

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

FORM NO. 3  
8-7-88

12  
2-8-91

15-023-202710-0000

**TYPE TEST:**  Deliverability  Open Flow      **TEST DATE:** 10/12/90

**COMPANY:** Harvest Energy Company      **LEASE:** Andrist      **WELL NO.:** 1-27

**COUNTY:** Cheyenne      **LOCATION:** SWSESW      **SECTION:** 27      **TWP:** 4S      **RNG:** 39W      **ACRES:**

**FIELD:** Wheeler      **RESERVOIR:** Niobrara      **PIPELINE CONNECTION:** Peoples Natural Gas

**COMPLETION DATE:** 9/25/89      **PLUG BACK TOTAL DEPTH:** 1,395'      **PACKER SET AT:** n/a

**CASING SIZE:** 4 1/2"      **WT.:** 10.5#      **I.D.:** 4.052"      **SET AT:** 1,407'      **PERF.:** 1290'      **TO:** 1308'

**TUBING SIZE:** 2 3/8"      **WT.:** 4#      **I.D.:** 2.041"      **SET AT:** 1,278'      **PERF.:**      **TO:**

**TYPE COMPLETION (Describe):** single gas      **TYPE FLUID PRODUCTION:**

**PRODUCING THRU:** tubing      **RESERVOIR TEMPERATURE (F):** 84      **BAR. PRESS - P<sub>a</sub>:** 14.4 Psia

**GAS GRAVITY - G<sub>g</sub>:** .5868      **% CARBON DIOXIDE:**      **% NITROGEN:**      **API GRAVITY OF LIQUID:**

**VERTICAL DEPTH (H):** 1,302'      **TYPE METER CONN.:** orifice      **(METER RUN)(PROVER) SIZE:** 2" meter run

**SHUT-IN PRESSURE:** SHUT IN 9/25 19 89 AT (AM)(PM) TAKEN 10/2 19 89 AT (AM)(PM)

**FLOW TEST:** STARTED 10/12 19 90 AT (AM)(PM) TAKEN 10/13 19 90 AT (AM)(PM)

**OBSERVED DATA**

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	CASINO 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						232		n/a			
FLOW	.500	64	20.3	60	60	130		60		24	

**RATE OF FLOW CALCULATIONS**

COEFFICIENT (F <sub>p</sub> )(F <sub>d</sub> ) Mafd	(METER) (PROVER) PRESSURE psia	EXTENSION $\sqrt{P_m h_w}$	GRAVITY FACTOR F <sub>g</sub>	FLOWING TEMP. FACTOR F <sub>L</sub>	DEVIATION FACTOR F <sub>pv</sub>	RATE OF FLOW R Mafd	GOR	G <sub>m</sub>
1.2379242	78.4	39.893859	1.3074	1.0	1.0047	64.870162		

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

(P<sub>c</sub>)<sup>2</sup> = 60.712960      (P<sub>w</sub>)<sup>2</sup> = 5.5353600      P<sub>d</sub> = \_\_\_\_\_ %      (P<sub>c</sub> - 14.4) + 14.4 = \_\_\_\_\_      (P<sub>a</sub>)<sup>2</sup> = 0.207      (P<sub>d</sub>)<sup>2</sup> = \_\_\_\_\_

(P <sub>c</sub> ) <sup>2</sup> - (P <sub>a</sub> ) <sup>2</sup> or (P <sub>c</sub> ) <sup>2</sup> - (P <sub>d</sub> ) <sup>2</sup>	(P <sub>c</sub> ) <sup>2</sup> - (P <sub>w</sub> ) <sup>2</sup>	$\frac{P_c^2 - P_a^2}{P_c^2 - P_w^2}$	LOG [ ]	"n"	n x LOG [ ]	ANTILOG	OPEN FLOW DELIVERABILITY EQUALS R x ANTILOG Mafd
60.505600	55.1776	1.0965609	.0400327	.928	.0371504	1.0893072	70.66

**OPEN FLOW** 70.66 Mafd @ 14.65 psia      **DELIVERABILITY** Mafd @ 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 13th day of February, 1991

Witness (if any) \_\_\_\_\_  
For Commission \_\_\_\_\_

FFR 8 1991

**RECEIVED**

\_\_\_\_\_  
For Company  
Alan L. Nackerud  
Checked by \_\_\_\_\_