

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

TYPE TEST:  Deliverability  Open Flow TEST DATE: 4-25 to 5-1-87

COMPANY: Goodland Gas Company LEASE: Glasco WELL NO.: 1-6

COUNTY: Sherman LOCATION: SE 1/4 SECTION: 6 TWP: 8S RNG: 38W ACRES:

FIELD: Goodland RESERVOIR: Niobrara PIPELINE CONNECTION: KN Energy

COMPLETION DATE: 11-7-78 PLUG BACK TOTAL DEPTH: 942' PACKER SET AT: None

CASING SIZE: 4 1/2" WT. L.D. SET AT: 910' PERF. TO: None

TUBING SIZE: None WT. L.D. SET AT: PERF. TO:

TYPE COMPLETION (Describe): Open hole TYPE FLUID PRODUCTION: Gas

PRODUCING THRU: Casing RESERVOIR TEMPERATURE: F BAR. PRESS - P<sub>a</sub>: 14.4 Psia

GAS GRAVITY - G<sub>g</sub>: 0.5827 % CARBON DIOXIDE: 1.280 % NITROGEN: 2.635 API GRAVITY OF LIQUID: --

VERTICAL DEPTH (H): TYPE METER CONN.: Orifice - flange (METER RUN)(PROVER) SIZE: 2.067

SHUT-IN PRESSURE: SHUT IN 4-25 19.87 AT 10:10 (AM)(PM) TAKEN 4-28 19.87 AT 9:56 (AM)(PM)

FLOW TEST: STARTED 4-28 19.87 AT 9:59 (AM)(PM) TAKEN 5-1 19.87 AT 10:05 (AM)(PM)

OBSERVED DATA

DURATION OF SHUT-IN 72 HR.

SHUT-IN OR FLOW	ORIFICE SIZE In.	(METER) (PROVER) PRESSURE psig	DIFF. In. (h <sub>w</sub> )(h <sub>d</sub> )	FLOWING TEMP. t	WELL-HEAD TEMP. t	CASING WELLHEAD PRESS		TUBING WELLHEAD PRESS		DURATION HOURS	LIQUID PROD. Bbls.
						psig	(P <sub>w</sub> )(P <sub>i</sub> )(P <sub>c</sub> ) psia	psig	(P <sub>w</sub> )(P <sub>i</sub> )(P <sub>c</sub> ) psia		
SHUT-IN	--	--	--	--	--	22.6	37.0	--	--	72	--
FLOW	0.500	15.7	0.22	60	--	15.9	30.30	--	--	72	--

RATE OF FLOW CALCULATIONS

COEFFICIENT (F <sub>o</sub> )(P <sub>o</sub> ) Mcfd	(METER) (PROVER) PRESSURE psia	EXTENSION √P <sub>m</sub> h <sub>w</sub>	GRAVITY FACTOR F <sub>g</sub>	FLOWING TEMP. FACTOR F <sub>L</sub>	DEVIATION FACTOR F <sub>pv</sub>	RATE OF FLOW R Mcfd	GOR	Q <sub>m</sub>
50.5	30.10	2.57	1.31	1.00	1.0007	4	--	--

RECEIVED  
STATE CORPORATION COMMISSION

(OPEN FLOW) (DELIVERABILITY) CALCULATIONS

(P<sub>e</sub>)<sup>2</sup> = 1369.00 ; (P<sub>w</sub>)<sup>2</sup> = 918.09 ; P<sub>d</sub><sup>2</sup> = \_\_\_\_\_ % (P<sub>c</sub> - 14.4) + 14.4 = \_\_\_\_\_

(P<sub>e</sub>)<sup>2</sup> - (P<sub>a</sub>)<sup>2</sup> or (P<sub>e</sub>)<sup>2</sup> - (P<sub>d</sub>)<sup>2</sup> : (P<sub>e</sub>)<sup>2</sup> - (P<sub>w</sub>)<sup>2</sup> : [ (P<sub>c</sub>)<sup>2</sup> - (P<sub>a</sub>)<sup>2</sup> / (P<sub>c</sub>)<sup>2</sup> - (P<sub>w</sub>)<sup>2</sup> ] : LOG [ ] : "n" : n x LOG [ ] : ANTILOG : OPEN FLOW DIVISION DELIVERABILITY EQUALS R x ANTILOG Mcfd

1161.64	450.90	2.58	0.41	0.767	0.32	2.07	9
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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 15 day of MAY, 1987

*Harold D. Lathrop*  
For Company

Witness (if any)

Checked by

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

FORM O-2  
8-7-58  
29  
6-4-59

TYPE TEST:  Deliverability  Open Flow TEST DATE:

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COMPANY: Glasco LEASE: Glasco WELL NO.: 1-6

