

15-023-20040-00-00

STATE OF KANSAS - CORPORATION COMMISSION
ONE POINT STABILIZED OPEN FLOW OR DELIVERABILITY TEST

FORM G-2
8-7-58

TYPE TEST: Deliverability Open Flow TEST DATE: Sept. 15, 1977

COMPANY: Kan.-Nebr. Nat. Gas Co. LEASE: Harkins WELL NO.: 1-29

COUNTY: Cheyenne LOCATION: 1320' FWL 1320' FNL SECTION: 29 TWP: 4S RNG: 41W ACRES: 160

FIELD: Wildcat RESERVOIR: Niobrara PIPELINE CONNECTION: None

COMPLETION DATE: PLUG BACK TOTAL DEPTH: PACKER SET AT:

CASING SIZE: 4 1/2" WT. I.D. SET AT 1307' PERF. 1217' TO 1237'

TUBING SIZE: NO TBG WT. I.D. SET AT PERF. TO

TYPE COMPLETION (Describe): Single (Gas) TYPE FLUID PRODUCTION: None

PRODUCING THRU: Casing RESERVOIR TEMPERATURE F BAR. PRESS - P_a Bar. Press. Est. 13.0 Psia

GAS GRAVITY - G_g: .610 BTU .952 % CARBON DIOXIDE: % NITROGEN: API GRAVITY OF LIQUID:

VERTICAL DEPTH (H): TYPE METER CONN.: None Test Ran With 2" Critical Flow Prover (METER RUN) (PROVER) SIZE:

SHUT-IN PRESSURE: SHUT IN 19 AT (AM)(PM) TAKEN 9-15 1977 AT 1:40 (AM)(PM)

FLOW TEST: STARTED Sept. 15 1977 AT 1:45 (AM)(PM) TAKEN 9-16 1977 AT 2:00 (AM)(PM)

OBSERVED DATA

DURATION OF SHUT-IN 3 wks.

SHUT-IN OR FLOW	ORIFICE SIZE in.	(METER) (PROVER) PRESSURE psig	DIFF. in. (h _w)(h _d)	FLOWING TEMP. t	WELL-HEAD TEMP. t	CASING WELLHEAD PRESS.		TUBING WELLHEAD PRESS.		DURATION HOURS	LIQUID PROD. Bbls.
						psig	(P _w)(P _i)(P _c) psia	psig	(P _w)(P _i)(P _c) psia		
SHUT-IN						280.0	293.0	NO	TBG		
FLOW	1/4"	210.0	---	66	---	210.0	223.0	"	"	24	None

RATE OF FLOW CALCULATIONS

COEFFICIENT (F _b)(F _d) Mcfd	(METER) (PROVER) PRESSURE psia	EXTENSION $\sqrt{P_m h_w}$	GRAVITY FACTOR F _g	FLOWING TEMP. FACTOR F _t	DEVIATION FACTOR F _{pv}	RATE OF FLOW R Mcfd	GOR	G _m
1.115	223.0	---	1.280	0.9943	1.020	322.78		

(OPEN FLOW) (DELIVERABILITY) CALCULATIONS

(P_c)² = 85.8 ; (P_w)² = 44.1 ; P_d = _____ % (P_c - 14.4) + 14.4 = _____ ; (P_w)² = 0.207 ; (P_d)² = .2

$\frac{(P_c)^2 - (P_w)^2}{(P_c)^2 - (P_d)^2}$	$(P_c)^2 - (P_w)^2$	$\frac{P_c^2 - P_w^2}{P_c^2 - P_w^2}$	LOG []	"n"	n x LOG []	ANTILOG	OPEN FLOW DELIVERABILITY EQUALS R x ANTILOG Mcfd
85.6	41.7	2.05	.3118	.765	.2385	1.73	558.40

OPEN FLOW 558.40 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 19th day of September, 1977.

