Orion inc.
Geophysical / Geological
Consulting and Services

2103 Orchard Lane
Lawrence, Kansas 66044
(913) 841-5366

Lease: Delbert Brunk

Well: Delbert Brunk #4 API# 15-087-20,125

Location: cNW,NW,NW Sec. 25, T.9S, R19E 4950'N & 4950'W
Jefferson County, Kansas
Northeast McLouth Oil Field

Surface Elevation 1136' ASL Topo

Date Spudded: February 26, 1985

Date Completed: March 2, 1985

Total Depth: 1800 T.D. Mississippian

Initial Production: gas in Lower McLouth

Operator: Jerry Lutz
Route 131 South
Reed City, Michigan 49677 616-832-2347

Drilling Company: Caney Valley Drilling
Box 350
Caney, Kansas 67333 316-673-9091

Geology: Tom W. Stander
Orion, Inc.
2103 Orchard Lane
Lawrence, Kansas 66044 913-841-5366

Mud Logger: Tony Wendle
Maverick Mud Co.
P.O. Box 31
Pratt, Kansas 67124 316-672-7565

Engineering: Rex Keith
Karma, Inc.
Route 1, Box 76
Oskaloosa, Kansas 66066 913-863-2294

Drilling Mud: Trotter International
Box 1462
Topeka, Kansas 66601 913-862-0702

Logging: Glen Schmeidler
Great Guns
Box 8196
Topeka, Kansas 66608 913-233-0521

Surface:	Bit size 12¼", set 275' of 8 5/8" O.D. 19.5 lb. pipe, use 150 sacks of portland cement, 3% cal., pump by Consolidated Well Service from Ottawa, Kansas, set up time 8 hours
Production:	Bit size 6½" O.D. using four drill collars, each drilling joint length 30 feet
Drilling Unit:	1984 Speedstar
Mud Pump:	6 x 10
Drilling Fluids:	Surface mud up to drill through glacial till sand, 119-1100 native mud and pond water, 1100-T.D. chemical mud, visc. 30-3 , wt. 9.0-9.2, f.l. 8-12 cc at T.D. mud, visc. 45 , wt. 9.
Logs:	Great Guns - G. Schmeidler Dual Induction Compensated Density, Compensated Neutron, GR, SP, Caliper
Cores:	Lower McLouth 1592-1616, 24ft. boxed and sent to oil field lab

Drilling Bit Record:

1A surface	Hughes	RRRR	Jff	12¼"	0-278
1	Gault	RT	DMJ175	6 3/4	646-1047
3	Gault	58820 New	TMJ175	6 3/4	1047-1592
4	Varel	7720 New		6½	1592-1800T.D.

Core bit 4 15/16

Summary

D. Brunk #4 API #15-087-20,125
cNW,NW,NW Sec.25 , T9S, R19E, Jefferson County, Kansas
Surface elevation: 1136 ft. A.S.L. Topo
All depths from surface elevation. ground level .

Electric Log Picks

Geologic Section	Depth (feet)	Datum (ft. ASL)	Remarks
T. Oread limestone			
T. Douglas Group (T. Lawrence Fm.)			
T. Stranger Formation			
T. Lansing Group (T. Stanton lm.)			
T. Vilas shale			
T. Plattsburg limestone			
T. Kansas City (T. Bonner Springs)	606	530	
T. Wyandotte limestone	642	494	
T. Lane shale	721	415	
T. Iola limestone	732	404	
T. Chanute shale	764	372	
T. Drum limestone	780	356	
T. Cherryvale shale	786	350	
T. Dennis limestone	806	330	
T. Galesburg shale	832	304	
T. Swope limestone	836	300	
T. Ladore shale	858	278	
T. Hertha limestone	862	274	
B. Kansas City (B. Hertha/ T. Pleasanton Group)	889	247	
T. Marmaton Gp.(T. Lenapah lm.)	1016	+120	
T. Nowata shale	1032	+104	
T. Altamont limestone	1036	+100	
T. Bandera shale	1063	+ 73	
T. Pawnee limestone	1066	+ 70	
T. Labette shale	1091	+ 45	
T. Fort Scott limestone	1098	+ 38	
T. Cherokee Group	1109	+ 27	
T. Squirrel sandstone			Not Present
T. Bevier coal bed	1198	- 62	
T. Ardmore limestone			Not Present
T. Croweburg coal bed	1230	- 94	
T. Upper Cattleman sandstone	1238	-102	15 ft. shaly sandstone, 7-9 ohms water wet
T. Fleming coal bed	1278	-142	
T. Mineral coal bed	1302	-166	
T. Scammon coal bed	1350	-214	
T. Middle Cattleman ss.	1361	-225	6 ft. shaly sandstone, 9 ohms, water
T. Lower Cattleman ss.	1387	-251	8 ft. shaly sandstone 5-6 ohms, water
T. Tebo coal bed			Not Present
T. Weir-Pittsburg coal bed	1425	-289	

Summary Continued

Geologic Section	Depth	Datum	Remarks
T. Dry Wood coal bed	1497	-354	
T. Rowe coal bed			Not Present
T. Neutral coal bed	1516	-373	
T. Upper McLouth sandstone			Not Present
T. Middle McLouth sandstone	1573	-430	6 ft. oil sandstone, good show 12 ohms, about 20-30% oil sat.
T. Lower McLouth sandstone	1601	-458	39 ft. clean sandstone, heavy tarly oil in core, gassly top 12 ft. 30-10 ohm oil, tar, gas zone, bottom 37 ft. water wet 10-3
T. Burgess sandstone	Not Present		
T. Mississippian limestone	1640	-497	
T. 40 foot dolomite zone	1678	-535	No show
T. Osage (Burlington/Keokuk)	1766	-623	No show
T.D.	1800		Mississippi Osage Zone

Recommendation

Geological formations were running 11-15 feet low to Brunk #1 and two to four feet low to Brunk #2.

The electric logs and the core indicated only 12 feet of gassy tarry (heavy) potential pay sand in the upper portion of the Lower McLouth Sandstone. hydrocarbon saturations are low. This zone should be tested for gas production but it is expected to be a marginal pay zone.

The Middle McLouth Sandstone had a good oil show in the sample and bleed oil into the pit. Electric logs indicated low (20-30%) oil saturation. This zone should be tested after the Lower McLouth Sandstone.

The other potential zones in this well did not have any shows of hydrocarbons.

Tom W. Stander
Petroleum Geologist
Orion, Inc.

Driller Logs — February 26, 1985 - March, 1985
Brunk #4 — NW, NW, NW Sec. 25, T9S, R19E
API # 15-087-20,125 — Caney Valley

0-32	32	clay
32-59	27	sandy clay
59-84	25	shale
84-102	18	gravel
102-113	11	limestone
113-123	10	shale
123-147	24	limestone
147-181	34	shale
181-197	18	sandy shale
197-200	3	limestone
200-203	3	shale
203-233	30	sandy shale
233-239	6	limestone
239-244	5	shale
244-275	31	limestone
275-422	147	shale
422-430	8	limestone
430-547	117	shale
547-551	4	limestone
551-556	5	shale
556-569	13	limestone
569-572	3	shale
572-577	5	limestone
577-596	19	shale
596-618	22	limestone
618-645	27	shale
645-658	13	limestone
658-689	31	shale
689-708	19	limestone
708-717	9	shale
717-722	5	limestone
722-733	11	shale
733-743	10	limestone
743-758	15	shale
758-765	8	limestone
765-781	16	shale
781-786	5	limestone
786-791	5	shale
791-796	5	limestone
796-802	6	shale
802-877	75	limestone
877-1015	38	shale
1015-1021	6	limestone
1021-1035	14	shale
1035-1040	5	limestone
1040-1058	18	shale
1058-1061	3	limestone
1061-1070	9	shale
1070-1083	13	limestone
1083-1387	304	shale
1387-1395	8	sand
1395-1592	197	sandy shale
1592-1616	24 ft. core 10 ft shale 14 ft. sand	
1616-1640	24	sand
1640-1800	T.D. Missippi Limestone	

Geologist Log: Tom W. Stander
February 28, 1985 - March 2, 1985

Samples 1000 - T.D. 1800
Drilling time 500-T.D. 1800
Dry sample 1000-1300, Dry and wet samples 1300-TD

1000-1030	30	80% shale, gray sandy sandstone, gray shale, angular poorly sorted, no show Hepler sandstone
1030-1060	30	shale gray, black, mica limestone, clear to buff, crystalline
1060-1090	30	shale, black, gray, green limestone, clear, green, sandy
1090-1120	30	shale black, gray; limestone, clear to gray, crystalline
1120-1150	30	shale gray, green, sandy; limestone, crystalline, clean; pyrite
1150-1180	30	shale, gray sandy; minor black shale
1180-1200	20	shale, gray-black, green, sandy sandstone, very fine grained, subangular, mica; pyrite, 10 ft. sample interval
1200-1210	10	shale gray - green, sandy, pyrite
1210-1220	10	shale, gray green; pyrite sandstone, minor amounts, very fine grained, angular, no show
1220-1230	10	sandstone, green, very fine grained, tight shale, black sandy, gray sandstone, brown, fine grained, medium porosity, may have brown oil strain or limonite coloring, no oil fluorescence
1230-1240	10	sandstone, very fine grained, shaly, low porosity, no shows, subrounded; shale, gray to black Upper Cattleman Sandstone
1240-1250	10	shale, gray to black, sandy sandstone, (same as above) no shows
1250-1260	10	sandstone, (same as above), no shows, minor mica shale dark gray, gray
1260-1270	10	shaly, sandy light gray, shale dark gray
1270-1280	10	shale, sandy gray black shale
1280-1290	10	shale dark gray, sandy black, green coal
1290-1300	10	shale sandy, light gray green; coal
		Wet and Dry Samples 1300 - T.D.
1300-1310	10	shale, gray green, reddish-brown, yellow, purple, lime green, red
1310-1320	10	shale, (same as above) plus black sandstone clean, low porosity, no shows
1320-1330	10	shale green and gray, pyrite sandstone, green fine grained, no show
1330-1340	10	shale, green and gray, sandstone clear, fine grained no shows
1340-1350	10	shale gray and dark gray, sandy some sandstone
1350-1360	10	shale dark gray, sandy; pyrite minor limestone buff crystalline
1360-1370	10	sandstone, middle Cattleman fine grained, clear, subrounded low to medium porosity, cemented, no show
1370-1380	10	sandstone, (same as above); black shale; shale gray green
1380-1390	10	shale, gray, green, black some minor sandstone

