# KANSAS CORPORATION COMMISSION
## MULTIPOINT BACK PRESSURE TEST

FORM G-1
8-7-58

| | | | | | |
|---|---|---|---|---|---|
| TYPE TEST: ☒ Initial ☐ Annual ☐ Special | | | | TEST DATE: 5-10-06 | |
| COMPANY | | | LEASE | | WELL NO. |
| Osage Resources LLC | | | Osage | | 100 |
| COUNTY | LOCATION | | SECTION | TWP RNG | ACRES |
| Barber | Ne Sw Nw Ne | | 30 | 33S 14W | |
| FIELD | RESERVOIR | | PIPELINE CONNECTION | | |
| Aetna Gas Area | Mississippian | | Oneok | | |
| COMPLETION DATE | | PLUG BACK DEPTH | 5340 | | PACKER SET AT |
| 3/14/06 | | TOTAL DEPTH | 5340 | | NA |
| CASING SIZE | WT. | ID | SET AT | PERF. | TO |
| 5.500 | 15.500 | 4.950 | 4340 | 4700 | 4753 |
| TUBING SIZE | WT. | ID | SET AT | PERF. | TO |
| 2.375 | 4.700 | 1.995 | 5186 | | |
| TYPE COMPLETION (Describe) | | | TYPE FLUID PRODUCTION | | |
| Acid BKDN and Sand | | | Gas & Water | | |
| PRODUCING THRU (Annulus/Tubing) | | | RESERVOIR TEMPERATURE F | | BAR PRESS - Pa |
| Annulus | | | 110 | | 14.4 psia |
| GAS GRAVITY - Gg | % CARBON DIOXIDE | | % NITROGEN | | API GRAVITY OF LIQUID |
| .635 | .086 | | 1.403 | | |
| VERTICAL DEPTH (H) | | | TYPE METER CONN. | | METER RUN SIZE |
| 4727 | | | Flange | | 2 |
| REMARKS | | | | | |

## OBSERVED SURFACE DATA

| RATE NO. | ORIFICE SIZE in. | (METER) PRESSURE psig | DIFF. $(h_w)$ $(h_t)$ | FLOWING TEMP. t. | WELLHEAD TEMP. t. | CASING WELLHEAD PRESS. psig | CASING WELLHEAD PRESS. $(P_w)$ $(P_t)$ $(P_c)$ psia | TUBING WELLHEAD PRESS. psig | TUBING WELLHEAD PRESS. $(P_w)$ $(P_t)$ $(P_c)$ psia | DURATION HOURS | LIQUID PROD. Bbls. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SHUT-IN | | | | | | 490 | 504 | | | | |
| 1. | 1.000 | 51.00 | 60.00 | 63 | | 474 | 488 | | | 1.00 | 53.4 |
| 2. | 1.000 | 69.00 | 202.00 | 61 | | 450 | 464 | | | 1.00 | |
| 3. | 1.000 | 81.00 | 276.00 | 63 | | 433 | 447 | | | 1.00 | |
| 4. | 1.500 | 84.00 | 66.00 | 63 | | 399 | 413 | | | 1.00 | 65.1 |

## FLOW STREAM ATTRIBUTES

| RATE NO. | COEFFICIENT $(F_b)$ Mcfd | (METER) PRESSURE psia | EXTENSION $\sqrt{P_m \times H_w}$ | GRAVITY FACTOR Fg | FLOWING TEMP FACTOR Ft | DEVIATION FACTOR Fpv | RATE OF FLOW Q Mcfd | GOR | $G_m$ |
|---|---|---|---|---|---|---|---|---|---|
| 1. | 5.073 | 65.4 | 62.64 | 1.2549 | .9971 | 1.0056 | 399 | 311.8 | 3.581 |
| 2. | 5.073 | 83.4 | 129.80 | 1.2549 | .9990 | 1.0072 | 831 | | .635 |
| 3. | 5.073 | 95.4 | 162.27 | 1.2549 | .9971 | 1.0082 | 1038 | | .635 |
| 4. | 13.090 | 98.4 | 80.59 | 1.2549 | .9971 | 1.0084 | 1331 | 851.6 | 2.776 |