NOV 25 1977

[Signature]
For Company

Witness (if any)

STATE OF KANSAS - CORPORATION COMMISSION
MULTIPOINT BACK PRESSURE TEST

FORM CG-1

TYPE TEST: Initial Annual Special TEST DATE: Sept. 15, 1977

COMPANY: Kansas-Nebr. Nat. Gas Co. LEASE: Harkins WELL NO.: 1-29
 COUNTY: Cheyenne LOCATION: 1320' FWL 1320' FNL SECTION: 29 TWP: 4S RNG: 41W ACRES: 160
 FIELD: Wildcat RESERVOIR: Niobrara PIPELINE CONNECTION: None

COMPLETION DATE: PLUG BACK TOTAL DEPTH: PACKER SET AT:

CASING SIZE: 4 1/2" WT. ID. SET AT: 1307 PERFORATION: 1217' TO 1237'

TUBING SIZE: NO TEG WT. ID. SET AT: PERFORATION: TO

TYPE COMPLETION (Describe): Single (Gas) TYPE FLUID PRODUCTION: None

PRODUCING THROUGH: Casing RESERVOIR TEMPERATURE: Bar. Press. Est. 13.0 BAR PRESS - P_a: 1144/Psia

GAS GRAVITY - G_g: .610 BTU: .952 % CARBON DIOXIDE: % NITROGEN: API GRAVITY OF LIQUID:

VERTICAL DEPTH (H): TYPE METER CONN.: None (METER-RUN) (PROVER) SIZE: 2" Critical Flow Prover

REMARKS:

OBSERVED DATA

DURATION OF SHUT-IN: 2 WKS.

RATE No.	ORIFICE SIZE in.	(METER) (PROVER) PRESSURE psig	DIFF. (h _w) (h _d)	FLOWING TEMP. t	WELL-HEAD TEMP. t	CASING WELLHEAD PRESS.		TUBING WELLHEAD PRESS.		DURATION HOURS	LIQUID PROD. Bbls.
						psig	(P _w)(P _t)(P _c) psia	psig	(P _w)(P _t)(P _c) psia		
SHUT IN						280	293	NO	TBG		
1	7/32"	262	----	67	---	262	275	"	"	1	None
2	1/4"	252	----	64	---	252	265	"	"	1	"
3	5/16"	238	----	62	---	238	251	"	"	1	"
4	3/8"	218	----	61	---	218	231	"	"	1	"
5											

RATE OF FLOW CALCULATIONS

RATE NO.	COEFFICIENT (F _b)(F _p) Mcfd	(METER) (PROVER) PRESSURE psia	EXTENSION $\sqrt{P_m z h_w}$	GRAVITY FACTOR F _g	FLOWING TEMP FACTOR F _t	DEVIATION FACTOR F _{pv}	RATE OF FLOW Q Mcfd	GOR	G _m
1	0.8608	275.0	----	1.280	0.9933	1.025	308.49		
2	1.115	265.0	----	1.280	0.9962	1.024	385.81		
3	1.714	251.0	----	1.280	0.9981	1.023	562.26		
4	2.439	231.0	----	1.280	0.9990	1.021	735.57		
5									

PRESSURE CALCULATIONS

RATE NO.	P _t psia	P _c psia	P _w psia	(P _c) ² THOUSANDS	(P _w) ² THOUSANDS	PLOTING POINTS		% SHUT-IN $100 \left[\frac{P_w - P_a}{P_c - P_a} \right]$
						(P _c) ² - (P _w) ² THOUSANDS	Q Mcfd	
1		293.0	275.0	85.8	75.6	10.2	308.5	
2		293.0	265.0	85.8	70.2	15.6	385.8	
3		293.0	251.0	85.8	63.0	22.8	562.3	
4		293.0	231.0	85.8	47.5	38.3	735.6	
5								

INDICATED WELLHEAD OPEN FLOW 1,520 Mcfd @ 14.65 psia "a" = .765

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 19th day of September, 1977.

Witness (if any)