1390-1400	10	sandstone, clear subrounded fine grained, cemented, no show shale, gray, green, red
1400-1410	10	shale, sandy gray, green sandstone, shaly gilsonite, minor gas bubbles, minor oil(dead)
1410-1420	10	shale, 90% dark gray
1420-1430	10	shale, 80% dark gray
1430-1440	10	sandstone, 70%, shale, gilsonite very fine grained, low porosity subrounded, no show
1440-1450	10	sandstone, 50%, (same as above) gray shale; 50%; pyrite
1450-1460	10	shale, dark gray, sandy
1460-1470		shale, dark gray
1470-1480	10	shale, black sandy, gilsonite sandstone, clean, tight
1480-1490	10	shale black (coal) gray and green sandstone, clean shaly, gilsonite
1490-1500	10	shale black, 80% some sandstone
1500-1510	10	shale black 50% sandstone 50% clear medium grained, subangular, gilsonite
1510-1520	10	sandstone clear, fine grained low porosity, shaly shale green and gray
1520-1530		shale black-gray, brown, green sandstone clear, (same as above) pyrite
1530-1540	10	shale black-gray sandy; pyrite
1540-1550	10	missing samples
1550-1560	10	shale, dark gray; sandstone, clean, limestone buff
1560-1570	10	shale dark gray, sandy
1570-1580	10	shale dark gray, sandy gray, green
1583	circ	sandstone, Middle McLouth Sandstone 1567 (-424), subrounded medium grained, clear, medium porosity, medium sorted, excellence show of live brown oil, good order, very pale blue fluorescence, fair cut fluorescence good bleed on pit, cemented, may be low permeability 1567 Top 1578 Bottom, 11 ft. thick. This zone should be tested
1580-1590	10	sandstone, 40% (same as above), pyrite; shale black, gray, green
1592	20 min. circ.	sandstone, (same as above), shale, dark gray, gray
1592	30 min. circ.	shale, gray, green, dark gray, green, sandy; pyrite
		Top Lower McLouth 1592 (-449)
	Core #1	Lower McLouth Sandstone

Core #1 Lower McLouth
Top of core 1592
Bottom of core 1616
Recovered 24 feet

1592-1596	4	shale gray, fine texture, massive bedding, medium to firm hardness, sandy in part, no oil bleed or gas
1596-1600	4	sandy shale, light gray to gray, fine texture shale, fine grained sandstone, streaks of oil and gas

1600–1616	16	sandstone, light gray to gray, fine grained, well sorted, fair to poor porosity, abundant, heavy asphaltic oil throughout zone, some shale dispersed throughout sandstone. Bottom of core 1616 Boxed and shipped to oil field labs
1616–1625	9	sandstone, clear, subrounded, medium porosity, poorly sorted, 40% or less saturated with heavy black oil in samples which doesn't fluorescence, some gas bubbles; shales from above
1625–1630	5	sandstone 20% (same as above), with heavy oil; sandstone gray, dirty, shaly, with oil strain, shales from above
1630–1635	5	sandstone, (same as above, oil strained by with high water saturation, 60% shale black, green, gray
1635–1640		sandstone and shale, (same as above), poor oil show no Burgess Sandstone
1640–1645	5	limestone, brown-lime, green black sandy shale, other shale as above T. Mississippi Limestone 1641(-498)
1645–1650	5	limestone buff, green crystalline, no chert
1650–1660		limestone white and buff, some shale, green and gray Forty Foot Zone 1680 (-537) 2 foot drilling break circ. for sample 15-30 minutes
1660–1670	10	limestone, buff, clear, white crystalline, no chert
1670–1680	5	limestone white to buff, no chert
1683 15 min. circ.		limestone white to buff, crystalline, lst break, dolomite very fine sugar texture, limy color mineral fluorescence
1680–1690	10	limestone white to buff crystalline, shale gray green
1690–1700	10	limestone clear, some white chert
1700–1710	10	limestone, clear to buff
1710–1720	10	limestone clear, white, black pale blue
1720–1730	10	limestone, white, buff, white chert
1730–1740	10	limestone white, buff, black and green shale
1740–1750	10	limestone, white buff
1750–1760	10	limestone, buff, white; chert
1765 circ.		limestone, white, buff, chert black and green shale; no show
1760–1770	10	limestone, white buff 10% chert T. Osage B/K 1768 (-625) 2 gas unit kick on hot wire above background
1771 cir. 15 min.		50% chert white to pale blue 50% limestone, buff, limestone, clear medium grained soft to firm, angular crystalline, some gas bubbles
1771 30 min. circ.		chert 70%, pale blue; limestone buff, very fine grained, brown color
1770–1780	10	chert, 50% limestone, fine grained, brown granular texture poor to fair porosity,
1780–1790	10	chert, white limestone, fine grained, granular texture
1790–1800	10	chert, pale blue limestone, brown to buff granular texture
1800 30 min. circ.		limestone and chert, (same as above)

T.D. 1800 March 2, 1985
Circulation 1½ hours Condition hole vis. 45 wt. 9
Pulled drill pipe Open hole Logged Great Guns
Dual Induction, Compensated Density, Compensated Neutron, SP, GR, Caliper

Delbert Brunk 4 25-9-19E

WELL LOG ANALYSIS

The following report is the result of a computerized analysis of open hole electric well logs. The electric logs conducted at each well were compensated density porosity, compensated neutron porosity, dual induction electrical, R. A. guard, gamma ray (GR), spontaneous potential (SP) and caliper logs.

The reserves results are based on current standard engineering formulas for oil, gas and water estimates for open hole electric logs. Some of the results (true porosity and water saturations) are quite accurate, while other estimates (oil and gas saturations) may vary in accuracy. In particular, the estimated gas saturations may be quite low compared to the actual gas saturation, and at the same time the estimated oil saturation may be quite high compared to the actual oil saturations. The inaccuracies are a result of several uncontrollable drilling and reservoir factors.

Thus in this well, the gas saturation estimates are expected to be lower than the actual inplace gas saturation. Water saturation estimates are expected to be quite accurate.

WELL LOG ANALYSIS

ORION, INC.

2103 Orchard Lane, Lawrence, Kansas 66044 (913) 841-5366

Well Name Brunk #4 API# 15-087-20,125
Location cNW NW NW Sec. 25, T9S, R19E County, State Jefferson, Kansas
Logging Company Great Guns, Topeka, Kansas
Logs Used C. Density Porosity, C. Neutron Porosity, Duel Induction, SP, GR, Caliper
Analyst(s) Tom W. Stander Date April 18, 1985
Tammy Steeples
Formation Name Upper Cattleman Rw = 0.20 @ 90 °F
Formation Summary 1238-1260
Average Porosity .09
Average Shale Volume .47

In Place Reserves

Water	15,471	barrels/acre
Oil	511	barrels/acre
Gas	-0-	MCF/acre

Primary Saturations for Each Zone in Formation*

Depth	True Porosity	Shale Content	Water Saturation	Oil Saturation	Gas Saturation
1238-1240	.09	.50	.99	.01	.00
1240-1248	.08#	.41#	1.00	.00	.00
1248-1250	.11	.50	.94	.06	.00
1250-1252	.12	.49	.99	.01	.00
1252-1254	.13	.44	.90	.10	.00
1254-1256	.09	.53	.98	.02	.00
1256-1258	.09	.51	.96	.04	.00
1258-1260	.07	.57	.91	.09	.00

Value is the average for these zones.
*Each two foot zone analyzed. See computer printout for detailed analysis of each zone.

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Well Name Brunk #4 API# 15-087-20,125
Location cNW NW NW Sec. 25, T9S, R19E County, State Jefferson, Kansas
Logging Company Great Guns, Topeka, Kansas
Logs Used C. Density Porosity, C. Neutron Porosity, Duel Induction, SP, GR, Caliper
Analyst(s) Tom W. Stander Date April 18, 1985
Tammy Steeples
Formation Name Middle Cattleman Rw = 0.20 @ 90 °F
Formation Summary 1360-1372
Average Porosity .09
Average Shale Volume .49

In Place Reserves

Water	14,394	barrels/acre
Oil	730	barrels/acre
Gas	-0-	MCF/acre

Primary Saturations for Each Zone in Formation*

Depth	True Porosity	Shale Content	Water Saturation	Oil Saturation	Gas Saturation
1360-1364	.05#	.48#	1.00	.00	.00
1364-1366	.11	.26	.96	.04	.00
1366-1368	.10	.36	.98	.02	.00
1368-1370	.08	.57	.92	.08	.00
1370-1372	.06	.70	.97	.03	.00

#Value is the average for these zones.

