STATE OF KANSAS – CORPORATION COMMISSION

Form C-5
8-7-58

ONE POINT STABILIZED OPEN FLOW OR DELIVERABILITY TEST

15-023-20066-0000

P2
11-26-90

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

COMPANY	LEASE	WELL NO.
Harvest Energy Company	Holliman	#1-5

COUNTY	LOCATION	SECTION	TWP.	RNG	ACRES
Cheyenne	CSESE	5	T3S	R39W	

FIELD	RESERVOIR	PIPELINE CONNECTION
Bird City	Niobrara	Williams Natural Gas

COMPLETION DATE	PLUG BACK TOTAL DEPTH	PACKER SET AT
6/15/78	1347'	N/A

CASING SIZE	WT.	I.D.	SET AT	PERF.	TO
4½"			1390'	1210 1215 1220	1212 1218 1228

TUBING SIZE	WT.	I.D.	SET AT	PERF.	TO
Single gas					

TYPE COMPLETION (Describe)	TYPE FLUID PRODUCTION
N/A	

PRODUCING THRU	RESERVOIR TEMPERATURE °F	BAR. PRESS – P_a
Casing	118	14.4 Psia

GAS GRAVITY – G_g	% CARBON DIOXIDE	% NITROGEN	API GRAVITY OF LIQUID
.5897	1.609	4.513	

VERTICAL DEPTH (H)	TYPE METER CONN.	(METER RUN)(PROVER) SIZE
1223'	orifice	2"

SHUT-IN PRESSURE: SHUT IN 8/26 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 X h_d)	FLOWING TEMP. t	WELL-HEAD TEMP. t	CASING WELLHEAD PRESS. psig	CASING WELLHEAD PRESS. (P_w X P_t X P_c) psia	TUBING WELLHEAD PRESS. psig	TUBING WELLHEAD PRESS. (P_w X P_t X P_c) psia	DURATION HOURS	LIQUID PROD. Bbls.
SHUT-IN						288		N/A			
FLOW	.250	48	11	60	60	32		N/A		24	

RATE OF FLOW CALCULATIONS

COEFFICIENT (F_b) (F_p) 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
.3124326	62.4	26.199237	1.3019	1.0	1.0047	10.71		

(OPEN FLOW) (DELIVERABILITY) CALCULATIONS

$(P_c)^2$: 91.44576 $(P_w)^2$: 2.15296 P_d = _____ % $(P_c - 14.4) + 14.4$ = _____ $(P_d)^2$ = 0.207 $(P_d)^2$ = _____

$(P_c)^2 - (P_a)^2$ or $(P_c)^2 - (P_d)^2$	$(P_c)^2 - (P_w)^2$	$\left[\frac{P_c^2 - P_a^2}{P_c^2 - P_d^2}\right]$ / $\left[\frac{P_c^2 - P_a^2}{P_a^2 - P_w^2}\right]$	LOG [ ]	"n"	n x LOG [ ]	ANTILOG	OPEN FLOW DELIVERABILITY EQUALS R x ANTILOG Mcfd
91.23876	89.2928	1.0217930	.0093629	.85	.0079584	1.0184940	10.91

OPEN FLOW 10.91 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 20th day of November, 19 90

STATE CORPORATION COMMISSION
NOV 26 1990

_____ Witness (If any)

_____ For Company

_____ For Commission

_____ Checked by