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COUNTY: \_\_\_\_\_ LOCATION: \_\_\_\_\_ SECTION: \_\_\_\_\_ TWP: \_\_\_\_\_ RNG: \_\_\_\_\_ ACRES: \_\_\_\_\_

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FIELD: \_\_\_\_\_ RESERVOIR: \_\_\_\_\_ PIPELINE CONNECTION: \_\_\_\_\_

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

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CASING SIZE: \_\_\_\_\_ WT. \_\_\_\_\_ I.D. \_\_\_\_\_ SET AT \_\_\_\_\_ PERF. \_\_\_\_\_ TO \_\_\_\_\_

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TUBING SIZE: \_\_\_\_\_ WT. \_\_\_\_\_ I.D. \_\_\_\_\_ SET AT \_\_\_\_\_ PERF. \_\_\_\_\_ TO \_\_\_\_\_

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TYPE COMPLETION (Describe): \_\_\_\_\_ TYPE FLUID PRODUCTION: \_\_\_\_\_

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PRODUCING THRU: \_\_\_\_\_ RESERVOIR TEMPERATURE  $F$ : \_\_\_\_\_ BAR. PRESS -  $P_a$ : 14.4 Psia

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GAS GRAVITY -  $G_g$ : 5827 % CARBON DIOXIDE: \_\_\_\_\_ % NITROGEN: \_\_\_\_\_ API GRAVITY OF LIQUID: \_\_\_\_\_

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VERTICAL DEPTH (H): \_\_\_\_\_ TYPE METER CONN.: F (METER RUN) (PROVER) SIZE: 2

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SHUT-IN PRESSURE: SHUT IN \_\_\_\_\_ 19 \_\_\_\_\_ AT \_\_\_\_\_ (AM)(PM) TAKEN \_\_\_\_\_ 19 \_\_\_\_\_ AT \_\_\_\_\_ (AM)(PM)

FLOW TEST: STARTED \_\_\_\_\_ 19 \_\_\_\_\_ AT \_\_\_\_\_ (AM)(PM) TAKEN \_\_\_\_\_ 19 \_\_\_\_\_ AT \_\_\_\_\_ (AM)(PM)

**OBSERVED DATA** DURATION OF SHUT-IN \_\_\_\_\_ HR.

SHUT-IN OR FLOW	ORIFICE SIZE in.	(METER) (PROVER) PRESSURE psig	DIFF. in. (h <sub>w</sub> )(h <sub>d</sub> )	FLOWING TEMP. t	WELL-HEAD TEMP. t	CASING WELLHEAD PRESS.		TUBING WELLHEAD PRESS.		DURATION HOURS	LIQUID PROD. Bbls.
						psig	(P <sub>w</sub> )(P <sub>i</sub> )(P <sub>c</sub> ) psia	psig	(P <sub>w</sub> )(P <sub>i</sub> )(P <sub>c</sub> ) psia		
SHUT-IN						22.6	37.0			72	
FLOW	.500	15.7	.22	60		15.9	30.30			72	

**RATE OF FLOW CALCULATIONS**

COEFFICIENT $\frac{(P_c)^2 - (P_d)^2}{(P_c)^2 - (P_w)^2}$	(METER) (PROVER) PRESSURE psia	EXTENSION $\sqrt{P_m h_w}$	GRAVITY FACTOR $\gamma_g$	FLOWING TEMP. $F_L$	DEVIATION FACTOR $F_{pv}$	RATE OF FLOW $R$ Mcfd	GOR	$Q_m$
1.219	30.10	2.59	1.31	1.0	1.011	4.15		

**(OPEN FLOW) (DELIVERABILITY) CALCULATIONS**

$(P_c)^2 = 1369.00$   $(P_w)^2 = 918.09$   $P_d =$  \_\_\_\_\_ %  $(P_c - 14.4) + 14.4 =$  \_\_\_\_\_  $(P_c)^2 = 0.207$   $(P_d)^2 =$  \_\_\_\_\_

$\frac{(P_c)^2 - (P_w)^2}{(P_c)^2 - (P_d)^2}$	$(P_c)^2 - (P_w)^2$	$\frac{P_c^2 - P_w^2}{P_c^2 - P_d^2}$	LOG [ ]	"n"	n x LOG [ ]	ANTILOG	OPEN FLOW DELIVERABILITY EQUATION R x ANTILOG Mcfd
1161.64	450.91	2.576	.4109	.767	.3151	2.065	8.57

OPEN FLOW 9 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)  
Del Z. Bartholomew  
 For Commission

For Company \_\_\_\_\_  
 Checked by \_\_\_\_\_

RECEIVED  
 STATE CORPORATION COMMISSION  
 OIL & GAS DIVISION  
 Kansas