*Each two foot zone analyzed. See computer printout for detailed analysis of ea[illegible]ne.

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ORION, INC.

2103 Orchard Lane, Lawrence, Kansas 66044 (913) 841-5366

Well Name Brunk #4 API# 15-087-20,125
Location cNW NW NW Sec. 25, T9S, R19E County, State Jefferson, Kansas
Logging Company Great Guns, Topeka, Kansas
Logs Used C. Density Porosity, C. Neutron Porosity, Duel Induction, SP, GR, Caliper
Analyst(s) Tom W. Stander Date April 18, 1985
Tammy Steeples
Formation Name Lower Cattleman Rw = 0.20 @ 90 °F
Formation Summary 1386-1396
Average Porosity .14
Average Shale Volume .33

In Place Reserves

Water	9,733	barrels/acre
Oil	1,202	barrels/acre
Gas	2	MCF/acre

Primary Saturations for Each Zone in Formation*

Depth	True Porosity	Shale Content	Water Saturation	Oil Saturation	Gas Saturation
1386-1390	.09#	.43#	1.00	.00	.00
1390-1392	.19	.09	.85	.15	.00
1392-1394	.17	.22	.93	.07	.00
1394-1396	.15	.50	.76	.24	.00

Value is the average for these zones.

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Logging Company Great Guns, Topeka, Kansas
Logs Used C. Density Porosity, C. Neutron Porosity, Duel Induction, SP, GR, Caliper
Analyst(s) Tom W. Stander Date April 18, 1985
Tammy Steeples

Formation Name Middle McLouth Rw = 0.20 @ 90 °F
Formation Summary 1572-1580
Average Porosity .16
Average Shale Volume .30

In Place Reserves

Water	8,302	barrels/acre
Oil	4,267	barrels/acre
Gas	-0-	MCF/acre

Primary Saturations for Each Zone in Formation*

Depth	True Porosity	Shale Content	Water Saturation	Oil Saturation	Gas Saturation
1572-1574	.10	.50	.86	.14	.00
1574-1576	.15	.11	.77	.23	.00
1576-1578	.19	.12	.59	.38	.03
1578-1580	.22	.26	.47	.53	.00

*Each two foot zone analyzed. See computer printout for detailed analysis of each zone.

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Logging Company Great Guns, Topeka, Kansas
Logs Used C. Density Porosity, C. Neutron Porosity, Duel Induction, SP, GR, Caliper
Analyst(s) Tom W. Stander Date April 18, 1985
Tammy Steeples

Formation Name Lower McLouth Rw = 0.20 @ 90 °F
Formation Summary 1594-1640
Average Porosity .23
Average Shale Volume .04

In Place Reserves
Water 59,310 barrels/acre
Oil 25,993 barrels/acre
Gas 7 MCF/acre

Primary Saturations for Each Zone in Formation*

Depth	True Porosity	Shale Content	Water Saturation	Oil Saturation	Gas Saturation
1594-1596	.19	.11	.43	.57	.00
1596-1598	.19	.09	.41	.59	.00
5198-1600	.18	.19	.40	.60	.00
1600-1602	.20	.06	.36	.64	.00
1602-1604	.23	.02	.33	.62	.05
1604-1606	.25	.00	.34	.52	.14
1606-1608	.25	.00	.38	.50	.12
1608-1610	.25	.00	.45	.55	.00
1610-1612	.24	.00	.53	.47	.00
1612-1614	.24	.01	.56	.44	.00
1614-1616	.23	.00	.67	.33	.00
1616-1618	.24	.00	.70	.30	.00
1618-1620	.25	.00	.74	.26	.00
1620-1622	.25	.00	.85	.15	.00
1622-1624	.25	.00	1.00	.00	.00
1624-1626	.25	.00	.96	.04	.00
1626-1630	.24#	.00#	1.00	.00	.00
1630-1632	.24	.01	.97	.03	.00
1632-1634	.24	.01	1.00	.00	.00
1634-1636	.22	.00	.95	.05	.00
1636-1640	.16#	.19#	1.00	.00	.00

Value is the average for these zones.
*Each two foot zone analyzed. See computer printout for detailed analysis of each zone.

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Location cNW NW NW Sec.25, T9S, R19E County, State Jefferson, Kansas
Logging Company Great Guns, Topeka, Kansas
Logs Used C. Density Porosity, C. Neutron Porosity, Duel Induction, SP, GR, Caliper
Analyst(s) Tom W. Stander Date April 18, 1985
Tammy Steeples

Formation Name Forty Foot Zone Rw = 0.20 @ 90 °F
Formation Summary 1676-1688
Average Porosity .11
Average Shale Volume .02

In Place Reserves

Water	9,943	barrels/acre
Oil	28	barrels/acre
Gas	-0-	MCF/acre

Primary Saturations for Each Zone in Formation*

Depth	True Porosity	Shale Content	Water Saturation	Oil Saturation	Gas Saturation
1676-1684	.09#	.02#	1.00	.00	.00
1684-1686	.16	.01	.99	.01	.00
1686-1688	.11	.01	1.00	.00	.00

Value is the average for these zones.

*Each two foot zone analyzed. See computer printout for detailed analysis of each zone.

WELL LOG ANALYSIS

ORION, INC.

2103 Orchard Lane, Lawrence, Kansas 66044 (913) 841-5366

Well Name Brunk #4 API# 15-087-20,125
Location cNW NW NW Sec.25, T9S, R19E County, State Jefferson, Kansas
Logging Company Great Guns, Topeka, Kansas
Logs Used C. Density Porosity, C. Neutron Porosity, Duel Induction, SP, GR, Caliper
Analyst(s) Tom W. Stander Date April 18, 1985
Tammy Steeples
Formation Name Osage Rw = @ °F
Formation Summary 1764-1790
Average Porosity .14
Average Shale Volume .03

In Place Reserves

Water	12,608	barrels/acre
Oil	92	barrels/acre
Gas	-0-	MCF/acre

Primary Saturations for Each Zone in Formation*

Depth	True Porosity	Shale Content	Water Saturation	Oil Saturation	Gas Saturation
1764-1766	.08	.07	.90	.05	.05
1766-1768	.09	.24	.87	.13	.00
1768-1770	.13	.17	.97	.03	.00
1770-1772	.12	.06	1.00	.00	.00
1772-1774	.11	.03	.95	.05	.00
1774-1780	.08#	.00#	1.00	.00	.00
1780-1782	.11	.05	.97	.02	.01
1782-1784	.13	.03	.97	.03	.00
1784-1790	.16#	.03#	1.00	.00	.00

#Value is the average for these zones.

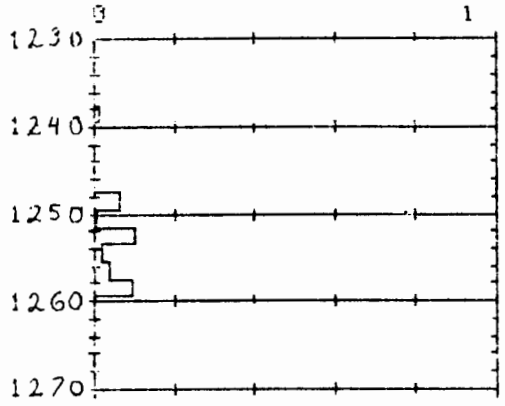
*Each two foot zone analyzed. See computer printout for detailed analysis of each zone.

