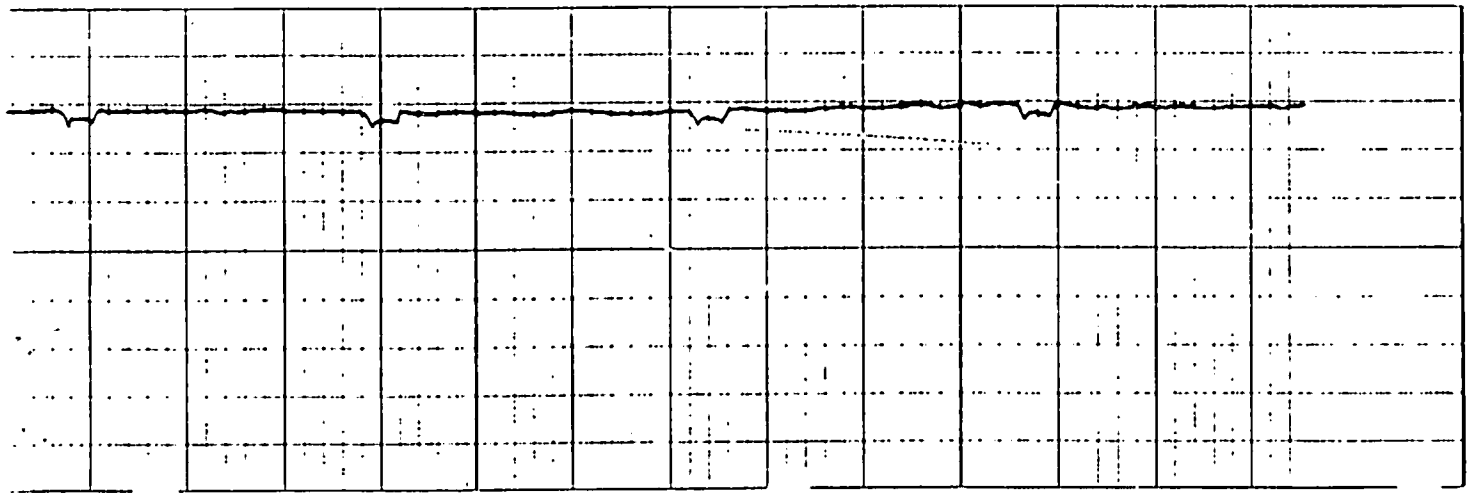

·00
3000
3100

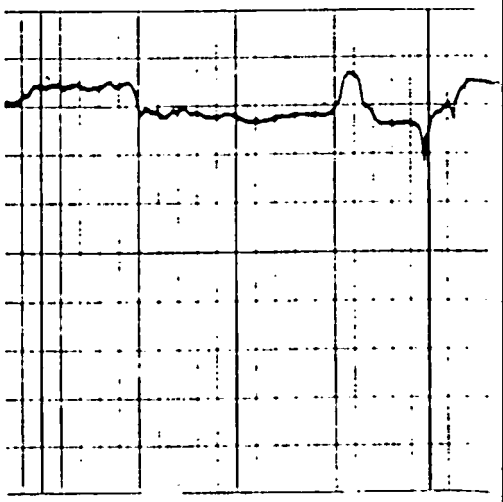


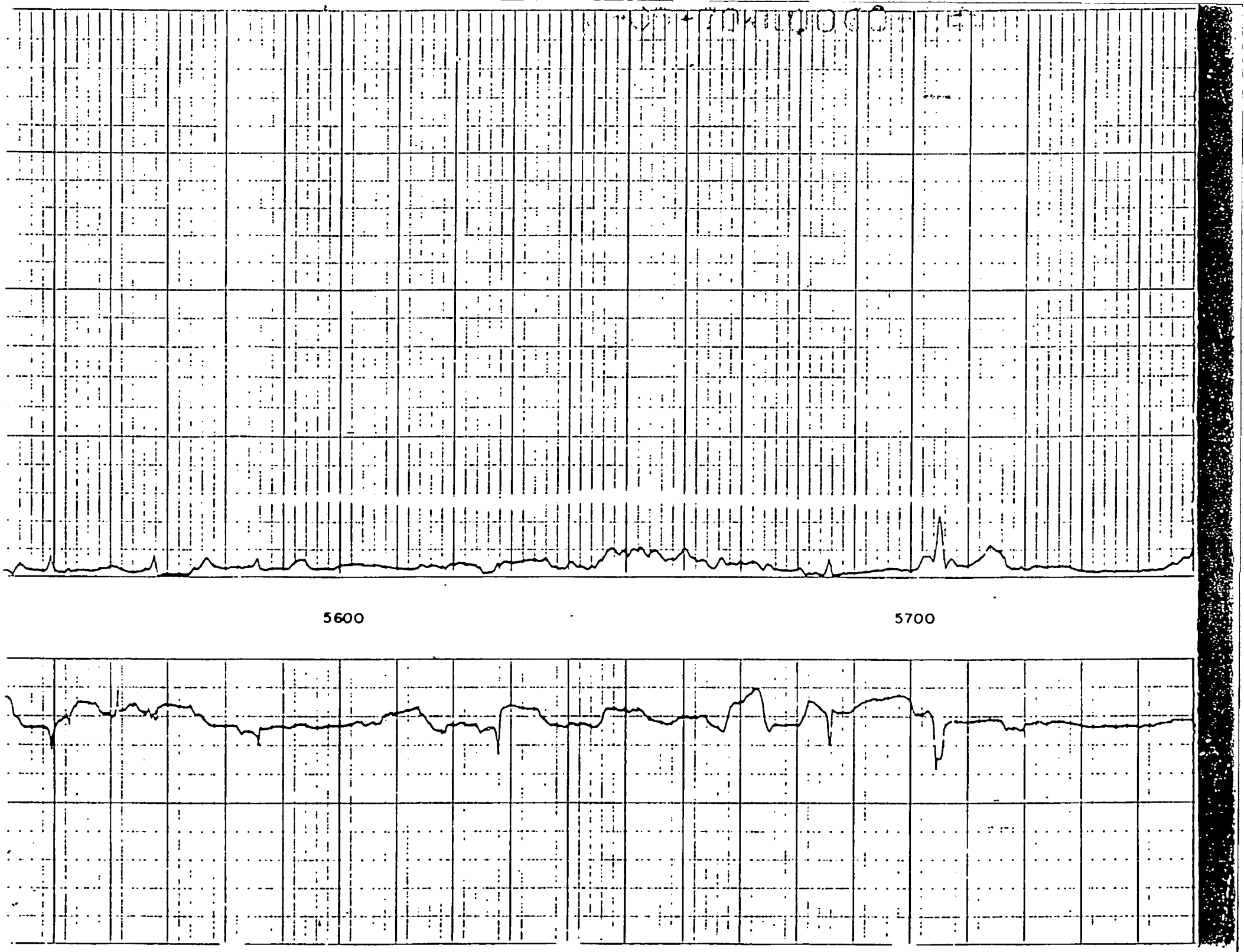


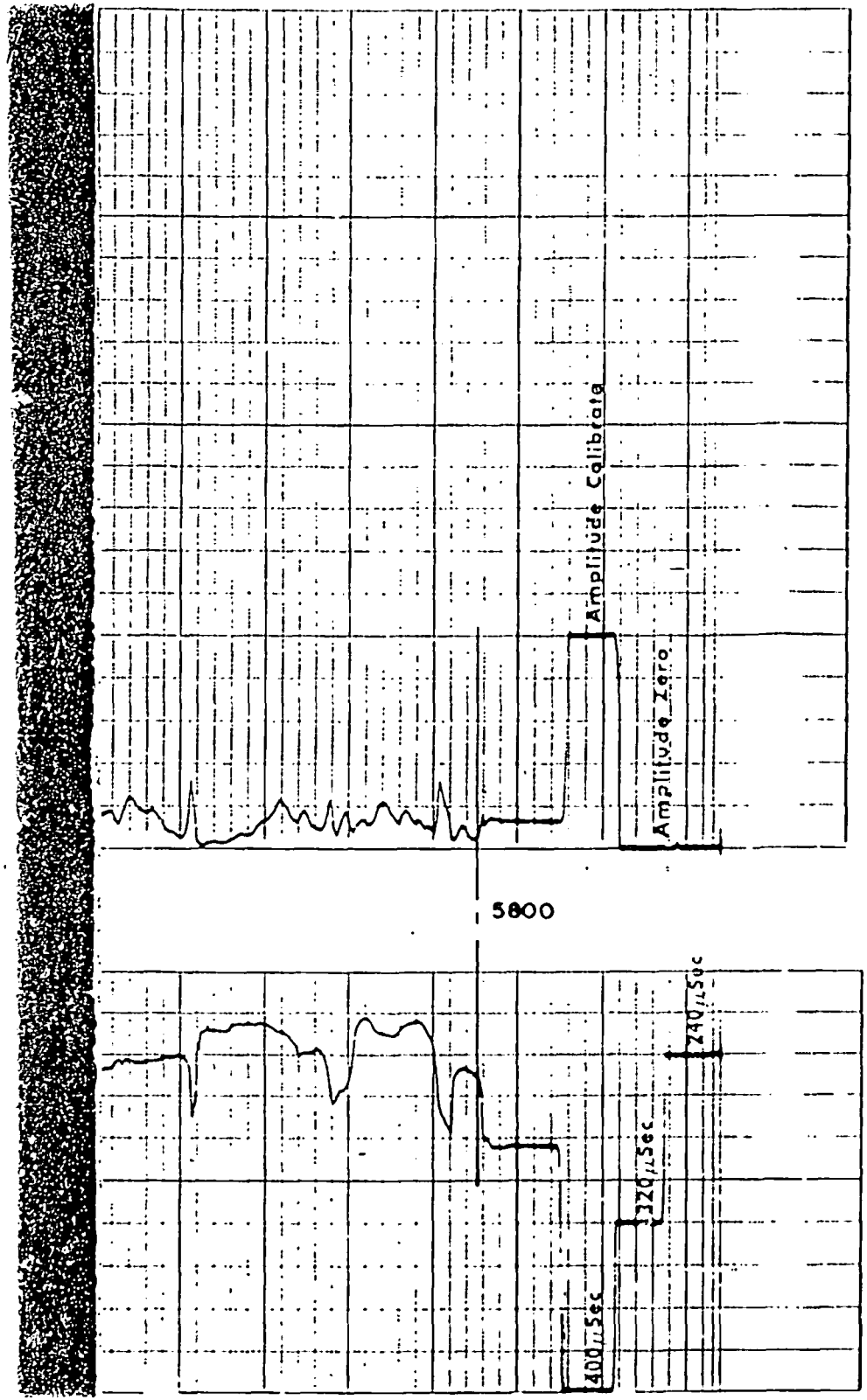
'0

3200

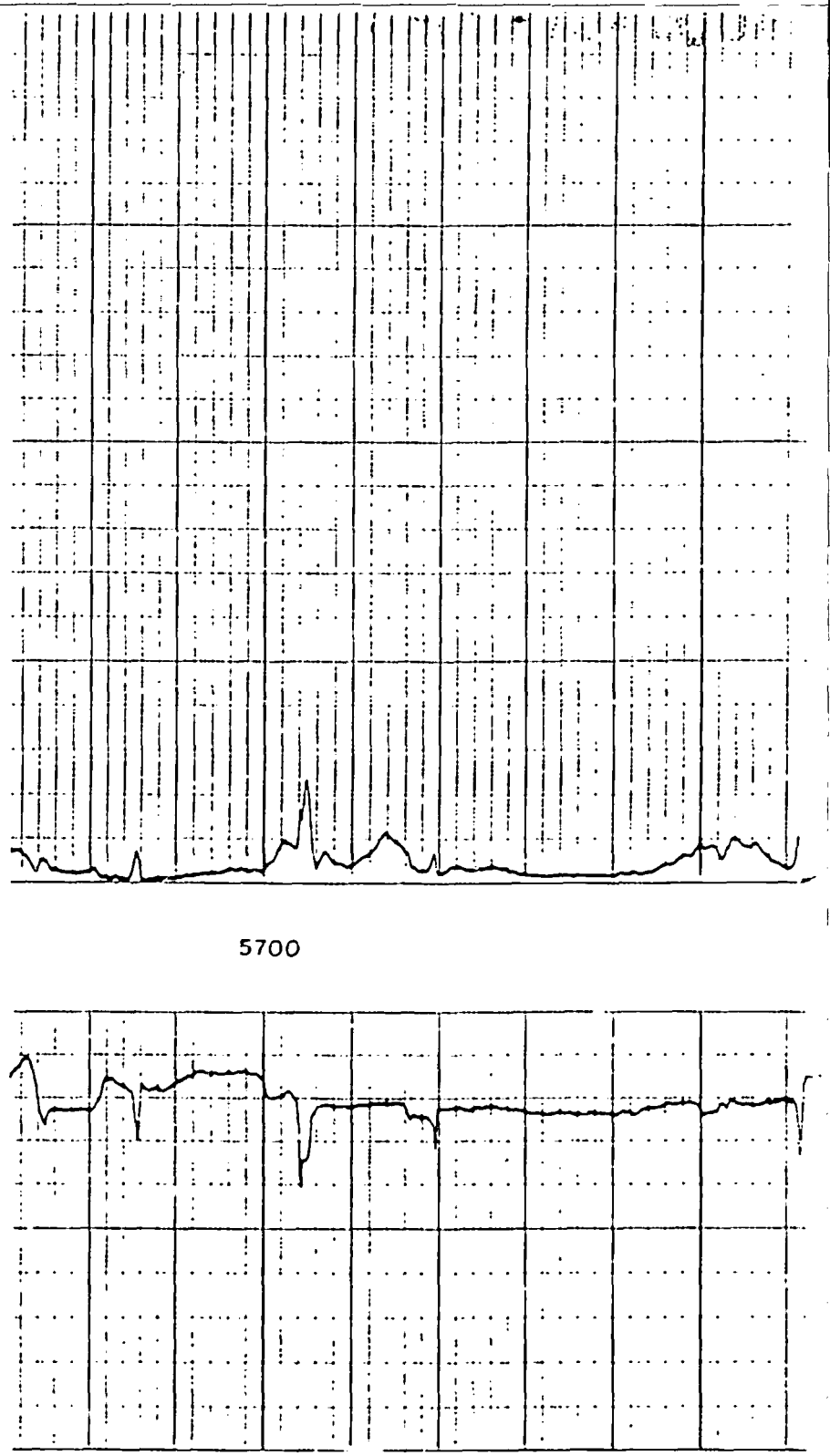


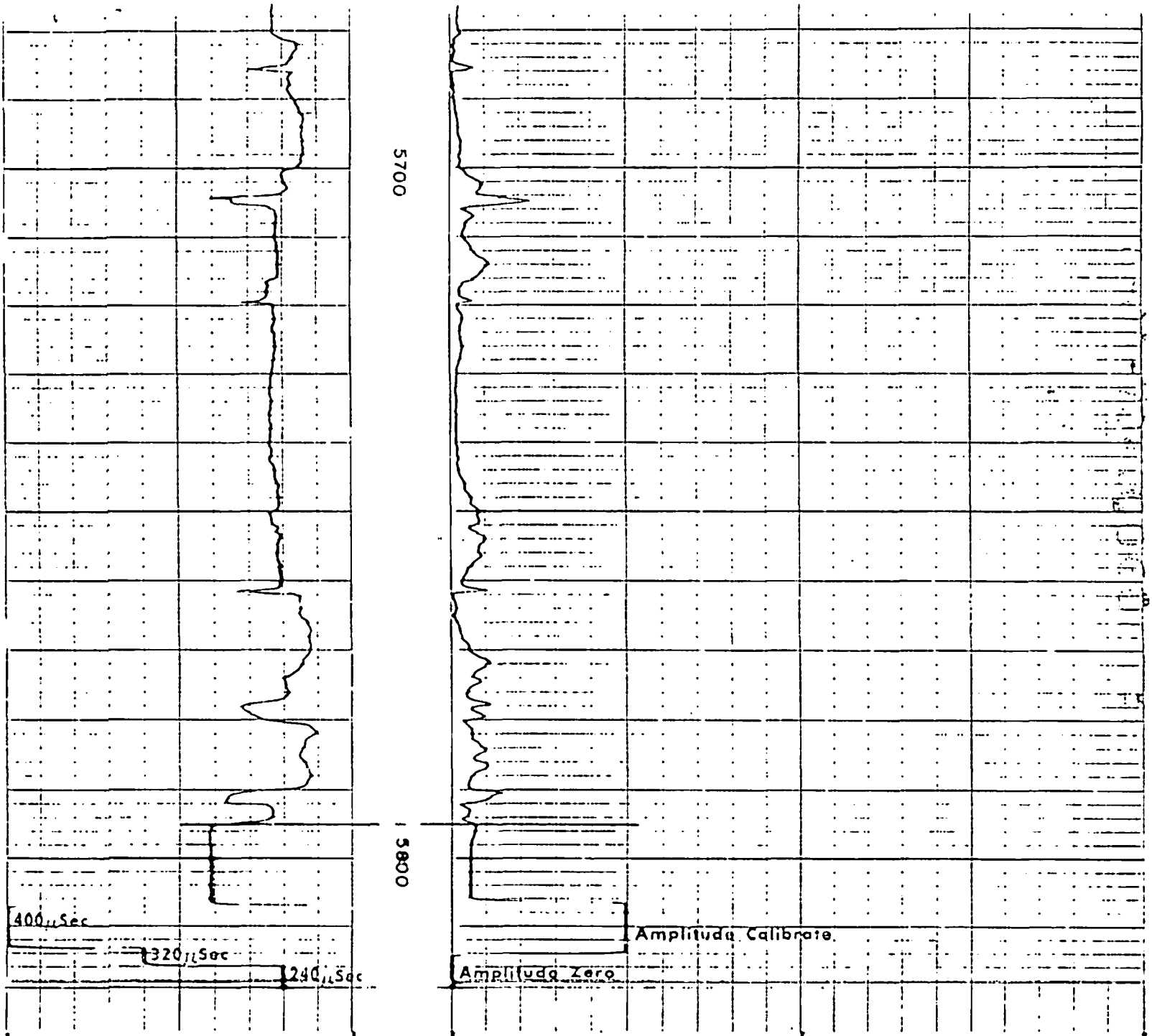



5600
5700



REPEAT SECTION





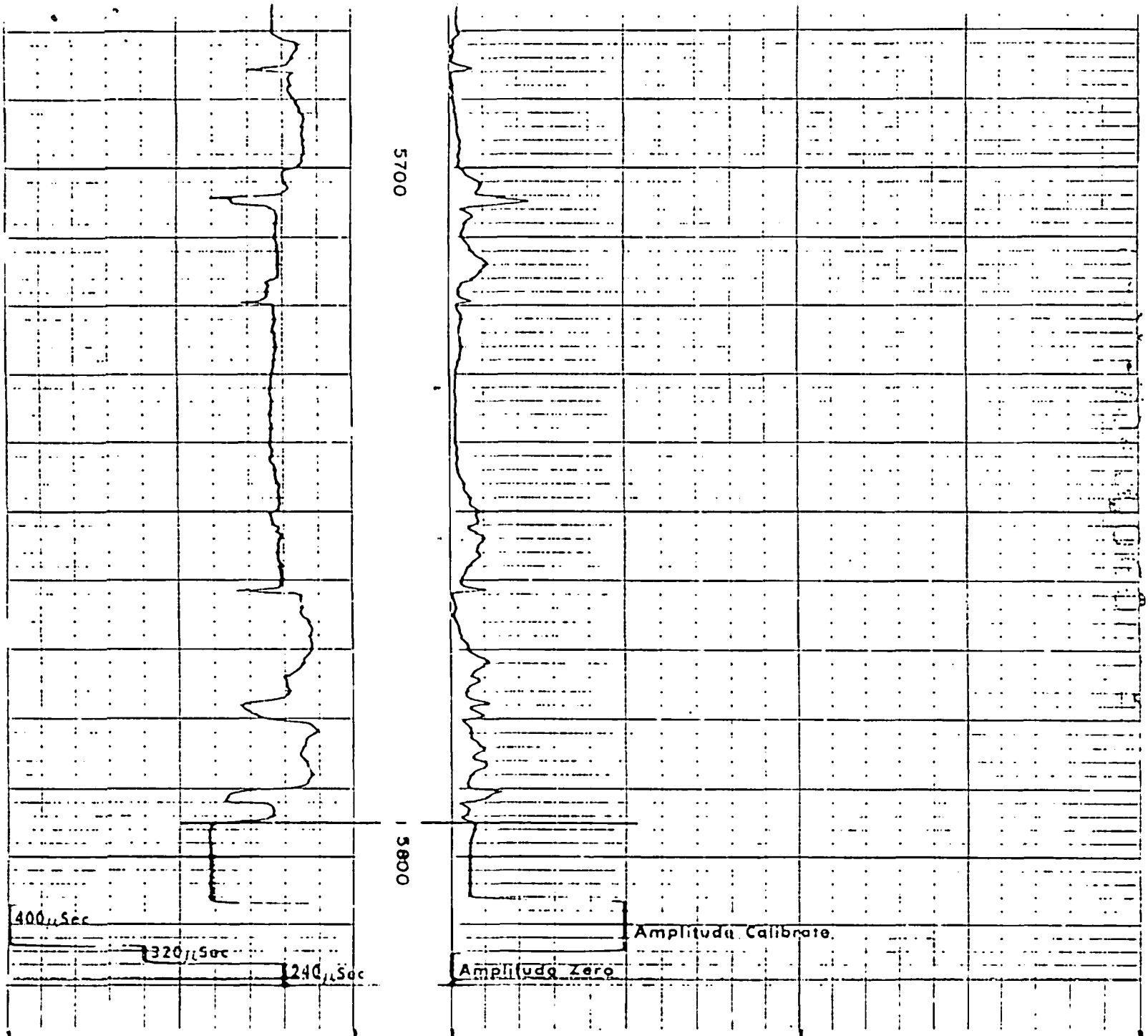
COMPANY MESA PETROLEUM COMPANY

WELL BIERE #1-22

FIELD WILDCAT

COUNTY ROOSEVELT STATE MONTANA

SCHL FR 5795
SCHL TD 5803
DRLR TD ----
Elev:
KB 2086
DF ----
GL 2074



COMPANY MESA PETROLEUM COMPANY

WELL BIERE #1-22

FIELD WILDCAT

COUNTY ROOSEVELT STATE MONTANA

SCHL FR 5795
SCHL TD 5803
DRLR TD ----
Elev:
KB 2086
DF ----
GL 2074

Neutron Cal. Zero

Neutron Zero

RADIOACTIVITY CALIBRATION DATA

COMPANY MESA PETROLEUM COMPANY

WELL BIERO - S.W.D. #1

FIELD WILDCAT

COUNTY ROOSEVELT STATE MONTANA

SCHL. FR 949
SCHL. TO 950
DRLR TO 950
Elev.
KB 2087
DF ----
GL 2075

NW SW
C85-21049

LOCATE WELL CORRECTLY

(SUBMIT IN TRIPLICATE)
TO
OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

RECEIVED

LOG OF WELL

Company MESA PETROLEUM CO. Lease Biero Well No. SWD #1-W
P. O. Box 2009
Address Amarillo, Texas Field (or Area) Poplar

The well is located 1750 ft. from (S) line and 140 ft. from (W) line of Sec. 22

Sec. 22 ; T. 25N ; R. 51E ; County ROOSEVELT ; Elevation 2087 R.B. (D.F., R.B. or G.L.)

Commenced drilling June 24, 1970 19__ ; Completed July 9 19 70

The information given herewith is a complete and correct record of the well. The summary on this page is for the condition of the well at the above date.

Completed as Salt Water Disposal (oil well, gas well, dry hole)

Signed

Title Consultant

Date July 17, 1970

IMPORTANT ZONES OF POROSITY

(denote oil by O, gas by G, water by W; state formation if known)

From to From to
From to From to
From to From to
From to From to

CASING RECORD

Size Casing	Weight Per Ft.	Grade	Thread	Casing Set	From	To	Sacks of Cement	Cut and Pulled from
8-5/8	24#	J-55	8 rd	998			500	

TUBING RECORD

Size Tubing	Weight Per Ft.	Grade	Thread	Amount	Perforations
2-3/8 E.U.E.	4.70	J-55	8 rd	1790	796-800,804-808,812-820, 2 P.P. 825-834

COMPLETION RECORD

Rotary tools were used from 0 to 990

Cable tools were used from to

Total depth 990 ft.; Plugged back to 990 T.D.; Open hole from to

PERFORATIONS Interval From	To	Number and Size and Type	ACIDIZED, SHOT, SAND FRACED, CEMENTED Interval From	To	Amount of Material Used	Pressure
796	800	9-3/8 Jet	796	800	500 Gal. 15% HCl	400#
804	808	9-3/8 Jet				
812	820	17-3/8 Jet				
825	834	19-3/8 Jet				

(If PBA show plugs above)

INITIAL PRODUCTION S.W.D.

Well is ~~producing~~ injecting in from Judith River (pool) formation. Initial injection 966 B.W.D. at 390 P.S.I.

I. P. barrels of oil per hours (measured or flowing)

Mcf of gas per hours,

barrels of water per hours, or % W.C.

(OVER)

Schlumberger Well Services
A Division of Schlumberger Technology Corporation
Houston, Texas 77001

July 17, 1970

Please Reply To
Schlumberger Well Services

Box 908
Williston, N. Dak.
58801

Mesa Petroleum Company
784 Lincoln Tower Bldg.
Denver, Colorado - 80203
Attention: Mr. William Dodds

Gentlemen:

Enclosed are 7 prints of the GRN & Shooting Record on:
Company Mesa Petroleum Co., Well Biere-S.W.D. #1,
Field Wildcat, County Roosevelt State Montana.

Additional prints are being sent to:

2 prints
State Oil & Gas Cons. Comm.
15 Poly Drive
Billings, Montana - 59101

1 prints
Robert Snyder
64 Midland Bank Bldg.
Billings, Montana - 59101

1 prints
John Graham
Box 241
Billings, Montana - 59103

1 prints
Petroleum Engineering & Mgment. Corp.
250 Securities Bldg.
Billings, Montana - 59103
Attn: Lewis Correll

____ prints

____ prints

____ prints

____ prints

The film is to be mailed to:

Mesa Petroleum Company
784 Lincoln Tower Bldg.
Denver, Colorado - 80203
Attn: Mr. William Dodds

We appreciate the privilege of serving you.

RECEIVED
FEB 25 2000
Office of Enforcement
Compliance & Environmental
Justice

Very truly yours,
Schlumberger Well Services

Merle D. Kline by TW
DISTRICT MANAGER

SWS-1327-C

DELIVERY TICKET

WISCO

P.O. BOX 2477
WILLISTON, N. DAK. 58802-2477

SHIPPED TO	
ADDRESS	
CITY & STATE	
CARE OF	
(LEASE) (WELL NO.) (FIELD) (RIG)	
INVOICE TO	
ADDRESS	
CITY & STATE	

CUSTOMER ORDER NO.	ORDERED BY	DATE 7-1
CUSTOMER REQUISITION NO.	TAKEN BY	FILLED BY
ORDERED VIA		
SHIPPED VIA		
SPECIAL INSTRUCTIONS		

DATE	DESCRIPTION	UNITS	UNIT PRICE	AMOUNT
		CITY COUNTY	TAX	
		STATE TAX		

SERVICES PERFORMED BY

WISCO REPRESENTATIVE

Thank You Mr. _____

APPROVED BY

COMPANY NAME

TOTAL

DT NO. 73274

INVOICE NO. | DATE

DELIVERY TICKET

WISCO

P.O. BOX 2477
WILLISTON, N. DAK. 58802-2477

SHIPPED TO	
ADDRESS	
CITY & STATE	
CARE OF	
(LEASE) (WELL NO.) (FIELD) (RIG)	
INVOICE TO	Mesa [illegible] #1-22 120
ADDRESS	
CITY & STATE	

CUSTOMER ORDER NO.	ORDERED BY	DATE
CUSTOMER REQUISITION NO.	TAKEN BY	FILLED BY
ORDERED VIA		
SHIPPED VIA		
SPECIAL INSTRUCTIONS		

DATE	DESCRIPTION	UNITS	UNIT PRICE	AMOUNT
7-10 & 11 - 85	~~[illegible]~~ Crew traveled to location			
	Started to drill at 42 ft.			
	Drilled to 140 ft - Hole			
	started to flow - Heated			
	up to 175 degrees -			
	[illegible] [illegible] took over			
	[illegible]			
	Crew traveled [illegible]			
	Rig	12	125.00	1500.00
	[illegible]	12	[illegible]	180.00
	[illegible]	18	[illegible]	288.00
	[illegible]	5	65.00	325.00
	[illegible]	5	[illegible]	75.00
		CITY COUNTY	TAX	
			STATE TAX	

RECEIVED
FEB 25 2010
Office of Enforcement
Compliance & Environmental
Justice

SERVICES PERFORMED BY

WISCO REPRESENTATIVE

Thank You Mr. ______________________
APPROVED BY

COMPANY NAME

TOTAL	[illegible]
DT NO.	73529
INVOICE NO.	DATE

DELIVERY TICKET

WISCO

P.O. BOX 2477
WILLISTON, N. DAK. 58802-2477

SHIPPED TO	
ADDRESS	
CITY & STATE	
CARE OF	
(LEASE) (WELL NO.) (FIELD) (RIG)	
INVOICE TO	[illegible]
ADDRESS	
CITY & STATE	

CUSTOMER ORDER NO.	ORDERED BY	DATE
CUSTOMER REQUISITION NO.	**TAKEN BY**	**FILLED BY**

ORDERED VIA

SHIPPED VIA

SPECIAL INSTRUCTIONS

DATE	DESCRIPTION	UNITS	UNIT PRICE	AMOUNT
7-11-13 [illegible]	[illegible]			
	Started drilling at 500 ft			
	[illegible] 1658 [illegible]			
	[illegible]			
	[illegible] 440 ft [illegible] Depth			
	440 ft [illegible]			
	[illegible]			
	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]
		CITY COUNTY TAX		
		STATE TAX		

RECEIVED
FEB 25 2014
Office of Enforcement
Compliance & Environmental
Justice

SERVICES PERFORMED BY

WISCO REPRESENTATIVE

Thank You Mr. [illegible]

APPROVED BY

COMPANY NAME

TOTAL

DT NO. 30

INVOICE NO.

DATE

DELIVERY TICKET

WISCO

P.O. BOX 2477
WILLISTON, N. DAK. 58802-2477

SHIPPED TO	
ADDRESS	
CITY & STATE	
CARE OF	
(LEASE) (WELL NO.) (FIELD) (RIG)	
INVOICE TO	[illegible]
ADDRESS	
CITY & STATE	

CUSTOMER ORDER NO.	ORDERED BY	DATE
CUSTOMER REQUISITION NO.	TAKEN BY	FILLED BY
ORDERED VIA		
SHIPPED VIA		
SPECIAL INSTRUCTIONS		

DATE	DESCRIPTION	UNITS	UNIT PRICE	AMOUNT
[illegible]	[illegible]			
	[illegible]			
	[illegible]			
	[illegible]			
	[illegible]			
	[illegible]			
	[illegible]			
	[illegible]			
	[illegible]			
	[illegible]			
	[illegible]			
	[illegible]			
	[illegible]			
	[illegible]			[illegible]
	[illegible]			[illegible]
	[illegible]	[illegible]		[illegible]
				[illegible]
				[illegible]
				[illegible]
	RECEIVED	CITY COUNTY	TAX	
	FEB 25 [illegible]		STATE TAX	

SERVICES PERFORMED BY

WISCO REPRESENTATIVE

Thank You Mr. ______ APPROVED BY

Office of Enforcement Compliance & Environmental Justice

COMPANY NAME

TOTAL	
DT NO.	[illegible]31
INVOICE NO.	DATE

DELIVERY TICKET

WISCO

P.O. BOX 2477
WILLISTON, N. DAK. 58802-2477

SHIPPED TO

ADDRESS

CITY & STATE

CARE OF

(LEASE) (WELL NO.) (FIELD) (RIG)

INVOICE TO

ADDRESS

CITY & STATE

CUSTOMER ORDER NO.	ORDERED BY	DATE
CUSTOMER REQUISITION NO.	TAKEN BY	FILLED BY

ORDERED VIA

SHIPPED VIA

SPECIAL INSTRUCTIONS

DATE	DESCRIPTION	UNITS	UNIT PRICE	AMOUNT

RECEIVED
FEB 25 2000
Office of Enforcement
Compliance & Environmental
Justice

CITY COUNTY TAX

STATE TAX

SERVICES PERFORMED BY

WISCO REPRESENTATIVE

Thank You Mr.

APPROVED BY

COMPANY NAME

TOTAL

DT NO. 75026

INVOICE NO.

DATE

DELIVERY TICKET

WISCO

P.O. BOX 2477
WILLISTON, N. DAK. 58802-2477

SHIPPED TO	[illegible]
ADDRESS	
CITY & STATE	
CARE OF	
(LEASE) (WELL NO.) (FIELD) (RIG)	[illegible]
INVOICE TO	[illegible]
ADDRESS	
CITY & STATE	

CUSTOMER ORDER NO	ORDERED BY	DATE
	[illegible]	[illegible]
CUSTOMER REQUISITION NO	TAKEN BY	FILLED BY
	[illegible]	

ORDERED VIA

SHIPPED VIA [illegible]

SPECIAL INSTRUCTIONS

DATE	DESCRIPTION	UNITS	UNIT PRICE	AMOUNT
[illegible]	[illegible]			
	[illegible]	[illegible]		[illegible]
	[illegible]			
	[illegible]			
	[illegible]	[illegible]		[illegible]
[illegible]	[illegible]			
	[illegible]	[illegible]	[illegible]	
	[illegible]			
	[illegible]			
	[illegible]	[illegible]	[illegible]	140.00
	[illegible]			
	[illegible]			
	[illegible]	[illegible]	[illegible]	
	[illegible]			
	[illegible]			
	[illegible]			1910.00
		CITY COUNTY	TAX	
		STATE TAX		

RECEIVED
FEB 25 2000
Office of Enforcement
Compliance & Environmental
Justice

SER...

...RMED BY

WISCO REPRESEN...

Thank You Mr. [illegible]

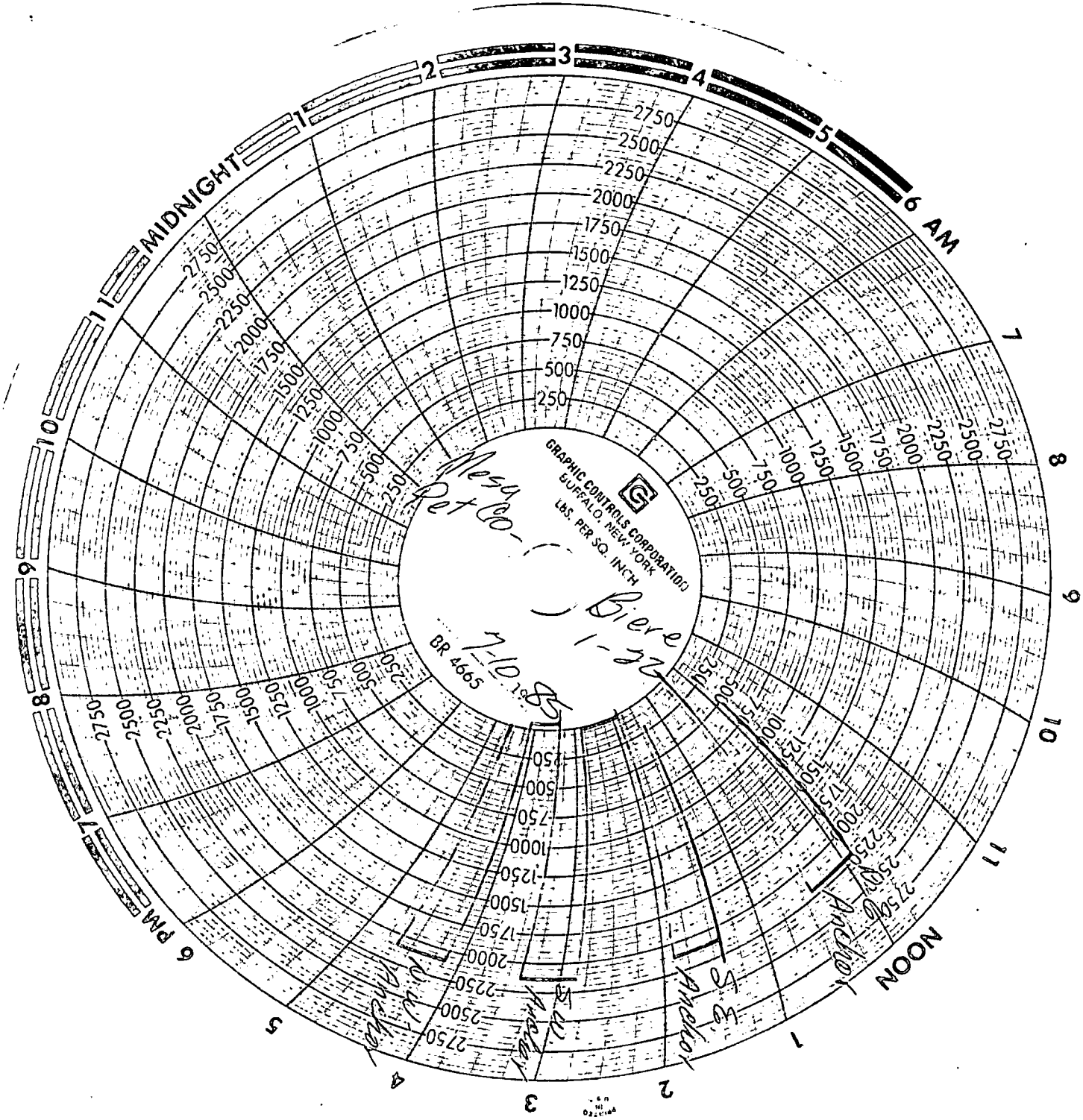
APPROVED BY

COMPANY NAME

TOTAL [illegible]

DT NO. 75027

INVOICE NO	DATE


GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK
LBS. PER SQ. INCH
BR 4665
MIDNIGHT
AM
NOON
PM
Mesa Pet Co-
Biere 1-22
7-10-85
Anchor
Anchor
Anchor
Anchor

RECEIVED

Service Order No. _____

DREW M. WALSH
E. PALSER JR.

RADIOACTIVE CONTAMINATION INSPECTION DATA SHEET

Date 7-13-85

CUSTOMER Company MESA PETROL COMPANY Well BIERE NO 1-22

Field POPLAR County ROOSEVELT State MT

Purpose of Survey NEUTRON LOG

Type Survey Meter VICTOREEN 493 Serial No. 3607M

Sealed Sources

Type Source Am BE Number 307

Condition of Source: Good ✓ Needs Repair ____

Condition of Source Shield: Good ✓ Needs Repair ____

Survey Readings:	Before Log	After Log
Normal Background	.02-.07 mr/hr	.02-.05
Storage Container	.1	.1
Tool	.03	.02
Logging Unit	.04	.03-05
Rig Floor	.03	.02-.05

Tracer Material

Tracer Suppliers Code ____ Date ____

Isotope ____ Activity ____

	Before	After
Background Measurement		
Ground Area Around Injection Equipment		
Flow Lines From Equipment to Wellhead		
Tracer Injection Tool		
Mixing Device or Tank		
Pump		
Hand Tools		
General Area		

On jobs using sealed sources only, the contamination level is considered to be twice the normal background reading for that location. Refer to Section 7 for detailed instructions on making survey. If levels are found that indicate contamination, the Supplementary Record on back of form must be filled out.

On jobs using tracer material the contamination level is .2 mr/hr at 1/2" from ground or other object. Refer to Section 7 for detailed instructions for making survey. If levels are found that indicate contamination, the Supplementary Record on back of form must be filled out..

Signature: [illegible] RA Sup. 7-13-85

Figure 5

RECEIVED
FEB 25 2003
Office of Enforcement
Compliance & Environmental
Justice

Form No.

(SUBMIT IN TRIPLICATE)
TO
BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA
P.O. BOX 217 HELENA, MT 59624

Oil or Gas Wells

ARM 36.22.307
ARM 36.22.1217
ARM 36.22.1242

REPORT OF PRODUCTION
(TO BE MADE BY PRODUCER)

NOV 1984
RECEIVED
OIL & GAS CONS. COMM.
STATE OF MONT.
BILLINGS

BOARD USE ONLY	
	FIL UNIT
	PROD
	CNTY

☐ 12. CHECK IF AMENDED REPORT

1. PRODUCER: Mesa Petroleum Co.
2. ADDRESS: P. O. Box 2009
3. CITY: Amarillo
4. STATE: Texas 5. ZIP: 79189
6. AGENT SIGNATURE: [signature]
7. FIELD NAME: Poplar
8. LEASE/UNIT NAME: Biere
9. COUNTY: Roosevelt
10. ☐ CHECK IF ADDRESS CHANGE
11. MONTH OF: October 198 4

13. WELL CLASSIFICATION (CHECK ONE)
X OIL WELLS
☐ NATURAL GAS WELLS

14. LEASE STATUS
1 NO WELLS PRODUCED
☐ NO WELLS SHUT IN

WELL DESCRIPTION							PRODUCTION INFORMATION			
15 WELL NUMBER	16 API NO (LAST 8 DIGITS)	17 DAYS PRODUCED	18 SEC	19 TWP	20 RGE	DO NOT USE	21 PRODUCING FORMATION	22 BBLS OF OIL / COND	23 MCF GAS @ 14.73 PSIA	24 BBLS OF WATER
BIERE 1-22	08521047	0	22	28N	51E		Charles "C"	0	0	0
							PLUGGED AND ABANDONED 9-17-84			
							FINAL REPORT			

25. INVENTORY SUMMARY	BBLS OIL AND COND.	MCF OF GAS	BBLS OF WATER
On Hand Start of Month	83		
Produced This Month	0	0	0
Sold This Month	0	0	
Spilled This Month	0		
Flared or Vented		0	
Used on Lease	0	0	
Injected	0	0	0
Surface Pits			0
Other	83 BS&W Tank Bottom	0	0

26. DISPOSITION INFORMATION		Bbls or MCF
BUYER	Getty	-0-
TRANSPORTER	Getty	Bbls.
BUYER		
TRANSPORTER		
BUYER		
TRANSPORTER		
BUYER		
TRANSPORTER		

NOTE: Separate production reports covering operations in each lease must be filed with the Helena office of the Board of Oil and Gas Conservation by the 20th day of each calendar month following the month covered by the report.

LOCATE WELL CORRECTLY

660' 1980'

(SUBMIT IN TRIPLICATE)
TO
OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

Form No. 4
(Gen. Rule 206.3 & 231)

RECEIVED JUL 1970 OIL & GAS CONS. COMM. BILLINGS, MONT.

LOG OF WELL

12

Company Mesa Petroleum Co. Lease Biere Well No. 1-22

Address Box 2009, Amarillo, Texas Field (or Area) Poplar

The well is located 1980 ft. from (S) line and 660 ft. from (W) line of Sec. 22

Sec. 22; T. 28N; R. 51E; County Roosevelt; Elevation 2086 KB 2074 GL (D.F., R.B. or G.L.)

Commenced drilling 5-6-70, 19__; Completed 6-8-70, 19__

The information given herewith is a complete and correct record of the well. The summary on this page is for the condition of the well at the above date.

Completed as oil (oil well, gas well, dry hole)

Signed [signature]

Title Production Superintendent

Date July 7, 1970

IMPORTANT ZONES OF POROSITY

(denote oil by O, gas by G, water by W; state formation if known)

From 698	to 876	Judith River	W	From 5516	to 5543	Charles "A"	W
From 3200	to 3570	Dakota	W	From 5635	to 5678	Charles "B"	W
From 4840	to 4992	Tyler	W	From 5788	to 5805	Charles "C"	O & W
From 5155	to 5288	Kibbey Ss.	W	From	to		

CASING RECORD

Size Casing	Weight Per Ft.	Grade	Thread	Casing Set	From	To	Sacks of Cement	Cut and Pulled from
8 5/8	24	J	8	741			465	none
5 1/2	15	J	8	5845			675	none

TUBING RECORD

Size Tubing	Weight Per Ft.	Grade	Thread	Amount	Perforations
2 7/8	6.7	J	8	5767	5791

COMPLETION RECORD

Rotary tools were used from 0 to 5845

Cable tools were used from ____ to ____

Total depth 5845 ft.; Plugged back to 5803 T.D.; Open hole from ____ to ____

PERFORATIONS			ACIDIZED, SHOT, SAND FRACED, CEMENTED			
Interval From	Interval To	Number and Size and Type	Interval From	Interval To	Amount of Material Used	Pressure
5791		Hydro-jet	5791		2000 gals 7 1/2% HCL	

(If P&A show plugs above)

INITIAL PRODUCTION

Well is producing from Charles "C" zone (pool) formation.

I. P. 516 barrels of oil per 24 hours flowing (pumping or flowing)

150 Mcf of gas per 24 hours.

966 barrels of water per 24 hours, or 65 % W.C.

(OVER)

Form No. 2

GENERAL RULES
201, 202, 213,
216, 219, 233.1

(SUBMIT IN QUADRUPLICATE)
TO
OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

RECEIVED
MAY 1970
OIL & GAS CONS. COMM.
STATE OF MONT.
BILLINGS

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE COMMISSION.

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill	X	Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

April 29, 1970

Following is a {notice of intention to do work} on land {~~XXXXX~~ leased} described as follows:

LEASE BIERE

MONTANA (State) ROOSEVELT (County) WILDCAT (Field)

Well No. 1-22 C NW SW (m. sec.) 28N (Township) 51E (Range) (Meridian)

The well is located 1980 ft. from {~~XXX~~ S} line and 660 ft. from {~~XX~~ W} line of Sec. 22

LOCATE ACCURATELY ON PLAT ON BACK OF THIS FORM THE WELL LOCAT[redacted] LEASE BOUNDARY

The elevation of the derrick floor above the sea level is not available

READ CAREFULLY DETAILS OF PLAN READ CAREFULLY

(State names of and expected depths to objective sands; show size, v ... sings; indicate mudding jobs, cementing points, and all other important proposed work, particularly all d ... cturing.)

Legal

DETAILS OF
RESU

It is proposed to drill a 12 1/4 inch hole to ... and set 8 5/8 inch casing and cement to GL. A 7 7/8 inch hole ... 00 feet, total depth, using conventional mud and logged and tested. If well is ... ered economic, 4 1/2 inch casing will be run and cemented. If well is dry, it will be plugged according to the rules and regulations of the Montana Conservation Commission.

AMOUNT RECEIVED $75.00
DRILLING PERMIT NO. 55582
RECEIPT NO. 7982

CORES AND CUTTINGS TO BE DELIVERED TO COMMISSION FIELD OFFICE IN ACCORDANCE WITH RULE NO. 230.

Approved subject to conditions on reverse of form

Date 5-4-70

By [signature] District Office Agent [signature] Title

10000 [illegible]

Company MESA PETROLEUM CO.

By [signature] J. L. Farrell

Title Prod. Supt.

Address ~~XXXXX~~ Box 2009, Amarillo, Texas 7910[illegible]

COMMISSION USE ONLY
API WELL NUMBER
[redacted] 215 [redacted] 0815 [redacted] 21101417 [redacted]

NOTE:—Reports on this form to be submitted to the District Agent for Approval in Quadruplicate.

WHEN USED AS PERMIT TO DRILL, THIS EXPIRES 90 DAYS FROM DATE OF APPROVAL.

Form No. 2

GENERAL RULES
201, 202, 213,
216, 219, 233.1

(SUBMIT IN QUADRUPLICATE)

TO

OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE COMMISSION.

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	
		Report of Change of Operator	XX

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

April 12, 1972

Following is a Notice of Change of Operator ~~notice of intention to do work~~ / ~~report of work done~~ on land ~~owned~~ / leased described as follows:

LEASE Biere

MONTANA (State) Roosevelt (County) Poplar (Field)

Well No. 1-22 22 (m. sec.) 28N (Township) 51E (Range) (Meridian)

The well is located 1980 ft. from ~~XXX~~ N / S line and 660 ft. from ~~XXX~~ E / W line of Sec. 22

LOCATE ACCURATELY ON PLAT ON BACK OF THIS FORM THE WELL LOCATION, AND SHOW LEASE BOUNDARY

The elevation of the derrick floor above the sea level is ~~XXXXX~~ 2086 KB

READ CAREFULLY — DETAILS OF PLAN OF WORK — READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work, particularly all details results Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

Effective April 1, 1972, the 1-22 Biere operated by Mr. John Snyder, Billings, Montana.

Approved subject to conditions on reverse of form

Date May 3, 1972

By Norman J. Beaudry, Administrator
~~District Office Agent~~ Title

Company Mesa Petroleum Co.

By [signature]

Title Operations Superintendent

Address Box 2009, Amarillo, Texas 79105

COMMISSION USE ONLY
API WELL NUMBER

NOTE:—Reports on this form to be submitted to the District Agent for Approval in Quadruplicate

WHEN USED AS PERMIT TO DRILL, THIS EXPIRES 90 DAYS FROM DATE OF APPROVAL.

Form No. 2

GENERAL RULES
201, 202, 213,
216, 219, 233.1

(SUBMIT IN QUADRUPLICATE)
TO

OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE COMMISSION.

RECEIVED
1972
OIL & GAS CONS.
STATE OF MONT.
HELENA

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	
		REPORT OF CHANGE OF OPERATOR	XX

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

August 21, 1972

Following is a {~~notice of intention to do work~~ / ~~report of work done~~} on land {~~owned~~ / leased} described as follows:

Notice of Change of Operator

LEASE Biere

MONTANA (State) Roosevelt (County) Poplar (Field)

Well No. I-22 22 (m. sec.) 28N (Township) 51E (Range) (Meridian)

The well is located 1980 ft. from {XXX / S} line and 660 ft. from {XXX / W} line of Sec. 22

LOCATE ACCURATELY ON PLAT ON BACK OF THIS FORM THE WELL LOCATION, AND SHOW LEASE BOUNDARY

The elevation of the derrick floor above the sea level is 2086' K.B.

READ CAREFULLY **DETAILS OF PLAN OF WORK** READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work, particularly all details results Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

Effective July 1, 1972, the No. 1-22 Biere operated by

AMARCO RESOURCES CORPORATION, 611 Midland Bank Building, Billings, Montana.

Approved subject to conditions on reverse of form

Date August 28, 1972

By Norman A. Beasley, Adm
~~District Office Agent~~ Title

Company John Snyder

By John Snyder

Title Operator

Address 611 Midland Bank Building
Billings, Montana 59101

COMMISSION USE ONLY
API WELL NUMBER

2|5

NOTE:—Reports on this form to be submitted to the District Agent for Approval in Quadruplicate

WHEN USED AS PERMIT TO DRILL THIS EXPIRES 90 DAYS FROM DATE OF APPROVAL.

Form No. 2

GENERAL RULES
201, 202, 213,
216, 219, 230,
231, 232

(SUBMIT IN QUADRUPLICATE)

TO

BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA

BILLINGS OR SHELBY

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE BOARD.

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	
		Report of Change of Operator	X

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

December 14, 1976

Following is a {notice of intention to do work / report of work done} on land {owned / leased} described as follows:

LEASE Biere

MONTANA (State) Roosevelt (County) Poplar (Field)

Well No. 1-22 22 (m. sec.) 28N (Township) 51E (Range) (Meridian)

The well is located 1980 ft. from {N / S} line and 660 ft. from {E / W} line of Sec. 22

LOCATE WELL SITE ACCURATELY ON PLAT ON BACK OF THIS FORM.

The elevation of the ground or K.B. above the sea level is 2086' KB.

READ CAREFULLY DETAILS OF PLAN OF WORK READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings, cementing points, and all other important proposed work, particularly all details of Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

Effective December 1, 1976, the No. 1-22 Biere will be operated by

MESA PETROLEUM CO., P.O. Box 2009, Amarillo, Texas 79105.

Approved subject to conditions on reverse of form

Date Dec 21-76

By Donald E. Ahlholm Adm
District Office Agent Title

Company Mesa Petroleum Co.

By S E Dobler S. E. Dobler

Title Supervisor, Drilling & Production

Address P.O. Box 2009
Amarillo, Texas 79105

BOARD USE ONLY
API WELL NUMBER

NOTE:—Reports on this form to be submitted to the appropriate District for approval

WHEN USED AS PERMIT TO DRILL, PERMIT EXPIRES 90 DAYS FROM DATE OF APPROVAL IF WELL NOT SPUDDED OR EXTENSION REQUESTED.

Form No. 2

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE BOARD.

(SUBMIT IN QUADRUPLICATE)
TO
BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

on weekly list 10-5-84

RECEIVED JUL - 1984 OIL & GAS CONS. COMM. STATE OF MONT. BILLINGS

MAC 36-3.18(10)-S18020
MAC 36-3.18(10)-S18030
MAC 36-3.18(10)-S18140
MAC 36-3.18(10)-S18170
MAC 36-3.18(10)-S18200
MAC 36-3.18(10)-S18310
MAC 36-3.18(10)-S18330
MAC 36-3.18(14)-S18380

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well Producer	X	Report of Fracturing	

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

July 18, 1984

Following is a {notice of intention to do work} on land {owned} described as follows:

LEASE Biere

MONTANA (State) Roosevelt (County) Poplar (Field)

Well No. 1-22 C NW SW 22 (m. sec.) 28N (Township) 51E (Range) (Meridian)

The well is located 1980 ft. from {N/S} line and 660 ft. from {E/W} line of Sec. 22

LOCATE WELL SITE ACCURATELY ON PLAT ON BACK OF THIS FORM.

The elevation of the ground or K.B. above the sea level is 2086 KB

READ CAREFULLY **DETAILS OF PLAN OF WORK** READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings, cementing points, and all other important proposed work, particularly all details of Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

Subject well is currently uneconomic to produce, and Mesa Petroleum Co. is proposing to plug subject well as follows: Well drilled to TD of 5845'; 5 1/2" casing set at 5845'. Well perforated at 5791'. Propose to set cast iron bridge plug at 5750', spot 25 sxs cement plug above CIBP. Perforate 5 1/2" casing 50' below 8 5/8" surface casing set at 741'. Squeeze 5 1/2" production casing with 50 sxs cement, leaving 20 sxs cement inside 5 1/2" casing. Spot 10 sxs cement plug at surface, set dry hole marker.

LOCATION INSPECTED & APPROVED:
Approved subject to conditions on reverse of form

Date JUL 23 1984

By Elaine Humphrey
District Office Agent Title

Company Mesa Petroleum Co.

By Randy Z. Nordover

Title Regulatory Coordinator

Address P. O. Box 2009/Amarillo, Texas 79189
806-378-1000

BOARD USE ONLY
API WELL NUMBER
25

NOTE:—Reports on this form to be submitted to the appropriate District for approval

WHEN USED AS PERMIT TO DRILL, PERMIT EXPIRES 90 DAYS FROM DATE OF APPROVAL IF WELL NOT SPUDDED OR EXTENSION REQUESTED.

OVER

OK as am. list 10-5-84

Form No. 2

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE BOARD.

(SUBMIT IN QUADRUPLICATE)

TO

BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA

BILLINGS OR SHELBY

MAC 36-3.18(10)-S18020
MAC 36-3.18(10)-S18030
MAC 36-3.18(10)-S18140
MAC 36-3.18(10)-S18170
MAC 36-3.18(10)-S18200
MAC 36-3.18(10)-S18310
MAC 36-3.18(10)-S18330
MAC 36-3.18(14)-S18380

RECEIVED OCT 1984 OIL & GAS CONS. COMM. STATE OF MONT. BILLINGS

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment Produced	X
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

September 26, 1984

Following is a {notice of intention to do work / report of work done} on land {owned / leased} {described as follows:

LEASE Biere

MONTANA (State) Roosevelt (County) Poplar (Field)

Well No. 1-22 C NW SW 22 (m. sec.) 28N (Township) 51E (Range) (Meridian)

The well is located 1980 ft. from {N / S} line and 660 ft. from {E / W} line of Sec. 22

LOCATE WELL SITE ACCURATELY ON PLAT ON BACK OF THIS FORM.

The elevation of the ground or K.B. above the sea level is 2086' KB

READ CAREFULLY **DETAILS OF PLAN OF WORK** READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings, cementing points, and all other important proposed work, particularly all details of Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

Subject well was plugged on 9/17/84 as follows: squeezed perfs at 5791' with 50 sxs cement. Top of cement at 5760'. Perforated tubing at 5750', spotted 30 sxs cement inside and outside of tubing from 5435' to 5750'. Perforated tubing from 993'-996' and pumped 50 sxs cement down tubing, pumped 85 sxs cement down 5-1/2" production casing. Pumped 220 sxs cement down 8-5/8" surface casing. Cut off casing 4' below ground level. Welded cap on 8-5/8" casing, dumped 10 sxs cement on top of cap. All casing and tubing was left in well.

LOCATION INSPECTED & APPROVED:

Approved subject to conditions on reverse of form

Date AUG - 5 1986

By Claire F. Humphrey by District Office Agent Title

Company Mesa Petroleum Co.

By Randy J. Nordoven

Title Regulatory Agent

Address P.O. Box 2009, Amarillo, TX 79189

806-378-1000

BOARD USE ONLY
API WELL NUMBER
25 (STATE) 015 (COUNTY) 21047 (WELL)

NOTE:—Reports on this form to be submitted to the appropriate District for approval

WHEN USED AS PERMIT TO DRILL, PERMIT EXPIRES 90 DAYS FROM DATE OF APPROVAL IF WELL NOT SPUDDED OR EXTENSION REQUESTED.

OVER

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE BOARD.

TO

BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA

BILLINGS OR SHELBY

SUNDRY NOTICES AND REPORT OF WELLS

ARM 36.22.307 ARM 36.22.1003
ARM 36.22.601 ARM 36.22.1004
ARM 36.22.602 ARM 36.22.1013
ARM 36.22.603 ARM 36.22.1301
ARM 36.22.604 ARM 36.22.1306
ARM 36.22.605 ARM 36.22.1309

Notice of Intention to Drill *		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	X
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

February 5, 1991

Following is a report of work done on land owned described as follows:

LEASE TYPE ..... (Private, State, Federal, Indian) LEASE BIERE

MONTANA (State) ROOSEVELT (County) POPLAR (Field)

Well No. BIERE # A-1 (SWD) (m. sec.) SEC. 22 T28N R51E (Township) (Range) (Meridian)

The well is located 1750 ft. from N/S line and 140 ft. from E/W line of Sec. 22

* For notice of intention to drill, write the API* or the well name of another well on this lease if one exists

LOCATE WELL SITE ACCURATELY ON PLAT ON BACK OF THIS FORM.

The elevation of the ground or K.B. above the sea level is 2087'

READ CAREFULLY **DETAILS OF PLAN OF WORK** READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings, cementing points, and all other important proposed work, particularly all details of Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

Subject well was plugged and abandoned on September 15, 1984 by filling the 5½" casing and tubing with 250 sx Class "H" cement. Cut casing 4' below ground level and welded cap on casing. Well P&A 9/15/84

LOCATION INSPECTED & APPROVED

Approved subject to conditions on reverse of form

Date FEB 12 1991

By [signature] District Office Agent, field supr Title

Company MESA OPERATING LTD PARTNERSHIP

By [signature]

Title Sr. Regulatory Analyst

Address P.O. Box 2009, Amarillo, Texas 79189

BOARD USE ONLY
API WELL NUMBER

STATE	COUNTY	WELL
25	985	21649

NOTE:—Reports on this form to be submitted to the appropriate District for approval.
DRILLING PERMIT EXPIRES SIX MONTHS FROM DATE OF APPROVAL.

7. MUD PROGRAM

The No. 1-22 Biere was drilled with fresh water and native mud, with the addit of 50 barrels of diesel oil, to near the Piper Limestone, where a Chemical Gel Mud was mixed. A Chemical Gel mud was then maintained to total depth, with a water loss of less than 10 cc. while drilling the Charles Formation.

Water flows were first noticed while making a trip for a new bit at 3265 feet, immediately below the top of the Dakota Sandstone. A tight connection at 763 also indicated a possible water flow from the Judith River. Both formations are used for salt water disposal from the nearby East Poplar Field. By the t the Otter-Upper Kibbey section from approximately 5000-5175 had been drilled, the water flow had become serious, and attempts to control the flow while circulating on bottom were unsuccessful. The Judith River, immediately below the surface casing, was squeeze cemented; however the water flow continued. With the rams closed, a 10.7-10.9 mud was mixed and the water flow finally stopped. The mud weight was kept in this range for the remainder of the well and no further problem was experienced with the water flow. Some damage occurred in the potential producing zone, the Charles C-2 Zone, as a result of the relati heavy mud. It is believed the water flow was coming from both the Judith Riv and Dakota formations.

Mud costs are not yet available, but they will be much higher than normal due to the above mentioned water flow.

8. BIT RECORD

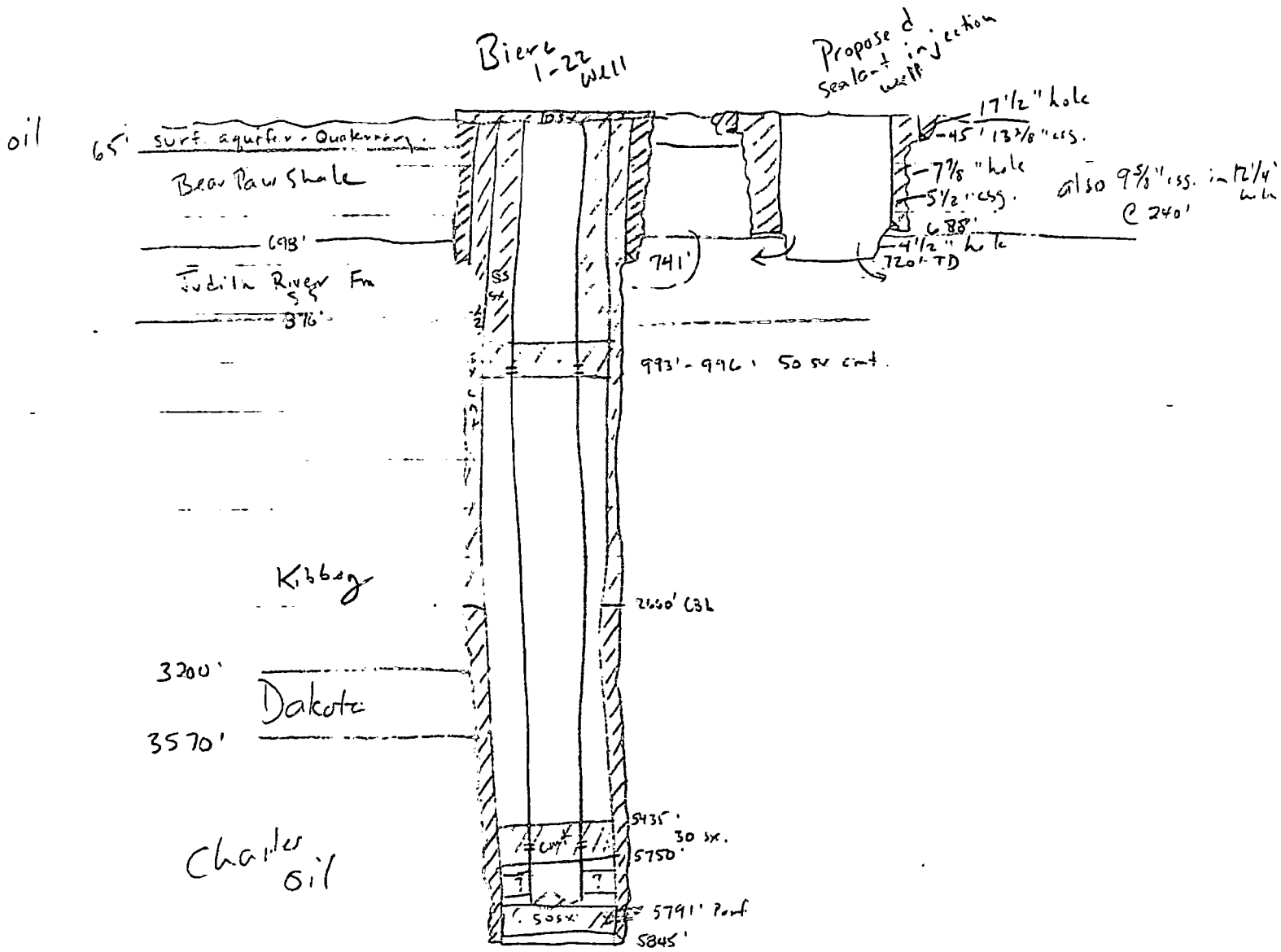
No.	Type	Make	Jet Size (32nds)			Depth Out	Feet	Hours	Deviation
1-S*	HTC	OSC3A	16	16	16 (RR)	745	705	8¼	**
1	STC	SDS	14	14	14	3265	2520	21⅛	¾°
2	STC	SDT	14	14	16	3729	464	9¼	Stuck pipe
3	HTC	OSC1G	14	14	16	4183	454	15⅛	
4	Sec	S4T	14	14	16	4512	329	15⅛	¾°
5	Sec	S88	14	14	16	4885***	373	23¾	Pull for DST
5	Sec	S88 RR	14	14	16	5175	290	20	
6	Sec	S6	14	16	16	5175	0	—	Cond. Hole
7	Sec	S88	14	16	16	5344	169	23¼	1°
8	Sec	M4N	14	16	16	5518	174	21	
9	HTC	OWV	14	16	16	5686	168	20⅛	1¼°
10	Sec	M4N	14	16	16	5800	114	15⅛	
11	STC	VT	15	15	15	5845	45	5¼	

* Bit 1-S was 12 1/4" in diameter; all other bits used were 7 7/8" diameter.

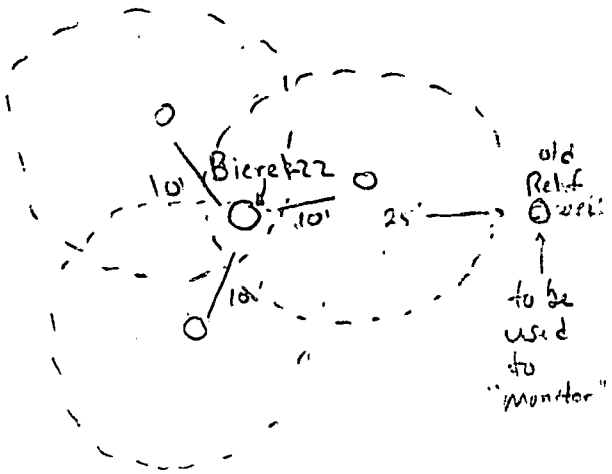
** Other straight-hole surveys were taken as follow: ⅛° at 222', ⅛° at 426', ¾° at 673'.

*** 4885' Board = 4886.49' S.L.M. (no correction made)

RECEIVED
FEB 2 5 ...
Office of Enforcement
Compliance & Environmental
Justice



Better Well Pattern:



By. N. Wiser 1-2-01

CANDIDATE WELL

Biere #1-22 Prod. well

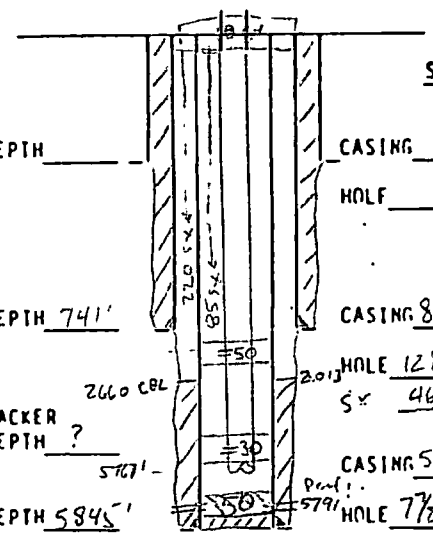
{T28N R51E S22
1980' SL 660' WL}

Drilled 5-6-70 → 6-8-70 Mesa Petroleum Co., Amarillo TX

DSTs: ① 3-4-70 ? Tyler Fm: 4842' – 2486# = .513 psi/ft
4881' – 2495# = .511 psi/ft

② 5-19-70 Kibby Fm 5113' – 2514# = .492 "
5171' – 2553# = .494 "

③ 5-24-70 Charles Fm 5753' – 2933# = .510 "
5796' – 2931# = .506 "



SIZE

DEPTH ____ CASING ____

HOLE ____

DEPTH 741' CASING 8 5/8"

HOLE 12 1/4" 2.013

SX 465 TOC = 0' (calc)

2660 CBL

PACKER DEPTH ?

5767'

CASING 5 1/2"

Perfs 5791'

DEPTH 5845' HOLE 7 7/8"

SX 675 TOC ≈ 2660' (CBL)

PBTD 5803' TD 5845

678' Judith River
876'
3200'
3570' Dakota
4840'
4902' Tyler
5155'
5288' Kibby
5516'
5805' Charles A, B, C

4-1-72 operated by Mr. John Snyder – Billings MT

7-1-72 operated by AMARCO Billings MT
↳ (earthen pits full of H_2O (salt) and under oil + water) – 3-31-76 ltr.

12-1-76 operated by Mesa Petroleum – Amarillo, TX

9-17-84 – – Tubing (2 7/8") cemented in! w/ perfs
P+A: ① 50 sxs squeezed into perfs @ 5791'
TOC = 5760'

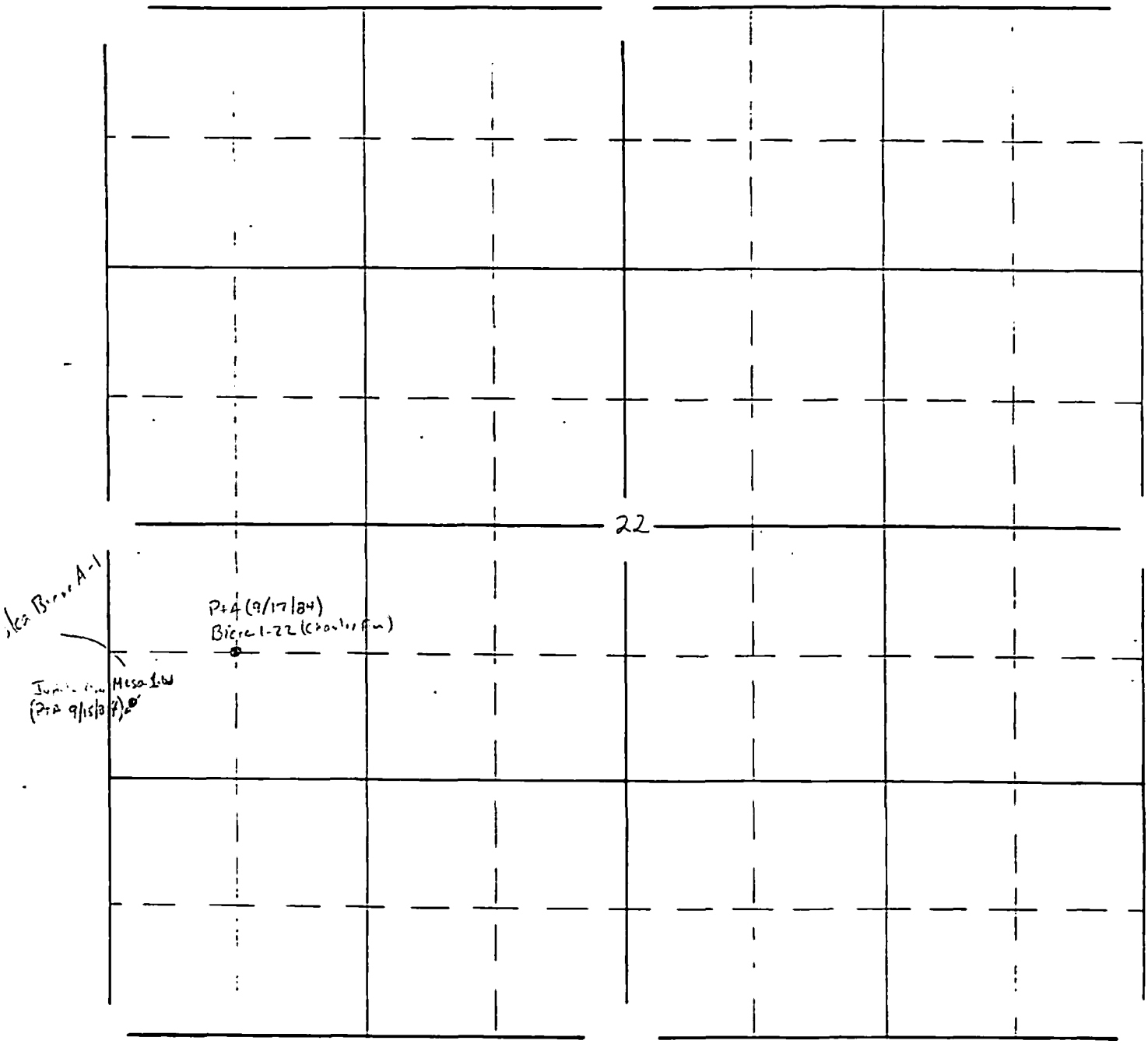
② 50 sx plug 5435' – 5750' (perf'd tubing)

③ 50 sx plug 993' – 996' (perf'd tubing)

④ 85 sx – sent down 5 1/2" x 2 7/8" annulus

⑤ 220 sx – sent down 8 5/8" x 5 1/2" annulus

7-12-85 → 7-29-85 'Relief' well drilled + plugged



LEGEND

- Dry Hole
- Oil Well
- Gas Well
- Water Disposal Well
- Water Injection Well
- Abandoned Oil Well
- Abandoned Gas Well
- Abandoned Disposal Well
- Abandoned Injection Well

DATUM

OPERATOR: _____

LSE. NAME & NO. _____

LOCATION: T28N; R51E; S22

COUNTY: Roosevelt MT

DATE. _____

SCALE: 1" = 500'

Permit

Cem. Top ○ Sur. Ele

Plug Int. U.S D.W.

