## FLUID SAMPLE DATA

Sampler Pressure _____ P.S.I.G. at Surface
Recovery: Cu. Ft. Gas _____
cc. Oil _____
cc. Water _____
cc. Mud _____
Tot. Liquid cc. _____
Gravity _____ ° API @ _____ °F.
Gas/Oil Ratio _____ cu. ft./bbl.

| | | RESISTIVITY | | CHLORIDE CONTENT |
|---|---|---|---|---|
| Recovery Water | @ °F. | | | ppm |
| Recovery Mud | @ °F. | | | ppm |
| Recovery Mud Filtrate | @ °F. | | | ppm |
| Mud Pit Sample | @ °F. | | | ppm |
| Mud Pit Sample Filtrate | @ °F. | | | ppm |

Mud Weight 9.6 vis 56 sec

Date 10-7-78 Ticket Number 503212
Kind of Job OPEN HOLE Halliburton District PRATT
Tester HERREN Witness DE COSTA
Drilling Contractor GABBERT - JONES DRILLING COMPANY NM

## EQUIPMENT & HOLE DATA

Formation Tested Kansas City
Elevation 2200' K.B. - 2195' GL Ft.
Net Productive Interval 6' Ft.
All Depths Measured From Ground Level
Total Depth 4440' Ft.
Main Hole/Casing Size 7 7/8"
Drill Collar Length 247' I.D. 2.25"
Drill Pipe Length 4140' I.D. 3.826"
Packer Depth(s) 4416' Ft.
Depth Tester Valve 4399' Ft.

Cushion TYPE NONE AMOUNT Ft. Depth Back Pres. Valve NONE Surface Choke 1" Bottom Choke .75"

Recovered 65' Feet of mud
Recovered Feet of
Recovered Feet of
Recovered Feet of
Recovered Feet of
Remarks

Meas. From Tester Valve

| TEMPERATURE | Gauge No. 6276 Depth: 4401' Ft. | Gauge No. 6275 Depth: 4436' Ft. | Gauge No. Depth: Ft. | TIME |
|---|---|---|---|---|
| | 12 Hour Clock | 12 Hour Clock | Hour Clock | Tool Opened A.M. |
| Est. 114 °F. | Blanked Off NO | Blanked Off YES | Blanked Off | 0630 P.M. |
| Actual °F. | Pressures | Pressures | Pressures | Opened Bypass A.M. P.M. |

| | | Field | Office | Field | Office | Field | Office | Reported Minutes | Computed Minutes |
|---|---|---|---|---|---|---|---|---|---|
| Initial Hydrostatic | | - | 2287 | 2229 | 2313 | | | | |
| First Period | Flow Initial | - | 10 | 31 | 33 | | | ——— | ——— |
| | Flow Final | - | 25 | 52 | 47 | | | 60 | 64 |
| | Closed in | - | 1377 | 1399 | 1403 | | | 60 | 60 |
| Second Period | Flow Initial | - | 42 | 42 | 67 | | | ——— | ——— |
| | Flow Final | - | 41 | 63 | 63 | | | 60 | 55 |
| | Closed in | - | 1418 | 1440 | 1442 | | | 120 | 121 |
| Third Period | Flow Initial | | | | | | | ——— | ——— |
| | Flow Final | | | | | | | | |
| | Closed in | | | | | | | | |
| Final Hydrostatic | | - | 2226 | 2279 | 2249 | | | ——— | ——— |

Legal Location Sec. - Twp. - Rng. 23 - 30 - 18
Lease Name CURTIS UNRUH
Well No. 1
Test No. 1
Tested Interval 4416' - 4440'
Field Area -
County KIOWA
State KANSAS
Lease Owner/Company Name THE MAURICE L. BROWN COMPANY

FORM 181-R2—PRINTED IN U.S.A.

# FORMATION TEST DATA

LITTLE'S 102548 SM 9/76

5

Casing perfs. _____ Bottom choke _____ Surf. temp _____ °F Ticket No. 503212

Gas gravity _____ Oil gravity _____ GOR _____

Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F

**INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED** _____

| Date Time a.m. p.m. | Choke Size | Surface Pressure psi | Gas Rate MCF | Liquid Rate BPD | Remarks |
|---|---|---|---|---|---|
| 1900 | | | | | Called out. |
| 2200 | | | | | On location. |
| 0315 | | | | | Tool through the table. |
| 0627 | | | | | Tool on bottom with a weight of 62,000#. |
| 0630 | | | | | Tool opened with a very weak blow. |
| 0710 | | | | | Blow died. |
| 0730 | | | | | Closed tool. |
| 0830 | | | | | Reopened the tool with no blow. |
| 0930 | | | | | Reclosed tool. |
| 1130 | | | | | Started off bottom. |
| 1330 | | | | | Tool in the table. |
| | | | | | |
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FORM 182-R1—PRINTED IN U.S.A.

# PRODUCTION TEST DATA

LITTLE'S 96672 5M 8/74

5

| Gauge No. | 6276 | Depth | 4401' | Clock No. | ???? | 12 hour | Ticket No. | 503212 | |
|---|---|---|---|---|---|---|---|---|---|

| | 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 | 10 | .000 | | 25 | .000 | 42 | .000 | | 41 | | | | | |
| 1 | .0941 | 13* | .0269 | | 63 | .0336 | 33** | .0608 | | 265*** | | | | | |
| 2 | .1613 | 16 | .0537 | | 238 | .1009 | 34 | .1148 | | 830 | | | | | |
| 3 | .2284 | 17 | .0806 | | 644 | .1682 | 35 | .1688 | | 1058 | | | | | |
| 4 | .2956 | 19 | .1075 | | 900 | .2355 | 36 | .2228 | | 1174 | | | | | |
| 5 | .3628 | 22 | .1343 | | 1046 | .3027 | 38 | .2768 | | 1237 | | | | | |
| 6 | .4300 | 25 | .1612 | | 1134 | .3700 | 41 | .3308 | | 1278 | | | | | |
| 7 | | | .1881 | | 1195 | | | .3849 | | 1308 | | | | | |
| 8 | | | .2149 | | 1239 | | | .4389 | | 1332 | | | | | |
| 9 | | | .2418 | | 1272 | | | .4929 | | 1349 | | | | | |
| 10 | | | .2687 | | 1298 | | | .5469 | | 1367 | | | | | |
| 11 | | | .2955 | | 1320 | | | .6009 | | 1379 | | | | | |
| 12 | | | .3224 | | 1338 | | | .6549 | | 1391 | | | | | |
| 13 | | | .3493 | | 1353 | | | .7090 | | 1403 | | | | | |
| 14 | | | .3761 | | 1367 | | | .7630 | | 1411 | | | | | |
| 15 | | | .4030 | | 1377 | | | .8170 | | 1418 | | | | | |

| Gauge No. | 6275 | Depth | 4436' | Clock No. | ???? | hour | 12 | | |
|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | .000 | 33 | .000 | | 47 | .000 | 67 | .000 | | 63 | | | | | |
| 1 | .0965 | 36* | .0272 | | 89 | .0348 | 54** | .0613 | | 282*** | | | | | |
| 2 | .1654 | 39 | .0544 | | 279 | .1045 | 54 | .1158 | | 842 | | | | | |
| 3 | .2343 | 40 | .0816 | | 667 | .1741 | 56 | .1702 | | 1091 | | | | | |
| 4 | .3032 | 42 | .1088 | | 931 | .2437 | 57 | .2247 | | 1202 | | | | | |
| 5 | .3721 | 44 | .1360 | | 1080 | .3134 | 60 | .2792 | | 1263 | | | | | |
| 6 | .4410 | 47 | .1632 | | 1166 | .3830 | 63 | .3337 | | 1303 | | | | | |
| 7 | | | .1904 | | 1225 | | | .3882 | | 1333 | | | | | |
| 8 | | | .2176 | | 1266 | | | .4426 | | 1355 | | | | | |
| 9 | | | .2448 | | 1299 | | | .4971 | | 1375 | | | | | |
| 10 | | | .2720 | | 1324 | | | .5516 | | 1391 | | | | | |
| 11 | | | .2992 | | 1347 | | | .6061 | | 1405 | | | | | |
| 12 | | | .3264 | | 1365 | | | .6606 | | 1415 | | | | | |
| 13 | | | .3536 | | 1381 | | | .7150 | | 1425 | | | | | |
| 14 | | | .3808 | | 1392 | | | .7695 | | 1435 | | | | | |
| 15 | | | .4080 | | 1403 | | | .8240 | | 1442 | | | | | |
| Reading Interval | | 10 | | 4 | | | 10 | | 8 | | | | | | Minutes |

REMARKS: * INTERVAL = 14 MINUTES. ** INTERVAL = 5 MINUTES. *** INTERVAL = 9 MINUTES.



# SPECIAL PRESSURE DATA

TICKET NO. 503212

| | O. D. | I. D. | LENGTH | DEPTH |
|---|---|---|---|---|
| Drill Pipe or Tubing | | | | |
| Reversing Sub | 6" | 2" | 1' | |
| Water Cushion Valve | | | | |
| Drill Pipe | 4½" | 3.826" | 4140' | |
| Drill Collars | 6" | 2.25" | 247' | |
| Handling Sub & Choke Assembly | | | | |
| Dual CIP Valve | 5" | .87" | 6' | |
| Dual CIP Sampler | | | | |
| Hydro-Spring Tester | 5" | .75" | 5' | 4399' |
| Multiple CIP Sampler | | | | |
| Extension Joint | | | | |
| AP Running Case | 5" | 3.06" | 4' | 4401' |
| Hydraulic Jar | 5" | 1.5" | 5' | |
| VR Safety Joint | 5" | 1" | 3' | |
| Pressure Equalizing Crossover | | | | |
| Packer Assembly | | | | |
| Distributor | | | | |
| Packer Assembly | 6 3/4" | 1.53" | 6' | 4416' |
| Flush Joint Anchor | 5" | 2.36" | 18' | |
| Pressure Equalizing Tube | | | | |
| Blanked-Off B.T. Running Case | 5" | 2.44" | 4' | 4436' |
| Drill Collars | | | | |
| Anchor Pipe Safety Joint | | | | |
| Packer Assembly | | | | |
| Distributor | | | | |
| Packer Assembly | | | | |
| Anchor Pipe Safety Joint | | | | |
| Side Wall Anchor | | | | |
| Drill Collars | | | | |
| Flush Joint Anchor | | | | |
| Blanked-Off B.T. Running Case | | | | |
| Total Depth | | | | 4440' |

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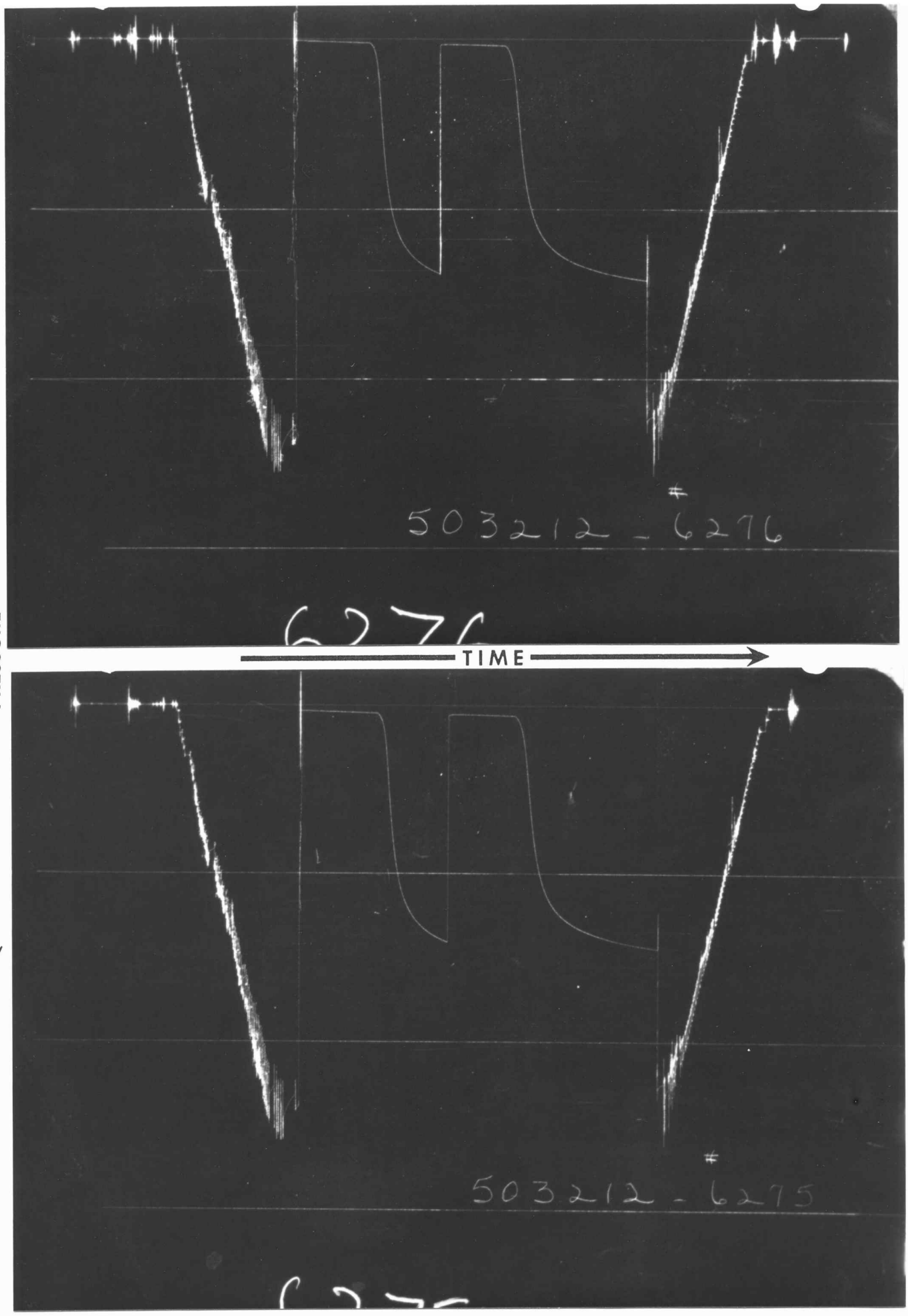
# EQUIPMENT DATA

LITTLE'S 96676 75C 8/74

5




Each Horizontal Line Equal to 1000 p.s.i.