WELL LOG ANALYSIS

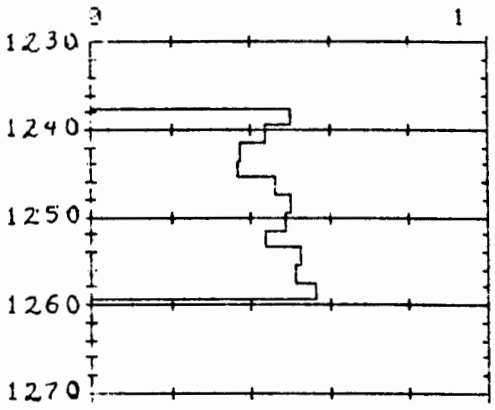
WELL BRUNK 4
LEGAL NW NW NW 25 9 19E
COUNTY JEFFERSON KANSAS
LEASE BRUNK

FORMATION 1
DEPTH 1238 TO 1260

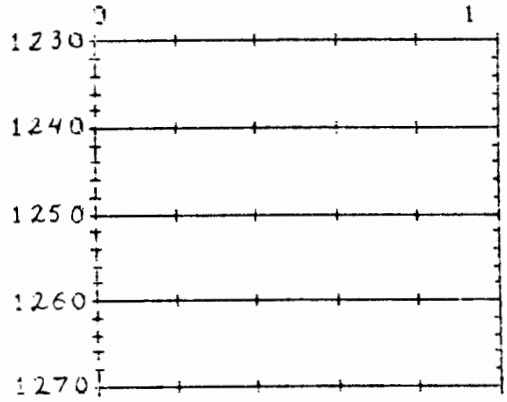
OIL SATURATION



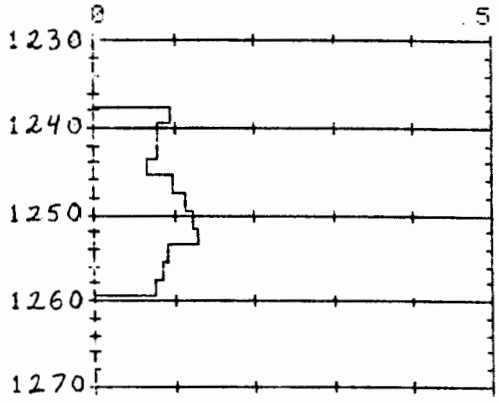
SHALE VOLUME



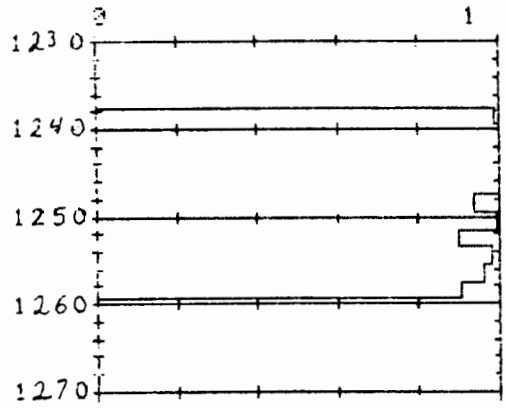
GAS SATURATION



TRUE POROSITY



WATER SATURATION

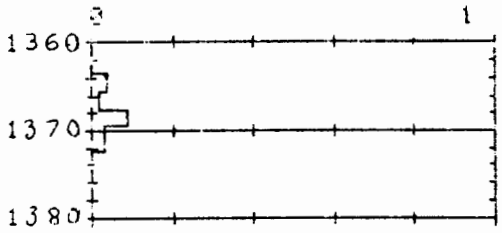


WELL LOG ANALYSIS

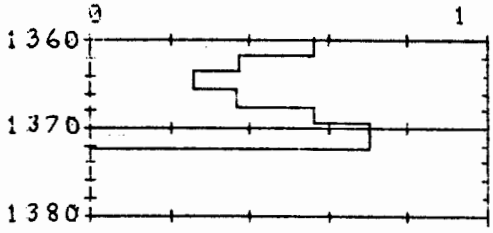
WELL BRUNK 4
LEGAL NW NW NW 25 9 19E
COUNTY JEFFERSON KANSAS
LEASE BRUNK

FORMATION 2
DEPTH 1360 TO 1372

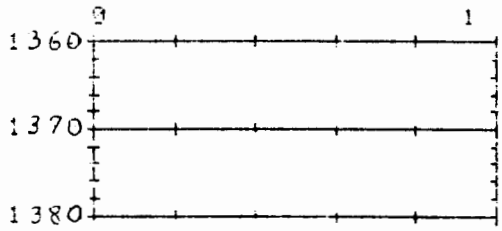
OIL SATURATION



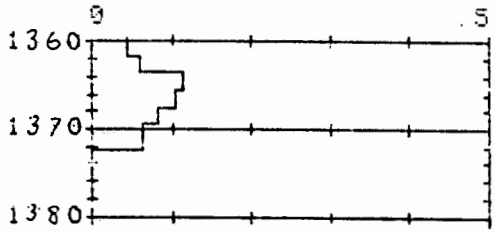
SHALE VOLUME



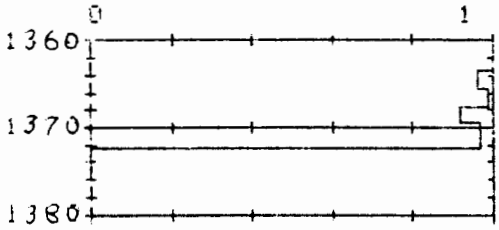
GAS SATURATION



TRUE POROSITY



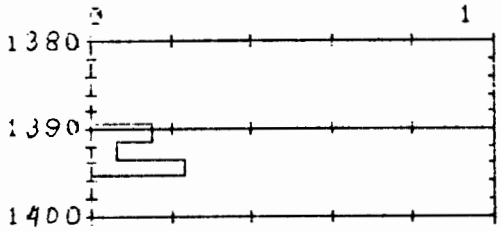
WATER SATURATION



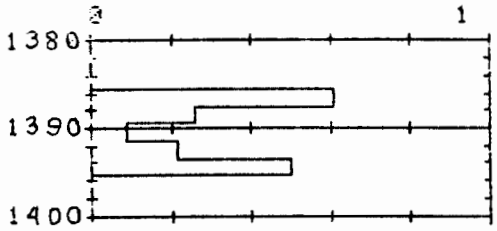
WELL BRUNK 4
LEGAL NW NW NW 25 9 19E
COUNTY JEFFERSON KANSAS
LEASE BRUNK

FORMATION 3
DEPTH 1386 TO 1396

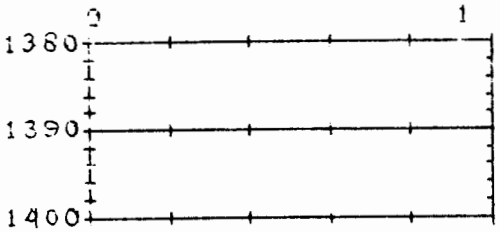
OIL SATURATION



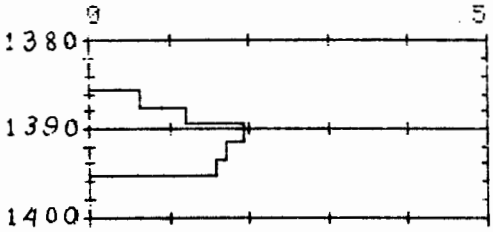
SHALE VOLUME



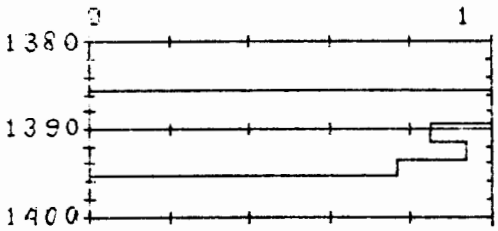
GAS SATURATION



TRUE POROSITY



WATER SATURATION

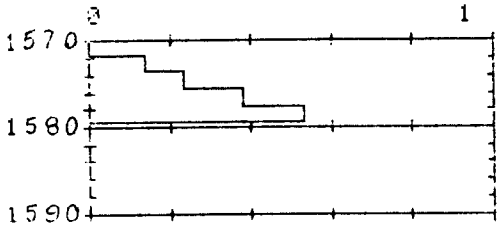


WELL LOG ANALYSIS

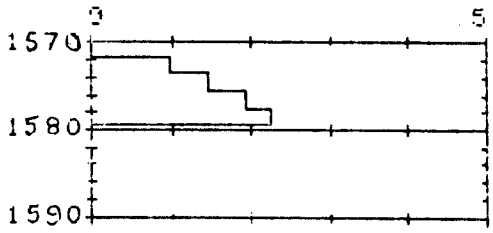
WELL BRUNK 4
LEGAL NW NW NW 25 9 19E
COUNTY JEFFERSON KANSAS
LEASE BRUNK

FORMATION 4
DEPTH 1572 TO 1580

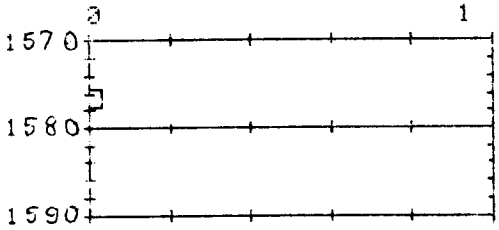
OIL SATURATION



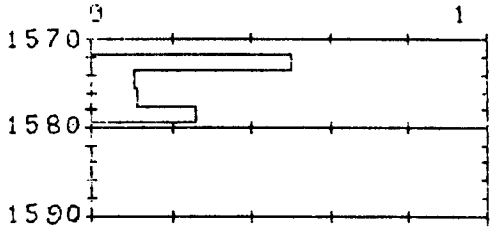
TRUE POROSITY



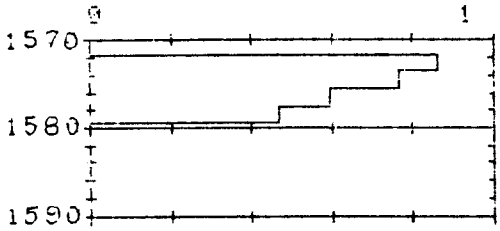
GAS SATURATION



SHALE VOLUME



WATER SATURATION

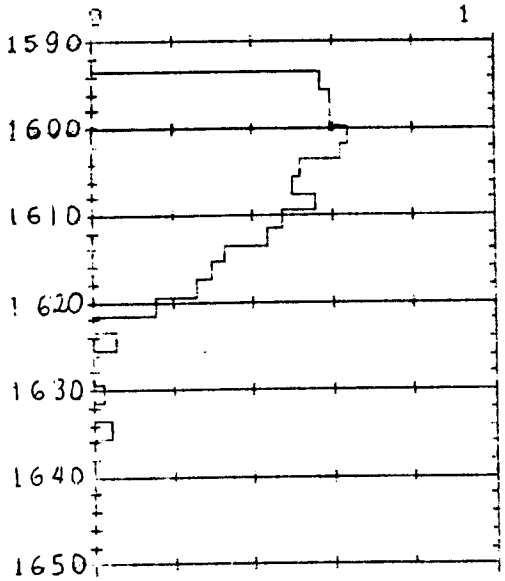


WELL LOG ANALYSIS

