

STATE OF KANSAS - CORPORATION COMMISSION

FORM 8
8-7-88

ONE POINT STABILIZED OPEN FLOW OR DELIVERABILITY TEST

15-023-20065-008
11-26-90

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

COMPANY: Harvest Energy Company LEASE: Shay WELL NO.: #1-3

COUNTY: Cheyenne LOCATION: CSWNE SECTION: 3 TWP: T3S RNO: R39W ACRES:

FIELD: Bird City RESERVOIR: Niobrara PIPELINE CONNECTION: Williams Natural Gas

COMPLETION DATE: 6/15/78 PLUG BACK TOTAL DEPTH: 1438' PACKER SET AT: N/A

CASING SIZE: 4 1/2" WT. I.D. SET AT: 1475' PERF. TO: 1363'

TUBING SIZE: N/A WT. I.D. SET AT: PERF. TO:

TYPE COMPLETION (Describe): Single gas TYPE FLUID PRODUCTION:

PRODUCING THRU: Casing RESERVOIR TEMPERATURE: 85 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 (H): 1358' TYPE METER CONN.: orifice (METER RUN)(PROVER) SIZE: 2"

SHUT-IN PRESSURE: SHUT IN 7/8 19.78 AT (AM)(PM) TAKEN 8/16 19.90 AT (AM)(PM)

FLOW TEST: STARTED 8/20 19.90 AT (AM)(PM) TAKEN 8/21 19.90 AT (AM)(PM)

OBSERVED DATA DURATION OF SHUT-IN: HR.

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 _e) psia	psig	(P _w)(P _e) psia		
SHUT-IN						298		N/A			
FLOW	.500	62	62	60	60	35		N/A		24	

RATE OF FLOW CALCULATIONS

COEFFICIENT (P _e)(P _w) ² Mafd	(METER) (PROVER) PRESSURE psia	EXTENSION √P _{wh} h _w	GRAVITY FACTOR P _g	FLOWING TEMP. T _L	DEVIATION FACTOR F _{pv}	RATE OF FLOW R Mafd	GOR	Q _m
1.2300825	76.4	68.824414	1.3019	1.0	1.0063	110.91		

(OPEN FLOW) (DELIVERABILITY) CALCULATIONS

(P_e)² = 97.59376 (P_w)² = 1.225 P_d² = _____ % (P_e - 14.4) + 14.4 = _____ (P_e)² = 0.207 (P_d)² = _____

(P _e) ² - (P _d) ²	(P _e) ² - (P _w) ²	$\frac{(P_e^2 - P_d^2)}{(P_e^2 - P_w^2)}$	LOG []	"n"	n x LOG []	ANTILOG	OPEN FLOW DELIVERABILITY EQUALS R x ANTILOG Mafd
97.38676	96.36876	1.0105636	.0045636	.85	.0038792	1.008972	111.91

OPEN FLOW 111.91 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 20th day of November, 1990.

Witness (if any) For Commission For Company Checked by NOV 26 1990