Plug Int. Inj. Zone

T. D.

WELL REPORT

MESA PETROLEUM COMPANY

NO. 1-22 BIERE

NW SW Section 22-28N-51E
Roosevelt County, Montana

1. GENERAL DATA

Elevations:	2074' G.L.; 2086' K.B.
Spudded:	May 6, 1970 - 3:45 p.m.
Surface Casing:	Ran 24 joints 8 5/8" casing (729.50'), cemented at 741' with 365 sacks 50-50 Posmix, 2% calcium chloride, 1/4# Flocele/sack, tailed-in with 100 sacks Regular Cement, 2% calcium chloride, 1/4# Flocele/sack, plug down 8:45 p.m., May 7.
Total Depth:	5845' Driller; 5845' Schlumberger (ceased drilling May 25)
Production Casing:	Ran 175 joints used 5½" casing, cemented at 5845' (set in full tension), cemented with 675 sacks Halliburton Light Cement, 10# Gilsonite/sack for first 625 sacks, salt saturated, tailed-in with 50 sacks Class G Cement, 1% Latex, displaced with 138 barrels salt water, full returns, plug down 5:45 a.m., May 27.
Status:	W.O.C. (May 28), will production test Charles C-2 Zone
Contractor:	Calvert Drilling and Exploration Company - Rig 22 Tool Pusher - Elwood Erickson

2. FORMATION TOPS AND MARKERS (Laterolog-Gamma Ray)

Name	Depth	Datum
Cretaceous		
Base Judith River	878	+1208
Eagle	1140	+946
Niobrara	1990	+96
Greenhorn	2343	-257
Muddy Sandstone	2940	-854
Dakota Siltstone	3128	-1042
Dakota Sandstone	3200	-1114
Jurassic		
Morrison	3570?	-1484
Swift	3593	-1507
Vanguard	3920	-1834
Rierdon	4103	-2017
Piper Shale	4283	-2197
Piper Limestone	4361	-2275
Kline	4499	-2413
Triassic		
Spearfish	4604	-2518
Pennsylvanian		
Amsden	4708	-2622
Tyler	4840	-2754
Tyler Sandstone	4856	-4968

FORMATION TOPS AND MARKERS (Continued)

Mississippian		
Otter	4992	-2906
Kibbey Sandstone	5130	-3044
Kibbey Limestone	5287	-3201
Charles	5446	-3360
A-4 Zone	5502	-3416
6th Salt	5581	-3495
B-1 Zone	5634	-3548
B-2 Zone	5652	-3566
B-3 Zone	5672	-3586
B-4 Marker (Base Greenpoint Anhydrite)	5702	-3616
C-2 Zone	5788	-3702
(Total Depth)	5845	-3759

3. CORES - None

4. DRILL STEM TESTS

Three Drill Stem Tests were taken on the No. 1-22 Biere, and the results of these tests are given below. All tests are straight anchor open-hole tests made by the Halliburton Company. No water cushion was used.

Drill Stem Test No. 1, 4859-4885, (Tyler), ¼" top choke, ¾" bottom choke 15 minute Preflow with weak to strong blow in 7 minutes, 30 minutes ISI, Reopened tool for 60 minutes with fair blow, strong blow in 5 minutes continuing for remainder of flow period, 60 minute FSI, No gas or fluid to surface.

Pipe Recovery: 120' Very slightly Mud Cut and Oil-flecked Salt Water
1369' Oil-flecked Salt Water (12,000 ppm Chlorides)
1489' Total Fluid

Pressures: First Flow 72-201 Second Flow 201-601
Shut-in 2500-2486 Hydrostatic 2557-2543

Chamber Recovery: 13 psi, No Gas, Trace Oil, 2150 cc Salt Water

Remarks: BHT 216°F., MW 10.0, Vis 100+; Water flow throughout test--probably from Judith River. Charts indicated possible formation damage. Test was mechanically successful.

Drill Stem Test No. 2, 5135-5175, (Kibbey), ¼" top choke, ¾" bottom choke 15 minute First Flow Period with steady weak 1" blow, 90 minute First Shut-in Period, 15 minute Second Flow Period with weak steady 1" blow, 15 minute Second Shut-in Period, 120 minute Third Flow Period, steady weak 1" blow in 4 minutes, 2¾" blow in 40 minutes, 4" blow in 70 minutes that decreased slightly to end of flow period, 120 minute Final Shut-in Period, No gas or fluid to surface.

Pipe Recovery: 180' Slightly Oil and Gas Cut Drilling Mud
120' Slightly Water Cut and Oil and Gas Cut Drilling Mud
60' Slightly Mud Cut Water with Trace of Oil and Gas
559' Slightly Oil and Gas Cut Water
919' Total Fluid

Pressures: First Flow 86-115 Second Flow 143-186 Third Flow 195-387
First Shut-in 2600 Second Shut-in 2355 Third Shut-in 2514
Hydrostatic 2876-2731

Chamber Recovery: Trace Gas with 16 psi, 100 cc Black Oil, 2050 cc Water

Remarks: BHT 218°F. Sampler Water had chlorides of 76,000 PPM, as measured by mud engineer, which differed considerably from Halliburton's Rw and salinity measurements. Test was mechanically successful.

DRILL STEM TESTS (Continued)

Drill Stem Test No. 3, 5785-5800', (Charles C-2 Zone), ¼" top choke, ¾" bottom choke; 15 minute Preflow with weak to strong blow in 10 minutes, ISI 30 minutes, Reopened tool for 120 minutes, ½" weak blow initially increasing to strong blow in 20 minutes which continued for remainder of flow period, 90 minute FSI (blow died immediately when tool was shut-in). No Gas or Fluid to surface.

Pipe Recovery: 400' Clean Green Oil (4.5 bbls.) 41° at 60°F.
120' Mud Cut Oil (1.7 bbls.)--50%+ Oil
160' Gas-Oil-Mud Emulsion (.96 bbls.)
310' Water (1.86 bbls.)--gray, sulfurous, salty
990' Total Fluid (9.02 bbls.)

Pressures: Preflow 46-139 Main Flow 139-417 Shut-in 2954-2931
Hydrostatic 3414-3392

Chamber Recovery: 0.1 cu. ft. Gas with 50 psi, 800 cc Oil, 1400 cc. Water

Remarks: BHT 221°F., GOR 20:1; Schlumberger measured Rw of 0.04 at BHT, which differed appreciably from Halliburton Rw. Charts indicated considerable formation damage. Test was mechanically successful. 1040' Gas in DP.

5. SAMPLES

Samples were collected as follow: 30' samples from below surface casing to 4400'; 10' samples from 4400' to 5450'; and 5' samples below 5450'. Sample quality was generally fair except when experiencing strong water flow while drilling the Otter-Kibbey Sandstone section, and except where otherwise noted. Samples were examined from shows, but were not described, from 2900-3700'. Samples were examined and described below 4400'. All samples were delivered to the State of Montana Oil and Gas Conservation Commission, Poly Drive, Billings, Montana, for further processing and storage.

6. LOGS AND LOG INTERPRETATION

The following Schlumberger logs were run: Laterolog with Gamma Ray from 741-5840', Sidewall Neutron Porosity Log from 2800-3150' and 4600-5842', Microlaterolog from 2800-3114' and 4616-5844', and a Moveable Oil Plot from 4800-5840'. Mr. Erickson, Schlumberger Engineer, made the following calculations:

Depth Interval	Porosity	Water Saturation	Remarks
4761	13%	80%	Amsden; Rw = .04
4766	5%	93%	
5528	10%	72%	Charles; Rw = .04
5542-44	15%	42%	Shaley
5788-93	20%	31%	Charles C-2 Zone
5795	11%	36%	
5796-98	17%	34%	
5800-02	13%	45%	

The Moveable Oil Plot indicates the Charles C-2 Zone from 5788-5803' to be probably oil productive. No other zones are believed to have economic potential in the No. 1-22 Biere, although the MOP indicates that moveable oil is present in other Charles zones, and in the Kibbey, Otter, and Tyler (Heath) Formations. Most of these zones are argillaceous. Perhaps the most interesting zone is lower Otter interval 5086-5130. Samples were poor in this interval due to a strong water flow occurring at the time it was drilled. A re-examination of samples failed to find any oil shows. It should be noted that 5' of free oil was recovered on a DST of the Otter (from a higher stratigraphic interval) in the Murphy E.P.E. #63 (SW NE 27-28N-51E).

A Drilling Time Log (5" = 100' Vertical Scale) was plotted by the wellsite geologist from 4300-5845'. A copy of the Drilling Time Log is included in this report.

7. MUD PROGRAM

The No. 1-22 Biere was drilled with fresh water and native mud, with the addition of 50 barrels of diesel oil, to near the Piper Limestone, where a Chemical Gel Mud was mixed. A Chemical Gel mud was then maintained to total depth, with a water loss of less than 10 cc. while drilling the Charles Formation.

Water flows were first noticed while making a trip for a new bit at 3265 feet, immediately below the top of the Dakota Sandstone. A tight connection at 763 also indicated a possible water flow from the Judith River. Both formations are used for salt water disposal from the nearby East Poplar Field. By the time the Otter-Upper Kibbey section from approximately 5000-5175 had been drilled, the water flow had become serious, and attempts to control the flow while circulating on bottom were unsuccessful. The Judith River, immediately below the surface casing, was squeeze cemented; however the water flow continued. With the rams closed, a 10.7-10.9 mud was mixed and the water flow finally stopped. The mud weight was kept in this range for the remainder of the well and no further problem was experienced with the water flow. Some damage occurred in the potential producing zone, the Charles C-2 Zone, as a result of the relatively heavy mud. It is believed the water flow was coming from both the Judith River and Dakota formations.

Mud costs are not yet available, but they will be much higher than normal due to the above mentioned water flow.

8. BIT RECORD

No.	Type	Make	Jet Size (32nds)			Depth Out	Feet	Hours	Deviation
1-S*	HTC	OSC3A	16	16	16 (RR)	745	705	$8\frac{1}{4}$	**
1	STC	SDS	14	14	14	3265	2520	$21\frac{1}{2}$	$\frac{3}{4}^{o}$
2	STC	SDT	14	14	16	3729	464	$9\frac{1}{4}$	Stuck pipe
3	HTC	OSC1G	14	14	16	4183	454	$15\frac{1}{2}$	
4	Sec	S4T	14	14	16	4512	329	$15\frac{1}{2}$	$\frac{1}{4}^{o}$
5	Sec	S88	14	14	16	4885***	373	$23\frac{3}{4}$	Pull for DST
5	Sec	S88 RR	14	14	16	5175	290	20	
6	Sec	S6	14	16	16	5175	0	--	Cond. Hole
7	Sec	S88	14	16	16	5344	169	$23\frac{1}{4}$	1°
8	Sec	M4N	14	16	16	5518	174	21	
9	HTC	OWV	14	16	16	5686	168	$20\frac{1}{2}$	$1\frac{1}{4}^{o}$
10	Sec	M4N	14	16	16	5800	114	$15\frac{1}{2}$	
11	STC	VT	15	15	15	5845	45	$5\frac{1}{4}$	

* Bit 1-S was 12 1/4" in diameter; all other bits used were 7 7/8" diameter bits.

** Other straight-hole surveys were taken as follow: $\frac{1}{2}^{o}$ at 222', $\frac{1}{2}^{o}$ at 426', $\frac{1}{4}^{o}$ at 673'.

*** 4885' Board = 4886.49' S.L.M. (no correction made)

SAMPLE DESCRIPTIONS

Sample descriptions begin at 4300 feet, above the Piper Limestone. Sample depths and tops are corrected for lag. Sample quality is fair, except where otherwise noted. Note: Samples were also examined from 2900-3700 feet, through the Muddy-Dakota sections, although lithology was not described. No shows were found in this interval. No Muddy sand was noted although the Laterolog indicates the presence of sandstone from 2938-2958. Samples were more representative through the Dakota-Lakota sections, especially in the Lakota, which contained much loose, medium grained, quartzose sand.

10-feet samples.

4300-4350 Shale, reddish brown, slightly calcareous, predominently subplaty. Samples are mostly greenish gray shale cavings and brown argillaceous limestone that is possibly from the Piper Limestone section. Sample quality is questionable.

4350-4359 Shale, as above, with interbedded Limestone, tan, grayish brown, crypto-microcrystalline, argillaceous, no visible porosity.

4359 Piper Limestone

4359-4385 Limestone, dark grayish brown, crypto-microcrystalline, argillaceous, no visible porosity. Stringers Shale, greenish gray, platy-subplaty.

4385-4415 Limestone, tan, brown, occasionally cream, crypto-microcrystalline, rarely pseudoolitic, usually earthy and argillaceous, no visible porosity. Stringers Shale, as above.

4415-4450 Shale, greenish gray, subplaty-platy. Shale, tan, brownish gray, calcareous-very calcareous--grading to argillaceous Limestone.

4450-4475 Shale, predominently greenish gray, tan, predominently subplaty. Interbedded Limestone, tan, brown, cryptocrystalline, rarely pseudoolitic-fragmental, argillaceous, no porosity.

4475-4500 Shale, greenish gray, some tan, predominently platy-subplaty.

4500-4600 No description--samples very poor due to inexperienced sample catcher. Samples consist entirely of coarse shale cavings.

4600-4620 Loose Sand, predominently clear, some orange, red, gray, tan, fine-coarse grained. predominently medium grained, subangular, locally subround, quartzose, questionable porosity. Shale, brownish red, reddish brown, greenish gray.

4620 Spearfish (Top possibly at 4603')

4620-4650 Shale, orange red, brownish red, very silty--grades to Siltstone. Much soft orange-red Shale washes out of samples.

4650-4695 Shale, as above, local white anhydrite inclusions, trace Anhydrite, white, pink.

4695-4706 Shale, as above, often grading to Siltstone, becoming more anhydritic.

4706 Amsden

4706-4750 Varicolored Shale, maroon, brownish red. reddish brown, locally waxy. Streaks Limestone, very light gray, off white, pink, lavender, purple, cryptocrystalline, no visible porosity.

4750-4760 Limestone, as above, becoming dolomitic in part with depth. Streaks Shale, as above. Samples mostly greenish gray shale cavings.

4760-4765 Shale, varicolored, mostly maroon, brownish red.

4765-4816 Limestone, off white, very light tan, locally with pink-red mottling, crypto-microcrystalline, poor intercrystalline porosity and "chalky" porosity. Trace Dolomite, pink-red, cryptocrystalline, no visible porosity. Trace varicolored Shale.

4816 or 4640 Tyler

4816-4855 Shale, maroon, brownish red, reddish brown, locally slightly silty. Samples 90% Amsden limestone.

4855-4870 Shale, as above, with trace Sandstone, red-light gray, fine grained, locally very fine or very fine-fine grained, subangular, locally argillaceous, quartzose, tight, no show. Trace loose fine grained, clear quartz Sand--cavings?

4870-4885 Sandstone, light red to very light gray with reddish cast, locally red, predominently fine grained, locally very fine-fine grained, subangular, little red argillaceous cement, quartzose (clear quartz), poor-fair porosity, often tight, 20-30% with pale yellow fluorescence and weak cut, no stain. Possible stringers brownish red shale.

4885-Circ. Samples 1½ hrs. Sandstone, as above, with slight oil show as above. Ran DST 1, 4859-4884.

4885-4892 Sandstone, as above, with slight oil show, as above.

4892-4930 Sandstone and loose Sand, white, occasionally red, light red, fine-coarse grained, predominently medium-fine grained, subangular-subround, occasionally round (better rounded with depth), quartzose, fair porosity, in part with weak yellow fluorescence and weak fluorescent cut. Streaks Shale, brownish red, occasionally lavender, light brownish red, occasionally red, tan, green, usually nonsilty.

4930-4950 Sandstone and loose Sand, white, light gray, occasionally red, fine-medium grained, subangular-subround, questionable porosity, some clusters have weak yellow fluorescence and very weak fluorescent cut. Some Shale, as above.

4950-4962 As above, increase in loose fine grained Sand, as above, often red, becoming better rounded.

4962-Circ. Samples 1 hr. Sand, loose, predominently red, occasionally light gray, colorless, fine-coarse grained, predominently fine grained, subround-subangular, occasionally round, quartzose, occasionally in friable red-white clusters, no show. Little Shale, as above.

4962-4975 Shale and Sandstone, as above, usually loose.

4975-4996 Shale, varicolored, predominently greenish gray, gray, grayish green, also reddish brown, brownish red, green.

4996 Otter

4996-5060 Shale, as above, becoming more varicolored, including vivid green, maroon, pale green, green. Limestone, off white, cream, in part light tan with reddish cast or pink-red mottling, matrix, cryptocrystalline, locally soft and chalky, often dolomitic, no visible porosity.

5060-5085 Interbedded varicolored Shale and Limestone, as above; some Limestone is off white-light tan, crypto-very fine crystalline, hard, no porosity.

5085-5134 Varicolored Shale, as above, gray, green, maroon, brownish red, greenish gray, trace pale green; some Shale, red-very light gray mottled, slightly calcareous

5134? Kibbey Sandstone

5134-5157 Siltstone, brownish red, red-orange, very argillaceous--grading to very fine grained Sandstone, tight. Interbedded Shale, brownish red, maroon. Samples due to water flow.

5157-5161 Sandstone, white, very fine-fine grained, subangular, quartzose (clear quartz), poor-fair porosity, approximately 50% with strong yellow fluorescence, and weak streaming cut, no stain. Poor samples due to water flow--mostly gray shale cavings.

5161-5169 Interbedded Siltstone and Shale, as from 5134-57.

5169-5175 Sandstone, as above, with oil show as above. Possible streaks Shale and Siltstone, as above--very poor samples.

5175-Circ. Samples 3 hrs. As above. Poor samples--much gray shale cavings and some reddish colored shales from Otter. Much loose Sand, clear, trace red, fine-medium, subangular to round, quartzose, questionable porosity, no show. Ran DST 2, 5135-5175.

5175-5188 Shale, brownish red, brick red. Some red-orange very fine grained Sandstone. Samples mostly greenish gray shale cavings.

5188-5200 Sandstone, red-orange, few dark gray grains, very fine-fine grained, scattered medium grains, subround-subangular (larger grains are better rounded), slightly argillaceous to argillaceous, slightly calcareous, friable, fair porosity, no show.

5200-5205 Shale, reddish brown, brick red, as above.

5205-5222 Siltstone and very fine grained Sandstone, red-orange, locally with very fine-fine grains, argillaceous, slightly calcareous, tight, no show. Some gray shale cavings.

5222-5238 Sandstone, red-orange to orange, locally with few green grains, predominently fine grained, locally very fine-fine grained, subround to subangular, slightly argillaceous to argillaceous, calcareous, fair-poor porosity, no show

5238-5252 Siltstone, red-orange, calcareous, argillaceous, grades to very fine grained Sandstone, tight, no show. Varicolored Shale, predominently red-orange, brick red, slightly calcareous to calcareous--locally soft and marly, trace grayish green.

5252-5256 Sandstone, red-orange, very fine-fine grained, scattered medium grained, predominently subround, calcareous, argillaceous, poor porosity, no show.

5256-5270 Siltstone and very fine grained Sandstone, with varicolored Shale, as from 5238-52, predominently red-orange, brick red, trace pale green, grayish green, maroon. Some Sandstone, red-orange, orange, very fine-fine grained, subround-round, calcareous, fair porosity.

5270-5286 Siltstone-very fine grained Sandstone, as above, with interbedded varicolored Shale, as above.

5286 Kibbey Limestone

5286-5308 Dolomite, cream, light tan, crypto-microcrystalline, silty (grades to dolomitic Siltstone), poor porosity. Limestone, cream, light tan, locally with pink or red cast, cryptocrystalline, subchalky in part, few anhydrite inclusions, no visible porosity.

5308-5320 Siltstone, red-orange, slightly calcareous, argillaceous.

5320-5350 Varicolored Shale, predominently red-orange, silty--grading to Siltstone; some Shale, brownish red, pale green, grayish green, nonsilty.

5350-5390 Varicolored Shale, red-orange, brownish red, reddish brown, some lavender, green, grayish green. Trip for new bit at 5344.

5390-5425 Varicolored Shale, as above. Trace Limestone, cream, light tan, matrix, cryptocrystalline, dolomitic in part, hard, no porosity.

5425-5445 Varicolored Shale, as above. Trace Limestone, cream, off white, cryptocrystalline, hard and dense, no porosity.

5445 Charles

5445-5460 Limestone, very light gray, light tan, local pink-red mottling, cream, matrix, crypto-microcrystalline, no visible porosity, rare fragments with yellow fluorescence and weak streaming cut. Some varicolored Shale, as above, predominently red-orange.

5460-5470 Limestone, dolomitic, tan, light tan, matrix, cryptocrystalline, rare oolites, anhydritic, no visible porosity, trace with yellow fluorescence and weak streaming cut, no stain. Anhydrite, light brown, tan.

5470-5475 Limestone, light gray, tan, brown, fragmental to matrix, cryptocrystalline, rarely oolitic, slightly argillaceous, no visible porosity, trace with yellow fluorescence and weak streaming cut. Little Dolomitic Limestone, tan, microcrystalline, poor intercrystalline porosity, even yellow fluorescence and poor streaming cut.

5475-5490 Limestone, tan, light tan, light brownish gray, matrix, locally matrix with fragmental, subchalky, earthy, no visible porosity.

5490-5495 Limestone, dark brown, grayish brown, matrix, locally matrix with fragmental, cryptocrystalline, hard, dense, no visible porosity, trace with yellow fluorescence and weak fluorescent cut.

5495-5500 Limestone, as above. Anhydrite, white.

5500-5518 Limestone, grayish brown, brown, matrix, cryptocrystalline, hard, no porosity. Limestone, tan, light brownish gray, matrix, cryptocrystalline, subchalky, no porosity, trace with spotty fluorescence and weak cut.

5518-Circ. Samples 1 hr. As above.

5518-5548 Limestone, cream, light tan, matrix, locally matrix with fragmental, cryptocrystalline to locally microcrystalline, often subchalky and earthy, poor intercrystalline porosity, 10% with dull yellow fluorescence and weak fluorescent cut or weak streaming cut, no stain except in few chalky fragments. Interbedded Limestone, brown, dark brown, matrix, cryptocrystalline, locally anhydritic, hard, no porosity, trace with spotty fluorescence and slow streaming cut.

5548-5575 Anhydrite, tan, light gray, cream, white, locally brown, occasionally slightly calcareous or dolomitic; few stringers Limestone or Dolomite, cream, light tan, cryptocrystalline, subearthy, no porosity.

5575-5578 Dolomite, tan, cryptocrystalline, earthy, argillaceous, no visible porosity.

5578-5582 Anhydrite, white, light gray.

6th Salt

5582-5595 Salt, as indicated by drilling time--no salt in samples.

5595-5634 Anhydrite, white, light gray, tan, few salt casts; streaks and interbeds of Limestone, light tan, cream, matrix, cryptocrystalline, locally fragmental, scattered anhydrite inclusions, hard, no visible porosity, trace with weak fluorescence and fluorescent cut.

5634 B-1 Zone

5634-5643 Limestone, tan, light grayish brown, matrix with fine fragmental to matrix, crypto-microcrystalline, locally very fine granular, subchalky in part, poor intercrystalline porosity, 10-20% with spotty yellow-pale yellow fluorescence with weak cut; some Limestone, dark brown, matrix, cryptocrystalline, hard, anhydritic, no visible porosity, trace with spotty yellow fluorescence along possible fracture surfaces.

5643-Circ. Samples 2 hrs. As above.

5643-5653 Anhydrite, white, light gray, occasional dark brown calcareous streaks.

5653 B-2 Zone

5653-5666 Limestone, tan, light brownish gray, occasionally dark brown mottled, matrix, crypto-microcrystalline, hard and brittle to subchalky and earthy, styolitic, few anhydrite inclusions, poor to no porosity, 10-20% with spotty bright yellow fluorescence with weak cut, rarely with oil stain and weak streaming cut.

5666-5669 Limestone, dark brown, brown, matrix, cryptocrystalline, hard, brittle anhydritic, no porosity.

5669-Circ. Samples 2 hrs. Limestone, as from 5653-5669.

5669-5672 Limestone, as from 5666-5669.

5672 B-3 Zone

5672-5678 Dolomitic Limestone and Dolomite, tan-brown, cryptocrystalline, argillaceous, no visible porosity.

5678-5695 Anhydrite, predominently light gray, also white. Poor samples--trip for new bit at 5686.

5695-5703 Anhydrite, as above; interbedded Dolomite, brownish gray, cryptocrystalline, earthy, no visible porosity.

5703 B-4 Marker (Base Greenpoint Anhydrite)

5703-5715 Dolomite and Dolomitic Limestone, tan, grayish brown, matrix, crypto-microcrystalline, locally fine granular, subchalky and earthy in part, poor porosity, trace with weak fluorescence and weak fluorescent cut. Streaks Anhydrite, white, light gray, tan.

5715-5740 Limestone, brown, tan, cream, matrix, cryptocrystalline, locally fine fragmental, few chalky streaks but usually hard and brittle, locally anhydritic, poor-no porosity, trace to 10% with pale yellow fluorescence and weak fluorescent cut. Interbedded Anhydrite, predominently white, light gray.

5740-5755 Limestone, as above, predominently brown, tan, often slightly fragmental, hard, less often cream and subchalky, scattered weak oil show as above. Increase in Anhydrite, as above.

5755-5789 Limestone, brown, occasionally dark brown, tan, matrix to matrix with fine fragmental, cryptocrystalline, few cream subchalky streaks, scattered anhydrite inclusions, very poor or no porosity, 10-15% with yellow or pale yellow fluorescence and weak fluorescent cut. Few streaks Anhydrite, white, light gray, tan.

5789 C-2 Zone

5789-5800 Limestone, tan, light brownish gray, light brown, matrix, crypto-micro-crystalline, locally slightly fragmental, subchalky in part, poor to locally fair intercrystalline porosity, usually with yellow or dull yellow fluorescence (fluorescence becomes brighter after drying), fluorescent cut or slow streaming cut.

5800-Circ. Samples 2 hrs. Limestone, as above. Ran DST 3, ~~5785-5800.~~

5800-5803 Limestone, as above--very poor samples after DST.

5803-5810 Limestone, brown-tan, matrix, crypto-microcrystalline, hard, brittle, poor porosity, scattered yellow fluorescence (10%) with weak cut.

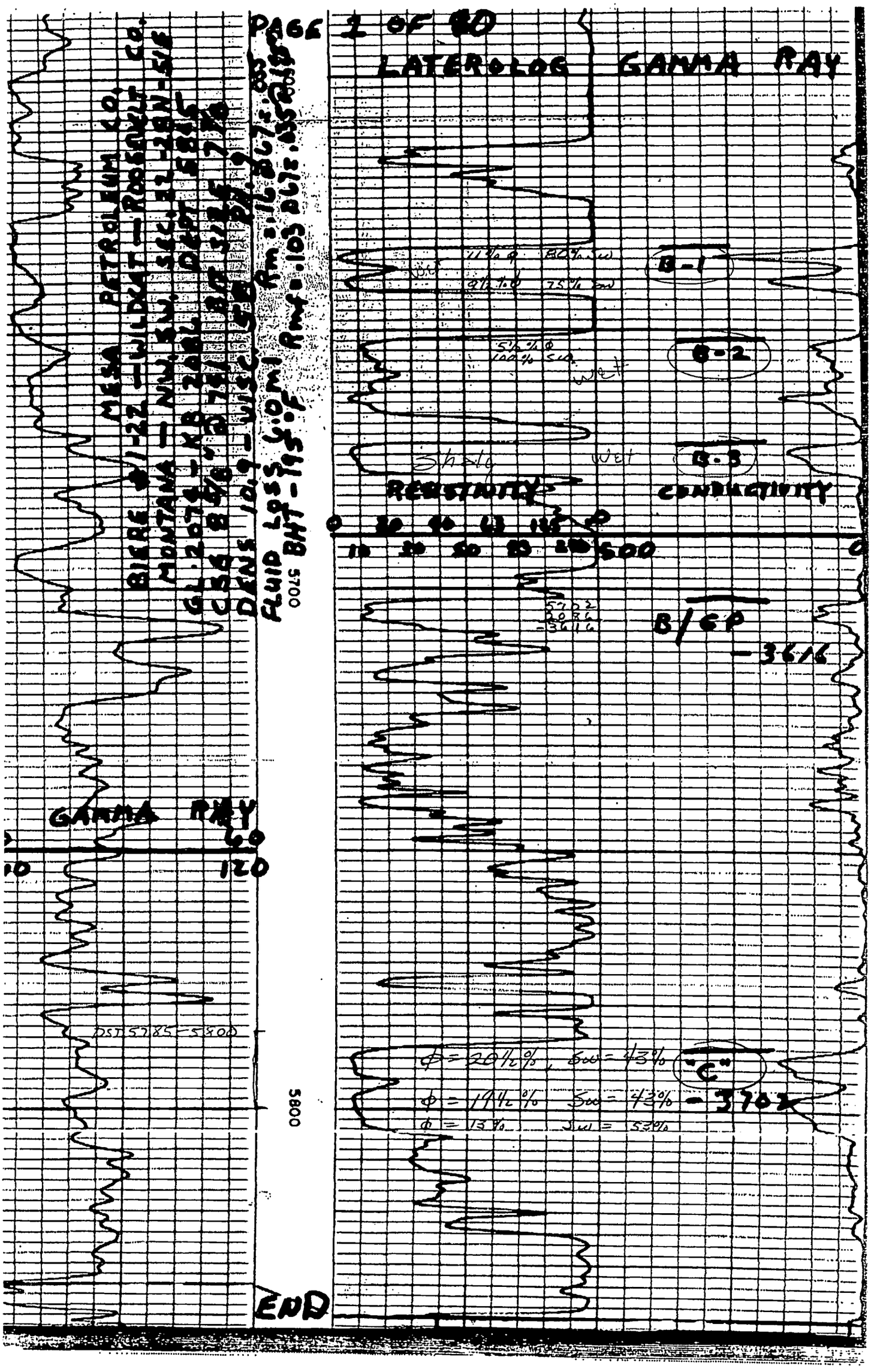
5810-5830 Limestone, tan, brown, dark brown, matrix to matrix with fragmental, crypto-microcrystalline, hard with few softer subchalky streaks, poor porosity, scattered (10%) fluorescence and weak cut as above.

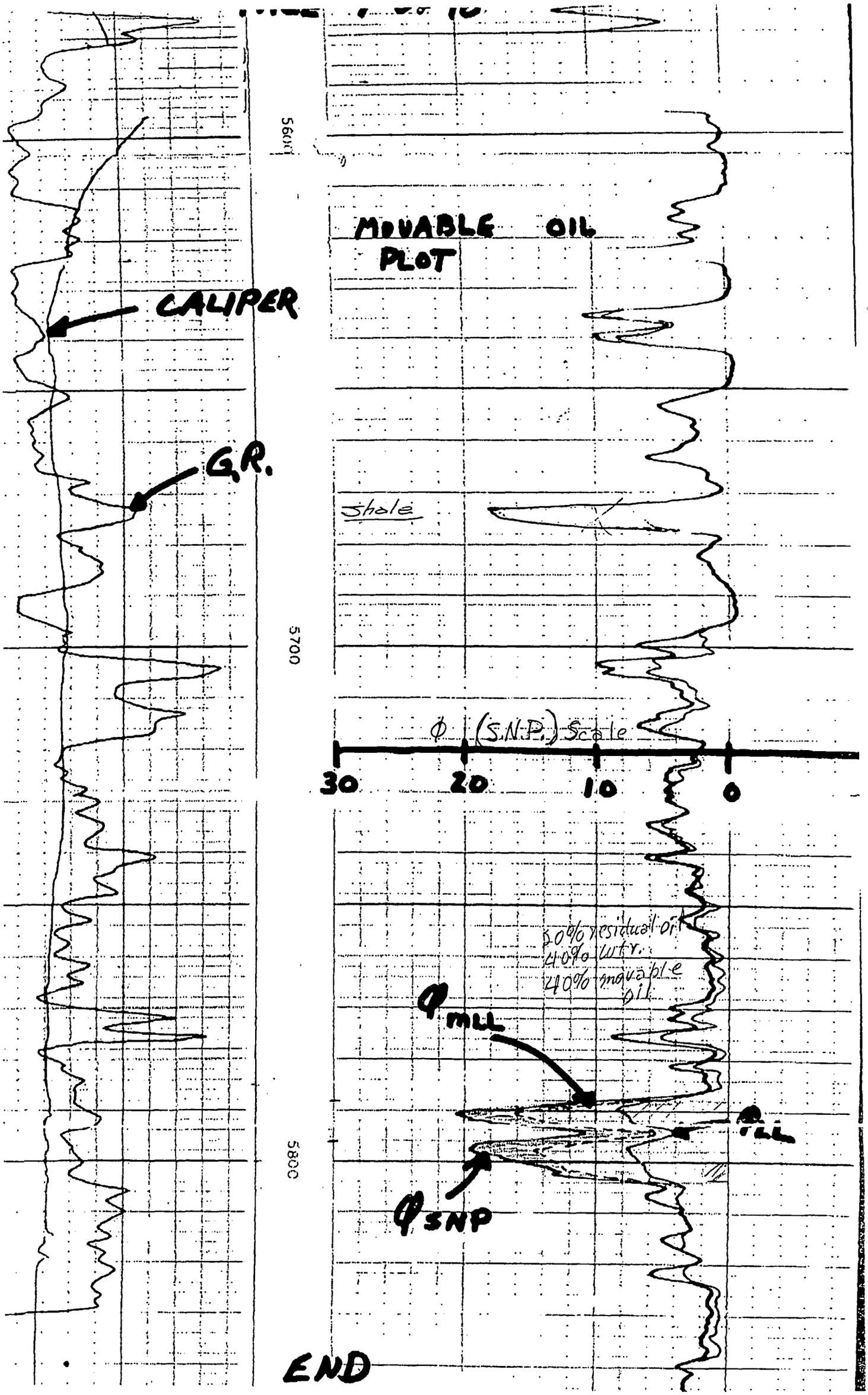
5830-5845 Limestone, with slight oil show as above. Some brown oil in mud that has contaminated some of sample cuttings. Oil is believed to be contamination. Lost some mud while drilling below 5810.

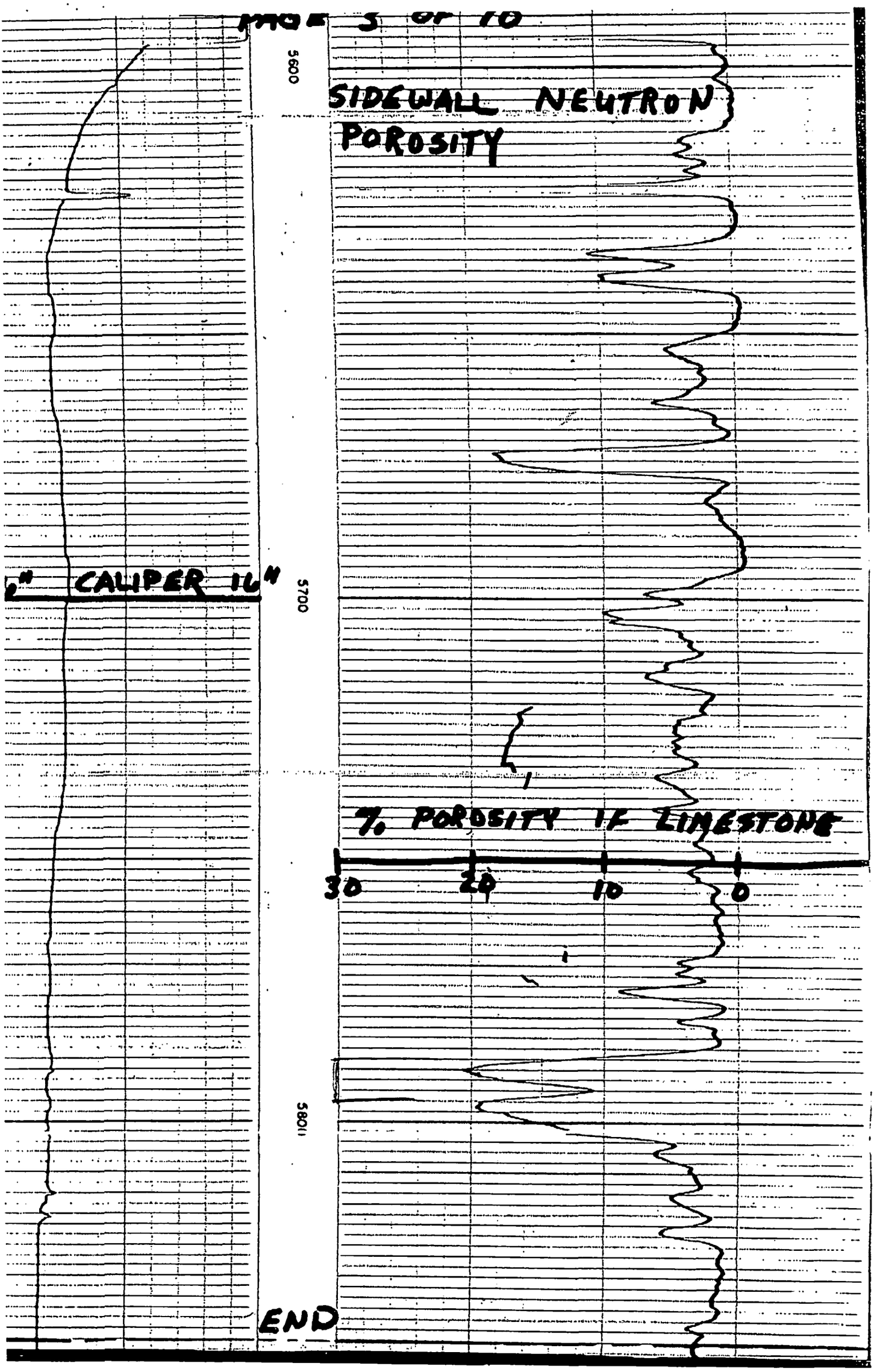
5845-Circ. Samples 2 hrs. As above.

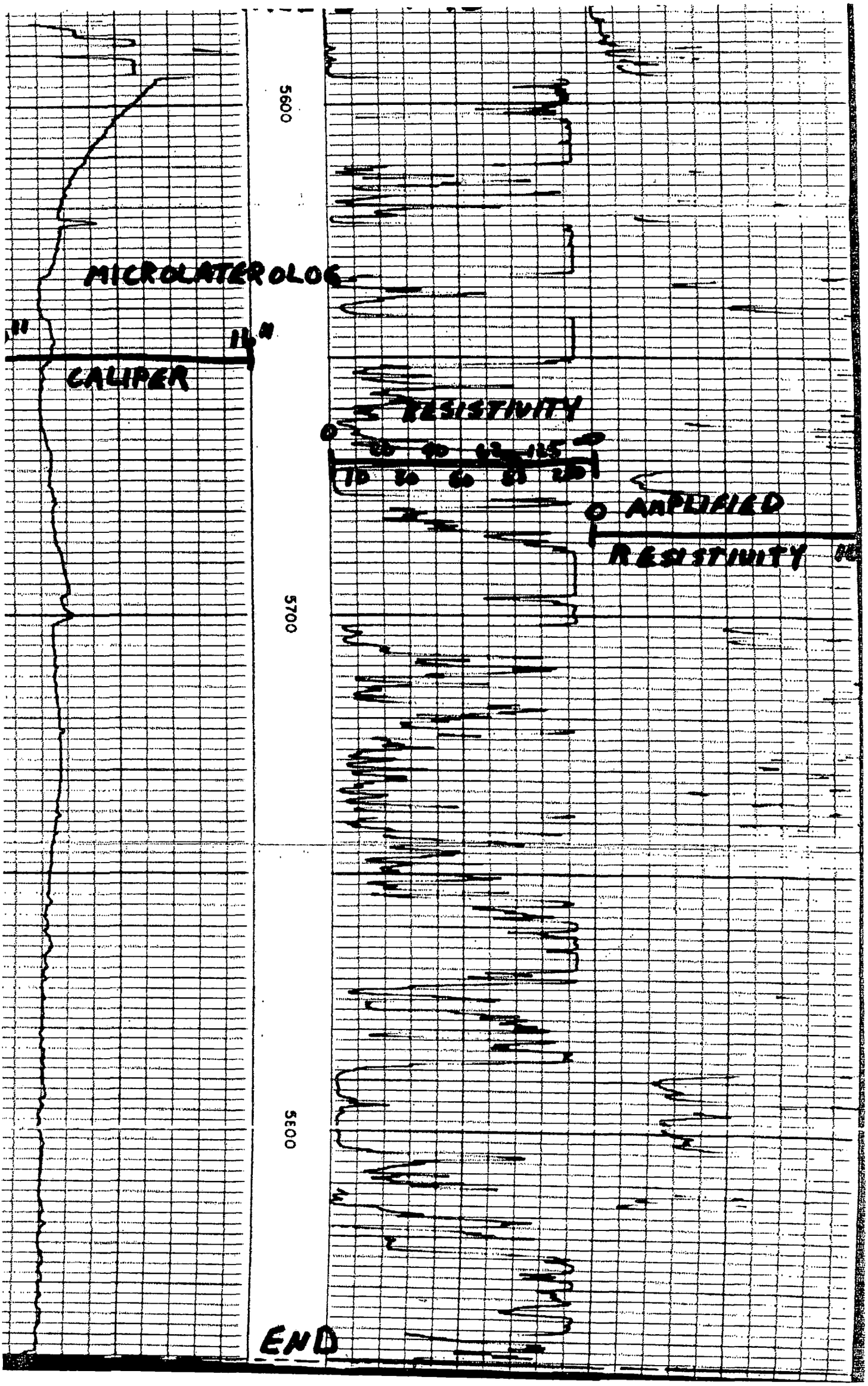
5845 = Driller's Total Depth

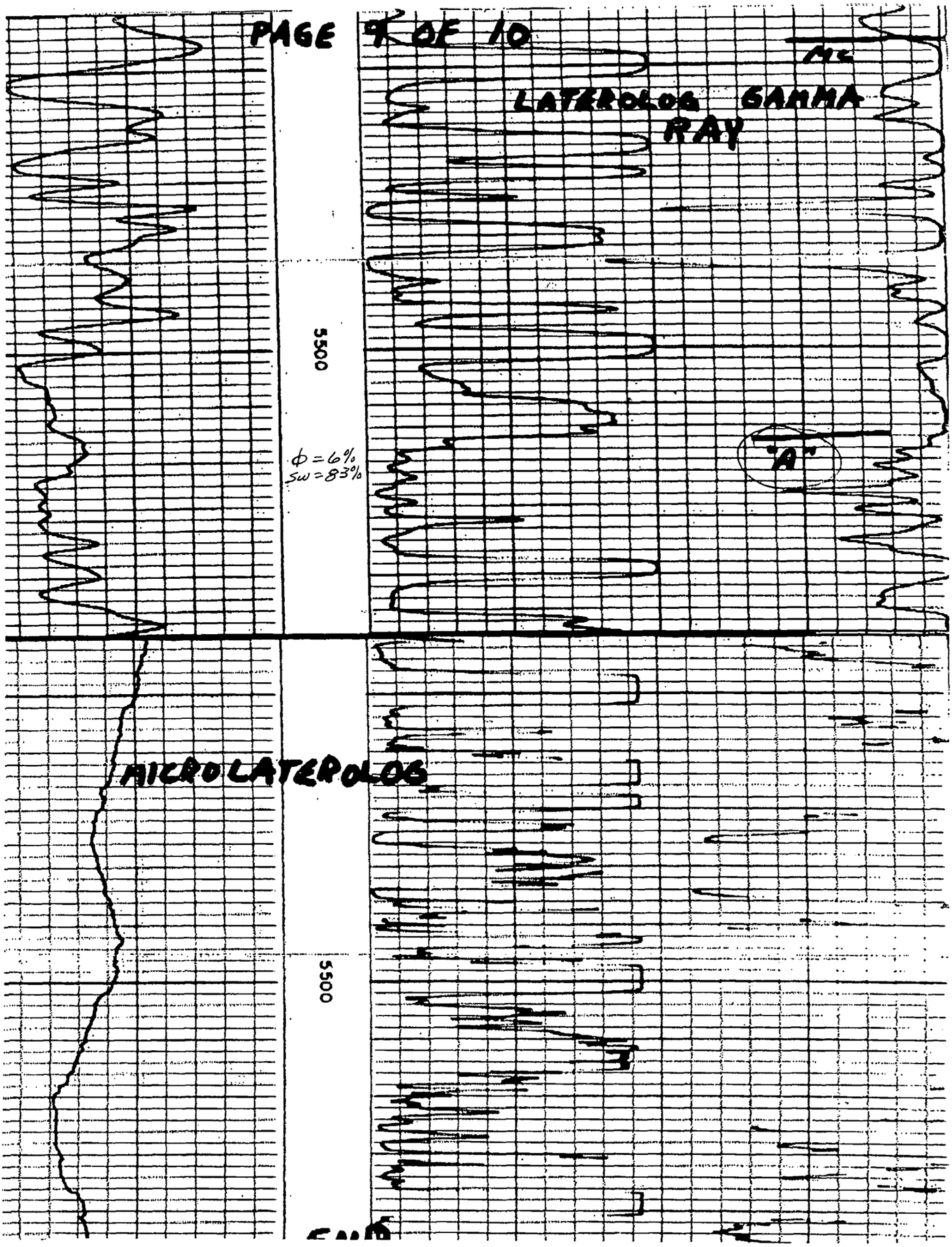
5845 = Schlumberger Total Depth


PAGE 1 OF 80
LATEROLOG GAMMA RAY
MESA PETROLEUM CO.
BIERE #1-22 — WILDCAT — ROOSEVELT CO.
MONTANA — NW. SW. SEC. 22-28N-51E
GL 2074 — KB 2086 DEPT 5845
CSG 8 5/8" @ 741 BIT SIZE 7 7/8
DENS 10.9 — VISC 58 PH 9
FLUID LOSS 6.0 ml Rm = .16 @ 67 = .085
BHT - 195°F Rmf = .103 @ 67 = .035 @ 195
11% φ 80% Sw
9½% φ 75% Sw
B-1
5½% φ
100% Sw
wet
B-2
Shale
wet
B-3
RESISTIVITY
CONDUCTIVITY
0 20 40 60 120 0
10 20 50 80 200 500 0
5702
2086
-3616
B/GP
-3616
GAMMA RAY
60
10 120
DST 5785-5800
φ = 20½%, Sw = 43%
"C"
φ = 19½% Sw = 43%
-3702
φ = 13% Sw = 53%
5700
5800
END

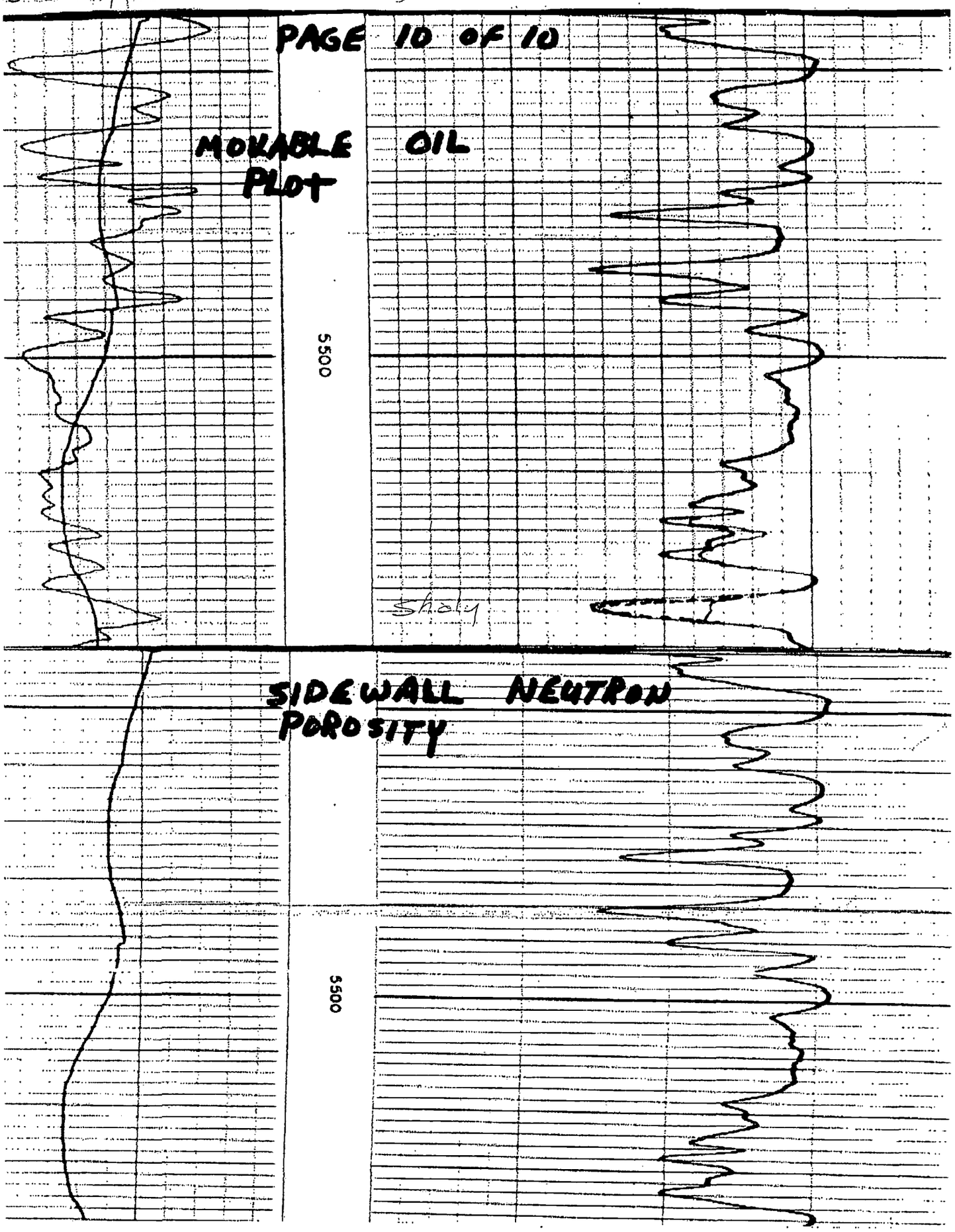

5600
5700
5800
MOVABLE OIL PLOT
CALIPER
G.R.
Shale
φ (S.N.P.) Scale
30
20
10
0
50% residual oil
40% wtr.
40% movable oil
φ MLL
φ SNP
END

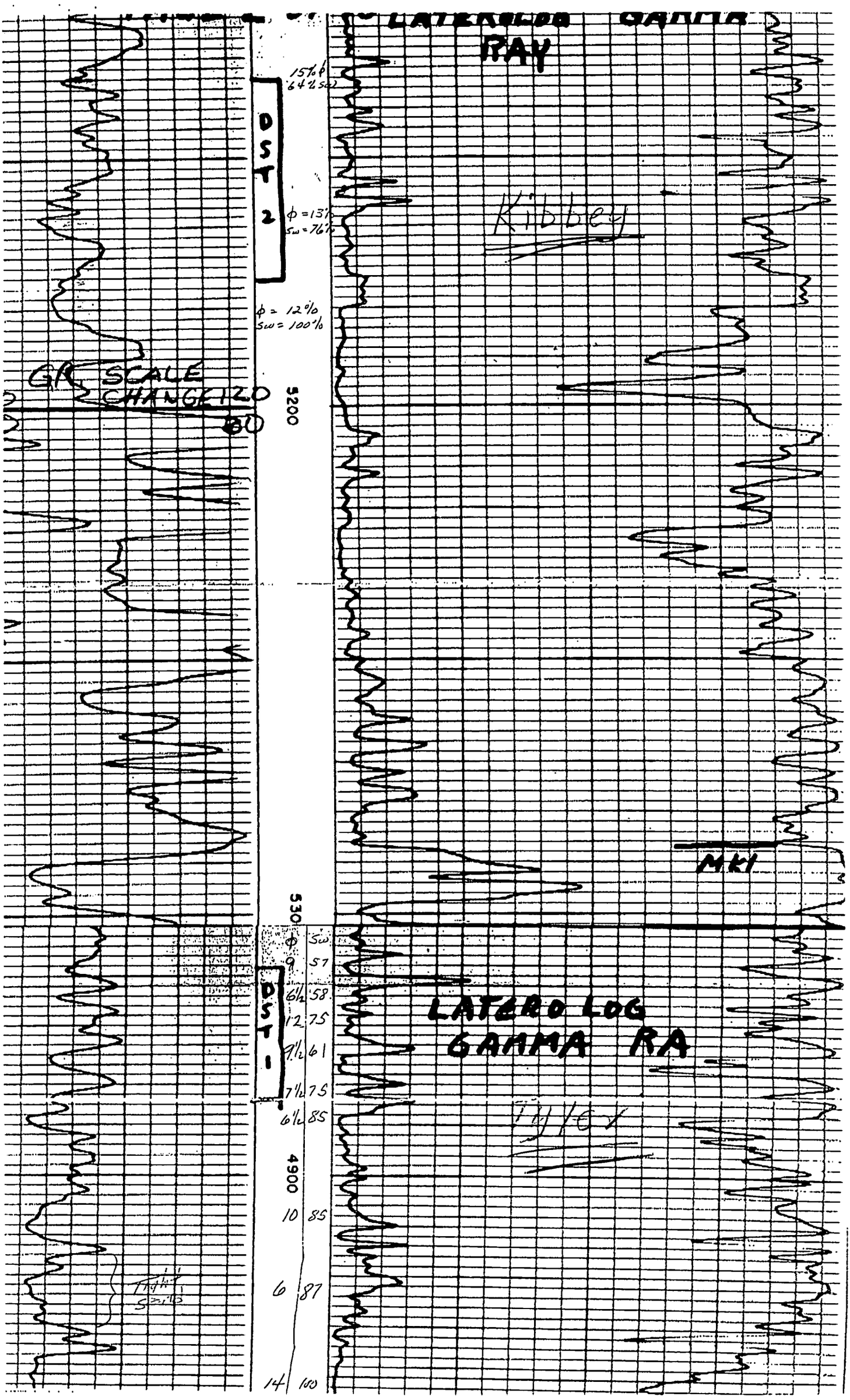

5600
SIDEWALL NEUTRON POROSITY
6" CALIPER 16"
5700
% POROSITY IF LIMESTONE
30
20
10
0
5801
END

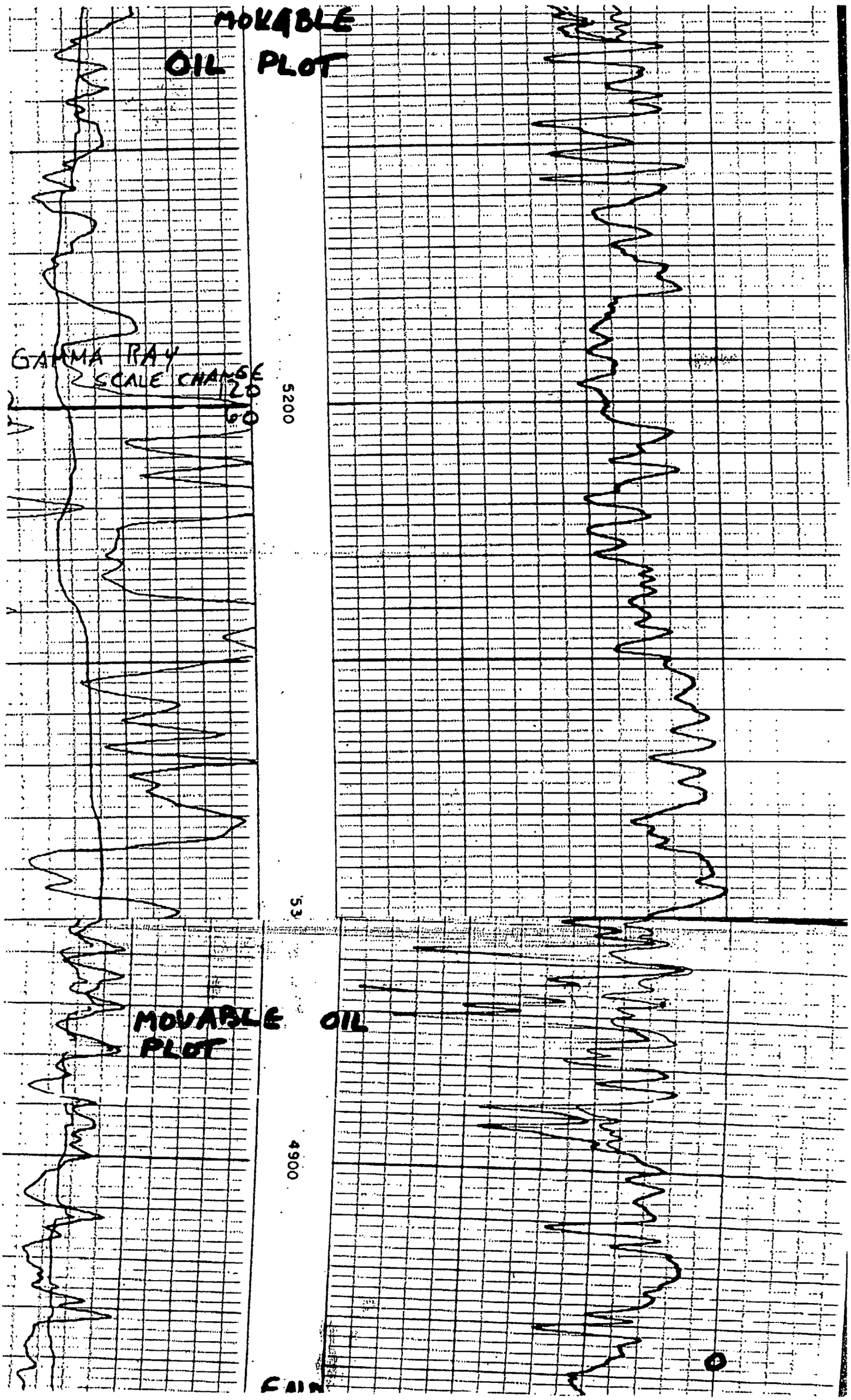

5600
MICROLATEROLOG
11"
11"
CALIPER
RESISTIVITY
0
AMPLIFIED
RESISTIVITY
5700
5800
END

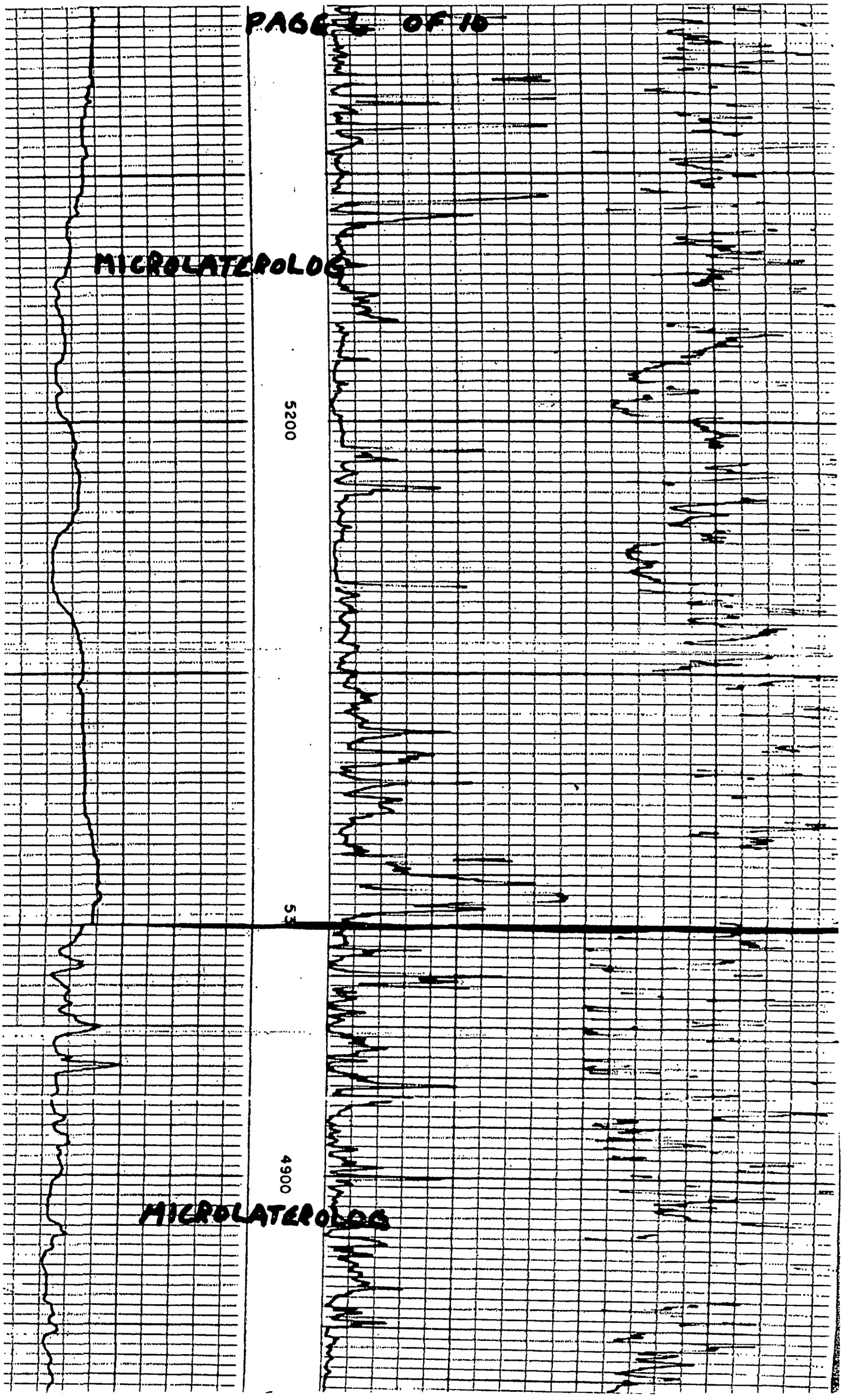

LATEROLOG
GAMMA RAY
5500
φ = 6%
Sw = 83%
"A"
MICROLATEROLOG
5500

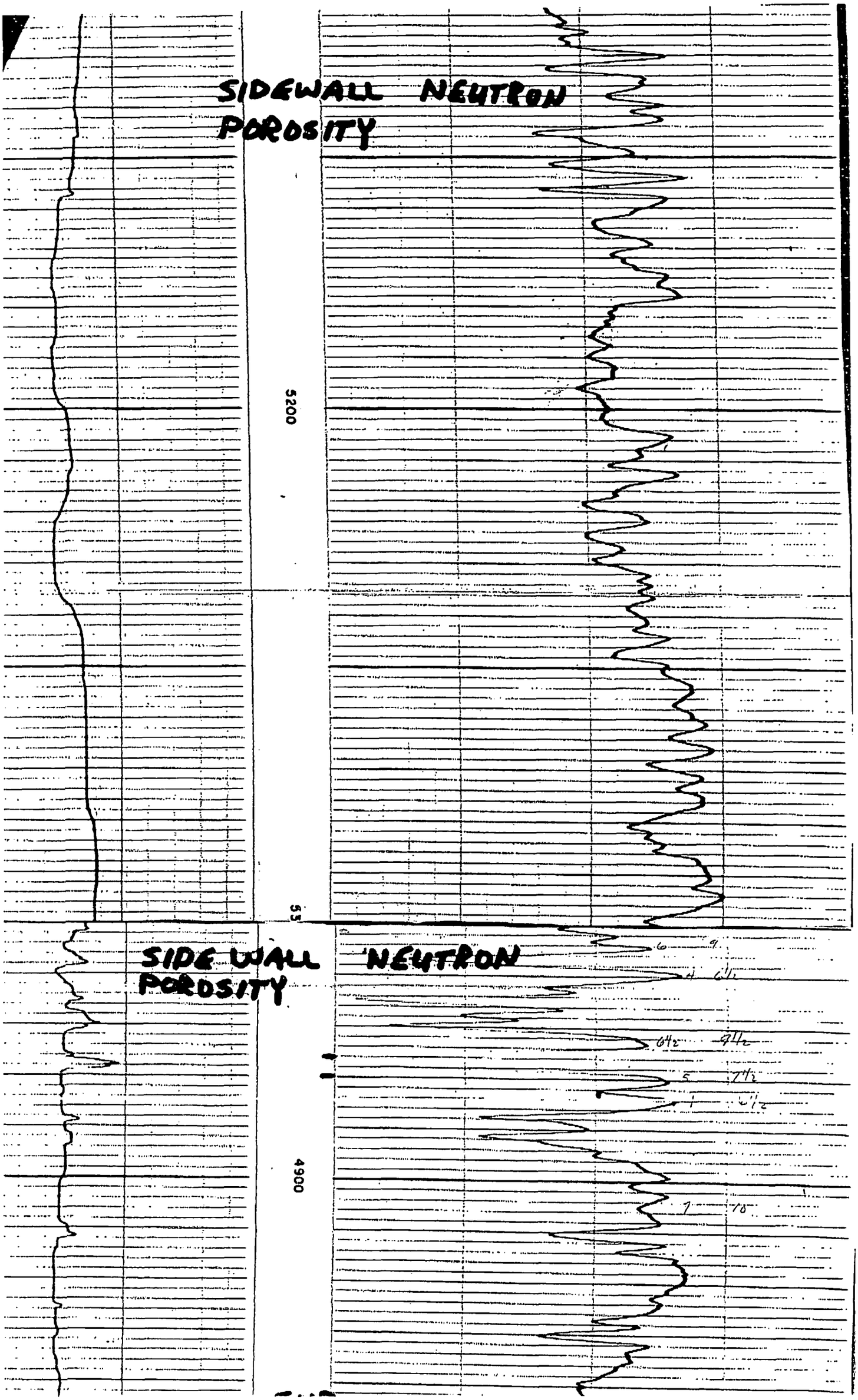
Rw=.04	φ	Rt	Sw	Rw	Rw = .05
4761	13	4	8.0		
66	5	21	9.3		
528	10	7	7.2		
542-44	15	8	4.2		
788-93	20	8	3.1	.03	43% Sw
5795	11	23	3.6	.03	42%
5796-98	20	8	3.1	.03	42%
798-5800	17	9	3.4	.03	43%
800-04	13	10	4.5	.03	53%

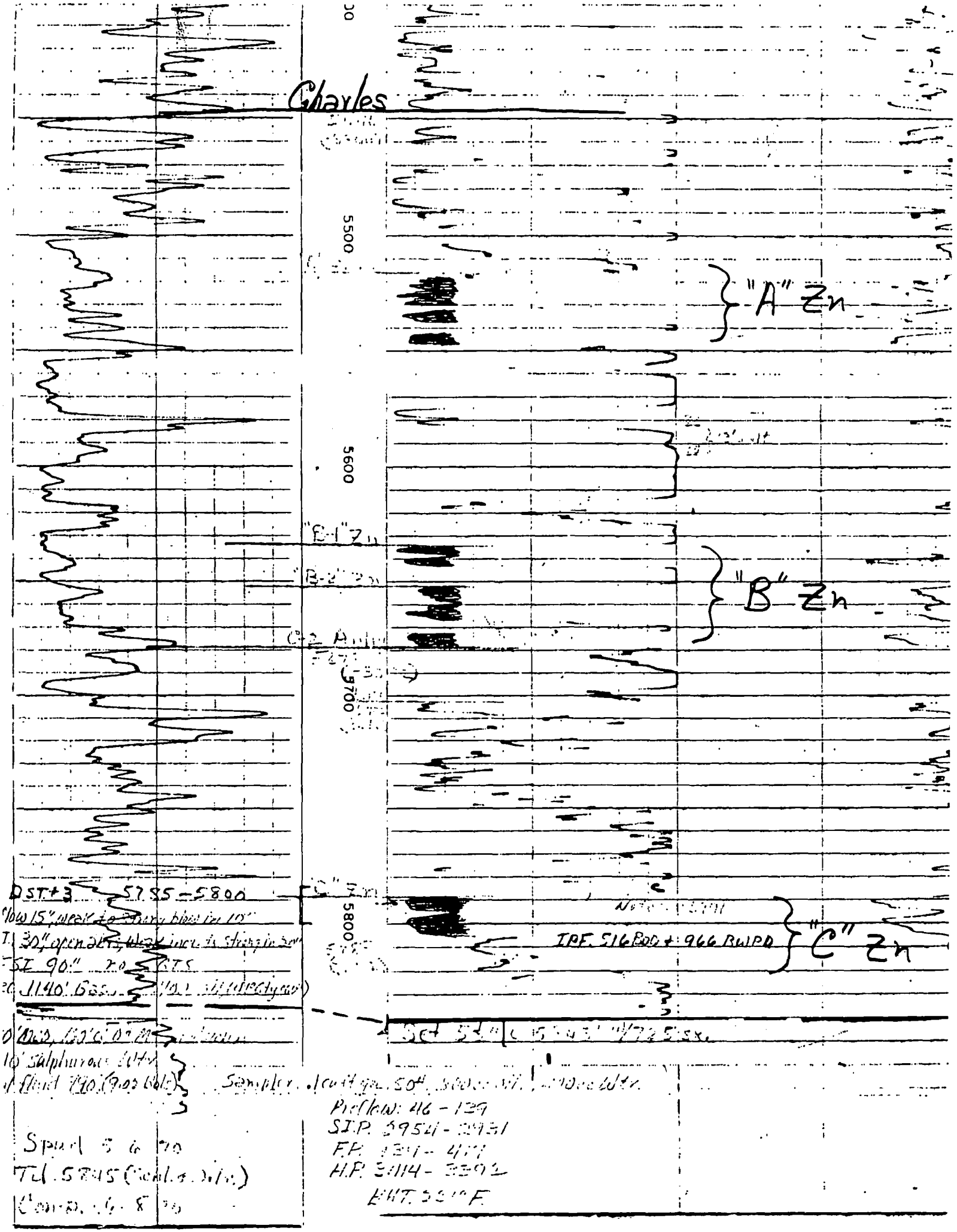



LATERLOG GAMMA RAY
15% φ
64% Sw
DST 2
φ = 13%
Sw = 76%
φ = 12%
Sw = 100%
GR SCALE CHANGE 120
80
5200
Kibbey
MKI
5300
φ Sw
9 57
6½ 58
12 75
9½ 61
7½ 75
6½ 85
DST 1
LATERO LOG
GAMMA RA
4900
10 85
6 87
14 100


MOVABLE
OIL PLOT
GAMMA RAY
SCALE CHANGE
120
60
5200
53
MOVABLE OIL
PLOT
4900
GAIN


MICROLATERLOG
5200
5
4900
MICROLATERLOG


SIDEWALL NEUTRON POROSITY
5200
55
SIDE WALL NEUTRON POROSITY
4900


Charles
5500
5600
5700
5800
"A" Zn
"B" Zn
"C" Zn
"B-1" Zn
"B-2" Zn
DST+3 5755-5800
IPF 516 BOD + 966 BWPD
Preflow: 46 - 139
S.I.P. 5954 - 2931
H.P. 3114 - 3392
Spud 5 6 70

Locate well by footage measurement from legal subdivision (Section) line and nearest drilling or producible well, if any.