## FLUID SAMPLE DATA

Sampler Pressure _____ P.S.I.G. at Surface
Recovery: Cu. Ft. Gas _____
cc. Oil _____
cc. Water _____
cc. Mud _____
Tot. Liquid cc. _____
Gravity _____ ° API @ _____ °F.
Gas/Oil Ratio _____ cu. ft./bbl.

| | | RESISTIVITY | | CHLORIDE CONTENT |
|---|---|---|---|---|
| Recovery Water | @ °F. | | | ppm |
| Recovery Mud | @ °F. | | | ppm |
| Recovery Mud Filtrate | @ °F. | | | ppm |
| Mud Pit Sample | @ °F. | | | ppm |
| Mud Pit Sample Filtrate | @ °F. | | | ppm |

Mud Weight 9.9 vis 48 sec

Date 10-11-78 Ticket Number 506932
Kind of Job OPEN HOLE Halliburton District PRATT
Tester MR. SEYFERT Witness MR. COSTA
Drilling Contractor C & J DRILLING COMPANY SM

## EQUIPMENT & HOLE DATA

Formation Tested Marmaton
Elevation 2202' Kelly bushing Ft.
Net Productive Interval - Ft.
All Depths Measured From Kelly bushing
Total Depth 4932' Ft.
Main Hole/Casing Size 7 7/8"
Drill Collar Length 247' I.D. 2.24"
Drill Pipe Length 4615' I.D. 3.826"
Packer Depth(s) 4891' Ft.
Depth Tester Valve 4874' Ft.

Cushion TYPE AMOUNT Ft. Depth Back Pres. Valve
Surface Choke 1" Bottom Choke .75"

Recovered 120 Feet of gas cut mud
Recovered 60 Feet of oil & gas cut mud
Recovered Feet of
Recovered Feet of
Recovered Feet of

Remarks SEE PRODUCTION TEST DATA SHEET

| TEMPERATURE | Gauge No. 6276 | Gauge No. 6275 | Gauge No. | TIME |
|---|---|---|---|---|
| | Depth: 4876 Ft. | Depth: 4929 Ft. | Depth: Ft. | |
| | 12 Hour Clock | 12 Hour Clock | Hour Clock | Tool A.M. |
| Est. °F. | Blanked Off no | Blanked Off yes | Blanked Off | Opened 0950 P.M. |
| 4927 | | | | Opened A.M. |
| Actual 110 °F. | Pressures | Pressures | Pressures | Bypass 1615 P.M. |

| | | Field | Office | Field | Office | Field | Office | Reported Minutes | Computed Minutes |
|---|---|---|---|---|---|---|---|---|---|
| Initial Hydrostatic | | | 2577 | 2712 | 2615 | | | | |
| First Period | Flow Initial | | 28 | 42 | 61 | | | ——— | ——— |
| | Flow Final | | 67 | 94 | 89 | | | 115 | 116 |
| | Closed in | | 1505 | 1533 | 1531 | | | 60 | 59 |
| Second Period | Flow Initial | | 39 | 63 | 71 | | | ——— | ——— |
| | Flow Final | | 79 | 109 | 102 | | | 90 | 88 |
| | Closed in | | 1557 | 1596 | 1588 | | | 120 | 122 |
| Third Period | Flow Initial | | | | | | | ——— | ——— |
| | Flow Final | | | | | | | | |
| | Closed in | | | | | | | | |
| Final Hydrostatic | | | 2561 | 2692 | 2600 | | | ——— | ——— |

Legal Location Sec. - Twp. - Rng. 23 30 18
Lease Name CURTIS UNRUH Well No. 1 Test No. 2
Tested Interval 4891 - 4932'
Field Area
Mea. From Tester Valve
County KIOWA State KANSAS
Lease Owner/Company Name THE MAURICE L. BROWN COMPANY

FORM 181-R2—PRINTED IN U.S.A.

# FORMATION TEST DATA

LITTLE'S 102548 5M 9/76

10

Casing perfs. _____ Bottom choke .75" Surf. temp _____ °F Ticket No. 506932

Gas gravity _____ Oil gravity _____ GOR _____

Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F

**INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED** _____

| Date Time a.m. p.m. | Choke Size | Surface Pressure psi | Gas Rate MCF | Liquid Rate BPD | Remarks |
|---|---|---|---|---|---|
| 0100 | | | | | Called out |
| 0400 | | | | | On location |
| 0715 | | | | | Picked up tools |
| 0740 | | | | | Tools at table |
| 0745 | | | | | Tool thru table |
| 0947 | | | | | Tool on bottom |
| 0950 | | | | | Tool opened with strong blow. |
| 1017 | | | | | Gas to the surface. |
| 1025 | 1/8" | 2 | 3.9 | | |
| 1030 | " | 3 | 4.8 | | |
| 1035 | " | 4 | 5.6 | | |
| 1040 | " | 6 | 7 | | |
| 1045 | " | 7 | 7.7 | | |
| 1050 | " | 8 | 8.3 | | |
| 1055 | " | 9 | 8.9 | | |
| 1100 | " | 10 | 9.5 | | |
| 1105 | " | 11 | 10 | | |
| 1110 | " | 12 | 10.5 | | |
| 1115 | " | 12 | 10.5 | | |
| 1120 | " | 13 | 11 | | |
| 1125 | " | 14 | 11 .6 | | |
| 1130 | " | 15 | 12.1 | | |
| 1135 | " | 16 | 12.5 | | |
| 1135 | " | 16 | 12.5 | | |
| 1140 | " | 16 | 12.5 | | |
| | | | | | |

Casing perfs. _____ Bottom choke .75" Surf. temp _____ °F Ticket No. 506932 Page 2

Gas gravity _____ Oil gravity _____ GOR _____

Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F

INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED _____

| Date Time a.m. p.m. | Choke Size | Surface Pressure psi | Gas Rate MCF | Liquid Rate BPD | Remarks |
|---|---|---|---|---|---|
| 1145 | 1/8" | 16 | 12.5 | | Closed tool |
| 1245 | | | | | Opened tool |
| 1250 | 1/8" | 11 | 10 | | |
| 1255 | " | 14 | 11.6 | | |
| 1300 | " | 16 | 12.5 | | |
| 1305 | " | 16 | 12.5 | | |
| 1310 | " | 17 | 13.1 | | |
| 1315 | " | 18 | 13.5 | | |
| 1320 | " | 19 | 14 | | |
| 1325 | " | 19 | 14 | | |
| 1330 | " | 20 | 14.6 | | |
| 1335 | " | 21 | 15.1 | | |
| 1340 | " | 21 | 15.1 | | |
| 1345 | " | 22 | 15.5 | | |
| 1350 | " | 22 | " | | |
| 1355 | " | 22 | " | | |
| 1400 | " | 22 | " | | |
| 1405 | " | 22 | " | | |
| 1410 | " | 22 | " | | |
| 1415 | | | | | Closed tool |
| 1615 | | | | | Tool off bottom |
| 1930 | | | | | Tool on walk |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

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# PRODUCTION TEST DATA

LITTLE'S 96672 5M 8/74

| Gauge No. | 6276 | | Depth | 4876' | | Clock No. | 14236 | | 12 hour | Ticket No. | 506932 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 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 | .0000 | 28 | .0000 | | 67 | .0000 | 39 | .0000 | | 79 | | | | | |
| 1 | .1068* | 29 | .0332** | | 623 | .0872*** | 51 | .0666**** | | 974 | | | | | |
| 2 | .2402 | 34 | .0731 | | 984 | .1877 | 61 | .1198 | | 1205 | | | | | |
| 3 | .3737 | 43 | .1129 | | 1177 | .2883 | 66 | .1731 | | 1319 | | | | | |
| 4 | .5071 | 52 | .1528 | | 1289 | .3889 | 72 | .2263 | | 1387 | | | | | |
| 5 | .6406 | 59 | .1927 | | 1362 | .4894 | 78 | .2796 | | 1430 | | | | | |
| 6 | .7740 | 67 | .2326 | | 1412 | .5900 | 79 | .3328 | | 1461 | | | | | |
| 7 | | | .2724 | | 1447 | | | .3861 | | 1483 | | | | | |
| 8 | | | .3122 | | 1471 | | | .4393 | | 1499 | | | | | |
| 9 | | | .3521 | | 1490 | | | .4926 | | 1512 | | | | | |
| 10 | | | .3920 | | 1505 | | | .5458 | | 1523 | | | | | |
| 11 | | | | | | | | .5991 | | 1532 | | | | | |
| 12 | | | | | | | | .6523 | | 1540 | | | | | |
| 13 | | | | | | | | .7056 | | 1546 | | | | | |
| 14 | | | | | | | | .7588 | | 1552 | | | | | |
| 15 | | | | | | | | .8120 | | 1557 | | | | | |
| Gauge No. | 6275 | | Depth | 4929' | | Clock No. | 10288 | | 12 hour | | | | | | |
| 0 | .0000 | 61 | .0000 | | 89 | .0000 | 71 | .0000 | | 102 | | | | | |
| 1 | .1054* | 56 | .0321** | | 666 | .0869*** | 80 | .0650 **** | | 1009 | | | | | |
| 2 | .2371 | 57 | .0707 | | 1026 | .1871 | 85 | .1170 | | 1241 | | | | | |
| 3 | .3688 | 67 | .1092 | | 1213 | .2873 | 94 | .1690 | | 1351 | | | | | |
| 4 | .5005 | 76 | .1477 | | 1323 | .3876 | 97 | .2210 | | 1419 | | | | | |
| 5 | .6323 | 81 | .1863 | | 1393 | .4878 | 101 | .2730 | | 1462 | | | | | |
| 6 | .7640 | 89 | .2248 | | 1440 | .5880 | 102 | .3250 | | 1490 | | | | | |
| 7 | | | .2634 | | 1474 | | | .3770 | | 1511 | | | | | |
| 8 | | | .3019 | | 1497 | | | .4290 | | 1528 | | | | | |
| 9 | | | .3404 | | 1517 | | | .4810 | | 1540 | | | | | |
| 10 | | | .3790 | | 1531 | | | .5330 | | 1552 | | | | | |
| 11 | | | | | | | | .5850 | | 1560 | | | | | |
| 12 | | | | | | | | .6370 | | 1568 | | | | | |
| 13 | | | | | | | | .6890 | | 1576 | | | | | |
| 14 | | | | | | | | .7410 | | 1582 | | | | | |
| 15 | | | | | | | | .7930 | | 1588 | | | | | |
| Reading Interval | 20 | | 6 | | | 15 | | 8 | | | | | | | Minutes |

REMARKS: *First interval is equal to 16 minutes. ** = 5 minutes. *** = 13 minutes. **** = 10 minutes.

10



# SPECIAL PRESSURE DATA

TICKET NO. 506932

| | O. D. | I. D. | LENGTH | DEPTH |
|---|---|---|---|---|
| Drill Pipe or Tubing | | | | |
| Reversing Sub | 6" | 2" | 1' | |
| Water Cushion Valve | | | | |
| Drill Pipe | 4½" | 3.826" | 4615' | |
| Drill Collars | 6" | 2.24" | 247' | |
| ~~Handling Sub & Choke Assembly~~ Double pin | 6" | 2" | 1' | |
| Dual CIP Valve | 5 3/4" | .87" | 6' | 4864' |
| Dual CIP Sampler | | | | |
| Hydro-Spring Tester | 5" | .75" | 5' | 4874' |
| Multiple CIP Sampler | | | | |
| Extension Joint | | | | |
| AP Running Case | 5" | 3.06" | 4' | 4876' |
| Hydraulic Jar | 5" | .87" | 5' | |
| VR Safety Joint | 5" | 1" | 3' | |
| Pressure Equalizing Crossover | | | | |
| Packer Assembly | 6 3/4" | 1.53" | 6' | 4891' |
| ~~Distributor~~ Cross over | 6" | 2" | 2' | |
| Packer Assembly | | | | |
| Flush Joint Anchor | 5" | 2.36" | 32' | |
| ~~Pressure Equalizing Tube~~ H.T. 500 | 5" | 2.25" | 1' | 4927' |
| Blanked-Off B.T. Running Case | 5" | 2.44" | 4' | 4929' |
| Drill Collars | | | | |
| Anchor Pipe Safety Joint | | | | |
| Packer Assembly | | | | |
| Distributor | | | | |
| Packer Assembly | | | | |
| Anchor Pipe Safety Joint | | | | |
| Side Wall Anchor | | | | |
| Drill Collars | | | | |
| Flush Joint Anchor | | | | |
| Blanked-Off B.T. Running Case | | | | |
| Total Depth | | | | 4932' |