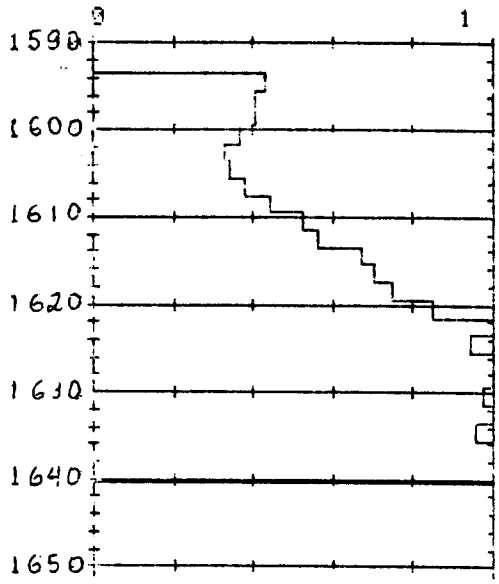
WELL BRUNK 4
LEGAL NW NW NW 25 9 19E
COUNTY JEFFERSON KANSAS
LEASE BRUNK

FORMATION 5
DEPTH 1594 TO 1640

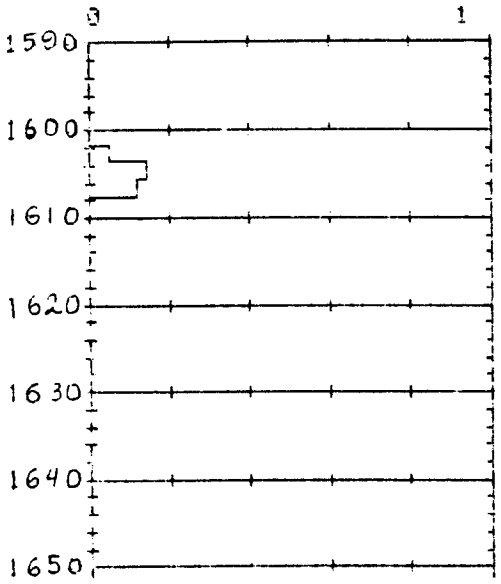
OIL SATURATION



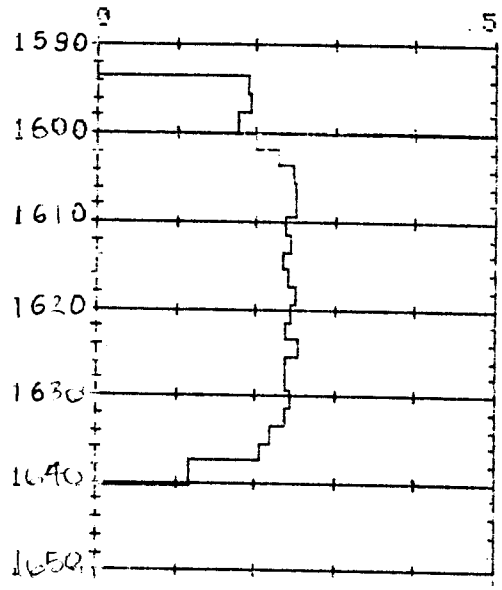
WATER SATURATION



GAS SATURATION



TRUE POROSITY

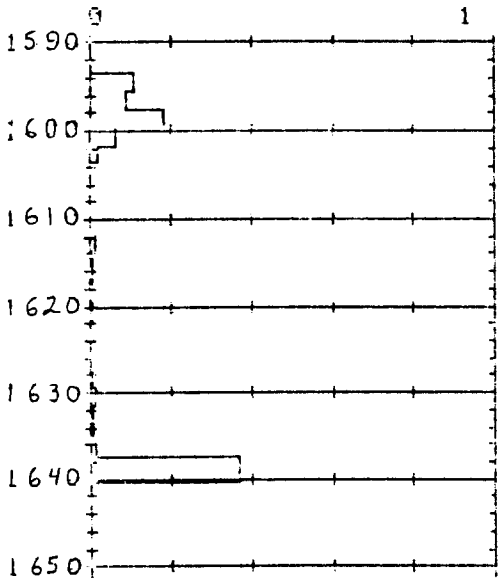


WELL LOG ANALYSIS

WELL BRUNK 4
LEGAL NW NW NW 25 9 19e
COUNTY JEFFERSON KANSAS
LEASE BRUNK

FORMATION 5
DEPTH 1594 TO 1640

SHALE VOLUME

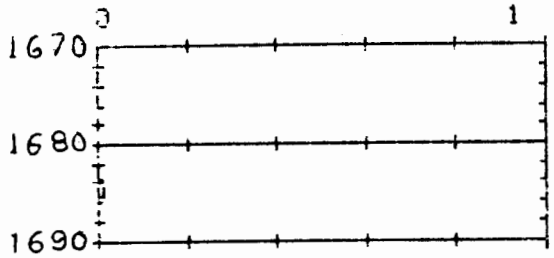


WELL LOG ANALYSIS

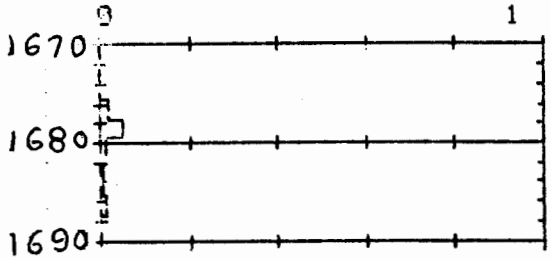
WELL BRUNK 4
LEGAL NW NW NW 25 9 19E
COUNTY JEFFERSON KANSAS
LEASE BRUNK

FORMATION 6
DEPTH 1676 TO 1688

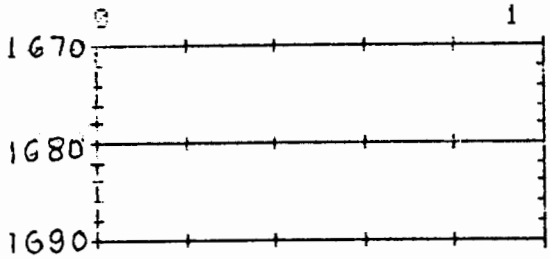
OIL SATURATION



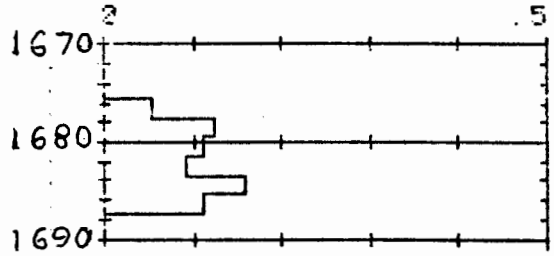
SHALE VOLUME



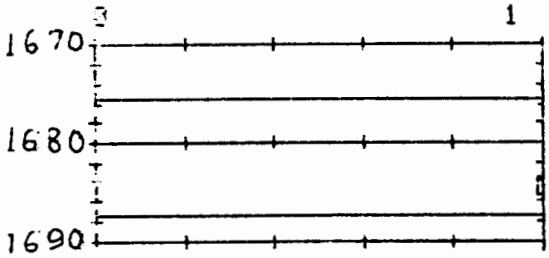
GAS SATURATION



TRUE POROSITY



WATER SATURATION

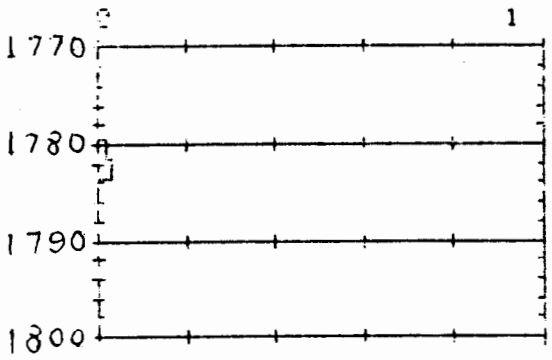


WELL LOG ANALYSIS

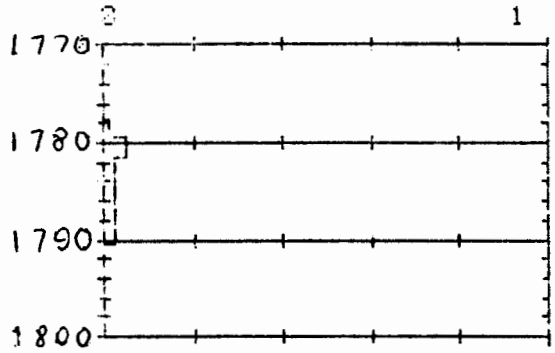
WELL BRUNK 4
LEGAL NW NW NW 25 9 19E
COUNTY JEFFERSON KANSAS
LEASE BRUNK

FORMATION 7
DEPTH 1778 TO 1790

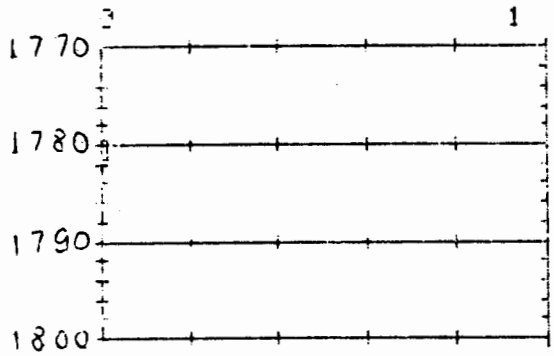
OIL SATURATION



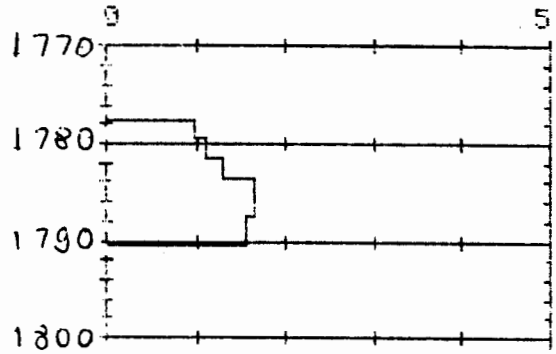
SHALE VOLUME



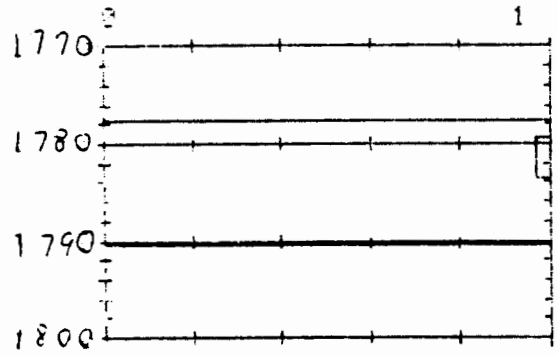
GAS SATURATION



TRUE POROSITY



WATER SATURATION



KS	COMPANY Jerry Lutz
COUNTY Jefferson	FARM D. Brunk WELL NO. 4
BLOCK NWNWNW	SURVEY 495 N 495 W
SEC. 25	1800 Miss. Osage TOTAL DEPTH
T. 9S R. 19E	API # 15-087-20,125
	CONTRACTOR Caney Valley
	COMMENCED Feb. 26, 85
	COMPLETED Mar. 2, 85
	REMARKS T.W. Stander - Orion
ALTITUDE GL 1143 ASL Topo	Maverick Mud - Tony Wendle
PRODUCTION	Great Guns, D.Ind, CD, CN, SP, GR