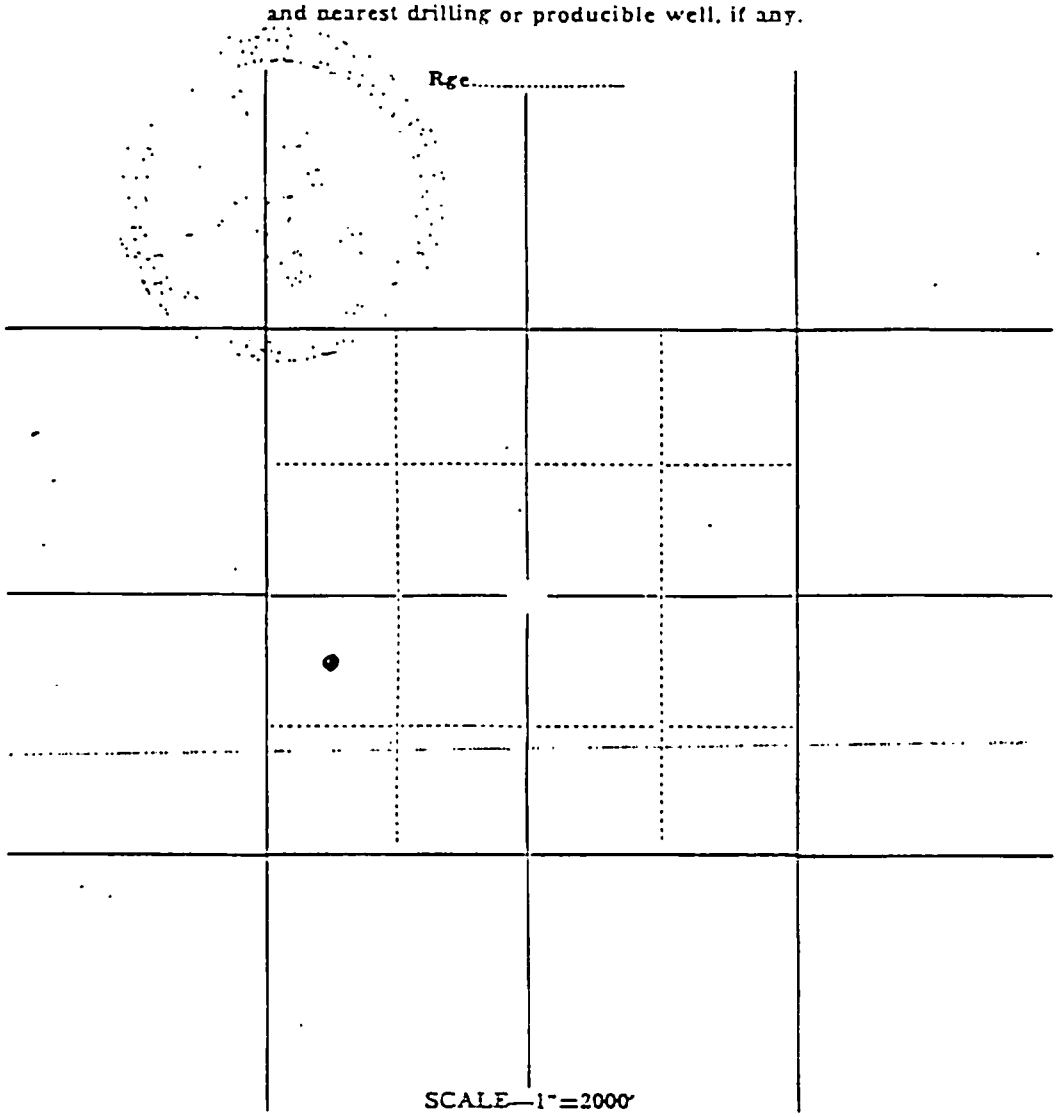
Form No. 2
File at
Billings
or Shelby

Rge.....

Form No. 2
File at
Billings
or Shelby

Locate
Well
Correctly

Twp.....



THE NOTICE OF INTENTION TO DRILL THIS WELL IS APPROVED SUBJECT TO THE FOLLOWING CONDITIONS:

1. Any person, before commencing the drilling of any oil or gas well or water source or injection well shall secure from the Board a drilling permit and shall pay to the Board the following amounts: for each well whose estimated depth is thirty-five hundred (3,500) feet or less, twenty-five dollars ($25.00); from thirty-five hundred and one (3,501) feet to seven thousand (7,000) feet, seventy-five dollars ($75.00); seven thousand and one (7,001) feet and deeper, one hundred fifty dollars ($150.00).

2. No well is to be spudded in unless the proper surety drilling bond has been posted and approved by the Board of Oil and Gas Conservation of the State of Montana.

3. Cable tool operators must construct an adequate sump to contain all mud and water bailed from the hole.

4. Surface or conductor casing must be properly cemented by an approved method and pressure tested to determine a tight bond with the surrounding formations in case an unexpected flow of oil, gas or water should be encountered, unless special permission has been granted for formation shut-off.

5. Any production casing must be cemented unless a formation shut-off or packer is approved by the Board. Sufficient cement must be used to protect the casing and all possible productive and fresh water bearing formations exposed in the process of drilling and not otherwise protected.

6. All production casing must be tested by bailing or pressure to determine if there is a tight bond with the surrounding formations or possible leaks in the casing. The results of the test must be reported on Form No. 2, said report to include the size, weight, thread and length of casing, amount of cement used, and date work is done. If test shows failure, the defect must be corrected before any drilling operations are resumed.

7. Any contemplated change in status of a well such as to plug and abandon, deepen, plug back, redrill, alter casing, etc. must be presented on Form No. 2 for approval by the Board prior to commencement of work.

8. A satisfactory drilling record must be kept for each tour, showing top and thickness of each and all formations drilled and all other information of value, one copy of which is to be kept at the rig while drilling is in progress for examination by any authorized agent of the Board.

9. All producing wells must be marked with name of the operator, number of the well and location, using reasonable precautions to preserve these markings at all times.

10. Delivery to the Board of two copies of all surveys, reports, analyses, logs, tests, samples and core descriptions, etc., as described in Rule 230 and one copy of all cementing records as furnished by the cementing company and described in Rule 234.

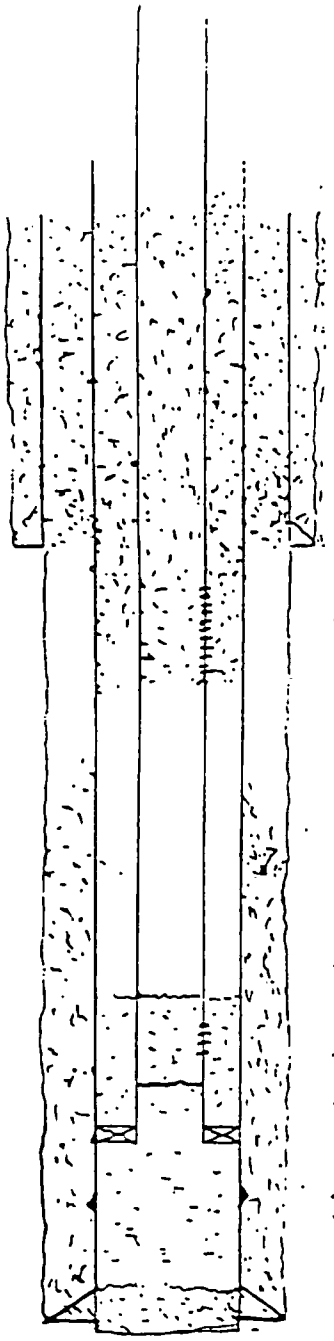
11. All work must be done in conformity with the regulations of the Board of Oil and Gas Conservation of the State of Montana, as contained in "General Rules and Regulations," and amendments thereto, as well as regulations prescribed in lieu thereof.

MESA PETROLEUM CO.

ONSHORE DIVISON

Subject _____

Prepared By _____ Date _____



Biere 1-22
1980' FS - 660' FWL
22 - 28N - 51E
Roosevelt Co, MT

Elev 2086 KB
2074 GL

SPUDDED @ 4 PM 5-6-70

24 jts 8 5/8" 24# @ 741' CMT/465 SXS
Perf 12 Holes 998'-996' - Pumped 30 SXS Class "H"
Pumped 85 SXS DN 5 1/2" Csg
Pumped 25 SXS DN 8 5/8" Csg
Pumped 20 SXS DN 2 7/8" TBG

698'-876' Judith River
3200'-3570 DAKOTA
4840'-4992' Tyler
5155'-5288 Kibby
5516'-5543 Charles "A"
5635'-5678' " "B"
5788-5808' " "C"

TOC Plug 5435'-5750' inside & outside of TBG (30 SXS "H")
Perf TBG - 4 Holes @ 5750'
TOC in TBG @ 5760' (50 SXS Class "H") Plug
PKR @ 5766.81' KB w/ 2 7/8" J-55 EUE 8RD 6.7# @ 5766'

Jet Notched @ 5791' w/ 2000 gal 7.5% HCl
PBTD 5803' KB
175 jts 15# J-55 STAC 5.5" @ 5845' KB CMT w/ 675 SXS

Received
Office of Enforcement

FEB 2 5 2001

Compliance & Env. Justice

RE1

Locate well by footage measurement from legal subdivision line, lease or property line and nearest drilling or producible well, if any.

Form No. 2
File at
Billings
or Shelby

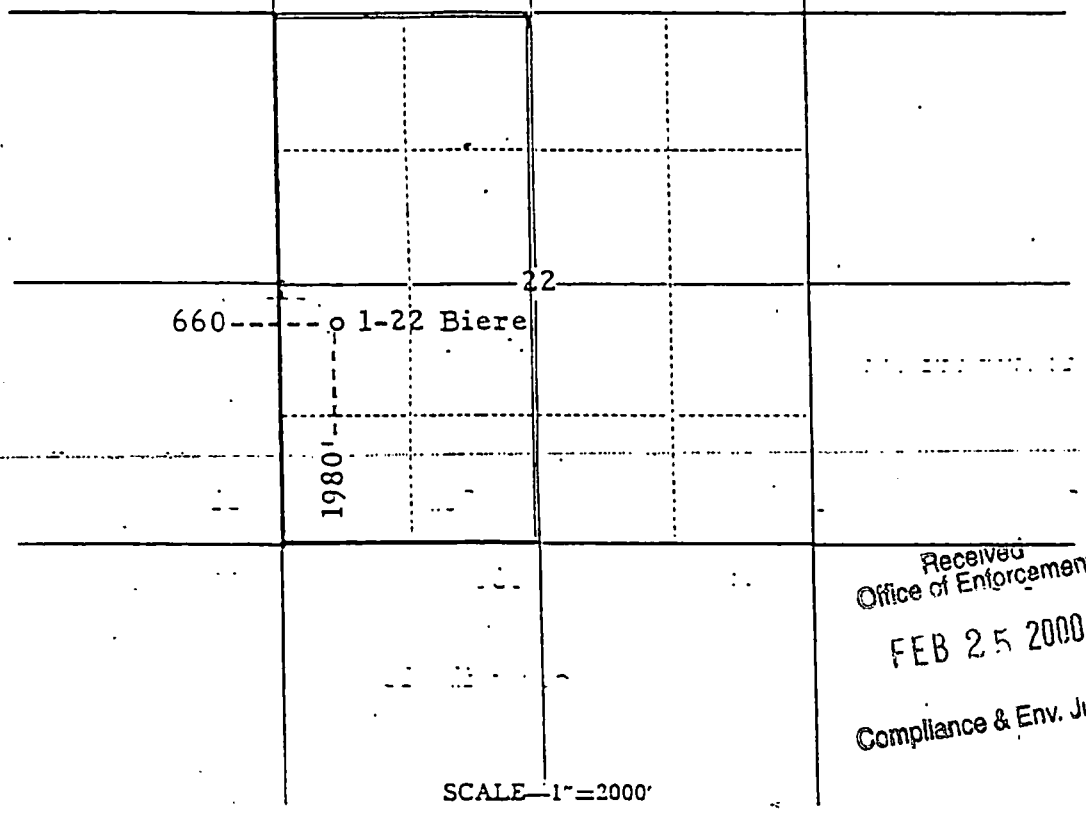
Rge. 51E

Form No. 2
File at
Billings
or Shelby

Locate
Well
Correctly

Locate
Lease
Boundary

Twp. 28N



Received
Office of Enforcement
FEB 25 2000
Compliance & Env. Justice

SCALE—1"=2000'

THE NOTICE OF INTENTION TO DRILL THIS WELL IS APPROVED SUBJECT TO THE FOLLOWING CONDITIONS:

1. Any person, before commencing the drilling of any oil or gas well, shall secure from the commission a drilling permit and shall pay to the commission therefor for the following amounts: for each well whose estimated depth is thirty-five hundred (3,500) feet or less, twenty-five dollars ($25.00); from thirty-five hundred and one (3,501) feet to seven thousand (7,000) feet, seventy-five dollars ($75.00); seven thousand (7,000) feet and deeper, one hundred fifty dollars ($150.00).
2. No well is to be spudded in unless the proper surety drilling bond has been posted and approved by the Oil and Gas Conservation Commission of the State of Montana.
3. Cable tool operators must construct an adequate sump to contain all mud and water bailed from the hole.
4. Surface or conductor casing must be properly cemented by an approved method to act as a tie in case an unexpected flow of oil, gas, or water should be encountered, unless special permission has been granted for formation shut-off.
5. Any contemplated change in status of a well such as to plug and abandon, deepen, plug back, redrill, alter casing, etc., must be presented on Sundry Notices and Report of Wells form for approval by agent prior to commencement of work.
6. All substantial showings of oil or gas must be tested for commercial possibilities before drilling ahead. Each such showing must be adequately protected by casing, mud or cement, as drilling progresses.
7. The production string must be cemented unless a formation shut-off or packer is approved by the agent. Sufficient cement must be used to protect the casing and possible productive formation exposed in the process of drilling not otherwise protected.
8. All production strings of casing must be tested by bailing or pressure to determine if there is a tight bond with the formation or possible leaks in the casing. The results of the test must be reported on Sundry Notices and Report of Wells form, said report to include the size, weight, thread and length of casing, amount of cement used, and date work is done. If test shows failure, the defect must be corrected before any drilling operations are resumed.
9. A satisfactory drilling record must be kept for each tour, showing top and thickness of each and all formations drilled and all other information of value, one copy of which is to be kept at the rig while drilling is in progress for examination when an agent visits the well.
10. All producing wells must be marked with name of the operator, number of the well, and location, using reasonable precautions to preserve these markings at all times.
11. Copies of all directional surveys, electrical logs, or tops from electrical log if electric survey is run, formation tests, and cementing record, as furnished by the cementing company, etc., must be filed with the State Inspector of the district together with four copies of the log, upon completion of the well.
12. All work must be done in conformity with the regulations of the Oil & Gas Conservation Commission of the State of Montana, as contained in "General Rules and Regulations," and amendments thereto, as well as regulations prescribed in lieu thereof.

COUNTY
FIELD or LOCATION
WELL
COMPANY

COMPANY MESA PETROLEUM CO.

WELL BIERE # 1-22

FIELD WILDCAT

COUNTY ROOSEVELT STATE MONTANA

LOCATION
NW SW

Sec. 22 Twp. 28 N Rge. 51E

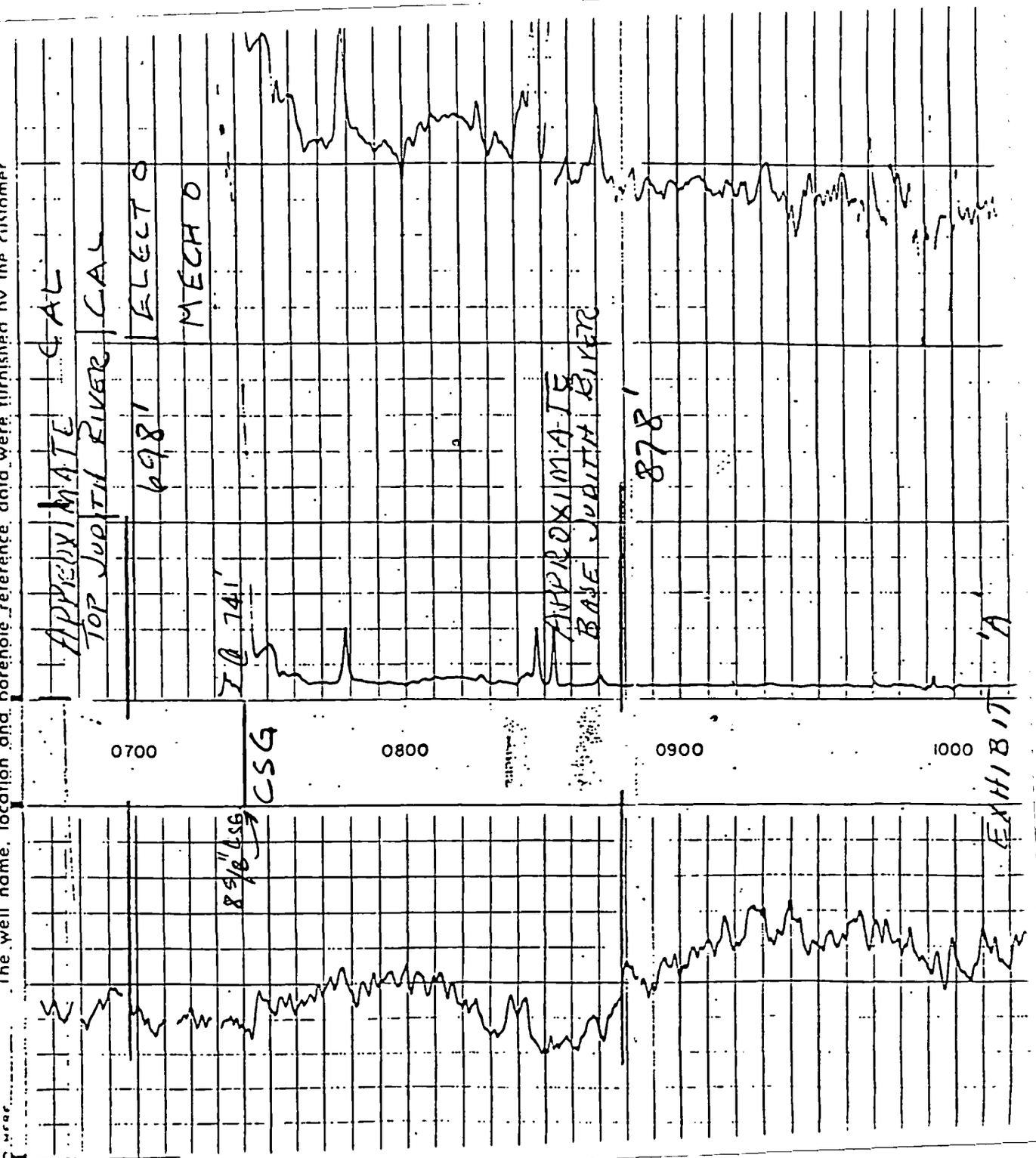
Other Services:
SNP
MLL
MOP

Permanent Datum: GL Elev. 2074
Log Measured From KB 1' Ft. Above Perm. Datum
Drilling Measured From KB

Elev.: K.B. 2086
D.F.
G.L. 2074

Date	5-25			
Run No.	ONE			
Depth—Driller	5845			
Depth—Logger	5845			
Btm. Log Interval	5840			
Top Log Intervel	741			
Casing—Driller	8 5/8 @ 741	@	@	@
Casing—Logger	741			
Bit Size	7 7/8			
Type Fluid in Hole	SBM			
Dens. / Visc.	10.9 / 58			
pH / Fluid Loss	9 / 6.0 ml	ml	ml	ml
Source of Sample	FLOW LINE			
R_m @ Meas. Temp.	.116 @ 167 °F	@ °F	@ °F	@ °F
R_{mf} @ Meas. Temp.	.103 @ 167 °F	.035 @ 195 °F	@ °F	@ °F
R_{mc} @ Meas. Temp.	— @ — °F	@ °F	@ °F	@ °F
Source: R_{mf} R_{mc}	M / —			
R_m @ BHT	.055 @ 195 °F	@ °F	@ °F	@ °F
Time Since Circ.	4 HRS			
Max. Rec. Temp.	195 °F	°F	°F	°F
Equip. / Location	5642 / WLSTN			
Recorded By	ERICKSON			
Witnessed By	MR GRAHAM			

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



SCHLUMBERGER

CEMENT BOND LOG

[redacted]

COUNTY ROOSEVELT, MONT.
Field or LOCATION WILDCAT
WELL BIERE #1-22
COMPANY MESA PETROLEUM

COMPANY MESA PETROLEUM COMPANY

WELL BIERE #1-22

FIELD WILDCAT

COUNTY ROOSEVELT STATE MONTANA

LOCATION NW-SW

Sec. 22 Twp. 28N Rge. 51E

Other Services:

PDC-N

Permanent Datum: GL, Elev. 2074
Log Measured From KB, 12 Ft. Above Perm. Datum
Drilling Measured From KB

Elev.: K.B. 2086
D.F. ----
G.L. 2074

RHS

Date	6/2/70	Type Drill Fluid	SBM
Run No.	ONE	Fluid Level	FULL
Depth — Driller		Max. Rec. Temp.	°F
Depth — Logger	5803	Est. Cement Top	2658
Btm. Log Interval	5795	Equip. | Location	5641 | WLSTN
Top Log Interval	2574	Recorded By	ST. AUBYN
Open Hole Size	7-7/8	Witnessed By	MR. TODD, FARRELL

CASING REC.	Size	Wt/Ft	Grade	Type Joint	Top	Bottom
Surface String	8-5/8				SURF	741
Prot. String						
Prod. String	5-1/2	15.5			SURF	5845
Liner						

PRIMARY CEMENTING DATA

STRING	Surface	1ST	2ND	2ND
Vol. of cement		50 SKS.	50 SKS.	625 SKS.
Type of cement		HAL-LT.	CLASS G.	HAL-LT.
Additive		SALT-SAT.	1 LATEX	SALT-SAT.
			.002-HR4	10:GILSONITE
Retarder				SACK
Wt. of slurry				
Water loss				
Type fluid in csg.				
Fluid wt.				

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

FOLD HERE

Equipment Data	
Type centralizers	
Logging speed	45 FPM
Sonde Type	SLS-D
Centralizer Type	SLS-A

PRIMARY CEMENTING PROCEDURE	Hours from start of operation	Hour — date
Started pumping cement		0430 - 5/27/70
Release pressure		0515 - 5/27/70
Start Cement Bond Log		1100 - 5/27/70

RECEIVED
OFFICE OF ENFORCEMENT
OCT 29 1998
DEPARTMENT OF ENVIRONMENTAL QUALITY

FOLD HERE

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

PRIMARY CEMENTING PROCEDURE

	Hour — date	Hours from start of operation
Started pumping cement	0430 - 5/27/70	
Release pressure	0545 - 5/27/70	
Start Cement Bond Log	1100 - 6/2/70	
Finish Cement Bond Log	1200 - 6/2/70	

Preceding fluid _____ Volume _____ bbls.
Cement pumped _____ bbls./minute

Pipe reciprocated during Pumping: Yes _____ No _____
Pipe reciprocated after plug down: Yes _____ min., No _____

Equipment Data

Type centralizers	
Logging speed	45 FPM
Sonde Type	SLS-D
Cartridge Type	SLC-A
Cartridge No.	28

SQUEEZE JOB DETAIL

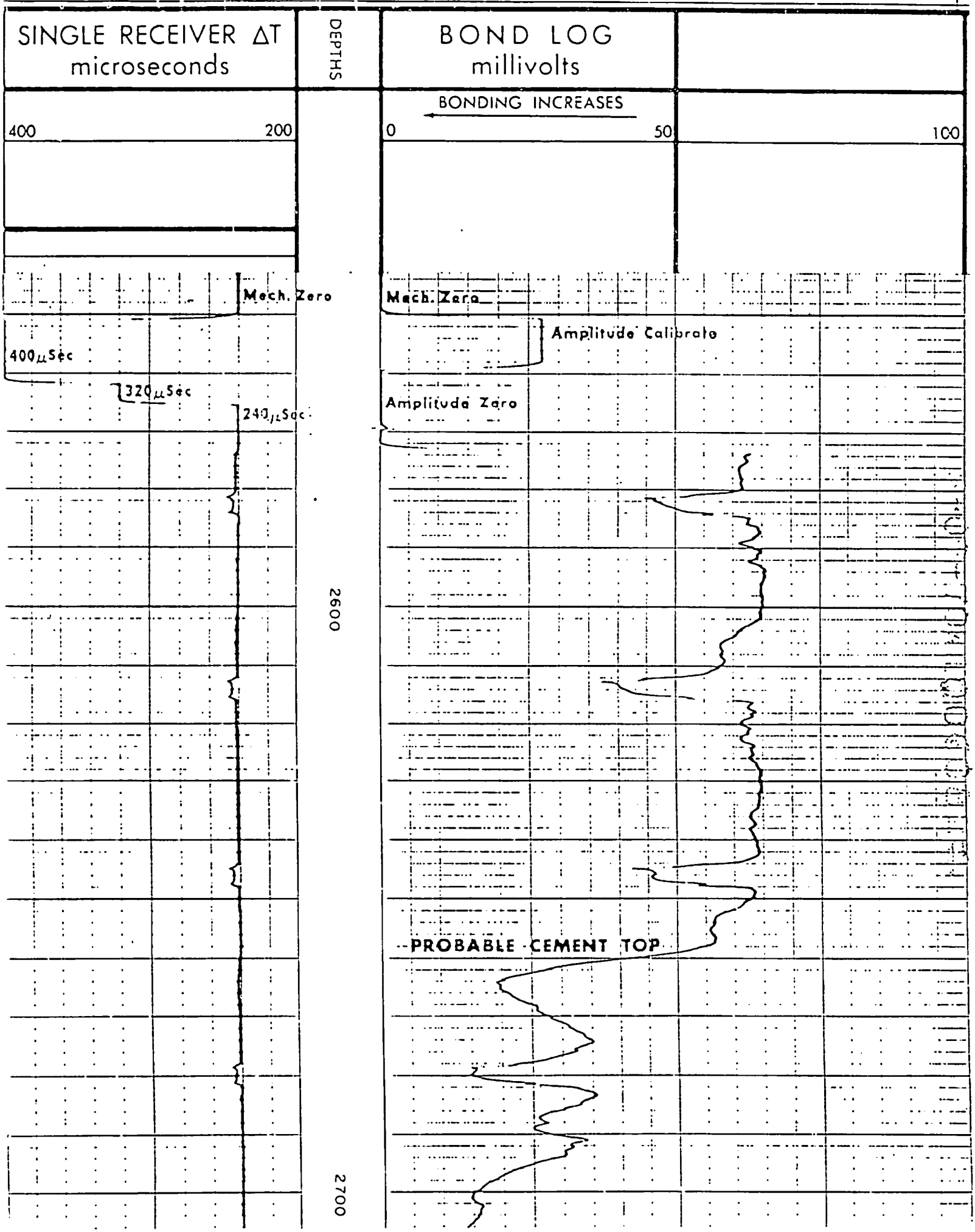
Squeeze number	1	2	3	4
Date				
Depth interval				
Type cement				
Volume of cement				
Additive				
Retarder				
Weight of slurry				
Preceding fluid				
Breakdown pressure				
Max. pressure-stage 1				
" " " 2				
" " " 3				
Final maximum pressure				
Started pumping cement				
Released pressure				
Start CBL				
Finish CBL				

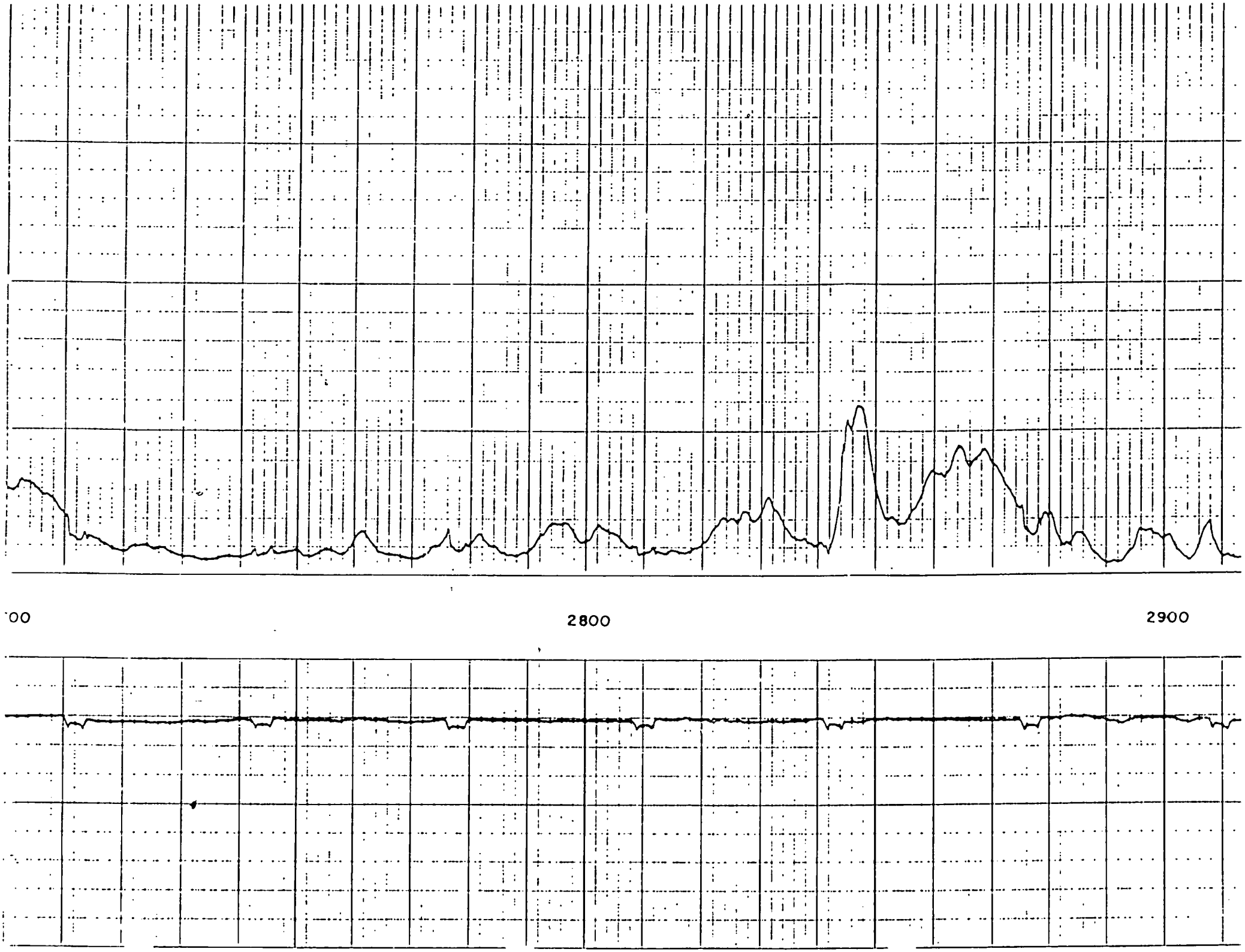
Centralizer Depths	Scratcher Depths

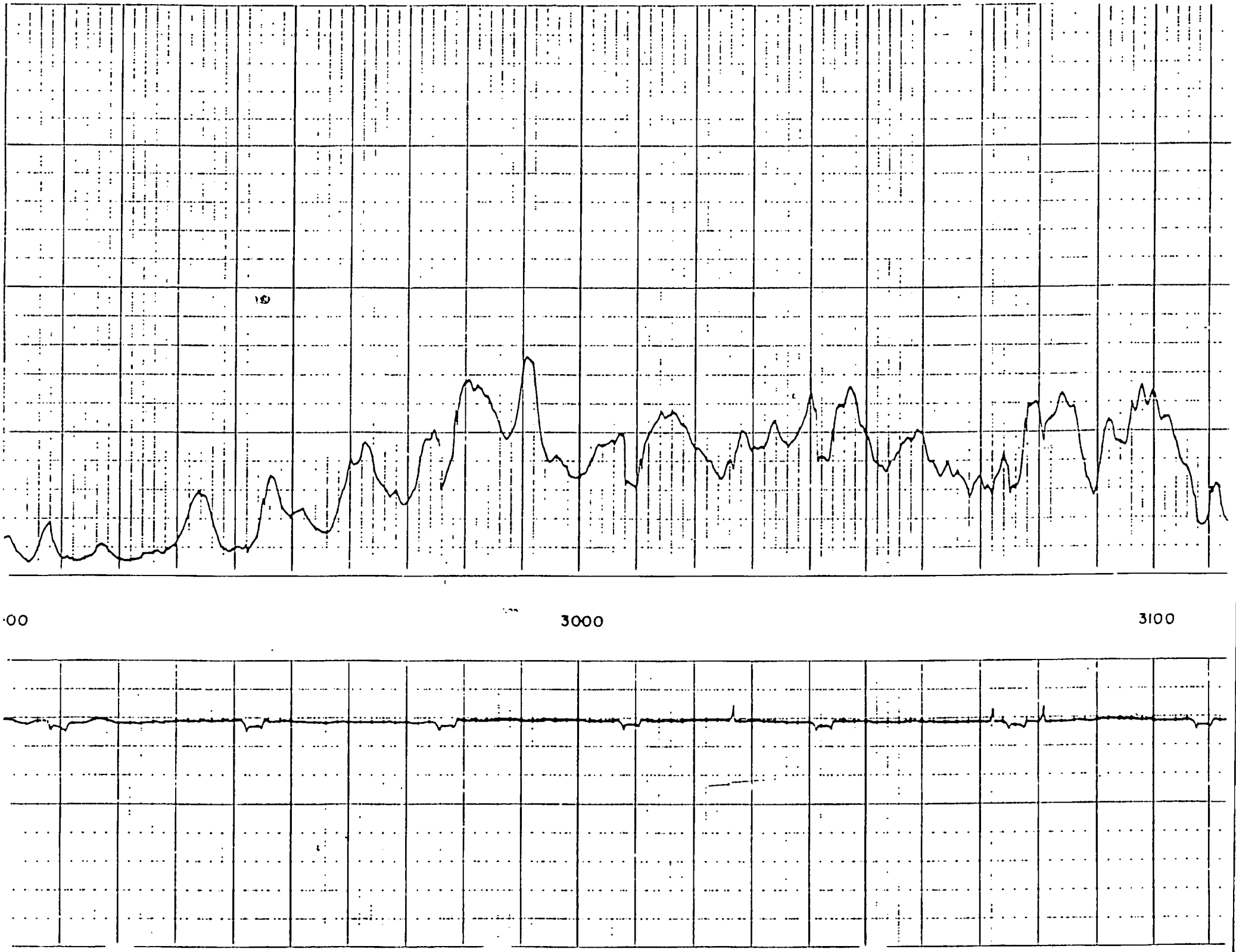
AVERAGE WELL DRIFT:
° from to ; ° from to ; ° from to

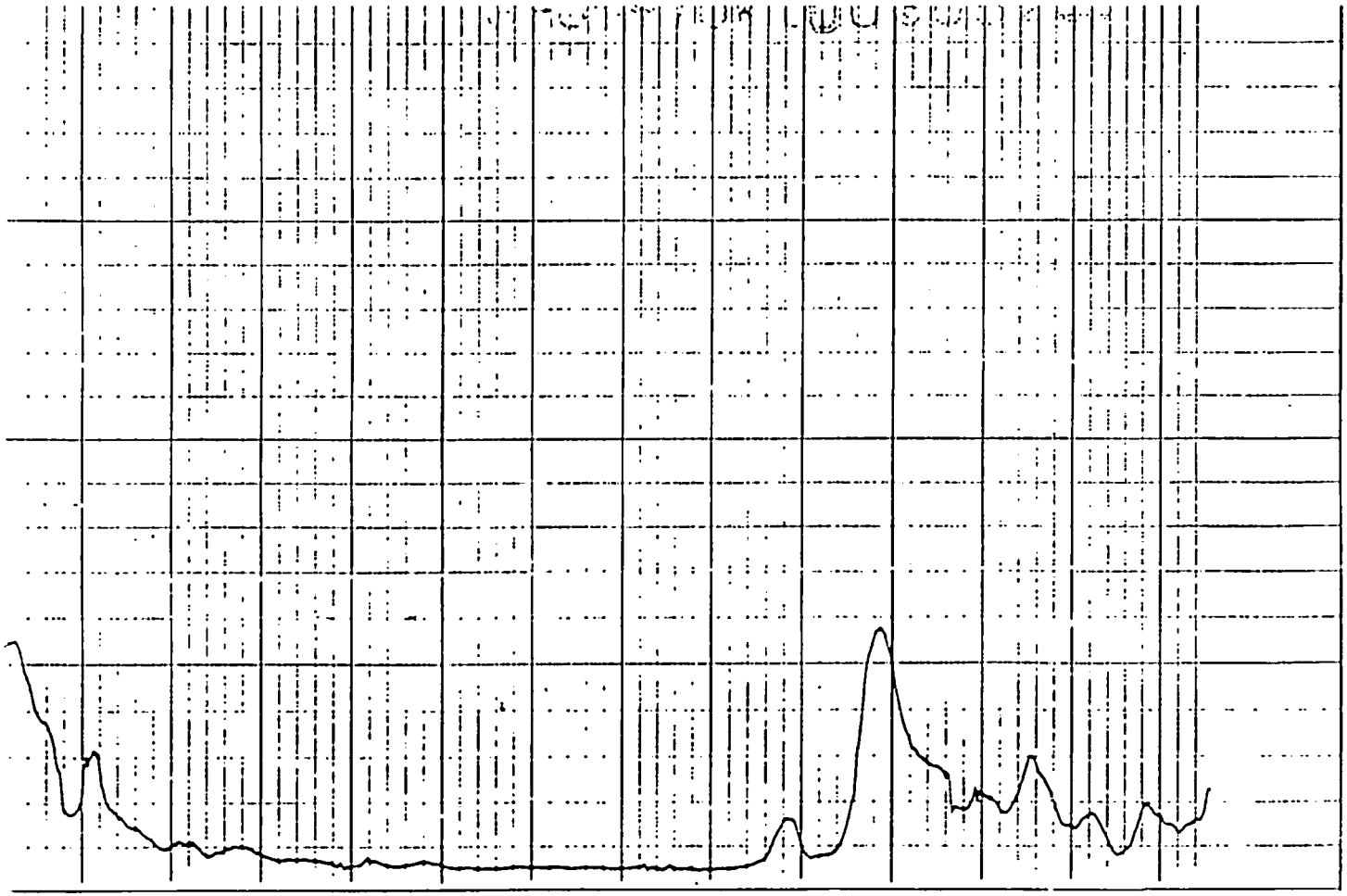
REMARKS
I.D. 06082

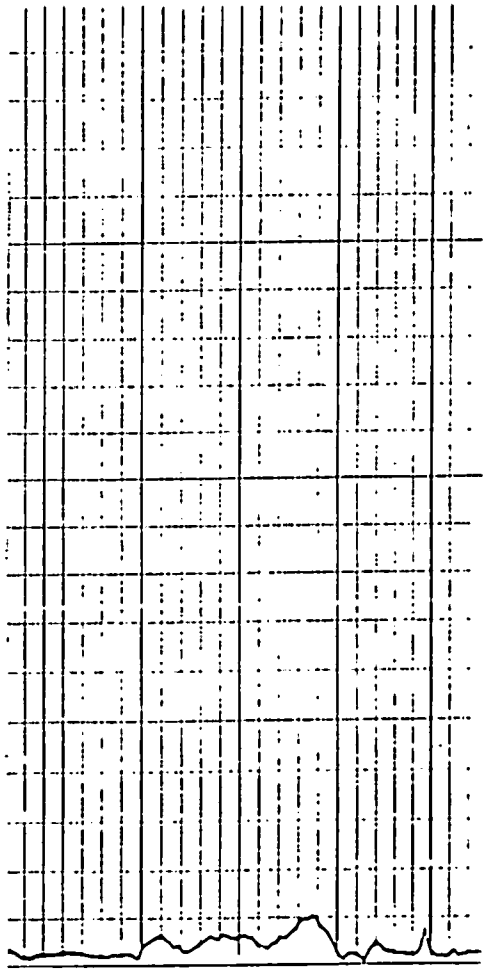
6-05-70WIL006082


SINGLE RECEIVER ΔT
microseconds
DEPTHS
BOND LOG
millivolts
BONDING INCREASES
400
200
0
50
100
Mech. Zero
400μSec
320μSec
240μSec
Mech. Zero
Amplitude Calibrate
Amplitude Zero
2600
PROBABLE CEMENT TOP
2700


'00
2800
2900

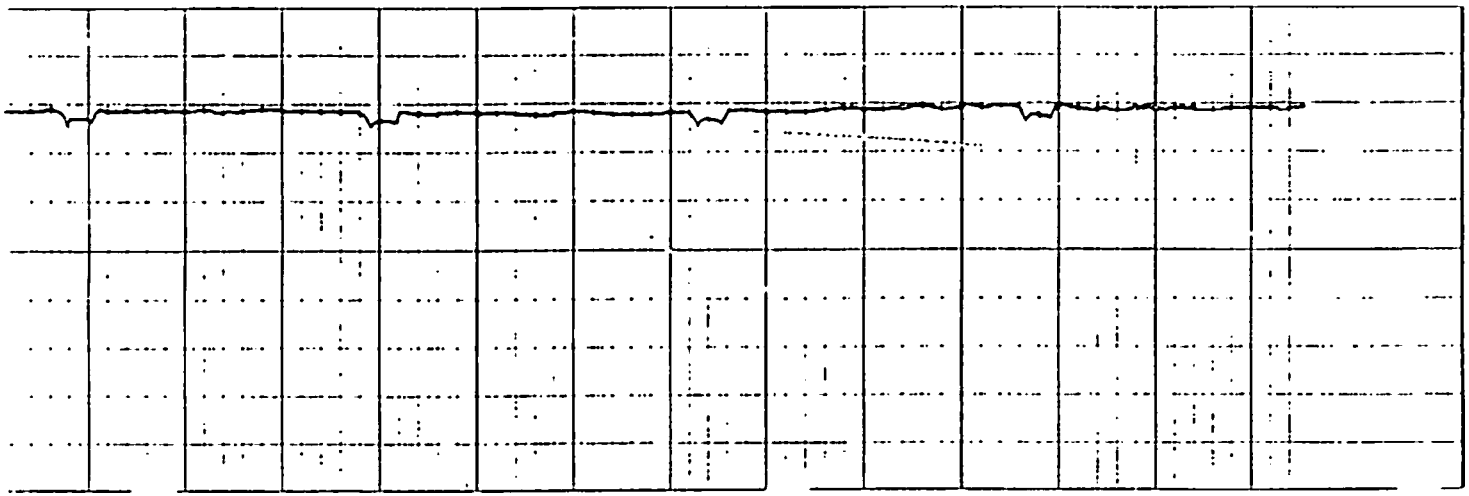

·00
3000
3100

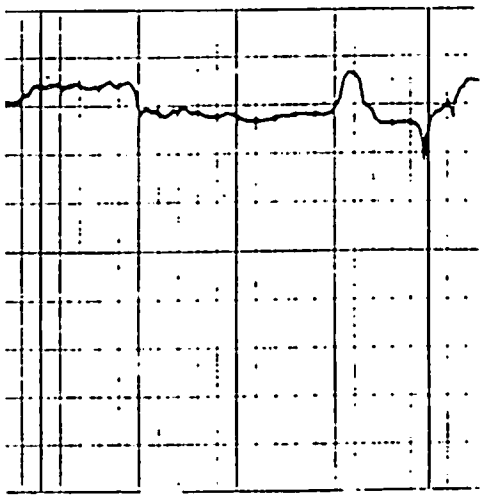


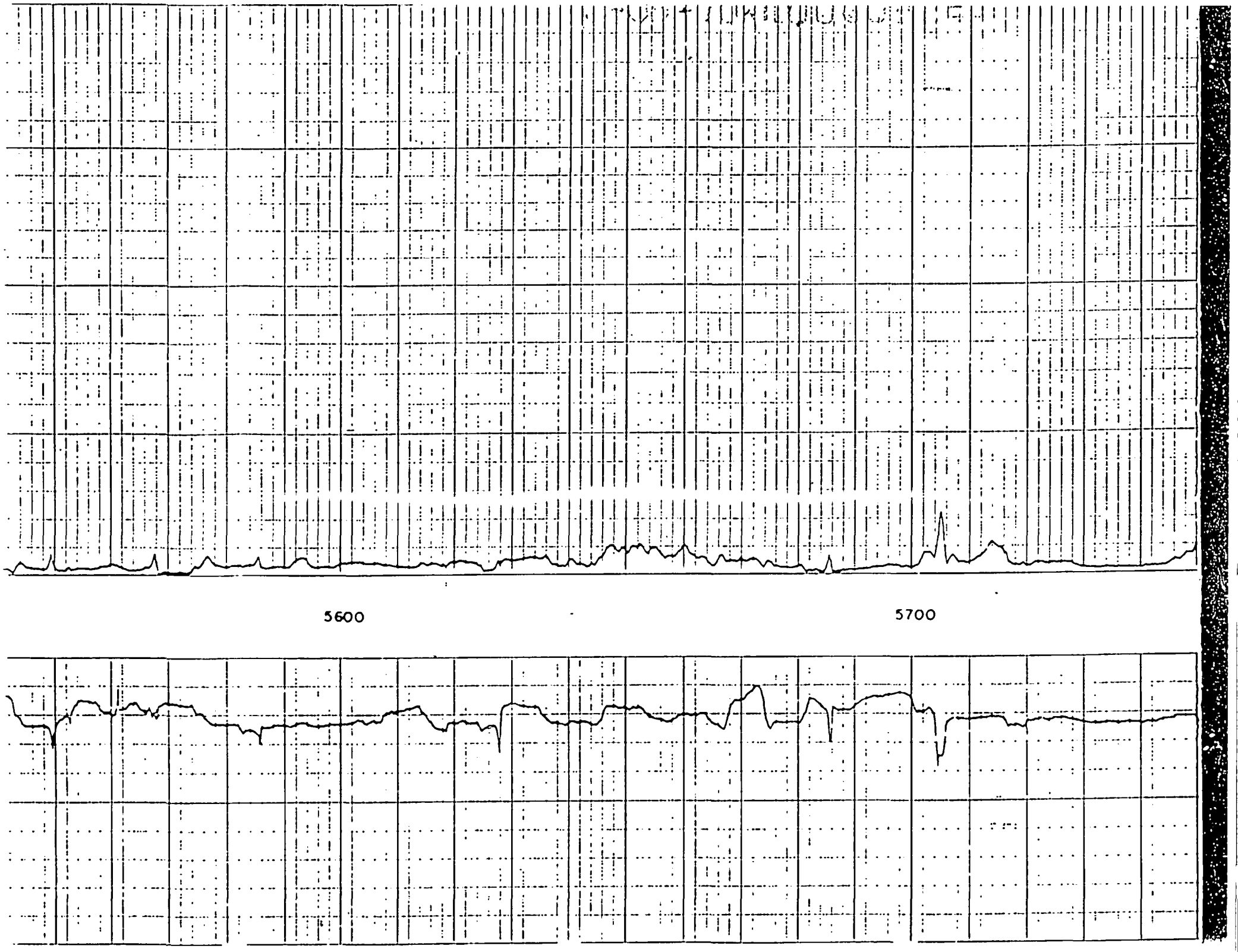


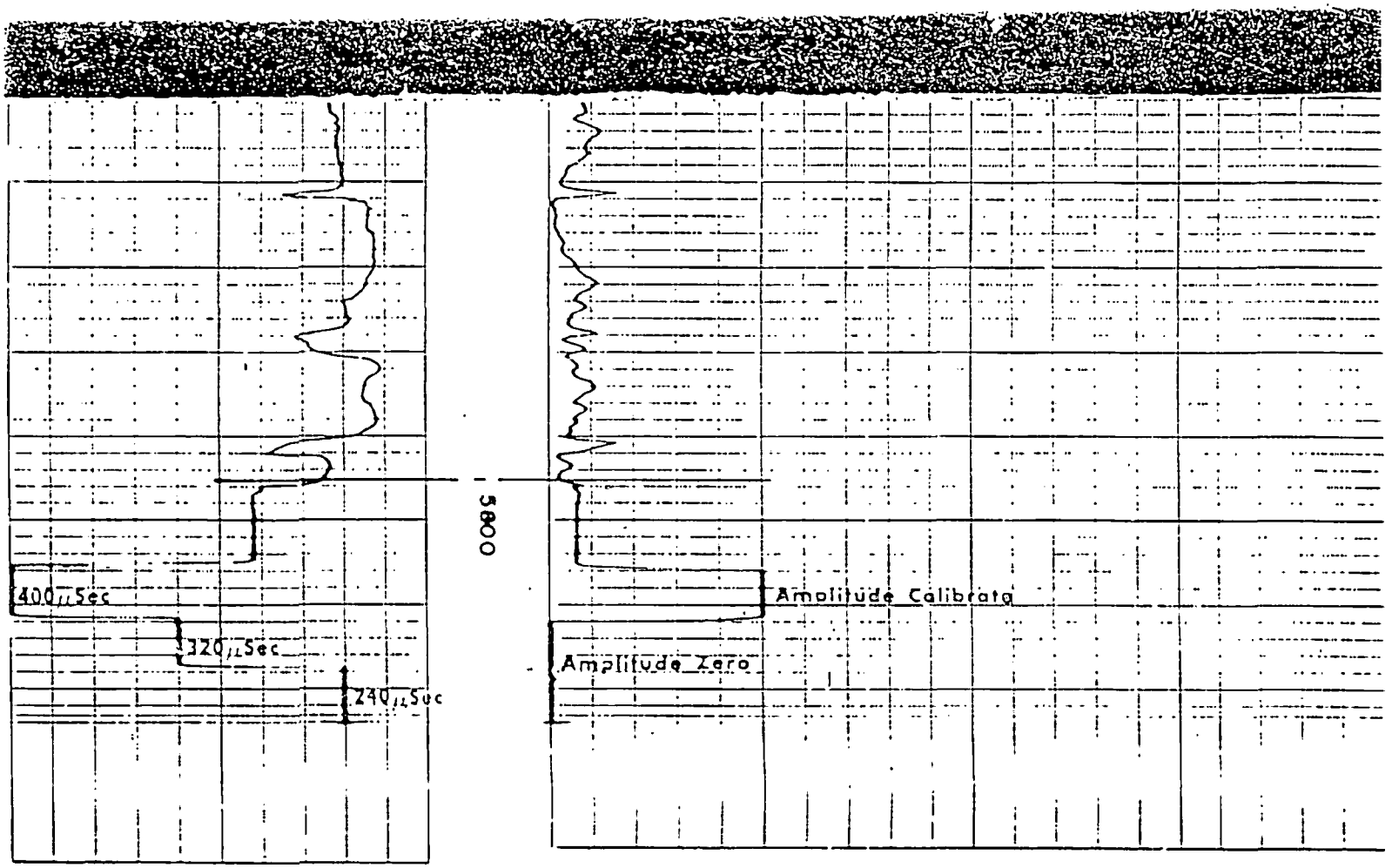
'0

3200

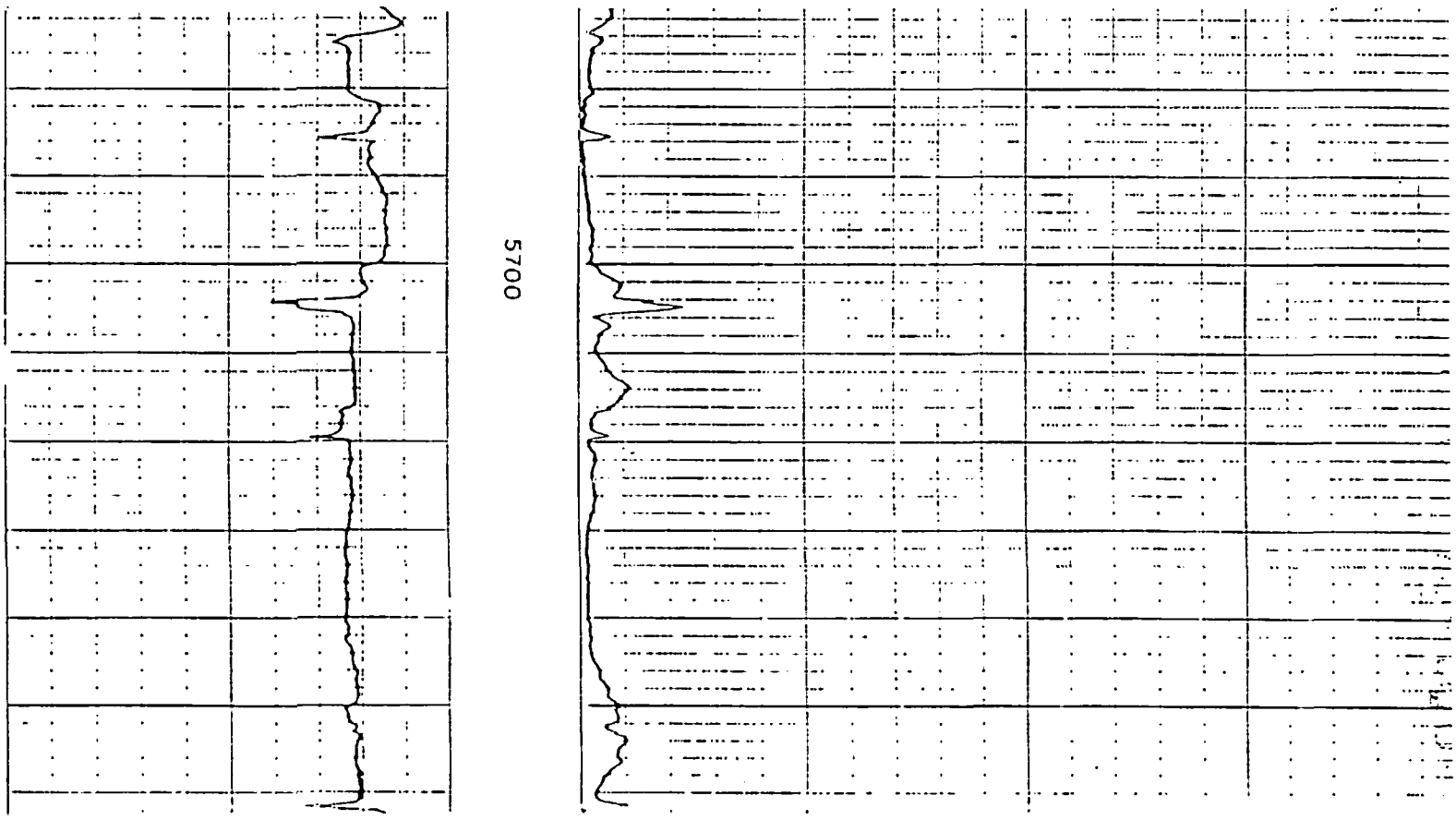


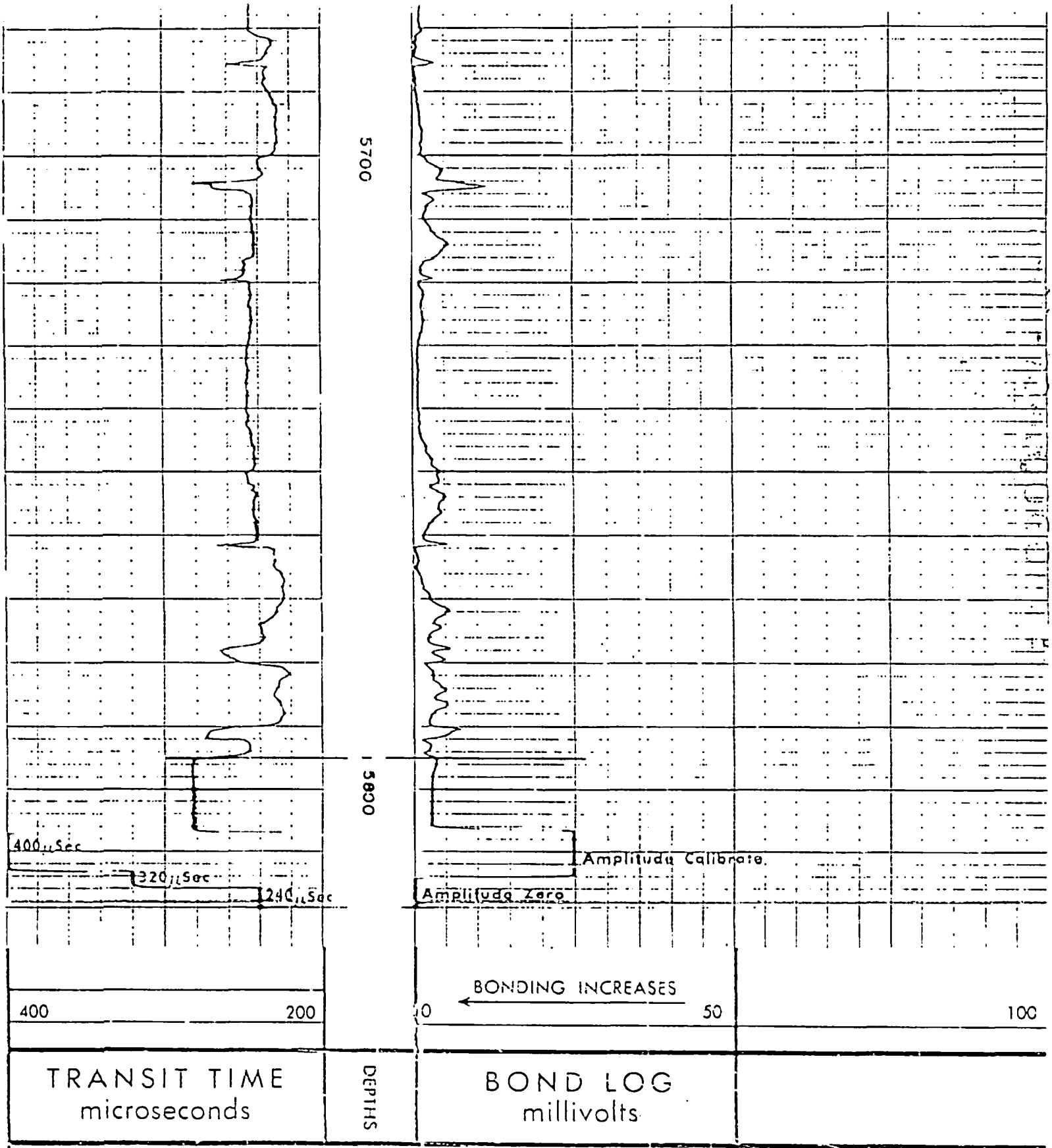



5600
5700



REPEAT SECTION





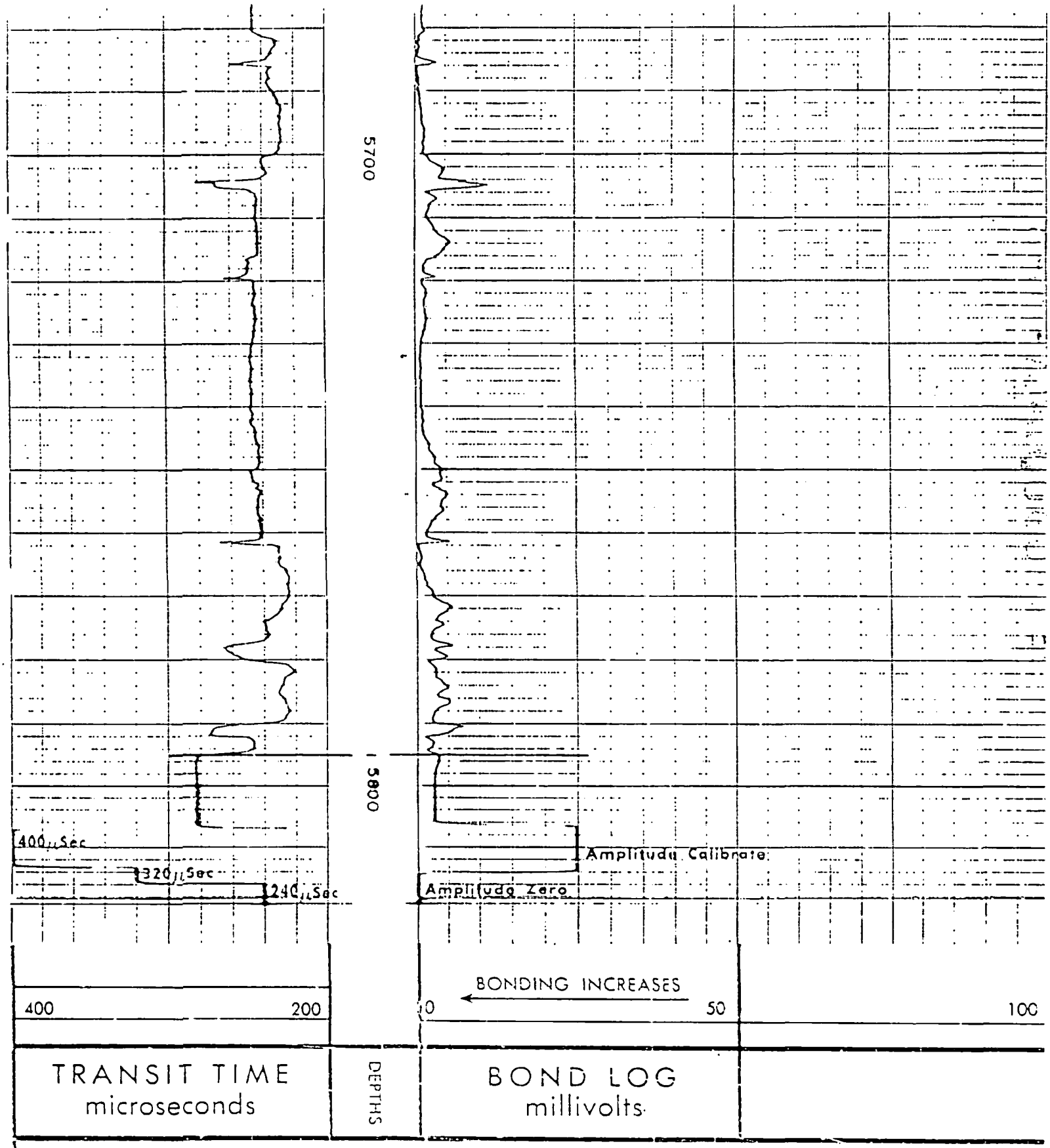
COMPANY MESA PETROLEUM COMPANY

WELL BIERE #1-22

FIELD WILDCAT

COUNTY ROOSEVELT STATE MONTANA

SCHL FR 5795
SCHL TD 5803
DRLR TD ----
Elev:
KB 2086
DF ----
GL 2074



COMPANY MESA PETROLEUM COMPANY

WELL BIERE #1-22

FIELD WILDCAT

COUNTY ROOSEVELT STATE MONTANA

SCHL FR 5795
SCHL TD 5803
DRLR TD ----
Elev:
KB 2086
DF ----
GL 2074

Neutron Cal. Zero

Neutron Zero

RADIOACTIVITY CALIBRATION DATA

COMPANY MESA PETROLEUM COMPANY

WELL BIERE - S.W.D. #1

FIELD WILDCAT

COUNTY ROOSEVELT STATE MONTANA

SCHL. FR 949
SCHL. TD 950
DRLR TD 950
Elev:
KB 2087
DF ----
GL 2075

NW SW
C85-21049

LOCATE WELL CORRECTLY

Form No. 1
(Mon. Rule 206.3 & 2211)

(SUBMIT IN TRIPLICATE)
TO
OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

RECEIVED

LOG OF WELL

Company MESA PETROLEUM CO. Lease Biere Well No. SWD #1-W
P. O. Box 2009
Address Amerillo, Texas Field (or Area) Poplar

The well is located 1750 ft. from (S) line and 140 ft. from (W) line of Sec. 22

Sec. 22 ; T. 29N ; R. 51E ; County Roosevelt ; Elevation 2087 R.B.
(D.F., R.B. or G.L.)

Commenced drilling June 24, 1970, 19__; Completed July 9, 19 70

The information given herewith is a complete and correct record of the well. The summary on this page is for the condition of the well at the above date.

Completed as Salt Water Disposal
(oil well, gas well, dry hole)

Signed

Title Consultant

Date July 17, 1970

IMPORTANT ZONES OF POROSITY

(denote oil by O, gas by G, water by W; state formation if known)

From ____ to ____ From ____ to ____
From ____ to ____ From ____ to ____
From ____ to ____ From ____ to ____
From ____ to ____ From ____ to ____

CASING RECORD

Size Casing	Weight Per Ft.	Grade	Thread	Casing Set	From	To	Sacks of Cement	Cut and Pulled from
8-5/8	24#	J-55	8 rd	998			500	

TUBING RECORD

Size Tubing	Weight Per Ft.	Grade	Thread	Amount	Perforations
2 3/8 E.U.H	6.5#	J-55	8 rd	790	796-800,804-808,812-320, 2 P.F. 825-834

COMPLETION RECORD

Rotary tools were used from 0 to 998
Cable tools were used from ____ to ____
Total depth 998 ft.; Plugged back to 950 T.D.; Open hole from ____ to ____

PERFORATIONS			ACIDIZED, SHOT, SAND FRACTED, CEMENTED			
Interval From	Interval To	Number and Size and Type	Interval From	Interval To	Amount of Material Used	Pressure
796	800	9-3/8 Jet	796	800	500 Gal. 15% HCl	400#
804	808	9-3/8 Jet				
812	820	17-3/8 Jet				
825	834	19-3/8 Jet				

(If F&A show plugs above)

INITIAL PRODUCTION S.W.D.

Well is injecting in Judith River (pool) formation. Initial injection 966 B.W.D. at 390 P.S.I.

I.P. ____ barrels of oil per ____ hours ____
(pumping or flowing)

____ Mcf of gas per ____ hours,
____ barrels of water per ____ hours, or ____ % W.C.

(OVER)

Schlumberger Well Services
A Division of Schlumberger Technology Corporation
Houston, Texas 77001

July 17, 1970

Please Reply To
Schlumberger Well Services

Box 908
Williston, N. Dak.
58801

Mesa Petroleum Company
784 Lincoln Tower Bldg.
Denver, Colorado - 80203
Attention: Mr. William Dodds

Gentlemen:

Enclosed are 7 prints of the GRN & Shooting Record on:
Company Mesa Petroleum Co., Well Biere-S.W.D. #1,
Field Wildcat, County Roosevelt State Montana.

Additional prints are being sent to:

2 prints
State Oil & Gas Cons. Comm.
15 Poly Drive
Billings, Montana - 59101

1 prints
Robert Snyder
64 Midland Bank Bldg.
Billings, Montana - 59101

1 prints
John Graham
Box 241
Billings, Montana - 59103

1 prints
Petroleum Engineering & Mgment. Corp.
250 Securities Bldg.
Billings, Montana - 59103
Attn: Lewis Correll

____ prints

____ prints

____ prints

____ prints

The film is to be mailed to:

Mesa Petroleum Company
784 Lincoln Tower Bldg.
Denver, Colorado - 80203
Attn: Mr. William Dodds

We appreciate the privilege of serving you.

RECEIVED
FEB 25 2003
Office of Enforcement
Compliance & Environmental
Justice

Very truly yours,
Schlumberger Well Services

Merle D. Kline by TW
DISTRICT MANAGER

SWS-1327-C

DELIVERY TICKET

WISCO

P.O. BOX 2477
WILLISTON, N. DAK. 58802-2477

SHIPPED TO	
ADDRESS	
CITY & STATE	
CARE OF	
(LEASE) (WELL NO.) (FIELD) (RIG)	
INVOICE TO	
ADDRESS	
CITY & STATE	

CUSTOMER ORDER NO.	ORDERED BY	DATE 7-1
CUSTOMER REQUISITION NO.	TAKEN BY	FILLED BY
ORDERED VIA		
SHIPPED VIA		
SPECIAL INSTRUCTIONS		

DATE	DESCRIPTION	UNITS	UNIT PRICE	AMOUNT
		CITY COUNTY	TAX	
		STATE TAX		

SERVICES PERFORMED BY

WISCO REPRESENTATIVE

Thank You Mr. _____ APPROVED BY

COMPANY NAME

TOTAL

DT NO. 73274

INVOICE NO. | DATE

DELIVERY TICKET

WISCO

P.O. BOX 2477
WILLISTON, N. DAK. 58802-2477

SHIPPED TO

ADDRESS

CITY & STATE

CARE OF

(LEASE) (WELL NO.) (FIELD) (RIG)

INVOICE TO
[illegible]

ADDRESS

CITY & STATE

CUSTOMER ORDER NO.	ORDERED BY	DATE

CUSTOMER REQUISITION NO.	TAKEN BY	FILLED BY

ORDERED VIA

SHIPPED VIA

SPECIAL INSTRUCTIONS

DATE	DESCRIPTION	UNITS	UNIT PRICE	AMOUNT
[illegible]	[illegible]			
	[illegible]			
	[illegible]			
	[illegible]			
	[illegible]			
	[illegible]			
	[illegible]			
	[illegible]			
	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]
		CITY COUNTY TAX		
		STATE TAX		

RECEIVED
FEB 25 2009
Office of Enforcement
Compliance & Environmental
Justice

SERVICES PERFORMED BY

WISCO REPRESENTATIVE

Thank You Mr.

APPROVED BY

COMPANY NAME

TOTAL [illegible]

DT NO. [illegible]29

INVOICE NO.

