STATE OF KANSAS — CORPORATION COMMISSION

FORM C-5
8-7-58

ONE POINT STABILIZED OPEN FLOW OR DELIVERABILITY TEST

15-091-20752-0000

TEST: ☐ Deliverability ☒ Open Flow TEST DATE: 8-4-83

COMPANY: Bogina Petroleum Engineers LEASE: Sandow WELL NO.: 3

COUNTY: Johnson LOCATION: NW NE SECTION: 6 TWP: 14 RNG: 23 ACRES:

FIELD: RESERVOIR: PIPELINE CONNECTION:

COMPLETION DATE: 5-1-82 PLUG BACK TOTAL DEPTH: PACKER SET AT:

CASING SIZE: 4" WT. I.D. SET AT PERF. 736-746 TO

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

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

PRODUCING THRU: Tbg. RESERVOIR TEMPERATURE F BAR. PRESS — P_a 14.4 Psia

GAS GRAVITY — G_g: .576 % CARBON DIOXIDE % NITROGEN API GRAVITY OF LIQUID

VERTICAL DEPTH (H) TYPE METER CONN. (METER RUN)(PROVER) SIZE: 2" orfice well tester

SHUT-IN PRESSURE: SHUT IN ______ 19__ AT ______ (AM)(PM) TAKEN 8-3 19 83 AT 1415 (AM)(PM)

FLOW TEST: STARTED 8-3- 19 83 AT 1430 (AM)(PM) TAKEN 8-4 19 83 AT 0800 (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. psig	CASING $(P_w)(P_t)(P_c)$ psia	TUBING WELLHEAD PRESS. psig	TUBING $(P_w)(P_t)(P_c)$ psia	DURATION HOURS	LIQUID PROD. Bbls.
SHUT-IN											
FLOW	1/4	82						217	231.4		
								91	105.4	17.5	

RATE OF FLOW CALCULATIONS

COEFFICIENT $(F_b)(F_p)$ Mcfd	(METER) (PROVER) PRESSURE psia	EXTENSION $\sqrt{P_m \times h_w}$	GRAVITY FACTOR F_g	FLOWING TEMP. FACTOR F_t	DEVIATION FACTOR F_{pv}	RATE OF FLOW R Mcfd	GOR	G_m
2" orfice well		tester	1.318			137		

(OPEN FLOW) (DELIVERABILITY) CALCULATIONS

$(P_c)^2$ = 53.5 ; $(P_w)^2$ = 11.1 ; P_d = 45.5 % $(P_c - 14.4) + 14.4$ = 231.4 ; $(P_a)^2$=0.207 $(P_d)^2$ = 53.3

$(P_c)^2-(P_a)^2$ or $(P_c)^2-(P_d)^2$	$(P_c)^2-(P_w)^2$	$\left[\frac{P_c^2-P_a^2}{P_c^2-P_w^2}\right]$ or $\left[\frac{P_c^2-P_d^2}{P_c^2-P_w^2}\right]$	LOG [ ]	"n"	n x LOG [ ]	ANTILOG	OPEN FLOW DELIVERABILITY EQUALS R x ANTILOG Mcfd
53.3	42.2	1.26303	.101415	.850	.086203	1.21956	167

OPEN FLOW 167 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__.

$P_a = .8(217) + 14.4$
$= 188$ psi
$P_a^2 = 35.344 \times 10^3$
$P_c^2 - (.8P_c)^2 = 17956$ psi
$= 4411$ CFD @ 188 psia

Witness (if any) ______ For Company ______

For Commission ______ Checked by ______

RECEIVED
STATE CORPORATION COMMISSION
NOV 2 6 1984
11-26-84
CONSERVATION DIVISION
Wichita, Kansas

SANDOW #3

RESERVE DATA

AND

ESTIMATE OF GAS RESERVES

OCT 17 1984

OPERATOR: Johnson County Airport

WELL NAME: Sandow #3

LOCATION: Sec. 6 - Twp. 14 - Rng. 23; NWNE

COUNTY: Jchnson

STATE: Kansas

RESERVOIR PARAMETERS

RESERVOIR	Bartlesville	
NET PAY	15	Feet
PRODUCTIVE VOLUMES	1200	Ac-Ft
POROSITY	26	%
WATER SATURATION	55	%
INITIAL WELLHEAD SHUT-IN-PRESSURE	231.4	Psia
RESERVOIR TEMPERATURE	540	°R
GAS GRAVITY	.576	
RESERVOIR PRESSURE	240	Psia
COMPRESSIBILITY FACTOR	.960	
INITIAL GAS IN PLACE PER ACRE-FOOT	82	MCF/Ac.Ft.
INITIAL RECOVERABLE GAS PER ACRE-FOOT	70	MCF/Ac.Ft.
INITIAL RECOVERABLE GAS	84	MMCF

Cenret Labs Century Refining Company, A Panhandle Eastern Company

316/624-4292

Liters

GAS ANALYSIS

Lab. No. K83NGII-1942 Date Run August 9, 1983
Company HOSCO Date Sampled August 4, 1983
Description Bogina Petroleum Engineers @ 0800
Well Name Sandow #3 Location Sec. 6-14-23
County Johnson State Kansas Zone
Perf. From To Sampled From Wellhead MS#
Field Determinations - Sample Press (psig) 91 Sp. Gravity
Ambient Temp (° F) Sample Temp (° F)
Requested By HOSCO Sampled By Shelm

CHROMATOGRAPH METHOD

Component	Mol %	G.P.M.*
Helium	0.42	
Hydrogen	0.03	
Carbon Dioxide	0.19	
Nitrogen	4.58	
Methane	94.65	
Ethane	0.09	0.023
Propane	0.01	0.002
i-Butane	-	-
n-Butane	-	-
i-Pentane	-	0.002
n-Pentane	-	0.001
Hexanes-Plus	0.03	0.012
TOTAL	100.00	0.043

* Calculated value based on ideal gas values from latest G. P. A. pub. 2145 at 60° F and 14.65 psia.

** Calculated value using method from G.P.A. pub. 2172 and latest gas values from 2145.

**	Z Factor at 60° F - 14.696 psia	
**	Gross Heating Value per cu. ft. at 60° F - 30" Hg Sat.	947 B.T.U.
**	Gross Heating Value per cu. ft. at 60° F - 30" Hg Dry	964 B.T.U.
**	Net Heating Value per cu. ft. at 60° F - 30" Hg Sat.	853 B.T.U.
**	Net Heating Value per cu. ft. at 60° F - 30" Hg Dry	868 B.T.U.
**	Specific Gravity (Air = 1.00)	0.576
	Gross Heating Value per cu. ft. at 60° F - 30" Hg Sat. Determined by Recording Calorimeter	