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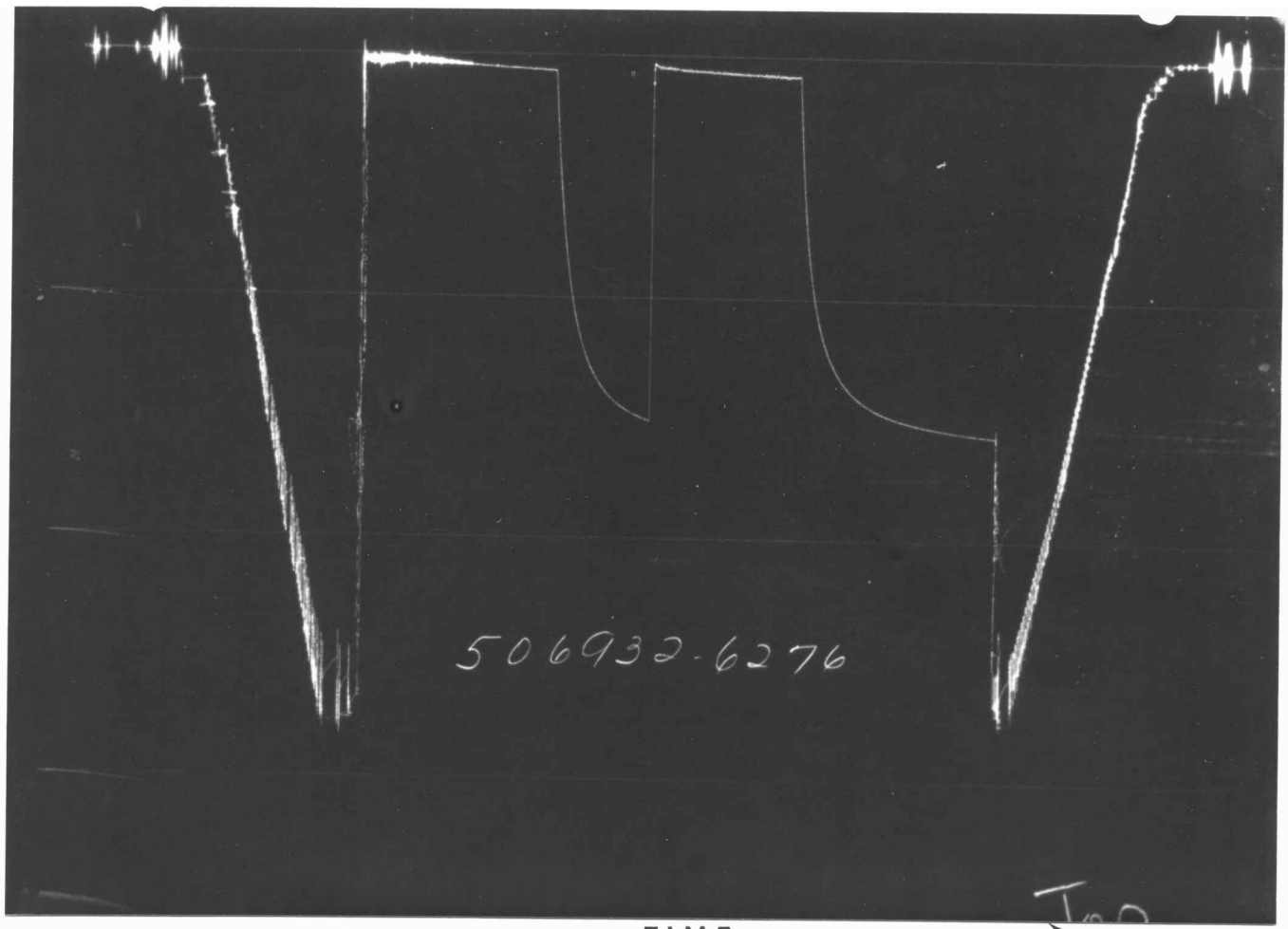
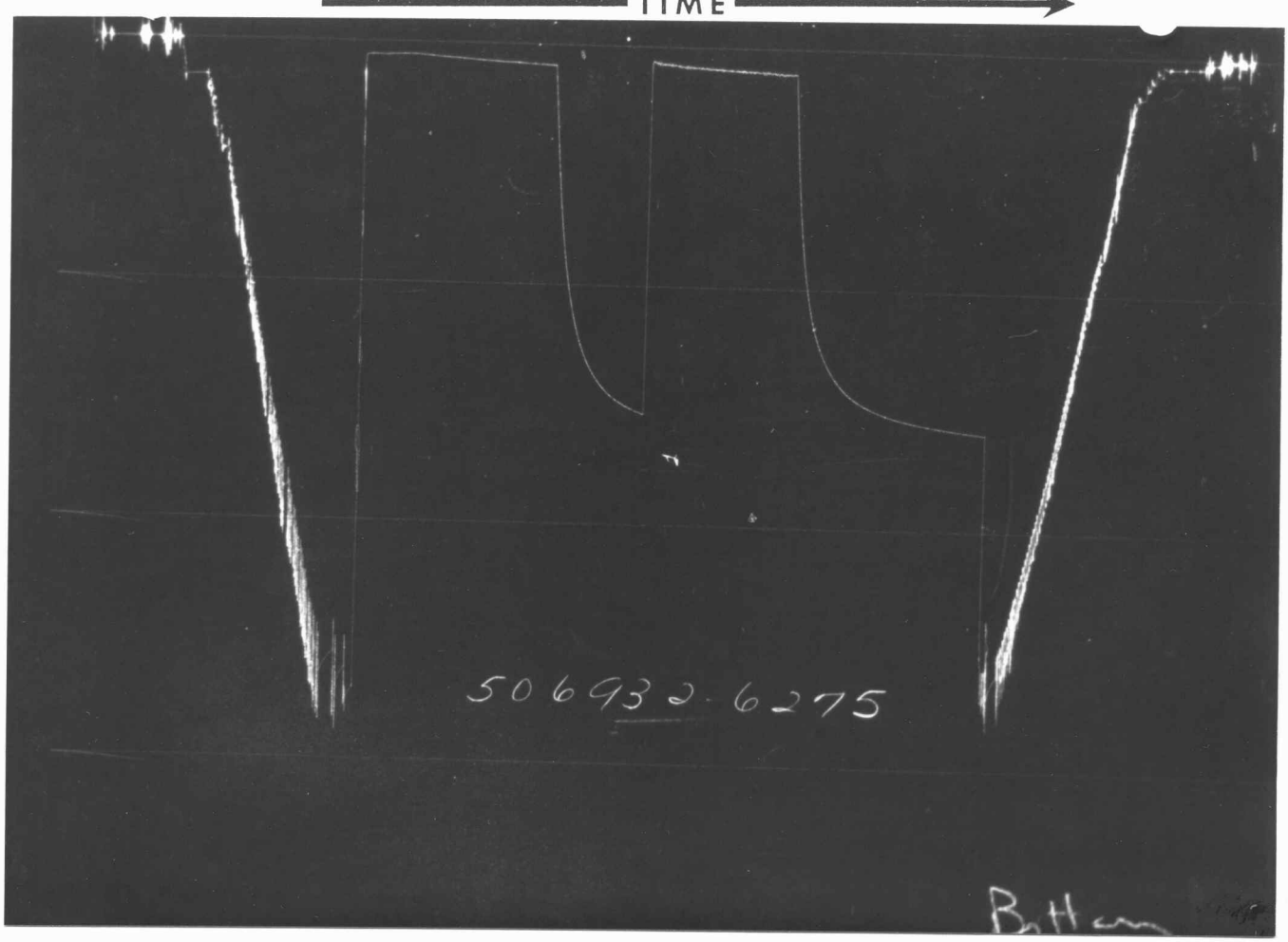
# EQUIPMENT DATA

LITTLE'S 96676 75C 8/74

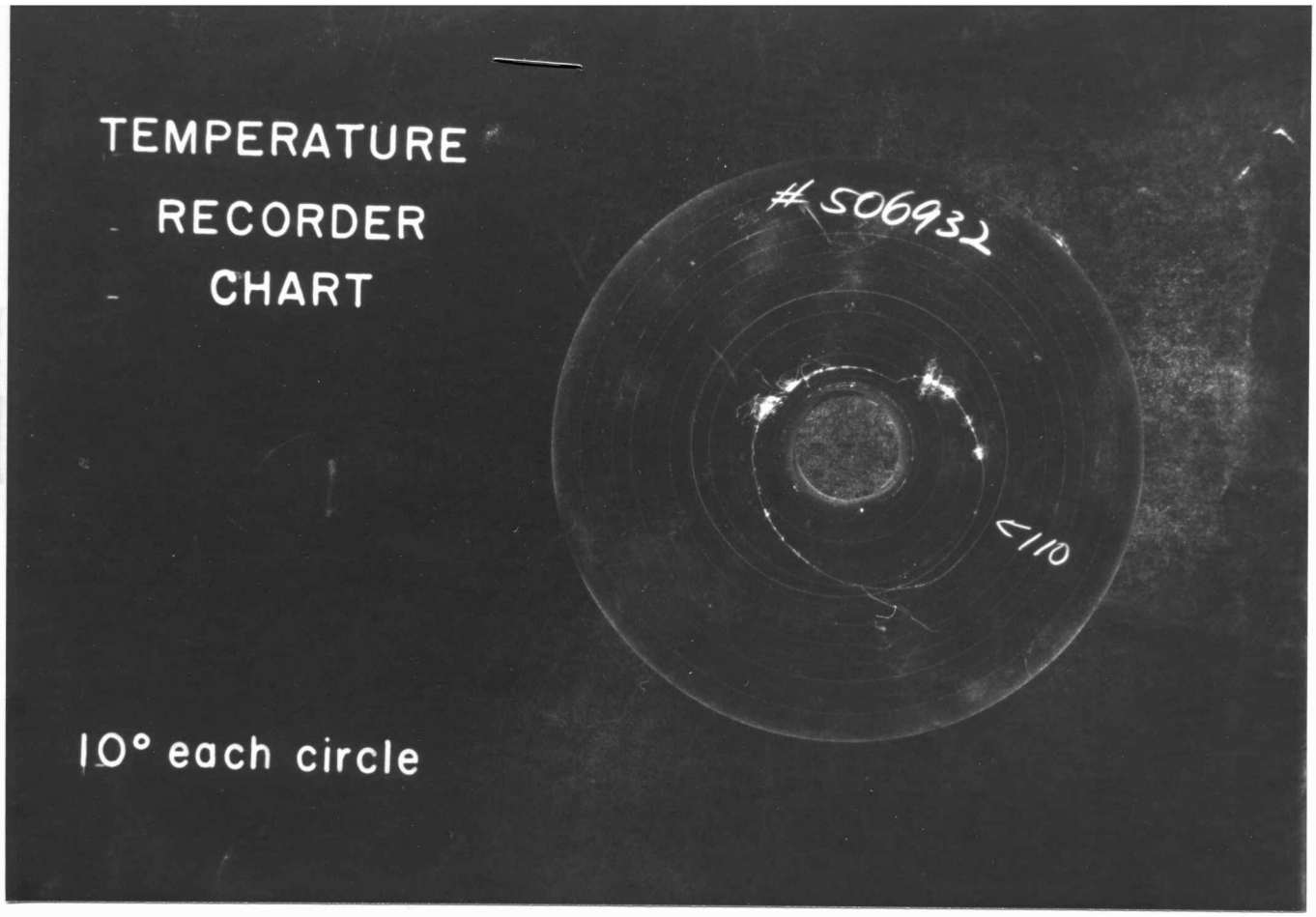



PRESSURE

TIME




Each Horizontal Line Equal to 1000 p.s.i.




$OF_3$ = Theoretical Open Flow Potential with/Damage Removed Max. . . . . MCF/D

$OF_4$ = Theoretical Open Flow Potential with/Damage Removed Min. . . . . MCF/D

$P_s$ = Extrapolated Static Pressure . . . . . Psig.

$P_F$ = Final Flow Pressure . . . . . Psig.

$P_{ot}$ = Potentiometric Surface (Fresh Water*) . . . . . Feet

$Q$ = Average Adjusted Production Rate During Test . . . . . bbls/day

$Q_1$ = Theoretical Production w/Damage Removed . . . . . bbls/day

$Q_g$ = Measured Gas Production Rate . . . . . MCF/D

$R$ = Corrected Recovery . . . . . bbls

$r_w$ = Radius of Well Bore . . . . . Feet

$t$ = Flow Time . . . . . Minutes

$t_o$ = Total Flow Time . . . . . Minutes

$T$ = Temperature Rankine . . . . . °R

$Z$ = Compressibility Factor . . . . . ——

$\mu$ = Viscosity Gas or Liquid . . . . . CP

Log = Common Log

* Potentiometric Surface Reference to Rotary Table When Elevation Not Given, Fresh Water Corrected to 100° F.

## FLUID SAMPLE DATA

Sampler Pressure _____ P.S.I.G. at Surface
Recovery: Cu. Ft. Gas _____
cc. Oil _____
cc. Water _____
cc. Mud _____
Tot. Liquid cc. _____
Gravity _____ ° API @ _____ °F.
Gas/Oil Ratio _____ cu. ft./bbl.

| | | RESISTIVITY | | CHLORIDE CONTENT |
|---|---|---|---|---|
| Recovery Water | @ °F. | | | ppm |
| Recovery Mud | @ °F. | | | ppm |
| Recovery Mud Filtrate | @ °F. | | | ppm |
| Mud Pit Sample | @ °F. | | | ppm |
| Mud Pit Sample Filtrate | @ °F. | | | ppm |

Mud Weight 9.7 vis 48 sec

Date 10-13-78 Ticket Number 506933
Kind of Job OPEN HOLE Halliburton District PRATT
Tester MR. SEYFERT Witness MR. COSTA
Drilling Contractor C & J DRILLING COMPANY RIG # 9 sm

## EQUIPMENT & HOLE DATA

Formation Tested Mississippian
Elevation -- Ft.
Net Productive Interval - Ft.
All Depths Measured From Kelly bushing
Total Depth 5080' Ft.
Main Hole/Casing Size 7 7/8"
Drill Collar Length 247' I.D. 2.25"
Drill Pipe Length 4758' I.D. 3.826"
Packer Depth(s) 5034' Ft.
Depth Tester Valve 5017' Ft.