DATE

DELIVERY TICKET

WISCO
P.O. BOX 2477
WILLISTON, N. DAK. 58802-2477

SHIPPED TO	
ADDRESS	
CITY & STATE	
CARE OF	
(LEASE) (WELL NO.) (FIELD) (RIG)	
INVOICE TO	[illegible]
ADDRESS	
CITY & STATE	

CUSTOMER ORDER NO.	ORDERED BY	DATE
CUSTOMER REQUISITION NO.	TAKEN BY	FILLED BY
ORDERED VIA		
SHIPPED VIA		
SPECIAL INSTRUCTIONS		

DATE	DESCRIPTION	UNITS	UNIT PRICE	AMOUNT
7-11-12-85	[illegible]			
	Started drilling at 200 ft			
	[illegible] 165 [illegible]			
	[illegible]			
	Made 240 ft total Depth			
	440 ft [illegible]			
	[illegible]			
	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	240.00
	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]
	RECEIVED			
	FEB 25 2004	CITY COUNTY	TAX	
	Office of Enforcement Compliance & Environmental Justice	STATE	TAX	

SERVICES PERFORMED BY

WISCO REPRESENTATIVE

Thank You Mr. [illegible]

APPROVED BY

COMPANY NAME

TOTAL	[illegible]
DT NO.	[illegible]30
INVOICE NO.	DATE

DELIVERY TICKET

WISCO

P.O. BOX 2477
WILLISTON, N. DAK. 58802-2477

SHIPPED TO	
ADDRESS	
CITY & STATE	
CARE OF	
(LEASE) (WELL NO.) (FIELD) (RIG)	
INVOICE TO	
ADDRESS	
CITY & STATE	

CUSTOMER ORDER NO.	ORDERED BY	DATE
CUSTOMER REQUISITION NO.	TAKEN BY	FILLED BY

ORDERED VIA

SHIPPED VIA

SPECIAL INSTRUCTIONS

DATE	DESCRIPTION	UNITS	UNIT PRICE	AMOUNT
[illegible]	[illegible]			
	RECEIVED	CITY COUNTY	TAX	
	FEB 25 2004		STATE TAX	

Office of Enforcement Compliance & Environmental Justice

SERVICES PERFORMED BY

WISCO REPRESENTATIVE

Thank You Mr.

APPROVED BY

COMPANY NAME

TOTAL

DT NO. 31

INVOICE NO.

DATE

DELIVERY TICKET

WISCO
P.O. BOX 2477
WILLISTON, N. DAK. 58802-2477

SHIPPED TO	[illegible]
ADDRESS	
CITY & STATE	
CARE OF	
(LEASE) [illegible]	(WELL NO.) 1-22
(FIELD)	(RIG)
INVOICE TO	[illegible]
ADDRESS	
CITY & STATE	

CUSTOMER ORDER NO.	ORDERED BY	DATE
	[illegible]	[illegible]
CUSTOMER REQUISITION NO.	TAKEN BY	FILLED BY
	[illegible]	
ORDERED VIA		
SHIPPED VIA	[illegible]	
SPECIAL INSTRUCTIONS		

DATE	DESCRIPTION	UNITS	UNIT PRICE	AMOUNT
	[illegible]			
	[illegible]			
	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]

RECEIVED
FEB 25 2003
Office of Enforcement
Compliance & Environmental
Justice

CITY COUNTY TAX
STATE TAX
TOTAL [illegible]

SERVICES PERFORMED BY

WISCO REPRESENTATIVE

Thank You Mr. [signature]
APPROVED BY

COMPANY NAME

DT NO. 75026

INVOICE NO.
DATE

DELIVERY TICKET

WISCO

P.O. BOX 2477
WILLISTON, N. DAK. 58802-2477

SHIPPED TO

ADDRESS

CITY & STATE

CARE OF

(LEASE) (WELL NO.) (FIELD) (RIG)

INVOICE TO

ADDRESS

CITY & STATE

CUSTOMER ORDER NO.	ORDERED BY	DATE
CUSTOMER REQUISITION NO.	TAKEN BY	FILLED BY

ORDERED VIA

SHIPPED VIA

SPECIAL INSTRUCTIONS

DATE	DESCRIPTION	UNITS	UNIT PRICE	AMOUNT

RECEIVED

FEB 25 2009

Office of Enforcement Compliance & Environmental Justice

CITY COUNTY TAX

STATE TAX

SER.

...MED BY

WISCO REPRESENT...

Thank You Mr.

APPROVED BY

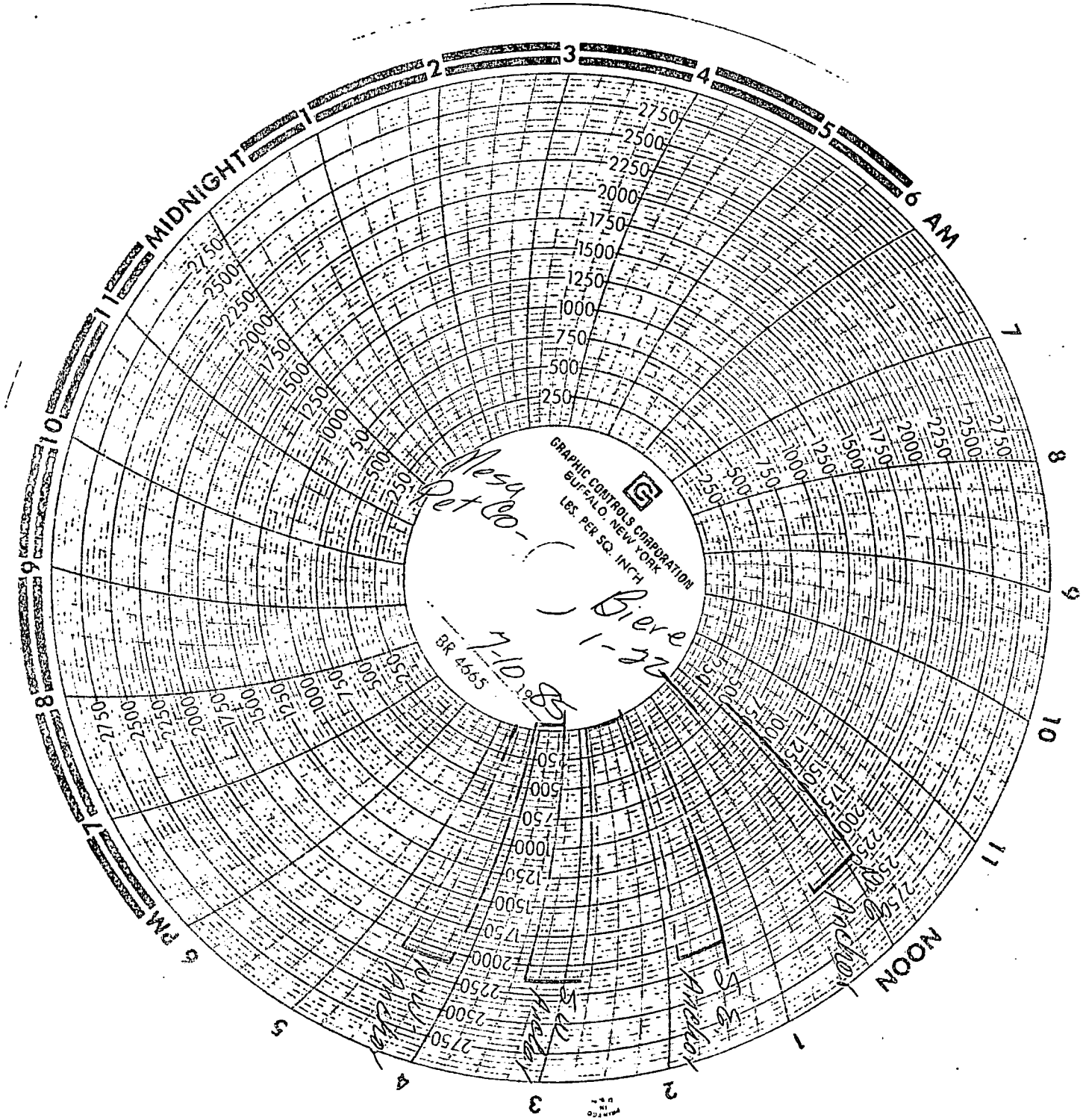
COMPANY NAME

TOTAL

DT NO. 75027

INVOICE NO.

DATE


GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK
LBS. PER SQ. INCH
BR 4665
MIDNIGHT
AM
NOON
PM
Mesa Pet Co-
Biere
1-22
7-10-85

RECEIVED

Service Order No. _____

DREW M. WALSH
E. PALSER JR

RADIOACTIVE CONTAMINATION INSPECTION DATA SHEET

Date 7-13-85

CUSTOMER Company MESA PETROL COMPANY Well BIERE NO 1-22

Field POPLAR County ROOSEVELT State MT

Purpose of Survey NEUTRON LOG

Type Survey Meter VICTOREEN 493 Serial No. 3607M

Sealed Sources

Type Source Am BE Number 307

Condition of Source: Good ✓ Needs Repair ____

Condition of Source Shield: Good ✓ Needs Repair ____

Survey Readings:	Before Log	After Log
Normal Background	.02-.07 mr/hr	.02-.05
Storage Container	.1	.1
Tool	.03	.02
Logging Unit	.04	.03-05
Rig Floor	.03	.02-.05

Tracer Material

Tracer Suppliers Code ____ Date ____

Isotope ____ Activity ____

	Before	After
Background Measurement		
Ground Area Around Injection Equipment		
Flow Lines From Equipment to Wellhead		
Tracer Injection Tool		
Mixing Device or Tank		
Pump		
Hand Tools		
General Area		

On jobs using sealed sources only, the contamination level is considered to be twice the normal background reading for that location. Refer to Section 7 for detailed instructions on making survey. If levels are found that indicate contamination, the Supplementary Record on back of form must be filled out.

On jobs using tracer material the contamination level is .2 mr/hr at 1/2" from ground or other object. Refer to Section 7 for detailed instructions for making survey. If levels are found that indicate contamination, the Supplementary Record on back of form must be filled out..

Signature: [illegible] RAS 7-12-85

Figure 5

FEB 25 2003
Office of Enforcement
Compliance & Environmental

CHECK SHEET

Date May 4, 1970

Company MESA PETROLEUM COMPANY P. O. BOX 2009 AMARILLO, TEXAS 79105

Well Name BIERE No. 1-22

County ROOSEVELT Field WILDCAT

Location 1980 FSL 660 FWL (C NW SW) Sec. 22 Twp. 28N Rge. 51E

Permit No.	
Receipt No.	
Drilling Fee	$75.00
Intention to Drill	4-29-70 (Approved 5-4-70)
API No.	085-21047
Permit Expiration Date	
Permit Extended 90 days	From To
$5,000 one well bond	
$5,000 blanket bond	
$10,000 blanket bond	X
Government Well	
Sundry Notices	Int to abandon 7-23-84
" "	Rlst's 1, 2, 3: 10-9-84 Compl. 6-8-70
" "	IPF 516 BOPD
" "	~~TD 5845~~ PB 5803
Log of Well	7-15-70
Subsequent Report of Abandonment 10-1-84	8/5/86 P&A 9-17-84
Electric Log	Laterolog
Radioactive Log 2 sets 5-28-70	Microlaterolog
	Neutron Porosity Log
	Movable Oil Plot
	Cement Bond Log
	Perf. Depth Control

FLUID SAMPLER DATA

Sampler Pressure 13 P.S.I.G. at Surface
Recovery: Cu. Ft. Gas 0
cc. Oil Trace
cc. Water 2150
cc. Mud 0
Tot. Liquid cc. 0
Gravity 0 ° API @ °F.
Gas/Oil Ratio 0 cu. ft./bbl.

	RESISTIVITY			CHLORIDE CONTENT
Recovery Water	.023	@ 95	°F.	12000 ppm
Recovery Mud		@	°F.	
Recovery Mud Filtrate		@	°F.	ppm
Mud Pit Sample	.090	@ .75	°F.	
Mud Pit Sample Filtrate	.090	@ 75	°F.	8,600 ppm
Mud Weight	10		vis	100+ cp

Date 3-4-70 Ticket Number 260317
Kind of Job OPEN HOLE Halliburton District GLENDIVE
Tester MR. ERICKSON Witness MR. GRAHAM
Drilling Contractor CALVERT DRILLING AND PROD. RIG #22 DR

EQUIPMENT & HOLE DATA

Formation Tested Tyler
Elevation 2086' Ft.
Net Productive Interval 15' Ft.
All Depths Measured From Kelly Bushing
Total Depth 4885' Ft.
Main Hole/Casing Size 7 7/8"
Drill Collar Length 469' I.D. 2.50"
Drill Pipe Length 4348' I.D. 3.826"
Packer Depth(s) 4849'-4859' Ft.
Depth Tester Valve 4837' Ft.

Cushion TYPE AMOUNT Ft. Depth Back Pres. Valve Surface Choke ½" Bottom Choke .75"

Recovered 120 Feet of very slightly mud cut and oil flake-salt water

Recovered 1369 Feet of salt water-with oil flake-12,000 PPM.

Recovered Feet of

Recovered Feet of

Recovered Feet of

Mea. From Tester Valve

Remarks Opened tool for 15 minute first flow with a weak blow, strong blow in 7 minutes. Closed tool for 31 minute first closed in pressure. Reopened tool for 59 minute second flow with a fair blow increasing to a strong blow in 5 minutes through out test. Closed tool for 60 minute second closed in pressure.

TEMPERATURE	Gauge No. 317 Depth: 4842 Ft.	Gauge No. 195 Depth: 4881 Ft.	Gauge No. Depth: Ft.	TIME
	12 Hour Clock	12 Hour Clock	Hour Clock	Tool Opened 3:30 P.M.
Est. °F.	Blanked Off No	Blanked Off Yes	Blanked Off	Tool Closed 6:00 P.M.
Actual 216 °F.	Pressures	Pressures	Pressures	

		Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic		2557	2548	2553	2566				
First Period Flow	Initial	72	59	99	69			—	—
	Final	201	229	227	275			15	15
	Closed in	2500	2529	2510	2548			30	31
Second Period Flow	Initial	201	219	227	235			—	—
	Final	601	633	625	651			60	59
	Closed in	2486	2527	2495	2545			60	60
Third Period Flow	Initial							—	—
	Final								
	Closed in								
Final Hydrostatic		2543	2467	2539	2486			—	—

Legal Location Sec. - Twp. - Rng. S 22-28N-51E
Lease Name
Well No.
Test No. 1
Tested Interval
Field Area WILDCAT
County ROOSEVELT
State MONTANA
Lease Owner/Company Name MESA PETROLEUM COMPANY

PRINTED IN U.S.A. FORMATION TEST DATA LITTLE'S 53429 11M 4/69—33, 84-19

Gauge No. 317			Depth 4842'			Clock No. 7132			12 hour		Ticket No. 260317		
First Flow Period			First Closed In Pressure			Second Flow Period		Second Closed In Pressure			Third Flow Period		Third Closed In Pressure		
	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.
0	.000	59	.000		229	.000	219	.000		633					
1	.0202	87	.0198		2478	.0708	299	.0407		2488					
2	.0404	130	.0396		2500	.1416	367	.0814		2504					
3	.0606	166	.0594		2510	.2124	437	.1221		2513					
4	.0808	193	.0792		2517	.2832	517	.1628		2519					
5	.1010	229	.0990		2520	.3540	584	.2035		2522					
6			.1188		2522	.4180	633**	.2552		2523					
7			.1386		2523			.2849		2525					
8			.1584		2525			.3256		2526					
9			.1782		2527			.3663		2527					
10			.2070		2529*			.4070		2527					
11															
12															
13															
14															
15															

Gauge No. 195			Depth 4881'			Clock No. 6863			hour 12						
0	.000	69	.000		275	.000	235	.000		651					
1	.0204	147	.0206		2497	.0693	322	.0414		2507					
2	.0408	181	.0412		2519	.1386	394	.0828		2522					
3	.0612	210	.0618		2527	.2079	463	.1242		2530					
4	.0816	241	.0824		2533	.2772	529	.1656		2535					
5	.1020	275	.1030		2538	.3465	594	.2070		2538					
6			.1236		2539	.4090	651**	.2484		2540					
7			.1442		2540			.2898		2542					
8			.1648		2542			.3312		2543					
9			.1854		2543			.3726		2545					
10			.2130		2545*			.4140		2545					
11															
12															
13															
14															
15															
Reading Interval	3		3			10		6							Minutes

REMARKS: * Last interval equal to 4 minutes ** =9 minutes.

RECEIVED OCT 1964 OIL & GAS CONS COMM STATE OF MONT BILLINGS

FLUID SAMPLER DATA

Sampler Pressure 16 P.S.I.G. at Surface

Recovery: Cu. Ft. Gas trace

cc. Oil 100-trace mud

cc. Water 2050

cc. Mud 0

Tot. Liquid cc. 2150

Gravity ____ ° API @ ____ °F.

Gas/Oil Ratio ____ cu. ft./bbl.

	RESISTIVITY			CHLORIDE CONTENT
Recovery Water	1.10	@90	°F.	4000 ppm
Recovery Mud	.156	@ 86	°F.	
Recovery Mud Filtrate	10.00	@ 85	°F.	4500 ppm
Mud Pit Sample	.300	@66	°F.	
Mud Pit Sample Filtrate	200	@65	°F.	30,000 ppm
Mud Weight	10.3	vis	41	cp

Date	5-19-70	Ticket Number	260318
Kind of Job	OPEN HOLE	Halliburton District	GLENDIVE
Tester	MR. ERICKSON	Witness	MR. TODD
Drilling Contractor	CALVERT DRILLING AND PROD. RIG 22 DR		

EQUIPMENT & HOLE DATA

Formation Tested	Kibby		
Elevation	2086' Ft.		
Net Productive Interval	10' Ft.		
All Depths Measured From	Kelly Bushing		
Total Depth	5175' Ft.		
Moin Hole/Casing Size	7 7/8"		
Drill Collar Length	4619'	I.D.	3.826"
Drill Pipe Length	469'	I.D.	2.50"
Packer Depth(s)	5125'-5135' Ft.		
Depth Tester Valve	5102' Ft.		

Cushion TYPE AMOUNT Ft. Depth Back Pres. Valve Surface Choice .25" Bottom Choice .75"

Recovered	180	Feet of	slightly oil and gas cut drilling mud
Recovered	120	Feet of	slightly water cut and oil and gas cut drilling mud
Recovered	60	Feet of	slightly mud cut water with slight oil and gas
Recovered	559	Feet of	slight oil and gas cut water
Recovered		Feet of	

Meas. From Tester Valve

Remarks Opened tool for 14 minute first flow with a weak blow 1" steady. Closed tool for 89 minute first closed in pressure. Reopened tool for 17 minute second flow with a weak blow 1" steady. Closed tool for 16 minute second closed in pressure. Reopened tool for 119 minute third flow with a weak blow, 1" blow in 4 minute, 2 3/4" blow in 40 minute 4" blow in 70 minutes then decreasing to end of test. Closed tool for 120 minute third GIP.

TEMPERATURE	Gauge No. 317	Gauge No. 195	Gauge No.
	Depth: 5113 Ft.	Depth: 5171 Ft.	Depth: Ft.
	12 Hour Clock	12 Hour Clock	Hour Clock
Est. °F.	Blanked Off No	Blanked Off Yes	Blanked Off
Actual 218 °F.	Pressures	Pressures	Pressures

TIME: Tool Opened 7:00 A.M. ~~P.M.~~; Tool Closed 1:15 P.M.

		Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic		2876	2753	2727	2767				
First Period	Flow Initial	26	70	99	88			—	—
	Flow Final	115	140	113	170			15	14
	Closed in	2600	2636	2640	2660			90	89
Second Period	Flow Initial	143	152	170	197			—	—
	Flow Final	186	212	198	239			15	17
	Closed in	2355	2406	2435	2429			15	16
Third Period	Flow Initial	195	216	227	251			—	—
	Flow Final	387	427	397	453			120	119
	Closed in	2514	2557	2553	2588			-	120
Final Hydrostatic		2731	2720	2799	2746			—	—

Legal Location Sec.-Twp.-Rng. S 22-28N-51E

Lease Name BIERE

Well No. 1-22

Test No. 2

Tested Interval 5135'-5175'

Field Area WILDCAT

County ROOSEVELT

State MONTANA

Lease Owner/Company Name MESA PETROLEUM COMPANY

PRINTED IN U.S.A.

FORMATION TEST DATA #2

LITTLE'S 88420 10M 4/68—11, 24-12

Gauge No. 317	Depth 5113'	Clock No. 7132	12 hour	Ticket No. 260318

	First Flow Period		First Closed In Pressure			Second Flow Period		Second Closed In Pressure			Third Flow Period		Third Closed In Pressure		
	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.
0	.000	70	.000		140	.000	152	.000		212	.000	216	.000		427
1	.021	97	.0611		2445	.0198	158	.0143		1892	.1355	266	.0821		2149
2	.042	109	.1222		2561	.0396	169	.0286		2132	.2710	304	.1642		2308
3	.063	122	.1833		2595	.0594	183	.0429		2220	.4065	332	.2463		2388
4	.084	130	.2444		2613	.0792	198	.0572		2296	.5420	360	.3284		2439
5	.100	140*	.3055		2621	.0990	208	.0715		2344	.6775	393	.4105		2477
6			.3666		2626	.1120	212***	.0858		2382	.8060	427****	.4926		2500
7			.4277		2629			.1001		2405			.5747		2519
8			.4888		2630			.1140		2406			.6568		2537
9			.5499		2633								.7289		2549
10			.6040		2636**								.8210		2557
11															
12															
13															
14															
15															

Gauge No. 195	Depth 5171'	Clock No. 6863	hour 12

0	.000	88	.000		170	.000	197	.000		239	.000	251	.000		453
1	.0203	142	.061		2468	.0206	187	.0139		1909	.1373	295	.0829		2176
2	.0406	142	.122		2582	.0412	197	.0278		2124	.2746	331	.1658		2338
3	.0609	156	.183		2620	.0618	211	.0417		2240	.4119	360	.2487		2421
4	.0812	159	.244		2636	.0824	227	.0556		2318	.5492	387	.3316		2470
5	.0950	170*	.305		2645	.1030	235	.0695		2366	.6865	419	.4145		2504
6			.366		2650	.1170	239***	.0834		2405	.8170	453****	.4974		2530
7			.427		2652			.0973		2425			.5803		2548
8			.488		2655			.1110		2429			.6632		2566
9			.549		2658								.7461		2578
10			.608		2660								.8290		2588
11															
12															
13															
14															
15															
Reading Interval	3				9		3			2		20		12	Minutes

REMARKS: * Last interval equal to 2 minutes **=8 minutes ***=2 minutes ****=19 minutes.

RECEIVED OIL & GAS CONS. COMM. STATE OF MONT. BILLINGS

SPECIAL PRESSURE DATA

FLUID SAMPLER DATA

Sampler Pressure 50 P.S.I.G. at Surface

Recovery: Cu. Ft. Gas .1

cc. Oil 800

cc. Water 1400

cc. Mud -0-

Tot. Liquid cc 2200

Gravity 41 °API @ 60 °F.

Gas/Oil Ratio 20 cu. ft./bbl.

	RESISTIVITY			CHLORIDE CONTENT
Recovery Water	.31	@ 90	°F.	17500 ppm
Recovery Mud		@	°F.	
Recovery Mud Filtrate		@	°F.	ppm
Mud Pit Sample		@	°F.	
Mud Pit Sample Filtrate	.14	@ 60	°F	62,000 ppm

Mud Weight 10.7 vis 52 cp

Date 5/24/70 Ticket Number 283316

Kind of Job OPEN HOLE Halliburton District GLENDIVE

Tester C. MOREY Witness MR. GRAHAM

Drilling Contractor CALVERTS DRILLING RIG #22

EQUIPMENT & HOLE DATA LC

Formation Tested Charles

Elevation 2086' KB Ft.

Net Productive Interval 10' Ft.

All Depths Measured From Kelly Bushing

Total Depth 5800' Ft.

Main Hole/Casing Size 7.875"

Drill Collar Length 469' I.D 2.50"

Drill Pipe Length 5280' I.D 3.826"

Packer Depth(s) 5777' -5785' Ft.

Depth Tester Valve 5752' Ft.

Cushion	TYPE	AMOUNT	Ft.	Depth Back Pres. Valve	Surface Choke	Bottom Choke
	None			None	.25"	.75"

Recovered 400 Feet of free oil (45 BBLS.)

Recovered 120 Feet of mud cut oil (50% oil (1.7 BBLS.) gas)

Recovered 160 Feet of gas - oil - mud - emulsion (.96 BBLS.)

Recovered 310 Feet of formation water (1.86 BBLS.) - grey in color.

Recovered Feet of (Sulphur) - (1140' of gas in pipe above recovery)

Remarks Opened tool for a 15 minute first flow weak (½") to strong in 10 minutes. Closed tool for a 30 minute first closed in pressure. Reopened tool for a 120 minute second flow weak blow (½") to strong in 20 minutes (bottom of 5 gallon bucket) remained strong for duration of 120 minutes. Closed tool for a 90 minute final closed in pressure.

TEMPERATURE	Gauge No. 675		Gauge No. 385		Gauge No.		TIME	
	Depth: 5753 Ft.		Depth: 5796 Ft.		Depth: Ft.			
	12 Hour Clock		12 Hour Clock		Hour Clock		Tool Opened	2:05 P.M.
Est. 221 °F.	Blanked Off No		Blanked Off Yes		Blanked Off			
Actual °F.	Pressures		Pressures		Pressures		Tool Closed	6:20 P.M.
	Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic	3391	3384	3414	3394				
First Period Flow Initial	23	28	46	58			—	—
First Period Flow Final	140	133	139	139			15	15
First Period Closed in	2956	2954	2954	2949			30	30
Second Period Flow Initial	140	142	139	155			—	—
Second Period Flow Final	396	410	417	412			120	120
Second Period Closed In	2933	2954	2931	2943			90	90
Third Period Flow Initial							—	—
Third Period Flow Final								
Third Period Closed in								
Final Hydrostatic	3368	3366	3392	3357			—	—

Legal Location Sec. - Twp. - Rng. 22 28N 51E

Lease Name MESA BLEVE

Well No. 1-22

Test No. 3

Tested Interval 5785' - 5800'

Field ARCH WILDCAT

County ROOSEVELT

State MONTANA

Lease Owner/Company Name MESA PETROLEUM COMPANY

Disc. Front Tester Valve

RECEIVED OCT 1 '94 OIL & GAS CONSERVATION COMMISSION STATE OF MONTANA

PRINTED IN U.S.A.

FORMATION TEST DATA #3

Gauge No. 675			Depth 5753'				Clock No. 3808			12 hour		Ticket No. 283316		
	First Flow Period		First Closed In Pressure			Second Flow Period		Second Closed In Pressure			Third Flow Period		Third Closed In Pressure		
	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.
0	.000	28	.000		133	.000	142	.000		410					
1	.0202	56	.0199		2903	.1355	210	.0605		2947					
2	.0404	86	.0398		2940	.2710	249	.1210		2952					
3	.0606	103	.0597		2947	.4065	289	.1815		2952					
4	.0808	124	.0796		2952	.5420	333	.2420		2952					
5	.1010	133	.0995		2952	.6775	373	.3025		2954					
6			.1194		2952	.8130	410	.3630		2954					
7			.1393		2954			.4235		2954					
8			.1592		2954			.4840		2954					
9			.1791		2954			.5445		2954					
10			.1990		2954			.6050		2954					
11															
12															
13															
14															
15															

Gauge No. 385			Depth 5796'				Clock No. 2795			12 hour				
0	.000	58	.000		139	.000	155	.000		412				
1	.0192	76	.020		2922	.1335	215	.0601		2938				
2	.0384	97	.040		2936	.2670	255	.1202		2943				
3	.0576	113	.060		2945	.4005	292	.1803		2943				
4	.0768	132	.080		2947	.5340	333	.2404		2943				
5	.0960	139	.100		2947	.6675	373	.3005		2943				
6			.120		2947	.8010	412	.3606		2943				
7			.140		2949			.4201		2943				
8			.160		2949			.4808		2943				
9			.180		2949			.5409		2943				
10			.200		2949			.6010		2943				
11														
12														
13														
14														
15														
Reading Interval	3		3			20		9						Minutes

REMARKS:

RECEIVED OCT 1 1 1993 OIL CON. DIV. DIST. 3

HALLIBURTON SERVICES

A DIVISION OF HALLIBURTON COMPANY
FORM 1906-R1

SEND ALL REMITTANCES TO
P. O. DRAWER 1431
DUNCAN, OKLAHOMA 73533

PAGE 1 OF 2 PAGES

INVOICE & TICKET NO. 283293

22-28N-51E

LL NO. AND FARM	COUNTY	STATE	DATE
[illegible]	[illegible]	[illegible]	6-5-70

INER	CONTRACTOR	DUNCAN USE ONLY
[illegible]	J [illegible]	

ARGE TO	DELIVERED TO	LOCATION	CODE
[illegible]		[illegible]	555

DRESS	SHIPPED VIA	LOCATION	CODE
BOX 2009 AMARILLO, TEXAS		2	

CUST. INV. REQ. ORIG. &	REQUISITION	LOCATION	CODE
☐ 1 ☐ 2 ☐ 3 ☐ 4	ORDER NO.	3	
		FULL MATERIAL DELIVERY TICKET NO. B-534122	
	TOTAL ACID - 30 DAYS 500	WELL TYPE O.W.	CODE
NO. COPIES			

DUNCAN USE ONLY

RECEIVED
OFFICE OF ENFORCEMENT
OCT 19 1998
COMPLIANCE & ENVIRONMENTAL

TYPE AND PURPOSE OF JOB: Hydro Jet Chevles "C"

TERMS: DUE BY THE 20TH OF FOLLOWING MONTH. INTEREST CHARGED AFTER 60 DAYS FROM DATE OF INVOICE.
$ _____ Cash discount allowed if paid by due date.
$ _____ Tax adjustment to be deducted if discounted.
$ _____ Interest if discounted.

PRICE REFERENCE	SECONDARY REF. OR PART NO.	CODE L	CODE D	DESCRIPTION	UNITS 1 QTY.	UNITS 1 MEAS.	UNITS 2 QTY.	UNITS 2 MEAS.
[illegible]-111				Mileage Charge	15	mi.		
[illegible]-121				Sand proportioner	95	hrs.		
[illegible]-006				Mileage Charge Acid	95	[illegible]		
				6-3-70				
[illegible]-056				Testing Tbg. (Pump Chg.)	2	hrs.		
2011-061				Additional hours	3	hrs.		
				6-4-70				
2112-730				Operators Service Chg.	1	Trip		
				6-5-70				
R301-002				Pump Chg max PSI	500	hrs.	3400 psi	
R301-200				Sand Proporterner	1	[illegible]		
R305-003				Hydro jet tool rental	1	[illegible]		
R305-300				Tbg. holddown	1	[illegible]		
				— Continued —				
				SERVICE CHARGE ON MATERIALS RETURNED		CU. FT.		
				SERVICE CHARGE N/A		CU. FT.		
500-311				2,020 TOTAL WEIGHT 120 LOADED MILES	000.00	TON MILES		

TAX REFERENCES

SU

WAS JOB SATISFACTORILY COMPLETED? _____
WAS OPERATION OF EQUIPMENT SATISFACTORY? _____
WAS PERFORMANCE OF PERSONNEL SATISFACTORY? _____

X _____
Customer or his Agent

J. D. [illegible]
Halliburton Operator

HALLIBURTON SERVICES

A DIVISION OF HALLIBURTON COMPANY
FORM 1906-R1

SEND ALL REMITTANCES TO
P. O. DRAWER 1431
DUNCAN, OKLAHOMA 73533

22-28N-51E

PAGE 1 OF 1 PAGES

INVOICE & TICKET NO. 283553

WELL NO. AND FARM	COUNTY	STATE	DATE
Mesa - Biere #1	Roosevelt	Montana	5-7-70

OWNER	CONTRACTOR	DUNCAN USE ONLY
Mesa	Calvert Drlg.	

CHARGE TO	DELIVERED TO	LOCATION	CODE
Mesa Pet. Corp.	[illegible]	1 Glendive	[illegible]

ADDRESS	SHIPPED VIA	LOCATION	CODE
Box 2009 ~~[illegible]~~, Amarillo, Texas		2 [illegible]	[illegible]

CUST. INV. REQ. ORIG. &	REQUISITION	LOCATION	CODE
☐ 1 ☐ 2 ☐ 3 ☐ 4		3	

ORDER NO.	BULK MATERIAL DELIVERY TICKET NO.
	B-53343

TOTAL ACID - 30 DAYS	WELL TYPE	CODE
	Wildcat	[illegible]

DUNCAN USE ONLY

NO. COPIES

TYPE AND PURPOSE OF JOB: Surface

TERMS: DUE BY THE 20TH OF FOLLOWING MONTH. INTEREST CHARGED AFTER 60 DAYS FROM DATE OF INVOICE

$ _____ Cash discount allowed if paid by due date.

$ _____ Tax adjustment may be deducted if discounted.

PRICE REFERENCE	SECONDARY REF. OR PART NO.	CODE L	CODE D	DESCRIPTION	UNITS 1 QTY.	UNITS 1 MEAS.	UNITS 2 QTY.	UNITS 2 MEAS.
4000-117				Mileage Charge	105	[illegible]		
4001-232				Pumping Charge	7/8	[illegible]		
[illegible]-502				Top Wood Plug - 8 5/8	1			
[illegible]-010				Perm Class "G" cont.	182	[illegible]		
[illegible]-105				Pocmix [illegible]	183			
[illegible]-106				C. Cement #2 Low/115 sks	[illegible]	[illegible]		
[illegible]-202				Flocalc - 1/4 #/sk w/46 sks	1160	[illegible]		
[illegible]-010				Perm Class "G" cont.	[illegible]	[illegible]		
36A	815.17502			8 5/8 Insert Float Valve	1			
37	815.19115			Orifice	1			
7A	825-217			8 5/8 Guide Shoe	1			
655	801.61716			8 5/8 E. Z. Leak Clamp	1			
660	807.9021			8 5/8 Fluidmaster Cont.	3			
35	89A10806			[illegible] Weld	1	[illegible]		
				SERVICE CHARGE ON MATERIALS RETURNED		CU. FT.		
500-209				SERVICE CHARGE	48.5	CU. FT.		
500-311				40.976 TOTAL WEIGHT 120 LOADED MILES	266.44	TON MILES		

SUI

TAX REFERENCES

SUI

WAS JOB SATISFACTORILY COMPLETED? _____

WAS OPERATION OF EQUIPMENT SATISFACTORY? _____

WAS PERFORMANCE OF PERSONNEL SATISFACTORY? _____

X _____ Customer or His Agent

_____ Halliburton Operator

HALLIBURTON SERVICES
A DIVISION OF HALLIBURTON COMPANY
FORM 1906-R1

SEND ALL REMITTANCES TO
P. O. DRAWER 1431
DUNCAN, OKLAHOMA 73533

PAGE 1 OF ____ PAGES

INVOICE & TICKET NO. 283537

22-28N-51E

WELL NO. AND FARM	COUNTY	STATE	DATE
1-22 Biere	Roosevelt	Montana	5-27-10

OWNER	CONTRACTOR	DUNCAN USE ONLY
MESA PET. CO.	Calvert Drlg. Co.	

CHARGE TO	DELIVERED TO	LOCATION	CODE
MESA Petroleum Co.		1 Glendive	555

ADDRESS	SHIPPED VIA	LOCATION	CODE
Box 2009 Amar. Ho. Texas		2	

CUST. INV. REQ. ORIG. &	REQUISITION	LOCATION	CODE
☐ 1 ☐ 2 ☐ 3 ☐ 4		3	

ORDER NO.	BULK MATERIAL DELIVERY TICKET NO.
	B-53415

TOTAL ACID - 30 DAYS	WELL TYPE	CODE
	Wildcat	WC

DUNCAN USE ONLY

NO. COPIES

TYPE AND PURPOSE OF JOB: Cement Production Casing

TERMS: DUE BY THE 20TH OF FOLLOWING MONTH. INTERES CHARGED AFTER 60 DAYS FROM DATE OF INVOICE

$_____ Cash discount allowed if paid by due date.

$_____ Tax adjustment may be deducted if discounted.

PRICE REFERENCE	SECONDARY REF. OR PART NO.	CODE L	CODE D	DESCRIPTION	UNITS 1 QTY.	UNITS 1 MEAS.	UNITS 2 QTY.	UNITS 2 MEAS.
R-001-032				Pumping Charge	5845	FT.		
R-000-117				Mileage	105	Miles		
-030-015				Top 5 W Plug				
R-023-127				Clean Casing	160	FT.		
-213-009				Mud Flush	500	GAL.		
505-230				Halliburton Latex cement	50	SK.		
501-392				HR-4 Mixed .002 w/50 SKS	9	lbs.		
505-172				Halliburton Light cement	615	SKS		
509-968				Hi-Sol Salt-mixed w/6255 WS	230	SKS		
505-291				Gilsonite Mixed 10 #	6300	lbs		
				PERSK W/679				
				SERVICE CHARGE ON MATERIALS RETURNED		CU. FT.		
500-207				SERVICE CHARGE	1130	CU. FT.		
500-314				96284 TOTAL WEIGHT 130 LOADED MILES	6253.4	TON MILES		

nty.

TAX REFERENCES

SUI

WAS JOB SATISFACTORILY COMPLETED? _____

WAS OPERATION OF EQUIPMENT SATISFACTORY? _____

WAS PERFORMANCE OF PERSONNEL SATISFACTORY? _____

X _____
Customer or His Agent

O. T. Gullickson
Halliburton Operator

HALLIBURTON SERVICES
A DIVISION OF HALLIBURTON COMPANY

P.O. BOX 84737
DALLAS, TEXAS 75284
DIRECT ANY CORRESPONDENCE TO
P.O. DRAWER 1431
DUNCAN, OKLAHOMA 73536

PAGE 1 OF 3 PAGES

INVOICE

NO. 856822

LEASE AND FARM: 22 Biere	COUNTY: Roosevelt	STATE: Montana	DATE: 9-14-84
CHARGE TO: Mesa Petroleum	OWNER: Same	DUNCAN USE ONLY	
ADDRESS: PO Box 2009	CONTRACTOR: Well Tech	LOCATION 1: Glendive	CODE: 55542
CITY, STATE, ZIP: Amarillo, TX 79189	SHIPPED VIA: Halco	LOCATION 2:	CODE:
	DELIVERED TO: Location	LOCATION 3:	CODE:
22-28N-51E	ORDER NO.: A4016	BULK MATERIAL DELIVERY TICKET NO: B-395778	
	WELL TYPE: wildcat		CODE: wild
	TYPE AND PURPOSE OF JOB: Plug to abandon		

SEP 1984
RECEIVED
OIL & GAS CONS. COMM.
STATE OF MONT.
BILLINGS

TERMS: INVOICES PAYABLE NET BY THE 20TH OF THE FOLLOWING MONTH AFTER DATE OF INVOICE. UPON CUSTOMER'S DEFAULT IN PAYMENT OF CUSTOMER'S ACCOUNT BY THE LAST DAY OF THE MONTH FOLLOWING THE MONTH IN WHICH THE INVOICE IS DATED, CUSTOMER AGREES TO PAY INTEREST THEREON AFTER DEFAULT AT THE HIGHEST LAWFUL CONTRACT RATE APPLICABLE BUT NEVER TO EXCEED 18% PER ANNUM IN THE EVENT IT SHOULD BE NECESSARY TO EMPLOY AN ATTORNEY TO ENFORCE COLLECTION OF SAID ACCOUNT. CUSTOMER AGREES TO PAY COLLECTION COSTS AND ATTORNEY FEES IN THE AMOUNT OF 20% OF THE AMOUNT OF THE UNPAID ACCOUNT.

PRICE REFERENCE	SECONDARY REF OR PART NO.	CODE L	CODE D	DESCRIPTION	UNITS 1 QTY	UNITS 1 MEAS	UNITS 2 QTY	UNITS 2 MEAS
000-117				MILEAGE 1 unit	125	mi		
011-234				Pump charge	8	HRS		
009-019				PUMP CHARGE 9-14-84	5260	BT		
009-027				EXTRA 10 HRS	1	ea		
000-117				MILEAGE 2ND DAY	125	mi		
				BULK TICKET	395787			
				AS PER ATTACHED B TICKET NO. 395778				

TAX REFERENCES

SL

WAS JOB SATISFACTORILY COMPLETED? _____

WAS OPERATION OF EQUIPMENT SATISFACTORY? _____

WAS PERFORMANCE OF PERSONNEL SATISFACTORY? _____

Roy I. Keene
CUSTOMER OR HIS AGENT

Daniel J. Popp
HALLIBURTON OPERATOR

Thank you

HALLIBURTON SERVICES
A DIVISION OF HALLIBURTON COMPANY

REMIT TO
P.O. BOX 84737
DALLAS, TEXAS 75284
DIRECT ANY CORRESPONDENCE TO
P.O. DRAWER 1431
DUNCAN, OKLAHOMA 73536

PAGE 1 OF 2 PAGES

State

INVOICE NO. 96053

FORM 1906 R-8

WELL NO. AND FARM	COUNTY	STATE	DATE
1-22 BIERE	ROOSEVELT	MONTANA	9-15-84

CHARGE TO	OWNER	DUNCAN USE ONLY
MESA PETROLEUM	SAME	

ADDRESS	CONTRACTOR	LOCATION	CODE
P.O. BOX 2009	NONE	1 GLENDIVE	555

CITY, STATE, ZIP	SHIPPED VIA	LOCATION	CODE
AMARILLO TEXAS 79189	CO. VEHICLE	2	

	DELIVERED TO	LOCATION	CODE
22-28N-51E	LOCATION	3	

ORDER NO	BULK MATERIAL DELIVERY TICKET NO
	B-395790

WELL TYPE	CODE
OIL WORK OVER	01

TYPE AND PURPOSE OF JOB: PLUG TO ABANDON

SEP 1984
RECEIVED
OIL & GAS CONS. COMM.
STATE OF MONT.
BILLINGS

TERMS: INVOICES PAYABLE NET BY THE 20TH OF THE FOLLOWING MONTH AFTER DATE OF INVOICE. UPON CUSTOMER'S DEFAULT IN PAYMENT OF CUSTOMER'S ACCOUNT BY THE LAST DAY OF THE MONTH FOLLOWING THE MONTH IN WHICH THE INVOICE IS DATED CUSTOMER AGREES TO PAY INTEREST THEREON AFTER DEFAULT AT THE HIGHEST LAWFUL CONTRACT RATE APPLICABLE BUT NEVER TO EXCEED 18% PER ANNUM. IN THE EVENT IT BECOMES NECESSARY TO EMPLOY AN ATTORNEY TO ENFORCE COLLECTION OF SAID ACCOUNT, CUSTOMER AGREES TO PAY COLLECTION COSTS AND ATTORNEY FEES IN THE AMOUNT OF 20% OF THE AMOUNT OF THE UNPAID ACCOUNT.

PRICE REFERENCE	SECONDARY REF OR PART NO	CODE L	CODE D	DESCRIPTION	UNITS 1 QTY	UNITS 1 MEAS	UNITS 2 QTY	UNITS 2 MEAS
R100-115				MILEAGE	125	mi		
R100-019				DUMP CHARGE	500	ft		

AS PER ATTACHED B TICKET NO. 395790

TAX REFERENCES

SL

WAS JOB SATISFACTORILY COMPLETED?

WAS OPERATION OF EQUIPMENT SATISFACTORY?

WAS PERFORMANCE OF PERSONNEL SATISFACTORY? AH016

X [signature] CUSTOMER OR HIS AGENT

[signature] HALLIBURTON OPERATOR

HALLIBURTON SERVICES
A DIVISION OF HALLIBURTON COMPANY

REMIT TO
P.O. BOX 84737
DALLAS, TEXAS 75284
DIRECT ANY CORRESPONDENCE TO
P.O. DRAWER 1431
DUNCAN, OKLAHOMA 73536

TICKET NO. 251932-X

FORM 1906 R9

PAGE 1 OF 2 PAGES

WELL NO. – FARM OR LEASE NAME	COUNTY	STATE	CITY/OFFSHORE LOCATION	DATE
1-2 Mesa Lease	Roosevelt	Mont		

CHARGE TO	OWNER	TICKET TYPE (CHECK ONE)	NITROGEN JOB
Mesa Petroleum	Same	SERVICE [X] SALES [ ]	YES [ ] NO [X]

ADDRESS	CONTRACTOR	LOCATION	CODE
P.O. Box 2009	Wisco	1 Glendive	

CITY, STATE, ZIP	SHIPPED VIA	FREIGHT CHARGES	LOCATION	CODE
Amarillo Texas 79189	Mesa	[ ] PPD [ ] COLLECT	2	

DELIVERED TO	LOCATION	CODE
Location	3	

ORDER NO.	REFERRAL LOCATION

WELL TYPE	WELL CATEGORY	WELL PERMIT NO.
Oil	Development	

TYPE AND PURPOSE OF JOB	
Squeeze Cement Connection Cs	B- 31649-2

DUNCAN USE ONLY

As consideration, the above-named Customer agrees to pay Halliburton in accord with the rates and terms stated in Halliburton's current price lists. Invoices payable NET by the 20th of the following month after date of invoice. Upon Customer's default in payment of Customer's account by the last day of the month following the month in which the invoice is dated, Customer agrees to pay interest thereon after default at the highest lawful contract rate applicable but never to exceed 18% per annum. In the event it becomes necessary to employ an attorney to enforce collection of said account, Customer agrees to pay all collection costs and attorney fees in the amount of 20% of the amount of the unpaid account. These terms and conditions shall be governed by the law of the state where services are performed or equipment or materials are furnished.

Halliburton warrants only title to the products, supplies and materials and that the same are free from defects in workmanship and materials. THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE WHICH EXTEND BEYOND THOSE STATED IN THE IMMEDIATE PRECEDING SENTENCE. Halliburton's liability and customer's exclusive remedy in any cause of action (whether in contract, tort, product liability, breach of warranty or otherwise) arising out of the sale or use of any products, supplies or materials is expressly limited to the replacement of such products, supplies or materials on their return to Halliburton or, at Halliburton's option, to the allowance to the customer of credit for the cost of such items. In no event shall Halliburton be liable for special, incidental, indirect, punitive or consequential damages.

PRICE REFERENCE	SECONDARY REF OR PART NO.	LOC.	ACCOUNT	DESCRIPTION	UNITS 1 QTY	UNITS 1 MEAS	UNITS 2 QTY	UNITS 2 MEAS	UNIT PRICE	AMOUNT
[illegible]				MILEAGE Pump Truck	[illegible]	[illegible]			[illegible]	[illegible]
[illegible]				Pump Charge						[illegible]

AS PER ATTACHED BULK MATERIAL DELIVERY TICKET NO. B- 31649-2 — 3174 20

SUB TOTAL	4288	40
TAX		
TAX		
TAX		
TOTAL		

WAS JOB SATISFACTORILY COMPLETED? _____

WAS OPERATION OF EQUIPMENT SATISFACTORY? _____

WAS PERFORMANCE OF PERSONNEL SATISFACTORY? _____

X [illegible]
CUSTOMER OR HIS AGENT (PLEASE PRINT)

X _____
CUSTOMER OR HIS AGENT (SIGNATURE)

TAX REFERENCES

RECEIVED
FEB 25 2000
Office of Enforcement
Compliance & Environmental
Justice

HALLIBURTON OPERATOR

WE CERTIFY THAT THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED HAS BEEN COMPLIED WITH IN THE PRODUCTION OF GOODS AND OR WITH RESPECT TO SERVICES FURNISHED UNDER THIS CONTRACT.

T. Ryan

EXTRA COPY

HALLIBURTON SERVICES
A Division of Halliburton Company
DUNCAN, OKLAHOMA 73536

FORM 1908 R-4

WORK ORDER CONTRACT AND PRE-TREATMENT DATA

ATTACH TO INVOICE & TICKET NO. [illegible]

DISTRICT [illegible] DATE [illegible]

TO: HALLIBURTON SERVICES YOU ARE HEREBY REQUESTED TO FURNISH EQUIPMENT AND SERVICEMEN TO DELIVER AND OPERATE THE SAME AS AN INDEPENDENT CONTRACTOR TO: [illegible] (CUSTOMER) AND DELIVER AND SELL PRODUCTS, SUPPLIES, AND MATERIALS FOR THE PURPOSE OF SERVICING

WELL NO. [illegible] LEASE [illegible] SEC. [illegible] TWP. [illegible] RANGE [illegible]

FIELD [illegible] COUNTY [illegible] STATE [illegible] OWNED BY [illegible]

THE FOLLOWING INFORMATION WAS FURNISHED BY THE CUSTOMER OR HIS AGENT

FORMATION NAME _____ TYPE _____

FORMATION THICKNESS _____ FROM _____ TO _____

PACKER: TYPE _____ SET AT _____

TOTAL DEPTH _____ MUD WEIGHT _____

BORE HOLE _____

INITIAL PROD: OIL _____ BPD, H_2O _____ BPD, GAS _____ MCF

PRESENT PROD: OIL _____ BPD, H_2O _____ BPD, GAS _____ MCF

	NEW USED	WEIGHT	SIZE	FROM	TO	MAX. ALLOW. P.S.I.
CASING	N	75	16	[illegible]	[illegible]	
LINER						
TUBING						
OPEN HOLE			16	[illegible]	[illegible]	SHOTS/FT.
PERFORATIONS						
PERFORATIONS						
PERFORATIONS						

PREVIOUS TREATMENT: DATE _____ TYPE _____ MATERIALS _____

TREATMENT INSTRUCTIONS: TREAT THRU TUBING ☐ ANNULUS ☐ CASING ☐ TUBING/ANNULUS ☐ HYDRAULIC HORSEPOWER ORDERED _____

[illegible]

CUSTOMER OR HIS AGENT WARRANTS THE WELL IS IN PROPER CONDITION TO RECEIVE THE PRODUCTS, SUPPLIES, MATERIALS, AND SERVICES

THIS CONTRACT MUST BE SIGNED BEFORE WORK IS COMMENCED

As consideration, the above-named Customer agrees:

(a) To pay Halliburton in accord with the rates and terms stated in Halliburton's current price lists.

(b) Halliburton shall not be responsible for and Customer shall secure Halliburton against any liability for damage to property of Customer and of the well owner (if different from Customer), unless caused by the willful misconduct or gross negligence of Halliburton, this provision applying to but not limited to subsurface damage and surface damage arising from subsurface damage.

(c) Customer shall be responsible for and secure Halliburton against any liability for reservoir loss or damage, or property damage resulting from subsurface pressure, losing control of the well and/or a well blowout, unless such loss or damage is caused by the willful misconduct or gross negligence of Halliburton.

(d) Customer shall be responsible for and secure Halliburton against any and all liability of whatsoever nature for damages as a result of subsurface trespass, or an action in the nature thereof, arising from a service operation performed by Halliburton hereunder.

(e) Customer shall be responsible for and secure Halliburton against any liability for injury to or death of persons, other than employees of Halliburton, or damage to property (including, but not limited to, injury to the well), or any damages whatsoever, irrespective of cause, growing out of or in any way connected with the use of radioactive material in the well hole, unless such damage shall be caused by the willful misconduct or gross negligence of Halliburton.

(f) Halliburton makes no guarantee of the effectiveness of the products, supplies or materials, nor of the results of any treatment or service.

(g) Customer shall, at its risk and expense, attempt to recover any Halliburton equipment, tools or instruments which are lost in the well and if such equipment, tools or instruments are not recovered, Customer shall pay Halliburton its replacement cost unless such loss is due to the sole negligence of Halliburton. If Halliburton equipment, tools or instruments are damaged in the well, Customer shall pay Halliburton the lesser of its replacement cost or the cost of repairs unless such damage is caused by the sole negligence of Halliburton. In the case of equipment, tools or instruments for marine operations, Customer shall, in addition to the foregoing, be fully responsible for loss of or damage to any of Halliburton's equipment, tools or instruments which occurs at any time after delivery to Customer at the landing until returned to the landing, unless such loss or damage is caused by the sole negligence of Halliburton.

(h) Because of the uncertainty of variable well conditions and the necessity of relying on facts and supporting services furnished by others, Halliburton is unable to guarantee the accuracy of any chart interpretation, research analysis, job recommendation or other data furnished by Halliburton. Halliburton personnel will use their best efforts in gathering such information and their best judgment in interpreting it, but Customer agrees that Halliburton shall not be responsible for any damages arising from the use of such information except where due to Halliburton's gross negligence or willful misconduct in the preparation or furnishing of it.

(i) Halliburton warrants only title to the products, supplies and materials and that the same are free from defects in workmanship and materials. THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTIABILITY, FITNESS OR OTHERWISE WHICH EXTEND BEYOND THOSE STATED IN THE IMMEDIATELY PRECEDING SENTENCE. Halliburton's liability and Customer's exclusive remedy in any cause of action (whether in contract, tort, breach of warranty or otherwise) arising out of the sale or use of any products, supplies or materials is expressly limited to the replacement of such products, supplies or materials on their return to Halliburton or, at Halliburton's option, to the allowance to the Customer of credit for the cost of such items. In no event shall Halliburton be liable for special, incidental, indirect, punitive or consequential damages

(j) Invoices payable NET by the 20th of the following month after date of invoice. Upon Customer's default in payment of Customer's account by the last day of the month following the month in which the invoice is dated, Customer agrees to pay interest thereon after default at the highest lawful contract rate applicable but never to exceed 18% per annum. In the event it becomes necessary to employ an attorney to enforce collection of said account, Customer agrees to pay all collection costs and attorney fees in the amount of 20% of the amount of the unpaid account.

(k) This contract shall be governed by the law of the state where services are performed or equipment or materials are furnished.

(l) Halliburton shall not be bound by any changes or modifications in this contract, except where such change or modification is made in writing by a duly authorized executive officer of Halliburton.

RECEIVED
FEB 25 2000
Office of Enforcement
Compliance & Environmental
Justice

I HAVE READ AND UNDERSTAND THIS CONTRACT AND REPRESENT THAT I AM AUTHORIZED TO SIGN THE SAME AS CUSTOMER'S AGENT.

SIGNED [illegible] CUSTOMER

DATE [illegible]

TIME [illegible] A.M. / P.M.

We certify that the Fair Labor Standards Act of 1938, as amended, has been complied with in the production of goods and/or with respect to services furnished under this contract.

RETAIN

HALLIBURTON SERVICES

JOB LOG

WELL NO. [illegible] LEASE [illegible] TICKET NO. [illegible]

CUSTOMER [illegible] PAGE NO. [illegible]

JOB TYPE [illegible] DATE [illegible]

FORM 2013 R-2

CHART NO.	TIME	RATE (BPM)	VOLUME (BBL) (GAL)	PUMPS T	PUMPS C	PRESSURE (PSI) TUBING	PRESSURE (PSI) CASING	DESCRIPTION OF OPERATION AND MATERIALS
1	1400							[illegible]
1	1450							[illegible]
1	1530							[illegible]
	[illegible]							[illegible]
1	[illegible]							[illegible]
1	[illegible]	1.5	[illegible]					[illegible]
1	[illegible]	1	75					[illegible]
1	[illegible]							[illegible]
1	[illegible]							[illegible]

Thank you

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Compliance & Environmental
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HALLIBURTON SERVICES

JOB SUMMARY

FORM 2025

DIVISION

HALLIBURTON LOCATION GLENDIVE

BILLED ON TICKET NO.

WELL DATA

FIELD FORAN SEC. 22 TWP. 14N RNG. 57E COUNTY ROOSEVELT STATE MONT

FORMATION NAME _____ TYPE _____

FORMATION THICKNESS _____ FROM _____ TO _____

INITIAL PROD: OIL _____ BPD. WATER _____ BPD. GAS _____ MCFD

PRESENT PROD: OIL _____ BPD. WATER _____ BPD. GAS _____ MCFD

COMPLETION DATE _____ MUD TYPE _____ MUD WT. _____

PACKER TYPE _____ SET AT _____

BOTTOM HOLE TEMP. _____ PRESSURE _____

MISC. DATA _____ TOTAL DEPTH _____

	NEW USED	WEIGHT	SIZE	FROM	TO	MAXIMUM PSI ALLOWABLE
CASING	N	[illegible]	16"	KB	44	
LINER						
TUBING						
OPEN HOLE			26"	KB	44	SHOTS/FT.
PERFORATIONS						
PERFORATIONS						
PERFORATIONS						

TOOLS AND ACCESSORIES

TYPE AND SIZE	QTY.	MAKE
FLOAT COLLAR		
FLOAT SHOE		
GUIDE SHOE		
CENTRALIZERS		
BOTTOM PLUG		
TOP PLUG		
HEAD		
PACKER		
OTHER		

NO FLOAT EQUIPMENT

JOB DATA

CALLED OUT	ON LOCATION	JOB STARTED	JOB COMPLETED
DATE [illegible]	DATE [illegible]	DATE [illegible]	DATE [illegible]
TIME [illegible]	TIME [illegible]	TIME [illegible]	TIME [illegible]

PERSONNEL AND SERVICE UNITS

NAME	UNIT NO. & TYPE	LOCATION
B. LEHMAN	5510 F-U	GLENDIVE
D. KLEIN	4061-5591 KOM	"
B. McKINNEY	5660 LMK	"

MATERIALS

TREAT. FLUID _____ DENSITY _____ LB/GAL.°API

DISPL. FLUID _____ DENSITY _____ LB/GAL.°API

PROP. TYPE _____ SIZE _____ LB. _____

PROP. TYPE _____ SIZE _____ LB. _____

ACID TYPE _____ GAL. _____ % _____

ACID TYPE _____ GAL. _____ % _____

ACID TYPE _____ GAL. _____ % _____

SURFACTANT TYPE _____ GAL. _____ IN _____

NE AGENT TYPE _____ GAL. _____ IN _____

FLUID LOSS ADD. TYPE _____ GAL.-LB. _____ IN _____

GELLING AGENT TYPE _____ GAL.-LB. _____ IN _____

FRIC. RED. AGENT TYPE _____ GAL.-LB. _____ IN _____

BREAKER TYPE _____ GAL.-LB. _____ IN _____

BLOCKING AGENT TYPE _____ GAL.-LB. _____

PERFPAC BALLS TYPE _____ QTY. _____

OTHER _____

OTHER _____

DEPARTMENT CEMENT

DESCRIPTION OF JOB OCS CEMENT CONDUCTOR CASING

JOB DONE THRU: TUBING ☐ CASING ☑ ANNULUS ☐ TBG./ANN. ☐

CUSTOMER REPRESENTATIVE X [signature]

HALLIBURTON OPERATOR [signature]

COPIES REQUESTED _____

CEMENT DATA

STAGE	NUMBER OF SACKS	TYPE	API CLASS	BRAND	BULK SACKED	ADDITIVES	YIELD CU.FT./SK.	MIXED LBS./GAL.
1	270	1	G	[illegible]		2% CC w/2% [illegible]	1.15	[illegible]

SUMMARY

PRESSURES IN PSI

CIRCULATING _____ DISPLACEMENT _____

BREAKDOWN _____ MAXIMUM _____

AVERAGE _____ FRACTURE GRADIENT _____

SHUT-IN: INSTANT _____ 5-MIN. _____ 15-MIN. _____

HYDRAULIC HORSEPOWER

ORDERED _____ AVAILABLE _____ USED _____

AVERAGE RATES IN BPM

TREATING _____ DISPL. _____ OVERALL _____

CEMENT LEFT IN PIPE

FEET 10 REASON _____

VOLUMES

PRESLUSH: BBL.-GAL. _____ TYPE _____

LOAD & BKDN: BBL.-GAL. _____ PAD: BBL.-GAL. _____

TREATMENT: BBL.-GAL. _____ DISPL: BBL.-GAL. 7.5

CEMENT SLURRY: BBL.-GAL. [illegible]

TOTAL VOLUME: BBL.-GAL. _____

REMARKS

SEE [illegible]

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FEB 25 2013

Office of Enforcement Compliance & Environmental Justice

CUSTOMER

CUSTOMER [illegible]

LEASE [illegible]

WELL NO. [illegible]

JOB TYPE OCS CEMENT CONDUCTOR CASING

DATE 7-9-13

HALLIBURTON SERVICES
A Division of Halliburton Company
DUNCAN, OKLAHOMA 73536

BULK MATERIALS DELIVERY AND TICKET CONTINUATION

PAGE OF

FOR INVOICE AND TICKET NO. _____

DATE	CUSTOMER ORDER NO.	WELL NO. AND FARM	COUNTY	STATE
7-9-85				

CHARGE TO	OWNER	CONTRACTOR	No. B 396492
Mesa	Mesa		

MAILING ADDRESS	DELIVERED FROM	LOCATION CODE	PREPARED BY
	Glendive, Montana	55530	V. L. Hoffman

CITY & STATE	DELIVERED TO	TRUCK NO.	RECEIVED BY
	Location		

PRICE REFERENCE	SECONDARY REF. OR PART NO.	CODE L	CODE D	DESCRIPTION	UNITS 1 QTY.	UNITS 1 MEAS.	UNITS 2 QTY.	UNITS 2 MEAS.	UNIT PRICE	AMOUNT
504-043				Regular class "G" Cement	250	sx			7.66	1915 00
509-406				Cal. Chl. mixed 2% w-250 sx	5	sx			37.00	185 00
				Returned Mileage Charge — TOTAL WEIGHT — LOADED MILES — TON MILES						
				SERVICE CHARGE ON MATERIALS RETURNED — CU. FEET						
500-207				SERVICE CHARGE — CU. FEET			260		.95	247 00
500-318				Mileage Charge — TOTAL WEIGHT 23,900 — LOADED MILES — TON MILES					.75	
No. B 396492				CARRY FORWARD TO INVOICE — SUB-TOTAL						

FORM 1911-R5 REV. 9-81

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Justice

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HALLIBURTON SERVICES
A DIVISION OF HALLIBURTON COMPANY

FORM 1906 R9

REMIT TO
P.O. BOX 84737
DALLAS, TEXAS 75284
DIRECT ANY CORRESPONDENCE TO
P.O. DRAWER 1431
DUNCAN, OKLAHOMA 73536

STATE

NO. 251139-9

PAGE 1 OF 2 PAGES

WELL NO. – FARM OR LEASE NAME	COUNTY	STATE	CITY/OFFSHORE LOCATION	DATE
1-22 BEIRE	ROOSEVELT	MT		7-12-

CHARGE TO	OWNER	TICKET TYPE (CHECK ONE)	NITROGEN JOB
MESA PETROLEUM	SAME	SERVICE [X] SALES [ ]	YES [ ] NO [X]

ADDRESS	CONTRACTOR	LOCATION	CODE
BOX 2009	WISCO	1 GLENDIVE	5553.

CITY, STATE, ZIP	SHIPPED VIA	FREIGHT CHARGES	LOCATION	CODE
AMARILLO, TX. 79189	VEHICLE	PPD [ ] COLLECT [ ]	2	

DELIVERED TO	LOCATION	CODE
LOCATION	3	

ORDER NO.	REFERRAL LOCATION

WELL TYPE	WELL CATEGORY	WELL PERMIT NO.
01 OIL	02 WORKOVER	

TYPE AND PURPOSE OF JOB	
035 CMT PROD. CSG.	B-396497

DUNCAN USE ONLY

22-33N-51E

JUL 2 1985
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OIL & GAS CONS. COMM.
STATE OF MONT.
BILLINGS

As consideration, the above-named Customer agrees and pay Halliburton to account upon the rates and terms stated in Halliburton's current price lists. Invoices payable NET by the 20th of the following month after date of invoice. Upon Customer's default in payment of Customer's account by the last day of the month following the month in which the invoice is dated, Customer agrees to pay interest thereon after default at the highest lawful contract rate applicable but never to exceed 18% per annum. In the event it becomes necessary to employ an attorney to enforce collection of said account, Customer agrees to pay all collection costs and attorney fees in the amount of 20% of the amount of the unpaid account. These terms and conditions shall be governed by the law of the state where services are performed or equipment or materials are furnished.

Halliburton warrants only title to the products, supplies and materials and that the same are free from defects in workmanship and materials. THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE WHICH EXTEND BEYOND THOSE STATED IN THE IMMEDIATE PRECEDING SENTENCE. Halliburton's liability and customer's exclusive remedy in any cause of action (whether in contract, tort, product liability, breach of warranty or otherwise) arising out of the sale or use of any products, supplies or materials is expressly limited to the replacement of such products, supplies or materials or their return to Halliburton or, at Halliburton's option, to the allowance to the customer of credit for the cost of such items. In no event shall Halliburton be liable for special, incidental, indirect, punitive or consequential damages.

PRICE REFERENCE	SECONDARY REF OR PART NO.	L.D.C.	ACCOUNT	DESCRIPTION	UNITS 1 QTY	UNITS 1 MEAS	UNITS 2 QTY	UNITS 2 MEAS
000-117				MILEAGE	26	mi		
007-013				Pump CHARGE	693	FT		
12A	~~825.205~~			5½ GUIDE SHOE	1	EA		
4A	820.4054			" S.S.F.C.	1	"		
40	807.91006			5-3 CENT	2	EA		
350	890.10802			WELD-A	1	EA		
030-015				5½ TOP PLUG	1	EA		
65	807.6056			5½ EZ-LOK	1	EA		

AS PER ATTACHED BULK MATERIAL DELIVERY TICKET NO. B-396497

WAS JOB SATISFACTORILY COMPLETED? _____

WAS OPERATION OF EQUIPMENT SATISFACTORY? _____

WAS PERFORMANCE OF PERSONNEL SATISFACTORY? _____

X John James
CUSTOMER OR HIS AGENT (PLEASE PRINT)

X [signature]
CUSTOMER OR HIS AGENT (SIGNATURE)

WE CERTIFY THAT THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED HAS BEEN COMPLIED

TAX REFERENCES

Larry S Kirkegard
HALLIBURTON OPERATOR

HALLIBURTON SERVICES

JOB SUMMARY

FORM 2023

DIVISION [illegible]

HALLIBURTON LOCATION [illegible]

BILLED ON TICKET NO. [illegible]

WELL DATA

FIELD _____ SEC. 7 TWP. [illegible] RNG. 16 COUNTY [illegible] STATE [illegible]

FORMATION NAME _____ TYPE _____

FORMATION THICKNESS _____ FROM _____ TO _____

INITIAL PROD: OIL _____ BPD. WATER _____ BPD. GAS _____ MCFD

PRESENT PROD: OIL _____ BPD. WATER _____ BPD. GAS _____ MCFD

COMPLETION DATE _____ MUD TYPE _____ MUD WT. _____

PACKER TYPE _____ SET AT _____

BOTTOM HOLE TEMP. _____ PRESSURE _____

MISC. DATA _____ TOTAL DEPTH _____

	NEW USED	WEIGHT	SIZE	FROM	TO	MAXIMUM PSI ALLOWABLE
CASING	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
LINER						
TUBING						
OPEN HOLE			7 7/8	[illegible]	[illegible]	SHOTS/FT.
PERFORATIONS						
PERFORATIONS						
PERFORATIONS						

JOB DATA

CALLED OUT	ON LOCATION	JOB STARTED	JOB COMPLETED
DATE [illegible]	DATE [illegible]	DATE [illegible]	DATE [illegible]
TIME [illegible]	TIME [illegible]	TIME [illegible]	TIME 0133

TOOLS AND ACCESSORIES

TYPE AND SIZE	QTY.	MAKE
FLOAT COLLAR [illegible]	1	[illegible]
FLOAT SHOE		
GUIDE SHOE [illegible]		
CENTRALIZERS [illegible]	7	"
BOTTOM PLUG		
TOP PLUG [illegible]	1	[illegible]
HEAD [illegible]	1	"
PACKER [illegible]	1	"
OTHER [illegible]	1	"

PERSONNEL AND SERVICE UNITS

NAME	UNIT NO. & TYPE	LOCATION
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	"
[illegible]	[illegible]	"

MATERIALS

TREAT. FLUID _____ DENSITY _____ LB/GAL.-°API

DISPL. FLUID _____ DENSITY _____ LB/GAL.-°API

PROP. TYPE _____ SIZE _____ LB. _____

PROP. TYPE _____ SIZE _____ LB. _____

ACID TYPE _____ GAL. _____ % _____

ACID TYPE _____ GAL. _____ % _____

ACID TYPE _____ GAL. _____ % _____

SURFACTANT TYPE _____ GAL. _____ IN _____

NE AGENT TYPE _____ GAL. _____ IN _____

FLUID LOSS ADD. TYPE _____ GAL.-LB. _____ IN _____

GELLING AGENT TYPE _____ GAL.-LB. _____ IN _____

FRIC. RED. AGENT TYPE _____ GAL.-LB. _____ IN _____

BREAKER TYPE _____ GAL.-LB. _____ IN _____

BLOCKING AGENT TYPE _____ GAL.-LB. _____

PERFPAC BALLS TYPE _____ QTY. _____

OTHER _____

OTHER _____

DEPARTMENT [illegible]

DESCRIPTION OF JOB [illegible]

JOB DONE THRU: TUBING ☐ CASING ☐ ANNULUS ☐ TBG./ANN. ☐

CUSTOMER REPRESENTATIVE X [illegible]

HALLIBURTON OPERATOR [illegible] COPIES REQUESTED _____

CEMENT DATA

STAGE	NUMBER OF SACKS	TYPE	API CLASS	BRAND	BULK SACKED	ADDITIVES	YIELD CU.FT./SK.	MIXED LBS./GAL.
[illegible]	[illegible]	[illegible]			[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]					[illegible]		

PRESSURES IN PSI

CIRCULATING _____ DISPLACEMENT _____

BREAKDOWN _____ MAXIMUM _____

AVERAGE _____ FRACTURE GRADIENT _____

SHUT-IN: INSTANT _____ 5-MIN. _____ 15-MIN. _____

HYDRAULIC HORSEPOWER

ORDERED _____ AVAILABLE _____ USED _____

AVERAGE RATES IN BPM

TREATING _____ DISPL. _____ OVERALL _____

CEMENT LEFT IN PIPE

FEET _____ REASON _____

SUMMARY

VOLUMES

PREFLUSH: BBL.-GAL. _____ TYPE _____

LOAD & BKDN: BBL.-GAL. _____ PAD: BBL.-GAL. _____

TREATMENT: BBL.-GAL. _____ DISPL: BBL.-GAL. _____

CEMENT SLURRY: BBL.-GAL. _____

TOTAL VOLUME: BBL.-GAL. _____

REMARKS

[illegible]

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Office of Enforcement Compliance & Environmental

RETAIN

CUSTOMER _____ LEASE _____ WELL NO. _____ JOB TYPE _____ DATE _____

HALLIBURTON SERVICES

A Division of Halliburton Company
DUNCAN, OKLAHOMA 73536

FORM 1908 R-4

WORK ORDER CONTRACT AND PRE-TREATMENT DATA

ATTACH TO INVOICE & TICKET NO. 251133

DISTRICT WILLISTON DATE 7-12-83

TO: HALLIBURTON SERVICES YOU ARE HEREBY REQUESTED TO FURNISH EQUIPMENT AND SERVICEMEN TO DELIVER AND OPERATE THE SAME AS AN INDEPENDENT CONTRACTOR TO: MESA PET. (CUSTOMER) AND DELIVER AND SELL PRODUCTS, SUPPLIES, AND MATERIALS FOR THE PURPOSE OF SERVICING

WELL NO. 1 LEASE BIEAE SEC. 2 TWP. 23N RANGE 51E

FIELD _____ COUNTY BOSEMAN STATE MT OWNED BY SAME

THE FOLLOWING INFORMATION WAS FURNISHED BY THE CUSTOMER OR HIS AGENT

FORMATION NAME _____ TYPE _____

FORMATION THICKNESS _____ FROM _____ TO _____

PACKER: TYPE _____ SET AT _____

TOTAL DEPTH _____ MUD WEIGHT _____

BORE HOLE _____

INITIAL PROD: OIL _____ BPD, H_2O _____ BPD, GAS _____ MCF

PRESENT PROD: OIL _____ BPD, H_2O _____ BPD, GAS _____ MCF

	NEW USED	WEIGHT	SIZE	FROM	TO	MAX. ALLOW. P.S.I.
CASING		4.	5½	KB	403.3	
LINER						
TUBING						
OPEN HOLE			7⅞	KB	700	SHOTS/FT.
PERFORATIONS						
PERFORATIONS						
PERFORATIONS						

PREVIOUS TREATMENT: DATE _____ TYPE _____ MATERIALS _____

TREATMENT INSTRUCTIONS: TREAT THRU TUBING ☐ ANNULUS ☐ CASING ☒ TUBING/ANNULUS ☐ HYDRAULIC HORSEPOWER ORDERED _____

CEMENT 5½ CASING

CUSTOMER OR HIS AGENT WARRANTS THE WELL IS IN PROPER CONDITION TO RECEIVE THE PRODUCTS, SUPPLIES, MATERIALS, AND SERVICES

THIS CONTRACT MUST BE SIGNED BEFORE WORK IS COMMENCED

As consideration, the above-named Customer agrees:

(a) To pay Halliburton in accord with the rates and terms stated in Halliburton's current price lists

(b) Halliburton shall not be responsible for and Customer shall secure Halliburton against any liability for damage to property of Customer and of the well owner (if different from Customer), unless caused by the willful misconduct or gross negligence of Halliburton, this provision applying to but not limited to subsurface damage and surface damage arising from subsurface damage.