## PRESSURE CALCULATION

| RATE NO. | Pt psia | Pc psia | Pw psia | $(Pc)^2$ Thousands | $(Pw)^2$ Thousands | PLOTTING POINTS $(P_c)^2 - (P_w)^2$ Thousands | PLOTTING POINTS Q Mcfd | % SHUT-IN $100 \left[\frac{Pw - Pa}{Pc - Pa}\right]$ |
|---|---|---|---|---|---|---|---|---|
| 1. | 488.4 | 504.4 | 489.0 | 254.4 | 239.1 | 15.3 | 399.9 | 96.9 |
| 2. | 464.4 | 504.4 | 464.9 | 254.4 | 216.1 | 38.3 | 831.5 | 91.9 |
| 3. | 447.4 | 504.4 | 448.1 | 254.4 | 200.8 | 53.6 | 1038.5 | 88.5 |
| 4. | 413.4 | 504.4 | 418.7 | 254.4 | 175.3 | 79.1 | 1331.1 | 82.5 |

INDICATED WELLHEAD OPEN FLOW 3503 Mcfd @ 14.65 psia "n" = .771

The undersigned authority, on behalf of the Company, states that he is duly authorized to make the above report and that he has knowledge of the facts stated herein and that said report is true and correct. Executed this the 15 day of May, 20 06

Witness (if any)