Cushion TYPE AMOUNT Ft. Depth Back Pres. Valve
Surface Choke 1" Bottom Choke .75"

Recovered 240 Feet of drilling mud
Recovered Feet of
Recovered Feet of
Recovered Feet of
Recovered Feet of

Meas. From Tester Valve

Remarks SEE PRODUCTION TEST DATA SHEET

| TEMPERATURE | Gauge No. 6276 | Gauge No. 6275 | Gauge No. | TIME |
|---|---|---|---|---|
| | Depth: 5019 Ft. | Depth: 5076 Ft. | Depth: Ft. | |
| | 12 Hour Clock | 12 Hour Clock | Hour Clock | Tool Opened A.M. P.M. |
| Est. °F. | Blanked Off no | Blanked Off yes | Blanked Off | Opened Bypass A.M. P.M. |
| 5075 Actual 108 °F. | Pressures | Pressures | Pressures | |

| | Field | Office | Field | Office | Field | Office | Reported Minutes | Computed Minutes |
|---|---|---|---|---|---|---|---|---|
| Initial Hydrostatic | | 2607 | | 2640 | | | | |
| First Period Flow Initial | | | | | | | — | — |
| First Period Flow Final | | | | | | | | |
| First Period Closed in | | | | | | | | |
| Second Period Flow Initial | | | | | | | — | — |
| Second Period Flow Final | | | | | | | | |
| Second Period Closed in | | | | | | | | |
| Third Period Flow Initial | | | | | | | — | — |
| Third Period Flow Final | | | | | | | | |
| Third Period Closed in | | | | | | | | |
| Final Hydrostatic | | 2593 | | 2628 | | | — | — |

Lease Name: CURTIS UNRUH
Well No.: 1
Test No.: 3
Legal Location Sec. - Twp. - Rng.: 23 30 18
Tested Interval: 5034 - 5080'
Field Area
County: KIOWA
State: KANSAS
Lease Owner/Company Name: THE MAURICE L. BROWN COMPANY

FORM 181-R2—PRINTED IN U.S.A.

# FORMATION TEST DATA

LITTLE'S 102548 5M 9/76

5

Casing perfs._____ Bottom choke_____ Surf. temp._____ °F Ticket No. 506933

Gas gravity_____ Oil gravity_____ GOR_____

Spec. gravity_____ Chlorides_____ ppm Res._____ @_____ °F

**INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED**_____

| Date Time a.m. p.m. | Choke Size | Surface Pressure psi | Gas Rate MCF | Liquid Rate BPD | Remarks |
|---|---|---|---|---|---|
| 2000 | | | | | Called out |
| 2130 | | | | | On location |
| 0005 | | | | | Picked up tools |
| 0025 | | | | | Tools at table |
| 0035 | | | | | Tool thru table |
| 0245 | | | | | Tool on bottom |
| 0247 | | | | | Opened -packer did not hole |
| 0250 | | | | | Tool on bottom. |
| 0253 | | | | | Tool opened - did not hold |
| 0310 | | | | | Started off bottom |
| 0515 | | | | | Tool at table |
| | | | | | |
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FORM 182-R1—PRINTED IN U.S.A.

# PRODUCTION TEST DATA

LITTLE'S 96672 5M 8/74

5

TICKET NO. 506933

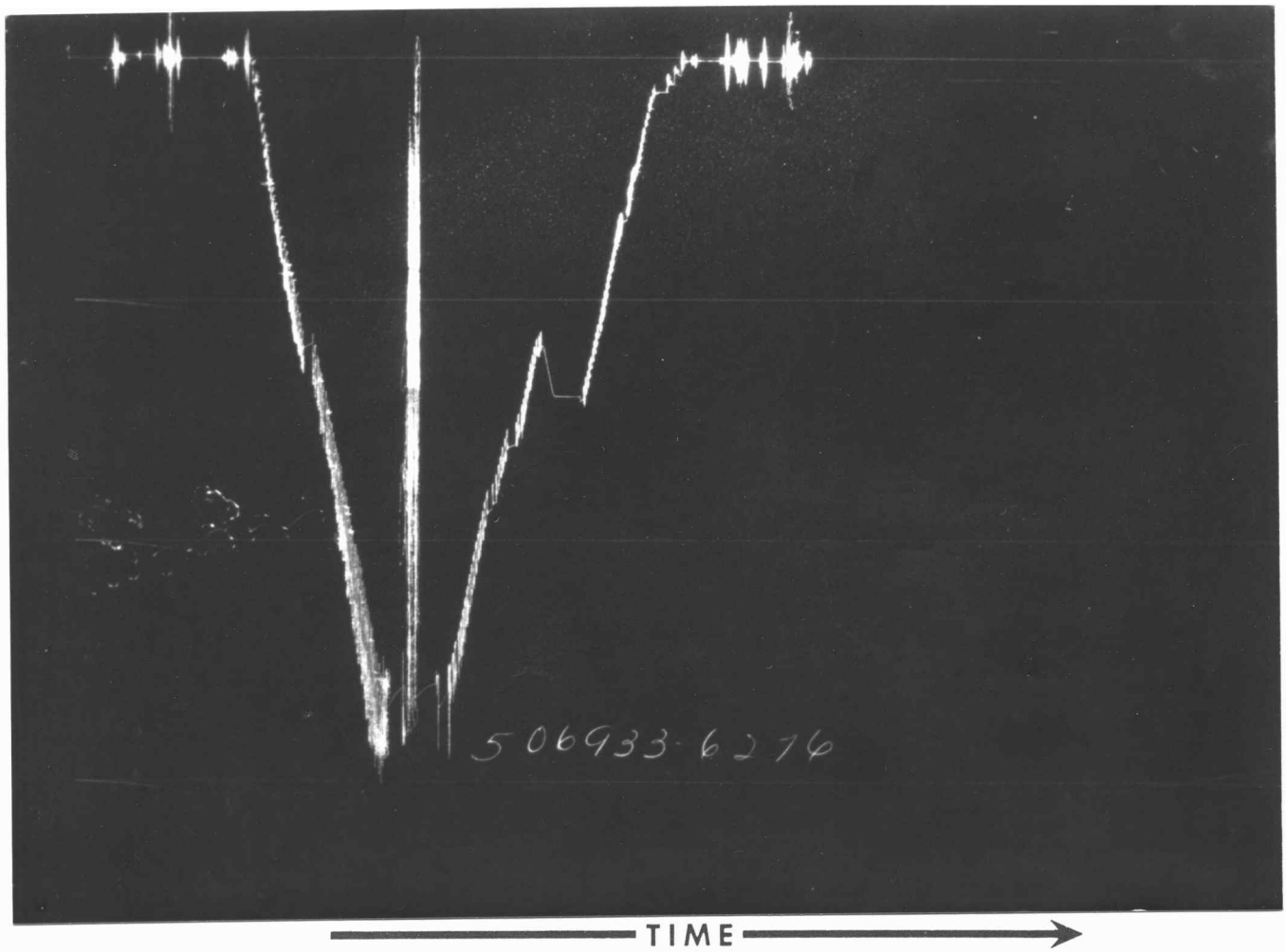
| | O. D. | I. D. | LENGTH | DEPTH |
|---|---|---|---|---|
| Drill Pipe or Tubing | | | | |
| Reversing Sub | 6" | 2" | 1' | |
| Water Cushion Valve | | | | |
| Drill Pipe | 4½" | 3.826" | 4758' | |
| Drill Collars | 6" | 2.25" | 247' | |
| ~~Handling Sub & Choke Assembly~~ Double pin | 6" | 2" | 1' | |
| Dual CIP Valve | 5 3/4" | .87" | 6' | 5007' |
| Dual CIP Sampler | | | | |
| Hydro-Spring Tester | 5" | .75" | 5' | 5017' |
| Multiple CIP Sampler | | | | |
| Extension Joint | | | | |
| AP Running Case | 5" | 3.06" | 4' | 5019' |
| Hydraulic Jar | 5" | .87" | 5' | |
| VR Safety Joint | 5" | 1" | 3' | |
| Pressure Equalizing Crossover | | | | |
| Packer Assembly | 6 3/4" | 1.53" | 6' | 5034' |
| Distributor | | | | |
| ~~Packer Assembly~~ Cross over | 6" | 2" | 2' | |
| Flush Joint Anchor | 5" | 2.36" | 37' | |
| ~~Pressure Equalizing Tube~~ HT 500 Temp | 5" | 2.25" | 1' | 5075' |
| Blanked-Off B.T. Running Case | 5" | 2.44" | 4' | 5076' |
| Drill Collars | | | | |
| Anchor Pipe Safety Joint | | | | |
| Packer Assembly | | | | |
| Distributor | | | | |
| Packer Assembly | | | | |
| Anchor Pipe Safety Joint | | | | |
| Side Wall Anchor | | | | |
| Drill Collars | | | | |
| Flush Joint Anchor | | | | |
| Blanked-Off B.T. Running Case | | | | |
| Total Depth | | | | 5080' |

FORM 187-R1—PRINTED IN U.S.A.