(c) Customer shall be responsible for and secure Halliburton against any liability for reservoir loss or damage, or property damage resulting from subsurface pressure, losing control of the well and/or a well blowout, unless such loss or damage is caused by the willful misconduct or gross negligence of Halliburton.

(d) Customer shall be responsible for and secure Halliburton against any and all liability of whatsoever nature for damages as a result of subsurface trespass, or an action in the nature thereof, arising from a service operation performed by Halliburton hereunder.

(e) Customer shall be responsible for and secure Halliburton against any liability for injury to or death of persons, other than employees of Halliburton, or damage to property (including, but not limited to, injury to the well), or any damages whatsoever, irrespective of cause, growing out of or in any way connected with the use of radioactive material in the well hole, unless such damage shall be caused by the willful misconduct or gross negligence of Halliburton.

(f) Halliburton makes no guarantee of the effectiveness of the products, supplies or materials, nor of the results of any treatment or service.

(g) Customer shall, at its risk and expense, attempt to recover any Halliburton equipment, tools or instruments which are lost in the well and if such equipment, tools or instruments are not recovered, Customer shall pay Halliburton its replacement cost unless such loss is due to the sole negligence of Halliburton. If Halliburton equipment, tools or instruments are damaged in the well, Customer shall pay Halliburton the lesser of its replacement cost or the cost of repairs unless such damage is caused by the sole negligence of Halliburton. In the case of equipment, tools or instruments for marine operations, Customer shall, in addition to the foregoing, be fully responsible for loss of or damage to any of Halliburton's equipment, tools or instruments which occurs at any time after delivery to Customer at the landing until returned to the landing, unless such loss or damage is caused by the sole negligence of Halliburton.

(h) Because of the uncertainty of variable well conditions and the necessity of relying on facts and supporting services furnished by others, Halliburton is unable to guarantee the accuracy of any chart interpretation, research analysis, job recommendation or other data furnished by Halliburton. Halliburton personnel will use their best efforts in gathering such information and their best judgment in interpreting it, but Customer agrees that Halliburton shall not be responsible for any damages arising from the use of such information except where due to Halliburton's gross negligence or willful misconduct in the preparation or furnishing of it.

(i) Halliburton warrants only title to the products, supplies and materials and that the same are free from defects in workmanship and materials. THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTIABILITY, FITNESS OR OTHERWISE WHICH EXTEND BEYOND THOSE STATED IN THE IMMEDIATELY PRECEDING SENTENCE. Halliburton's liability and Customer's exclusive remedy in any cause of action (whether in contract, tort, breach of warranty or otherwise) arising out of the sale or use of any products, supplies or materials is expressly limited to the replacement of such products, supplies or materials on their return to Halliburton or, at Halliburton's option, to the allowance to the Customer of credit for the cost of such items. In no event shall Halliburton be liable for special, incidental, indirect, punitive or consequential damages.

(j) Invoices payable NET by the 20th of the following month after date of invoice. Upon Customer's default in payment of Customer's account by the last day of the month following the month in which the invoice is dated, Customer agrees to pay interest thereon after default at the highest lawful contract rate applicable but never to exceed 18% per annum. In the event it becomes necessary to employ an attorney to enforce collection of paid account, Customer agrees to pay all collection costs and attorney fees in the amount of 20% of the amount of the unpaid account.

(k) This contract shall be governed by the law of the state where services are performed or equipment or materials are furnished.

(l) Halliburton shall not be bound by any changes or modifications in this contract, except where such change or modification is made in writing by a duly authorized executive officer of Halliburton.

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Compliance & Environmental
Justice

We certify that the Fair Labor Standards Act of 1938, as amended, has been complied with in the production of goods and/or with respect to services furnished under this contract.

I HAVE READ AND UNDERSTAND THIS CONTRACT AND REPRESENT THAT I AM AUTHORIZED TO SIGN THE SAME AS CUSTOMER'S AGENT

SIGNED _____ CUSTOMER

DATE 7-12-83

TIME _____ A.M. P.M.

CUSTOMER

HALLIBURTON SERVICES

JOB LOG

FORM 2013 R-2

WELL NO. 1-22 LEASE DIEKE TICKET NO. 257757

CUSTOMER MESA PET. PAGE NO.

JOB TYPE SINGLE STAGE DATE 7-12-85

CHART NO.	TIME	RATE (BPM)	VOLUME (BBL) (GAL)	PUMPS T	PUMPS C	PRESSURE (PSI) TUBING	PRESSURE (PSI) CASING	DESCRIPTION OF OPERATION AND MATERIALS
	2452	2	10				200	FRESH WATER FLUSH
	2457	2.4	61.5				250	MIX CMT 300 SKS.
	0122							DROP PLUG
	0124	2	15				500	FRESH WATER DISPLACE
	0132	2					1200	BUMP PLUG
	0133							BLED OFF FLOAT HELD

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FEB 25 [illegible]
Office of Enforcement
Compliance & Environmental
Justice

HALLIBURTON SERVICES
A Division of Halliburton Company
DUNCAN, OKLAHOMA 73536

BULK MATERIALS DELIVERY AND TICKET CONTINUATION

FOR ~~INVOICE AND~~ TICKET NO.

DATE	CUSTOMER ORDER NO.	WELL NO. AND FARM	COUNTY	STATE
7-12-85		1-22 BIERE	ROOSEVELT	MT

CHARGE TO	OWNER	CONTRACTOR	No.
Mesa Pet.		WISCO	B 396497

MAILING ADDRESS	DELIVERED FROM	LOCATION CODE	PREPARED BY
	Glendive, Montana	55530	J.L. Charles

CITY & STATE	DELIVERED TO	TRUCK NO.	RECEIVED BY
	Location		

PRICE REFERENCE	SECONDARY REF. OR PART NO.	CODE L	CODE D	DESCRIPTION	UNITS 1 QTY.	UNITS 1 MEAS.	UNITS 2 QTY.	UNITS 2 MEAS.	UNIT PRICE	AMOUNT
504-043				Class "G" Cement	150	sx			7.66	1149 00
509-406				Calcium Chloride (not mixed)	1	sk			37.00	37 00
500-314				Delivery Charge for 150 sx class "G" Cement w/2% CaCl. paid for on B396492 but notused or returned for credit. 14,340 lbs. 917.76 ton Miles @					.75	688 32
				Returned Mileage Charge / TOTAL WEIGHT / LOADED MILES / TON MILES						
				SERVICE CHARGE ON MATERIALS RETURNED / CU. FEET						
500-207				SERVICE CHARGE / CU. FEET			150		.95	142 50
500-314				Mileage Charge / TOTAL WEIGHT 14,180 / LOADED MILES 128 / TON MILES 907.52					.75	680 64
No. B 396497				CARRY FORWARD TO INVOICE / SUB-TOTAL						2677 46

THIS IS NOT AN INVOICE

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FEB 25 2003
Office of Enforcement
Compliance & Environmental
Justice

FORM 1911-R5 REV. 9-81

CUSTOMER

HALLIBURTON SERVICES
A Division of Halliburton Company
DUNCAN, OKLAHOMA 73536

FORM 1908 R-4

WORK ORDER CONTRACT AND PRE-TREATMENT DATA

ATTACH TO INVOICE & TICKET NO. [illegible]

DISTRICT [illegible] DATE [illegible]

TO: HALLIBURTON SERVICES YOU ARE HEREBY REQUESTED TO FURNISH EQUIPMENT AND SERVICEMEN TO DELIVER AND OPERATE THE SAME AS AN INDEPENDENT CONTRACTOR TO: [illegible] (CUSTOMER) AND DELIVER AND SELL PRODUCTS, SUPPLIES, AND MATERIALS FOR THE PURPOSE OF SERVICING

WELL NO. [illegible] LEASE [illegible] SEC. [illegible] TWP. [illegible] RANGE [illegible]

FIELD [illegible] COUNTY [illegible] STATE [illegible] OWNED BY [illegible]

THE FOLLOWING INFORMATION WAS FURNISHED BY THE CUSTOMER OR HIS AGENT

FORMATION NAME _____ TYPE _____

FORMATION THICKNESS _____ FROM _____ TO _____

PACKER: TYPE [illegible] SET AT [illegible]

TOTAL DEPTH _____ MUD WEIGHT _____

BORE HOLE _____

INITIAL PROD: OIL _____ BPD, H_2O _____ BPD, GAS _____ MCF

PRESENT PROD: OIL _____ BPD, H_2O _____ BPD, GAS _____ MCF

	NEW USED	WEIGHT	SIZE	FROM	TO	MAX. ALLOW. P.S.I.
CASING	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
LINER						
TUBING	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
OPEN HOLE			[illegible]	[illegible]	[illegible]	SHOTS/FT.
PERFORATIONS						
PERFORATIONS						
PERFORATIONS						

PREVIOUS TREATMENT: DATE _____ TYPE _____ MATERIALS _____

TREATMENT INSTRUCTIONS: TREAT THRU TUBING ☐ ANNULUS ☐ CASING ☐ TUBING/ANNULUS ☒ HYDRAULIC HORSEPOWER ORDERED _____

[illegible]

CUSTOMER OR HIS AGENT WARRANTS THE WELL IS IN PROPER CONDITION TO RECEIVE THE PRODUCTS, SUPPLIES, MATERIALS, AND SERVICES

THIS CONTRACT MUST BE SIGNED BEFORE WORK IS COMMENCED

As consideration, the above-named Customer agrees:

(a) To pay Halliburton in accord with the rates and terms stated in Halliburton's current price lists.

(b) Halliburton shall not be responsible for and Customer shall secure Halliburton against any liability for damage to property of Customer and of the well owner (if different from Customer), unless caused by the willful misconduct or gross negligence of Halliburton, this provision applying to but not limited to subsurface damage and surface damage arising from subsurface damage.

(c) Customer shall be responsible for and secure Halliburton against any liability for reservoir loss or damage, or property damage resulting from subsurface pressure, losing control of the well and/or a well blowout, unless such loss or damage is caused by the willful misconduct or gross negligence of Halliburton.

(d) Customer shall be responsible for and secure Halliburton against any and all liability of whatsoever nature for damages as a result of subsurface trespass, or an action in the nature thereof, arising from a service operation performed by Halliburton hereunder.

(e) Customer shall be responsible for and secure Halliburton against any liability for injury to or death of persons, other than employees of Halliburton, or damage to property (including, but not limited to, injury to the well), or any damages whatsoever, irrespective of cause, growing out of or in any way connected with the use of radioactive material in the well hole, unless such damage shall be caused by the willful misconduct or gross negligence of Halliburton.

(f) Halliburton makes no guarantee of the effectiveness of the products, supplies or materials, nor of the results of any treatment or service.

(g) Customer shall, at its risk and expense, attempt to recover any Halliburton equipment, tools or instruments which are lost in the well and if such equipment, tools or instruments are not recovered, Customer shall pay Halliburton its replacement cost unless such loss is due to the sole negligence of Halliburton. If Halliburton equipment, tools or instruments are damaged in the well, Customer shall pay Halliburton the lesser of its replacement cost or the cost of repairs unless such damage is caused by the sole negligence of Halliburton. In the case of equipment, tools or instruments for marine operations, Customer shall, in addition to the foregoing, be fully responsible for loss of or damage to any of Halliburton's equipment, tools or instruments which occurs at any time after delivery to Customer at the landing until returned to the landing unless such loss or damage is caused by the sole negligence of Halliburton.

(h) Because of the uncertainty of variable well conditions and the necessity of relying on facts and supporting services furnished by others, Halliburton is unable to guarantee the accuracy of any chart interpretation, research analysis, job recommendation or other data furnished by Halliburton. Halliburton personnel will use their best efforts in gathering such information and their best judgment in interpreting it, but Customer agrees that Halliburton shall not be responsible for any damages arising from the use of such information except where due to Halliburton's gross negligence or willful misconduct in the preparation or furnishing thereof.

(i) Halliburton warrants only title to the products, supplies and materials and that the same are free from defects in workmanship and materials. THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTIABILITY, FITNESS OR OTHERWISE WHICH EXTEND BEYOND THOSE STATED IN THE IMMEDIATELY PRECEDING SENTENCE. Halliburton's liability and Customer's exclusive remedy in any cause of action (whether in contract, tort, strict liability or otherwise) arising out of the sale or use of any products, supplies or materials is expressly limited to the replacement of such products, supplies or materials on their return to Halliburton or, at Halliburton's option, to the allowance to the Customer of credit for the cost of such items. In no event shall Halliburton be liable for special, incidental, indirect, punitive or consequential damages.

(j) Invoices payable NET by the 20th of the following month after date of invoice. Upon Customer's default in payment of Customer's account by the last day of the month following the month in which the invoice is dated, Customer agrees to pay interest thereon after default at the highest lawful contract rate applicable but never to exceed 18% per annum. In the event it becomes necessary to employ an attorney to enforce collection of said account, Customer agrees to pay all collection costs and attorney fees in the amount of 20% of the amount of the unpaid account.

(k) This contract shall be governed by the law of the state where services are performed or equipment or materials are furnished.

(l) Halliburton shall not be bound by any changes or modifications in this contract, except where such change or modification is made in writing by a duly authorized executive officer of Halliburton.

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Compliance & Environmental

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FEB 25 2000
Co. al

I HAVE READ AND UNDERSTAND THIS CONTRACT AND REPRESENT THAT I AM AUTHORIZED TO SIGN THE SAME AS CUSTOMER'S AGENT.

SIGNED _____ CUSTOMER

DATE _____

TIME _____ A.M. P.M.

We certify that the Fair Labor Standards Act of 1938, as amended, has been complied with in the production of goods and/or with respect to services furnished under this contract.

RETAIN

HALLIBURTON SERVICES
JOB SUMMARY

FORM 2025

HALLIBURTON DIVISION: Denver

HALLIBURTON LOCATION: Glendive

BILLED ON TICKET NO.: 251644

WELL DATA

FIELD: Poplar SEC. 22 TWP. 28N RNG. 51E COUNTY: Roosevelt STATE: Mont

FORMATION NAME _____ TYPE _____

FORMATION THICKNESS _____ FROM _____ TO _____

INITIAL PROD: OIL _____ BPD. WATER _____ BPD.GAS _____ MCFD

PRESENT PROD: OIL _____ BPD. WATER _____ BPD.GAS _____ MCFD

COMPLETION DATE _____ MUD TYPE _____ MUD WT. _____

PACKER TYPE: Baker SET AT ~~[illegible]~~ 686

BOTTOM HOLE TEMP. _____ PRESSURE _____

MISC. DATA _____ TOTAL DEPTH _____

	NEW USED	WEIGHT	SIZE	FROM	TO	MAXIMUM PSI ALLOWABLE
CASING	U	17	5½	[illegible]	700	
LINER						
TUBING	U	6.5	2⅞	RB	686	
OPEN HOLE			4.25	700	700	SHOTS/FT.
PERFORATIONS						
PERFORATIONS						
PERFORATIONS						

JOB DATA

CALLED OUT	ON LOCATION	JOB STARTED	JOB COMPLETED
DATE 7-14-[illegible]	DATE 7-14-[illegible]	DATE 7-14-[illegible]	DATE 7-15-[illegible]
TIME 1100	TIME 1430	TIME 2348	TIME 0236

TOOLS AND ACCESSORIES

TYPE AND SIZE	QTY.	MAKE
FLOAT COLLAR		
FLOAT SHOE		
GUIDE SHOE		
CENTRALIZERS		
BOTTOM PLUG		
TOP PLUG		
HEAD		
PACKER		
OTHER		

PERSONNEL AND SERVICE UNITS

NAME	UNIT NO. & TYPE	LOCATION
M Johnson	PO 25705	Glendive
R Harbor	RCM 3124-6[illegible]	"
D Farr	Bulk	

MATERIALS

TREAT. FLUID _____ DENSITY _____ LB/GAL.°API

DISPL. FLUID _____ DENSITY _____ LB/GAL.°API

PROP. TYPE _____ SIZE _____ LB. _____

PROP. TYPE _____ SIZE _____ LB. _____

ACID TYPE _____ GAL. _____ % _____

ACID TYPE _____ GAL. _____ % _____

ACID TYPE _____ GAL. _____ % _____

SURFACTANT TYPE _____ GAL. _____ IN _____

NE AGENT TYPE _____ GAL. _____ IN _____

FLUID LOSS ADD.TYPE _____ GAL.-LB. _____ IN _____

GELLING AGENT TYPE _____ GAL.-LB. _____ IN _____

FRIC. RED. AGENT TYPE _____ GAL.-LB. _____ IN _____

BREAKER TYPE _____ GAL.-LB. _____ IN _____

BLOCKING AGENT TYPE _____ GAL.-LB. _____

PERFPAC BALLS TYPE _____ QTY. _____

OTHER _____

OTHER _____

DEPARTMENT: Cent

DESCRIPTION OF JOB: Squeeze

JOB DONE THRU: TUBING ☐ CASING ☐ ANNULUS ☐ TBG./ANN. ☒

CUSTOMER REPRESENTATIVE X [signature]

HALLIBURTON OPERATOR: [signature] COPIES REQUESTED _____

CEMENT DATA

STAGE	NUMBER OF SACKS	TYPE	API CLASS	BRAND	BULK SACKED	ADDITIVES	YIELD CU.FT./SK.	MIXED LBS./GAL.
1	[illegible]	[illegible]	H	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]

SUMMARY

PRESSURES IN PSI

CIRCULATING _____ DISPLACEMENT _____

BREAKDOWN _____ MAXIMUM _____

AVERAGE _____ FRACTURE GRADIENT _____

SHUT-IN: INSTANT _____ 5-MIN. _____ 15-MIN. _____

HYDRAULIC HORSEPOWER

ORDERED _____ AVAILABLE _____ USED _____

AVERAGE RATES IN BPM

TREATING _____ DISPL. _____ OVERALL _____

CEMENT LEFT IN PIPE

FEET _____ REASON _____

VOLUMES

PRESLUSH: BBL.-GAL. _____ TYPE _____

LOAD & BKDN: BBL.-GAL. _____ PAD: BBL.-GAL. _____

TREATMENT: BBL.-GAL. _____ DISPL: BBL.-GAL. _____

CEMENT SLURRY: BBL.-GAL. _____

TOTAL VOLUME: BBL.-GAL. _____

REMARKS

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Compliance & Environmental
Justice

RETAIN

CUSTOMER: [illegible]

LEASE: [illegible]

WELL NO.: [illegible]

JOB TYPE: [illegible]

DATE: [illegible]

HALLIBURTON SERVICES

JOB LOG

WELL NO. 1-22 LEASE Dixie TICKET NO. 251 64X

CUSTOMER Mesa Pet PAGE NO. 1

JOB TYPE Squeeze DATE 7-14-85

FORM 2013 R-2

CHART NO.	TIME	RATE (BPM)	VOLUME (BBL) (GAL)	PUMPS T	PUMPS C	PRESSURE (PSI) TUBING	PRESSURE (PSI) CASING	DESCRIPTION OF OPERATION AND MATERIALS
	1430							On Loc Rig up
	2342	1	1			750		Press Test Lines
	2351	3	10			750		Est Inj Rate / Fresh Ahead
	0002	3	190			750		Mix & Pump H Cmt
	0117	3	65			750		Mix & Pump Thixotropic Cmt
	0142	3	7.3			750		Disp / Fresh H.O.
	0146	—	—			-		Sting out / Getting Flow back
	0185	—	—			—		Pull Tub out, Cmt Flow back
	0219	1	15			750		Pump down Csg with blind Rams
								closed cap of csg To Rct
	0230	—	—			0		Bleed Press & open blind Rams
								To clean Cmt out
	0235	—	—				—	Shut in Rams & csg
	0236	—	—				—	Job Completed
								[illegible]

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Office of Enforcement
Compliance & Environmental
Justice

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HALLIBURTON SERVICES
A Division of Halliburton Company
DUNCAN, OKLAHOMA 73536

BULK MATERIALS DELIVERY AND TICKET CONTINUATION

PAGE ____ OF ____
FOR INVOICE AND TICKET NO. ____

DATE	CUSTOMER ORDER NO.	WELL NO. AND FARM	COUNTY	STATE
7-14-85				

CHARGE TO	OWNER	CONTRACTOR	No. B 396500
Mesa Pet.			

MAILING ADDRESS	DELIVERED FROM	LOCATION CODE	PREPARED BY
	Glendive, Montana	55530	J.L. Charles
CITY & STATE	**DELIVERED TO**	**TRUCK NO.**	**RECEIVED BY**
	Location		

PRICE REFERENCE	SECONDARY REF. OR PART NO.	CODE L	CODE D	DESCRIPTION	UNITS 1 QTY.	UNITS 1 MEAS.	UNITS 2 QTY.	UNITS 2 MEAS.	UNIT PRICE	AMOUNT	
504-043				Class "H" Cement	1000	sx			7.66	7660	00
504-043				Class "H" Cement	200	sx			7.66	1532	00
508-127				Cal Seal mixed 10% w/200 sx	19	sx			16.20	307	80
507-277				Gel mixed 8% w/200 sx	200	cft	(15	sx)	.74	148	00
509-406				CaCl mixed 2% w/200 sx	4	sx			37.00	148	00
				Returned Mileage Charge / TOTAL WEIGHT / LOADED MILES / TON MILES							
				SERVICE CHARGE ON MATERIALS RETURNED / CU. FEET							
500-207				SERVICE CHARGE / CU. FEET			1233		.95	1171	35
500-314				Mileage Charge / 116,520 TOTAL WEIGHT / LOADED MILES / TON MILES					.75		
No. B 396500				CARRY FORWARD TO INVOICE / SUB-TOTAL							

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Office of Enforcement
Compliance & Environmental
Justice

FORM 1911-R5 REV. 9-81

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HALLIBURTON SERVICES
A DIVISION OF HALLIBURTON COMPANY

REMIT TO
P.O. BOX 84737
DALLAS, TEXAS 75284
DIRECT ANY CORRESPONDENCE TO
P.O. DRAWER 1431
DUNCAN, OKLAHOMA 73536

TICKET NO. 251716-3

FORM 1906 R9

PAGE 1 OF 2 PAGES

WELL NO. – FARM OR LEASE NAME	COUNTY	STATE	CITY/OFFSHORE LOCATION	DATE
1-32 Mesa Vista	Kent	Mt		2-13-8

CHARGE TO	OWNER	TICKET TYPE (CHECK ONE)	NITROGEN JOB
Mesa Petroleum	Same	SERVICE ☑ SALES ☐	YES ☐ NO ☒

ADDRESS	CONTRACTOR	LOCATION	CODE
Box 2009	Wiley	1 Kenline	55530

CITY, STATE, ZIP	SHIPPED VIA	FREIGHT CHARGES	LOCATION	CODE
Amarillo TX 79189	Hales	☐ PPD ☐ COLLECT	2	

DELIVERED TO	LOCATION	CODE
location	3	

ORDER NO.	REFERRAL LOCATION

WELL TYPE	WELL CATEGORY	WELL PERMIT NO.
09 Relief	01 Workover	

TYPE AND PURPOSE OF JOB	
100 Squeeze Abandon	B-396 304

DUNCAN USE ONLY

As consideration, the above-named Customer agrees to pay Halliburton in accord with the rates and terms stated in Halliburton's current price lists. Invoices payable NET by the 20th of the following month after date of invoice. Upon Customer's default in payment of Customer's account by the last day of the month following the month in which the invoice is dated, Customer agrees to pay interest thereon after default at the highest lawful contract rate applicable but never to exceed 18% per annum. In the event it becomes necessary to employ an attorney to enforce collection of said account, Customer agrees to pay all collection costs and attorney fees in the amount of 20% of the amount of the unpaid account. These terms and conditions shall be governed by the law of the state where services are performed or equipment or materials are furnished.

Halliburton warrants only title to the products, supplies and materials and that the same are free from defects in workmanship and materials. THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE WHICH EXTEND BEYOND THOSE STATED IN THE IMMEDIATE PRECEDING SENTENCE. Halliburton's liability and customer's exclusive remedy in any cause of action (whether in contract, tort, product liability, breach of warranty or otherwise) arising out of the sale or use of any products, supplies or materials is expressly limited to the replacement of such products, supplies or materials on their return to Halliburton or, at Halliburton's option, to the allowance to the customer of credit for the cost of such items. In no event shall Halliburton be liable for special, incidental, indirect, punitive or consequential damages.

PRICE REFERENCE	SECONDARY REF OR PART NO.	LOC.	ACCOUNT	DESCRIPTION	UNITS 1 QTY	UNITS 1 MEAS	UNITS 2 QTY	UNITS 2 MEAS	UNIT PRICE	AMOUNT
Long-117				MILEAGE	117	mi	2	unit	[illegible]	507.10
Pump-89	Rig-up			pump chg	300	FT				5656.00

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Office of Enforcement
Compliance & Environmental
Justice

AS PER ATTACHED BULK MATERIAL DELIVERY TICKET NO. B- 314 304 — [illegible]

WAS JOB SATISFACTORILY COMPLETED? _____

WAS OPERATION OF EQUIPMENT SATISFACTORY? _____

WAS PERFORMANCE OF PERSONNEL SATISFACTORY? _____

X [illegible]
CUSTOMER OR HIS AGENT (PLEASE PRINT)

X [illegible]
CUSTOMER OR HIS AGENT (SIGNATURE)

WE CERTIFY THAT THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED HAS BEEN COMPLIED WITH IN THE PRODUCTION OF GOODS AND OR WITH RESPECT TO SERVICES FURNISHED UNDER THIS CONTRACT.

TAX REFERENCES

		SUB TOTAL	5163.28
		TAX	
		TAX	
		TAX	

[illegible]

HALLIBURTON SERVICES

JOB SUMMARY

FORM 2025

DIVISION [illegible]

HALLIBURTON LOCATION Glendive

BILLED ON TICKET NO. 251716

WELL DATA

FIELD _____ SEC. 22 TWP. 28N RNG. 51E COUNTY Roosevelt STATE _____

FORMATION NAME _____ TYPE _____

FORMATION THICKNESS _____ FROM _____ TO _____

INITIAL PROD: OIL _____ BPD. WATER _____ BPD.GAS _____ MCFD

PRESENT PROD: OIL _____ BPD. WATER _____ BPD.GAS _____ MCFD

COMPLETION DATE _____ MUD TYPE _____ MUD WT. _____

PACKER TYPE _____ SET AT _____

BOTTOM HOLE TEMP. _____ PRESSURE _____

MISC. DATA _____ TOTAL DEPTH _____

	NEW USED	WEIGHT	SIZE	FROM	TO	MAXIMUM PSI ALLOWABLE
CASING	4	17.60	5 1/2	KB	700	
LINER						
TUBING						
OPEN HOLE			4 1/4	700	900	SHOTS/FT.
PERFORATIONS						
PERFORATIONS						
PERFORATIONS						

JOB DATA

CALLED OUT	ON LOCATION	JOB STARTED	JOB COMPLETED
DATE 7-15	DATE 7-15	DATE 7-16	DATE 7-16
TIME 1800	TIME 2200	TIME 0024	TIME 0100

TOOLS AND ACCESSORIES

TYPE AND SIZE	QTY.	MAKE
FLOAT COLLAR		
FLOAT SHOE		
GUIDE SHOE		
CENTRALIZERS		
BOTTOM PLUG		
TOP PLUG	24	
HEAD		
PACKER		
OTHER		

PERSONNEL AND SERVICE UNITS

NAME	UNIT NO. & TYPE	LOCATION
G. Scarphelt	35703	Glendive
D. Turner	2331-2374	"
B. Zinda	1146	"
N. Ford	Tonka	"

MATERIALS

TREAT. FLUID _____ DENSITY _____ LB/GAL.°API

DISPL. FLUID _____ DENSITY _____ LB/GAL.°API

PROP. TYPE _____ SIZE _____ LB. _____

PROP. TYPE _____ SIZE _____ LB. _____

ACID TYPE _____ GAL. _____ % _____

ACID TYPE _____ GAL. _____ % _____

ACID TYPE _____ GAL. _____ % _____

SURFACTANT TYPE _____ GAL. _____ IN _____

NE AGENT TYPE _____ GAL. _____ IN _____

FLUID LOSS ADD. TYPE _____ GAL.-LB. _____ IN _____

GELLING AGENT TYPE _____ GAL.-LB. _____ IN _____

FRIC. RED. AGENT TYPE _____ GAL.-LB. _____ IN _____

BREAKER TYPE _____ GAL.-LB. _____ IN _____

BLOCKING AGENT TYPE _____ GAL.-LB. _____

PERFPAC BALLS TYPE _____ QTY. _____

OTHER _____

OTHER Flocek 1000gal

DEPARTMENT Cmt

DESCRIPTION OF JOB Squeeze

JOB DONE THRU: TUBING ☐ CASING ☒ ANNULUS ☐ TBG./ANN. ☐

CUSTOMER REPRESENTATIVE X [signature]

HALLIBURTON OPERATOR G. W. Scarphelt COPIES REQUESTED _____

CEMENT DATA

STAGE	NUMBER OF SACKS	TYPE	API CLASS	BRAND	BULK SACKED	ADDITIVES	YIELD CU.FT./SK.	MIXED LBS./GAL.
	300		G			NEAT	1.15	15.8

PRESSURES IN PSI

CIRCULATING _____ DISPLACEMENT _____

BREAKDOWN _____ MAXIMUM _____

AVERAGE _____ FRACTURE GRADIENT _____

SHUT-IN: INSTANT _____ 5-MIN. _____ 15-MIN. _____

HYDRAULIC HORSEPOWER

ORDERED _____ AVAILABLE _____ USED _____

AVERAGE RATES IN BPM

TREATING _____ DISPL. _____ OVERALL _____

CEMENT LEFT IN PIPE

FEET _____ REASON _____

SUMMARY

VOLUMES

PRESLUSH: BBL.-GAL. _____ TYPE _____

LOAD & BKDN: BBL.-GAL. _____ PAD: BBL.-GAL. _____

TREATMENT: BBL.-GAL. _____ DISPL: BBL.-GAL. 17.5

CEMENT SLURRY: BBL.-GAL. 62

TOTAL VOLUME: BBL.-GAL. _____

REMARKS

See Job Log

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Office of Enforcement
Compliance & Environmental
Justice

CUSTOMER

CUSTOMER Mesa Petroleum

LEASE Mesa [illegible]

WELL NO. _____

JOB TYPE [illegible]

DATE _____

HALLIBURTON SERVICES

JOB LOG.

FORM 2013 R-2

WELL NO. [illegible] LEASE [illegible] TICKET NO. [illegible]

CUSTOMER [illegible] PAGE NO.

JOB TYPE [illegible] DATE [illegible]

CHART NO.	TIME	RATE (BPM)	VOLUME (BBL) (GAL)	PUMPS T	PUMPS C	PRESSURE (PSI) TUBING	PRESSURE (PSI) CASING	DESCRIPTION OF OPERATION AND MATERIALS
7/15	[illegible]							[illegible] Rig up
	[illegible]						100	[illegible]
	0025	12	[illegible]				1000	Esting [illegible] w/Fresh
	0027	8	24				750	pump [illegible]
	0030	9	[illegible]				600	pump out
	0040	12	12.5				1000	[illegible] w Fresh
	0042						500	Shut In
								Job Complete
								Frank Gould

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FEB 25 [illegible]

Office of Enforcement
Compliance & Environmental
Justice

RETAIN

HALLIBURTON SERVICES

A Division of Halliburton Company
DUNCAN, OKLAHOMA 73536

FORM 1908 R-4

WORK ORDER CONTRACT AND PRE-TREATMENT DATA

ATTACH TO INVOICE & TICKET NO. 251716

DISTRICT Williston

DATE

TO: HALLIBURTON SERVICES YOU ARE HEREBY REQUESTED TO FURNISH EQUIPMENT AND SERVICEMEN TO DELIVER AND OPERATE THE SAME AS AN INDEPENDENT CONTRACTOR TO: Mesa Petroleum (CUSTOMER) AND DELIVER AND SELL PRODUCTS, SUPPLIES, AND MATERIALS FOR THE PURPOSE OF SERVICING

WELL NO. 1-22 LEASE Mesa Bierle SEC. 22 TWP. 28N RANGE 51E

FIELD COUNTY Roosevelt STATE MT OWNED BY SAME

THE FOLLOWING INFORMATION WAS FURNISHED BY THE CUSTOMER OR HIS AGENT

FORMATION NAME TYPE

FORMATION THICKNESS FROM TO

PACKER: TYPE SET AT

TOTAL DEPTH MUD WEIGHT

BORE HOLE

INITIAL PROD: OIL BPD, H_2O BPD, GAS MCF

PRESENT PROD: OIL BPD, H_2O BPD, GAS MCF

	NEW USED	WEIGHT	SIZE	FROM	TO	MAX. ALLOW. P.S.I.
CASING	U	12.0	5/8	KB	700	
LINER						
TUBING						
OPEN HOLE			4 3/4	700	TD	SHOTS/FT.
PERFORATIONS						
PERFORATIONS						
PERFORATIONS						

PREVIOUS TREATMENT: DATE TYPE MATERIALS

TREATMENT INSTRUCTIONS: TREAT THRU TUBING ☐ ANNULUS ☐ CASING ☒ TUBING/ANNULUS ☐ HYDRAULIC HORSEPOWER ORDERED

Sqz - CZC

CUSTOMER OR HIS AGENT WARRANTS THE WELL IS IN PROPER CONDITION TO RECEIVE THE PRODUCTS, SUPPLIES, MATERIALS, AND SERVICES

THIS CONTRACT MUST BE SIGNED BEFORE WORK IS COMMENCED

As consideration, the above-named Customer agrees:

(a) To pay Halliburton in accord with the rates and terms stated in Halliburton's current price lists.

(b) Halliburton shall not be responsible for and Customer shall secure Halliburton against any liability for damage to property of Customer and of the well owner (if different from Customer), unless caused by the willful misconduct or gross negligence of Halliburton, this provision applying to but not limited to subsurface damage and surface damage arising from subsurface damage.

(c) Customer shall be responsible for and secure Halliburton against any liability for reservoir loss or damage, or property damage resulting from subsurface pressure, losing control of the well and/or a well blowout, unless such loss or damage is caused by the willful misconduct or gross negligence of Halliburton.

(d) Customer shall be responsible for and secure Halliburton against any and all liability of whatsoever nature for damages as a result of subsurface trespass, or an action in the nature thereof, arising from a service operation performed by Halliburton hereunder.

(e) Customer shall be responsible for and secure Halliburton against any liability for injury to or death of persons, other than employees of Halliburton, or damage to property (including, but not limited to, injury to the well), or any damages whatsoever, irrespective of cause, growing out of or in any way connected with the use of radioactive material in the well hole, unless such damage shall be caused by the willful misconduct or gross negligence of Halliburton.

(f) Halliburton makes no guarantee of the effectiveness of the products, supplies or materials, nor of the results of any treatment or service.

(g) Customer shall, at its risk and expense, attempt to recover any Halliburton equipment, tools or instruments which are lost in the well and if such equipment, tools or instruments are not recovered, Customer shall pay Halliburton its replacement cost unless such loss is due to the sole negligence of Halliburton. If Halliburton equipment, tools or instruments are damaged in the well, Customer shall pay Halliburton the lesser of its replacement cost or the cost of repairs unless such damage is caused by the sole negligence of Halliburton. In the case of equipment, tools or instruments for marine operations, Customer shall, in addition to the foregoing, be fully responsible for loss of or damage to any of Halliburton's equipment, tools or instruments which occurs at any time after delivery to Customer at the landing until returned to the landing, unless such loss or damage is caused by the sole negligence of Halliburton.

(h) Because of the uncertainty of variable well conditions and the necessity of relying on facts and supporting services furnished by others, Halliburton is unable to guarantee the accuracy of any chart interpretation, research analysis, job recommendation or other data furnished by Halliburton. Halliburton personnel will use their best efforts in gathering such information and their best judgment in interpreting it, but Customer agrees that Halliburton shall not be responsible for any damages arising from the use of such information except where due to Halliburton's gross negligence or willful misconduct in the preparation or furnishing of it.

(i) Halliburton warrants only title to the products, supplies and materials and that the same are free from defects in workmanship and materials. THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTIABILITY, FITNESS OR OTHERWISE WHICH EXTEND BEYOND THOSE STATED IN THE IMMEDIATELY PRECEDING SENTENCE. Halliburton's liability and Customer's exclusive remedy in any cause of action (whether in contract, tort, breach of warranty or otherwise) arising out of the sale or use of any products, supplies or materials is expressly limited to the replacement of such products, supplies or materials on their return to Halliburton or, at Halliburton's option, to the allowance to the Customer of credit for the cost of such items. In no event shall Halliburton be liable for special, incidental, indirect, punitive or consequential damages.

(j) Invoices payable NET by the 20th of the following month after date of invoice. Upon Customer's default in payment of Customer's account by the last day of the month following the month in which the invoice is dated, Customer agrees to pay interest thereon after default at the highest lawful contract rate applicable but never to exceed 18% per annum. In the event it becomes necessary to employ an attorney to enforce collection of said account, Customer agrees to pay all collection costs and attorney fees in the amount of 20% of the amount of the unpaid account.

(k) This contract shall be governed by the law of the state where services are performed or equipment or materials are furnished.

(l) Halliburton shall not be bound by any changes or modifications in this contract, except where such change or modification is made in writing by a duly authorized executive officer of Halliburton.

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FEB 25 2000
Office of Enforcement
Compliance & Environmental
Mediation

I HAVE READ AND UNDERSTAND THIS CONTRACT AND REPRESENT THAT I AM AUTHORIZED TO SIGN THE SAME AS CUSTOMER'S AGENT.

SIGNED CUSTOMER

DATE

TIME A.M. P.M.

We certify that the Fair Labor Standards Act of 1938, as amended, has been complied with in the production of goods and/or with respect to services furnished under this contract.

RETAIN

HALLIBURTON SERVICES
A Division of Halliburton Company
DUNCAN, OKLAHOMA 73536

BULK MATERIALS DELIVERY AND TICKET CONTINUATION

PAGE 09

FOR INVOICE AND TICKET NO.

DATE	CUSTOMER ORDER NO.	WELL NO. AND FARM	COUNTY	STATE
7-15-85				

CHARGE TO	OWNER	CONTRACTOR	No. B 396504
Mesa	Mesa		

MAILING ADDRESS	DELIVERED FROM	LOCATION CODE	PREPARED BY
	Glendive, Montana	55530	V. L. Hoffman

CITY & STATE	DELIVERED TO	TRUCK NO.	RECEIVED BY
	Location		

PRICE REFERENCE	SECONDARY REF. OR PART NO.	CODE L	CODE D	DESCRIPTION	UNITS 1 QTY.	UNITS 1 MEAS.	UNITS 2 QTY.	UNITS 2 MEAS.	UNIT PRICE	AMOUNT
504-043				Regualr Class "G" Cement	300	sx			7.66	2298 00
				Returned Mileage Charge / TOTAL WEIGHT		LOADED MILES		TON MILES		
				SERVICE CHARGE ON MATERIALS RETURNED				CU. FEET		
500-207				SERVICE CHARGE			300	CU. FEET	.95	285 00
500-314				Mileage Charge / 28,200 TOTAL WEIGHT		LOADED MILES		TON MILES	.75	
No. B 396504						CARRY FORWARD TO INVOICE		SUB-TOTAL		

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Compliance & Environmental
Justice

FORM 1911-R5 REV. 9-81

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HALLIBURTON SERVICES
A DIVISION OF HALLIBURTON COMPANY

REMIT TO
P.O. BOX 84737
DALLAS, TEXAS 75284
DIRECT ANY CORRESPONDENCE TO
P.O. DRAWER 1431
DUNCAN, OKLAHOMA 73536

TICKET NO. 251644-8

FORM 1906 R9

PAGE 1 OF 2 PAGES

WELL NO. – FARM OR LEASE NAME	COUNTY	STATE	CITY/OFFSHORE LOCATION	DATE
1-22 [illegible]	Roosevelt	M		[illegible]

CHARGE TO	OWNER	TICKET TYPE (CHECK ONE)	NITROGEN JOB
[illegible]	Same	SERVICE [X] SALES [ ]	YES [ ] NO [X]

ADDRESS	CONTRACTOR	LOCATION	CODE
[illegible]	[illegible]	1 [illegible]	[illegible]

CITY, STATE, ZIP	SHIPPED VIA	FREIGHT CHARGES	LOCATION	CODE
[illegible]	[illegible]	[ ] PPD [ ] COLLECT	2	

DELIVERED TO	LOCATION	CODE
[illegible]	3	

ORDER NO.	REFERRAL LOCATION

WELL TYPE	WELL CATEGORY	WELL PERMIT NO.
[illegible]	[illegible]	

TYPE AND PURPOSE OF JOB	
[illegible]	B– 396500

DUNCAN USE ONLY

As consideration, the above-named Customer agrees to pay Halliburton in accord with the rates and terms stated in Halliburton's current price lists. Invoices payable NET by the 20th of the following month after date of invoice. Upon Customer's default in payment of Customer's account by the last day of the month following the month in which the invoice is dated, Customer agrees to pay interest thereon after default at the highest lawful contract rate applicable but never to exceed 18% per annum. In the event it becomes necessary to employ an attorney to enforce collection of said account, Customer agrees to pay all collection costs and attorney fees in the amount of 20% of the amount of the unpaid account. These terms and conditions shall be governed by the law of the state where services are performed or equipment or materials are furnished.

Halliburton warrants only title to the products, supplies and materials and that the same are free from defects in workmanship and materials. THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE WHICH EXTEND BEYOND THOSE STATED IN THE IMMEDIATE PRECEDING SENTENCE. Halliburton's liability and customer's exclusive remedy in any cause of action (whether in contract, tort, product liability, breach of warranty or otherwise) arising out of the sale or use of any products, supplies or materials is expressly limited to the replacement of such products, supplies or materials on their return to Halliburton or, at Halliburton's option, to the allowance to the customer of credit for the cost of such items. In no event shall Halliburton be liable for special, incidental, indirect, punitive or consequential damages.

PRICE REFERENCE	SECONDARY REF OR PART NO.	LOC	ACCOUNT	DESCRIPTION	UNITS 1 QTY	UNITS 1 MEAS	UNITS 2 QTY	UNITS 2 MEAS	UNIT PRICE	AMOUNT
[illegible] 117				MILEAGE	117	[illegible]	1	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]			[illegible]	[illegible]	FT	1	[illegible]		[illegible]
[illegible]				[illegible]	1	[illegible]	2	[illegible]		[illegible]

AS PER ATTACHED BULK MATERIAL DELIVERY TICKET NO. B– 396500 [illegible]

WAS JOB SATISFACTORILY COMPLETED? _____

WAS OPERATION OF EQUIPMENT SATISFACTORY? _____

WAS PERFORMANCE OF PERSONNEL SATISFACTORY? _____

X _____
CUSTOMER OR HIS AGENT (PLEASE PRINT)

X _____
CUSTOMER OR HIS AGENT (SIGNATURE)

TAX REFERENCES

SUB TOTAL	
TAX	
TAX	
TAX	
TOTAL	

RECEIVED
FEB 25 2000
Office of Enforcement
Compliance & Environmental
Justice

[illegible]
HALLIBURTON OPERATOR

WE CERTIFY THAT THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED HAS BEEN COMPLIED WITH IN THE PRODUCTION OF GOODS AND OR WITH RESPECT TO SERVICES FURNISHED UNDER THIS CONTRACT.

EXTRA COPY

BAKER SERVICE TOOLS
A DIVISION OF BAKER OIL TOOLS, INC.
P.O. BOX 40129, HOUSTON, TEXAS 77240

SALES & SERVICE INVOICE

FORM BST-20-80 (REV. 4/83)

S.S.I. NO. 137-74681

REMIT TO: BAKER SERVICE TOOLS P.O. BOX 200415 HOUSTON, TEXAS 77216

TERMS: NET 30 DAYS FROM DATE OF INVOICE

DATE ISSUED: 07-14-85
SHIPPED FROM: (DISTRICT) Williston, N.D.

SOLD TO:
Mesa Petroleum
One Mesa Square - Box 20090
Amarillo, Texas 79189

SHIP TO:

COUNTY: Roosevelt
STATE: Montana
WELL NO.: 1-22
FIELD:
LEASE: Biere

PURCHASE ORDER NUMBER	REQUISITION NUMBER	JOB CODE	STATE TO	COUNTY TO	TERRITORY	CUSTOMER CODE	PROJECT CODE	SHIP VIA	DATE SHIPPED
		10	35		B4654	MEP	D-1	Our Delivery	07 14 85

ITEM	QUANTITY	COMMODITY NO.	DESCRIPTION	PRODUCT NO. F/PARTS	TAX CODE	REV. CODE	UNIT CONTROL CODE	DISC.	NET AMOUNT
01	01	400-21-2310	Cementing Service w/Baker Model "K-1" size 2AA Mech. Cement Retainer - 1st/8hr. Period or fraction			11	1,114 00		1,114 00
02	01	598-13-0000	Rental of Baker Cementing Manifold - Each day			B2	133 00		133 00
03	01	598-01-0002	Rental of Baker Model "D" Tubing Swivel - Each use			B6	89 00		89 00
04	170	400-21-2310	Round trip Mileage			WF	1 00		170 00

DO NOT PAY FROM THIS COPY
YOU WILL BE INVOICED

2

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FEB 25 2000
Office of Enforcement
Compliance & Environmental
Justice

TAX

SIGNED FOR BAKER SERVICE TOOLS
John C. Lotz
REPRESENTATIVE

I certify that the above materials or services have been received on the terms and conditions set forth on the reverse side hereof, which the undersigned has read and understood, that the basis for charges is correctly stated and that I am authorized to sign this memorandum as agent of owner or contractor.

AGENT OF OWNER OR CONTRACTOR: [signature] (NAME IN FULL)

CHECKED BY | CODED BY

TOTAL

CHARGES ARE SUBJECT TO CORRECTION BY OUR INVOICING DEPARTMENT IN ACCORDANCE WITH LATEST PRICE SCHEDULES AND THE ADDITION OF APPLICABLE STATE AND LOCAL SALES/USE TAX IF NOT LISTED ABOVE.

CUSTOMER'S COPY

BAKER SERVICE TOOLS
A DIVISION OF BAKER OIL TOOLS, INC.
P.O. BOX 40129, HOUSTON, TEXAS 77240

SALES & SERVICE INVOICE

REMIT TO: BAKER SERVICE TOOLS P.O. BOX 200415 HOUSTON, TEXAS 77216

TERMS: NET 30 DAYS FROM DATE OF INVOICE

137-74712

DATE ISSUED: 07/15/85
SHIPPED FROM: (DISTRICT) Williston, N.D.

SOLD TO: Mesa Petroleum Co.
Box 20090 One Mesa Square
Amarillo, TX 79189

SHIP TO:
COUNTY: Roosevelt
STATE: ~~ND~~ MT.
WELL NO.: 1-22
FIELD: N. Poplar
LEASE: Biere

PURCHASE ORDER NUMBER:
REQUISITION NUMBER:
JOB CODE: 15
STATE TO: 35
COUNTY TO:
TERRITORY: B4654
CUSTOMER CODE: MEP
PROJECT CODE: B-1
SHIP VIA: Our Delivery
DATE SHIPPED: 07/15/85

ITEM	QUANTITY	COMMODITY NO.	DESCRIPTION	PRODUCT NO. F/PARTS	TAX CODE	REV. CODE	UNIT CONTROL CODE		DISC.	NET AMOUNT	
01	01	620-03-1220	Rental of Baker Model "C-3" 10A Roto-Vert Casing Scraper. Run less than 10,500'.			B3	331	00		331	00
02	01	469-01-2001	Rental of Bottom Rotary Sub (2 3/8 API Box x 2 3/8 API Pin)			B2	30	00		30	00
03	150	620-03-1220	Round Trip Mileage from Warehouse to Location			WF	1	00		150	00

DO NOT PAY FROM THIS COPY
YOU WILL BE INVOICED

2

TAX ▷

SIGNED FOR BAKER SERVICE TOOLS
Jeff Stevens
REPRESENTATIVE

CUSTOMER'S COPY

I certify that the above materials or services have been received on the terms and conditions set forth on the reverse side hereof, which the undersigned has read and understood, that the basis for charges is correctly stated and that I am authorized to sign this memorandum as agent of owner or contractor.

AGENT OF OWNER OR CONTRACTOR: _____ (NAME IN FULL)

CHECKED BY | CODED BY J.S.

TOTAL ▷

CHARGES ARE SUBJECT TO CORRECTION BY OUR INVOICING DEPARTMENT IN ACCORDANCE WITH LATEST PRICE SCHEDULES AND THE ADDITION OF APPLICABLE STATE AND LOCAL SALES/USE TAX IF NOT LISTED ABOVE.

Terminal [illegible]

GETTER TRUCKING, INC.

Getter Job # [illegible]

PIPE TALLY OUT-BOUND

Sheet 1 of 1 Sheets

Supplier: MESA PET

Supplier Release #:

Date: 7/11/85

Customer's Name: MESA PET

Customer's Order No.: 4 [illegible]

Destination: BIERKE 1-22

From: Row 47 Rack 10

Shipped Via: GETTER

To: BIERKE 1-22

Size: 2 7/8 Weight: 6.50 Grade: J-55 Thread: EUE Range: 2

☑ NEW ☐ USED ☐ INSP. ☐ NON-INSP.

PIECES	FEET	INCHES	FEET	INCHES	FEET	INCHES	FEET	INCHES	FEET	INCHES	FEET	INCHES
1	31	60										
2	32											
3	30	80										
4	29	90										
5	29	60										
6	29	05										
7	30	35										
8												
9	213	30										
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
COLUMN TOTAL	213	30										
COLUMN TOTAL												
COLUMN TOTAL												
COLUMN TOTAL												
COLUMN TOTAL												
COLUMN TOTAL												
GRAND TOTAL												

Tallied By: [illegible]

Loader #: 5

Car or Truck No.: 334

Total No. of Joints: 7

Date Posted:

Rack Count Beginning: 7 Ending: 0

RECEIVED
FEB 25 2000
Office of Enforcement
Compliance & Environmental
Justice

FIELD COPY

Terminal Williston

GETTER TRUCKING, INC.

Getter Job # 8121

PIPE TALLY OUT-BOUND

Sheet 1 of 1 Sheets

Supplier Mesa Pet Supplier Release # Date 7/11/85

Customer's Name Mesa Pet Customer's Order No. 4 590000

Destination Bierne 1-22 From Row 73 Rack 47

Shipped Via Getter To Bierne 1-22

Size 2 7/8 Weight 6.50 Grade C-75 Thread EUE Range 2 ☑ NEW ☐ USED ☐ INSP. ☐ NON-INSP.

PIECES	FEET	INCHES	FEET	INCHES	FEET	INCHES	FEET	INCHES	FEET	INCHES	FEET	INCHES
1	31	85										
2	31	80										
3	31	85										
4	31	80										
5	27	30										
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
COLUMN TOTAL	127	30										
COLUMN TOTAL												
COLUMN TOTAL												
COLUMN TOTAL												
COLUMN TOTAL												
COLUMN TOTAL												
GRAND TOTAL												

Tallied By WAM Loader # 5

Car or Truck No. 334 Total No. of Joints 4

Date Posted

Rack Count Beginning 4 Ending 0

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FEB 25 '91
Office of Enforcement
Compliance & Environmental
Justice

FIELD COPY

Terminal WILLISTON

GETTER TRUCKING, INC.

Getter Job # 8121

PIPE TALLY OUT-BOUND

Sheet 1 of 1 Sheets

Supplier Mesa Pet

Supplier Release #

Date 7/11/85

Customer's Name Mesa Pet

Customer's Order No. 4 990000 (Row / Rack)

Destination Bierre 1-22

From 73 47

Shipped Via Getter

To Bierre 1-22

Size 2 7/8 Weight 6.50 Grade C75 Thread EUE Range 2 DM ☐ NEW ☐ USED ☐ INSP. ☐ NON-INSP.

PIECES	FEET	INCHES	FEET	INCHES	FEET	INCHES	FEET	INCHES	FEET	INCHES	FEET	INCHES
1	31	80										
2	31	85										
3	31	80										
4	31	85										
5	31	90										
6	159	10										
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
COLUMN TOTAL	159	20										
COLUMN TOTAL												
COLUMN TOTAL												
COLUMN TOTAL												
COLUMN TOTAL												
COLUMN TOTAL												
GRAND TOTAL												

Tallied By WAR

Loader # 5

Car or Truck No. 334

Total No. of Joints 5

Date Posted

Rack Count Beginning 5 Ending 0

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Office of Enforcement
Compliance & Environmental
Justice

FIELD COPY

Terminal WILLISTON

GETTER TRUCKING, INC.

Getter Job # 8121

PIPE TALLY OUT-BOUND

Sheet 1 of 1 Sheets

Supplier Mesa Pet

Supplier Release #

Date 7/11/85

Customer's Name Mesa Pet

Customer's Order No. 4 470000

Destination Bierne 1-22

From Row 23 Rack 47

Shipped Via Getter

To Bierne 1-22

Size 2⅞ Weight 6.50 Grade E75 Thread LCC Range 2

☐ NEW ☑ USED ☐ INSP. ☑ NON-INSP.

PIECES	FEET	INCHES	FEET	INCHES	FEET	INCHES	FEET	INCHES	FEET	INCHES	FEET	INCHES
1	31	80										
2	31	80										
3	30	25										
4	31	75										
5	31	85										
6	30	40										
7	31	80										
8	31	85										
9	31	85										
10	31	80										
11	322.71											
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
COLUMN TOTAL	3365	125										
COLUMN TOTAL												
COLUMN TOTAL												
COLUMN TOTAL												
COLUMN TOTAL												
COLUMN TOTAL												
GRAND TOTAL												

Tallied By DAN

Loader # 5

Car or Truck No. 334

Total No. of Joints 10

Date Posted

Rack Count Beginning 10 Ending 0

FIELD COPY

RECEIVED
FEB 25 2000
Office of Enforcement
Compliance & Environmental
Justice

Getter TRUCKING INC.

THIS MEMORANDUM

Is an acknowledgement that a bill of lading has been issued and is not the Original Bill of Lading, nor a copy or duplicate, covering the property named herein, and is intended solely for filing or record.

Shippers No. _____
Carriers No. _____
Agents No. _____

Date 7/11/85

TO:	FROM:
Consignee Mesa Pet	Shipper Mesa Pet
Street	Street
Destination Bicart 1-22	Origin Getter, Williston

Route: Bisbee

Vehicle Number 334 | Trailer Number 411

Number of Shipping Units	O HM	Kind of Packaging, Description of Articles, Special Marks and Exceptions	WEIGHT (subject to correction)	RATE	CHARGES (For Carrier use only
4		2 7/8 6.50 e.75 cue R-2 NU			
		127.30	827		
5		2 7/8 6.50 e.75 cue R-2 DM			
		159.20	1034		
10		2 7/8 6.50 e.75 cue R-2 UU	2048		
		315.15			
7		2 7/8 6.50 J-55 cue R-2 NU	1386		
		213.30			
		TOTAL	5296		
		RECEIVED			
		FEB 25 2003			

Received by: Office of Enforcement Compliance & Environmental Justice

TOTAL CHARGES $

C.O.D. FEE: Prepaid ☐ Collect ☐ $

Remit C.O.D. to: Address: City: State: Zip:

C.O.D. AMT.: $

FREIGHT CHARGES
FREIGHT PREPAID
Except when box at right is checked ☐ CHECK BOX if charges are to be collect

NOTE - Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding $ Per

Subject to Section 7 of the conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges
(Signature of Consignor)

RECEIVED subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading, the property described above in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated above which said carrier (the word carrier being understood throughout this contract as meaning any person, corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of said property over all or any portion of said route to destination and as to each party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.
Shipper hereby certifies that he is familiar with all the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns

This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. Per

SHIPPER	CARRIER: **GETTER TRUCKING, INC.**
PER:	PER: [illegible]
DATE:	DATE: 7/11/85

O Mark with an "X" to designate Hazardous Material as defined in Title 49 of the code of Federal Regulations Governing Transportation of Hazardous Materials. The use of this Column is an optional method of designating hazardous materials on bills of lading per section 172.201 and 172.202 (b) of the regulations governing the transportation of such materials

Getter TRUCKING INC.

THIS MEMORANDUM

Is an acknowledgement that a Bill of lading has been issued and is not the Original Bill of Lading, nor a copy or duplicate, covering the property named herein, and is intended solely for filing or record

Shippers No. _____
Carriers No. _____
Agents No. _____

Date [illegible]

TO: Consignee [illegible]	FROM: Shipper [illegible]
Street	Street
Destination [illegible]	Origin [illegible]
[illegible]	[illegible]

Route: [illegible] Vehicle Number [illegible] Trailer Number [illegible]

Number of Shipping Units	O HM	Kind of Packaging, Description of Articles, Special Marks and Exceptions	WEIGHT (subject to correction)	RATE	CHARGES (For Carrier use only)
3		[illegible]			
4		[illegible]			
4		[illegible]			
7		[illegible]			

Received by: [illegible]

TOTAL CHARGES $

C.O.D. FEE: Prepaid ☐ Collect ☐ $

Remit C.O.D. to: Address: City: State: Zip:

C.O.D. AMT.: $

FREIGHT CHARGES FREIGHT PREPAID Except when box at right is checked ☐ CHECK BOX if charges are to be collect

NOTE - Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding $ _____ Per _____

Subject to Section 7 of the conditions, if the shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.
(Signature of Consignor)

RECEIVED subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading, the property described above in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated above which said carrier (the word carrier being understood throughout this contract as meaning any person, corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of said property over all or any portion of said route to destination and as to each party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.
Shipper hereby certifies that he is familiar with all the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. Per

RECEIVED

SHIPPER	CARRIER: GETTER TRUCKING, INC.
PER:	PER:
DATE:	DATE:

FEB 25 [illegible]
Office of Enforcement
Compliance & Hazmat Unit
Justice

O Mark with an "X" to designate Hazardous Material as defined in Title 49 of the Federal Regulations Governing Transportation of Hazardous Materials. The use of this Column is an optional method of designating hazardous materials on bills of lading per section 172.201 and 172.202 (b) of the regulations governing the transportation of such materials.

Rel. # ✓

PO#

GETTER TRUCKING INC.

JOB ORDER

Date Order Taken 7-12-85 Time 2:15 P.M

Customer MESA

Ordered by BRETT

Charge to SAME

Contact for changes

From location YARD & SPEC TECH

To location Berec 1-22

Type truck — ☐ hot shot ☐ water ☐ vaccum ☒ pipe ☐ winch ☐ bed ☐ crane ☒ picker

Type trailer — ☐ pole ☐ water ☐ lowboy ☐ highboy #

Special instructions

3 JTS 5½ 20# N80 LTC

4 JTS 5½ 20# L80 LTC

4 JTS 5½ 17# N80 LTC

7 JTS 5½ 17# L80 LTC

19 JTS 2⅞ 6.5 C75 EUE

7 JTS 2⅞ 6.5 J55 EUE

Pogler, Mt. old Drive In Theater go North 3 Mi. - East 1 - North to loc.

Driver Truck doing job 334-411

Date to be done 7-12-85 Destination Time A.S.A.P.

Order taken by MIKE

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Office of Enforcement
Compliance & Environmental
Justice

H & L RENTAL, INC.

Remit To: Rt. 3 - Box 249A - Grand Coulee Road
Williston, North Dakota 58801
701-774-3063

TERMS: NET 30 DAYS FROM DATE OF INVOICE
A Finance Charge of 1½% Per Month (18% Annual) Will Be Charged
On Any Previous Balance Not Paid In 30 Days

5942

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FEB 25 2000
Office of Enforcement Compliance & Environmental Justice

DATE ISSUED [illegible]

INVOICE DATE

CHARGE TO [illegible]	STATE [illegible]	COUNTY	PURCHASE ORDER #
ADDRESS	REQUISITION #		UNIT #
	WELL NUMBER [illegible]	WELL NAME [illegible]	FIELD
ZIP CODE	EQUIPMENT DESCRIPTION [illegible]		

DATE	DESCRIPTION OF WORK			
[illegible]	Installed [illegible] NE [illegible]			
	Mileage [illegible] [illegible]			
	[illegible] [illegible]			
[illegible]	Test and Tag [illegible]			
	[illegible]			
	[illegible] Time [illegible]			
	FUEL ADJUSTMENT			
			SUB TOTAL	[illegible]
			TAX	
			TOTAL	

COMPANY REPRESENTATIVE	H & L REP.

HEXOM
EARTH CONSTRUCTION, INC.
Route #3 Box 238
WILLISTON, NORTH DAKOTA 58801

(701) 774-8511

INVOICE

7828

DATE	ORDER NO.
7-17-89	

SHIP TO

TO

Mesa Limited Partnership

P. O. Box 720

Killdeer, N. D. 58640

SALESPERSON	DATE SHIPPED	SHIPPED VIA	F.O.B. POINT	TERMS

QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
	100# of Russian Wild Rye grass seed	$2.64	$264.00

P. Kushinski
Bieri 1-22

A-89999 30201-155

RECEIVED
FEB 25 2000
Office of Enforcement
Compliance & Environmental
Justice

QUADRUPLICATE

Thank You

MATADOR SERVICE INC
KOCH
Subsidiary of Koch Industries Inc
4111 E. 37 N.
Wichita, Kansas 67201

FIELD ORDER
(Salt Water)

District No. 48 Date 7/9/85 Ticket No. 09189 409
Man # - Series #

Customers Name Mesa Petro.

Billing Address Box 2006 Amarillo, Texas

Origin Salsbury FW - Poplar City Water State MT

Destination Biere 1-22 State MT

Purchase Order _____ Truck No. 7968 Trailer No. 7015

Commodity	Barrels	Hours	Rate	Amount
Flammable Liquid N.O.S. UN1993 Fresh water	250	7	46.50	325.50
Flammable Liquid N.O.S. UN1993 Fresh water	130	4 1/2	46.50	209.25
Flammable Liquid N.O.S. UN1993	380			
Flammable Liquid N.O.S. UN1993				
Flammable Liquid N.O.S. UN1993				
Flammable Liquid N.O.S. UN1993				
10% DEV BBL	380			38.00

FEB 25 2003
Office of Enforcement
Compliance & Environmental
Justice

MATADOR SERVICE INC
KOCH Subsidiary of Koch Industries Inc

4111 E. 37 N.
Wichita, Kansas 67201

FIELD ORDER

District No. 23 Date 7-13-85 Ticket No. 15204-10
Man # - Series #

Customer's Name Mesa Petroleum

Billing Address Box 2009, Amarillo, Texas

Origin Biere 1-27 State Mont.

Destination Biere S/W Disposal State Mont.

Purchase Order _____ Truck No. 7750 Trailer No. 3037

Commodity	Barrels	Hours	Rate	Amount
Crude Oil, Petroleum, Flammable Liquid UN1267				
Fr Water	200	2	37.00 per hr.	74.00
Fr Water	105			

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FEB 25 2000
Office of Enforcement
Compliance & Environmental
Justice

MATADOR SERVICE INC
KOCH Subsidiary of Koch Industries Inc
4111 E. 37 N.
Wichita, Kansas 67201

FIELD ORDER

District No. 23 Date 7-12-85 Ticket No. 15204-11
Man # - Series #

Customer's Name MESA PETROLEUM

Billing Address BOX 2009, AMARILLO, TEXAS

Origin LAND TECH F/W SIDNEY State MONT.

Destination BIERE 1-22 POPLAR State MONT.

Purchase Order _____ Truck No. 7950 Trailer No. 7037

Commodity	Barrels	Hours	Rate	Amount
Crude Oil, Petroleum, Flammable Liquid UN1267				
FRESH WATER	160	[illegible]	$5.00 PER HR.	$500.00
[illegible] WATER			[illegible]	[illegible]

RECEIVED
FEB 25 2000
Office of Enforcement
Compliance & Environmental
Justice

MATADOR SERVICE INC
KOCH Subsidiary of Koch Industries Inc
4111 E. 37 N.
Wichita, Kansas 67201

FIELD ORDER
(Salt Water)

District No. 48 Date 7-14-85 Ticket No. 09858 351
Man # - Series #

Customers Name Mesa Petroleum
Billing Address 2009, Amarillo, Texas
Origin Salsbury State Kt
Destination Biere 1-22 State Kt
Purchase Order _____ Truck No. 7058 Trailer No. 7073

Commodity	Barrels	Hours	Rate	Amount
Flammable Liquid N.O.S. UN1993 fresh water	150	4 1/2	46.50	209.25
Flammable Liquid N.O.S. UN1993				
Flammable Liquid N.O.S. UN1993				
Flammable Liquid N.O.S. UN1993				
Flammable Liquid N.O.S. UN1993	F.w cost		10 per	15.00
Flammable Liquid N.O.S. UN1993				

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FEB 25 1991
Office of Enforcement
Compliance & Environmental
Justice

MATADOR SERVICE INC
KOCH Subsidiary of Koch Industries Inc
4111 E. 37 N.
Wichita, Kansas 67201

FIELD ORDER
(Salt Water)

District No. 48 Date 7-15-85 Ticket No. 01819-505
Man # - Series #

Customers Name MESA PET.
Billing Address BOX 2009 AMARILLO, TEXAS
Origin SALISBURY, POPLAR State MT.
Destination BIERE 1-22 State MT.
Purchase Order _____ Truck No. 7968 Trailer No. 7075

Commodity	Barrels	Hours	Rate	Amount
Flammable Liquid N.O.S. UN1993 FRESH WATER	150	6½	46.50	$302.25
Flammable Liquid N.O.S. UN1993 FRESH WATER	200			
Flammable Liquid N.O.S. UN1993				
Flammable Liquid N.O.S. UN1993				
Flammable Liquid N.O.S. UN1993				
Flammable Liquid N.O.S. UN1993				
.10/BBL FW. COST				$35.00

MESA
PETROLEUM CO.

OCT 1984
RECEIVED
OIL & GAS CONS. COMM.
STATE OF MONT.
BILLINGS

October 3, 1984

Montana Board of Oil & Gas Conservation
2535 St. Johns Ave.
Billings, MT 59102

Attention Donna Uvelac

Subject: Biere 1-22
NWSW Sec. 22, T28N, R51E
Roosevelt County, Montana
Poplar Field

Gentlemen:

Enclosed are three copies of the DST's ran on the subject well as requested. If you have any further questions regarding this matter, please call me.

Sincerely,

Randy Nordsven

Randy Nordsven
Regulatory Agent

ksp
Enclosures

27331
10 of 18

MESA PETROLEUM CO.

COMPLETION REPORT — DAILY

Date: 5-16-85

WELL NAME	CONTRACTOR	DAY NO.
BIERE 1-22	WISCO W/S	7

PBTD	DAILY COST	COMPLETION COST	TCTD
700'	27,331	100,008	100,008

SUPERVISOR JOHN JAMES | OART: WOC PLUG #2

406-482-6400

0600-1430-8½ HRS - WOC PLUG #1 SICP @ 0600 HR = 800 PSI
0700 HRS ATTEMPED TO BLEED OFF CSG PRESS - FLOWED BACK 3 BBLS F. WTR - SHUT IN CSG - SICP = 600 PSI - 1000 HRS - ATTEMPED TO TO BLEED OFF SICP PRESS - FLOWED BACK 15 BBLS F. WTR - SHUT IN CSG - SIP = 200 PSI - 1430 HRS SICP = 200 PSI

1430-1530-1 HR - RU OIL WELL PERF WL AND RUN TEMP UNDER 200 PSI - SURFACE - 112°F - 66' 191°F - 240' 107°F - 350' 105°F 440' 107°F - WIRE LINE T.D. 440'

1530-1600-½ HR - RD OIL WELL PERF - SICP = 200 PSI - FLOW BACK 3 BBLS GREEN CMT

1600-1630-½ HR - RU RIG PUMP + EST. INJ. RATE @ 2 BPM = 1000 PSI

1630-2230-6 HRS - PU NEW 4¼" BIT - FOUR 3⅛" D.C. + TIH HOLE TO 400' WASHED FROM 400' TO 686' (TOP OF CMT RETIANER) HAD NO HARD CMT - VERY SMALL AMOUNT CMT @ 440' - FLOWED 3 BPH ON FREE FLOW - FLUID TEMP 90°F - DRLG CMT RET. + CLEAN OUT HOLE TO 900' - HARD CMT 840' TO 900' NOTE P+A WELL HAS NO CHANGED - FLOWING ½ BPH FLUID + SMALL AMOUNT AIR FLOW - VERY SMALL FLUID + AIR FLOW BETWEEN 5½" X 16" CSG ON NEW HOLE -

2230-2300-½ HR - CIRC. CHECK HOLE FOR FREE FLOW - HAD 8 BPH - TEMP 100°F

2300-2330-½ HR - TOH

2330-0100-1½ HRS - PU 5½" CSG SCRAPER + TIH TO 690' - TOH + LD SAME

0100-0145 ¾ HR - RU HALLIBURTON ON 5½" BREADEN HEAD - CLOSE BLIND RAMS

SEE PAGE #2

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Office of Enforcement
Compliance & Environmental
Justice

DO-9 2/84

RIG SUPERIVISON	500.00
UNIT	4100.00
RENTAL	1000.00
FREIGHT	800.00
HALCO	
BAKER	431
WELDER	230
WTR	250
M/S	

6400
431
6831
230
7061
250
7311
14000
21 3.1

TIME	OPERATIONS LAST 24 HOURS CONTINUED
	EST INJECTION RATE W/ F. WTR - AIR 12 BPM = 1000 PSI - PUMP 1000 GALS OF FLOW CHECK - FLOWED W/ 300 SX CL'G NEAT - AIR 12 BPM = 1000 PSI - PLUG IN PLACE 7-16-85 0145 HRS 7-16-85 - SICP = 500 PSI - EST TOP CMT 800'
	NOTE - P+A WELL DID NOT CHANGE WHILE PUMPING CMT - NEW HOLE INCREASED IN FLUID + AIR FLOW WHILE PUMPING CMT [redacted]
0145-0600	4¼ HRS WOC [redacted] PLUG #2 - 0700 HRS = 500 PSI = CSG PRES
	07:00 HRS 7-16-85 P+A HAS NOT CHANGED - NEW HAS MORE BLOW

WELL NUMBER	SIGNED	DATE
BIERE 1-22	JOHN JAMES 406-482-6400	5-16-85

RM 107

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FEB 25 2011
Office of Enforcement
Compliance & Environmental
Justice

MEBA

DAILY DRILLING REPORT

WELL	SIZE & DEPTH LAST CSG	DAYS SINCE SPUD	FORMATION

CONTRACTOR	DEPTH TODAY/TVD	DEPTH YESTERDAY	PROGRESS	ACCUMULATED MUD COST

OPERATION AT 0600	DAILY COST	ACCUMULATED COST	AFE/COST

MUD DATA	☐ PIT ☐ FLOW LINE	WT.	VIS.	P.V./Y.P.	GELS.	PH.	W.L.	CHL.	SAND	OIL	SOL.	MBT.	HTHP FL at _____°F

PUMP DATA	NUMBER AND TYPE	LINER SIZE x STROKE	SPM	GPM	P.S.I.	NOZ. VEL.	A.V.-D.P.	A.V.-D.C.	SLOW PUMP RATE & PRESS.