For Company

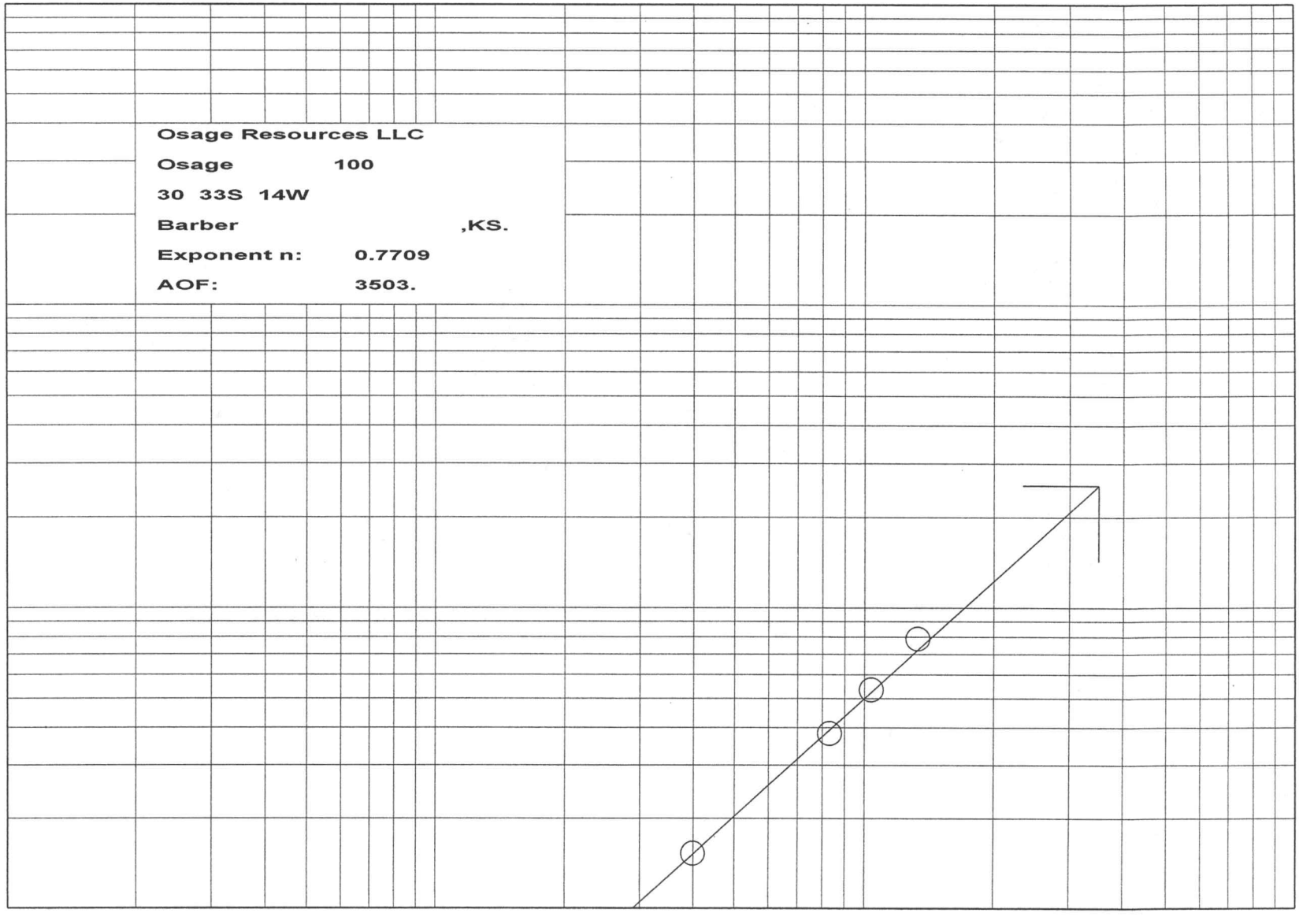
For Commission

Checked by

GAS WELL BACK PRESSURE CURVE

WELL TESTER: Trilobite Testing

TEST DATE: 5-10-06



# KANSAS CORPORATION COMMISSION
# ONE POINT STABLIZED OPEN FLOW OR DELIVERABILITY TEST

FORM G-2
(Rev.8/98)

TYPE TEST:
☒ Open Flow
☒ Deliverability

TEST DATE: 5-11-06 API No. 15007225690001

| Company | Lease | Well Number |
|---|---|---|
| Osage Resources LLC | Osage | 100 |

| County | Location | Section | TWP | RNG(E/W) | Acres Attributed |
|---|---|---|---|---|---|
| Barber | Ne Sw Nw Ne | 30 | 33S | 14W | |

| Field | Reservoir | Gas Gathering Connection |
|---|---|---|
| Aetna Gas Area | Mississippian | Oneok |

| Completion Date | Plug Back Total Depth | Packer Set at |
|---|---|---|
| 3/14/06 | 5340 | NA |

| Casing Size | Weight | Internal Diameter | Set at | Perforations | To |
|---|---|---|---|---|---|
| 5.500 | 15.500 | 4.950 | 4340 | 4700 | 4753 |

| Tubing Size | Weight | Internal Diameter | Set at | Perforations | To |
|---|---|---|---|---|---|
| 2.375 | 4.700 | 1.995 | 5186 | | |

| Type Completion (Describe) | Type Fluid Production | Pump Unit or Traveling Plunger? |
|---|---|---|
| Acid BKDN and Sand | Gas & Water | yes |

| Producing Thru(Annulus/Tubing) | % Carbon Dioxide | % Nitrogen | Gas Gravity- Gg |
|---|---|---|---|
| Annulus | .086 | 1.403 | .635 |

| Vertical Depth (H) | Pressure Taps | Meter Run Size |
|---|---|---|
| 4727 | flange | 2 |

| | | | |
|---|---|---|---|
| Pressure Buildup: Shut in | 5/7/06 @ 9:30 | TAKEN | 5/10/06 @ 10:30 |
| Well on Line: Started | 5/10/06 @ 10:30 | TAKEN | 5/11/06 @ 10:45 |