# EQUIPMENT DATA

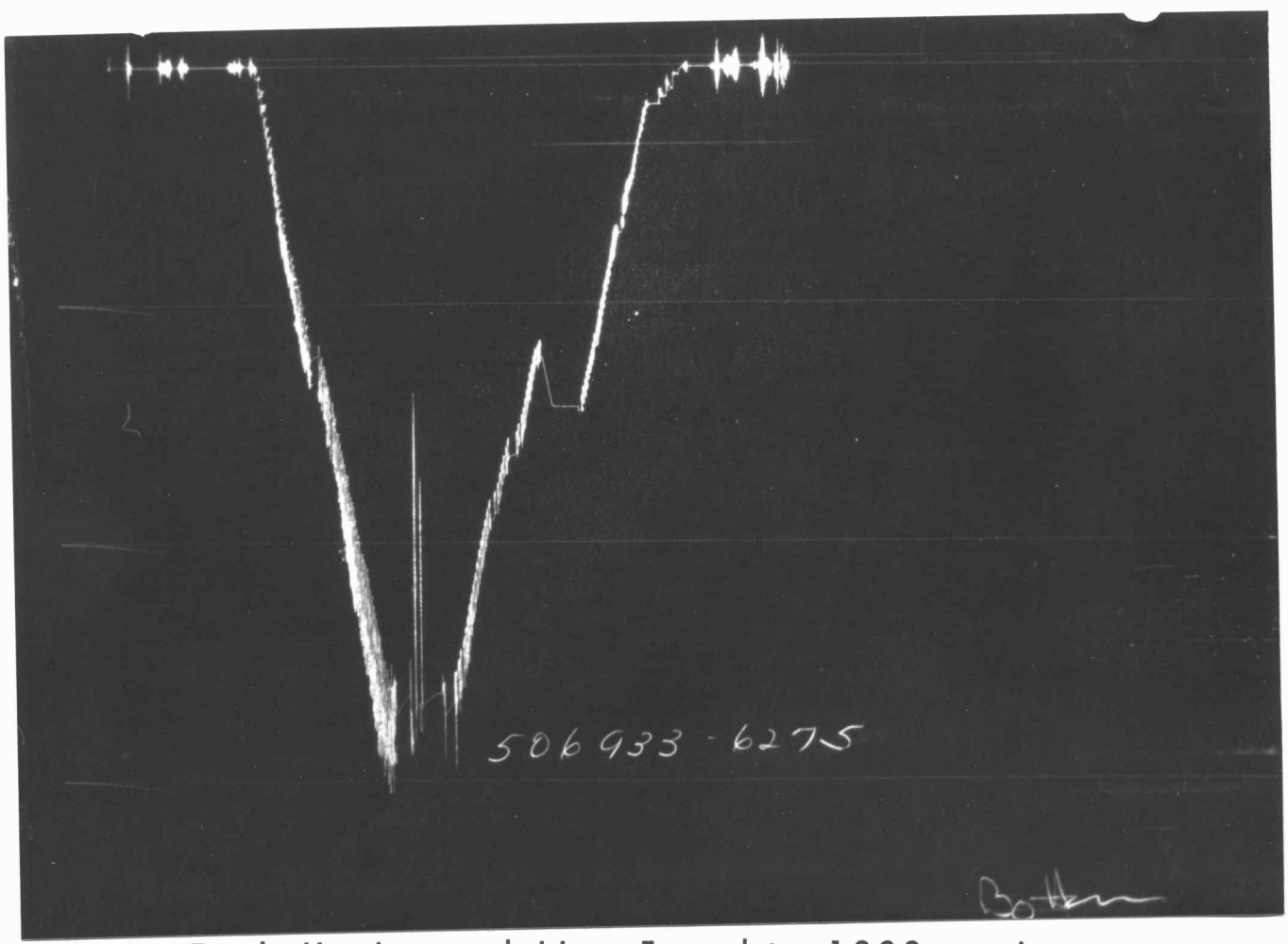
LITTLE'S 96676 75C 8/74

5

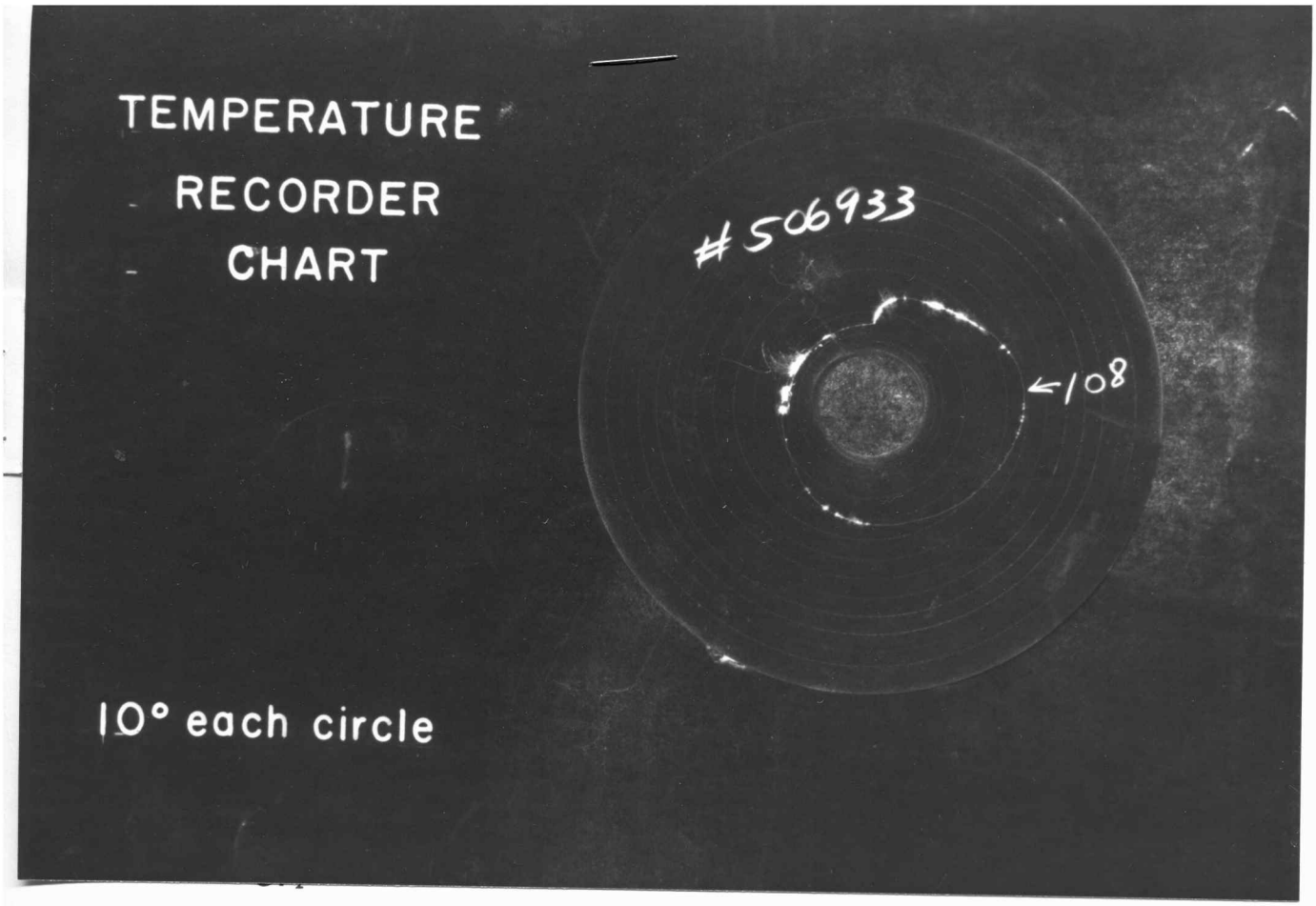



PRESSURE

TIME




Each Horizontal Line Equal to 1000 p.s.i.




$OF_3$ = Theoretical Open Flow Potential with/Damage Removed Max. . . . . MCF/D

$OF_4$ = Theoretical Open Flow Potential with/Damage Removed Min. . . . . MCF/D

$P_s$ = Extrapolated Static Pressure . . . . . Psig.

$P_F$ = Final Flow Pressure . . . . . Psig.

$P_{ot}$ = Potentiometric Surface (Fresh Water*) . . . . . Feet

$Q$ = Average Adjusted Production Rate During Test . . . . . bbls/day

$Q_1$ = Theoretical Production w/Damage Removed . . . . . bbls/day

$Q_g$ = Measured Gas Production Rate . . . . . MCF/D

$R$ = Corrected Recovery . . . . . bbls

$r_w$ = Radius of Well Bore . . . . . Feet

$t$ = Flow Time . . . . . Minutes

$t_o$ = Total Flow Time . . . . . Minutes

$T$ = Temperature Rankine . . . . . °R

$Z$ = Compressibility Factor . . . . . ——

$\mu$ = Viscosity Gas or Liquid . . . . . CP

Log = Common Log

* Potentiometric Surface Reference to Rotary Table When Elevation Not Given, Fresh Water Corrected to 100° F.

## FLUID SAMPLE DATA

Sampler Pressure _____ P.S.I.G. at Surface
Recovery: Cu. Ft. Gas _____
cc. Oil _____
cc. Water _____
cc. Mud _____
Tot. Liquid cc. _____
Gravity _____ ° API @ _____ °F.
Gas/Oil Ratio _____ cu. ft./bbl.

| | | RESISTIVITY | | CHLORIDE CONTENT |
|---|---|---|---|---|
| Recovery Water | @ | °F. | | ppm |
| Recovery Mud | @ | °F. | | ppm |
| Recovery Mud Filtrate | @ | °F. | | ppm |
| Mud Pit Sample | @ | °F. | | ppm |
| Mud Pit Sample Filtrate | @ | °F. | | ppm |

Mud Weight 9.6 vis 48 sec

Date 10-13-78 Ticket Number 503213
Kind of Job OPEN HOLE TEST Halliburton District PRATT
Tester G. L. HERREN Witness DELBERT COSTA
Drilling Contractor GABBERT & JONES DRILLING COMPANY BJS

## EQUIPMENT & HOLE DATA

Formation Tested Mississippi
Elevation 2200' KB Ft.
Net Productive Interval 9' Ft.
All Depths Measured From Kelly Bushing
Total Depth 5080' Ft.
Main Hole/Casing Size 7 7/8"
Drill Collar Length 247' I.D. 2.25"
Drill Pipe Length 4734' I.D. 3.826"
Packer Depth(s) 5006' 5012' Ft.
Depth Tester Valve 4989' Ft.

Cushion TYPE AMOUNT Ft. Depth Back Pres. Valve
Surface Choke 1" Bottom Choke .75"

Recovered 180 Feet of gas cut mud.
Recovered Feet of
Recovered Feet of
Recovered Feet of
Recovered Feet of

Remarks SEE PRODUCTION TEST DATA SHEET....CHARTS INDICATE PARTIAL PLUGGING OF ANCHOR PERFORATIONS DURING INITIAL FLOW PERIOD....

| TEMPERATURE | Gauge No. 6276 | Gauge No. 6275 | Gauge No. | TIME |
|---|---|---|---|---|
| | Depth: 4991' Ft. | Depth: 5077' Ft. | Depth: Ft. | |
| | 12 Hour Clock | 12 Hour Clock | Hour Clock | Tool Opened 0925 A.M. P.M. |
| Est. °F. | Blanked Off NO | Blanked Off YES | Blanked Off | |
| 5075' Actual 105 °F. | Pressures | Pressures | Pressures | Opened A.M. Bypass 1455 P.M. |

| | | Field | Office | Field | Office | Field | Office | Reported Minutes | Computed Minutes |
|---|---|---|---|---|---|---|---|---|---|
| Initial Hydrostatic | | | 2694 | 2671 | 2749 | | | | |
| First Period | Flow Initial | | 19 | 186 | 314 | | | ——— | ——— |
| | Flow Final | | 96 | 186 | 191 | | | 60 | 60 |
| | Closed in | | 1544 | 1564 | 1571 | | | 60 | 61 |
| Second Period | Flow Initial | | 96 | 94 | 108 | | | ——— | ——— |
| | Flow Final | | 80 | 83 | 95 | | | 90 | 89 |
| | Closed in | | 1505 | 1513 | 1525 | | | 120 | 118 |
| Third Period | Flow Initial | | | | | | | ——— | ——— |
| | Flow Final | | | | | | | | |
| | Closed in | | | | | | | | |
| Final Hydrostatic | | | 2603 | 2671 | 2661 | | | ——— | ——— |

Legal Location Sec. - Twp. - Rng. 23 30 18
Lease Name CURTIS UNRUH Well No. 1 Test No. 4
Tested Interval 5012' to 5080'
Lease Owner/Company Name THE MAURICE L. BROWN COMPANY
Field Area
County KIOWA State KANSAS
Mea. From Tester Valve

FORM 181-R2—PRINTED IN U.S.A.

# FORMATION TEST DATA

LITTLE'S 102548 5M 9/76

(5)

Casing perfs._____ Bottom choke_____ Surf. temp_____ °F Ticket No. 503213

Gas gravity_____ Oil gravity_____ GOR_____

Spec. gravity_____ Chlorides_____ ppm Res._____ @_____ °F

**INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED** Merla Orifice Tester

| Date Time a.m. p.m. | Choke Size | Surface Pressure psi | Gas Rate MCF | Liquid Rate BPD | Remarks |
|---|---|---|---|---|---|
| 0400 | | | | | Called out. Relieved tester. |
| 0800 | | | | | Tool thru table. |
| 0922 | | | | | Tool on bottom - weight 70M |
| 0925 | | | | | Opened tool with a strong blow. |
| 0926 | | | | | Off bottom of bucket. |
| 0930 | 3/4" | 11 | 274 | | Gas to surface in 5 minutes. |
| 0935 | 3/4" | 14 | 317 | | Gas readings. |
| 0940 | 3/4" | 16 | 344 | | " |
| 0945 | " | 18 | 370 | | " |
| 0950 | " | " | 370 | | " |
| 0955 | " | " | " | | " |
| 1000 | " | " | " | | " |
| 1005 | " | " | " | | " |
| 1010 | " | " | " | | " |
| 1015 | " | " | " | | " |
| 1020 | " | " | " | | " |
| 1025 | " | " | " | | " Closed tool. |
| 1125 | " | 20 | 398 | | Reopened tool. |
| 1130 | " | " | " | | Gas readings. |
| 1135 | " | 22 | 424 | | " |
| 1140 | " | " | " | | " |
| 1145 | " | 21 | 411 | | " |
| 1150 | " | " | " | | " |
| 1155 | " | " | " | | " |
| 1200 | " | 20 | 398 | | " |
| | | | | | |

FORM 182-R1—PRINTED IN U.S.A.

# PRODUCTION TEST DATA

LITTLE'S 96672 5M 6/74

5

Casing perfs._____ Bottom choke_____ Surf. temp_____ °F Ticket No. 503213

Gas gravity_____ Oil gravity_____ GOR_____

Spec. gravity_____ Chlorides_____ ppm Res._____ @_____ °F



**INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED**_____

| Date Time a.m. p.m. | Choke Size | Surface Pressure psi | Gas Rate MCF | Liquid Rate BPD | Remarks |
|---|---|---|---|---|---|
| 1205 | 3/4" | 20 | 398 | | Gas readings. |
| 1210 | " | 20 | " | | " |
| 1215 | " | " | " | | " |
| 1220 | " | 19 | 384 | | " |
| 1225 | " | " | " | | " |
| 1230 | " | " | " | | " |
| 1235 | " | 18 | 370 | | " |
| 1240 | " | " | " | | " |
| 1245 | " | " | " | | " |
| 1250 | " | " | " | | " |
| 1255 | " | " | " | | Closed tool. |
| 1455 | | | | | Started off bottom with tool. |
| 1730 | | | | | Tool in table. |
| | | | | | |
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FORM 182-R1—PRINTED IN U.S.A.

# PRODUCTION TEST DATA

LITTLE'S 96672 5M 8/7

5

| Gauge No. | 6276 | | Depth | 4991' | | Clock No. | ? | | 12 hour | Ticket No. | 503213 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 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 | .0000 | 19 | .0000 | | 96 | .0000 | 96 | .0000 | | 80 | | | | | |
| 1 | .0687 | 94 | .0348* | | 1338 | .0544** | 94 | .0414*** | | 1234 | | | | | |
| 2 | .1373 | 98 | .0626 | | 1426 | .1156 | 89 | .0967 | | 1346 | | | | | |
| 3 | .2060 | 98 | .0904 | | 1457 | .1767 | 88 | .1519 | | 1385 | | | | | |
| 4 | .2746 | 98 | .1182 | | 1473 | .2379 | 86 | .2072 | | 1409 | | | | | |
| 5 | .3433 | 98 | .1460 | | 1488 | .2991 | 85 | .2624 | | 1427 | | | | | |
| 6 | .4120 | 96 | .1738 | | 1498 | .3602 | 84 | .3177 | | 1443 | | | | | |
| 7 | | | .2016 | | 1506 | .4214 | 83 | .3729 | | 1454 | | | | | |
| 8 | | | .2294 | | 1513 | .4826 | 81 | .4282 | | 1465 | | | | | |
| 9 | | | .2572 | | 1520 | .5437 | 81 | .4834 | | 1473 | | | | | |
| 10 | | | .2850 | | 1525 | .6050 | 80 | .5387 | | 1480 | | | | | |
| 11 | | | .3128 | | 1530 | | | .5939 | | 1486 | | | | | |
| 12 | | | .3406 | | 1534 | | | .6492 | | 1493 | | | | | |
| 13 | | | .3684 | | 1538 | | | .7044 | | 1498 | | | | | |
| 14 | | | .3962 | | 1541 | | | .7597 | | 1503 | | | | | |
| 15 | | | .4240 | | 1544 | | | .8150 | | 1505 | | | | | |
| Gauge No. | 6275 | | | | Depth | 5077' | | Clock No. | ? | | 12 | hour | | | |
| 0 | .0000 | 314 | .0000 | | 191 | .0000 | 108 | .0000 | | 95 | | | | | |
| 1 | .0663 | 198 | .0333* | | 1395 | .0529** | 106 | .0398*** | | 1268 | | | | | |
| 2 | .1326 | 192 | .0599 | | 1459 | .1123 | 101 | .0928 | | 1367 | | | | | |
| 3 | .1989 | 196 | .0865 | | 1486 | .1718 | 100 | .1458 | | 1404 | | | | | |
| 4 | .2652 | 195 | .1131 | | 1503 | .2312 | 98 | .1988 | | 1428 | | | | | |
| 5 | .3315 | 193 | .1398 | | 1516 | .2907 | 97 | .2518 | | 1445 | | | | | |
| 6 | .3980 | 191 | .1664 | | 1526 | .3502 | 96 | .3048 | | 1461 | | | | | |
| 7 | | | .1930 | | 1534 | .4096 | 96 | .3578 | | 1472 | | | | | |
| 8 | | | .2196 | | 1540 | .4691 | 95 | .4108 | | 1482 | | | | | |
| 9 | | | .2462 | | 1547 | .5285 | 95 | .4638 | | 1491 | | | | | |
| 10 | | | .2729 | | 1552 | .5880 | 95 | .5169 | | 1498 | | | | | |
| 11 | | | .2995 | | 1557 | | | .5699 | | 1504 | | | | | |
| 12 | | | .3261 | | 1561 | | | .6229 | | 1510 | | | | | |
| 13 | | | .3527 | | 1564 | | | .6759 | | 1516 | | | | | |
| 14 | | | .3793 | | 1568 | | | .7289 | | 1521 | | | | | |
| 15 | | | .4060 | | 1571 | | | .7820 | | 1525 | | | | | |
| Reading Interval | 10 | | 4 | | | 9 | | 8 | | | | | | | Minutes |