CASING RECORD

Surface: 8 5/8 ODX 275", 158sx 3% Cal

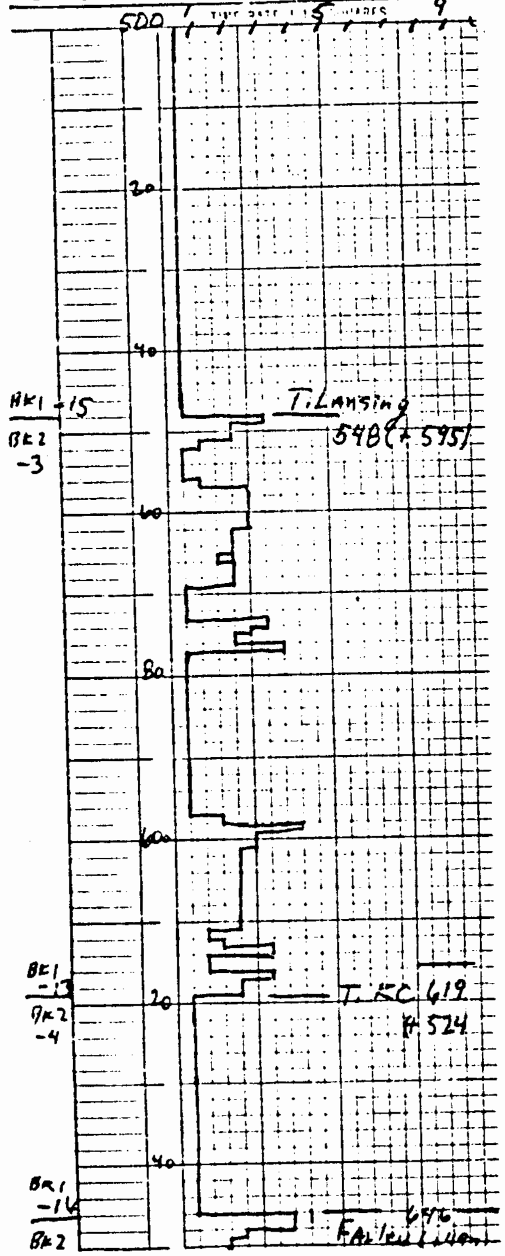
Prod. 4 1/2 ODX

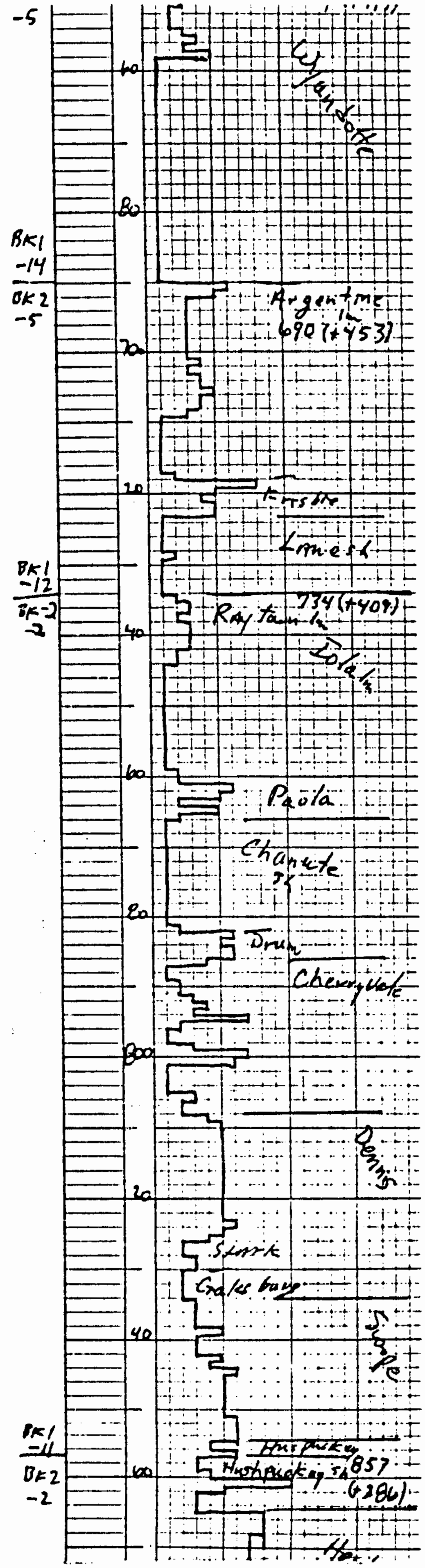
All depth from GL

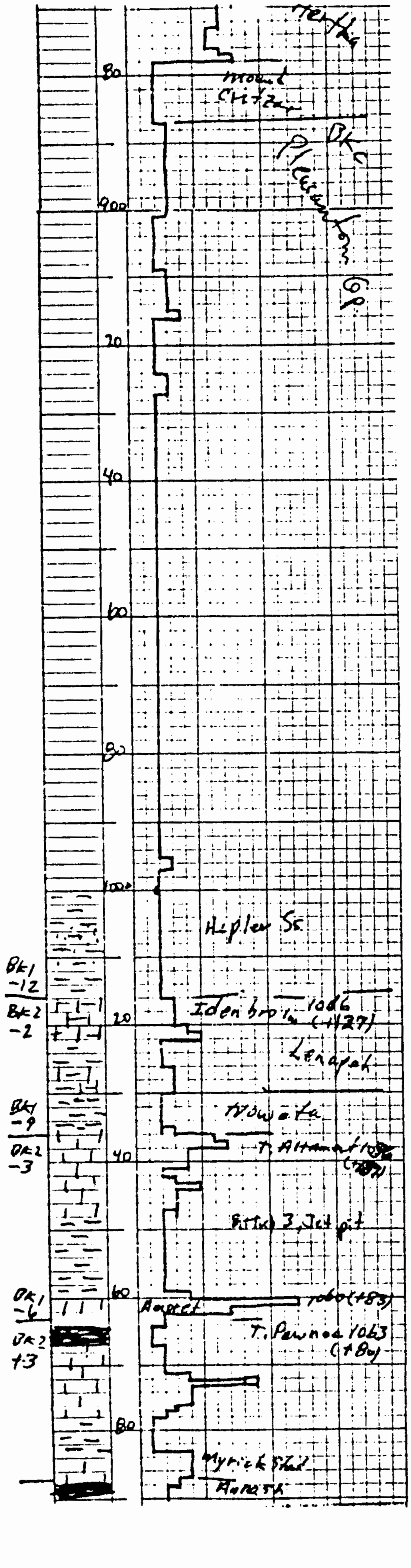
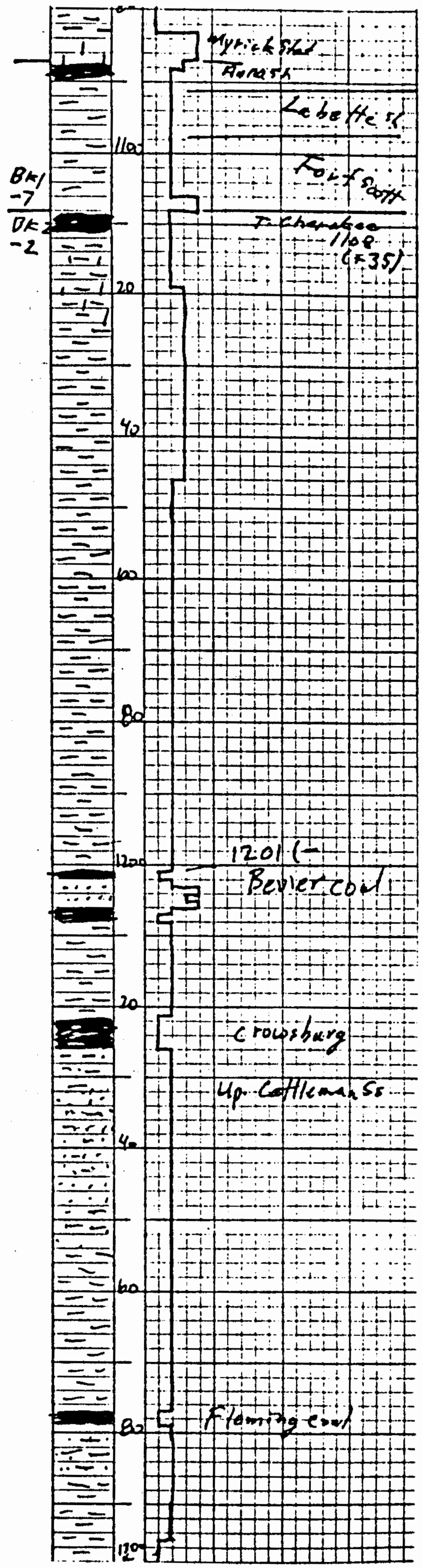
SHOT 1 STRIP ONE