BIT #	SIZE	MAKE	TYPE	SN	JETS	DEPTH IN	DEPTH OUT	FOOTAGE	HOURS	AVG. ROP	RPM	WT.-M LB.	CONDITION

MUD LOG DATA	DEPTH	MUD WT.	BGG	CG	TG	DXC	SHALE DENS.	EPP	FR. GR.	ROP IN SHALE

TORQUE	ROT. WEIGHT	P.U. WEIGHT	S.O. WEIGHT	BHA WEIGHT-AIR	BHA WEIGHT-MUD	DRILLING TIME	ACCUM. ROT. HOURS

DRILL STRING DATA	D.P.O.D.	CONN	GRADE	WT./FT.	LENGTH	D.P.	BOP TEST
						COND.	BHA INSP.
						SURF.	SHOE TEST
						INT./PROD.	MACP
						PROD./LINER	

BOTTOM HOLE ASSEMBLY	LENGTH	DESCRIPTION

DIRECTIONAL DRILLING DATA (Operation From 0600 To 0600)							DOG LEG SEVERITY 0/100 FT.	
M.D.	ANGLE	DIRECTION	T.V.D.	TOTAL COORDINATES NORTH/SOUTH	TOTAL COORDINATES EAST/WEST	VERT. SEC.		SURVEY NO.

1028 1
2 833
800.001

DRILLING BREAKS DEPTHS	ROP	GAS	MUD WT.	CHLORIDES	HEAVIES
	/ /	/ /	/ /	/ /	
	/ /	/ /	/ /	/ /	
	/ /	/ /	/ /	/ /	

WIND	SEA	VIS.	BAR. PRESS.	ACCIDENTS	MEN ONBOARD

P. WTR.	D. WTR.	FUEL USED	WT. MATR.	CEMENT

☐ CHECK IF SUMMARY CONTINUED ON BACK	SIGNED	DATE

DO-1 REV. 9/19/84

To: T.L. McPherson

MESA

Add to Well History Date 6/22/89

Well Name: Bieri Well No: 1-22 Producing formation: P & A

County & State: Roosevelt Co. Montana Perforations:

Perforations: P & A Supervisor: F. Kershisnik

DWC: CWC:

On 6/20/89 I (Fred Kershisnik) met with Mr. L.M. Lockman on the abandoned location. There was "1" rotten ± 200 bbl. wooden tank with 8'x8'x8' building, 2 seperate piles of debri. (junk), and a bolted tank, taken apart, and piled in his wheat field. All equipment looks to be of no value. Mr. Lockman sugested digging a hole and buring all of the "junk" on location, with about 3' of top cover so the land could be farmed. He also asked if we could supply him with aprox 150# of annual rye grass to seed the disturbed area this fall. Estimated cost for work $2000.

To: T.L. McPherson

MESA

Add to Well History Date 6/22/89

Well Name: Bieri Well No: 1-22 Producing formation: P & A

County & State: Roosevelt Co. Montana Perforations:

Perforations: P & A Supervisor: F. Kershisnik

DWC: CWC:

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To: T. L. McPherson

MESA

Page 1 of 1

Add to Well History Date 7/13/89

Well Name: Bieri Well No: 1-22 Producing formation: P & A

County & State: Roosevelt County Montana Perforations:

Perforations: Supervisor:

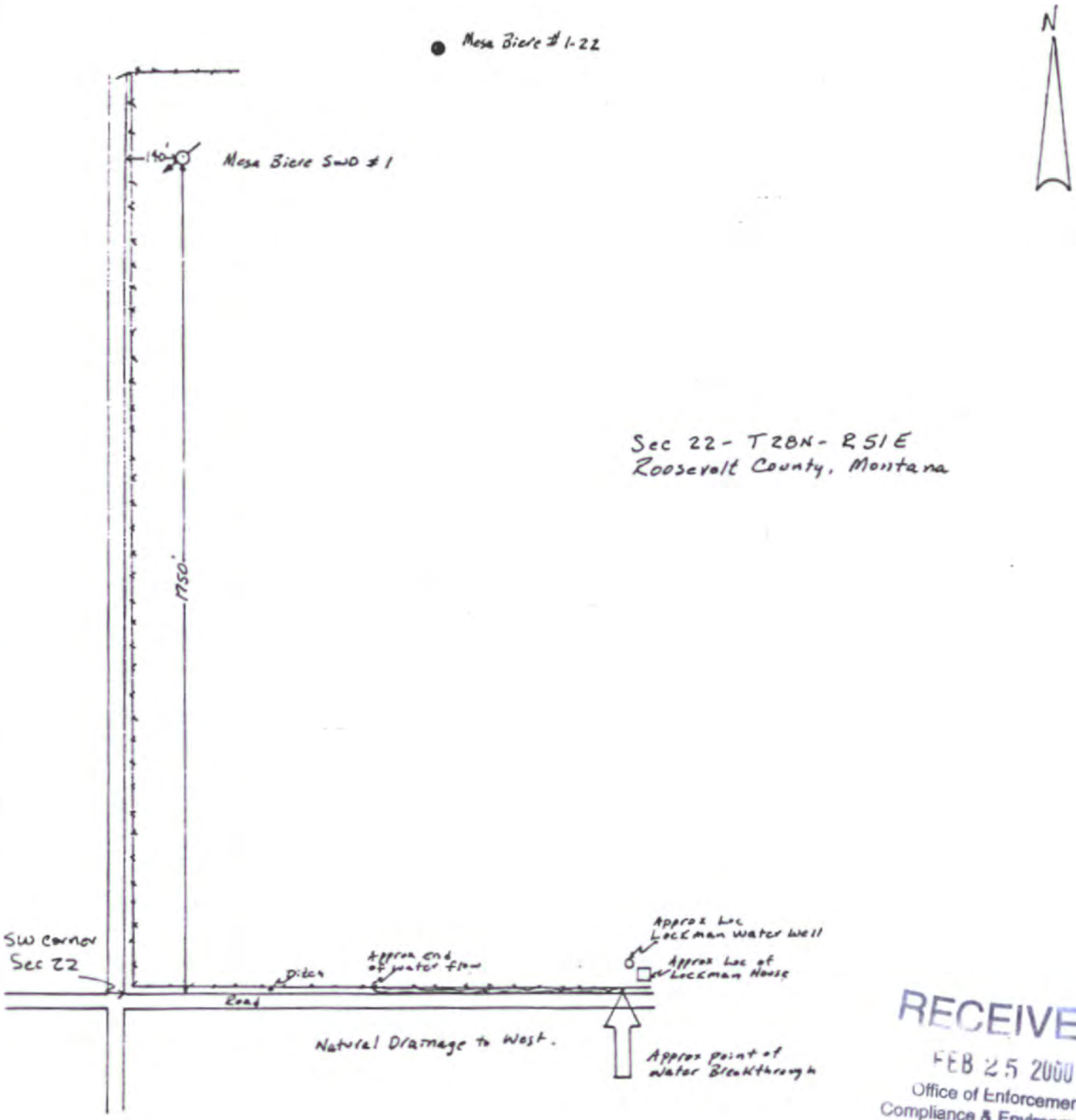
DWC: $1681 CWC: $1681

On 6/22/89 we reclaimed the Bieri 1-22 location. All junk, including the wooden tank, was buried on location with 2' of cover on top. The land owner, Mr. I. M. Lokkman inspected the reclaimed location and was pleased with it. At that time it was determined that only 100# of annual rye grass seed for him to seed the affected area, so we left him with 100# of annual rye grass seed. I contacted Mr. L. D. Hodges with Montana Oil & Gas Commission and told him the reclaimed location was ready for his inspection. A report of his inspection will follow.

Received
Office of Enforcement
FEB 25 2000
Compliance & Env. Justice

Received
Office of Enforcement
Compliance & Env. Justice

PROD-13 11/84



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FEB 25 2000
Office of Enforcement
Compliance & Environmental
Justice

FIG 1

DIAGRAM OF WATER FLOW AREA
MESA BIERE SWD # 1

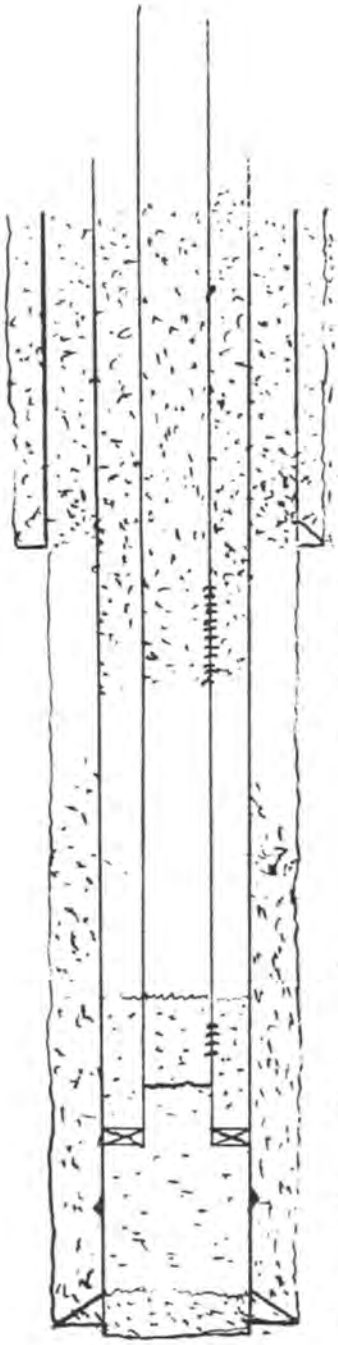
2/28/72 RDR

MESA PETROLEUM CO.

ENGINEERING RECORD
ONSHORE DIVISON

Subject _____

Prepared By _____ Date _____



Biere 1-22
1980' FS – 660' FWL
22 - 28N - 51E
Roosevelt Co, MT

Elev 2086 KB
2074 GL

SPUDDED @ 4 PM 5-6-70

24 jts 8 5/8" 24# @ 741' CMT/465 SXS
Perf 12 Holes 998'-996' - Pumped 30 SXS CLASS "H"
Pumped 85 SXS DN 5 1/2" Csg
Pumped 25 SXS DN 8 5/8" Csg
Pumped 20 SXS DN 2 7/8" TBG

698'-876' JUDITH RIVER
3200'-3570 DAKOTA
4840'-4992' Tyler
5155'-5288' KIBBY
5516'-5543 CHARLES "A"
5635'-5678' " "B"
5788-5805' " "C"

TOC Plug 5435'-5750' INSIDE & OUTSIDE of TBG (30 SXS "H")
Perf TBG - 4 Holes @ 5750'
TOC IN TBG @ 5760' (50 SXS Class "H") Plug
PKR @ 5766.81' KB w/ 2 7/8" J-55 EUE 8RD 6.7# @ 5766'

JET NOTCHED @ 5791' w/2000 gal 7.5% HCl
PBTD 5803' KB
175 jts 15# J-55 STAC 5.5" @ 5845' KB CMT w/675 SXS

RECEIVED
FEB 25 2011
Office of Enforcement
Compliance & Environmental
Justice

RE1

Milchem

MILCHEM INCORPORATED
POST OFFICE BOX 22111 HOUSTON, TEXAS 77027

DELIVERY TICKET OR SERVICE ORDER **No.** 65037

(7) BATCH NO. | (8) | (9) PRICE CODE

(10) SHIPPED FROM: Williston | WHSE NO.: 0533800

(11) F.O.B. ☐ - 1 WELLSITE ☒ - OUR WHSE ☐ - 2 -

(12) ☒ WITH SERVICE ☐ WITHOUT SERVICE | NO. DAYS ON JOB

☒ DRILLING FLUIDS
☐

(13) DELIVERED BY: ~~ML-946~~ Frank Ent

(1) SOLD TO: Mesa Pet. | (2) NO.

(14) DATE SHIPPED: MONTH 7 | DAY 10 | YEAR 85

(3) BILLING ADDRESS: One Mesa Square, P.O. Box 2009

(15)

(4) CITY, STATE, ZIP CODE: Amarillo. Tx. 79189

(16) CUSTOMER ORDER NO.

(5) WELL NAME | (6) STATE CODE | (6) WELL NO.: —

(17) DATE BILLED | MONTH | DAY | YEAR

65037

PACKING UNIT SIZE - WT. (18)	PACKING UNIT CONTAINER (19)	CODE (20)	PRODUCT NAME (21)	NO. UNITS DELIVERED (22)	(23)	(24)
100#	Bag	5150	Mil-gel	86	5.25	451.50
50#	Bag	8300	Mil Lime	10	5.70	57.00

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FEB 25 2000
Office of Enforcement
Compliance & Environmental
Justice

(25) PALLETS DELIVERED

"THIS IS TO CERTIFY THE ABOVE-NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED AND ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION."

(26) TOTAL 508.50

(32) MATERIAL SHIPPED BY

Swamper @$12.00 P/Hr. for 5 Hrs. 60.00

(27) ☐ NO Tax Mont. STATE SALES TAX

(28) ☐ CO./PH. SALES TAX

(32) MATERIAL RECEIVED BY

(29) ☐ CITY SALES TAX

(30) TRANSPORTATION 15,000 min. cwt @$1.61 phw 241.50

IRCHASE PRICE FOR MERCHANDISE ED IS PAYABLE AT HOUSTON, TEXAS

(31) TOTAL 800.00

CUSTOMER

COPIES
White — Denver
Green — Customer
Gold — Denver
Pink — Denver
Canary — Station

oil well perforators

303-377-6664

INVOICE NO. B-

REMIT: SUITE 317 CHERRY CREEK PLAZA
500 SOUTH CHERRY CREEK
DENVER, COLORADO 80222

TERMS: Net — 30 Days

FROM: _____

CHARGE TO _____ TRUCK NO. _____

ADDRESS _____

FIELD _____ WELL _____

COUNTY _____ STATE _____ CUST. NO. _____

TO OIL WELL PERFORATORS, INC.:

CONDITIONS OF THIS CONTRACT

You are hereby requested to furnish the service and materials and equipment herein set forth upon the back side of this service ticket and invoice as well as general terms and conditions outlined in your current published price manual.

Received the below services according to the terms and conditions as shown above, which we have read and which we hereby agree.

CUSTOMER _____ AGENT _____ DATE _____

OPERATOR:

CREW:

CSG ZERO

FLUID LEVEL

CO. TD OWPTD

DEPTHS REFER TO:

JOB DATA	DATE	TIME	HRS.
REPORT			
ARRIVE LOC.			
RIG UP			
START WAIT			
END WAIT			
END JOB			
UNLOAD			

REMARKS:

PERFORATING INTERVALS

SHOTS	FROM	TO

SERVICES	FROM	TO	TOTAL	AMOUNT	PRICE PAGE
SERVICE CHG.					
PERF. TYPE		TOTAL SHOTS			
DEPTH CHARGE					
OPERATION CHARGE					
OTHER					
JOB TOTAL		2310			
30% Dis		693			
		1617			
TOTAL STANDBY HRS.					
HOIST TRK. MILES		Thavn-Yar			
SUB TOTAL				1617	—
STATE TAX %					
TOTAL					

RECEIVED
FEB 25 2003
Office of Enforcement
Compliance & Environmental
Justice

COPIES

White	Denver
Green	Customer
Gold	Denver
Pink	Denver
Canary	Station

oil well perforators

303-377-6664

INVOICE NO. B- 14020

REMIT: SUITE 317 CHERRY CREEK PLAZA
500 SOUTH CHERRY CREEK
DENVER, COLORADO 80222

TERMS: Net — 30 Days

FROM: _____

CHARGE TO [illegible] TRUCK NO. [illegible]

ADDRESS [illegible]

FIELD [illegible] WELL [illegible]

COUNTY [illegible] STATE MONTANA CUST. NO. _____

TO OIL WELL PERFORATORS, INC.:

CONDITIONS OF THIS CONTRACT

You are hereby requested to furnish the service and materials and equipment herein set forth upon the back side of this service ticket and invoice as well as general terms and conditions outlined in your current published price manual.

Received the below services according to the terms and conditions as shown above, which we have read and which we hereby agree.

CUSTOMER [illegible] AGENT [illegible] DATE 7-13-85

OPERATOR: [illegible]

CREW: [illegible]

CSG [illegible] ZERO [illegible]

FLUID WATER LEVEL FULL

CO. TD 705 OWPTD 592

DEPTHS REFER TO: OWP GR/N 7-13-85

JOB DATA	DATE	TIME	HRS.
REPORT	7-13-85	[illegible]	
ARRIVE LOC.		[illegible]	
RIG UP		[illegible]	
START WAIT			
END WAIT			
END JOB		[illegible]	
UNLOAD	7-13-85	[illegible]	

REMARKS:

UNITS [illegible]

PERFORATING INTERVALS

SHOTS	FROM	TO

SERVICES		FROM	TO	TOTAL	AMOUNT	PRICE PAGE
SERVICE CHG. 7-13-85						3-1
PERF. TYPE			TOTAL SHOTS			
DEPTH CHARGE	GAMMA RAY - NEUTRON	SURF	592	592		17
	CBL-GR	SURF	592	592		17
	HRD TEMP	SURF	592	592		18
OPERATION CHARGE	GAMMA RAY - NEUTRON	592	SURF	592		17
	CBL-GR	592	SURF	592		17
	HRD TEMP	SURF	592	592		18
OTHER	[illegible]					[illegible]
	[illegible]					[illegible]
	[illegible]					
	BOOK TOTAL	4365.00				
	30%	1309.50				
	JOB	3055.50				
TOTAL STANDBY HRS.						
HOIST TRK. MILES		[illegible]				
	SUB TOTAL				[illegible]	50
STATE	TAX %					
	TOTAL					

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FEB 25 2000
Office of Enforcement
Compliance & Environmental
Justice

COPIES

White	Denver
Green	Customer
Gold	Denver
Pink	Denver
Canary	Station

oil well perforators

303-377-6664

INVOICE NO. B-

REMIT: SUITE 317 CHERRY CREEK PLAZA
500 SOUTH CHERRY CREEK
DENVER, COLORADO 80222

TERMS: Net — 30 Days

FROM: _____

CHARGE TO _____ TRUCK NO. _____

ADDRESS _____

FIELD _____ WELL _____

COUNTY _____ STATE _____ CUST. NO. _____

TO OIL WELL PERFORATORS, INC.:

CONDITIONS OF THIS CONTRACT

You are hereby requested to furnish the service and materials and equipment herein set forth upon the back side of this service ticket and invoice as well as general terms and conditions outlined in your current published price manual.

Received the below services according to the terms and conditions as shown above, which we have read and which we hereby agree.

CUSTOMER _____ AGENT _____ DATE _____

OPERATOR:	
CREW:	
CSG	ZERO
FLUID	LEVEL
CO. TD	OWPTD
DEPTHS REFER TO:	

PERFORATING INTERVALS

SHOTS	FROM	TO

JOB DATA	DATE	TIME	HRS.
REPORT			
ARRIVE LOC.			
RIG UP			
START WAIT			
END WAIT			
END JOB			
UNLOAD			

REMARKS:

SERVICES	FROM	TO	TOTAL	AMOUNT	PRICE PAGE
SERVICE CHG.					
PERF. TYPE		TOTAL SHOTS			
DEPTH CHARGE					
OPERATION CHARGE					
OTHER					
BOOK PRICE NI ☆ = 2615.-					
30% = 784.50					
1830.50					
PLUS ☆ 250.00					
TOTAL STANDBY HRS. 2080.50					
HOIST TRK. MILES Thank-You					
SUB TOTAL				2080	50
STATE TAX %					
TOTAL					

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FEB 25 20[illegible]
Office of Enforcement
Compliance & Environmental
Justice

Form No. 6

SUBMIT IN TRIPLICATE
TO
BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA
P.O. BOX 217 HELENA, MT 59624

Oil or Gas Wells

ARM 36.22.307
ARM 36.22.1217
ARM 36.22.1242

REPORT OF PRODUCTION

(TO BE MADE BY PRODUCER)

NOV 1984
RECEIVED
OIL & GAS CONS. COMM.
STATE OF MONT.
BILLINGS

BOARD USE ONLY	
	F L UNIT
	PROD
	CNTY

☐ 12. CHECK IF AMENDED REPOR

1 PRODUCER: Mesa Petroleum Co.
2 ADDRESS: P. O. Box 2009
3 CITY: Amarillo
4 STATE: Texas 5. ZIP: 79189
6 AGENT SIGNATURE: [signature]

7. FIELD NAME: Poplar
8 LEASE/UNIT NAME: Biere
9 COUNTY: Roosevelt
10. ☐ CHECK IF ADDRESS CHANGE
11 MONTH OF: October 1984

13 WELL CLASSIFICATION CHECK ONE
X OIL WELLS
☐ NATURAL GAS WELLS

14. LEASE STATUS
1 NO WELLS PRODUCED
☐ NO WELLS SHUT IN

WELL DESCRIPTION / PRODUCTION INFORMATION

15 WELL NUMBER	16 API NO (LAST 8 DIGITS)	17 DAYS PRODUCED	18 SEC	19 TWP	20 RGE	DO NOT USE	21 PRODUCING FORMATION	22 BBLS OF OIL / COND	23 MCF GAS @ 14.73 PSIA	24 BBLS WATER
BIERE										
1-22	08521047	0	22	28N	51E		Charles "C"	0	0	0
							PLUGGED AND ABANDONED 9-17-84			
							FINAL REPORT			

25 INVENTORY SUMMARY	BBLS OIL AND COND	MCF OF GAS	BBLS OF WATER
On Hand Start of Month	83		
Produced This Month	0	0	0
Sold This Month	0	0	
Spilled This Month	0		
Flared or Vented		0	
Used on Lease	0	0	
Injected	0	0	0
Surface Pits			0
Other	83 BS&W Tank Bottom	0	0

26. DISPOSITION INFORMATION	Bbls or MCF
BUYER Gerry	-0- Bbls.
TRANSPORTER Gerry	
BUYER	
TRANSPORTER	
BUYER	
TRANSPORTER	
BUYER	
TRANSPORTER	

NOTE: Separate production reports covering operations in each lease must be filed with the Helena office of the Board of Oil and Gas Conservation by the 20th day of each calendar month following the month covered by the report.

INITIAL PRODUCTION—(Continued)

Initial 10-day average production _____ (bbl./day) (if taken)
Pressures (if measured): Tubing 40 psi flowing; 700 psi shut-in
Casing 0 psi flowing; packer psi shut-in
Gravity 41 ° API (corrected to 60° F.)

DRILL STEM TESTS

D.S.T. No.	From	To	Tool Open (Min.)	Shut-In	F.P.	S.I.P.	Recovery	Cushion
1	4859	4985	60	1 hr	20	2486	120' VSM&O flected SW	
							1369' oil flected SW	0
2	5135	5177	120	2 hr	387	2514	180' SO&GCDM, 120' SWCO&GCDM	
							60' SMCW, 559' water, oil & gas tr,	
3	5785	5800	120	1 1/2 hr	417	2931	1140' gas, 400' oil, 120' MC oil, 160'	
							GO&M emul., 310' sulf. wtr.	

LOGS RUN

Type	Intervals From	Intervals To
laterolog-gamma	741	5840
neutron-density log	2800	5842
movable oil plot	4800	5840

FORMATION RECORD

From	To	SAMPLE AND CORE NO. AND DESCRIPTION	Top of Formation
		Judith River	698
		Eagle	1140
		Greenhorn	2343
		Muddy	2940
		Dakota Ss.	3196
		Swift	3654
		Rierdon	4102
		Piper Ls.	4361
		Amsden	4708
		Tyler	4840
		Otter	4992
		Kibbey Ss.	5154
		Kibbey Ls.	5288
		Charles	5446
		"B" Zone	5634
		Greenpoint Anhy.	5678
		"C" zone	5788
		T. D.	5845

Operator:	MESA PETROLEUM CO		
Well/Lease Name:	BIERE NW SW	First Production Date:	01/70
Well #:	1-22	Last Production Date:	08/84
Location:	22 28N 51E	Cum. Thru L. P. Date Oil:	155,544
State:	MT		
District:	001		
County:	ROOSEVELT	Gas Cum. Since Date:	01/73
Regulatory #:			
API #:	25-085-2104700		
Field:	POPLAR		
Reservoir:	MADISON		
Basin:	WILLISTON BASIN		
Gas Gatherer:			
Liquid Gatherer:	WESCO		
Status Date:	09/84		
Status:	P&A		

Received
Office of Enforcement
FEB 2[illegible] [illegible]
Compliance & Env. Justice

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Year	Oil Prod BBLS	Gas Prod MCF	Water BBLS	# of Wells	Days On	Allowables
1973	15,412		366,491	1		
1974	9,428		305,944	1		
1975	8,269		150,800	1		
1976	2,947		19,600	1		
1977	10,092		360,906	1		
1978	7,425		435,660	1		
1979	5,794		416,400	1		
1980	4,769		390,000	1		
1981	4,755		414,000	1		
1982	3,169		403,850	1		
1983	2,555		418,200	1	349	
1984	1,109		230,100	1	181	

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Date MO/YR	Oil Prod BBLS	BBLS /Day	Cum. Oil Prod. BBLS	Gas Prod MCF	Cum. Gas MCF	GOR SCF/BBLS	Water	% Water	# of Wells	Days On	Allowables
01/73	1,084	36	80,904				13,990	92.81	1		
02/73	1,741	57	82,645				35,786	95.36	1		
03/73	1,553	51	84,198				33,008	95.51	1		
04/73	1,536	51	85,734				34,140	95.69	1		
05/73	1,177	39	86,911				24,150	95.35	1		
06/73	950	31	87,861				18,013	94.99	1		
07/73	1,506	50	89,367				38,254	96.21	1		
08/73	1,287	42	90,654				38,254	96.75	1		
09/73	1,509	50	92,163				37,020	96.08	1		
10/73	644	21	92,807				12,380	95.06	1		
11/73	882	29	93,689				40,080	97.85	1		
12/73	1,543	51	95,232				41,416	96.41	1		
Totals	15,412						366,491				
01/74	1,108	36	96,340				41,416	97.39	1		
02/74	1,200	39	97,540				37,408	96.89	1		
03/74	1,134	37	98,674				41,416	97.33	1		
04/74	0	0	98,674				0		0		
05/74	0	0	98,674				0		0		
06/74	0	0	98,674				0		0		
07/74	0	0	98,674				0		0		
08/74	1,314	43	99,988				32,064	96.06	1		
09/74	1,289	42	101,277				40,080	96.88	1		
10/74	1,305	43	102,582				41,416	96.95	1		
11/74	768	25	103,350				30,728	97.56	1		
12/74	1,310	43	104,660				41,416	96.93	1		
Totals	9,428						305,944				
01/75	878	29	105,538				33,400	97.44	1		
02/75	869	29	106,407				34,736	97.56	1		
03/75	1,112	37	107,519				38,744	97.21	1		
04/75	61	2	107,580				3,840	98.44	1		
05/75	0	0	107,580				0		0		
06/75	1,241	41	108,821				40,080	97.00	1		
07/75	535	18	109,356				0	0.00	1		
08/75	0	0	109,356				0		0		
09/75	463	15	109,819				0	0.00	1		
10/75	1,222	40	111,041				0	0.00	1		
11/75	1,131	37	112,172				0	0.00	1		
12/75	757	25	112,929				0	0.00	1		
Totals	8,269						150,800				
01/76	469	15	113,398				0	0.00	1		
02/76	1,017	33	114,415				0	0.00	1		
03/76	454	15	114,869				0	0.00	1		
04/76	133	4	115,002				0	0.00	1		
05/76	0	0	115,002				0		0		
06/76	0	0	115,002				0		0		
07/76	0	0	115,002				0		0		
08/76	0	0	115,002				0		0		
09/76	0	0	115,002				0		0		
10/76	0	0	115,002				0		0		
11/76	0	0	115,002				0		0		
12/76	874	29	115,876				19,600	95.73	1		
Totals	2,947						19,600				
01/77	1,338	44	117,214				43,090	96.99	1		
02/77	1,242	41	118,456				37,828	96.82	1		
03/77	1,141	38	119,597				37,848	97.07	1		
04/77	1,037	34	120,634				36,300	97.22	1		
05/77	626	21	121,260				22,800	97.33	1		
06/77	411	14	121,671				14,440	97.23	1		
07/77	326	11	121,997				9,600	96.72	1		
08/77	1,048	34	123,045				35,450	97.13	1		
09/77	727	24	123,772				32,400	97.81	1		

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Date MO/YR	Oil Prod BBLS	BBLS /Day	Cum. Oil Prod. BBLS	Gas Prod MCF	Cum. Gas MCF	GOR SCF/BBLS	Water	% Water	# of Wells	Days On	Allowables
10/77	578	19	124,350				31,750	98.21	1		
11/77	818	27	125,168				30,900	97.42	1		
12/77	800	26	125,968				28,500	97.27	1		
Totals	10,092						360,906				
01/78	777	26	126,745				38,400	98.02	1		
02/78	643	21	127,388				34,700	98.18	1		
03/78	628	21	128,016				37,120	98.34	1		
04/78	692	23	128,708				37,450	98.19	1		
05/78	711	23	129,419				39,370	98.23	1		
06/78	557	18	129,976				36,400	98.49	1		
07/78	724	24	130,700				37,200	98.09	1		
08/78	616	20	131,316				37,200	98.37	1		
09/78	483	16	131,799				33,790	98.59	1		
10/78	470	15	132,269				31,200	98.52	1		
11/78	583	19	132,852				36,000	98.41	1		
12/78	541	18	133,393				36,830	98.55	1		
Totals	7,425						435,660				
01/79	629	21	134,022				37,200	98.34	1		
02/79	553	18	134,575				33,600	98.38	1		
03/79	563	19	135,138				37,200	98.51	1		
04/79	509	17	135,647				36,000	98.61	1		
05/79	527	17	136,174				37,200	98.60	1		
06/79	399	13	136,573				34,800	98.87	1		
07/79	461	15	137,034				37,200	98.78	1		
08/79	509	17	137,543				37,200	98.65	1		
09/79	492	16	138,035				33,600	98.56	1		
10/79	317	10	138,352				30,000	98.95	1		
11/79	495	16	138,847				36,000	98.64	1		
12/79	340	11	139,187				26,400	98.73	1		
Totals	5,794						416,400				
01/80	188	6	139,375				13,200	98.60	1		
02/80	452	15	139,827				32,400	98.62	1		
03/80	534	18	140,361				37,200	98.58	1		
04/80	463	15	140,824				34,800	98.69	1		
05/80	460	15	141,284				37,200	98.78	1		
06/80	328	11	141,612				31,200	98.96	1		
07/80	363	12	141,975				31,200	98.85	1		
08/80	441	15	142,416				37,200	98.83	1		
09/80	395	13	142,811				36,000	98.91	1		
10/80	268	9	143,079				26,400	99.00	1		
11/80	418	14	143,497				36,000	98.85	1		
12/80	459	15	143,956				37,200	98.78	1		
Totals	4,769						390,000				
01/81	487	16	144,443				37,200	98.71	1		
02/81	418	14	144,861				33,600	98.77	1		
03/81	476	16	145,337				37,200	98.74	1		
04/81	401	13	145,738				34,800	98.86	1		
05/81	378	12	146,116				33,600	98.89	1		
06/81	403	13	146,519				36,000	98.89	1		
07/81	442	15	146,961				37,200	98.83	1		
08/81	378	12	147,339				37,200	98.99	1		
09/81	186	6	147,525				19,200	99.04	1		
10/81	455	15	147,980				34,800	98.71	1		
11/81	337	11	148,317				36,000	99.07	1		
12/81	394	13	148,711				37,200	98.95	1		
Totals	4,755						414,000				
01/82	358	12	149,069				37,200	99.05	1		
02/82	206	7	149,275				24,000	99.15	1		
03/82	315	10	149,590				37,200	99.16	1		
04/82	329	11	149,919				36,000	99.09	1		

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Date MO/YR	Oil Prod BBLS	BBLS /Day	Cum. Oil Prod. BBLS	Gas Prod MCF	Cum. Gas MCF	GOR SCF/BBLS	Water	% Water	# of Wells	Days On	Allowables
05/82	327	11	150,246				37,200	99 13	1		
06/82	139	5	150,385				20,400	99.32	1		
07/82	265	9	150,650				33,600	99.22	1		
08/82	224	7	150,874				37,200	99.40	1		
09/82	252	8	151,126				36,000	99.30	1		
10/82	271	9	151,397				37,200	99.28	1		
11/82	210	7	151,607				32,200	99.35	1		
12/82	273	9	151,880				35,650	99.24	1		
Totals	3,169						403,850				
01/83	198	6	152,078				33,350	99.41	1	29	
02/83	243	8	152,321				32,200	99.25	1	28	
03/83	269	8	152,590				35,650	99.25	1	31	
04/83	194	6	152,784				27,600	99.30	1	30	
05/83	232	7	153,016				34,500	99.33	1	31	
06/83	212	7	153,228				39,200	99.46	1	30	
07/83	196	6	153,424				32,200	99.39	1	31	
08/83	223	7	153,647				39,200	99.43	1	28	
09/83	193	7	153,840				33,800	99.43	1	26	
10/83	163	5	154,003				36,400	99.55	1	28	
11/83	222	7	154,225				37,700	99.41	1	29	
12/83	210	7	154,435				36,400	99.43	1	28	
Totals	2,555						418,200			349	
01/84	171	5	154,606				39,000	99.56	1	30	
02/84	219	7	154,825				37,700	99.42	1	29	
03/84	129	4	154,954				40,300	99.68	1	31	
04/84	182	6	155,136				39,000	99.54	1	30	
05/84	187	6	155,323				39,000	99.52	1	30	
06/84	170	6	155,493				35,100	99.52	1	27	
07/84	14	4	155,507				0	0.00	1	3	
08/84	37	37	155,544				0	0.00	1	1	
09/84	0	0	155,544				0		0	0	
10/84	0	0	155,544				0		0	0	
11/84	0	0	155,544				0		0	0	
12/84	0	0	155,544				0		0	0	
Totals	1,109						230,100			181	

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Api Number	Well Number	Well Type	Latitude	Longitude	Lat/Long Source	Dwights Well ID
25-085-2104700	1-22	O&G	48.163120	105.1259920		R8220750

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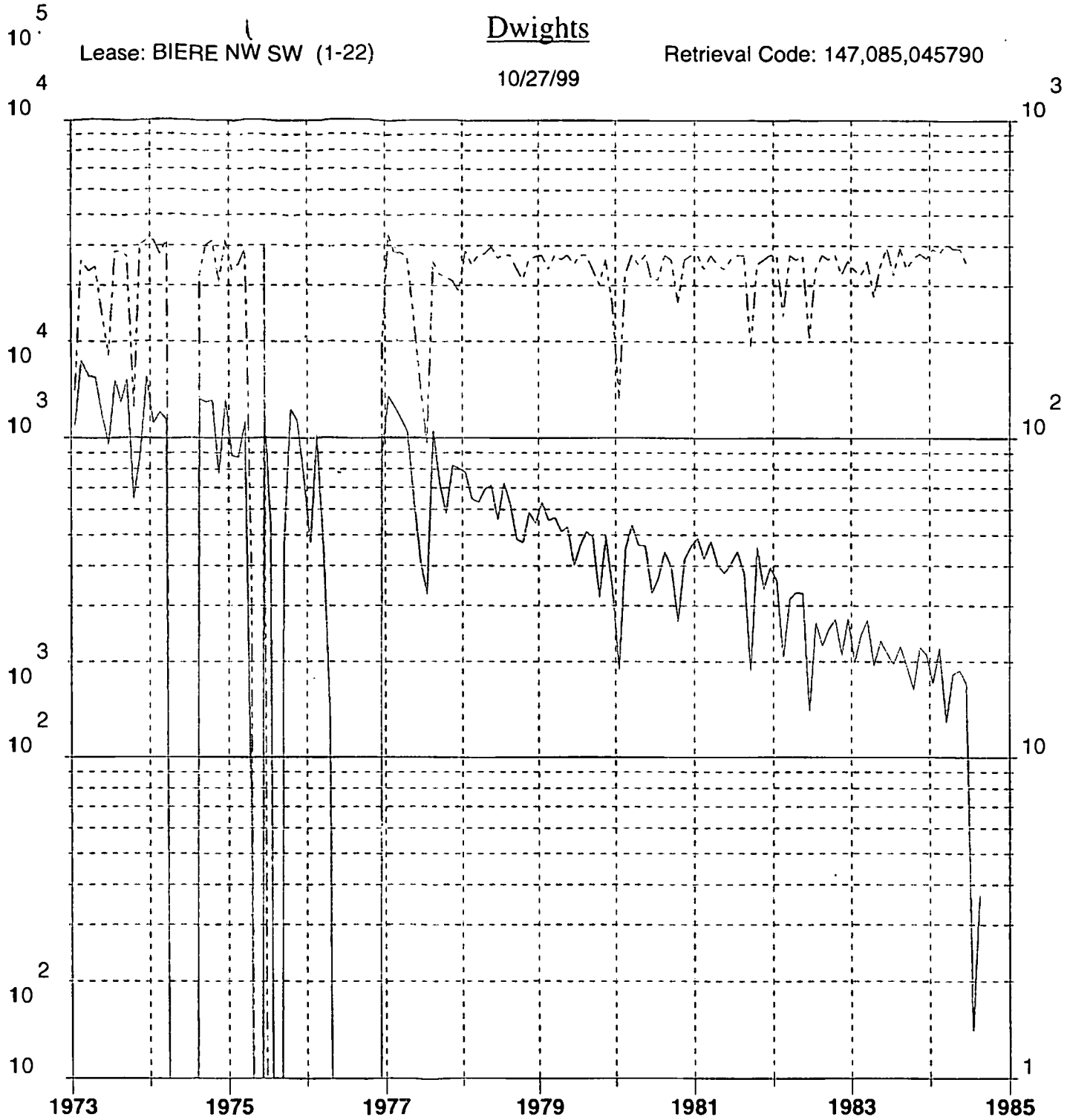
WSN	UWI (APINum)	Operator	Well Number	WELL BHTUNCOR.P	WELL CUMOIL	WELL CUMGAS	WELL CUMWTR	Township	Range	Section
49	250850500900	AJAX OIL & GAS CORP INC	1	169				28N	51E	33
48	250850501100	MURPHY ET AL	63	187				28N	51E	27
43	250850501200	MURPHY OIL USA INC	72					28N	51E	22
46	250850501400	MURPHY & ASSOC INC	55	164	48216	186	2785142	28N	51E	23
44	250850501600	MURPHY C H & CO	3-G					28N	51E	23
45	250850501700	MURPHY C H & CO	26	221				28N	51E	23
31	250850501900	MURPHY C H & CO	22	182	13190	0	882690	28N	51E	14
29	250850502000	MURPHY OIL USA INC	74	184				28N	51E	13
34	250850502100	MURPHY OIL USA INC	104	161	122532	507	8476835	28N	51E	14
36	250850502400	MURPHY OIL USA INC	32	210	6263	80	475917	28N	51E	15
30	250850502500	MURPHY C H & CO	20	134	234522	247	6936596	28N	51E	14
52	250850502600	MURPHY C H & CO	2	173				28N	52E	18
32	250850502700	MURPHY C H & CO	101		1686	0	95147	28N	51E	14
33	250850502701	MURPHY EXPL & PROD CO	101					28N	51E	14
37	250850502900	THOMAS C C	1	137				28N	51E	16
24	250850503000	MURPHY OIL USA INC	9	182	126934	542	798297	28N	51E	11
26	250850503100	MURPHY OIL USA INC	100	186	147075	807	555619	28N	51E	11
27	250850503200	MURPHY C H & CO	24	212	41470	726	546853	28N	51E	12
15	250850503400	MURPHY OIL USA INC	6	216	96673	286	7463060	28N	51E	10
18	250850503700	THOMAS C C	2		1684322	0	3243585	28N	51E	10
28	250850503800	MURPHY CO INC	61	195				28N	51E	12
17	250850503900	THOMAS C C	1	183	30362	74	1451466	28N	51E	10
23	250850504100	MURPHY OIL USA INC	7		265633	424	4322817	28N	51E	11
13	250850504300	MURPHY ET AL	67	187				28N	51E	9
16	250850504400	MURPHY C H & CO	11		174031	1016	751623	28N	51E	10
25	250850504500	MURPHY C H & CO	15		121896	493	1362762	28N	51E	11
19	250850504600	THOMAS C C	3		113646	0	304488	28N	51E	10
20	250850504700	THOMAS C C	4	198				28N	51E	10
9	250850504800	MURPHY C H & CO	14	150	607	0	8065	28N	51E	3
7	250850505000	MURPHY OIL USA INC	17	172	21410	384	824446	28N	51E	2
6	250850505100	MURPHY OIL USA INC	5		233029	965	3324256	28N	51E	2
2	250850505200	MURPHY C H & CO	76	180				28N	51E	1
12	250850505300	MURPHY C H & CO	59	97				28N	51E	4
10	250850505400	MURPHY C H & CO	80	177				28N	51E	3
3	250850505500	MURPHY OIL USA INC	99	180				28N	51E	1
8	250850505600	MURPHY C H & CO	18	184	100062	212	4179795	28N	51E	2
1	250850505700	MURPHY C H & CO	3	182	8	0	0	28N	51E	1
5	250850505800	MURPHY C H & CO	1		144472	463	7991396	28N	51E	2
11	250850505900	MURPHY & ASSOC INC	45	168	4	0	0	28N	51E	4
129	250850506000	MURPHY OIL USA INC	52	187				29N	51E	35
120	250850506100	MURPHY OIL USA INC	39	169	121231	745	5918976	29N	51E	32
124	250850506200	MURPHY OIL USA INC	85	179	41512	557	2051650	29N	51E	33
123	250850506400	MURPHY CO INC	16	178	23184	187	783308	29N	51E	33
127	250850506500	MURPHY OIL USA INC	88	168	117447	517	7671890	29N	51E	34
118	250850506700	MURPHY OIL USA INC	102	189	64339	169	6608505	29N	51E	31
117	250850506900	MURPHY OIL USA INC	77		92017	7902	917350	29N	51E	31
119	250850507100	MURPHY OIL USA INC	36	176	127	0	0	29N	51E	32
125	250850507200	MURPHY OIL USA INC	86	183				29N	51E	33
126	250850507300	MURPHY ET AL	66	171	218029	1412	696832	29N	51E	34
121	250850507500	MURPHY ET AL	2-G					29N	51E	33
116	250850507600	MURPHY ET AL	69	186	54811	536	2589930	29N	51E	31
128	250850507700	MURPHY OIL USA INC	89	169	1124	0	21484	29N	51E	34
130	250850507800	WILLIAMS & WAGNER	1	177				29N	51E	36

Dwights

Lease: BIERE NW SW (1-22)

Retrieval Code: 147,085,045790

10/27/99



Oil (bbl/mo)

Water (bbl/mo)

Gas (mcf/mo)

County: ROOSEVELT, MT	F.P. Date: 01/70
Field: POPLAR	Oil Cum: 155.5 mbbl
Reservoir: MADISON	Gas Cum: 0 mcf
Operator: MESA PETROLEUM	Location: 22 28N 51E

WSN	UWI (APINum)	Operator	Well Number	WELL BHTUNCOR.P	WELL CUMOIL	WELL CUMGAS	WELL CUMWTR	Township	Range	Section
65	250850507900	MURPHY ET AL	46	168				29N	50E	25
110	250850508100	MURPHY C H & CO	31	166	140568	710	1602803	29N	51E	30
105	250850508300	MURPHY C H & CO	28	200	20591	566	353303	29N	51E	29
112	250850508500	MURPHY C H & CO	70	187	367908	3352	1881903	29N	51E	30
107	250850508900	MURPHY C H & CO	78	185	938	0	47380	29N	51E	29
114	250850509100	MURPHY OIL USA INC	106	186	44426	0	1601306	29N	51E	30
103	250850509200	MURPHY ET AL	5-G					29N	51E	29
106	250850509501	MURPHY OIL USA INC	60		55237	434		29N	51E	29
104	250850509700	MURPHY & ASSOC INC	25	186				29N	51E	29
100	250850509800	MURPHY OIL USA INC	51	208				29N	51E	27
111	250850509900	MURPHY OIL USA INC	56	208	347721	706	1001235	29N	51E	30
113	250850510100	MURPHY OIL USA INC	105	190	245747	1821	373688	29N	51E	30
86	250850510300	MURPHY OIL USA INC	19	183	143	0	15277	29N	51E	19
64	250850510400	MURPHY C H & CO	23		7065	189	4	29N	50E	24
97	250850510500	MURPHY OIL USA INC	47	215				29N	51E	21
92	250850510600	MURPHY OIL USA INC	21	200	123089	642	9674789	29N	51E	20
63	250850510700	AJAX	1	211				29N	50E	23
88	250850510800	MURPHY C H & CO	92	183	4616	0	132860	29N	51E	19
99	250850510900	MURPHY CO INC	96	170	21495	446	822214	29N	51E	21
91	250850511000	MURPHY OIL USA INC	109	183				29N	51E	19
90	250850511200	MURPHY & ASSOC INC	107	159	63163	200	1577415	29N	51E	19
94	250850511400	MURPHY & ASSOC INC	90	180	67135	840	359132	29N	51E	20
96	250850511500	MURPHY OIL USA INC	38	163	40915	15553	2051407	29N	51E	21
89	250850511600	MURPHY & ASSOC INC	93					29N	51E	19
93	250850511700	MURPHY OIL USA INC	84		95408	1150	3079532	29N	51E	20
87	250850511800	MURPHY & ASSOC INC	27	176	119995	576	2689126	29N	51E	19
98	250850512000	MURPHY C H & CO	62	172	13460	392	501430	29N	51E	21
81	250850512100	MURPHY OIL USA INC	98	174	15532	220	604914	29N	51E	17
62	250850512500	MURPHY OIL USA INC	75	170				29N	50E	13
82	250850512600	MURPHY OIL USA INC	33	178				29N	51E	18
73	250850513000	ASHLAND OIL & REFG CO	1	173				29N	51E	16
78	250850513400	MURPHY OIL USA INC	34					29N	51E	17
61	250850513500	MURPHY OIL USA INC	54		23855	682	767871	29N	50E	13
83	250850513600	MURPHY OIL USA INC	37	152				29N	51E	18
74	250850513700	MURPHY OIL USA INC	6					29N	51E	16
60	250850513800	MURPHY OIL USA INC	48	147	63661	18	3720158	29N	50E	13
84	250850513900	MURPHY OIL USA INC	94	164	4	0	0	29N	51E	18
76	250850514200	MURPHY C H & CO	49	178				29N	51E	16
79	250850514400	MURPHY OIL USA INC	40	186				29N	51E	17
75	250850514500	EMPIRE STATE OIL CO	7					29N	51E	16
77	250850514600	WAGNER M R	1	211				29N	51E	16
67	250850515000	MURPHY C H & CO	73		55346	445	1283062	29N	51E	7
56	250850515100	MURPHY CO INC	71	182				29N	50E	12
57	250850515400	MURPHY OIL USA INC	95	151	1632	0	0	29N	50E	12
53	250850515600	AJAX DRLG CO	1	146				29N	50E	10
72	250850515800	DEEP ROCK OIL ETAL	1	167				29N	51E	8
66	250850516300	MURPHY OIL USA INC	65	186	1033	0	137383	29N	51E	7
71	250850516400	BROOKS & SULLIVAN	1	222				29N	51E	8
59	250850516700	RICHFIELD OIL CORP	1	154				29N	50E	12
68	250850516800	RICHFIELD OIL CORP	1		457999	59498	2375183	29N	51E	7
69	250850516900	RICHFIELD OIL CO OF MONT	2					29N	51E	7
58	250850517000	RICHFIELD OIL CORP	1	170	268468	785	1867055	29N	50E	12
70	250850517500	RICHFIELD OIL CO OF MONT	3	165				29N	51E	7
21	250850537400	POLUMBUS E A	4A		94875	27234	721081	28N	51E	10
22	250850537401	POLUMBUS CORP THE	4A					28N	51E	10

Niska EPU 110-X

Poplar unit field miles.

Decline curve Bim 1-22!

1970 -	June	217
	7	7316
	8	7881
	9	6460
	10	~~4623~~ 6167
	11	4623
	12	5277
		37,941
1971	1	4656
	2	3812
	3	3274
	4	2475
	5	4116
	6	2743
	7	3187
	8	2099
	9	2904
	10	2886
	11	2036
	12	1433
		35,621
1972	1	1871
	2	2314
	3	2070
	4	~~3442~~ 1789
	5	2069
	6	1903
	7	1842
	8	~~2029~~
	9	2029
	10	2001
	11	1872
	12	1938
		21,698
1973	1	1085
	2	1741
	3	1553
	4	1537
	5	1177
	6	~~1507~~
	7	1507
	8	1287
	9	1510
	10	645
	11	883
	12	[illegible]

1974	1	1108
	2	1200
	3	1135
	4	51
	5	51
	6	51
	7	51
	8	1315
	9	1290
	10	1306
	11	768
	12	~~4~~ 1311
		9,433
1975	1	878
	2	869
	3	1113
	4	61
	5	51
	6	1241
	7	436
	8	218
	9	433
	10	1222
	11	1131
	12	613
		8,215
1976	1	469
	2	1017
	3	454
	4	133
	5	51
	6	51
	7	51
	8	51
	9	51
	10	51
	11	51
	12	874
		2,947

1977	1	1338
	2	1242
	3	1141
	4	1037
	5	626
	6	411
	7	326
	8	1048
	9	727
	10	578
	11	818
	12	800
		10,092

1980	1	188
	2	452
	3	534
	4	463
	5	460
	6	322
	7	363
	8	2,782
	9	
	10	
	11	
	12	

1978	1	777
	2	643
	3	628
	4	692
	5	711
	6	557
	7	724
	8	616
	9	483
	10	470
	11	583
	12	541
		7,425

1979	1	629
	2	553
	3	563
	4	509
	5	526
	6	399
	7	461
	8	509
	9	492
	10	317
	11	495
	12	340
		5,793

EAST Poplar

		U-20	U-22	U-26	U-32	U-55
1955	12	4384/8171	91/368	1345/5400	29/261	822/203
	11	1847/2354	95/855	971/2766	321/1284	2068/132
	10	2313/4002	78/711	1236/5024	356/2224	2143/139
	9	1626/3064	64/585	1106/3366	136/1251	
	8	1063/2017	75/693	859/1866	190/1305	1971/37.
	7	1913/3963	122/837	1684/4009	202/1854	2218/23.
	6	2835/5332.	485/625	2346/5546	930/5338	1035/11
	5	4042/8708	341/1961	3067/7257	846/4862	
	4	4946/6901	139/10629	3709/9745	830/4754	
	3	2214/2602	193/1094	3072/6545	0/0.	
	2	6204/18759	138/730	1992/2888	270/1088	
	1	8049/27060	383/3115	1937/9496	168/1032	

1954	12-	8542/27265	562/1698	2158/9913	695/3967
	11	5296/4371	0/0	1523/1732	452/3344
	10	8416/5714	37/89	2967/10122	720/4511
	~~9~~	~~214/219~~			
	9-	8858/9077	214/219	3180/5316	327/1902
	8	9996/4831	0/0	2229/2913	10/327
	7	5831/3228	342/1686	2210/3139	102/941
	6	6883/3362	730/668	3240/2806	181/1658
	5	7753/3498	737/6743	1761/1192	174/1588
	4	5056/-	659/-	0	—
	3	9510/5288	822/4624	1953/1295	—
	2	2055/519	553/1689	2564/1174	—
	1	288/59	35/95	279/151	

Dwight's Energydata Inc.
Rocky Mountain
Montana Oil

Run Date: 10/27/99
Published 9/99
(#147,085,045790)

Operator:	MESA PETROLEUM CO		
Well/Lease Name:	BIERE NW SW	First Production Date:	01/70
Well #:	1-22	Last Production Date:	08/84
Location:	22 28N 51E	Cum. Thru L. P. Date Oil:	155,544
State:	MT		
District:	001		
County:	ROOSEVELT	Gas Cum. Since Date:	01/73
Regulatory #:			
API #:	25-085-2104700		
Field:	POPLAR		
Reservoir:	MADISON		
Basin:	WILLISTON BASIN		
Gas Gatherer:			
Liquid Gatherer:	WESCO		
Status Date:	09/84		
Status:	P&A		

Received
Office of Enforcement
FEB 2 5 2000
Compliance & Env. Justice

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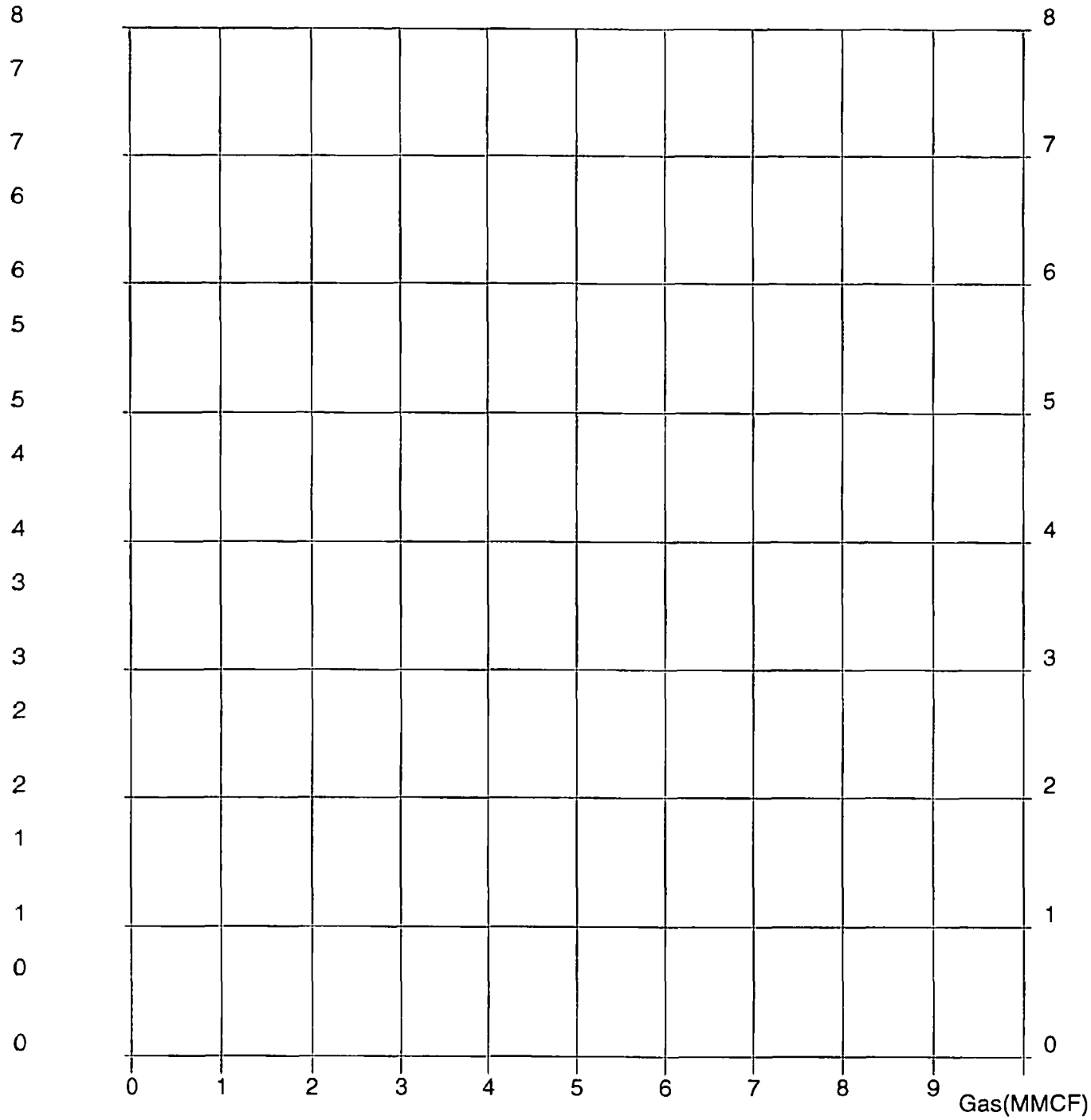
Dwights

Lease: BIERE NW SW (1-22)

Retrieval Code: 147,085,045790

10/27/99



WHSIP

WHFP

County: ROOSEVELT, MT	F.P. Date: 01/70
Field: POPLAR	Oil Cum: 155.5 mbbl
Reservoir: MADISON	Gas Cum: 0 mcf
Operator: MESA PETROLEUM	Location: 22 28N 51E

BHP/Z

DWIGHTS ENERGYDATA, INC.
OIL LEASE HISTORY
MONTANA OIL

RUN DATE: 10/27/99
Published 9/99
(#147,085,045790)

OPERATOR (#471075)	WELL NAME	WELL #
MESA PETROLEUM CO	BIERE NW SW	1-22

LOCATION	STATE	DIST	COUNTY (#085)
22 28N 51E	MT	001	ROOSEVELT

API #	FIELD (#11175)	RESERVOIR
25-085-2104700	POPLAR	MADISON

TOTAL DEPTH	UPPER PERF	LOWER PERF	GAS GATH	LIQ GATH	GAS GRAV	LIQ GRAV	TEMP GRAD
				WESCO			

COMP DATE	1ST PROD DATE	LAST PROD DATE	STATUS DATE	STATUS
	7001	8408	8409	P&A

BEG LIQ CUM	BEG GAS CUM
79820	

CUM THRU LPD OIL/BBLS	OIL CUM SINCE DATE
155544	FPDAT

Year	Oil Prod BBLS	Gas Prod MCF	Water BBLS	# of Wells	Days On	Allowables
1973	15,412		366,491	1		
1974	9,428		305,944	1		
1975	8,269		150,800	1		
1976	2,947		19,600	1		
1977	10,092		360,906	1		
1978	7,425		435,660	1		
1979	5,794		416,400	1		
1980	4,769		390,000	1		
1981	4,755		414,000	1		
1982	3,169		403,850	1		
1983	2,555		418,200	1	349	
1984	1,109		230,100	1	181	

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Date MO/YR	Oil Prod BBLS	BBLS /Day	Cum. Oil Prod. BBLS	Gas Prod MCF	Cum. Gas MCF	GOR SCF/BBLS	Water	% Water	# of Wells	Days On	Allowables
01/73	1,084	36	80,904				13,990	92.81	1		
02/73	1,741	57	82,645				35,786	95.36	1		
03/73	1,553	51	84,198				33,008	95.51	1		
04/73	1,536	51	85,734				34,140	95.69	1		
05/73	1,177	39	86,911				24,150	95.35	1		
06/73	950	31	87,861				18,013	94.99	1		
07/73	1,506	50	89,367				38,254	96.21	1		
08/73	1,287	42	90,654				38,254	96.75	1		
09/73	1,509	50	92,163				37,020	96.08	1		
10/73	644	21	92,807				12,380	95.06	1		
11/73	882	29	93,689				40,080	97.85	1		
12/73	1,543	51	95,232				41,416	96.41	1		
Totals	15,412						366,491				
01/74	1,108	36	96,340				41,416	97.39	1		
02/74	1,200	39	97,540				37,408	96.89	1		
03/74	1,134	37	98,674				41,416	97.33	1		
04/74	0	0	98,674				0		0		
05/74	0	0	98,674				0		0		
06/74	0	0	98,674				0		0		
07/74	0	0	98,674				0		0		
08/74	1,314	43	99,988				32,064	96.06	1		
09/74	1,289	42	101,277				40,080	96.88	1		
10/74	1,305	43	102,582				41,416	96.95	1		
11/74	768	25	103,350				30,728	97.56	1		
12/74	1,310	43	104,660				41,416	96.93	1		
Totals	9,428						305,944				
01/75	878	29	105,538				33,400	97.44	1		
02/75	869	29	106,407				34,736	97.56	1		
03/75	1,112	37	107,519				38,744	97.21	1		
04/75	61	2	107,580				3,840	98.44	1		
05/75	0	0	107,580				0		0		
06/75	1,241	41	108,821				40,080	97.00	1		
07/75	535	18	109,356				0	0.00	1		
08/75	0	0	109,356				0		0		
09/75	463	15	109,819				0	0.00	1		
10/75	1,222	40	111,041				0	0.00	1		
11/75	1,131	37	112,172				0	0.00	1		
12/75	757	25	112,929				0	0.00	1		
Totals	8,269						150,800				
01/76	469	15	113,398				0	0.00	1		
02/76	1,017	33	114,415				0	0.00	1		
03/76	454	15	114,869				0	0.00	1		
04/76	133	4	115,002				0	0.00	1		
05/76	0	0	115,002				0		0		
06/76	0	0	115,002				0		0		

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Date MO/YR	Oil Prod BBLS	BBLS /Day	Cum. Oil Prod. BBLS	Gas Prod MCF	Cum. Gas MCF	GOR SCF/BBLS	Water	% Water	# of Wells	Days On	Allowables
01/73	1,084	36	80,904				13,990	92.81	1		
02/73	1,741	57	82,645				35,786	95.36	1		
03/73	1,553	51	84,198				33,008	95.51	1		
04/73	1,536	51	85,734				34,140	95.69	1		
05/73	1,177	39	86,911				24,150	95.35	1		
06/73	950	31	87,861				18,013	94.99	1		
07/73	1,506	50	89,367				38,254	96.21	1		
08/73	1,287	42	90,654				38,254	96.75	1		
09/73	1,509	50	92,163				37,020	96.08	1		
10/73	644	21	92,807				12,380	95.06	1		
11/73	882	29	93,689				40,080	97.85	1		
12/73	1,543	51	95,232				41,416	96.41	1		
Totals	15,412						366,491				
01/74	1,108	36	96,340				41,416	97.39	1		
02/74	1,200	39	97,540				37,408	96.89	1		
03/74	1,134	37	98,674				41,416	97.33	1		
04/74	0	0	98,674				0		0		
05/74	0	0	98,674				0		0		
06/74	0	0	98,674				0		0		
07/74	0	0	98,674				0		0		
08/74	1,314	43	99,988				32,064	96.06	1		
09/74	1,289	42	101,277				40,080	96.88	1		
10/74	1,305	43	102,582				41,416	96.95	1		
11/74	768	25	103,350				30,728	97.56	1		
12/74	1,310	43	104,660				41,416	96.93	1		
Totals	9,428						305,944				
01/75	878	29	105,538				33,400	97.44	1		
02/75	869	29	106,407				34,736	97.56	1		
03/75	1,112	37	107,519				38,744	97.21	1		
04/75	61	2	107,580				3,840	98.44	1		
05/75	0	0	107,580				0		0		
06/75	1,241	41	108,821				40,080	97.00	1		
07/75	535	18	109,356				0	0.00	1		
08/75	0	0	109,356				0		0		
09/75	463	15	109,819				0	0.00	1		
10/75	1,222	40	111,041				0	0.00	1		
11/75	1,131	37	112,172				0	0.00	1		
12/75	757	25	112,929				0	0.00	1		
Totals	8,269						150,800				
01/76	469	15	113,398				0	0.00	1		
02/76	1,017	33	114,415				0	0.00	1		
03/76	454	15	114,869				0	0.00	1		
04/76	133	4	115,002				0	0.00	1		
05/76	0	0	115,002				0		0		
06/76	0	0	115,002				0		0		

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Date MO/YR	Oil Prod BBLS	BBLS /Day	Cum. Oil Prod. BBLS	Gas Prod MCF	Cum. Gas MCF	GOR SCF/BBLS	Water	% Water	# of Wells	Days On	Allowables
07/76	0	0	115,002				0		0		
08/76	0	0	115,002				0		0		
09/76	0	0	115,002				0		0		
10/76	0	0	115,002				0		0		
11/76	0	0	115,002				0		0		
12/76	874	29	115,876				19,600	95.73	1		
Totals	2,947						19,600				
01/77	1,338	44	117,214				43,090	96.99	1		
02/77	1,242	41	118,456				37,828	96.82	1		
03/77	1,141	38	119,597				37,848	97.07	1		
04/77	1,037	34	120,634				36,300	97.22	1		
05/77	626	21	121,260				22,800	97.33	1		
06/77	411	14	121,671				14,440	97.23	1		
07/77	326	11	121,997				9,600	96.72	1		
08/77	1,048	34	123,045				35,450	97.13	1		
09/77	727	24	123,772				32,400	97.81	1		
10/77	578	19	124,350				31,750	98.21	1		
11/77	818	27	125,168				30,900	97.42	1		
12/77	800	26	125,968				28,500	97.27	1		
Totals	10,092						360,906				
01/78	777	26	126,745				38,400	98.02	1		
02/78	643	21	127,388				34,700	98.18	1		
03/78	628	21	128,016				37,120	98.34	1		
04/78	692	23	128,708				37,450	98.19	1		
05/78	711	23	129,419				39,370	98.23	1		
06/78	557	18	129,976				36,400	98.49	1		
07/78	724	24	130,700				37,200	98.09	1		
08/78	616	20	131,316				37,200	98.37	1		
09/78	483	16	131,799				33,790	98.59	1		
10/78	470	15	132,269				31,200	98.52	1		
11/78	583	19	132,852				36,000	98.41	1		
12/78	541	18	133,393				36,830	98.55	1		
Totals	7,425						435,660				
01/79	629	21	134,022				37,200	98.34	1		
02/79	553	18	134,575				33,600	98.38	1		
03/79	563	19	135,138				37,200	98.51	1		
04/79	509	17	135,647				36,000	98.61	1		
05/79	527	17	136,174				37,200	98.60	1		
06/79	399	13	136,573				34,800	98.87	1		
07/79	461	15	137,034				37,200	98.78	1		
08/79	509	17	137,543				37,200	98.65	1		
09/79	492	16	138,035				33,600	98.56	1		
10/79	317	10	138,352				30,000	98.95	1		
11/79	495	16	138,847				36,000	98.64	1		
12/79	340	11	139,187				26,400	98.73	1		

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Date MO/YR	Oil Prod BBLS	BBLS /Day	Cum. Oil Prod. BBLS	Gas Prod MCF	Cum. Gas MCF	GOR SCF/BBLS	Water	% Water	# of Wells	Days On	Allowables
05/83	232	7	153,016				34,500	99.33	1	31	
06/83	212	7	153,228				39,200	99.46	1	30	
07/83	196	6	153,424				32,200	99.39	1	31	
08/83	223	7	153,647				39,200	99.43	1	28	
09/83	193	7	153,840				33,800	99.43	1	26	
10/83	163	5	154,003				36,400	99.55	1	28	
11/83	222	7	154,225				37,700	99.41	1	29	
12/83	210	7	154,435				36,400	99.43	1	28	
Totals	2,555						418,200			349	
01/84	171	5	154,606				39,000	99.56	1	30	
02/84	219	7	154,825				37,700	99.42	1	29	
03/84	129	4	154,954				40,300	99.68	1	31	
04/84	182	6	155,136				39,000	99.54	1	30	
05/84	187	6	155,323				39,000	99.52	1	30	
06/84	170	6	155,493				35,100	99.52	1	27	
07/84	14	4	155,507				0	0.00	1	3	
08/84	37	37	155,544				0	0.00	1	1	
09/84	0	0	155,544				0		0	0	
10/84	0	0	155,544				0		0	0	
11/84	0	0	155,544				0		0	0	
12/84	0	0	155,544				0		0	0	
Totals	1,109						230,100			181	

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Api Number	Well Number	Well Type	Latitude	Longitude	Lat/Long Source	Dwights Well ID
25-085-2104700	1-22	O&G				R8220750

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Dwights Discover CD-ROM ID: R-822077-0 Original
Copyright 1999 Rockies Run Date: 27-Oct-99

State : Montana MT Merid 28N - 51E - 22 nw sw

County: ROOSEVELT Oper: MESA PETROLEUM CO

Field : POPLAR Compl: 07/09/1970 SP DISP

Well: BIERE #1-W Last Info: 03/04/1991
Ftg: 1750 fsl 140 fwl
Lat-Long by TDG: 48.162506 - 105.128113
Obj: Judith River ss Permit #: 06/18/1970 API: 25-085-2104900
Elev: 2087KB

Spud: 06/24/1970
TD: 998 PB: 950

Casing: 8 5/8 @ 998 w/500
DST : None
Logs : GR-Neu
Tubing: 2 1/2 @ 790
Perfs : 796-800
w/9 JSPF - acid w/500 gal 15% HCL
804-808
w/9 JSPF
812-820
w/17 JSPF
825-834
w/19 JSPF

Dwights Discover CD-ROM ID: R-822075-0 Original
Copyright 1999 Rockies Run Date: 27-Oct-99

State : Montana MT Merid 28N - 51E - 22 c nw sw

County: ROOSEVELT Oper: MESA PETROLEUM CO

Field : POPLAR Compl: 06/08/1970 D OG O&G

Well: BIERE #1-22 Last Info: 04/13/1988
Ftg: 1980 fsl 660 fwl
Lat-Long by TDG: 48.163132 - 105.125992
Obj: 5900 Charles Permit #: 05/06/1970 API: 25-085-2104700
Elev: 2086KB

Spud: 05/06/1970
TD: 5845 on 06/08/1970 PB: 5803

Elev: 2086KB FORMATION TOPS (Type: L=Log S=Sample V=True Vertical)
(Source: H=Dwights,I=IOG,T=Govt,S=Shell,U=USGS,R=NRIS
M=Munger,N=NDGS,B=Boyd,G=GDS,X=Proprietary)

Formation	Depth	Elev	T/S	Formation	Depth	Elev	T/S
Judith River	698	1388	L T	Tyler	4840	-2754	L T
Eagle	1140	946	L T	Otter	4992	-2906	L T
Greenhorn	2343	-257	L T	Kibbey ss	5154	-3068	L T
Muddy	2940	-854	L T	Kibbey ls	5288	-3202	L T
Dakota ss	3196	-1110	L T	Charles	5446	-3360	L T
Swift	3654	-1568	L T	B zn	5634	-3548	L T
Rierdon	4102	-2016	L T	Greenpoint anhy	5678	-3592	L T
Piper ls	4361	-2275	L T	TD	5845	-3759	L T
Amsden	4708	-2622	L T				

Notes : (Plugged & abandoned September 1984)

DST : #1 4859- 4885 (Tyler)
op 15 si 30 op 60 si 60. IF op w/wk blo, incr to strng/7 min; FF op w/fr blo, incr to strng/5 min & held. Rec 120 ft VSMCSW w/oil flecks 1369 ft SW w/oil flecks; Smplr: tr oil 2150 cc wtr (Rw .023 ohms @ 95 F, 12,000 ppm Cl). HP 2557-2543 FP 72-201 201-601 SIP 2500-2486 BHT 216F
#2 5135- 5175 (Kibbey)
op 15 si 90 op 15 si 15 op 120 si 120. IF op w/1 in blo; 2F op w/1 in blo, FF op w/wk blo, incr to 4 in/70 min, decr to end. Rec 180 ft SO&GCDM 120 ft SWC&O&GCDM 60 ft SMCW w/tr O&G 559 ft SO&GCW; Smplr: tr gas @ 16 psi 100 cc oil 2050 cc wtr (Rw 1.1 ohms @ 90 F, 4000 ppm Cl). HP 2876-2731 FP 26-115 143-186 195-387 SIP 2600-2355-2514 BHT 218 F
#3 5785- 5800 (Charles)
op 15 si 30 op 120 si 90. IF op w/1/2 in blo, incr to strng/10 min; FF op w/1/2 in blo, incr to strng/20 min & held. Rec 400 ft oil 120 ft MCO160 ft GOM emuls 310 ft wtr 1140 ft gas; Smplr: .1 CFG @ 50 psi 800 cc oil 1400 cc wtr (Rw .31 ohms @ 90 F, 17,500 ppm Cl). HP 3391-3368 FP 23-140 140-396 SIP 2956-2933

<< State Records >>
Casing: 8 5/8 @ 741 w/465 - 5 1/2 @ 5845 w/675
Logs : LL-G N-DL MOP
Tubing: 2 7/8 @ 5767

Continued

State : Montana MT Merid 28N - 51E - 22 c nw sw

County: ROOSEVELT Oper: MESA PETROLEUM CO

Field : POPLAR Compl: 06/08/1970 D OG O&G

Continued

Perfs : 5788-5805 (Charles C)
- acid w/2000 gal 7 1/2% HCL
PZone : 5788-5805 (Charles C)
IP : F 516 BOPD grav 41, 150 GMCFPD 966 BWPD

PRODUCTION &
INJECTION DATA

SURFACE EQUIPMENT

PLUGGING &
ABANDONMENT

Location Of Tank Battery & Pipeline Information

All wells on the Biere lease were plugged & abandoned in 1984. A relief well was drilled to 900' in 1985 to pump cement again into Biere 1-22 well.