REMARKS: * INTERVAL = 5 MINUTES ** INTERVAL = 8 MINUTES *** INTERVAL = 6 MINUTES

(57)

FORM 183-R1—PRINTED IN U.S.A.

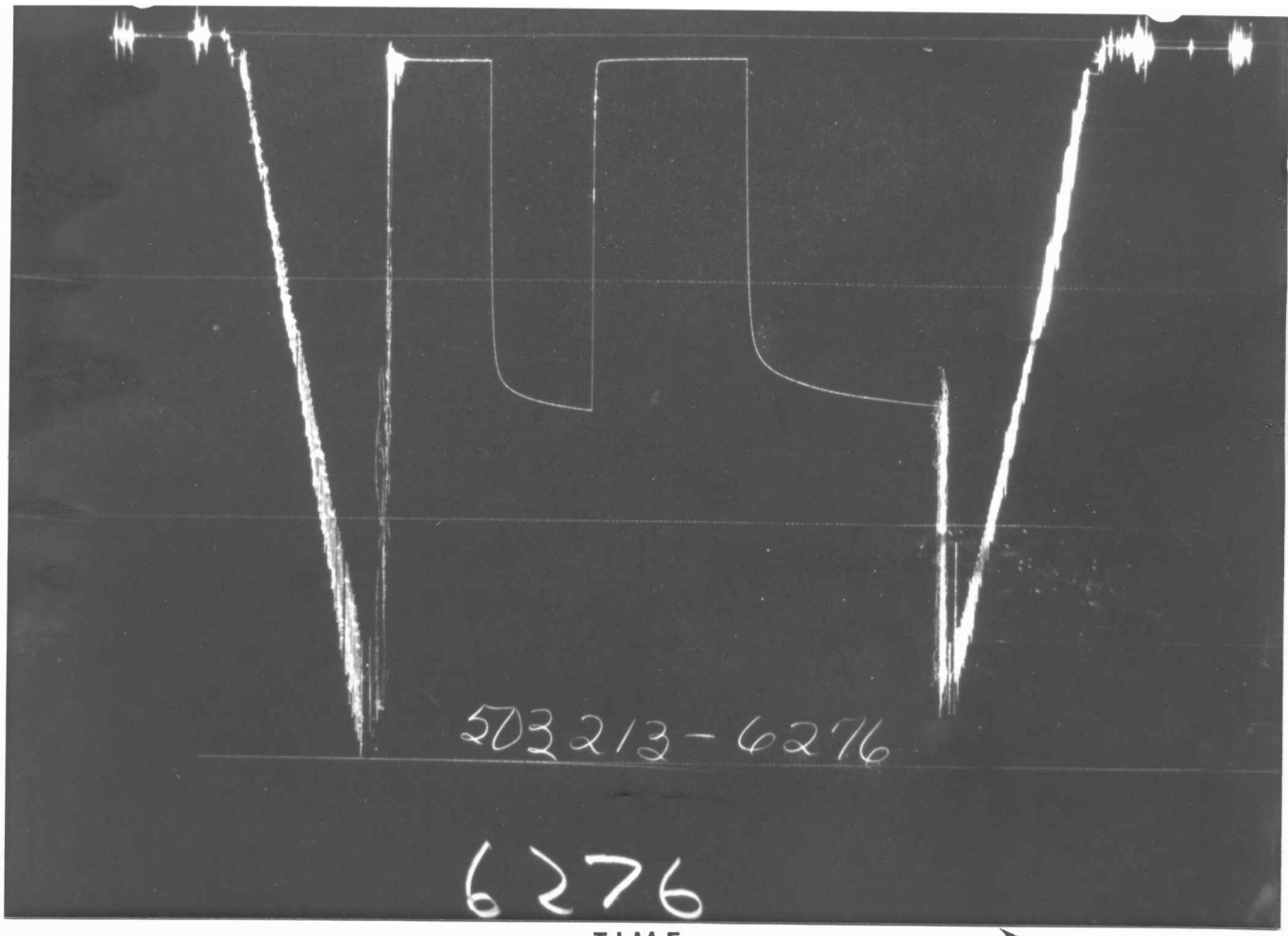
# SPECIAL PRESSURE DATA

LITTLE'S 96673 75C 8/74

TICKET NO. 503213

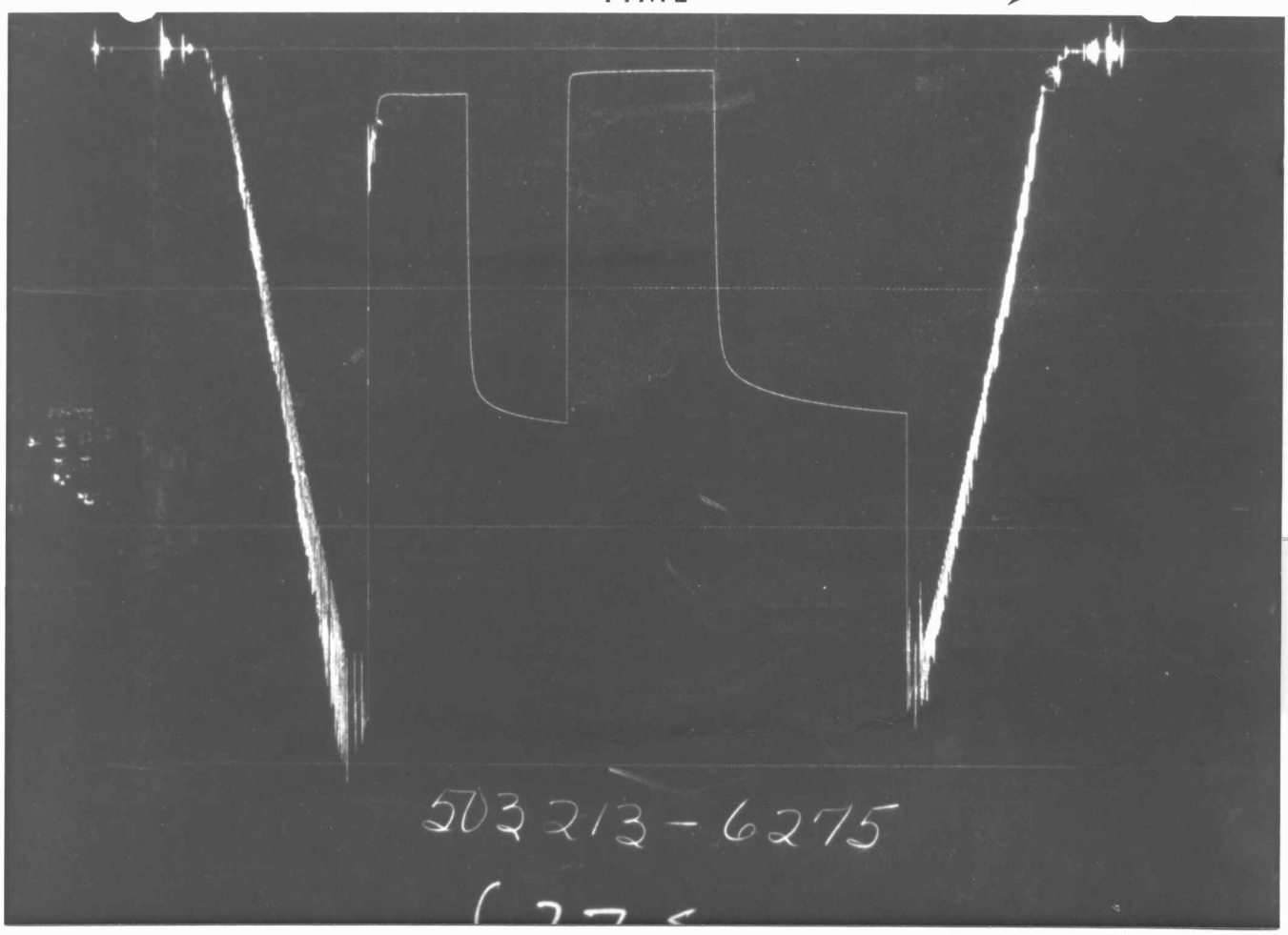
| | O. D. | I. D. | LENGTH | DEPTH |
|---|---|---|---|---|
| Drill Pipe or Tubing | | | | |
| Reversing Sub | 6.00" | 2.00" | 1.00' | |
| Water Cushion Valve | | | | |
| Drill Pipe | 4.50" | 3.826" | 4734' | |
| Drill Collars | 6.00" | 2.25" | 247' | |
| Handling Sub & Choke Assembly X OVER | 6.00" | 2.00" | 2.00' | |
| Dual CIP Valve | 5.00" | .87" | 6.00' | 4984' |
| Dual CIP Sampler | | | | |
| Hydro-Spring Tester | 5.00" | .75" | 5.00' | 4989' |
| Multiple CIP Sampler | | | | |
| Extension Joint | | | | |
| AP Running Case | 5.00" | 3.06" | 4.00' | 4991' |
| Hydraulic Jar | 5.00" | 1.50" | 5.00' | |
| VR Safety Joint | 5.00" | 1.00" | 3.00' | |
| Pressure Equalizing Crossover | | | | |
| Packer Assembly | 6.75" | 1.53" | 6.00' | 5006' |
| Distributor | | | | |
| Packer Assembly | 6.75" | 1.53" | 6.00' | 5012' |
| Flush Joint Anchor | 5.00" | 2.36" | 58' | |
| Pressure Equalizing Tube | 6.00" | 2.00" | 4.00' X OVER | |
| Blanked-Off B.T. Running Case | 5.00" | 2.44" | 4.00' | 5077' |
| Drill Collars | | | | |
| Anchor Pipe Safety Joint | | | | |
| Packer Assembly | | | | |
| Distributor | | | | |
| Packer Assembly | | | | |
| Anchor Pipe Safety Joint | | | | |
| Side Wall Anchor | | | | |
| Drill Collars | | | | |
| Flush Joint Anchor | | | | |
| Blanked-Off B.T. Running Case | | | | |
| Total Depth | | | | 5080' |