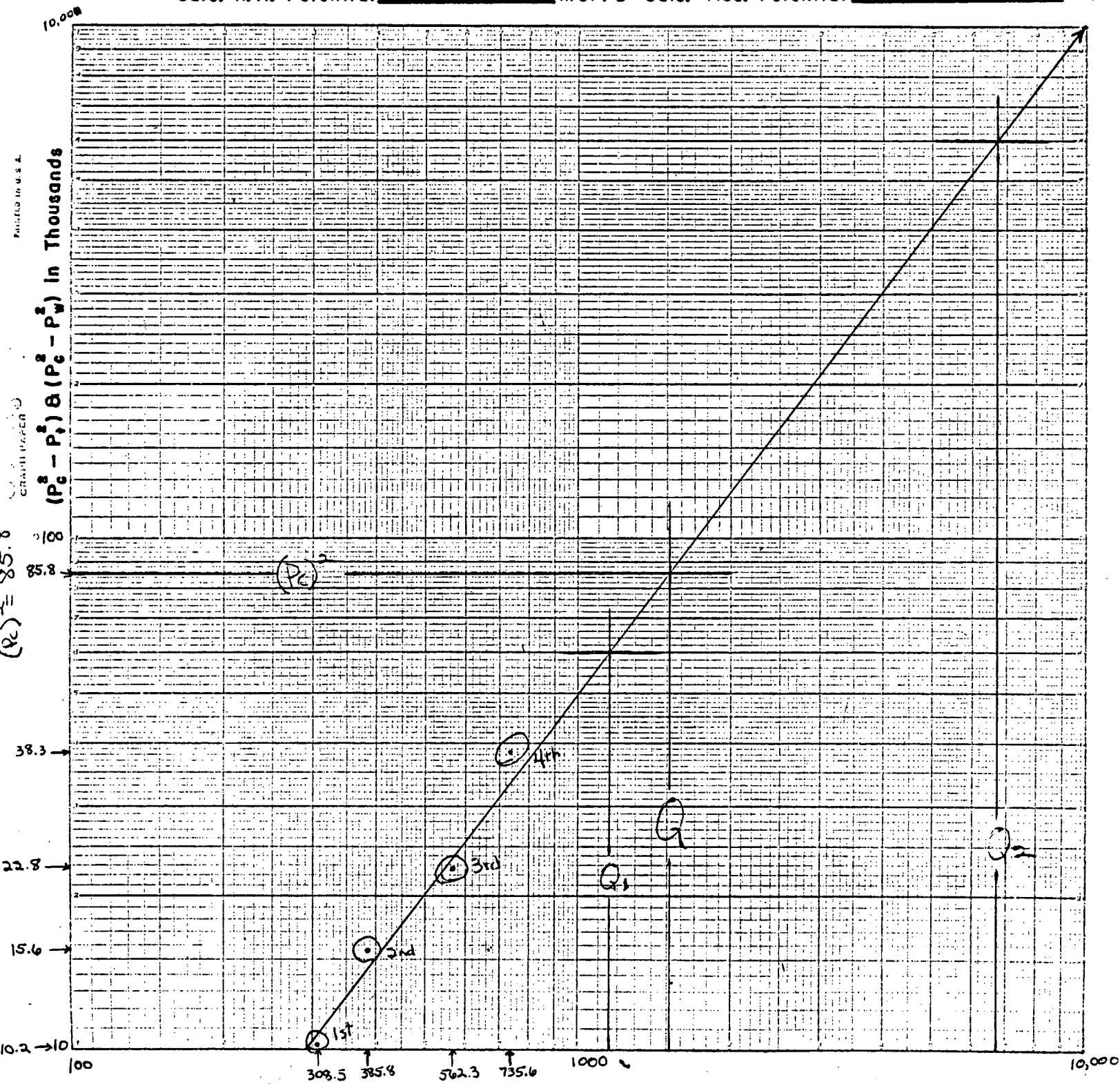
For Commission

[Signature]
For Company

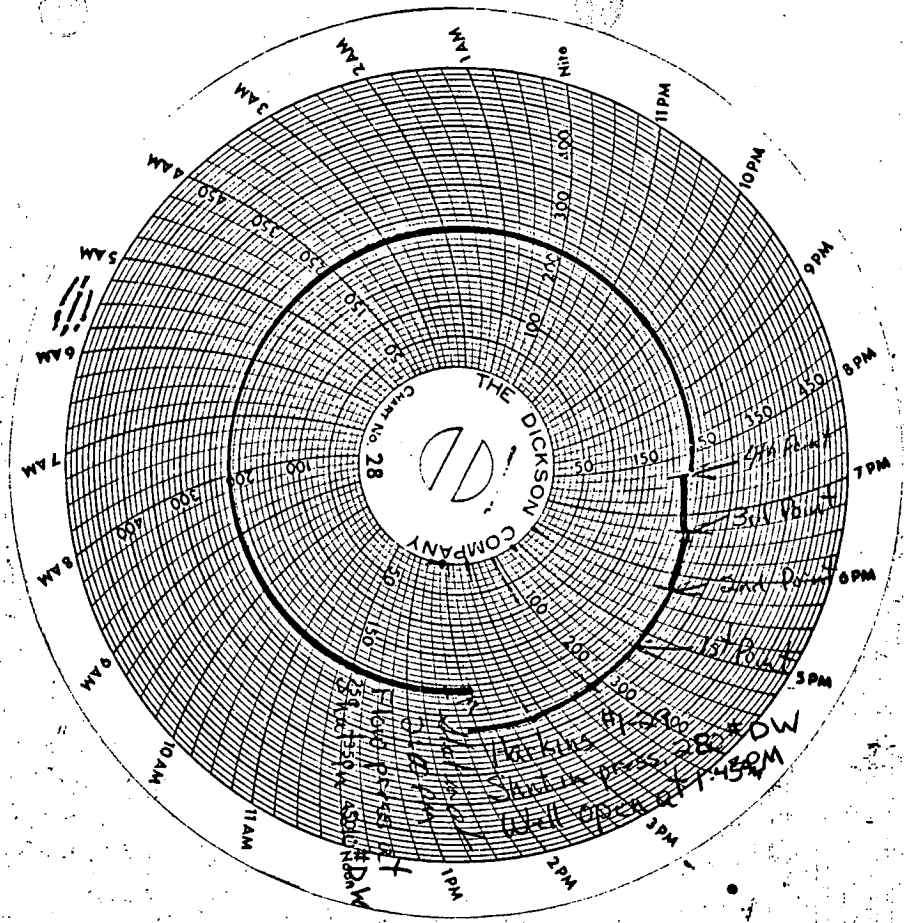
Checked by

BACK PRESSURE CURVE

Operator Kan-Nobr. Nat. Gas Lease Harkins Well No. 1-29
 County Cheyenne Field Wildcat Location C11N Sec. 20 - 48-41W
 Date of Test 9-15-77 Slope "n" .765 W.H. _____ Abs. _____
 Calc. W.H. Potential _____ MCF/D Calc. Abs. Potential _____ MCF/D



$Q_2 = 6,750, \log; 3.8293$ Q in MCF/Day $Q = 1,520$ MCF/Day
 $Q_1 = 1,160, \log; \frac{3.0645}{.7648} = .765 = "n"$



KANSAS-NEBRASKA NATURAL GAS COMPANY, INC.
Back Pressure Field Data Sheet

Date of Test 9-15 1977

Lease Harkins Well No. 1-29 Company Kansas-Nebr. Nat. Gas
 Field Wildcat County Cheyenne State Kansas Location CNW Sec. 29-4S-41W
 Production Casing 4 1/2" Wt. J Set at 1307 Perf. 1217 to 1237
 Tubing Size NO TBG Set at - Perf. - to -
 Meter run None Conn. None Shut-in Pressure 280 psig. Well shut in 3 wks.
 Gravity - BHT - D.W (Before or After)
 Test Run on: Casing, ~~Tubing~~, ~~Annulus~~ (Cross out, those not applicable.)
 Other remarks about test set-up: Well open at 1:45 PM

OBSERVATIONS