## OBSERVED SURFACE DATA

| Static/ Dynamic Property | Orifice Size in. | Meter Pressure psig | Pressure Diff. In. $H_2O$ | Flowing Temp. t. | WellHead Temp. t. | Casing WellHead Press. $(P_w)$ $(P_t)$ $(P_c)$ psig | Casing WellHead Press. psia | Tubing WellHead Press. $(P_w)$ $(P_t)$ $(P_c)$ psig | Tubing WellHead Press. psia | Duration (Hours) | Liquid Prod. Barrels |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Shut-in | | | | | | 490 | 504 | | | 73.0 | |
| Flow | 1.500 | 60.0 | 28.00 | 64 | | 309 | 323 | | | 24.0 | |

## FLOW STREAM ATTRIBUTES

| COEFFICIENT $(F_b)$ Mcfd | (METER) PRESSURE psia | EXTENSION $\sqrt{P_m \times H_w}$ | GRAVITY FACTOR Fg | FLOWING TEMP FACTOR Ft | DEVIATION FACTOR Fpv | RATE OF FLOW R Mcfd | GOR | $G_m$ |
|---|---|---|---|---|---|---|---|---|
| 13.090 | 74.4 | 45.64 | 1.2549 | .9962 | 1.0063 | 751 | | .635 |

## (OPEN FLOW)(DELIVERABILITY) CALCULATIONS

$(Pc)^2$ = 254.4 $(Pw)^2$ = 105.0 Pd = 11.9 % (Pc - 14.4) + 14.4 = $(Pa)^2$ = 0.207 $(Pd)^2$ = 3.60

| $(P_c)^2 - (P_a)^2$ or $(P_c)^2 - (P_d)^2$ | $(P_c)^2 - (P_w)^2$ | $\frac{(P_c)^2 - (P_a)^2 \text{ or } (P_c)^2 - (P_d)^2}{(P_c)^2 - (P_w)^2}$ | LOG [ ] | Backpressure Curve Slope"n" ---- or ---- Assigned Standard Slope | n x LOG [ ] | Antilog | Open Flow Deliverability = R x Antilog Mcfd |
|---|---|---|---|---|---|---|---|
| 254.21 | 149.47 | 1.701 | .2306 | .771 | .1778 | 1.506 | 1131 |
| 250.82 | 149.47 | 1.678 | .2248 | .771 | .1733 | 1.490 | 1120 |

OPEN FLOW 1131 Mcfd @ 14.65 psia DELIVERABILITY 1120 Mcfd @ 14.65 psia

The undersigned authority, on behaf of the Company, states that he is duly authorized to make the above report and that he has knowledge of the facts stated herein and that said report is true and correct. Executed this the 15 day of May, 20 06

Witness (if any)

For Company

For Commission

Checked by

Form G-2
Rev.8/98

I declare under penelty or perjury under the laws of the state of kansas that I am authorized to request exempt status under rule K.A.R. 82-3-304 on behalf of the operator Osage Resources LLC and that the foregoing information and statements contained on this application form are true and correct to the best of my knowledge and belief based upon gas production records and records of equipment installation and/or of type completion or upon use of the gas well herein named.

I hereby request a permanent exemption from open flow testing for the Osage gas well on the grounds that said well:

(check one)

- ☐ is a coalbed methane producer
- ☐ is cycled on plunger lift due to water
- ☐ is a source of natural gas for injection into an oil reservoir undergoing ER
- ☐ is on vacum at the present time; KCC approval Docket No. _____
- ☐ is incapable of producing at a daily rate in exess of 150 mcf/D

Date: _____

Signature: _____

Title: _____

**Instructions:**

All active gas wells must have at least an original G-2 form on file with the conservation division. If a gas well meets the eligibility criteria set out in KCC regulation K.A.R. 82-3-304, the operator may complete the statement provided above in order to obtain a testing exemption.

At some point during the succeeding calendar year, wellhead shut-in pressure shall be measured after a minimum of 24 hours shut-in/buildup time and shall be reported on the front side of this form under "observed surface data." Shut-in pressure shall thereafter be reported yearly in the same manner.

The G-2 form conveying the newest shut-in pressure reading shall be filed with the Wichita office no later than thirty (30) days after the taking of the pressure reading. The form must be signed and dated on the front side as though it was a verified report of test results.