# EQUIPMENT DATA

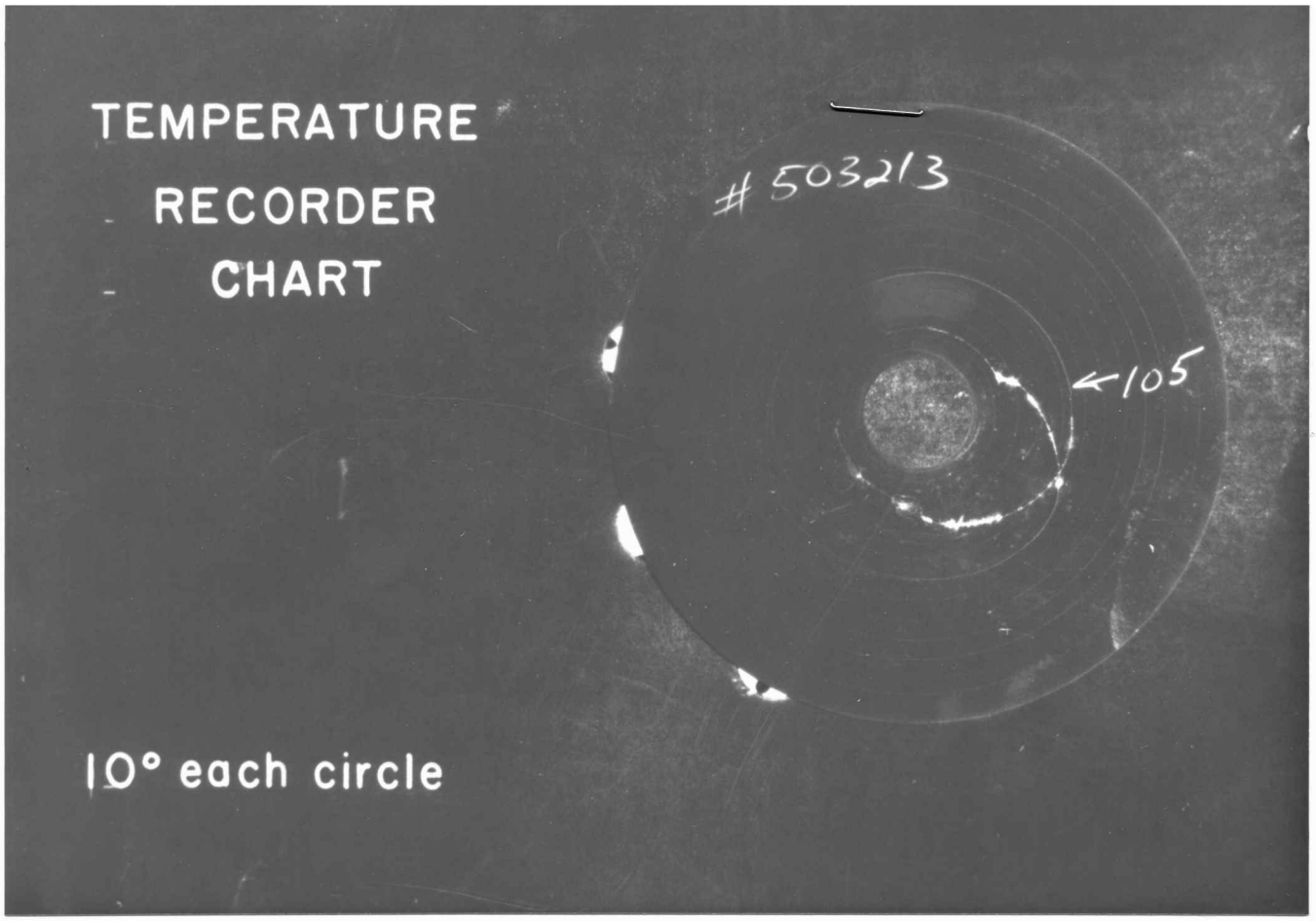



PRESSURE

TIME




Each Horizontal Line Equal to 1000 p.s.i.




$OF_3$ = Theoretical Open Flow Potential with/Damage Removed Max. .... MCF/D

$OF_4$ = Theoretical Open Flow Potential with/Damage Removed Min. .... MCF/D

$P_S$ = Extrapolated Static Pressure ..... Psig.

$P_F$ = Final Flow Pressure ..... Psig.

$P_{ot}$ = Potentiometric Surface (Fresh Water*) ..... Feet

$Q$ = Average Adjusted Production Rate During Test ..... bbls/day

$Q_1$ = Theoretical Production w/Damage Removed ..... bbls/day

$Q_g$ = Measured Gas Production Rate ..... MCF/D

$R$ = Corrected Recovery ..... bbls

$r_w$ = Radius of Well Bore ..... Feet

$t$ = Flow Time ..... Minutes

$t_o$ = Total Flow Time ..... Minutes

$T$ = Temperature Rankine ..... °R

$Z$ = Compressibility Factor ..... ——

$\mu$ = Viscosity Gas or Liquid ..... CP

Log = Common Log

* Potentiometric Surface Reference to Rotary Table When Elevation Not Given, Fresh Water Corrected to 100° F.

## FLUID SAMPLE DATA

Sampler Pressure _____ P.S.I.G. at Surface
Recovery: Cu. Ft. Gas _____
cc. Oil _____
cc. Water _____
cc. Mud _____
Tot. Liquid cc. _____
Gravity _____ ° API @ _____ °F.
Gas/Oil Ratio _____ cu. ft./bbl.

| | | RESISTIVITY | | CHLORIDE CONTENT |
|---|---|---|---|---|
| Recovery Water | @ °F. | | | ppm |
| Recovery Mud | @ °F. | | | ppm |
| Recovery Mud Filtrate | @ °F. | | | ppm |
| Mud Pit Sample | @ °F. | | | ppm |
| Mud Pit Sample Filtrate | @ °F. | | | ppm |

Mud Weight 9.5 vis 54 sec

Date 10-14-78 Ticket Number 503214
Kind of Job OPEN HOLE TEST Halliburton District PRATT
Tester G.L. HERREN Witness DELBERT COSTA
Drilling Contractor GABBERT & JONES DRILLING COMPANY PW

## EQUIPMENT & HOLE DATA

Formation Tested Mississippi
Elevation _____ Ft.
Net Productive Interval 9' Ft.
All Depths Measured From Kelly Bushing
Total Depth 5093' Ft.
Main Hole/Casing Size 7 7/8"
Drill Collar Length 247' I.D. 2.25"
Drill Pipe Length 4704' I.D. 3.826"
Packer Depth(s) 5070' Ft.
Depth Tester Valve 5053' Ft.

Cushion TYPE AMOUNT _____ Ft. Depth Back Pres. Valve _____ Surface Choke 1" Bottom Choke .75"

Recovered 2976 Feet of free oil.
Recovered _____ Feet of _____
Recovered _____ Feet of _____
Recovered _____ Feet of _____
Recovered _____ Feet of _____

Meas. From Tester Valve

Remarks Charts indicate possible partial plugging during early part of final flow period. - SEE PRODUCTION TEST DATA SHEET -

Q = Questionable

| TEMPERATURE | Gauge No. 6276 Depth: 5055 Ft. | Gauge No. 6275 Depth: 5090 Ft. | Gauge No. Depth: Ft. | TIME |
|---|---|---|---|---|
| | 12 Hour Clock | 12 Hour Clock | Hour Clock | Tool Opened A.M. |
| Est. °F. | Blanked Off No | Blanked Off Yes | Blanked Off | Opened 0435 P.M. |
| 5088' @ Actual 114 °F. | Pressures | Pressures | Pressures | Opened A.M. Bypass 0935 P.M. |

| | | Field | Office | Field | Office | Field | Office | Reported Minutes | Computed Minutes |
|---|---|---|---|---|---|---|---|---|---|
| Initial Hydrostatic | | | 2655 | 2671 | 2678 | | | | |
| First Period Flow | Initial | | 240-Q | 167 | 198 | | | ——— | ——— |
| | Final | | 364 | 354 | 373 | | | 60 | 61 |
| | Closed in | | 1567 | 1575 | 1573 | | | 60 | 58 |
| Second Period Flow | Initial | | 476 | 427 | 516 | | | ——— | ——— |
| | Final | | 533 | 531 | 540 | | | 60 | 60 |
| | Closed in | | 1565 | 1575 | 1571 | | | 120 | 121 |
| Third Period Flow | Initial | | | | | | | ——— | ——— |
| | Final | | | | | | | | |
| | Closed in | | | | | | | | |
| Final Hydrostatic | | | 2612 | 2671 | 2629 | | | ——— | ——— |

Legal Location Sec. - Twp. - Rng. 23 - 30 - 18
Lease Name CURTIS UNRUH
Well No. 1
Test No. 5
Tested Interval 5070' - 5093'
Lease Owner/Company Name THE MAURICE L. BROWN COMPANY
Field Area
County KIOWA
State KANSAS

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# FORMATION TEST DATA

LITTLE'S 102548 5M 9/76

Casing perfs._____ Bottom choke_____ Surf. temp._____ °F Ticket No. 503214

Gas gravity_____ Oil gravity_____ GOR_____

Spec. gravity_____ Chlorides_____ ppm Res._____ @_____ °F

**INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED** Merla Tester

| Date Time a.m. p.m. | Choke Size | Surface Pressure psi | Gas Rate MCF | Liquid Rate BPD | Remarks |
|---|---|---|---|---|---|
| 0315 | | | | | Tool through table. |
| 0432 | | | | | Tool on bottom - 70,000#. |
| 0435 | | | | | Opened tool with a very strong blow. |
| 0440 | 3/4" | 18 | 370 | | Gas to the surface. |
| 0445 | " | 20 | 398 | | |
| 0450 | " | " | " | | |
| 0455 | " | 18 | 370 | | |
| 0500 | " | 16 | 344 | | |
| 0505 | " | " | " | | |
| 0510 | " | " | " | | |
| 0515 | " | " | " | | |
| 0520 | " | 15 | 331 | | |
| 0525 | " | 14 | 317 | | |
| 0530 | " | " | " | | |
| 0535 | " | " | " | | Closed tool. |
| 0635 | " | " | " | | Reopened tool. |
| 0640 | " | 12 | 288 | | |
| 0645 | | | | | Well unloading oil. |
| 0735 | | | | | Closed tool. |
| 0935 | | | | | Started off bottom with tool. |
| 1100 | | | | | 33 stands out. Geologist called to |
| | | | | | see about unloading oil in pit. |
| 1145 | | | | | Dropped bar. |
| 1230 | | | | | Resumed pulling tool. |
| 1520 | | | | | Tool in table. |
| | | | | | |

| Gauge No. | 6276 | | Depth | 5055' | | Clock No. | ??? | | 12 hour | Ticket No. | 503214 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 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 | 240-Q | .000 | | 364 | .000 | 476 | .000 | | 533 | | | | | |
| 1 | .0759 | 179* | .0139 | | 1126** | .0688 | 445 | .0623 | | 1348*** | | | | | |
| 2 | .1449 | 216 | .0417 | | 1323 | .1373 | 420 | .1177 | | 1434 | | | | | |
| 3 | .2140 | 253 | .0695 | | 1399 | .2060 | 405 | .1731 | | 1477 | | | | | |
| 4 | .2830 | 286 | .0973 | | 1448 | .2747 | 447 | .2285 | | 1502 | | | | | |
| 5 | .3520 | 326 | .1251 | | 1481 | .3434 | 493 | .2839 | | 1517 | | | | | |
| 6 | .4210 | 364 | .1529 | | 1504 | .4120 | 533 | .3393 | | 1527 | | | | | |
| 7 | | | .1806 | | 1521 | | | .3947 | | 1535 | | | | | |
| 8 | | | .2084 | | 1533 | | | .4501 | | 1540 | | | | | |
| 9 | | | .2362 | | 1541 | | | .5055 | | 1544 | | | | | |
| 10 | | | .2640 | | 1548 | | | .5609 | | 1550 | | | | | |
| 11 | | | .2918 | | 1552 | | | .6163 | | 1554 | | | | | |
| 12 | | | .3196 | | 1557 | | | .6717 | | 1557 | | | | | |
| 13 | | | .3494 | | 1562 | | | .7271 | | 1561 | | | | | |
| 14 | | | .3752 | | 1565 | | | .7825 | | 1563 | | | | | |
| 15 | | | .4030 | | 1567 | | | .8380 | | 1565 | | | | | |
| Gauge No. | 6275 | | Depth | 5090' | | Clock No. | ??? | 12 | hour | | | | | | |
| 0 | .000 | 198 | .000 | | 373 | .000 | 516 | .000 | | 540 | | | | | |
| 1 | .0732 | 188* | .0135 | | 1153** | .0665 | 453 | .0604 | | 1358*** | | | | | |
| 2 | .1398 | 223 | .0404 | | 1333 | .1330 | 428 | .1141 | | 1441 | | | | | |
| 3 | .2063 | 259 | .0673 | | 1407 | .1995 | 411 | .1678 | | 1483 | | | | | |
| 4 | .2729 | 293 | .0942 | | 1455 | .2660 | 453 | .2215 | | 1507 | | | | | |
| 5 | .3395 | 332 | .1211 | | 1488 | .3325 | 498 | .2752 | | 1522 | | | | | |
| 6 | .4060 | 373 | .1480 | | 1510 | .3990 | 540 | .3289 | | 1532 | | | | | |
| 7 | | | .1749 | | 1527 | | | .3825 | | 1540 | | | | | |
| 8 | | | .2018 | | 1539 | | | .4362 | | 1546 | | | | | |
| 9 | | | .2287 | | 1548 | | | .4899 | | 1551 | | | | | |
| 10 | | | .2556 | | 1554 | | | .5436 | | 1555 | | | | | |
| 11 | | | .2825 | | 1559 | | | .5973 | | 1558 | | | | | |
| 12 | | | .3094 | | 1564 | | | .6510 | | 1562 | | | | | |
| 13 | | | .3363 | | 1567 | | | .7047 | | 1565 | | | | | |
| 14 | | | .3632 | | 1571 | | | .7584 | | 1568 | | | | | |
| 15 | | | .3900 | | 1573 | | | .8120 | | 1571 | | | | | |
| Reading Interval | 10 | | 4 | | | 10 | | 8 | | | | | | | Minutes |

REMARKS: * = 11 minute interval; ** = 2 minute interval; *** = 9 minute interval.

Q = Questionable reading.....