The relief well was located 25' NNE of Biere #1-22. This relief well was plugged and abandoned in 1985 as per Mesa's well records.

All surface equipment was removed in 1989 as per information from Mesa Petroleum.

Currently, there are no records in Pioneer's files as to tank battery location, equipment nor any information as to the old pit location's.

Pioneer will continue efforts to locate tank battery, pipelines & old pit location's.

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Office of Enforcement
FEB 2 [illegible]
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Office of Enforcement
FEB 2 [illegible]
Compliance & Env. Justice

ADDITION TO WELL RECORD

505-632-3584

BIERE #1-22 Producer

OPERATOR:	MESA	OP NO.:	04-MT-0399-01
PROSPECT:	SYNDER SW POPULAR	ID NO.:	01-04-MT-0399-0001-000-0
LOCATION:	SEC 22-T28N-R51E	TYPE WELL:	ABANDONMENT
COUNTY, STATE:	ROOSEVELT CO., MT	CASING:	8 5/8" @ 741'
MESA WI:	43.33%	CASING:	5 1/2" @ 5,845'
AFE NO.:	A4-016		
AFE COST:	$30,100		

RECEIVED

SEP 24 1984

9/11/84
PO: Prep to release pkr & POH w/tbg

MI & RU WellTech PU @ 0900 hrs, 9-10-84. Set pumps & pits @ 1400 hrs. Loaded pits w/wtr & SDON.

CWC $1,740

9/12/84
PO: Prep to mix 14 ppg mud & attempt to kill well

Mixed 100 BSW w/10.5 ppg mud. Pumped 25 bbls down tbg & killed well. Attempted to ND wellhead. Well flowed up csg @ 9 BWPH @ 50 psi. Pumped 75 bbls down csg, but was unable to kill well. Well flowed back 36 BW, no gas & light trace of oil. SION.

CWC $3,924

9/13/84
PO: Prep to kill well & POH w/pkr & tbg

WO for truck (4 hrs) to haul 125 BSW to location. Mixed 10.9 ppg mud (42 vis). Pumped 30 bbls 10.9 ppg mud down csg in unsuccessful attempt to kill well. SDON.

CWC $3,924

9/14/84
PO: Prep to pump cmt plugs/P&A

Opened csg to tank battery. Well flowed approx 9 BPH. Pumped 50 bbls 10.9 ppg mud down csg & 30 bbls down tbg. Still unable to kill, appears to have csg leak in the Judith River Formation. Tied csg into tank battery & flowed 140 BW in 2 hrs (increased from 9 BPH to 70 BPH). Ordered out backhoe & dug pits to flow into while attempting to install BOP & stripping head. Unable to install BOP due to strong kick from csg. SION.

CWC $12,638

XC: RESERVOIR, ACTG., CEN. RCDS., PROD RCDS., GAS CONT., DRLG MGR, DIV MGR, D&M, MC&P MATERIAL CONTROL, PRODUCTION FOREMAN

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Office of Enforcement

FEB 25 2000

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9/15/84
PO: Prep to P&A

WO cmt 4 hrs. Halliburton had PU bulk trucks from evening before & had not notified Mesa. Established IR of 5 BPM w/no pressure down tbg. Mixed 50 sx Class "H" cmt (16.5 ppg) & pumped down tbg @ 5 BPM w/700 psi. Displaced w/33.3 BFW. Let set 1 hr. RU Oilwell Perforators & RIH. TOC @ 5760'. Shot 4 shots @ 5750'. Mixed 30 sx Class "H" cmt (16.5 ppg) & displaced w/31 BFW leaving 315' of cmt inside & outside tbg from 5435' to 5750'. RU perforators & shot 12 holes w/1 9/16" gun @ 993-996'. Mixed 30 sx Class "H "cmt & pumped down tbg on vacuum. SI tbg. Mixed & pumped 85 sx down 5½" csg. SI csg. Mixed & pumped 25 sx down 8 5/8" csg. Mixed & pumped an additional 20 sx down tbg. Released rig @ 1830 hrs, 9-14-84.

CWC $25,638

9/16/84
PO: Prep to P&A

Mixed 65 sx Class "H" cmt & pumped into surface csg. WOC 1 hr. Mixed & pumped 60 sx Class "H cmt into surface csg @ 2 BPM w/max pressure 200 psi. Mixed & pumped 20 sx Class "H" cmt into surface csg after WOC 2 hrs.

CWC $27,335

9/17/84
PO: Prep to P&A

Surface csg still has small leak. Will attempt to pump 50 sx Class "H" cmt into surface csg.

CWC $27,335

9/18/84
PO: FINAL REPORT - P&A

Mixed & pumped ½ bbl cmt down 5½" - 8 5/8" annulus @ 1200 psi (held @ 800 psi). SD for 2 hrs. Cut off csg & tbg 4' below GL. Welded cap on 8 5/8" csg. Poured 10 sx cmt on top of cap.

CWC $30,941

FINAL REPORT - P&A

BIERE A-1 SWD

9/16/84
PO: Prep to P&A

Ordered 250 sx Class "H" cmt. Mixed & pumped down tbg & csg. Held 250 psi.

CWC $3,254

9/17/84
PO: FINAL REPORT - P&A

Cut csg 4' below GL. Welded cap on csg.

CWC $4,104

FINAL REPORT - P&A

Report

Field Investigation Biere Well Evaluation, Poplar, Montana

Prepared for

Pioneer Natural Resources

August 2000

CH2MHILL

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September 12, 2000

VIA OVERNIGHT MAIL

Mr. Nathan Wiser
U.S. Environmental Protection Agency
Office of Enforcement, Compliance, and Environmental Justice
Technical Enforcement Program (8ENF-T)
999 18th Street, Suite 500
Denver, CO 80202-2466

Re: Amended SDWA Order, Docket No. SDWA-8-99-68

Dear Mr. Wiser:

Pioneer Natural Resources USA recently conducted investigatory activities near the old Mesa Petroleum, or "Biere," wells, located at the south flank of the East Poplar Oil Field. Enclosed for your information is a Field Investigation Report prepared by Pioneer's technical consultant, CH2M Hill, which summarizes the results of the groundwater sampling and other measures implemented at the site. A copy of the Report also has been provided to the Fort Peck Tribal Environmental Officer.

Pioneer continues its efforts to determine whether the Biere wells could represent a source of local contamination and to identify any remedial measures that may be necessary. We shortly will send you a summary of the next phase of planned response activities. If you have any questions concerning the enclosed information or any other aspect of Pioneer's response program, please let me know.

Sincerely,

Steven L. Leifer

Enclosure

c: Jennifer G. Fry, Pioneer Natural Resources USA, Inc.
John W. Ross, The Brown Law Firm

Received
Office of Enforcement
SEP 13 2000
Compliance & Env. Justice

Report

Field Investigation Biere Well Evaluation, Poplar, Montana

Submitted to

Pioneer Natural Resources

August 2000

REGISTERED PROFESSIONAL GEOLOGIST
CHARLES F. FEAST
8/23/2000
588
STATE OF IDAHO

Received
Office of Enforcement
SEP 13 2000
Compliance & Env. Justice

CH2MHILL

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A Well Logs and Construction Diagrams

B Chain-of-Custody Information, Laboratory Analytical Reports, Laboratory QA/QC

Tables

1 Summary of Well Construction, Geology, Water Levels, Temperature, and Specific Conductance

2 Summary of May 31-June 1, 2000, Water Samples

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Introduction

In response to reported salinity impacts to the shallow water table aquifer northeast of Poplar, Montana, Pioneer Natural Resources (the business successor to Mesa Petroleum) conducted a field investigation in the vicinity of the old Mesa Petroleum (Biere wells). The investigation was conducted between February and June 2000 and included gathering background information, and locating the buried well heads of the Biere Production Well, the Biere Relief Well, and the Salt Water Disposal Well. In early May 2000, eight shallow monitoring wells were installed to the base of the shallow water table aquifer. In late May to early June 2000, water levels and water samples were collected from two existing U.S. Geological Survey (USGS) monitoring wells and four existing domestic wells, in addition to the eight new monitoring wells. A limited amount of historical water chemistry and well construction data gleaned from published USGS reports (Open-File Report 95-749) was also incorporated into this investigation.

This report presents the data collected during this investigation.

Field Investigations

Site Setting

The Biere wells are located on the south flank of the East Poplar Oil Field on the west-central side of Section 22, Township 28 North, Range 51 East. The topography slopes gently to the west from a low ridge (elevation 2220) bounding the east side and falling through three broad topographic steps to the Poplar River (elevation approximately 1965). Land uses in this area consist largely of dry-land wheat farming. Consequently the wells installed during this investigation were restricted to field margins and road right-of-ways where land owner access agreements could be obtained. In addition to the new and existing shallow wells incorporated into this investigation, at least 13 petroleum wells (gas, oil, and salt water disposal) are located within or adjacent to the study area. Most of the petroleum wells have been abandoned and the wellheads cut off below grade. Figure 1 shows the general project area, the Biere wells, known petroleum wells in the vicinity, and the monitoring and domestic wells used in this investigation.

Well Installation

Six monitoring wells (PNR6, PNR 7, PNR8, PNR9, PNR10, and PNR12—see Figure 1) were installed between May 1 and May 8, 2000, by the hollow-stem auger drilling method by Hansen Environmental Drilling, Glasgow, Montana. During drilling, geologic samples were collected on 5-foot intervals (typical) using a 24-inch split-spoon sampler. With the exception of PNR6 and PNR10, the drill holes were advanced through the surficial till and shallow water-bearing gravel to the top of the Bear Paw Shale. Well PNR6 was drilled to 32 feet, which may have been short of the Bear Paw Shale. Well PNR10 was drilled to 91 feet and sampled to 93 feet, which was the limit of the available augers. This well did not reach the Bear Paw Shale but the iron-stained gravel in the final sample suggested that the shale was close. These wells were constructed of 2-inch Schedule 40 polyvinyl chloride (PVC) casing and well screen.

Between May 8 and May 12, 2000, two wells, PNR4 and PNR5, were drilled near the Biere Production/Relief wells and the Salt Water Disposal Well (respectively). These two monitoring wells were drilled by Sharp Drilling of Sidney, Montana, using mud rotary techniques. At both locations, 6-inch-diameter steel surface casing was cemented into a 10-inch-diameter hole to a depth of approximately 35 feet. After the cement had cured, a 6-inch (nominal) mud rotary bore hole was advanced to the top of the Bear Paw Shale. These wells were completed with 2-inch-diameter, type 304 stainless steel well screen and casing.

Table 1 provides a list of the wells installed and existing wells incorporated into this investigation. Appendix A contains the well logs and construction diagrams for the wells installed during this investigation and for the two existing USGS monitoring wells incorporated into the investigation.

Water Levels and Well Sampling

On May 24, 2000, the new wells were surveyed for location and elevation and water levels were measured on all new wells and a partial set of the existing wells. On May 24, free oil was observed on top of the water column in PNR4. An inter-face probe lowered into well indicated that the top of the oil was at 11.5 feet below the top of the casing and the free water level beneath the oil was at 52.2 feet—indicating that about 40.7 feet of oil (approximately 6.5 gallons) had accumulated in the well. Because of liquid phase and density separation, free oil will gradually accumulate in the well. It is important to note that the measured thickness of oil does not imply that the aquifer is filled with oil; it only indicates that free oil is present.

On May 31 and June 1, 2000, all new monitoring wells and selected available existing wells were sampled. With the exception of PNR4, all wells were sampled for common ions, and the common constituents of petroleum benzene, toluene, ethylbenzene, and xylene (BTEX). Field parameters, consisting of temperature, specific conductivity, pH, and oxidation-reduction potential (ORP), were measured. Laboratory measurements of pH and specific conductivity were also conducted. Because of concerns over safe handling and proper disposal of liquids removed prior to sampling (purge water) only a sample of the floating oil from PNR4 was collected. This sample was submitted for specific gravity determination, sulfur content by weight percent, and BTEX.

All water samples and the oil sample from PNR4 were sent to Energy Labs, Inc., Billings, Montana, for analysis. Table 2 provides the tabulated water chemistry data from this sampling event. Appendix B contains the sample chain-of-custody information, the laboratory analytical reports and the laboratory quality assurance/quality control (QA/QC) data for these samples.

Existing Water Chemistry Data

Selected water chemistry data contained in various published reports was collated and tabulated and is provided in Table 3. This data was used to augment the May 31 to June 1, 2000, sampling data to compare the basic water types present in the study area.

TABLE 1

Summary of Well Construction, Geology, Water Levels, Temperature, and Specific Conductance

Location, Geology and Well Construction														
	Location and Elevation				Geology				Well Construction					
	Northing	Easting	MP elev.	GS Elev	Bear Paw Shale		Bottom of Till	Gravel Thick	Bottom	BOScr	TOScr	Sump	Screen	TOSd
Well No.	(ft)	(ft)	(ft msl)	(ft msl)	Depth (ft)	Elev	Depth (ft)	Feet	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
PNR4	120239.6	75663.2	2084.21	2080.9	57.5	2023	45.0	12.5	59.5	57.5	47.5	2.0	10.0	41.0
PNR5	119992.6	75218.1	2085.56	2082.6	62.0	2021	31.5	30.5	64.0	62.0	47.0	2.0	15.0	37.0
PNR6	119552.8	77716.9	2119.07	2116.5	32.0	2085	16.0	16.0	32.0	30.0	15.0	2.0	15.0	12.0
PNR7	120878.4	73768.5	2072.22	2069.6	46.0	2024	38.0	8.0	42.0	42.0	37.0	0.0	5.0	33.0
PNR8	118196.1	73316.9	2062.99	2060.2	77.2	1983	70.5	6.7	77.5	76.5	71.5	1.0	5.0	67.0
PNR9	119459.5	69844.4	2017.26	2014.1	78.0	1936	63.0	15.0	80.0	78.0	63.0	2.0	15.0	53.0
PNR10	117193.4	69833.0	2011.69	2009.2	95.0	1914	63.0	>38	91.0	89.0	74.0	2.0	15.0	62.0
PNR12	120894.2	77696.5	2101.23	2098.4	80.0	2018	54.0	26.0	80.0	75.0	60.0	5.0	15.0	55.0
USGS 93-3	119878.7	75070.9	2083.46	2082.1	56.0	2026	33.0	23.0	81.0	57.0	52.0	24.0	5.0	44.0
USGS 93-3a	119884.1	75079.3	2083.23	2082.0			26.0		49.0	46.0	41.0	3.0	5.0	37.0
USGS 92-12	123453.5	75096.4	2065.92	***2063.4***	65.0	1998	62.0	3.0	68.0	63.0	33.0	5.0	30.0	12.0
M-28 Lockman	118433.6	76557.0	2096.63	2102.8										
M-30 Trottier (new)	118063.2	78960.5	2163.79	***2160.0***										
M-31Trottier	118180.7	75212.4	2087.17	***2086.0***										
Whitmer	116848.3	69257.9	1981.44	1980.4										

Bold Italics indicated estimated value

MP = Measure point, GS = Ground surface, BOScr = Bottom of screen, TOScr = Top of screen, TOSd = Top of sand filter pack

Water Levels and Field Parameters										
	5/6/00				5/24/00		6/1/00			
	DTW	Elev.	Temp	SC	DTW	Elev.	DTW	Elev.	Temp	SC
Well No.	(ft)	(ft msl)	°C	mS	(ft)	(ft msl)	(ft)	(ft msl)	°C	mS
PNR4					11.85	2072.36	15.20	2069.01	***60.0***	
PNR5					36.32	2049.24	37.17	2048.39	41.6	96.60
PNR6	19.50	2099.57	8.3	2.70	20.25	2098.82	20.32	2098.75	9.4	0.12
PNR7	25.10	2047.12	8.3	53.10	25.59	2046.63	25.45	2046.77	10.0	52.40
PNR8	62.70	2000.29	10.0	3.50	63.47	1999.52	63.64	1999.35	9.7	5.60
PNR9	56.00	1961.26	8.9	9.50	57.16	1960.10	57.18	1960.08	11.4	9.70
PNR10			8.3	3.80	53.90	1957.79	53.93	1957.76	10.5	3.20
PNR12	50.00	2051.23		4.70	51.01	2050.22	51.10	2050.13	12.1	4.50
USGS 93-3			24.0	88.90			35.31	2048.15	24.8	97.60
USGS 93-3a			25.0	95.20						
USGS 92-12			12.0	2.12			15.10	2050.82	10.8	2.70
M-28 Lockman					48.68	2047.95	49.23	2047.40	11.4	60.50
M-30 Trottier (new)									9.8	2.60
M-31Trottier					40.26	2046.91	40.37	2046.80	11.0	87.20
Whitmer					23.82	1957.62			10.1	3.30

Shaded values are depth to top of oil and elevation of top of oil

Bold Italics indicated estimated value

DTW = Depth to water, SC = Specific conductance, mS = milli Siemens

TABLE 2

Summary of May 31 - June 1, 2000, Water Samples

Biere Well Evaluation

Parameter	units	PNR-4	PNR-5	PNR-6	PNR-7	PNR-8	PNR-9	PNR-10	PNR-12	FPB-92-12	FPB-93-3	M-28 (Lockman Culvert Well)	M-31 (Trottier Old Well)	Buckles-Whitmer	M-30 (Trottier new well)
Sample Date		6/1/00	6/1/00	5/31/00	5/31/00	5/31/00	6/1/00	6/1/00	5/31/00	6/1/00	6/1/00	6/1/00	6/1/00	5/31/00	6/1/00
Field Temp	°C	60	41.6	9.4	10	9.7	11.4	10.5	12.1	10.8	24.8	12	11	10.1	9.8
Field SC	mS		96.6	0.12	52.4	5.8	9.7	3.2	4.5	2.7	97.8	60.5	87.2	3.26	2.6
Field pH*	S.U.		7.3	5.9	6.8	5.8	9.1	8.9	6	6.5	8.5	7	7.6	9.2	9.2
ORP	Mv		5.8	85.2	48	102.5	-108	-83.3	81.2	48	51	19.5	-17	-105	-115
Laboratory Results															
Calcium	mg/l		1170	109	2770	272	583	208	425	240	1080	1530	1760	133	126
Magnesium	mg/l		213	77	2130	200	355	111	328	260	257	749	783	88	118
Potassium	mg/l		396	8	55	12	16	8	17	14	403	62	122	8	7
Sodium	mg/l		22600	75	6800	420	887	435	362	95	23400	14200	20200	432	325
Total Hardness as CaCO3 (Calc'd)	mg/l		3810	587	15700	1500	2920	978	2410	1670	3770	6920	7610	695	801
Chloride	mg/l		38900	14	21700	380	3060	147	76	11	39800	25800	36000	794	36
Sulfate	mg/l		1690	229	1540	738	609	1210	2030	1410	1730	1910	1690	279	501
Alkalinity as CaCO3	mg/l		267	511	343	484	263	528	699	389	396	600	481	353	1020
Bicarbonate	mg/l		325	624	418	586	321	645	853	474	483	732	582	429	1240
Carbonate	mg/l		-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Specific Conductance	umhos/cm		85100	1210	48200	4080	9310	3120	4580	2580	87000	58900	80500	3220	2380
Total Dissolved Solids (Calc'd)	mg/l		65200	849	35300	2350	5700	2480	1020	2330	67000	44700	60800	1970	1740
pH	s.u.		7.4	8	7.2	7.8	7.3	7.8	7.8	7.9	7.1	7.1	7.1	8.2	8
Nitrogen, Nitrate plus Nitrite	mg/l		-0.05	0.08	4.11	-0.05	-0.05	-0.05	95.7	3.94	-0.05	20.9	0.17	-0.05	-0.05
Iron	mg/l		0.2	0.09	2.8	25.2	35.4	12.1	39.3	12.1	-0.08	8.6	9.5	4.82	5.63
Benzene	ug/l**	330,000	1.2	-0.5	27	-0.5	-0.5	-0.5	-0.5	-0.5	4.4	14	41	-0.5	-0.5
Ethylbenzene	ug/l**	1,950,000	8.7	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Toluene	ug/l**	1,270,000	0.75	-0.5	-0.5	-0.5	0.88	0.8	-0.5	-0.5	-0.5	2.8	0.88	-0.5	-0.5
m+p Xylenes	ug/l**	na	3.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
o Xylene	ug/l**	na	0.68	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Total Xylenes	ug/l**	3,190,000	4.2	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
API Gravity @ 60°F		40.2													
Sulfur	% by wt.	0.35													
Calculated Ratios															
Na/Cl			0.58	5.38	0.31	1.11	0.29	2.96	4.64	8.64	0.59	0.55	0.56	0.54	9.03
Cl/TDS			0.60	0.02	0.61	0.16	0.54	0.06	0.08	0.00	0.59	0.58	0.59	0.40	0.02
Na/TDS			0.35	0.09	0.19	0.18	0.16	0.16	0.35	0.04	0.35	0.32	0.33	0.22	0.19
(Na+Cl)/TDS			0.94	0.10	0.81	0.34	0.69	0.23	0.43	0.05	0.94	0.89	0.92	0.62	0.21
TDS/SC			0.77	0.70	0.73	0.58	0.61	0.79	0.22	0.90	0.77	0.76	0.78	0.81	0.73
SO4/Cl			0.04	18.38	0.07	1.94	0.20	8.23	26.03	126.18	0.04	0.07	0.05	0.35	13.92
SO4/Na			0.07	3.05	0.23	1.76	0.69	2.78	5.81	14.84	0.07	0.13	0.08	0.65	1.54
SO4/TDS			0.03	0.27	0.04	0.31	0.11	0.49	1.99	0.61	0.03	0.04	0.03	0.14	0.29
Benzene/Toluene		0.26	1.60	-	-	-	-	-	-	-	-	5.00	46.59	-	-

Negative numbers in Laboratory Results section denotes "less than", the number given is the reported detection limit.

* Field pH - Meter subsequently determined to be inaccurate, field pH values not reliable.

** Parts per billion, units for all from PNR4 were reported in ug/g or parts per million, numbers shown for all are ug/mg (parts per billion).

.99 .3 .8 .34 .69 .23 .43 .05 .94 .89 .92 .62 .21

TABLE 3
Historical Water Chemistry Analysis
Biere Well Evaluation

Well	Sample Date	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	HCO_3 mg/l	SO_4 mg/l	Cl mg/l
M-31 (Trottier - old)	08/28/1997	2000	844	19000	100	505	1600	36000
FPB-93-3	08/28/1997	1100	255	23600	410	444	1600	37000
Whitmer	08/27/1997	100	65	384	6.7	364	260	520
M-30 (Trottier - new)	09/03/1997	120	103	313	7	951	440	23
M-36 (Denise Grainger)	09/03/1997	170	120	433	6.9	642	1100	76
M-27 (Reddoor)	08/26/1990	330	200	590	12	314	330	1700
M-28 (Lockman)	07/20/1991	1600	1400	2200	20	708	1600	7900
FPB-92-12	07/24/1993	280	270	100	13	445	1500	15
M-25 (Ricker)	08/25/1990	160	120	530	8.7	342	150	1100
M-32 (Hendrickson)	08/17/1993	88	57	290	5.4	413	180	330
M-33 (Logerings)	08/23/1990	46	36	47	5.2	310	47	7.3
Murphy 63 (Mh - Miss. Heath Fm.)	01/24/1956	1400	230	21500	500	390	1400	36000
Tenneco 1 (Mc - Miss. Charles Fm.)	01/09/1967	810	150	63000	500	310	1500	98000
Buckles A-1(Mc - Miss. Charles Fm.)	04/30/1981	4000	970	26000	500	350	2300	50000

Analysis and Observations

Using the data provided in Tables 1, 2, and 3, a limited interpretation of the data has been accomplished. Analysis and field observations reported here focus on the following three primary components:

- Hydrogeologic properties of the shallow gravel aquifer
- Groundwater flow directions
- Water chemistry

The following are the significant observations from this preliminary analysis relative to each of these main subject areas.

Hydrogeologic Properties

Table 1 provides a summary of the geology at each location, and the well logs in Appendix A provide more descriptive details. As shown, the shallow aquifer is highly variable and consists of from 3 to more than 30 feet of coarse gravel sandwiched between the overlying clayey till and the underlying Bear Paw Shale. Both the till and the shale act as confining layers and the water level in most wells stands above the top of the gravel, consequently the shallow aquifer is hydrologically a semi-confined to fully confined aquifer over most of the study area.

Because these are small-diameter monitoring wells with fine-slot well screens, well yields observed during sampling are not reliably converted into aquifer hydraulic properties. However, limited data were collected and, based on this information, the shallow aquifer wells yield from less than 1 to more than 20 gallons per minute (gpm). This range of well yields is reflective of the high degree of variability in the gravel layer which ranged from very dirty (containing a lot of fine sand and silt) to very clean, and the range of thickness observed.

Two wells installed during this investigation appear anomalous and reveal something of the complexities of the shallow groundwater system. Well PNR6, east of the Biere wells (Figure 1), appears to be installed in a secondary shallow aquifer developed in a shallow sandy zone (possibly a dune deposit) within the upper part of the till. This well was the first well installed; What now is interpreted to be tight, clayey till, was identified at the time as the top of the Bear Paw Shale; therefore, the boring was terminated. Water level in this well is very high compared to other wells and the water chemistry is distinctly different.

The second anomalous well is PNR8 (Figure 1) which was installed into the shallow gravel on top of the Bear Paw Shale. The gravel aquifer at this location is thin and very dirty which is reflected in the low well yield. Although the general geology, water level, and general water type in this well is consistent with other shallow wells, the water chemistry is much less saline than expected given its location near, and generally downgradient of, the highly saline Trottier well (M-30). The lower-than-expected salinity at PNR8 indicates that this well is in a low- to no- flow part of the aquifer that is isolated from the main body of the saline water, or that water movement in the shallow groundwater system follows highly convoluted preferential flow paths.

Figure 2 illustrates the general configuration of the potentiometric surface of the shallow aquifer on May 31-June 1, 2000. The potentiometric surface map depicts the elevation head (pressure) of the aquifer since the aquifer is confined, however it is more easily comprehended if thought of as a contour map of the top of the water surface. In either case hydraulic gradients and general groundwater flow directions are shown by the shape and steepness of the contour lines. This figure does not include the water level in PNR6 but does include a density corrected elevation for the hydraulic head in PNR4. As can be seen from this figure the hydraulic head data indicates a mound around the Biere wells that flows away in all directions. To the west of the Biere and Salt Water Disposal Wells the gradients flatten out considerably and indicate a gentle southwesterly flow toward the Poplar River valley. The shallow well distribution is not sufficient to determine the presence or extent of the mound and subsequent flow directions to the north, east, or south.

Figure 3 provides a contour map of the top of the Bear Paw Shale in the study area using all available information. As shown on this figure the Bear Paw Shale appears to form a bench beneath the Biere well area and falls off steeply to the west toward the Poplar River valley. On the basis of this very limited data set, there were no obvious or significant incised channels detected in the top of the Bear Paw Shale that could be acting as preferred flow paths affecting contaminant distribution. Variations in gravel thickness and higher permeability in cleaner portions of the aquifer are apparently the dominant characteristic affecting groundwater movement through the shallow aquifer.

Water Chemistry

The salt water in the oil bearing formations in this area (primarily the Mississipian Charles Formation) is predominantly a hot, sodium chloride brine. Therefore the principal water chemistry parameters in this investigation consist of temperature (T), specific conductivity (SC), sodium (Na), chloride (Cl), and total dissolved solids (TDS). The deep formation brine has a temperature of about 94 degrees Celsius (200 degrees Fahrenheit); an SC of 80,000 to 110,000 microsiemens (µS); Na of 21,500 to 26,000 milligrams per liter (mg/L); Cl of 30,000 to 50,000 mg/L, and TDS of 60,000 to 85,000 mg/L. In contrast, using M-30 and FPB92-12 as examples, the background quality in the shallow aquifer for these same parameters: T ranges from 10 to 11 degrees Centigrade; SC from 2,600 to 2,700 µS; Na from 95 to 325 mg/L; Cl from 11 to 36 mg/L; and TDS is in the 2,380 to 2,580 mg/L range.

Figures 4 through 7 illustrate the variability in temperature, TDS, SC, and chloride water chemistry in the shallow aquifer determined from this investigation. Sodium concentrations are not shown in this series because this ion interacts with the soil matrix through cation exchange which can introduce additional spatial variability. The water level map for the shallow aquifer presented in Figure 2 is screened back beneath the water chemistry parameters in these figures to illustrate the differences and similarities between flow and chemistry.

As can be seen on these figures there is a large area around the Biere, Lockman (M-28), and Trottier (M-31) wells with elevated conductivity, chloride, and TDS. The shape of the contour lines funneling to the west suggests saline water from the Biere well area may be moving toward PNR7. The shape of the contour lines on these figures is heavily influenced by lack of data in some areas so the indication of westward flow may only be an artifact of

the contouring routine. However, as will be discussed, organic constituents detected in PNR7 support some flow in this general direction.

Elevated temperatures appear restricted to the area around the Biere Production and Salt Water Disposal wells. In constructing the temperature map, an estimated temperature of 60 degrees Centigrade (140 degrees Fahrenheit) was used for the bottom hole temperature of PNR4. This is approximately the temperature of the water encountered during the initial exploratory boring drilled near the Biere wells in February 2000.

Figure 8 is a trilinear or Piper diagram showing the primary water types present in the monitoring wells, domestic wells, and from historical data on oil field brines in the Murphy 63 and Buckles A-1 wells. The clustering or distribution of wells in the triangles and top "diamond" portion of the diagram is useful in examining the ionic similarities between waters. This diagram reveals an almost identical water type for the oil wells, M-28 (Lockman), M-31 (Trottier), and the wells around the Biere wells which confirms that oil field brines have dominated the shallow water chemistry in this area.

As illustrated by their unique position on the diamond and lower right triangle, wells M-30 (New Trottier well) and PNR6 are similar to each other and distinctly different from all other wells, which supports the interpretation that wells PNR6 and M-30 are in a secondary shallow water bearing formation.

With the exception of M-30 and PNR6, all the other wells demonstrate various degrees of mixing between the two chemistry end points represented by the brine (cluster in the lower right corner of the lower triangles) and the current background water which is appears to be generally represented by wells FPB92-12, M-36, PNR10, and PNR12, which occupy the upper left quadrant of the lower right triangle.

BTEX Analysis

Some of the constituents of BTEX were detected in several of the wells and Table 3 provides a summary of this data. All BTEX constituents were detected in the floating oil in PNR4 in the parts per million range; benzene (330 micrograms per gram [μg/g]), toluene (1,950 μg/g), ethylbenzene (1,270 μg/g), and xylene (3,190 μg/g). All BTEX compounds were also detected in well PNR5, but at greatly reduced concentrations—all well below their maximum contaminant level (MCL) of 5; 700; 1,000; and 10,000 μg/L (parts per billion), respectively, established by the EPA for drinking water. Only benzene was detected above the MCL in wells PNR7 (27 μg/L), M-28 (Lockman, 14 μg/L), and M-31 (Trottier, 41 μg/L). Benzene was not detected in any of the other monitoring wells or existing domestics wells.

The BTEX data confirm that the raw petroleum contains these compounds at levels exceeding MCLs. The BTEX distribution indicates lower than expected concentrations in the immediate vicinity of the Biere well area (PNR5 and FPB93-3) and higher concentrations at downgradient well PNR7 and in the lateral gradient wells M-28 and M-31. The relatively high level of benzene in PNR7 lends support to a current or historical component of flow in this direction as indicated by the common ion data. Several explanations for the lateral distribution can be postulated ranging from sampling variability, mounding, preferred lateral flow paths, or by a second source of BTEX up-gradient (generally northeast-to southeast) of M-28 and M-31. The data set is not adequate to resolve this issue.

Summary

The primary findings of this investigation are the following:

1. This report is primarily designed to present the field investigation results as a source of data with minimal interpretation.

2. The study area is underlain by tight clayey glacial till. Beneath the till is a gravel aquifer of highly variable thickness and water bearing properties. The aquifer is confined above by the till and below by the Bear Paw Shale. As a consequence of these enveloping confining units the aquifer is under confined to semi-confined conditions over much of the area.

3. The shallow aquifer water chemistry in an undefined area extending from the Biere well site to the east beyond the Trottier residence has been essentially replaced by sodium chloride brine.

4. Benzene concentrations exceed MCLs in the crude oil and in several monitoring and unused domestic wells, which suggests that the native oil is the source of benzene (and other BTEX constituents). Either multiple sources and/or complex hydrogeologic flow patterns are believed responsible for the observed benzene distribution.

5. The most likely source(s) of saline water and BTEX in the study area are petroleum wells penetrating the Mississippian Age oil formations at depth.

6. All the oil exploratory, production, and salt water disposal wells drilled in the study area, and the historical handling of the produced fluids, may have contributed and many may still be contributing BTEX and saline water into the shallow aquifer at highly variable rates. Water chemistry signatures evaluated to date to do not allow differentiation between the multiple possible sources.

7. Either or both the Biere Production and Relief Wells appear to be a specific source of saline water impacting the shallow aquifer in the immediate vicinity of the Biere wells, and this impact appears to extend at least 1/3 mile to the west. Other specific sources, flow paths, and direct mechanisms responsible for water quality impacts beyond the immediate vicinity of the Biere wells cannot be determined with the available data.

8. A secondary shallow groundwater system that is largely unaffected by saline water is present east of the Biere well site and appears to extend at least to the new supply well (M-30) southeast of the impacted area.

9. The data presentation and resultant preliminary interpretations presented in this report are heavily influenced by limited data distribution, especially to the southeast, south, and southwest.

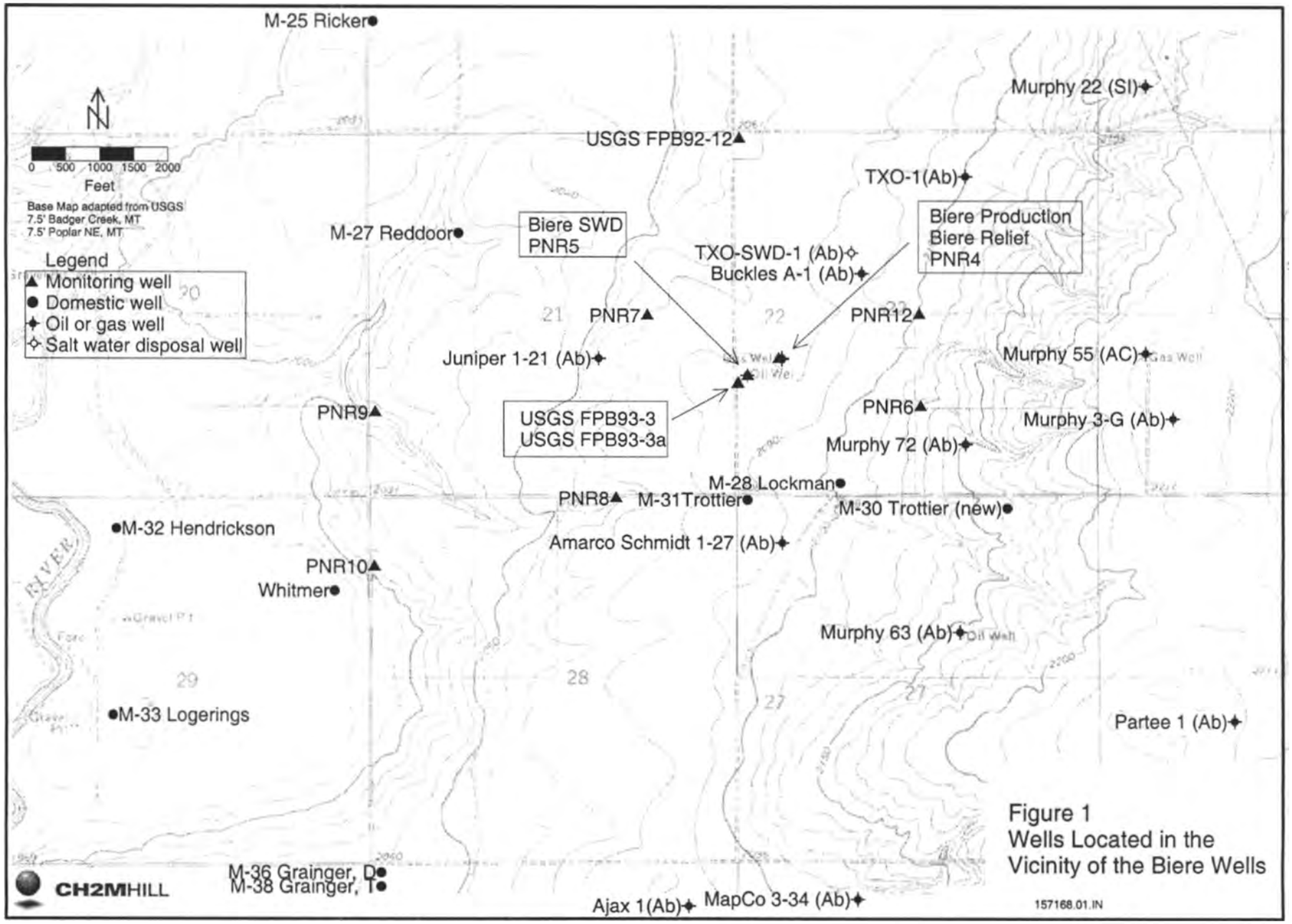


Figure 1
Wells Located in the
Vicinity of the Biere Wells

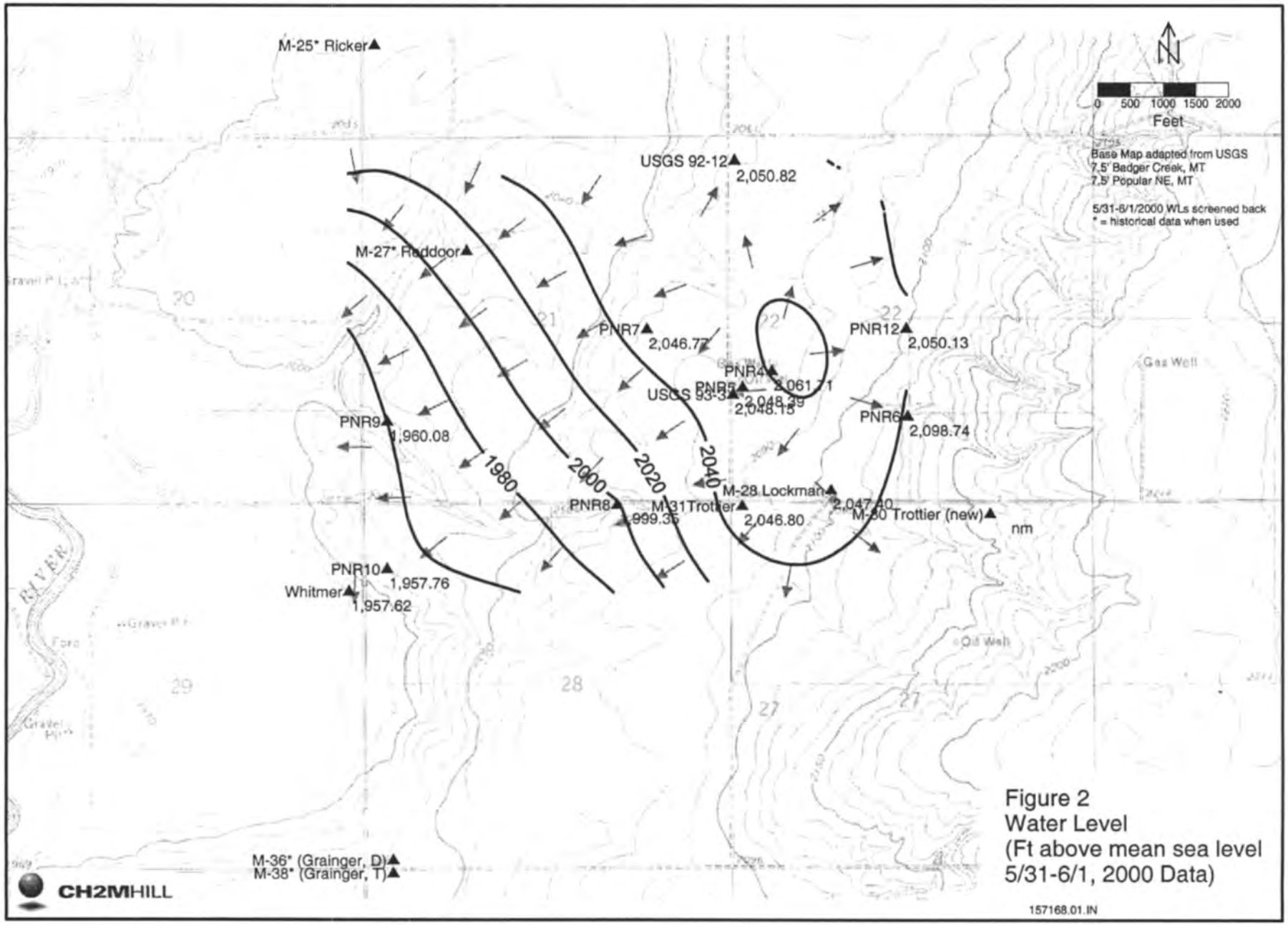


Figure 2
Water Level
(Ft above mean sea level
5/31-6/1, 2000 Data)

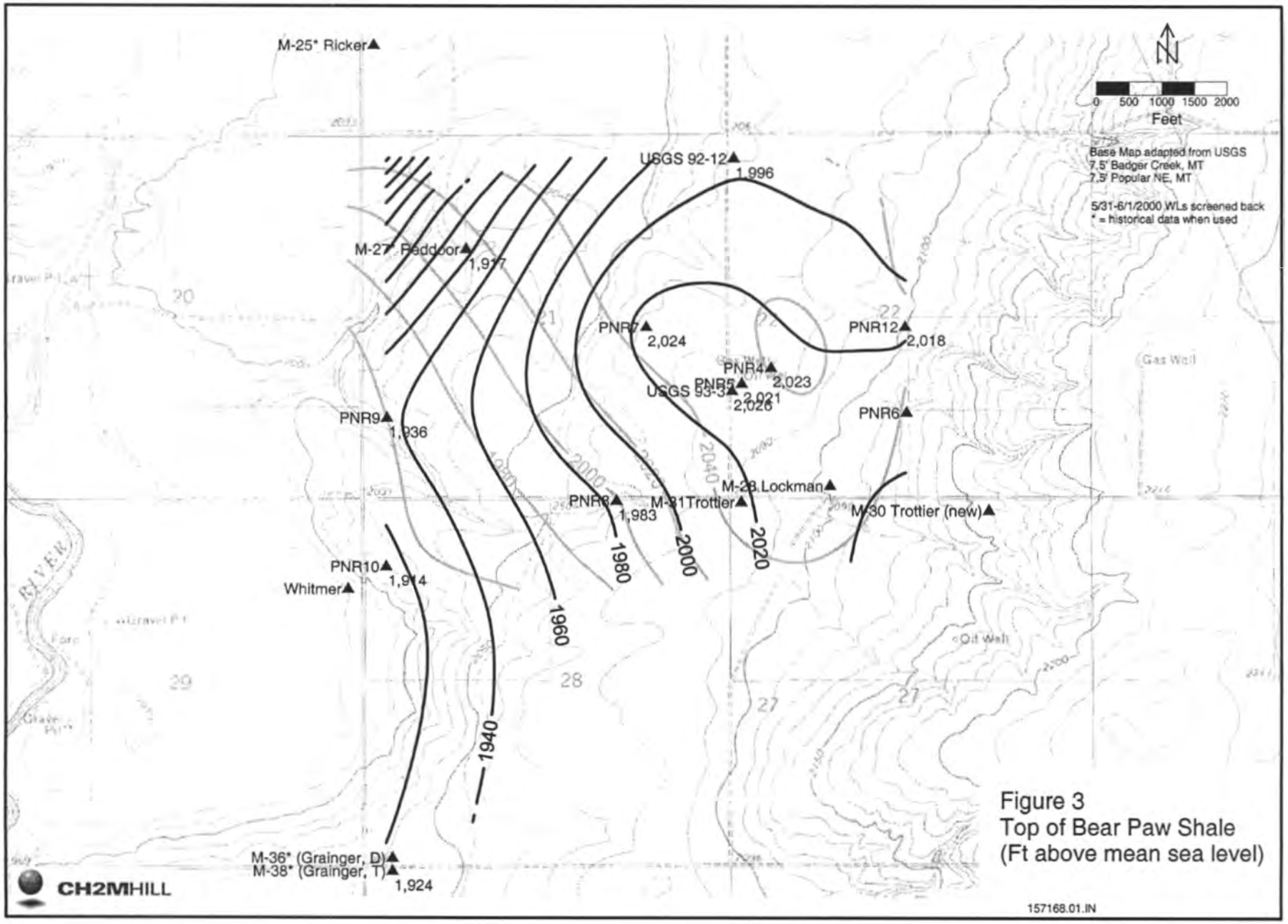


Figure 3
Top of Bear Paw Shale
(Ft above mean sea level)

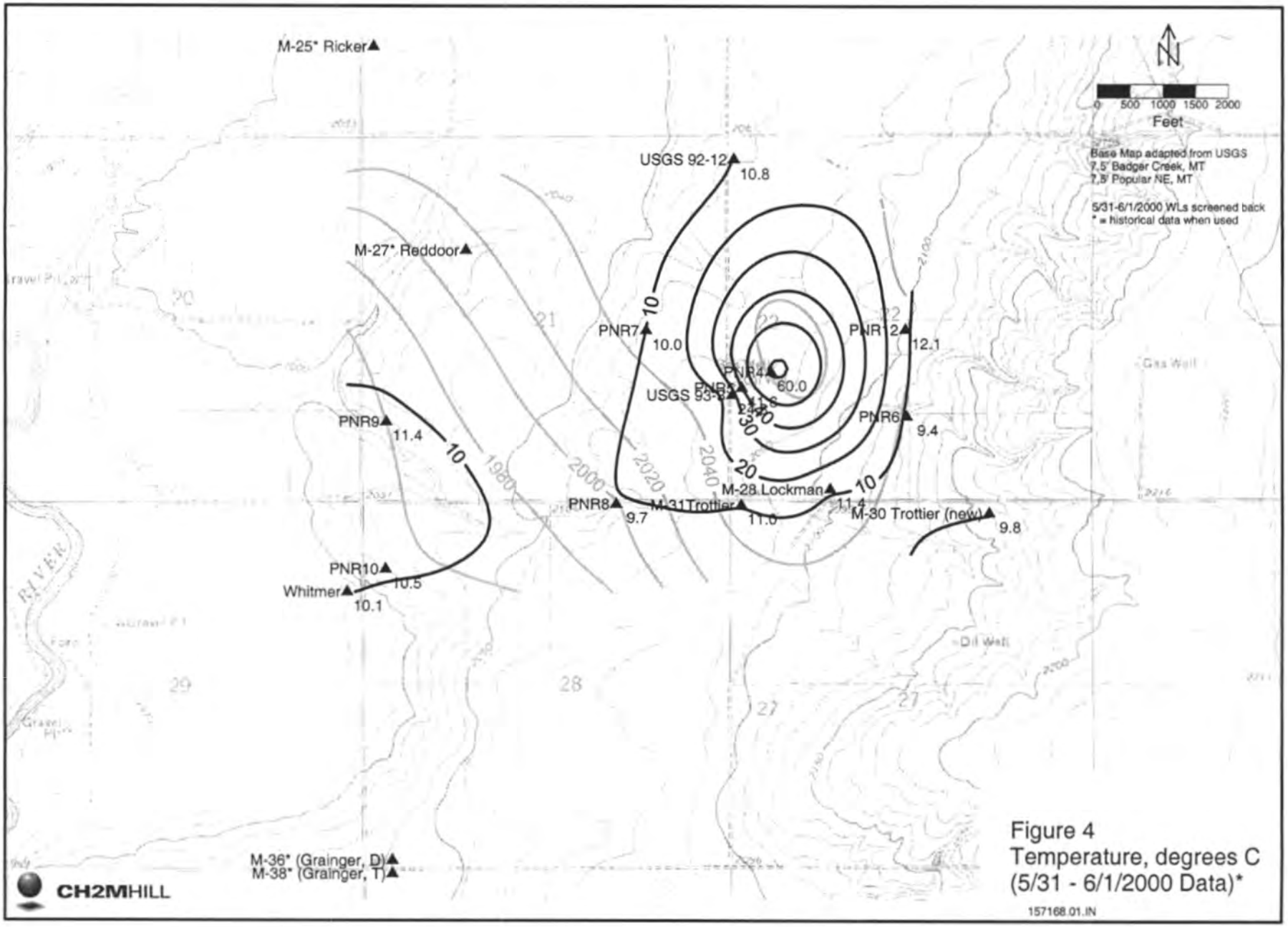


Figure 4
Temperature, degrees C
(5/31 - 6/1/2000 Data)*

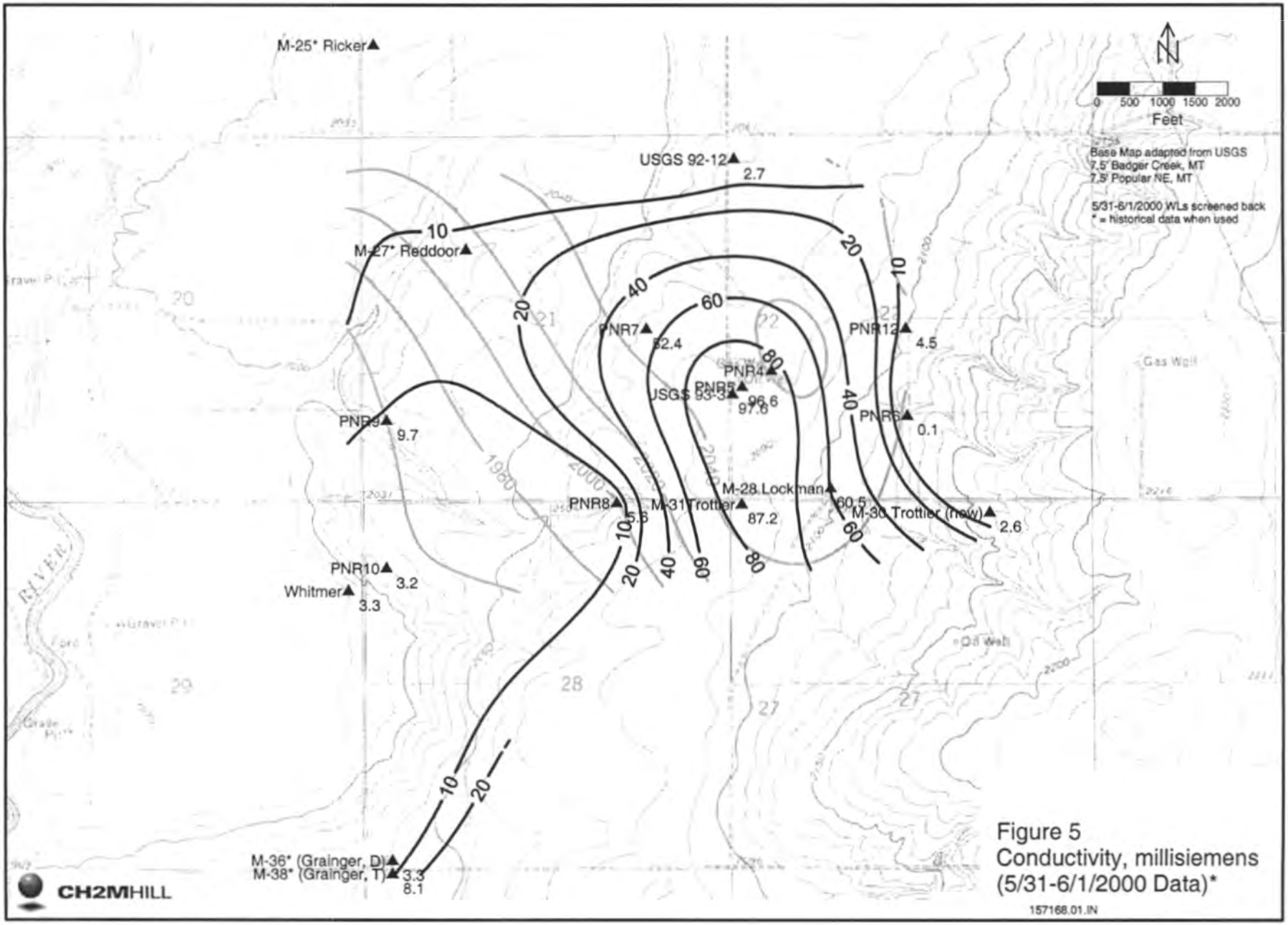


Figure 5
Conductivity, millisiemens
(5/31-6/1/2000 Data)*

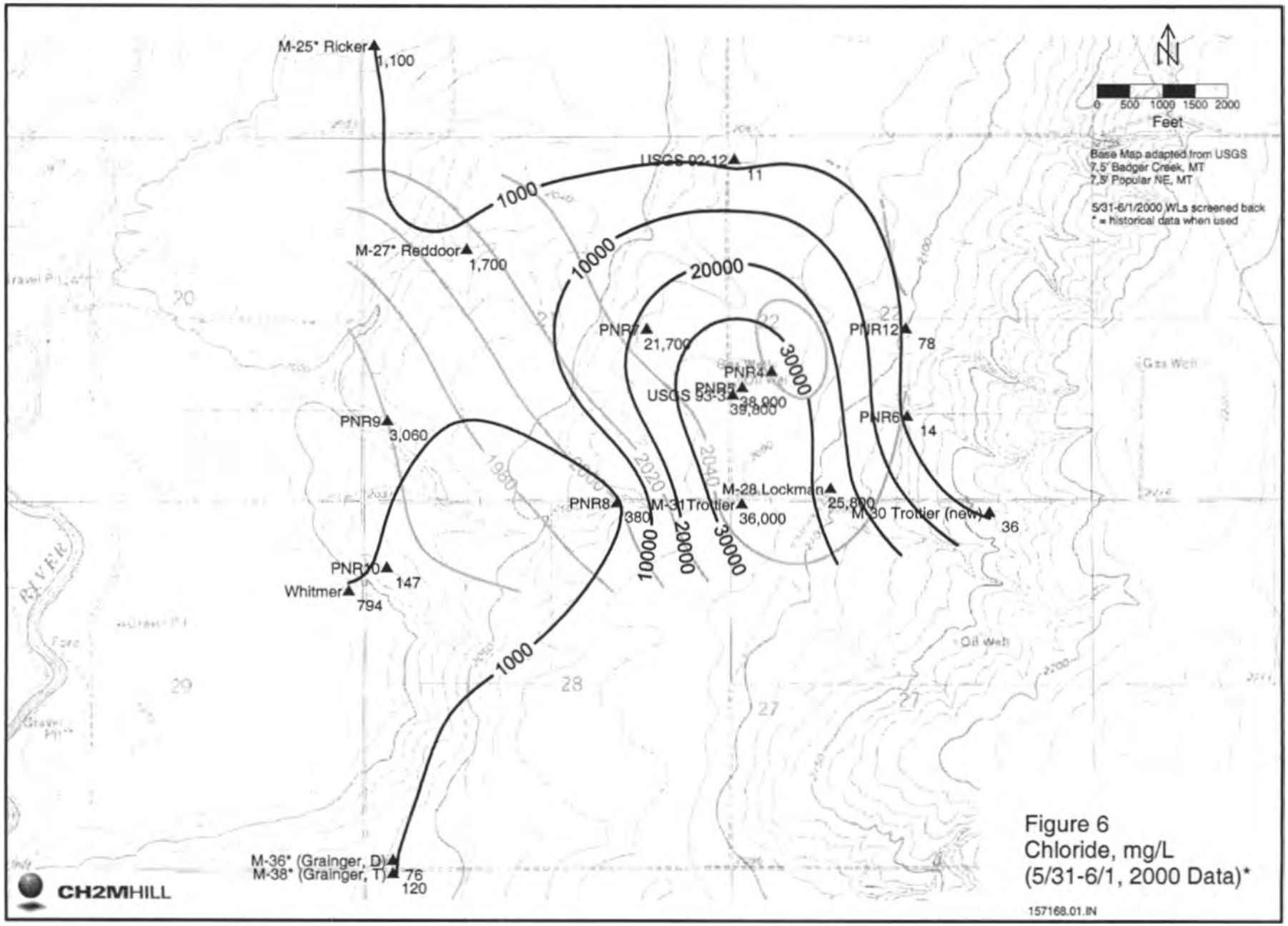


Figure 6
Chloride, mg/L
(5/31-6/1, 2000 Data)*

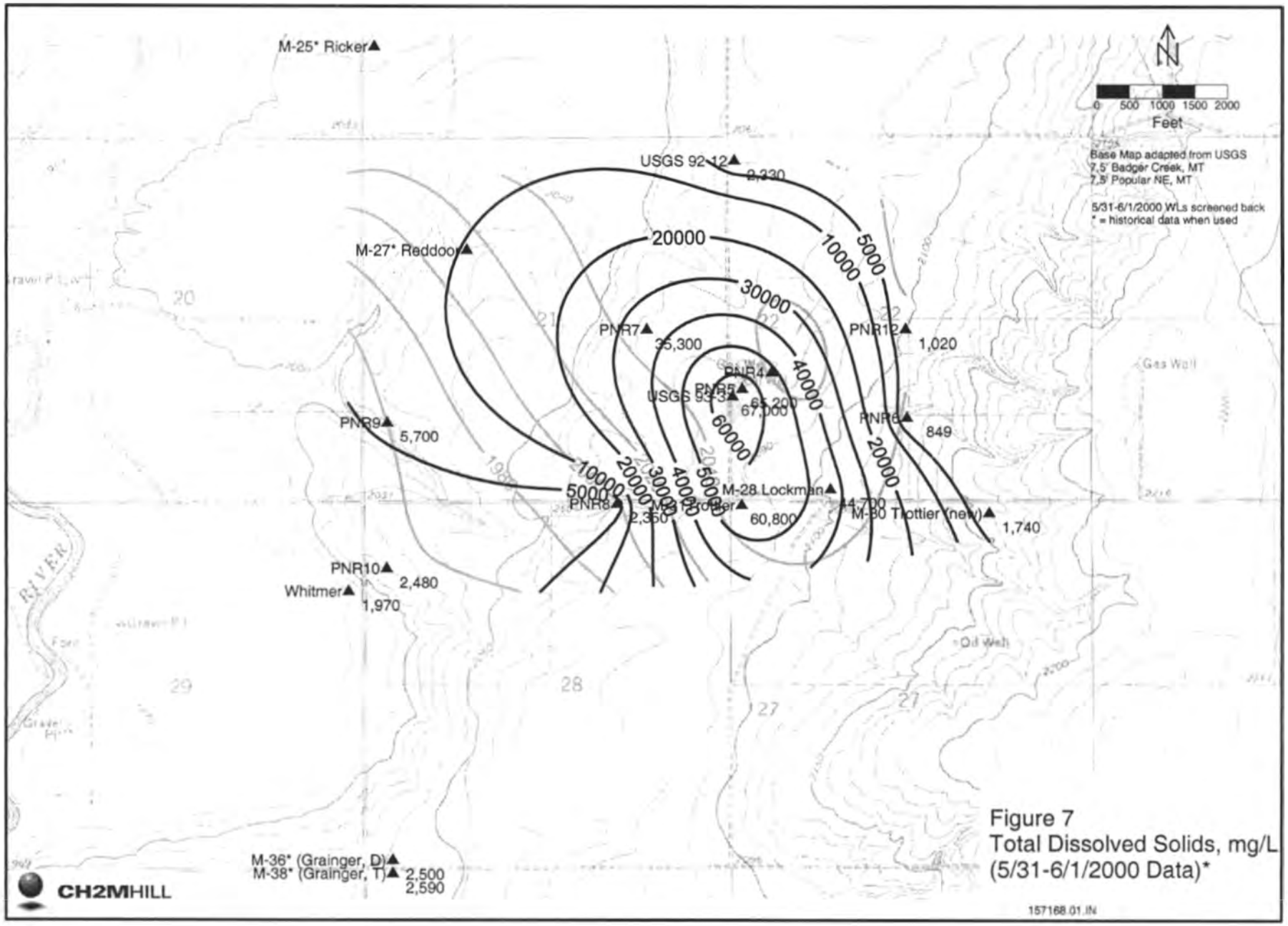
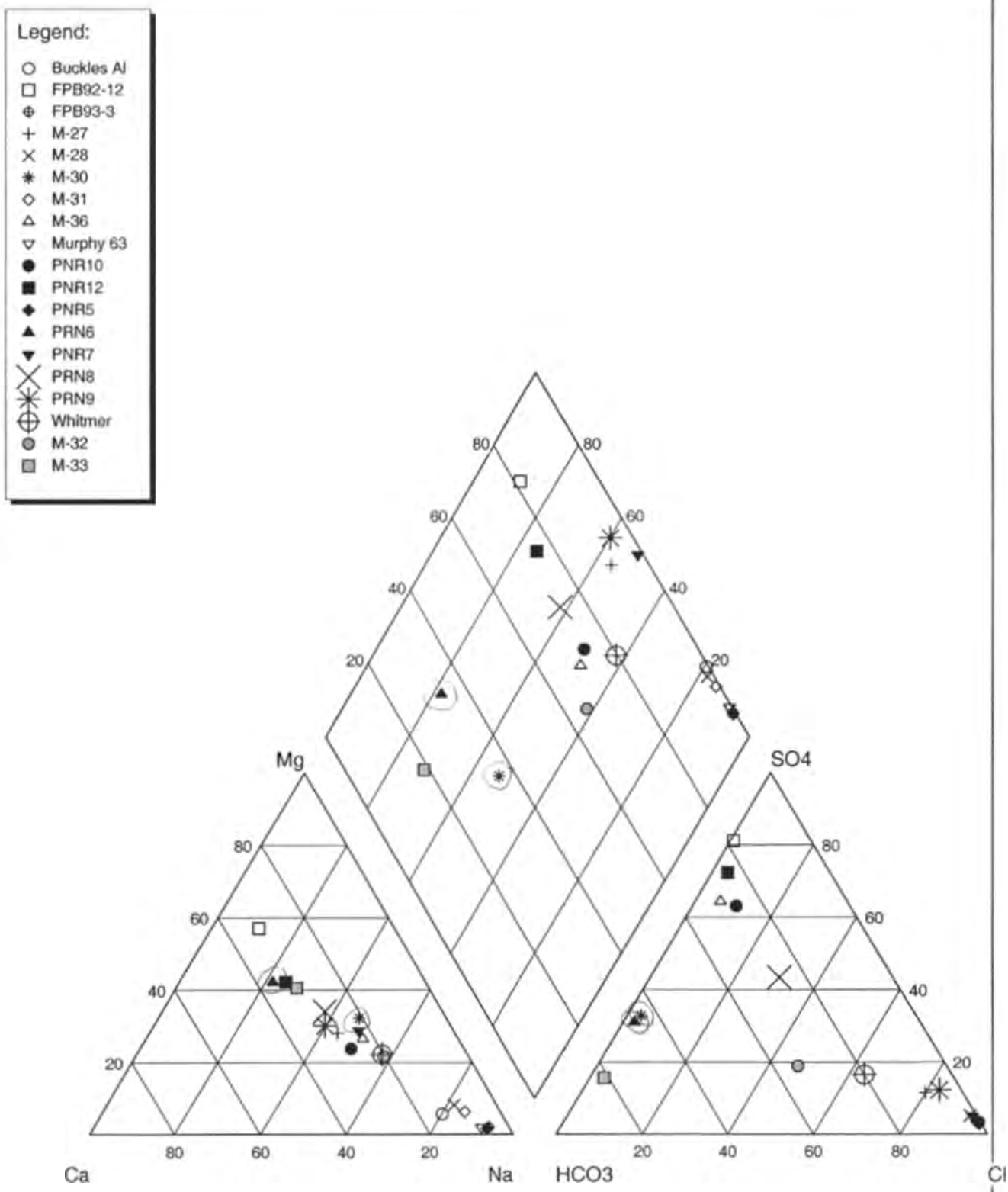


Figure 7
Total Dissolved Solids, mg/L
(5/31-6/1/2000 Data)*



DESCRIPTION: Figure 8
Piper Diagram Showing Water Quality of Selected Wells

CH2MHILL

CLIENT: Pioneer Natural Resources	
PROJECT: Biere Well Evaluation, Poplar, MT.	
PROJ. #: 157168.01.IN	DATE: 8/10/2000

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APPENDIX A

Well Logs and Construction Diagrams

CH2MHILL

Well Number: PNR6 - 1st well drilled

Client: Pioneer Natural Resources
Project: Biere Well Investigation
Location: Popular, MT
Project Number: 157168.O1.IN

Driller: Hansen Environmental, Glasgow, MT
Drilling Method: Hollow Stem Auger, CME 55
Sampling Method: Split Spoon
Logged by: C. Peterson/MSE-HKM
Start/Finish Date: 5/1/2000 to 5/1/2000

Depth (ft)	Sample Info: Number	Type	Recovery (in/in)	6"-6"-6"-6" (N)	Soil Log	Soil Description	Well Drawing	Well Construction Notes
-5								
0						Ground Surface		2.5 ft above ground
						Top Soil		2" Sch. 40 PVC flush jt. threaded casing
5	1	SS	24/24	4 5 8 12		**CL** Lean clay, some fine gravels, little sand, moist, stiff, trace to few small white (gypsum) crystals.		
10	2	SS	24/24	3 5 7 9				Bentonite chips
15	3	SS	24/24	4 7 7 9		**CL** As above, colors change to red and motttled, very moist, fine black lignite fragments.		
20	4	SS	18/24	2 5 9 12				20 - 40 CSSI Sand
25	5	SS	-	4 10 10 12		**ML** Sandy silt, wet, stiff, some clay, light gray brown. Sand content increasing from 25 feet.		2" Sch. 40 PVC well screen, .010" slots
30	6	SS	-	3 9 13 13				
35	7	SS	-	3 6 9 11		**Shale** Bear Paw Shale (?), dry to wet, thinly laminated to massive, weak to soft, dark to light gray.		Nominal 7.25" diam. auger hole 0 to 32 ft.
40						End of Log		Locking security cover not shown
45								
50								
55								
60								
65								
70								
75								
80								
85								
90								
95								

CH2MHILL

Well Number: PNR5

Client: Pioneer Natural Resources
Project: Biere Well Investigation
Location: Popular, MT
Project Number: 157168.01.IN

Driller: Sharp Drilling, Sidney, MT
Drilling Method: Mud Rotary Mayhew 1000
Sampling Method: Grab
Logged by: C. Feast
Start/Finish Date: 5/8/2000 to 5/112000

Depth (ft)	Sample Info: Sample #	Sample Type	Soil Log	Soil Description	Well Drawing	Well Construction Notes
-5						
0				Ground Surface		2.9 ft. above ground
				Top Soil Silt with gravel, brown		
5	1 Grab	G				2-in type 304 SS riser
10						Surface casing (not shown) 6" dia., .250" wall, steel well casing to 34.5 FBGS (shoe), cemented in 10" hole with neat cement grout
15				**CL** Clay and silty clay with gravel, occassional large gravels, brown.		
20	2 Grab	G				
25						Neat cement grout
30						
	3 Grab	G		**GP - SP** Poorly graded gravels and poorly graded sands, fine to medium gravel and fine to coarse sand. Oil sheen and foam on pit. Brown.		Hole Plug
35						
40	4 Grab	G				
45				**GC - GP** Layers of clayey gravel, clean gravel, fine silty sand, brown		10-20 CSSI Sand
50						
55	5 Grab	G				2-in type 304 SS screen 0.010 slot
60						
	6 Grab	G		**Shale** Bear Paw Shale, sticky, weathered, dark gray.		10" dia. hole 0 - 34.5 ft. 6" dia. hole 34.5 - 64 ft. Locking security cover not shown
65				End of Log		
70						
75						
80						
85						
90						
95						

CH2MHILL

Well Number: PNR4

Client: Pioneer Natural Resources
Project: Biere Well Investigation
Location: Popular, MT
Project Number: 157168.01.IN

Driller: Sharp Drilling, Sidney, MT
Drilling Method: Mud Rotary Mayhew 1000
Sampling Method: Grab
Logged by: C. Feast
Start/Finish Date: 5/10/2000 to 5/12/2000

Depth (ft)	Sample Info: Sample #	Sample Info: Sample Type	Soil Log	Soil Description	Well Drawing	Well Construction Notes
-5						3.3 ft. above ground
0				Ground Surface		
5	1 Grab	G		**Top Soil** Soil over brown silty clay with occasional gravel, clay forms chunks in mud stream, dense, plastic.		2-in type 304 SS riser
10						Surface casing (not shown) 6" dia., .250" wall, steel well casing to 34.5 FBGS (shoe), cemented in 10" hole with neat cement grout
15				**CL** As above, color grades to gray by 20 feet gray below 20 feet.		
20	2 Grab	G				
25						Neat cement grout
30	3 Grab	G		**CL** Clay, occasional gravel, dense, plastic, gray.		
35	4 Grab	G				Hole Plug
40	5 Grab	G		**CL** Clay, gray to brown, very little gravel or sand.		
45				**SP** Sand layered with clay and silty sand.		10-20 CSSI Sand
50	6 Grab	G				
55				**GP** Gravel, coarse, rounded, some clay layers.		2-in type 304 SS screen 0.010 slot
60	7 Grab	G		**Shale** Bear Paw Shale, sticky, weathered, dark gray.		
65				End of Log		10" dia. hole 0 - 34.5 ft. 6" dia. hole 34.5 - 59.5 ft. Locking security cover not shown
70						
75						
80						
85						
90						
95						