# FieldNotes
# Field Measurements

| | Date | Clock Time | Comment | Tubing Pres | Casing Pres | Static1 Pres | Diff1 Pres | Meter1 Temp | Gas1 Rate | Orifice1 |
|---|---|---|---|---|---|---|---|---|---|---|
| | yyyy/mm/d | hh:mm:ss | | psi(g) | psi(g) | psi(g) | in of H2O | °F | MMCF/D | in |
| 1 | 2006/05/10 | 10:30:00 | Shutin | | | | | | | |
| 2 | | 10:30:00 | | 66.00 | 490.00 | 34.00 | 0.00 | 67.00 | 0.000 | 0.000 |
| 3 | | 10:45:00 | | 68.00 | 484.00 | 36.00 | 18.20 | 66.00 | 0.194 | 1.000 |
| 4 | | 11:00:00 | | 70.00 | 481.00 | 42.00 | 43.10 | 63.00 | 0.317 | |
| 5 | | 11:15:00 | | 71.00 | 479.00 | 44.00 | 52.00 | 62.00 | 0.356 | |
| 6 | | 11:30:00 | 1st point | | | | | | | |
| 7 | | 11:30:00 | | 73.00 | 474.00 | 51.00 | 60.00 | 63.00 | 0.404 | |
| 8 | | 11:45:00 | | 76.00 | 469.00 | 64.00 | 114.00 | 62.00 | 0.614 | |
| 9 | | 12:00:00 | | 100.00 | 461.00 | 63.00 | 179.00 | 62.00 | 0.769 | |
| 10 | | 12:15:00 | | 81.00 | 457.00 | 65.00 | 184.00 | 61.00 | 0.790 | |
| 11 | | 12:30:00 | 2nd point | | | | | | | |
| 12 | | 12:30:00 | | 79.00 | 450.00 | 69.00 | 202.00 | 61.00 | 0.850 | |
| 13 | | 12:45:00 | | 71.00 | 443.00 | 74.00 | 229.00 | 61.00 | 0.933 | |
| 14 | | 13:00:00 | | 70.00 | 439.00 | 75.00 | 231.00 | 63.00 | 0.941 | |
| 15 | | 13:15:00 | | 64.00 | 435.00 | 80.00 | 252.00 | 62.00 | 1.012 | |
| 16 | | 13:30:00 | 3rd point | | | | | | | |
| 17 | | 13:30:00 | | 68.00 | 433.00 | 81.00 | 276.00 | 63.00 | 1.065 | |
| 18 | | 14:45:00 | | 73.00 | 435.00 | 62.00 | 36.00 | 63.00 | 0.872 | 1.500 |
| 19 | | 15:00:00 | | 77.00 | 420.00 | 71.00 | 44.00 | 62.00 | 1.022 | |
| 20 | | 15:15:00 | | 81.00 | 409.00 | 75.00 | 44.00 | 63.00 | 1.045 | |
| 21 | | 15:30:00 | 4th point | | | | | | | |
| 22 | | 15:30:00 | | 80.00 | 399.00 | 84.00 | 66.00 | 63.00 | 1.345 | |
| 23 | 2006/05/11 | 10:45:00 | 1 point | | | | | | | |
| 24 | | 10:45:00 | | 66.00 | 309.00 | 60.00 | 28.00 | 64.00 | 0.758 | |