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# SPECIAL PRESSURE DATA

LITTLE'S 96673 75C 8/74

TICKET NO. 503214

| | O. D. | I. D. | LENGTH | DEPTH |
|---|---|---|---|---|
| Drill Pipe or Tubing | | | | |
| Reversing Sub | 6" | 2" | 1' | |
| Water Cushion Valve | | | | |
| Drill Pipe | 4 1/2" | 3.826" | 4704' | |
| Drill Collars | 6" | 2.25" | 247' | |
| ~~Handling Sub & Choke Assembly~~ Double Pin Sub | 6" | 2" | 1' | |
| Dual CIP Valve | 5" | .87" | 6' | 5048' |
| Dual CIP Sampler | | | | |
| Hydro-Spring Tester | 5" | .75" | 5' | 5053' |
| Multiple CIP Sampler | | | | |
| Extension Joint | | | | |
| AP Running Case | 5" | 3.06" | 4' | 5055' |
| Hydraulic Jar | 5" | 1.5" | 5' | |
| VR Safety Joint | 5" | 1" | 3' | |
| Pressure Equalizing Crossover | | | | |
| Packer Assembly | | | | |
| Distributor | | | | |
| Packer Assembly | 6 3/4" | 1.53" | 6' | 5070' |
| Flush Joint Anchor | 5" | 2.36" | 17' | |
| Pressure Equalizing Tube | | | | |
| Blanked-Off B.T. Running Case | 5" | 2.44" | 4' | 5090' |
| Drill Collars | | | | |
| Anchor Pipe Safety Joint | | | | |
| Packer Assembly | | | | |
| Distributor | | | | |
| Packer Assembly | | | | |
| Anchor Pipe Safety Joint | | | | |
| Side Wall Anchor | | | | |
| Drill Collars | | | | |
| Flush Joint Anchor | | | | |
| Blanked-Off B.T. Running Case | | | | |
| Total Depth | | | | 5093' |

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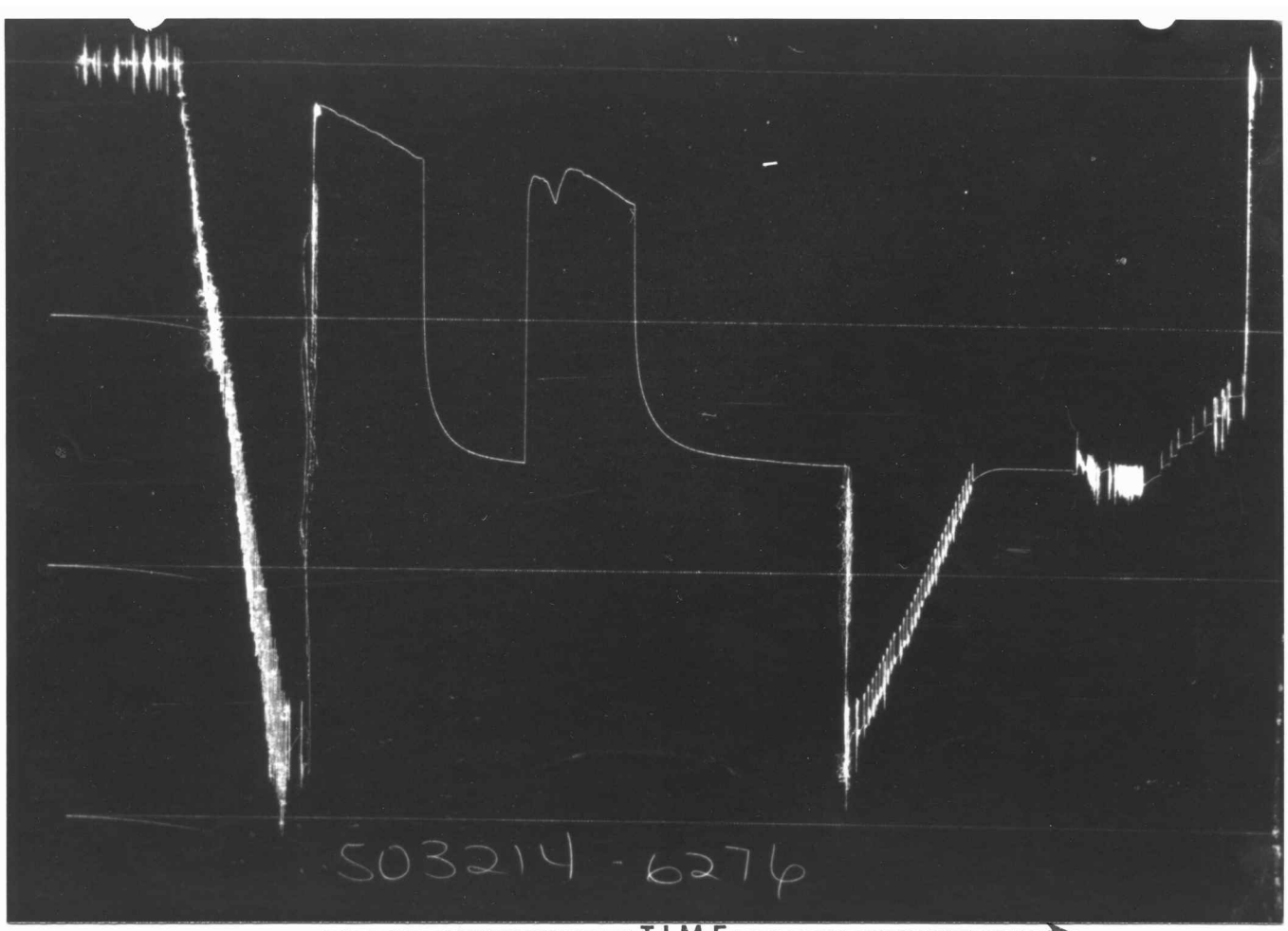
# EQUIPMENT DATA

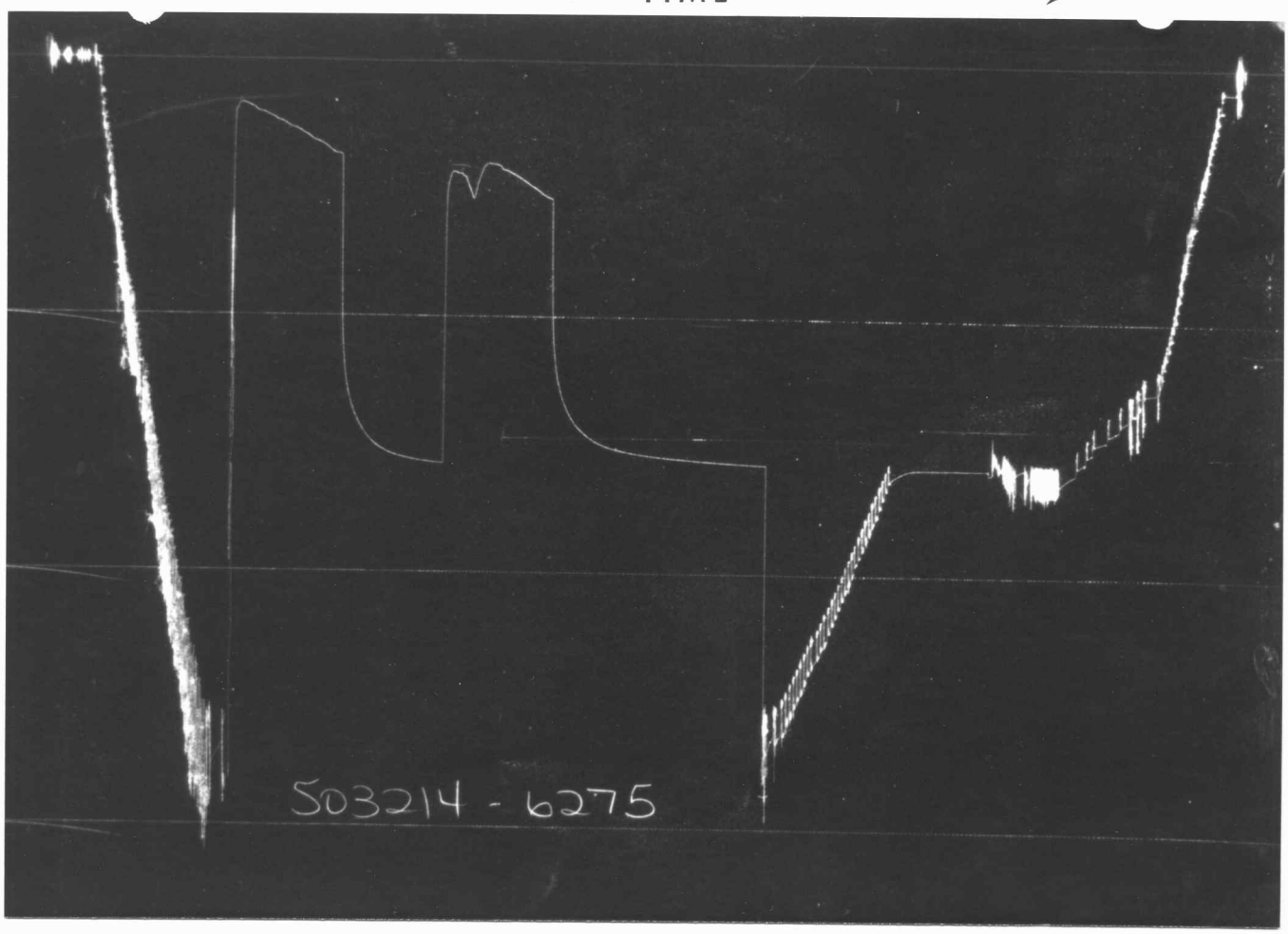
LITTLE'S 96676 75C 8/74

5

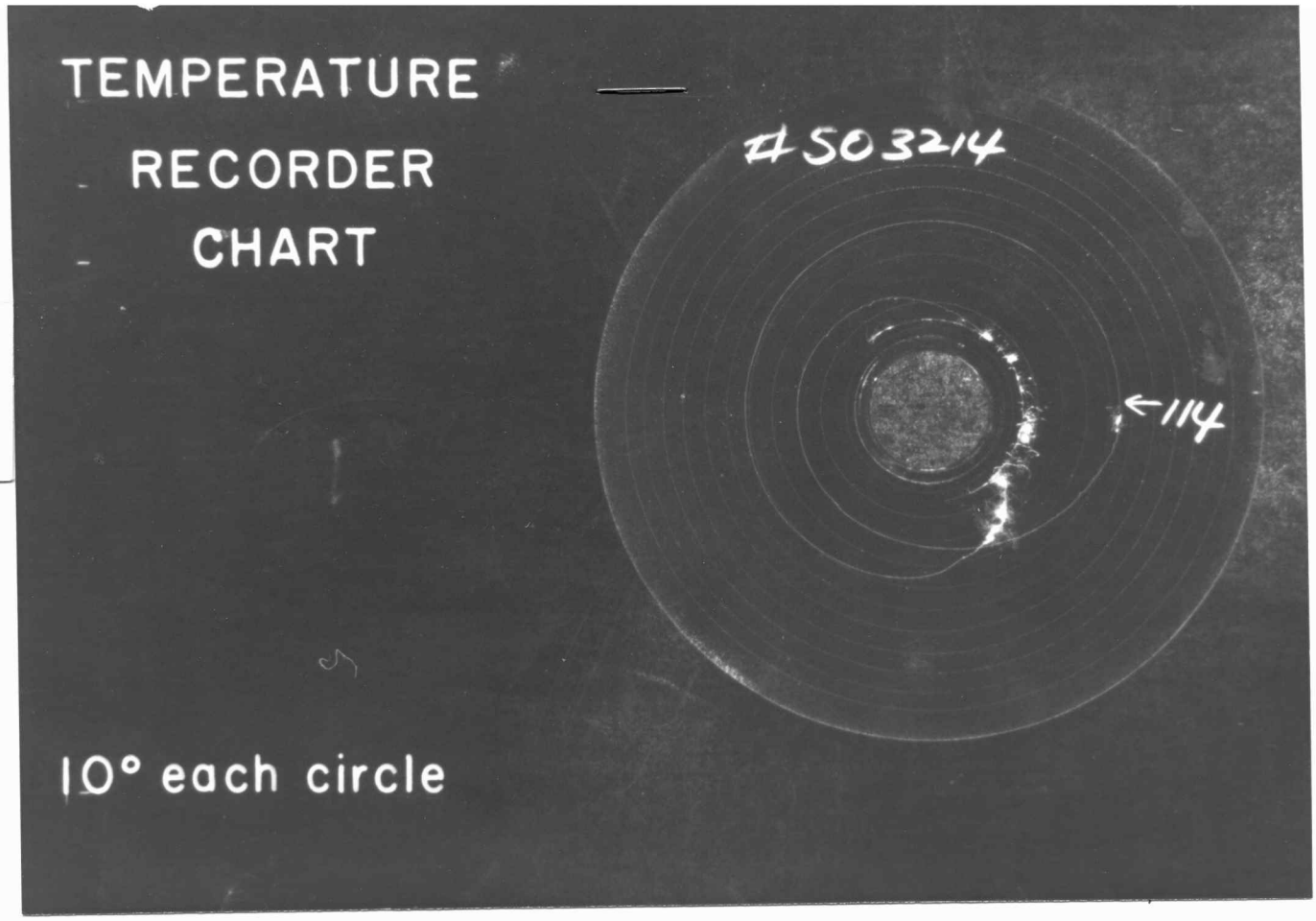



PRESSURE

TIME




Each Horizontal Line Equal to 1000 p.s.i.




$OF_3$ = Theoretical Open Flow Potential with/Damage Removed Max. . . . . MCF/D

$OF_4$ = Theoretical Open Flow Potential with/Damage Removed Min. . . . . MCF/D

$P_s$ = Extrapolated Static Pressure . . . . . Psig.

$P_F$ = Final Flow Pressure . . . . . Psig.

$P_{ot}$ = Potentiometric Surface (Fresh Water *) . . . . . Feet

$Q$ = Average Adjusted Production Rate During Test . . . . . bbls/day

$Q_1$ = Theoretical Production w/Damage Removed . . . . . bbls/day

$Q_g$ = Measured Gas Production Rate . . . . . MCF/D

$R$ = Corrected Recovery . . . . . bbls

$r_w$ = Radius of Well Bore . . . . . Feet

$t$ = Flow Time . . . . . Minutes

$t_o$ = Total Flow Time . . . . . Minutes

$T$ = Temperature Rankine . . . . . °R

$Z$ = Compressibility Factor . . . . . ——

$\mu$ = Viscosity Gas or Liquid . . . . . CP

Log = Common Log

* Potentiometric Surface Reference to Rotary Table When Elevation Not Given, Fresh Water Corrected to 100° F.