Date	Time	Orif. Size	Flow. Temp.	Meter or Prover Pressure psig	Diff. h _w Inches of Water.	Wellhead Working Pressure psig	Remarks
9-15-77	2:30P	2" x .0938	76°	277		277	Blowing Dry
	2:45P		76°	277		277	" " 1% Drawdown
9-15-77	3:30P	2" x .1875	67°	270	Skipped .125 Plate to get more drawdown	270	Blowing Dry
	3:45P		67°	268		268	" " 4.2% drawdown
9-15-77	4:30P	2" x .2188	67°	262		262	Blowing Dry
	4:45P		67°	262		262	" " 6.4% Drawdown
9-15-77	5:30P	2" x .250	65°	254		254	Blowing Dry
	5:45P		64°	252		252	" " 10% Drawdown
9-15-77	6:30P	2" x .312	64°	244		244	Blowing Dry
	6:45P		62°	238		238	" " 15% Drawdown
9-15-77	7:30P	2" x .375	61°	219		219	Blowing Dry
	7:45P		61°	218		218	" " 22% Drawdown
9-15-77		3" x .250			Well Put on Stabilization Test.		
9-16-77	1:30P	2" x .250	66°	210		210	Blowing Dry
	1:45P		66°	210		210	" " "
	2:00P		66°	210		210	" " 25% Drawdown
<p>Sample taken for BTU and Specific Gravity and well shut in at 2:20 PM.</p> <p style="text-align: right;"><i>[Signature]</i></p>							

STATE CORPORATION COMMISSION

Tested By Steven Steele

NOV 2 1977

Witness Steven McClymont

CONSERVATION DIVISION
Wichita, Kansas

KNING E21