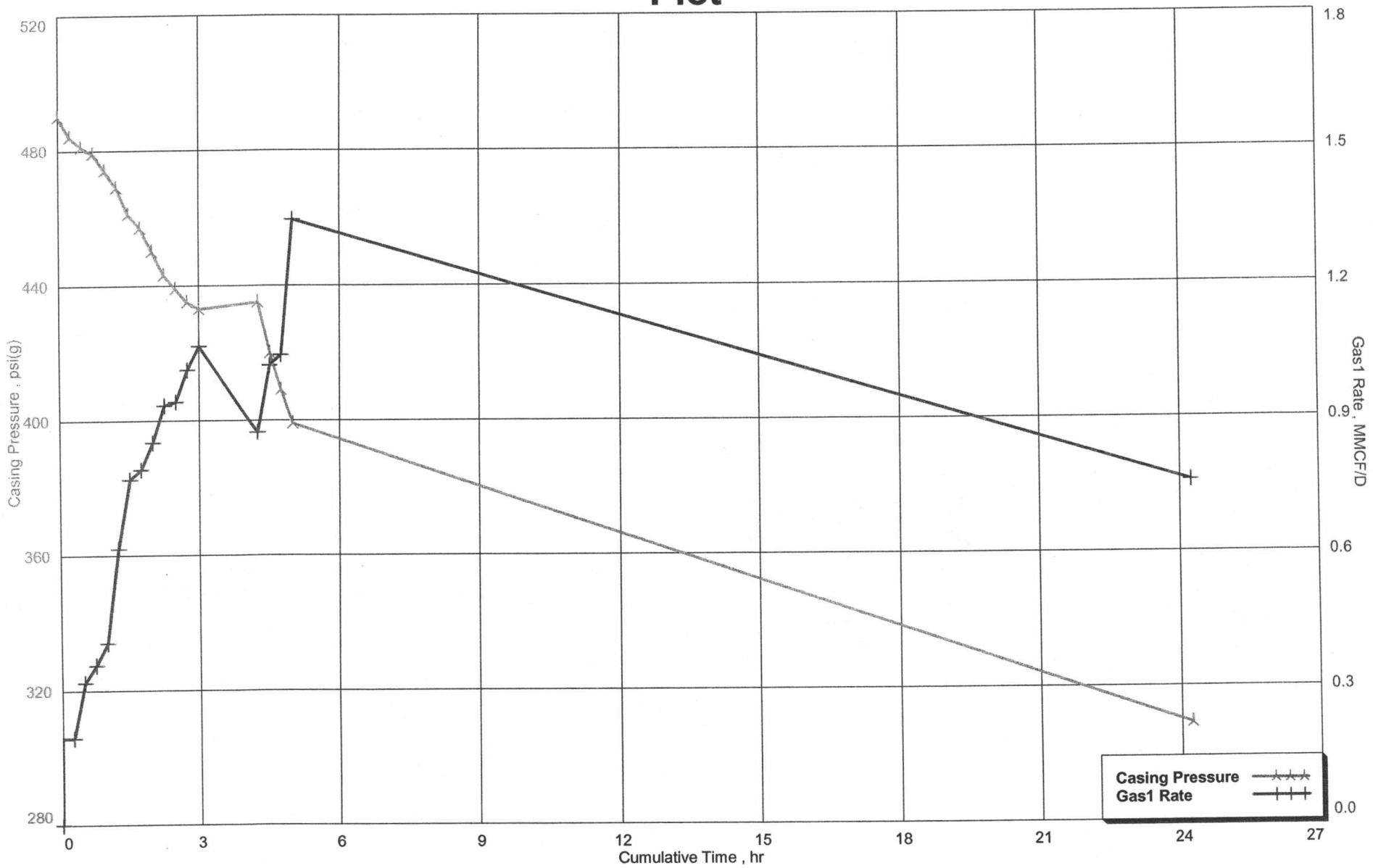
2006/05/10 10:30:00 To 2006/05/11 10:45:00

| | | | | |
|---|---|---|---|---|
| Gas | 0.165 | Cum. | 0.165 | MMCF |
| Oil | 0.000 | Cum. | 0.000 | bbl |
| Water | 0.000 | Cum. | 0.000 | bbl |
| Condensate | 0.000 | Cum. | 0.000 | bbl |

Company Name: Osage Resources LLC
Unique Well ID: NE SW NW NE 30 33s-14w
Start Test Date: 2006/05/10
Final Test Date: 2006/05/11

Well Name: Osage #100

# Plot



Form G-2
(Rev. 1/03)

# KANSAS CORPORATION COMMISSION
# ONE POINT STABILIZED OPEN FLOW OR DELIVERABILITY TEST

Type Test: *(See Instructions on Reverse Side)*

Open Flow
Deliverabilty

Test Date:

API No. 15
15007225690001

| Company | Lease | Well Number |
|---|---|---|
| Osage Resources, L.L.C. | Osage | No. 100 |

| County | Location | Section | TWP | RNG (E/W) | Acres Attributed |
|---|---|---|---|---|---|
| Barber | NE SW NW NE | 30 | 33S | 14 | |

| Field | Reservoir | Gas Gathering Connection |
|---|---|---|
| Aetna Gas Area | Mississippian | OneOk |

| Completion Date | Plug Back Total Depth | Packer Set at |
|---|---|---|
| 3/14/2006 | 5340' KB | NA |

| Casing Size | Weight | Internal Diameter | Set at | Perforations | To |
|---|---|---|---|---|---|
| 5 1/2" | 15.5 | 4.95" | 5340' KB | 4722' | 4753' |

| Tubing Size | Weight | Internal Diameter | Set at | Perforations | To |
|---|---|---|---|---|---|
| 2 3/8" | 4.7 | 1.995" | 5186' | NA | NA |

| Type Completion (Describe) | Type Fluid Production | Pump Unit or Traveling Plunger? Yes / No |
|---|---|---|
| Acid BKDN and Sand Frac. | Gas & Water | |

| Producing Thru (Annulus / Tubing) | % Carbon Dioxide | % Nitrogen | Gas Gravity - $G_g$ |
|---|---|---|---|
| Annulus | | | |

Vertical Depth(H) | Pressure Taps | (Meter Run) (Prover) Size

Pressure Buildup: Shut in _____ 19 ___ at _____ (AM) (PM) Taken _____ 19 at _____ (AM) (PM)

Well on Line: Started _____ 19 ___ at _____ (AM) (PM) Taken _____ 19 at _____ (AM) (PM)

## OBSERVED SURFACE DATA

Duration of Shut-in _____ Hours

| Static / Dynamic Property | Orifice Size inches | Circle one: Meter or Prover Pressure psig | Pressure Differential in (h) Inches $H_20$ | Flowing Temperature t | Well Head Temperature t | Casing Wellhead Pressure ($P_w$) or ($P_t$) or ($P_c$) psig | Casing Wellhead Pressure psia | Tubing Wellhead Pressure ($P_w$) or ($P_t$) or ($P_c$) psig | Tubing Wellhead Pressure psia | Duration (Hours) | Liquid Produced (Barrels) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Shut-In | | | | | | 480 | | | | 24 | 136 |
| Flow | | | | | | | | | | | |

## FLOW STREAM ATTRIBUTES

| Plate Coeffiecient ($F_b$) ($F_p$) Mcfd | Circle one: Meter or Prover Pressure psia | Press Extension $\sqrt{P_m \times H_w}$ | Gravity Factor $F_g$ | Flowing Temperature Factor $F_{tt}$ | Deviation Factor $F_{pv}$ | Metered Flow R (Mcfd) | GOR (Cubic Feet/ Barrel) | Flowing Fluid Gravity $G_m$ |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |

## (OPEN FLOW) (DELIVERABILITY) CALCULATIONS

$(P_c)^2$ = _____ : $(P_w)^2$ = _____ : $P_d$ = _____ % $(P_c - 14.4) + 14.4$ = _____ : $(P_a)^2$ = 0.207 $(P_d)^2$ = _____

| $(P_c)^2 - (P_a)^2$ or $(P_c)^2 - (P_d)^2$ | $(P_c)^2 - (P_w)^2$ | Choose formula 1 or 2: 1. $P_c^2 - P_a^2$ 2. $P_c^2 - P_d^2$ divided by: $P_c^2 - P_w^2$ | LOG of formula 1. or 2. and divide by: $P_c^2 - P_w^2$ | Backpressure Curve Slope = "n" or Assigned Standard Slope | n x LOG | Antilog | Open Flow Deliverability Equals R x Antilog Mcfd |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |

Open Flow Mcfd @ 14.65 psia Deliverability Mcfd @ 14.65 psia

The undersigned authority, on behalf of the Company, states that he is duly authorized to make the above report and that he has knowledge of the facts stated therein, and that said report is true and correct. Executed this the _____ day of _____, 19 _____.