TIME RATE SCALE 1/10" = 1/2 MINUTES

450 TULSA, OKLAHOMA PRINTED IN U.S.A.






Mound City
900
20
40
60
80
1000
Hepler Ss
Bk1 -12
Bk2 -2
Idenbro 1066 (+127)
Lenapah
Bk1 -9
Dk2 -3
Nowata
T. Altamont
Bk1 3, Jet pit
Dk1 -6
Dk2 +3
Amoret 1080 (+83)
T. Pawnee 1063 (+80)
Myrick Sta
Anna Sh

Myrick Sta
Anna Sh
Labette Sh
Fort Scott
1100
Bk1 -7
Dk2 -2
T. Cherokee 1108 (+35)
20
40
60
80
1200
1201
Bevier coal
Croweburg
Up. Cattleman Ss
Fleming coal
1300

2

STATE ks	COMPANY Jerry Lutz
COUNTY Jefferson	FARM D. Brunk WELL NO. 4
BLOCK CNWNWNW	SURVEY 4950'N 4950'W
SEC. 25	1800 Miss Osage
T. 9S R. 19E	TOTAL DEPTH API 15-087-20,125
	CONTRACTOR Caney Valley
	COMMENCED Feb. 26, 85
	COMPLETED Mar 2, 85
	REMARKS T.W. Strander Orion
ALTITUDE GL 1143 Am. Topo PRODUCTION	Maverick Mud-Tony Wendle

CASING RECORD 3% col

Surface 8 5/8 X275, 158sx class A

Prod. 4 1/2 OD X

All depth from Ground level

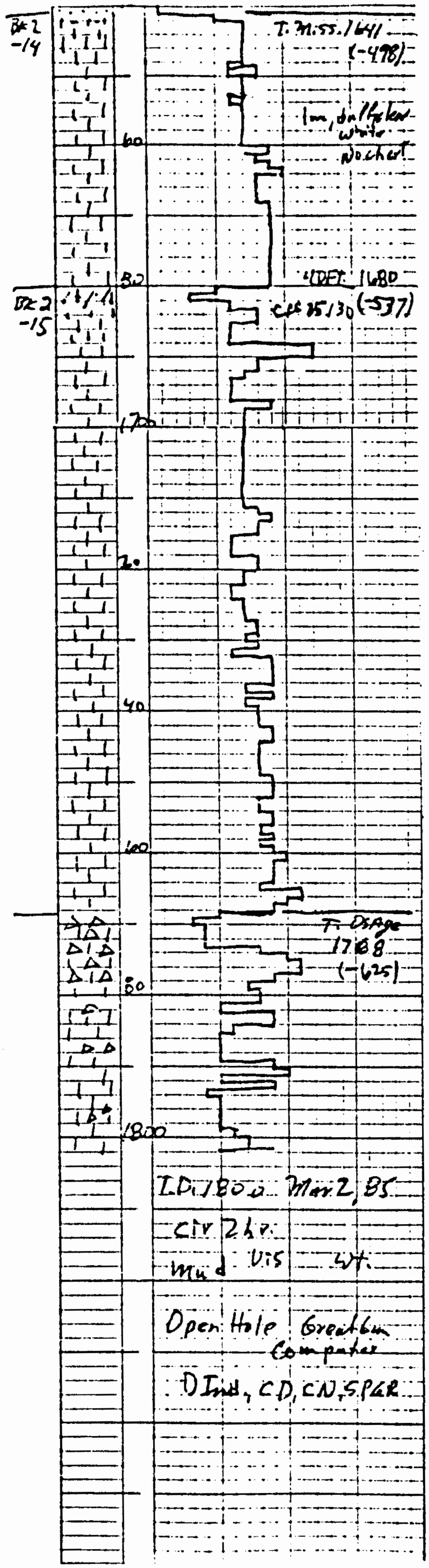
SHOT 2 STRIP TWO

TIME RATE SCALE 1/10" = 1/2 MINUTES

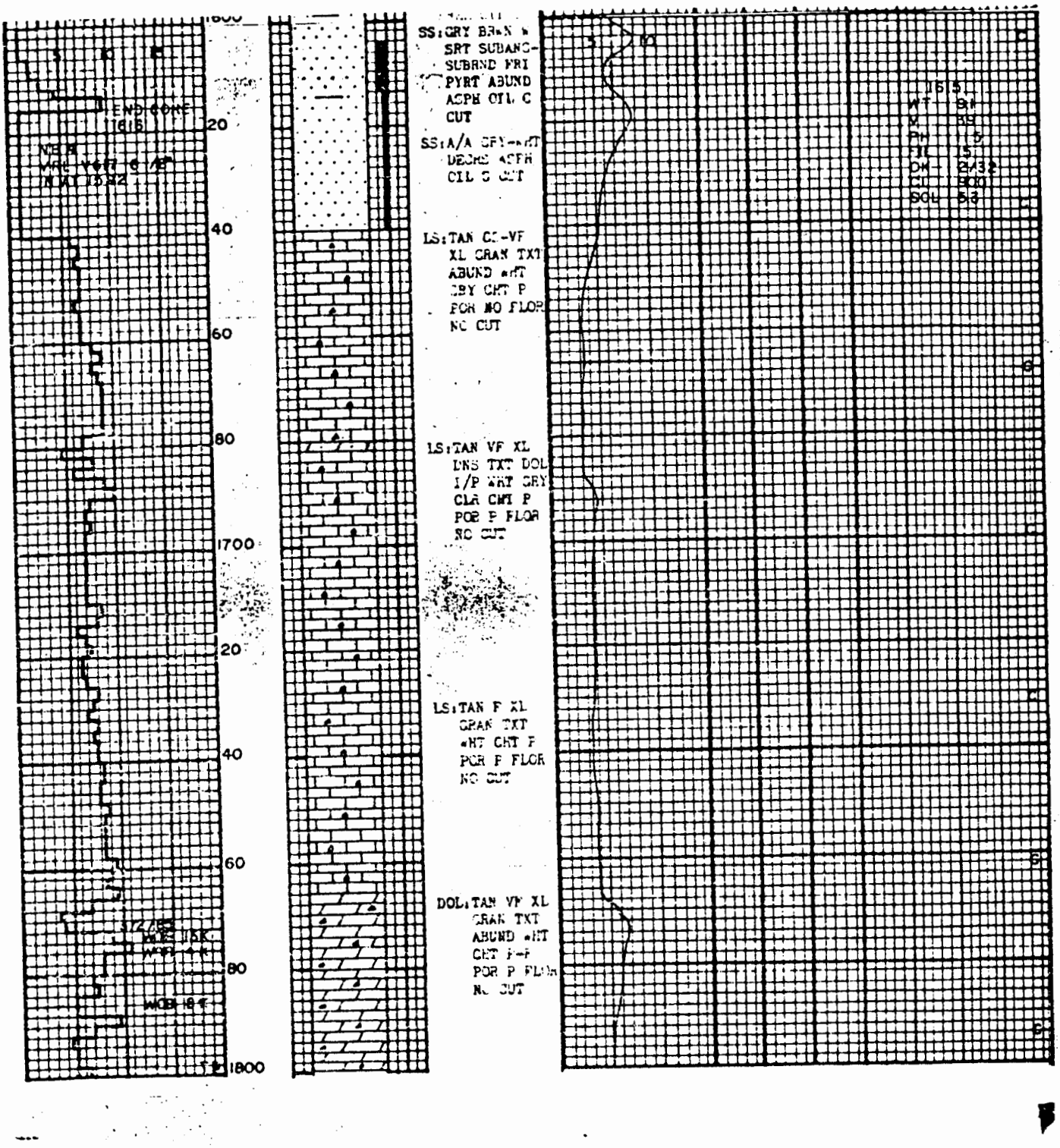
TULSA, OKLAHOMA 74121 PRINTED IN U.S.A.