CH2MHILL

Well Number: PNR7

Client: Pioneer Natural Resources
Project: Biere Well Investigation
Location: Popular, MT
Project Number: 157168.O1.IN

Driller: Hansen Environmental, Glasgow, MT
Drilling Method: Hollow Stem Auger, CME 55
Sampling Method: Split Spoon
Logged by: C. Feast
Start/Finish Date: 5/5/2000 to 5/5/2000

Depth (ft)	Sample Info: Number	Type	Recovery (In/In)	6"-6"-6"-6" (N)	Soil Log	Soil Description	Well Drawing	Well Construction Notes
-5								
0						Ground Surface		2.6 ft above ground
						Top Soil		2" Sch. 40 PVC flush jt. threaded casing
5	1	SS	18/24	7 6 7 8		**ML - CL** Silty clay, occ. fine gravel and coase sand grains, black mottles, moist, dense, stiff, med. brown.		Bentonite chips
10								
15	2	SS	24/24	4 3 4 7		**ML - CL** As above, gravel is larger (1/2" minus) and more common. Large cobble at 24 ft.		
20								
25	3	SS	24/24	2 5 7 9		**CL - ML** Silty clay, abundant Fe marbilization and inclusions, stiff, dense, plastic, moist, med to dark brown		
30	8*	SS	18/24	2 2 5 6				Bentonite pellets
35	9*	SS	24/24	2 5 7 9				20 - 40 CSSI Sand
40	10*	SS	14/24	7 12 12 10		**CL** Clay to silty clay as above, increase moisture and plasticity at 36.5 feet, coal frags. med. to dark brown		2" Sch. 40 PVC well screen, .010" slots
	11*	SS	24/24	10 8 7 15				
45	5	SS	20/24	5 12 17 19		**GP - GW** Gravel, sandy, coarse, clean to dirty, wet, brown. Bedded clayey gravel and fine sand in bottom of spoon.		Nominal 7.25" diam. auger hole 0 to 42 ft.
50	6a	SS	24/24	5 14 18 20				
55	6b	SS	24/24	7 12 15 18		**CL - Shale?** Bearpaw Shale. Clay to weathered shale, dark grey, platy but massive, no indurated fragments, iron stains and inclusions, plastic and sticky when wetted, increasingly dense and dry with depth, occ. bivalve shell fragments and casts.		Initial hole drilled to 62 feet, shale at 46 feet. Borehole too smeared to complete well. Moved 12 feet east and drilled and sampled to 44 feet. Shale at 44 feet in new hole. SS #'s 8, 9, 10 and 11 from new hole.
60	7	SS	-	4 13 28 30				
65								
70								
75						End of Log		
80								
85								
90								
95								

CH2MHILL

Well Number: PNR8

Client: Pioneer Natural Resources
Project: Biere Well Investigation
Location: Popular, MT
Project Number: 157168.O1.IN

Driller: Hansen Environmental, Glasgow, MT
Drilling Method: Hollow Stem Auger, CME 55
Sampling Method: Split Spoon
Logged by: C. Feast
Start/Finish Date: 5/6/2000 to 5/6/2000

Depth (ft)	Sample Number	Type	Recovery (in/in)	6"-6"-6"-6" (N)	Soil Log	Soil Description	Well Drawing	Well Construction Notes
-5								
0						Ground Surface		2.6 ft above ground
						Top Soil		
5	1	SS	24/24	5 5 8 9		**ML** Silt, clayey, occ. fine gravel and coase sand grains, marbled with white fine xtalline (gypsum) veins, moist, dense, stiff, med.to light brown.		
10	2	SS	24/24	2 4 6 7				
15								
20	3	SS	24/24	5 7 3 9		**CL** Clay, occ. 1" minus gravel and coarse sand grains, moist, very plastic, stiff (single unbroken core), med. brown. Fine gravel at 19 ft.		2" Sch. 40 PVC flush jt. threaded casing
25	4	SS	24/24	3 5 6 7				
30	5	SS	24/24	2 4 7 8				
35	6	SS	24/24	1 3 4 8		**CL** Clay as above with less gravel, mottled with iron stains, moist, v.stiff, dense, plastic, moist, med to dark brown and gray		
40	7	SS	24/24	2 3 5 7				Bentonite chips
45	8	SS	-	4 4 5 9				
50	9	SS	24/24	4 6 8 12		**CL** Clay as above, no mottling, moist to wet, stiff, dense, solid gray. Large gravel at 38 ft. Appears saturated at 50 ft.		
55	10	SS	16/24	3 5 7 10				
60	11	SS	24/24	2 5 6 7				
65	12	SS	24/24	2 4 7 11				Bentonite pellets
70	13	SS	21/24	4 4 4 4				20 - 40 CSSI Sand
75	14	SS	21/24	5 10 23 18		**SP - CL** Sand and silty clay, finely bedded in alternating 3 to 4" thick beds. Sand at 71 feet contains fine coal fragments seen in other wells, Silty clay beds are varved, light gray		2" Sch. 40 PVC well screen, .010" slots
	15	SS	-	9 12 23 33				
80								Nominal 7.25" diam. auger hole 0 to 77 ft.
85								Locking security cover not shown
90						**SP - GP** Sand and gravel, poorly sorted, fine to coarse silty sand and 1/2 ' minus gravel. Loose and greenish gray to 75.5, dense with iron staining to 77.2 feet		
95								
100								
105						**CL - Shale** Bearpaw Shale. Clay to weathered shale, platy but massive, no indurated fragments, dense, dry, dark gray.		
110								
115						End of Log		
120								

CH2MHILL

Well Number: PNR9

Client: Pioneer Natural Resources
Project: Biere Well Investigation
Location: Popular, MT
Project Number: 157168.O1.IN

Driller: Hansen Environmental, Glasgow, MT
Drilling Method: Hollow Stem Auger, CME 55
Sampling Method: Split Spoon
Logged by: C. Feast
Start/Finish Date: 5/3/2000 to 5/3/2000

Depth (ft)	Sample Number	Type	Recovery (in/in)	6"-6"-6"-6" (N)	Soil Log	Soil Description	Well Drawing	Well Construction Notes
-5								
0						Ground Surface		3.1 ft above ground
						Top Soil Silt, clayey, moist, med. brown		
5	1	SS	19/24	8 10 14 17		**ML** Silt, clayey, occ. med. angular gravel and coarse sand grains, dense, dry, stiff, med.to light brown.		
10	2	SS	24/24	10 11 11 19				
15	3	SS	24/24	3 4 8 8		**CL** Clay, occ. 1/4" minus rounded gravel and coarse sand grains, moist, mottled med.brown and gray, iron staining, very plastic, stiff (single unbroken core), med. brown.		
20	4	SS	24/24	3 4 6 12				2" Sch. 40 PVC flush jt. threaded casing
25	5	SS	24/24	3 6 6 10				
30	6	SS	24/24	3 4 7 10		**CL** Clay as above with less gravel, occ. brown organic inclusion, moist-damp, v.stiff, dense, plastic, massive, moist, med to dark gray. Increase in moisture and plasticity at 25-27 feet.		
35	7	SS	2/24	4 7 9 12				Bentonite chips
	8	SS	24/24	1 3 5 8				
40	9	SS	24/24	2 4 6 9				
45	10	SS	16/24	4 6 8 13		**CL** Clay, massive, stiff and dense as above. Includes 1/4' minus gravel and small coal fragments., med-dark gray.		
50	11	SS	24/24	3 5 7 10				Bentonite pellets
55	12	SS	24/24	3 4 7 10		**CL** Clay as above, massive, dense, plastic, moist, with occ. 1" minus gravel, med-dark gray.		
60	13	SS	12/24	3 8 10 15				20 - 40 CSSI Sand
65	14	SS	21/24	5 7 7 11		**SW - GP** Sand and Gravel, sand is well graded, fine grained, gravel poorly graded from fine to coarse, clean, wet, light to dark gray		
70	15	SS	21/24	16 17 29				2" Sch. 40 PVC well screen, .010" slots
75	16	SS	14/24	17 9 8 6				
80	17	SS	16/24	5 8 11 14		**ML- CL - Weathered Shale?** Silty clay to sandy silt, fine to med bedding, numerous black carbon? inclusions. Distinctly different from CL above but may not be top of Bearpaw Shale.		Nominal 7.25" diam. auger hole 0 to 80 ft.
85								Locking security cover not shown
90								
95								

CH2MHILL

Well Number: PNR10

Client: Pioneer Natural Resources
Project: Biere Well Investigation
Location: Popular, MT
Project Number: 157168.O1.IN

Driller: Hansen Environmental, Glasgow, MT
Drilling Method: Hollow Stem Auger, CME 55
Sampling Method: Split Spoon
Logged by: C. Feast
Start/Finish Date: 5/4/2000 to 5/4/2000

Depth (ft)	Sample Number	Type	Recovery (in/in)	6"-6"-6"-6" (N)	Soil Description	Well Construction Notes
-5						
0					Ground Surface	2.8 ft above ground
					Top Soil Silt, clayey, moist, med. brown	
5	1	SS	22/24	10 4 5 7		
10					**ML** Silt, clayey, w/fine gravel, iron oxide inclusions, abundant white xtalline streaks and patches, damp, med. brown. Increase gravel at 11-11.5 ft.	
15	2	SS	6/24	2 3 4 7		
20					**CL** Clay, silty, occ. 1/4" minus rounded gravel and coarse sand grains, iron streaks, coal fragments, damp, stiff, med. brown.	2" Sch. 40 PVC flush jt. threaded casing
25	3	SS	24/24	5 5 7 10		
30						
35	4	SS	20/24	3 4 6 10	**CL** Clay, silty, as above with occ. fine to v. coarse gravel and gypsum xtals, occ. iron oxide streaks and inclusions, v.stiff, dense, plastic, massive, moist, mottled brown and gray.	Bentonite chips
40						
45	5	SS	24/24	4 6 7 15		Bentonite pellets
50	6	SS	24/24	2 4 6 10		
55	8	SS	24/24	7 11 3 12	**CL** Clay, with occ fine-med. gravel, massive, stiff, dense, plastic, med-dark gray.	
60	9	SS	24/24	8 7 6 9		Hole collapse
65	10	SS	0/24	5 4 5 6	**SW - GP** Sand and Gravel, sand is well graded, fine grained, gravel poorly graded from fine to coarse, clean, wet, light to dark gray. Abundant charcoal or wood fragments at 79-81. Increase fines with depth to silty sandy gravel, brown and gray bedding at bottom.	
70	11	SS	24/24	8 14 30 28		20 - 40 CSSI Sand
75	12	SS	24/24	5 7 10 14		
80	13	SS	0/24	5 5 8 11		2" Sch. 40 PVC well screen, .010" slots
85	14	SS	15/24	5 6 8 6		
90	15	SS	16/18	5 38 50/5		Hole collapse
	16	SS	12/18	6 16 45		
95					End of Log	
100						Nominal 7.25" diam. auger hole 0 to 93 ft.
105						Locking security cover not shown
110						
115						
120						

CH2MHILL

Well Number: PNR12

Client: Pioneer Natural Resources
Project: Biere Well Investigation
Location: Popular, MT
Project Number: 157168.O1.IN

Driller: Hansen Environmental, Glasgow, MT
Drilling Method: Hollow Stem Auger, CME 55
Sampling Method: Split Spoon
Logged by: C. Feast and C. Peterson/MSE-HKM
Start/Finish Date: 5/1/2000 to 5/1/2000

Depth (ft)	Sample Info: Number	Type	Recovery (in/in)	6"-6"-6"-6" (N)	Soil Log	Soil Description	Well Construction Notes
-5							
0						Ground Surface	3.1 ft above ground
						Top Soil Silt, clayey, moist, med. brown	
5	1	SS	20/24	4 7 7 7		**CL-ML** Sandy and silty clay, dense, mosit, stiff, trace orange mottling, med.brown.	
10	2	SS	20/24	2 4 6 7		**CL** Clay, lean, occ. 1/4" minus rounded gravel, very moist, mottled med.brown and gray, trace iron staining, plastic, stiff, med. brown.	
15	3	SS	24/24	3 5 9 10			
20	4	SS	0/24	3 7 9 11			2" Sch. 40 PVC flush jt. threaded casing
25	5	SS	24/24	3 7 8 13		**CL** Clay, lean, gravelly and sandy, very moist, occ. gypsum xtals and coal or charcoal fragments, med. brown.	
30	6	SS	24/24	3 6 8 11			
35	7	SS	2/24	1 4 7 10		**CL** Clay, lean, occ. fine gravel, stiff, dense, occ gypsum xtals and iron oxide staining, very moist, dark brown.	Bentonite chips
40	8	SS	24/24	4 8 11 15			
45	9	SS	24/24	3 13 16 19		**ML** Silt, clayey, very stiff, moist, light to med. brown becoming more gray with depth. Moisture increase, bedding plans and gray mottling, more evident from 50 -52 ft.	
50	10	SS	16/24	6 11 18 32			Bentonite pellets
55	11	SS	24/24	12 45 38 50/4			
60	12	SS	24/24	12 20 22 29		**SW - GP** Sand and Gravel, sand is well graded, fine grained, gravel poorly graded from fine to coarse, mostly clean with occ. thin silty beds, wet, light gray to light brown.	20 - 40 CSSI Sand
65	13	SS	12/24	8 8 26 36/3			
70	14	SS	21/24	8 11 11 10			2" Sch. 40 PVC well screen, .010" slots
75	15	SS	12/24	-			
80	16	SS	14/24	14 24 47 50/5		**Shale** Bear Paw Shale, Dense clay - weathered shale, massive, damp, occ. partings, slickensides and concoidal fractures in core, dark gray.	Nominal 7.25" diam. auger hole 0 to 80 ft.
85							Locking security cover not shown
90						End of Log	
95							

Well Drawing

CH2MHILL

Well Number: FPB92-12

Client: Pioneer Natural Resources
Project: Biere Well Investigation
Location: Popular, MT
Project Number: 157168.01.IN

Driller:
Drilling Method: Auger
Sampling Method:
Logged by: S.D. Craigg, USGS
Start/Finish Date: to 9/1/1992

Depth (ft)	Sample Info: Number	Type	Recovery (in/in)	6"-6"-6"-6" (N)	Soil Log	Soil Description	Well Drawing	Well Construction Notes
-5								
0						Ground Surface		2.5 ft. above ground
5						**SM** Silty sand, medium-brown		2-in type PVC riser
10								Surface casing (not shown)
15								
20								
25								
30						**CL** Clay, silty, medium brown; encountered a large boulder at 33 ft; 34-48 ft becomes more moist; from 48-62 ft, becomes very tight and difficult to drill		
35								
40								
45								Sand
50								
55								2-in type PVC screen 0.032 slot
60								
65						**Sand** Sand(?); drilling much easier and bit cuts like it is moving through sand, presumably water bearing		5 foot sump
70								
75						**CL** Drilling very difficult; decided to complete well; brought up bit for sample (sample was a gray clay), could not continue augering		
80								
85						End of Log		
90								Log and well construction from USGS Open File Report 95-749
95								

CH2MHILL

Well Number: FPB93-3

Client: Pioneer Natural Resources
Project: Biere Well Investigation
Location: Popular, MT
Project Number: 157168.01.IN

Driller:
Drilling Method: Mud Rotary
Sampling Method:
Logged by: J.N. Thamke, USGS
Start/Finish Date: to 6/24/1993

Depth (ft)	Sample Info: Number	Type	Recovery (In/In)	6"-6"-6"-6" (N)	Soil Log	Soil Description	Well Drawing	Well Construction Notes
-5								
0						Ground Surface		1.6 ft. above ground
5								4-in type PVC riser
10						Clay loam and gravel, caramel-brown		Surface casing (not shown)
15								
20								
25								Bentonite Chips
30						**GC** Clay and gravel, mostly coarse to very coarse gravel, caramel-brown		
35						**Sand** Sand, fine-grained, caramel-brown		
40						Gravel and sand, mostly fine gravel, caramel-brown		
45								Natural Cuttings
50						Sand and cobbles		
55						sand and large cobbles		4-in type PVC screen 0.025 slot
60								
65								24 foot sump
70						**Shale** Shale, dark-gray, smooth, small calcareous pieces (Bearpaw Shale)		
75								
80								
85						End of Log		
90								Log and well construction from USGS Open File Report 95-749
95								

APPENDIX B

Chain-of-Custody Information, Laboratory Analytical Reports, Laboratory QA/QC

ENERGY LABORATORIES, INC.
P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325
FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL eli@energylab.com

LABORATORY ANALYSIS REPORT

MSE-HKM	Project ID:	BIERE WELL SITE, POPLAR OIL FIELD		
Charlie Peterson	Sample ID:	PNR-5		
PO Box 31318	Laboratory ID:	00-54376-8		
Billings, MT 59107-1318	Sample Matrix:	Water		
	Sample Date:	01-Jun-00 1810		
	Received at lab:	05-Jun-00	Reported:	12-Jun-00

	Results	Units	Qual	Reporting Limit	Regulatory Limit	Method	Analyzed	
Calcium	1170	mg/l		1		EPA 200.7	09-Jun-00 1114	MKE
Magnesium	213	mg/l		1		EPA 200.7	09-Jun-00 1114	MKE
Potassium	396	mg/l		1		EPA 200.7	09-Jun-00 1114	MKE
Sodium	22600	mg/l		1		EPA 200.7	09-Jun-00 1114	MKE
Total Hardness as CaCO3	3810	mg/l		1		CALC.	09-Jun-00 1421	RLH
Chloride	38900	mg/l		1		EPA 300.0	09-Jun-00 1130	MKE
Sulfate	1690	mg/l		1		EPA 300.0	07-Jun-00 2138	RLH
Alkalinity as CaCO3	267	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Bicarbonate	325	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Carbonate	<1	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Specific Conductance @ 25 C	85100	umhos/cm		1		SM2510B	09-Jun-00 1745	CAR
Total Dissolved Solids Calculated	65200	mg/l		1		CALC.	09-Jun-00 1421	RLH
pH	7.4	s.u.		0.1		EPA 150.1	05-Jun-00 1626	CAR
Nitrogen, Nitrate plus Nitrite	<0.05	mg/l		0.05		EPA 353.2	06-Jun-00 1756	BAS
Iron	0.2	mg/l		0.03		EPA 200.7	08-Jun-00 1814	MKE

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LABORATORY ANALYSIS REPORT

MSE-HKM	Project ID:	BIERE WELL SITE, POPLAR OIL FIELD		
Charlie Peterson	Sample ID:	PNR-6		
PO Box 31318	Laboratory ID:	00-54376-9		
Billings, MT 59107-1318	Sample Matrix:	Water		
	Sample Date:	31-May-00		
	Received at lab:	05-Jun-00	Reported:	12-Jun-00

	Results	Units	Qual	Reporting Limit	Regulatory Limit	Method	Analyzed	
Calcium	109	mg/l		1		EPA 200.7	07-Jun-00 1730	RLH
Magnesium	77	mg/l		1		EPA 200.7	07-Jun-00 1730	RLH
Potassium	6	mg/l		1		EPA 200.7	07-Jun-00 1730	RLH
Sodium	75	mg/l		1		EPA 200.7	07-Jun-00 1730	RLH
Total Hardness as CaCO3	587	mg/l		1		CALC.	08-Jun-00 1622	RLH
Chloride	14	mg/l		1		EPA 300.0	07-Jun-00 2202	RLH
Sulfate	229	mg/l		1		EPA 300.0	07-Jun-00 2202	RLH
Alkalinity as CaCO3	511	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Bicarbonate	624	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Carbonate	<1	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Specific Conductance @ 25 C	1210	umhos/cm		1		SM2510B	05-Jun-00 1627	CAR
Total Dissolved Solids Calculated	849	mg/l		1		CALC.	08-Jun-00 1622	RLH
pH	8.0	s.u.		0.1		EPA 150.1	05-Jun-00 1627	CAR
Nitrogen, Nitrate plus Nitrite	0.06	mg/l		0.05		EPA 353.2	06-Jun-00 1758	BAS
Iron	0.09	mg/l		0.03		EPA 200.7	08-Jun-00 1816	MKE

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LABORATORY ANALYSIS REPORT

MSE-HKM	Project ID:	BIERE WELL SITE, POPLAR OIL FIELD		
Charlie Peterson	Sample ID:	PNR-7		
PO Box 31318	Laboratory ID:	00-54376-11		
Billings, MT 59107-1318	Sample Matrix:	Water		
	Sample Date:	31-May-00		
	Received at lab:	05-Jun-00	Reported:	12-Jun-00

	Results	Units	Qual	Reporting Limit	Regulatory Limit	Method	Analyzed	
Calcium	2770	mg/l		1		EPA 200.7	07-Jun-00 1736	RLH
Magnesium	2130	mg/l		1		EPA 200.7	07-Jun-00 1736	RLH
Potassium	55	mg/l		1		EPA 200.7	07-Jun-00 1736	RLH
Sodium	6800	mg/l		1		EPA 200.7	07-Jun-00 1736	RLH
Total Hardness as CaCO3	15700	mg/l		1		CALC.	09-Jun-00 0921	RLH
Chloride	21700	mg/l		1		EPA 300.0	08-Jun-00 1315	RLH
Sulfate	1540	mg/l		1		EPA 300.0	07-Jun-00 2300	RLH
Alkalinity as CaCO3	343	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Bicarbonate	418	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Carbonate	< 1	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Specific Conductance @ 25 C	48200	umhos/cm		1		SM2510B	09-Jun-00 1745	CAR
Total Dissolved Solids Calculated	35300	mg/l		1		CALC.	09-Jun-00 0921	RLH
pH	7.2	s.u.		0.1		EPA 150.1	05-Jun-00 1631	CAR
Nitrogen, Nitrate plus Nitrite	4.11	mg/l		0.05		EPA 353.2	06-Jun-00 1841	BAS
Iron	2.6	mg/l		0.03		EPA 200.7	08-Jun-00 1826	MKE

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LABORATORY ANALYSIS REPORT

MSE-HKM	Project ID:	BIERE WELL SITE, POPLAR OIL FIELD		
Charlie Peterson	Sample ID:	PNR-8		
PO Box 31318	Laboratory ID:	00-54376-12		
Billings, MT 59107-1318	Sample Matrix:	Water		
	Sample Date:	31-May-00		
	Received at lab:	05-Jun-00	Reported:	12-Jun-00

	Results	Units	Qual	Reporting Limit	Regulatory Limit	Method	Analyzed	
Calcium	272	mg/l		1		EPA 200.7	07-Jun-00 1740	RLH
Magnesium	200	mg/l		1		EPA 200.7	07-Jun-00 1740	RLH
Potassium	12	mg/l		1		EPA 200.7	07-Jun-00 1740	RLH
Sodium	420	mg/l		1		EPA 200.7	07-Jun-00 1740	RLH
Total Hardness as CaCO3	1500	mg/l		1		CALC.	09-Jun-00 1521	RLH
Chloride	380	mg/l		1		EPA 300.0	07-Jun-00 2312	RLH
Sulfate	738	mg/l		1		EPA 300.0	07-Jun-00 2312	RLH
Alkalinity as CaCO3	464	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Bicarbonate	566	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Carbonate	< 1	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Specific Conductance @ 25 C	4080	umhos/cm		1		SM2510B	05-Jun-00 1633	CAR
Total Dissolved Solids Calculated	2350	mg/l		1		CALC.	09-Jun-00 1521	RLH
pH	7.8	s.u.		0.1		EPA 150.1	05-Jun-00 1633	CAR
Nitrogen, Nitrate plus Nitrite	< 0.05	mg/l		0.05		EPA 353.2	06-Jun-00 1800	BAS
Iron	25.2	mg/l		0.03		EPA 200.7	08-Jun-00 1832	MKE

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LABORATORY ANALYSIS REPORT

MSE-HKM	Project ID:	BIERE WELL SITE, POPLAR OIL FIELD		
Charlie Peterson	Sample ID:	PNR-9		
PO Box 31318	Laboratory ID:	00-54376-2		
Billings, MT 59107-1318	Sample Matrix:	Water		
	Sample Date:	01-Jun-00 1010		
	Received at lab:	05-Jun-00	Reported:	12-Jun-00

	Results	Units	Qual	Reporting Limit	Regulatory Limit	Method	Analyzed	
Calcium	583	mg/l		1		EPA 200.7	07-Jun-00 1711	RLH
Magnesium	355	mg/l		1		EPA 200.7	07-Jun-00 1711	RLH
Potassium	16	mg/l		1		EPA 200.7	07-Jun-00 1711	RLH
Sodium	887	mg/l		1		EPA 200.7	07-Jun-00 1711	RLH
Total Hardness as CaCO3	2920	mg/l		1		CALC.	09-Jun-00 1419	RLH
Chloride	3060	mg/l		1		EPA 300.0	07-Jun-00 2028	RLH
Sulfate	609	mg/l		1		EPA 300.0	09-Jun-00 1043	MKE
Alkalinity as CaCO3	263	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Bicarbonate	321	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Carbonate	<1	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Specific Conductance @ 25 C	9310	umhos/cm		1		SM2510B	05-Jun-00 1557	CAR
Total Dissolved Solids Calculated	5700	mg/l		1		CALC.	09-Jun-00 1419	RLH
pH	7.3	s.u.		0.1		EPA 150.1	05-Jun-00 1557	CAR
Nitrogen, Nitrate plus Nitrite	<0.05	mg/l		0.05		EPA 353.2	06-Jun-00 1750	BAS
Iron	35.4	mg/l		0.03		EPA 200.7	08-Jun-00 1800	MKE

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LABORATORY ANALYSIS REPORT

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BOISE

MSE-HKM
Charlie Peterson
PO Box 31318
Billings, MT 59107-1318

Project ID: BIERE WELL SITE, POPLAR OIL FIELD
Sample ID: PNR-10
Laboratory ID: 00-54376-1
Sample Matrix: Water
Sample Date: 01-Jun-00 0845
Received at lab: 05-Jun-00
Reported: 12-Jun-00

	Results	Units	Qual	Reporting Limit	Regulatory Limit	Method	Analyzed	
Calcium	208	mg/l		1		EPA 200.7	07-Jun-00 1707	RLH
Magnesium	111	mg/l		1		EPA 200.7	07-Jun-00 1707	RLH
Potassium	8	mg/l		1		EPA 200.7	07-Jun-00 1707	RLH
Sodium	435	mg/l		1		EPA 200.7	07-Jun-00 1707	RLH
Total Hardness as CaCO3	978	mg/l		1		CALC.	08-Jun-00 1612	RLH
Chloride	147	mg/l		1		EPA 300.0	07-Jun-00 1953	RLH
Sulfate	1210	mg/l		1		EPA 300.0	07-Jun-00 1953	RLH
Alkalinity as CaCO3	528	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Bicarbonate	645	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Carbonate	<1	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Specific Conductance @ 25 C	3120	umhos/cm		1		SM2510B	05-Jun-00 1555	CAR
Total Dissolved Solids Calculated	2480	mg/l		1		CALC.	08-Jun-00 1612	RLH
pH	7.6	s.u.		0.1		EPA 150.1	05-Jun-00 1555	CAR
Nitrogen, Nitrate plus Nitrite	<0.05	mg/l		0.05		EPA 353.2	06-Jun-00 1750	BAS
Iron	12.1	mg/l		0.03		EPA 200.7	08-Jun-00 1758	MKE

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FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL eli@energylab.com

LABORATORY ANALYSIS REPORT

MSE-HKM	Project ID:	BIERE WELL SITE, POPLAR OIL FIELD		
Charlie Peterson	Sample ID:	PNR-12		
PO Box 31318	Laboratory ID:	00-54376-10		
Billings, MT 59107-1318	Sample Matrix:	Water		
	Sample Date:	31-May-00		
	Received at lab:	05-Jun-00	Reported:	12-Jun-00

	Results	Units	Qual	Reporting Limit	Regulatory Limit	Method	Analyzed	
Calcium	425	mg/l		1		EPA 200.7	07-Jun-00 1732	RLH
Magnesium	328	mg/l		1		EPA 200.7	07-Jun-00 1732	RLH
Potassium	17	mg/l		1		EPA 200.7	07-Jun-00 1732	RLH
Sodium	362	mg/l		1		EPA 200.7	07-Jun-00 1732	RLH
Total Hardness as CaCO3	2410	mg/l		1		CALC.	08-Jun-00 1623	RLH
Chloride	78	mg/l		1		EPA 300.0	07-Jun-00 2249	RLH
Sulfate	2030	mg/l		1		EPA 300.0	07-Jun-00 2249	RLH
Alkalinity as CaCO3	699	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Bicarbonate	853	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Carbonate	< 1	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Specific Conductance @ 25 C	4580	umhos/cm		1		SM2510B	05-Jun-00 1629	CAR
Total Dissolved Solids Calculated	4020	mg/l		1		CALC.	08-Jun-00 1623	RLH
pH	7.6	s.u.		0.1		EPA 150.1	05-Jun-00 1629	CAR
Nitrogen, Nitrate plus Nitrite	95.7	mg/l		0.05		EPA 353.2	06-Jun-00 1840	BAS
Iron	39.3	mg/l		0.03		EPA 200.7	08-Jun-00 1820	MKE

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LABORATORY ANALYSIS REPORT

MSE-HKM	Project ID:	BIERE WELL SITE, POPLAR OIL FIELD		
Charlie Peterson	Sample ID:	LOCKMAN CULVERT WELL		
PO Box 31318	Laboratory ID:	00-54376-3		
Billings, MT 59107-1318	Sample Matrix:	Water		
	Sample Date:	01-Jun-00 1200		
	Received at lab:	05-Jun-00	Reported:	12-Jun-00

	Results	Units	Qual	Reporting Limit	Regulatory Limit	Method	Analyzed	
Calcium	1530	mg/l		1		EPA 200.7	09-Jun-00 1110	MKE
Magnesium	749	mg/l		1		EPA 200.7	09-Jun-00 1110	MKE
Potassium	62	mg/l		1		EPA 200.7	09-Jun-00 1110	MKE
Sodium	14200	mg/l		1		EPA 200.7	09-Jun-00 1110	MKE
Total Hardness as CaCO3	6920	mg/l		1		CALC.	09-Jun-00 1409	RLH
Chloride	25800	mg/l		1		EPA 300.0	08-Jun-00 1228	RLH
Sulfate	1910	mg/l		1		EPA 300.0	07-Jun-00 2040	RLH
Alkalinity as CaCO3	600	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Bicarbonate	732	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Carbonate	< 1	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Specific Conductance @ 25 C	58900	umhos/cm		1		SM2510B	09-Jun-00 1745	CAR
Total Dissolved Solids Calculated	44700	mg/l		1		CALC.	09-Jun-00 1409	RLH
pH	7.1	s.u.		0.1		EPA 150.1	05-Jun-00 1600	CAR
Nitrogen, Nitrate plus Nitrite	20.9	mg/l		0.05		EPA 353.2	06-Jun-00 1751	BAS
Iron	8.6	mg/l		0.03		EPA 200.7	08-Jun-00 1802	MKE

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LABORATORY ANALYSIS REPORT

MSE-HKM	Project ID:	BIERE WELL SITE, POPLAR OIL FIELD		
Charlie Peterson	Sample ID:	M-30		
PO Box 31318	Laboratory ID:	00-54376-4		
Billings, MT 59107-1318	Sample Matrix:	Water		
	Sample Date:	01-Jun-00 1230		
	Received at lab:	05-Jun-00	Reported:	12-Jun-00

	Results	Units	Qual	Reporting Limit	Regulatory Limit	Method	Analyzed	
Calcium	126	mg/l		1		EPA 200.7	09-Jun-00 1112	MKE
Magnesium	118	mg/l		1		EPA 200.7	09-Jun-00 1112	MKE
Potassium	7	mg/l		1		EPA 200.7	09-Jun-00 1112	MKE
Sodium	325	mg/l		1		EPA 200.7	09-Jun-00 1112	MKE
Total Hardness as CaCO3	801	mg/l		1		CALC.	09-Jun-00 1410	RLH
Chloride	36	mg/l		1		EPA 300.0	07-Jun-00 2051	RLH
Sulfate	501	mg/l		1		EPA 300.0	07-Jun-00 2051	RLH
Alkalinity as CaCO3	1020	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Bicarbonate	1240	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Carbonate	<1	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Specific Conductance @ 25 C	2380	umhos/cm		1		SM2510B	05-Jun-00 1602	CAR
Total Dissolved Solids Calculated	1740	mg/l		1		CALC.	09-Jun-00 1410	RLH
pH	8.0	s.u.		0.1		EPA 150.1	05-Jun-00 1602	CAR
Nitrogen, Nitrate plus Nitrite	<0.05	mg/l		0.05		EPA 353.2	06-Jun-00 1752	BAS
Iron	5.63	mg/l		0.03		EPA 200.7	08-Jun-00 1808	MKE

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LABORATORY ANALYSIS REPORT

MSE-HKM	Project ID:	BIERE WELL SITE, POPLAR OIL FIELD		
Charlie Peterson	Sample ID:	TROTTIER OLD WELL		
PO Box 31318	Laboratory ID:	00-54376-5		
Billings, MT 59107-1318	Sample Matrix:	Water		
	Sample Date:	01-Jun-00 1340		
	Received at lab:	05-Jun-00	Reported:	12-Jun-00

	Results	Units	Qual	Reporting Limit	Regulatory Limit	Method	Analyzed	
Calcium	1760	mg/l		1		EPA 200.7	07-Jun-00 1721	RLH
Magnesium	783	mg/l		1		EPA 200.7	07-Jun-00 1721	RLH
Potassium	122	mg/l		1		EPA 200.7	07-Jun-00 1721	RLH
Sodium	20200	mg/l		1		EPA 200.7	07-Jun-00 1721	RLH
Total Hardness as CaCO3	7610	mg/l		1		CALC.	09-Jun-00 0919	RLH
Chloride	36000	mg/l		1		EPA 300.0	08-Jun-00 1240	RLH
Sulfate	1690	mg/l		1		EPA 300.0	07-Jun-00 2103	RLH
Alkalinity as CaCO3	461	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Bicarbonate	562	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Carbonate	<1	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Specific Conductance @ 25 C	80500	umhos/cm		1		SM2510B	09-Jun-00 1745	CAR
Total Dissolved Solids Calculated	60800	mg/l		1		CALC.	09-Jun-00 0919	RLH
pH	7.1	s.u.		0.1		EPA 150.1	05-Jun-00 1605	CAR
Nitrogen, Nitrate plus Nitrite	0.17	mg/l		0.05		EPA 353.2	06-Jun-00 1752	BAS
Iron	9.5	mg/l		0.03		EPA 200.7	08-Jun-00 1810	MKE

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LABORATORY ANALYSIS REPORT

MSE-HKM	Project ID:	BIERE WELL SITE, POPLAR OIL FIELD		
Charlie Peterson	Sample ID:	FPB-92-12		
PO Box 31318	Laboratory ID:	00-54376-6		
Billings, MT 59107-1318	Sample Matrix:	Water		
	Sample Date:	01-Jun-00 1550		
	Received at lab:	05-Jun-00	Reported:	12-Jun-00

	Results	Units	Qual	Reporting Limit	Regulatory Limit	Method	Analyzed	
Calcium	240	mg/l		1		EPA 200.7	07-Jun-00 1723	RLH
Magnesium	260	mg/l		1		EPA 200.7	07-Jun-00 1723	RLH
Potassium	14	mg/l		1		EPA 200.7	07-Jun-00 1723	RLH
Sodium	95	mg/l		1		EPA 200.7	07-Jun-00 1723	RLH
Total Hardness as CaCO3	1670	mg/l		1		CALC.	08-Jun-00 1620	RLH
Chloride	11	mg/l		1		EPA 300.0	07-Jun-00 2115	RLH
Sulfate	1410	mg/l		1		EPA 300.0	07-Jun-00 2115	RLH
Alkalinity as CaCO3	389	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Bicarbonate	474	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Carbonate	<1	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Specific Conductance @ 25 C	2580	umhos/cm		1		SM2510B	05-Jun-00 1607	CAR
Total Dissolved Solids Calculated	2330	mg/l		1		CALC.	08-Jun-00 1620	RLH
pH	7.9	s.u.		0.1		EPA 150.1	05-Jun-00 1607	CAR
Nitrogen, Nitrate plus Nitrite	3.94	mg/l		0.05		EPA 353.2	06-Jun-00 1754	BAS
Iron	12.1	mg/l		0.03		EPA 200.7	08-Jun-00 1812	MKE

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LABORATORY ANALYSIS REPORT

MSE-HKM	Project ID:	BIERE WELL SITE, POPLAR OIL FIELD		
Charlie Peterson	Sample ID:	FPB-93-3		
PO Box 31318	Laboratory ID:	00-54376-7		
Billings, MT 59107-1318	Sample Matrix:	Water		
	Sample Date:	01-Jun-00 1655		
	Received at lab:	05-Jun-00	Reported:	12-Jun-00

	Results	Units	Qual	Reporting Limit	Regulatory Limit	Method	Analyzed	
Calcium	1080	mg/l		1		EPA 200.7	07-Jun-00 1726	RLH
Magnesium	257	mg/l		1		EPA 200.7	07-Jun-00 1726	RLH
Potassium	403	mg/l		1		EPA 200.7	07-Jun-00 1726	RLH
Sodium	23400	mg/l		1		EPA 200.7	07-Jun-00 1726	RLH
Total Hardness as CaCO3	3770	mg/l		1		CALC.	09-Jun-00 0919	RLH
Chloride	39800	mg/l		1		EPA 300.0	08-Jun-00 1251	RLH
Sulfate	1730	mg/l		1		EPA 300.0	07-Jun-00 2127	RLH
Alkalinity as CaCO3	396	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Bicarbonate	483	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Carbonate	<1	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Specific Conductance @ 25 C	87000	umhos/cm		1		SM2510B	09-Jun-00 1745	CAR
Total Dissolved Solids Calculated	67000	mg/l		1		CALC.	09-Jun-00 0919	RLH
pH	7.1	s.u.		0.1		EPA 150.1	05-Jun-00 1617	CAR
Nitrogen, Nitrate plus Nitrite	<0.05	mg/l		0.05		EPA 353.2	06-Jun-00 1755	BAS
Iron	<0.08	mg/l	*	0.03		EPA 200.7	07-Jun-00 1910	RLH

*Detection limit raised due to matrix interference.

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LABORATORY ANALYSIS REPORT

MSE-HKM	Project ID:	BIERE WELL SITE, POPLAR OIL FIELD		
Charlie Peterson	Sample ID:	WHITMER WELL		
PO Box 31318	Laboratory ID:	00-54376-13		
Billings, MT 59107-1318	Sample Matrix:	Water		
	Sample Date:	31-May-00		
	Received at lab:	05-Jun-00	Reported:	12-Jun-00

	Results	Units	Qual	Reporting Limit	Regulatory Limit	Method	Analyzed	
Calcium	133	mg/l		1		EPA 200.7	07-Jun-00 1746	RLH
Magnesium	88	mg/l		1		EPA 200.7	07-Jun-00 1746	RLH
Potassium	8	mg/l		1		EPA 200.7	07-Jun-00 1746	RLH
Sodium	432	mg/l		1		EPA 200.7	07-Jun-00 1746	RLH
Total Hardness as CaCO3	695	mg/l		1		CALC.	08-Jun-00 1626	RLH
Chloride	794	mg/l		1		EPA 300.0	07-Jun-00 2324	RLH
Sulfate	279	mg/l		1		EPA 300.0	07-Jun-00 2324	RLH
Alkalinity as CaCO3	352	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Bicarbonate	429	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Carbonate	<1	mg/l		1		SM2320B	07-Jun-00 0906	MKE
Specific Conductance @ 25 C	3220	umhos/cm		1		SM2510B	05-Jun-00 1635	CAR
Total Dissolved Solids Calculated	1970	mg/l		1		CALC.	08-Jun-00 1626	RLH
pH	8.2	s.u.		0.1		EPA 150.1	05-Jun-00 1635	CAR
Nitrogen, Nitrate plus Nitrite	<0.05	mg/l		0.05		EPA 353.2	06-Jun-00 1801	BAS
Iron	4.82	mg/l		0.03		EPA 200.7	08-Jun-00 1834	MKE

Lab Nos. 00-54376-1-13

QUALITY ASSURANCE DATA PACKAGE

This report is a summary of the results of quality assurance tests performed with the sample analyses. They are performed to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate and precise results. The date the quality assurance sample was analyzed is consistent with Energy Laboratories' Quality Assurance Plan.

Constituents	Duplicate Analysis ——mg/l (ppm)—— Original	Duplicate	Spiked Analysis, % Recovery	Blank Analysis, mg/l (ppm)	Control Sample Analysis, mg/l (ppm)	True Value Acceptable +/- 10% mg/l (ppm)
Calcium	425	426	92	<1	49	50
Magnesium	328	329	97	<1	50	50
Potassium	17	16	94	<1	47	50
Sodium	362	362	87	<1	48	50
Chloride	<1	<1	118	<1	26	25
Sulfate	1690	1670	119	<1	103	100
Alkalinity as $CaCO_3$	396	398	92	2	101	100
Conductivity, μmhos/cm	2580	2550	N/A	<1	N/A	N/A
pH, s.u.	7.9	7.9	N/A	N/A	N/A	N/A
Nitrate plus Nitrite as N	0.41	0.40	102	<0.05	2.35	2.3
Iron, Total	0.09	0.09	91	<0.03	4.94	5

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Client: MSE-HKM
Date Sampled: 01-JUN-2000 08:45
Date Received: 05-JUN-2000 00:00
Analysis Date: 08-JUN-2000 19:36
File: /chem/IONTRAP2.i/vc060800.b/14jun08.d
Project Info: BIERE WELL SITE, POPLAR OIL FIELD
Sample Info: PNR-10

Lab No.: 001-00-54376
Report Date: 06/12/2000 16:32
Extraction Method: EPA 5030
Sample Matrix: WATER; pH= < 2

EPA METHOD 524.2
VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
Benzene	71-43-2	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Toluene	108-88-3	1000	0.60	
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	9.56	96	74--127
Toluene d8	10.0	9.73	97	80--120
p-Bromofluorobenzene	10.0	10.2	102	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:
U- Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HJC Reviewing Supervisor: mm

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Client: MSE-HKM
Date Sampled: 01-JUN-2000 10:10
Date Received: 05-JUN-2000 00:00
Analysis Date: 08-JUN-2000 20:13
File: /chem/IONTRAP2.i/vc060800.b/15jun08.d
Project Info: BIERE WELL SITE, POPLAR OIL FIELD
Sample Info: PNR-9

Lab No.: 002-00-54376
Report Date: 06/12/2000 16:32
Extraction Method: EPA 5030
Sample Matrix: WATER; pH= < 2

EPA METHOD 524.2
VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
Benzene	71-43-2	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Toluene	**108-88-3**	**1000**	**0.86**	
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	9.76	98	74--127
Toluene d8	10.0	10.1	101	80--120
p-Bromofluorobenzene	10.0	10.8	108	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:
U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HJC Reviewing Supervisor: M

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Client: MSE-HKM
Date Sampled: 01-JUN-2000 12:00
Date Received: 05-JUN-2000 00:00
Analysis Date: 08-JUN-2000 20:50
File: /chem/IONTRAP2.i/vc060800.b/16jun08.d
Project Info: BIERE WELL SITE, POPLAR OIL FIELD
Sample Info: LOCKMAN CULVERT WELL

Lab No.: 003-00-54376
Report Date: 06/12/2000 16:32
Extraction Method: EPA 5030
Sample Matrix: WATER; pH= < 2

EPA METHOD 524.2
VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
Benzene	**71-43-2**	**5**	**14**	**D**
Ethylbenzene	100-41-4	700	<0.50	U
Toluene	**108-88-3**	**1000**	**2.8**	
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	10.4	104	74--127
Toluene d8	10.0	9.66	97	80--120
p-Bromofluorobenzene	10.0	10.2	102	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:
U= Indicates compound was analyzed for but not detected.
D= Value derived from a 5 times dilution.

REPORT COMMENTS: None

Analyst: HJC Reviewing Supervisor: [illegible]

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Client: MSE-HKM
Date Sampled: 01-JUN-2000 12:30
Date Received: 05-JUN-2000 00:00
Analysis Date: 08-JUN-2000 21:27
File: /chem/IONTRAP2.i/vc060800.b/17jun08.d
Project Info: BIERE WELL SITE, POPLAR OIL FIELD
Sample Info: M-30

Lab No.: 004-00-54376
Report Date: 06/12/2000 16:32
Extraction Method: EPA 5030
Sample Matrix: WATER; pH= < 2

EPA METHOD 524.2
VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
Benzene	71-43-2	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Toluene	108-88-3	1000	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	9.13	91	74--127
Toluene d8	10.0	9.59	96	80--120
p-Bromofluorobenzene	10.0	10.4	104	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:
U- Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HJC Reviewing Supervisor: MM

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Client: MSE-HKM
Date Sampled: 01-JUN-2000 13:40
Date Received: 05-JUN-2000 00:00
Analysis Date: 08-JUN-2000 22:03
File: /chem/IONTRAP2.i/vc060800.b/18jun08.d
Project Info: BIERE WELL SITE, POPLAR OIL FIELD
Sample Info: TROTTIER OLD WELL

Lab No.: 005-00-54376
Report Date: 06/12/2000 16:32
Extraction Method: EPA 5030
Sample Matrix: WATER; pH= < 2

EPA METHOD 524.2
VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
Benzene	**71-43-2**	**5**	**41**	**D**
Ethylbenzene	100-41-4	700	<0.50	U
Toluene	**108-88-3**	**1000**	**0.88**	
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	11.0	110	74--127
Toluene d8	10.0	10.0	100	80--120
p-Bromofluorobenzene	10.0	9.75	98	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U- Indicates compound was analyzed for but not detected.

D- Value derived from a 10 times dilution.

REPORT COMMENTS: None

Analyst: HJC Reviewing Supervisor: MM

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Client: MSE-HKM
Date Sampled: 01-JUN-2000 15:50
Date Received: 05-JUN-2000 00:00
Analysis Date: 08-JUN-2000 22:40
File: /chem/IONTRAP2.i/vc060800.b/19jun08.d
Project Info: BIERE WELL SITE, POPLAR OIL FIELD
Sample Info: FPB-92-12

Lab No.: 006-00-54376
Report Date: 06/13/2000 10:38
Extraction Method: EPA 5030
Sample Matrix: WATER; pH= < 2

EPA METHOD 524.2
VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
Benzene	71-43-2	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Toluene	**108-88-3**	**1000**	**<0.50**	**0.30J**
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	9.30	93	74--127
Toluene d8	10.0	10.5	105	80--120
p-Bromofluorobenzene	10.0	10.9	109	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U- Indicates compound was analyzed for but not detected.

J- Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst: HJC Reviewing Supervisor: MD

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Client: MSE-HKM
Date Sampled: 01-JUN-2000 15:50
Date Received: 05-JUN-2000 00:00
Analysis Date: 12-JUN-2000 16:11
File: /chem/IONTRAP2.i/vc061200.b/10jun12.d
Project Info: BIERE WELL SITE, POPLAR OIL FIELD
Sample Info: FPB-92-12

Lab No.: 006-00-54376 Dup
Report Date: 06/13/2000 10:49
Extraction Method: EPA 5030
Sample Matrix: WATER; pH= < 2

EPA METHOD 524.2
VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
Benzene	71-43-2	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Toluene	**108-88-3**	**1000**	**<0.50**	**0.26J**
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	9.10	91	74--127
Toluene d8	10.0	10.4	104	80--120
p-Bromofluorobenzene	10.0	10.8	108	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:
U= Indicates compound was analyzed for but not detected.
J= Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst: HJC Reviewing Supervisor: MM

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Client: MSE-HKM
Date Sampled: 01-JUN-2000 16:55
Date Received: 05-JUN-2000 00:00
Analysis Date: 08-JUN-2000 23:17
File: /chem/IONTRAP2.i/vc060800.b/20jun08.d
Project Info: BIERE WELL SITE, POPLAR OIL FIELD
Sample Info: FPB-93-3

Lab No.: 007-00-54376
Report Date: 06/12/2000 16:33
Extraction Method: EPA 5030
Sample Matrix: WATER; pH= < 2

EPA METHOD 524.2
VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
Benzene	**71-43-2**	**5**	**4.4**	
Ethylbenzene	100-41-4	700	<0.50	U
Toluene	**108-88-3**	**1000**	**<0.50**	**0.16J**
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	11.5	115	74--127
Toluene d8	10.0	9.86	99	80--120
p-Bromofluorobenzene	10.0	9.37	94	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:
U- Indicates compound was analyzed for but not detected.
J- Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst: HGC Reviewing Supervisor: MJ

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Client: MSE-HKM
Date Sampled: 01-JUN-2000 18:10
Date Received: 05-JUN-2000 00:00
Analysis Date: 08-JUN-2000 23:53
File: /chem/IONTRAP2.i/vc060800.b/21jun08.d
Project Info: BIERE WELL SITE, POPLAR OIL FIELD
Sample Info: PNR-5

Lab No.: 008-00-54376
Report Date: 06/12/2000 16:33
Extraction Method: EPA 5030
Sample Matrix: WATER; pH= < 2

EPA METHOD 524.2
VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
Benzene	71-43-2	5	1.2	
Ethylbenzene	100-41-4	700	6.7	
Toluene	108-88-3	1000	0.75	
m+p-Xylenes	108383/106423		3.5	
o-Xylene	95-47-6		0.68	
Total Xylenes		10000	4.2	

SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	10.4	104	74--127
Toluene d8	10.0	10.0	100	80--120
p-Bromofluorobenzene	10.0	9.22	92	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:
U- Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HJC Reviewing Supervisor: MM

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Client: MSE-HKM
Date Sampled: 31-MAY-2000 00:00
Date Received: 05-JUN-2000 00:00
Analysis Date: 09-JUN-2000 14:39
File: /chem/IONTRAP2.i/vc060900.b/09jun09.d
Project Info: BIERE WELL SITE, POPLAR OIL FIELD
Sample Info: PNR-6

Lab No.: 009-00-54376
Report Date: 06/12/2000 17:01
Extraction Method: EPA 5030
Sample Matrix: WATER; pH= < 2

EPA METHOD 524.2
VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
Benzene	71-43-2	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Toluene	108-88-3	1000	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	8.02	80	74--127
Toluene d8	10.0	10.9	109	80--120
p-Bromofluorobenzene	10.0	11.2	112	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:
U- Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HJC Reviewing Supervisor: MM

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Client: MSE-HKM
Date Sampled: 31-MAY-2000 00:00
Date Received: 05-JUN-2000 00:00
Analysis Date: 09-JUN-2000 15:19
File: /chem/IONTRAP2.i/vc060900.b/10jun09.d
Project Info: BIERE WELL SITE, POPLAR OIL FIELD
Sample Info: PNR-12

Lab No.: 010-00-54376
Report Date: 06/12/2000 17:01
Extraction Method: EPA 5030
Sample Matrix: WATER; pH= < 2

EPA METHOD 524.2
VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
Benzene	71-43-2	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Toluene	108-88-3	1000	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	8.32	83	74--127
Toluene d8	10.0	11.2	112	80--120
p-Bromofluorobenzene	10.0	11.4	114	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:
U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HJC Reviewing Supervisor: MM

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Client: MSE-HKM
Date Sampled: 31-MAY-2000 00:00
Date Received: 05-JUN-2000 00:00
Analysis Date: 09-JUN-2000 15:53
File: /chem/IONTRAP2.i/vc060900.b/11jun09.d
Project Info: BIERE WELL SITE, POPLAR OIL FIELD
Sample Info: PNR-7

Lab No.: 011-00-54376
Report Date: 06/12/2000 17:04
Extraction Method: EPA 5030
Sample Matrix: WATER; pH= < 2

EPA METHOD 524.2
VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
Benzene	**71-43-2**	**5**	**27**	**D**
Ethylbenzene	100-41-4	700	<0.50	U
Toluene	108-88-3	1000	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	9.22	92	74--127
Toluene d8	10.0	10.9	109	80--120
p-Bromofluorobenzene	10.0	10.2	102	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:
U- Indicates compound was analyzed for but not detected.
D- Value derived from a 20 times dilution.

REPORT COMMENTS: None

Analyst: HJC Reviewing Supervisor: MM

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Client: MSE-HKM
Date Sampled: 31-MAY-2000 00:00
Date Received: 05-JUN-2000 00:00
Analysis Date: 09-JUN-2000 13:10
File: /chem/IONTRAP2.i/vc060900.b/08jun09.d
Project Info: BIERE WELL SITE, POPLAR OIL FIELD
Sample Info: PNR-8

Lab No.: 012-00-54376
Report Date: 06/13/2000 10:39
Extraction Method: EPA 5030
Sample Matrix: WATER; pH= < 2

EPA METHOD 524.2
VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
Benzene	71-43-2	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Toluene	108-88-3	1000	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	7.63	76	74--127
Toluene d8	10.0	10.7	107	80--120
p-Bromofluorobenzene	10.0	11.2	112	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:
U- Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: [illegible] Reviewing Supervisor: [illegible]

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Client: MSE-HKM
Date Sampled: 31-MAY-2000 00:00
Date Received: 05-JUN-2000 00:00
Analysis Date: 12-JUN-2000 16:48
File: /chem/IONTRAP2.i/vc061200.b/11jun12.d
Project Info: BIERE WELL SITE, POPLAR OIL FIELD
Sample Info: PNR-8

Lab No.: 012-00-54376 Dup
Report Date: 06/13/2000 10:49
Extraction Method: EPA 5030
Sample Matrix: WATER; pH= < 2

EPA METHOD 524.2
VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
Benzene	71-43-2	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Toluene	108-88-3	1000	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	9.50	95	74--127
Toluene d8	10.0	10.2	102	80--120
p-Bromofluorobenzene	10.0	10.3	103	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:
U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HC Reviewing Supervisor: MJ

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Client: MSE-HKM
Date Sampled: 31-MAY-2000 00:00
Date Received: 05-JUN-2000 00:00
Analysis Date: 10-JUN-2000 01:56
File: /chem/IONTRAP2.i/vc060900.b/27jun09.d
Project Info: BIERE WELL SITE, POPLAR OIL FIELD
Sample Info: WHITMER WELL

Lab No.: 013-00-54376
Report Date: 06/12/2000 17:01
Extraction Method: EPA 5030
Sample Matrix: WATER; pH= < 2

EPA METHOD 524.2
VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
Benzene	71-43-2	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Toluene	108-88-3	1000	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	8.77	88	74--127
Toluene d8	10.0	10.5	105	80--120
p-Bromofluorobenzene	10.0	11.3	113	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:
U- Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HGC Reviewing Supervisor: [illegible]

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Client: MSE-HKM
Date Sampled:
Date Received: 05-JUN-2000 00:00
Analysis Date: 09-JUN-2000 17:22
File: /chem/IONTRAP2.i/vc060900.b/13jun09.d
Project Info: BIERE WELL SITE, POPLAR OIL FIELD
Sample Info: TRIP BLANK

Lab No.: 014-00-54376
Report Date: 06/12/2000 17:01
Extraction Method: EPA 5030
Sample Matrix: WATER; pH= < 2

EPA METHOD 524.2
VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
Benzene	71-43-2	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Toluene	108-88-3	1000	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	9.03	90	74--127
Toluene d8	10.0	10.7	107	80--120
p-Bromofluorobenzene	10.0	10.8	108	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:
U- Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: JAC Reviewing Supervisor: MJ

Quality Control Sample: Laboratory Reagent Blank 08-JUN-2000 18:22
Report Date: 06/12/2000 16:36
Extraction Method: EPA 5030
Sample Matrix: WATER
File: /chem/IONTRAP2.i/vc060800.b/12jun08.d
Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 524.2
VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
Benzene	71-43-2	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Toluene	108-88-3	1000	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	10.6	106	74--127
Toluene d8	10.0	10.8	108	80--120
p-Bromofluorobenzene	10.0	11.1	111	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:
U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HJC Reviewing Supervisor: MM

Quality Control Sample: Laboratory Reagent Blank 09-JUN-2000 10:24
Report Date: 06/12/2000 17:01
Extraction Method: EPA 5030
Sample Matrix: WATER
File: /chem/IONTRAP2.i/vc060900.b/04jun09.d
Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 524.2
VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
Benzene	71-43-2	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Toluene	108-88-3	1000	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	8.66	87	74--127
Toluene d8	10.0	10.8	108	80--120
p-Bromofluorobenzene	10.0	10.8	108	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:
U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HK Reviewing Supervisor: MM

Quality Control Sample: Laboratory Reagent Blank 09-JUN-2000 19:50
Report Date: 06/12/2000 17:01
Extraction Method: EPA 5030
Sample Matrix: WATER
File: /chem/IONTRAP2.i/vc060900.b/17jun09.d
Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 524.2
VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
Benzene	71-43-2	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Toluene	108-88-3	1000	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	8.68	87	74--127
Toluene d8	10.0	10.8	108	80--120
p-Bromofluorobenzene	10.0	11.0	110	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:
U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HJC Reviewing Supervisor: MJ

EPA METHOD 524.2 BLANK SPIKE REPORT

Quality Control Sample: Reference Sample Analysis 08-JUN-2000 07:44
Report Date: 06/08/2000 08:07
Extraction Method: EPA 5030
Sample Matrix: WATER
File: /chem/IONTRAP2.i/vc060800.b/lfb0608a.d
Remarks: This reference sample was spiked into a blank sample matrix then extracted and analyzed with your set of samples to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate results.

CONCENTRATION UNITS = ug/L (ppb)

Spike Compound	Added	Measured	%Rec	QC Limits
Benzene	5.00	4.86	97	60--140
Carbon tetrachloride	5.00	5.38	108	60--140
Chlorobenzene	5.00	4.97	99	60--140
1,2-Dichlorobenzene	5.00	5.14	103	60--140
1,4-Dichlorobenzene	5.00	5.17	103	60--140
1,2-Dichloroethane	5.00	5.04	101	60--140
1,1-Dichloroethene	5.00	4.96	99	60--140
cis-1,2-Dichloroethene	5.00	5.20	104	60--140
trans-1,2-Dichloroethene	5.00	5.14	103	60--140
1,2-Dichloropropane	5.00	4.91	98	60--140
Ethylbenzene	5.00	4.78	96	60--140
Methylene Chloride	5.00	6.52	130	60--140
Styrene	5.00	4.83	97	60--140
Tetrachloroethene	5.00	5.18	104	60--140
Toluene	5.00	5.23	105	60--140
1,2,4-Trichlorobenzene	5.00	4.72	94	60--140
1,1,1-Trichloroethane	5.00	5.13	103	60--140
1,1,2-Trichloroethane	5.00	4.56	91	60--140
Trichloroethene	5.00	5.50	110	60--140
Vinyl Chloride	5.00	5.57	111	60--140
m+p-Xylenes	10.0	9.96	100	60--140
o-Xylene	5.00	5.06	101	60--140
Bromodichloromethane	5.00	5.01	100	60--140
Bromoform	5.00	3.94	79	60--140
Chlorodibromomethane	5.00	4.61	92	60--140
Chloroform	5.00	4.81	96	60--140
Bromobenzene	5.00	5.00	100	60--140
Bromochloromethane	5.00	4.66	93	60--140
Bromomethane	5.00	4.83	97	60--140
n-Butylbenzene	5.00	5.43	109	60--140
sec-Butylbenzene	5.00	5.56	111	60--140
tert-Butylbenzene	5.00	5.73	115	60--140
Chloroethane	5.00	3.69	74	60--140
Chloromethane	5.00	5.07	101	60--140
2-Chlorotoluene	5.00	5.62	112	60--140
4-Chlorotoluene	5.00	5.40	108	60--140
1,2-Dibromo-3-chloropropane	5.00	4.54	91	60--140
1,2-Dibromoethane	5.00	4.37	87	60--140
Dibromomethane	5.00	4.52	90	60--140
1,3-Dichlorobenzene	5.00	5.05	101	60--140
Dichlorodifluoromethane	5.00	4.88	98	60--140

(report continued on page 2)

Sample Info:

EPA METHOD 524.2
VOLATILE ORGANICS ANALYSIS REPORT (continued)

CONCENTRATION UNITS = ug/L (ppb)

Spike Compound	Added	Measured	%Rec	QC Limits
1,1-Dichloroethane	5.00	5.25	105	60--140
1,1-Dichloropropene	5.00	5.18	104	60--140
1,3-Dichloropropane	5.00	4.52	90	60--140
cis-1,3-Dichloropropene	5.00	5.13	103	60--140
trans-1,3-Dichloropropene	5.00	4.72	94	60--140
2,2-Dichloropropane	5.00	5.29	106	60--140
Hexachlorobutadiene	5.00	5.65	113	60--140
Isopropylbenzene	5.00	5.60	112	60--140
p-Isopropyltoluene	5.00	5.46	109	60--140
Methyl-t-butyl ether	5.00	4.80	96	60--140
Naphthalene	5.00	4.63	93	60--140
n-Propylbenzene	5.00	5.85	117	60--140
1,1,1,2-Tetrachloroethane	5.00	4.99	100	60--140
1,1,2,2-Tetrachloroethane	5.00	4.72	94	60--140
Trichlorofluoromethane	5.00	5.27	105	60--140
1,2,3-Trichlorobenzene	5.00	4.61	92	60--140
1,2,3-Trichloropropane	5.00	4.95	99	60--140
1,2,4-Trimethylbenzene	5.00	5.58	112	60--140
1,3,5-Trimethylbenzene	5.00	5.94	119	60--140

SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	10.4	104	74--127
Toluene d8	10.0	11.0	110	80--120
p-Bromofluorobenzene	10.0	10.9	109	80--120

REPORT COMMENTS: None

Analyst: HJC Reviewing Supervisor: MJ

ENERGY LABORATORIES, INC.
P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325
FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL eli@energylab.com

Client: MSE-HKM

Login No.: 00-54376
Date: 16-Jun-00

VOLATILE ORGANIC CHEMICALS LABORATORY ANALYSIS REPORT

BIERE WELL SITE, POPLAR OIL FIELD

Received:05-Jun-00

Lab No./ Sample Info.	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	Units	Q	Date Analyzed	Surrogate %Rec.
015-00-54376	< 100	330	1950	1270	3190	µg/g(ppm)	1	14-Jun-00	87
PNR-4									
01-Jun-00 18:45						Seq. I.D.:B06140Q1		Analyst:bjm	

Qualifiers(Q) and Notes

(1)The reporting limit for MTBE was increased due to sample matrix interference.

EPA Method 8021

Date: 16-Jun-00

VOLATILE ORGANIC CHEMICALS ANALYSIS QUALITY ASSURANCE REPORT

QC Sample I.D.	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	Units	Q	Date Analyzed	Surrogate %Rec
Method Blank	< 0.10	< 0.050	< 0.050	< 0.050	< 0.050	µg/g(ppm)		14-Jun-00	101

Sequence I.D.: B06140Q1

LABORATORY CONTROL SAMPLE ANALYSIS RESULTS

Date Analyzed: 14-Jun-00 13:23:00

Sequence I.D.: B06140Q1

Constituent	SPIKE ADDED µg/g(ppm)	MS CONC. µg/g(ppm)	MS %Rec.	QC Limit %Rec.	Surrogate %Rec.
MTBE	2.0	1.7	85	60-140	103
Benzene	2.0	1.7	85	60-140	
Toluene	2.0	2.0	100	60-140	
Ethylbenzene	2.0	2.2	110	60-140	
Xylenes	6.0	6.0	100	60-140	

Nos.: 001-00-54376 - 015-00-54376

Date: 05-JUN-00

Received by: Justin McMillan

Login Date: 06-JUN-00

Logged In by: Justin McMillan

SAMPLE CONDITION QA/QC REPORT

This report provides information about the condition of the sample(s) and associated sample custody information on receipt at the laboratory.

Chain of Custody Form Completed & Signed	Yes	Comments:
Chain of Custody Seal	No	Comments:
Intact	N/A	Comments:
Signature Match Chain of Custody vs. Seal	N/A	Comments:
Samples Received Cold	N/A	Comments: Sample received @ 3 C
Samples Received Within Holding Time	Yes	Comments:
Samples Received in Proper Containers	Yes	Comments:
Samples Received Properly Preserved	N/A	Comments:

Samples requiring analysis for volatile organics are tested for proper preservation at the time of analysis. Any preservation problems encountered for these samples are noted on the analytical parameter report pages.

Client notified about sample discrepancies:

Who: _____ By: _____ Date/Time: _____

Method of Shipping: Hand Del.

Additional comments: _____

CHAIN OF CUSTODY RECORD

PLEASE PRINT OR TYPE ALL INFORMATION EXCEPT SIGNATURES

Login Date: Custody Seal: Intact: Signature Match: Yes/No Log Reason: Shipped By: Shipping Bill #: Cooler Size:

BILLINGS, MT
P.O. Box 30916 (59107) watts 800-735-4489
1120 South 27th (59101) voice 406-252-6325
Fax 406-252-6069

CASPER, WY
P.O. Box 3258 (82602) watts 888-235-0515
2393 Salt Creek Highway (82601) voice 307-235-0515
Fax 307-234-1639

GILLETTE, WY
1105 West First Street (82716) voice 307-686-7175
Fax 307-682-4625

HELENA, MT
P.O. Box 5688 (59604)
2704 Billings Ave. (59601) Voice/Fax 406-442-0711

RAPID CITY, SD
P.O. Box 2470 (57709) watts 888-672-1225
610 Farnwood (57701) voice 605-342-1225
Fax 605-342-1397

P.O. #

Project Name / Address: Biere Well Site Poplar Oilfield

Contact Name & Phone: Charles Peterson

Sampler's Signature: [signature]

Invoice to: MSE-HKM

Report to: MSE-HKM Chuck Feast - CH2MHILL

Lab No. (For Lab Use Only)	DATE	TIME	SAMPLE I.D.	number of containers / Sample Type: A W S V U O / Air Water Soils/Solids Vegetation Urine Other	Specific gravity	Benzene, Toluene, Ethylbenzene, Xylenes BTEX per Bert Brown	Sulfate	Sulfide	Chloride				Comments, Special Instructions, etc.
[redacted]	6/1/00	18:45	PNR-4	1W									Hold remainder
[redacted]													of sample after
[redacted]													initial analysis
[redacted]													pr possible additional
[redacted]													analysis per Charlie. JM
[redacted]													
[redacted]													List of analysis per
[redacted]													Charlie P. JM
[redacted]													
[redacted]													

1. Relinquished (signature)	Date	Time	Received by: (signature)	2. Relinquished (signature)	Date	Time	Received for Laboratory by: (signature)
[signature]	6/5/00	10:15			06/05/00	10:15	[signature]

LABORATORIES

CHAIN OF CUSTODY RECORD

PLEASE PRINT OR TYPE ALL INFORMATION EXCEPT SIGNATURES

Shipped by: Hand del
Shipping Bill #:
Code Six:
Custody Seal:
Intact:
Signature Match?: Yes
If no - Reason:

For Lab Use Only 3°C

BILLINGS, MT P.O. Box 30916 (59107) 1120 South 27th (59101) watts 800-735-4489 voice 406-252-6325 Fax 406-252-6069
CASPER, WY P.O. Box 3258 (82602) 2393 Salt Creek Highway (82601) watts 888-235-0515 voice 307-235-0515 Fax 307-234-1639
GILLETTE, WY 1105 West First Street (82716) voice 307-686-7175 Fax 307-682-4625
HELENA, MT P.O. Box 5688 (59604) 2704 Billings Ave. (59601) Voice/Fax 406-442-0711
RAPID CITY, SD P.O. Box 2470 (57709) 610 Farnwood (57701) watts 888-672-1225 voice 605-342-1225 Fax 605-342-1397

P.O. #

Project Name / Address: Biere Well Site Poplar Oil Field

Contact Name & Phone: Charlie Peterson 656-6399

Sampler's Signature: [signature]

Invoice to: MSE-HKM

Report to: MSE-HKM - Charlie Peterson
cc: Chuck Feast - CH2MHILL
PO Box 8748
Boise, ID 83707

Lab No. For Lab Use Only	DATE	TIME	SAMPLE I.D.	number of containers Sample Type: A W S V U O Air Water Soils/Solids Vegetation Urine Other	Analysis Requested: Domestic	BTEX by 524.2							Comments, Special Instructions, etc.
009-00-54376	5/31/00		PNR-6	3W	X	X							
010	5/31/00		PNR-12	3W	X	X							
011	5/31/00		PNR-7	3W	X	X							
012	5/31/00		PNR-8	3W	X	X							
013	5/31/00		Whitmer Well	3W	X	X							
014			Trip blank	1W		X							

1. Relinquished (signature)	Date	Time	Received by: (signature)	2. Relinquished (signature)	Date	Time	Received for Laboratory by: (signature)
[signature]	6/5/00	10:15			06/05/00	10:15	[signature]

ENERGY LABORATORIES

CHAIN OF CUSTODY RECORD

Shipped by: Hand del.
Shipping Bill #:
Code Six:
Intact:
Signature Match?:
If no - Reason:

For Lab Use Only 3°C

PLEASE PRINT OR TYPE ALL INFORMATION EXCEPT SIGNATURES

BILLINGS, MT
P.O. Box 30916 (59107) toll free 800-735-4489
1120 South 27th (59101) voice 406-252-6325
Fax 406-252-6069

CASPER, WY
P.O. Box 3258 (82602) toll free 888-235-0515
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1105 West First Street (82716) voice 307-686-7175
Fax 307-682-4625

HELENA, MT
P.O. Box 5688 (59604)
2704 Billings Ave. (59601) Voice/Fax 406-442-0711

RAPID CITY, SD
P.O. Box 2470 (57709) toll free 888-672-1225
610 Farmstead (57701) voice 605-342-1225
Fax 605-342-1397

P.O. #

Project Name / Address: Biere Well Site Popar Oil Field

Contact Name & Phone

Sampler's Signature: [signature]

Invoice to: MSE-HKM

Report to: MSE-HKM
Check Fenst - CH2MHill

Lab No. (For Lab Use Only)	DATE	TIME	SAMPLE I.D.	number of containers / Sample Type: A W S V U O / Air Water Soils/Solids Vegetation Urine Other	Domestic	BTEX by 524.2							Comments, Special Instructions, etc.
001-00-54376	6/1/00	8:45	PNR-10	3w	X	X							
002	6/1/00	10:10	PNR-9	3w	X	X							
003	6/1/00	12:00	Lockman Culvert Well	3w	X	X							
004	6/1/00	12:30	M-30	3w	X	X							
005	6/1/00	13:40	Trottier old well	3w	X	X							
006	6/1/00	15:50	FPB-92-12	3w	X	X							
007	6/1/00	16:55	FPB-93-3	3w	X	X							
008	6/1/00	18:10	PNR-5	3w	X	X							

1. Relinquished (signature)	Date	Time	Received by: (signature)	2. Relinquished (signature)	Date	Time	Received for Laboratory by: (signature)
[signature]	6/5/00	10:15			06/05/00	10:15	[signature]

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LABORATORY ANALYSIS REPORT

MSE-HKM	Project ID:	BIERE WELL SITE, POPLAR OIL FIELD		
Charlie Peterson	Sample ID:	PNR-4		
PO Box 31318	Laboratory ID:	00-54376-15		
Billings, MT 59107-1318	Sample Matrix:	Waste		
	Sample Date:	01-Jun-00 1845		
	Received at lab:	05-Jun-00	Reported:	12-Jun-00

	Results	Units	Qual	Reporting Limit	Regulatory Limit	Method	Analyzed	
API Gravity @ 60°F	40.2	°				ASTM D1298	06-Jun-00 1100	MS
Sulfur	0.35	% by wt.				LECO	13-Jun-00 1200	SM