

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

FORM NO. 8-7-58

15-023-20145-0000

TYPE TEST: Deliverability Open Flow TEST DATE: 8/21/90

COMPANY: Harvest Energy Company LEASE: Sherlock WELL NO.: #1-4
 COUNTY: Cheyenne LOCATION: CSE SECTION: 4 TWP: T3S R90 ACRES: R39W
 FIELD: Bird City RESERVOIR: Niobrara PIPELINE CONNECTION: Williams Natural Gas

COMPLETION DATE: 1/8/81 PLUG BACK TOTAL DEPTH: 1377' PACKER SET AT: N/A
 CASINO SIZE: 4 1/2" WT. I.D. SET AT: 1415" PERFORATION: 1270 TO 1272
 TUBING SIZE: 1 1/2" WT. I.D. SET AT: 1261" PERFORATION: 1282 TO 1296
 TYPE COMPLETION (Describe): Single gas TYPE FLUID PRODUCTION: open

PRODUCING THRU: Tubing RESERVOIR TEMPERATURE F: 80 BAR. PRESS - P_a: 14.4 Psia

GAS GRAVITY - G_g: .5897 % CARBON DIOXIDE: 1.609 % NITROGEN: 4.513 API GRAVITY OF LIQUID: _____

VERTICAL DEPTH (ft): 1291' TYPE METER CONN.: orifice (METER RUN)(PROVER) SIZE: 2"

SHUT-IN PRESSURE: SHUT IN 6/3 81 AT (AM)(PM) TAKEN 8/16 90 AT (AM)(PM)
 FLOW TEST: STARTED 8/20 90 AT (AM)(PM) TAKEN 8/21 90 AT (AM)(PM)

OBSERVED DATA

SHUT-IN OR FLOW	ORIFICE SIZE in.	(METER) (PROVER) PRESSURE psig	DIFF. in. (h _w)(h _d)	FLOWING TEMP. °F	WELL-HEAD TEMP. °F	CASINO WELLHEAD PRESS.		TUBING WELLHEAD PRESS.		DURATION HOURS	LIQUID PROD. Bbls.
						psig	(P _w)(P _c)(P _d) psia	psig	(P _w)(P _c)(P _d) psia		
SHUT-IN						285		285			
FLOW	.875	43	40	60	60	130		37		24	

RATE OF FLOW CALCULATIONS

COEFFICIENT (P _w) ² / (P _c) ² - (P _d) ²	(METER) (PROVER) PRESSURE psia	EXTENSION √P _{wh} h _w	GRAVITY FACTOR P _g	FLOWING TEMP. °F	DEVIATION FACTOR P _{pv}	RATE OF FLOW R Mscfd	GOR	G _m
3.8629001	57.4	47.916594	1.3019	1.0	1.0047	242.11		

(OPEN FLOW) (DELIVERABILITY) CALCULATIONS

(P_c)² = 89.64036 (P_w)² = 264196 P_d = _____ % (P_a = 14.4) + 14.4 = _____ (P_w)² = 0.207 (P_d)² = _____

(P _c) ² - (P _d) ²	(P _c) ² - (P _w) ²	$\frac{(P_c^2 - P_d^2)}{(P_c^2 - P_w^2)}$	LOG []	"n"	n = LOG []	ANTILOG	OPEN FLOW DELIVERABILITY EQUALS R = ANTILOG Mscfd
89.43336	86.9984	1.0279886	.0119882	.85	.01019	1.0237409	247.86

OPEN FLOW 247.86 Mscfd @ 14.65 psia DELIVERABILITY Mscfd @ 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 20th day of November, 1990.

Witness (if any) _____ For Commission _____
 NOV 26 1990 11-26-90 _____ For Company _____
 Checked by _____