_____ Witness (if any)

_____ For Company

_____ For Commission

_____ Checked by

STATE OF KANSAS - CORPORATION COMMISSION
MULTIPOINT BACK PRESSURE TEST

FORM CG-1 Rev.

TYPE TEST: ☑ Initial ☐ Annual ☐ Special TEST DATE:

COMPANY Osage Resources, L.L.C. LEASE Osage WELL NO: No. 100

COUNTY Barber LOCATION NE SW NW NE SECTION 30 TWP 33S R14W RNG (E/W) ACRES

API WELL NUMBER 15 - 15007225690001 RESERVOIR Mississippian PIPELINE CONNECTION OneOK

COMPLETION DATE 3/14/2006 PLUG BACK TOTAL DEPTH 5340' KB PACKER SET AT

CASING SIZE 5.5" WT. 15.5 ID. 4.950" SET AT 5340' KB PERF. 4722' TO 4753'

TUBING SIZE 2.375" WT. 4.7 ID. 1.995" SET AT 5186' PERF. TO

TYPE COMPLETION (Describe) Acid braekdown and Sand Fracture TYPE FLUID PRODUCTION 100 to 130 BFPD

PRODUCING THRU Annulus RESERVOIR TEMPERATURE °F 122 BAR PRESS - $P_a$ 14.4 Psia

GAS GRAVITY - $G_g$ % CARBON DIOXIDE % NITROGEN API GRAVITY OF LIQUID

VERTICAL DEPTH (H) TYPE METER CONNECTION 2" orifice w/Abb Total Flow meter. (METER RUN) (PROVER) SIZE 2"

REMARKS

OBSERVED DATA DURATION OF SHUT-IN_____ HR.

| RATE NO. | ORIFICE SIZE in | (METER) (PROVER) PRESSURE Psig | DIFF. $(h_w)$ $(h_d)$ | FLOWING TEMP t | WELL-HEAD TEMP. t | CSG WELLHEAD PRESS. Psig | CSG WELLHEAD PRESS. $(P_w)(P_t)(P_c)$ Psia | TBG WELLHEAD PRESS. Psig | TBG WELLHEAD PRESS. $(P_w)(P_t)(P_c)$ Psia | FLOW DURATION (HOURS) | LIQUID PROD. Bbls. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SHUT IN | | | | | | | | | | | |
| 1 | | | | | | | | | | | |
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |

RATE OF FLOW CALCULATIONS

| RATE NO. | COEFFICIENT $(F_b)$ $(F_p)$ Mcfd | (METER) (PROVER) PRESSURE Psia | PRESS EXTENSION $\sqrt{P_m * h_w}$ | GRAVITY FACTOR $F_g$ | FLOWING TEMP FACTOR $F_t$ | DEVIATION FACTOR $F_{pv}$ | RATE OF FLOW Q Mcfd | GOR $(ft^3/Bbl)$ | $G_m$ |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |

PRESSURE CALCULATIONS

| RATE NO. | $P_t$ Psia | $P_c$ Psia | $P_w$ Psia | $(P_c)^2$ THOUSANDS | $(P_w)^2$ THOUSANDS | PLOTTING POINTS $(P_c)^2 - (P_w)^2$ THOUSANDS | PLOTTING POINTS Q Mcfd | % SHUT-IN $100 \frac{(P_w - P_a)}{(P_c - P_a)}$ |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |

INDICATED WELLHEAD OPEN FLOW Mcfd @ 14.65 Psia "n" =

The undersigned authority, on behalf of the Company, states that he is duly authorized to make the above report and that he has knowledge of the facts stated herein, and that said report is true and correct. Executed this the_____day of _____, 19___.

Witness (if any) For Company

For Commission Checked By (Rev.10/96)