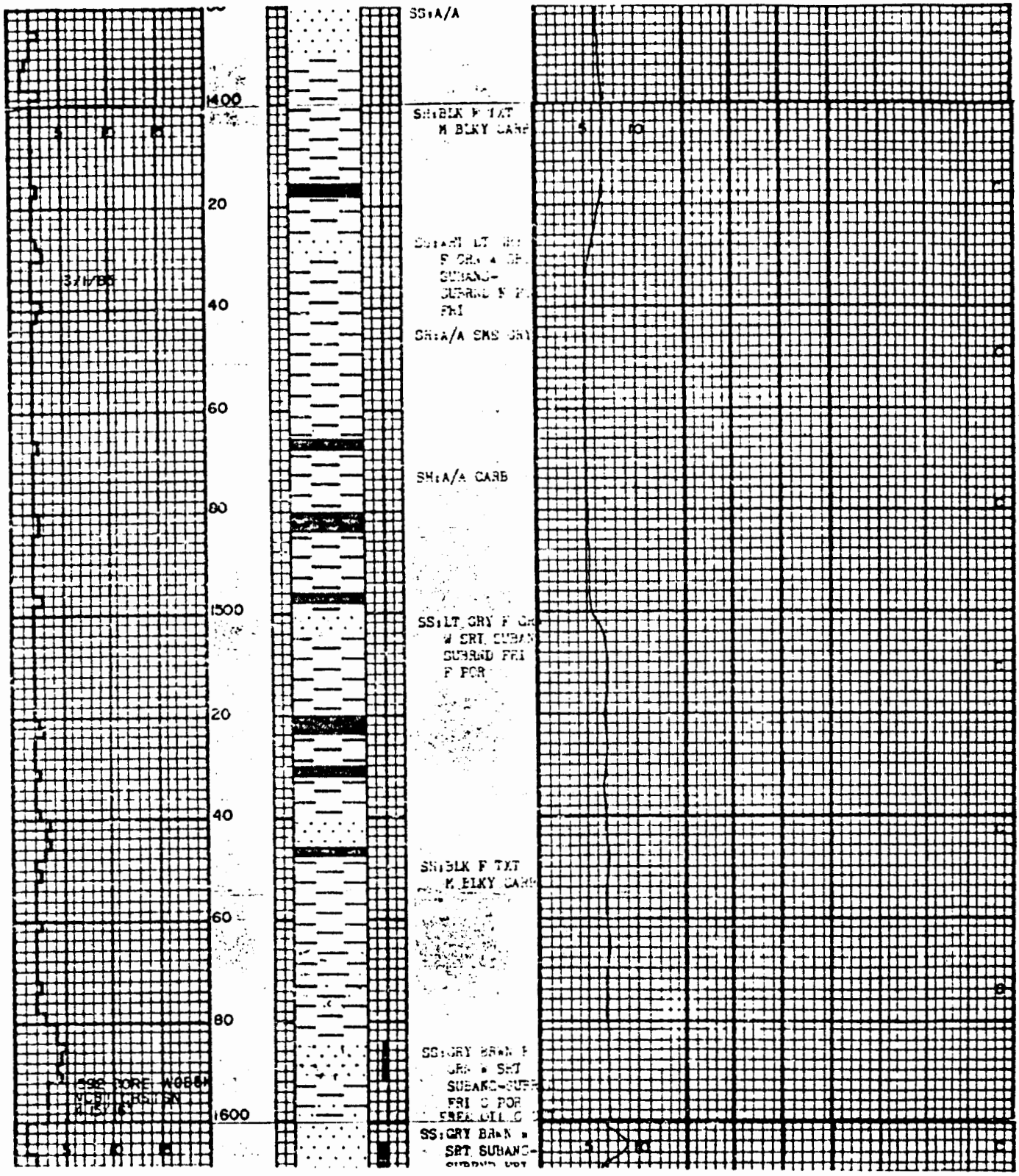
1300 — Mineral coal — lm 1312C — 20 — 40 — Sammon coal — middle Cattleman NS Ss — 60 — 80 — Lower Cattleman NOS Ss — 1400

40 — coal — 60 — 80 — Sh black coal — Drywood coal — Ss, sh, coal — 1500 — Rowe fp — 20 — Neutral — 40 — coal vis 35 wt 8.9 — 60 — Ss — 80 — Ss — Ss — gSO, girder vis 34 wt 8.9 — Ss — Lower McL. Core 1 1592(-449) -1616 — 1600 — T. McL 1602 — best zone plug core — 20 — Ss — 40 — Bkl -14 — T. Miss. 1641 (-498)


T. Miss. 1641
(-498)
white
No chert
60
1700
40
1800
T. Osage
1768
(-625)
Mar 2, 85
Mud Vis Wt.
Open Hole
Computer

Delbert Brunk 4
25-9-19E




SS:A/A
1400
20
40
60
80
1500
20
40
60
80
1600
SH:A/A CARB

MAVERICK MUD CO.

P.O. BOX 31 PHONE 1 (316) 672-7565 PRATT, KS 67124

COMPANY: JERRY LUTZ COUNTY: JEFFERSON, KS ENGINEER: T WENDLE

WELL: BRUNK NO 4 ELEVATION: GL 1143 KB 1147 REMARKS: INTERVAL LOGGED

LOCATION: SEC 25 - T9S - R19E DATE LOGGED: 2/28/85 - 3/2/85 1200' - 1800

POROSITY ∅ — FAIR — GOOD

SANDSTONE, SILTSTONE, SHALE, LIMESTONE, DOLOMITE, ANHYDRITE / GYP, CHERT

OIL FLUORESCENCE & LEACH — FAIR — GOOD

METHANE C-1, ETHANE C-2, PROPANE C-3, BUTANES C-4

NB – NEW BIT
NCB – NEW CORE BIT
CO – CIRCULATED OUT
DST – DRILL STEM TEST
LAT – LOGGED AFTER TRIP

API NO. 15-087-20125

MUD DATA & BG GAS

DRILLING RATE MIN. / FT.

CORE, DST, DEPTH

∅ POR

LITHOLOGY %

OIL FLUO

LEACH

FORMATION DESCRIPTION

LS: TAN VF-XL DNS TXT PYRT I/P P POR NO FLOR NO CUT

SS: CLR WHT LT GRY F GRN SUBANG-SUBRD W SHT DOL CMT P-F POR

SH: LT GRY-GRY F TXT BLKY M

SH: A/A

SH: A/A

SH: A/A CARB

SS: WHT F GRN SUBANG-SUBRD

CHROMATOGRAPHIC % ANALYSIS OF GAS IN MUD

C-1 C-2 C-3 C-4

HOT WIRE GAS ANALYSIS

MUD ——— CUTTINGS – – –

LOG

Company Jerry Lutz Lease D. Brunk Well No. 4

Depth Interval, Feet	Description
	LOWER McCLOUTH SANDSTONE
1592.0 - 1600.4	Sandstone, black, slightly carbonaceous.
1600.4 - 1601.0	Sandstone, brown.
1601.0 - 1602.0	Sandstone, brownish black.
1602.0 - 1603.0	Sandstone, black, slightly carbonaceous.
1603.0 - 1608.5	Sandstone, light brown.
1608.5 - 1608.7	Shale, gray.
1608.7 - 1613.6	Sandstone, light brown.
1613.6 - 1614.1	Shale, gray.
1614.1 - 1615.8	Sandstone, light brown, with scattered gray shale nodules and partings.

Oilfield Research Laboratories

RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1

Company Jerry Lutz Lease D. Brunk Well No. 4

Sample No.	Depth, Feet	Porosity Percent	Percent Saturation			Oil Content Bbls. / A. Ft.	Permeability, Millidarcys
			Oil	Water	Total		
1	1592.5	22.9	54	18	72	959	1533.
2	1593.5	23.0	47	15	62	839	973.
3	1594.5	23.3	42	21	63	759	1363.
4	1595.6	23.4	58	16	74	1053	1226.
5	1596.4	23.8	60	24	84	1108	1226.
6	1597.4	23.5	46	24	70	839	1495.
7	1598.6	23.2	67	11	78	1206	1533.
8	1599.5	23.6	63	16	79	1154	1115.
9	1600.5	21.2	22	36	58	362	1277.
10	1601.4	21.8	20	36	56	338	926.
11	1602.6	22.0	65	19	84	1109	873.
12	1603.6	21.2	8	45	53	132	849.
13	1604.5	20.9	10	37	47	162	764.
14	1605.4	20.9	6	42	48	97	873.
15	1606.5	18.5	5	44	49	72	873.
16	1607.6	21.0	5	43	48	82	231.
17	1608.4	19.0	6	41	47	88	764.
18	1609.7	18.7	6	48	54	87	259.
19	1610.5	18.0	17	38	55	237	679.
20	1611.5	16.5	7	51	58	90	384.
21	1612.5	20.2	7	43	50	110	1019.
22	1613.5	18.6	8	43	51	115	1019.
23	1614.5	17.5	6	40	46	82	955.
24	1615.4	16.8	5	35	40	65	1019.

25-9-19E

Oilfield Research Laboratories

RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Jerry Lutz Lease D. Brunk Well No. 4

Sample No.	Depth, Feet	Effective Porosity Percent	Original Oil Saturation		Oil Recovery		Residual Saturation			Volume of Water Recovered cc*	Effective Permeability Millidarcys**	Initial Fluid Production Pressure Lbs /Sq./In.
			%	Bbls./A. Ft.	%	Bbls./A. Ft.	% Oil	% Water	Bbls./A. Ft.			
24	1615.4	17.2	17	227	0	0	17	74	227	820	162.93	5

Notes: cc—cubic centimeter.

*—Volume of water recovered at the time of maximum oil recovery.

**—Determined by passing water through sample which still contains residual oil.

Card 1, 2, 3

Sec. 25, T. 9 S., R. 19 E.

Location or Spot 4950'N, 4950'W

County Jefferson

Well Lutz #4 Brunk

Core Diameter _____ Inch (es) 8 boxes 1595 - 1614.5* NA, B-9 Cherokee

Box 2	Depth 1595 - 1597.5	Box	Depth		
Box 3	Depth 1597.5 - 1600.5	Box	Depth		
Box 4	Depth 1600.5 - 1602 *	Box	Depth		
Box 5	Depth 1602 - 1604.3	Box	Depth		
Box 6	Depth 1607.4 - 1610	Box	Depth		
Box 7	Depth 1604.3 - 1607.4	Box	Depth		
Box 8	Depth 1610 - 1612.5	Box	Depth		
Box 9	Depth 1612.5 - 1614.5	Box	Depth		

* The core may be mis labeled; around 1600 or 1601. 1601 may be marked twice so that everything below 1601 is 1' shallow.