KANSAS CORPORATION COMMISSION
ONE POINT STABLIZED OPEN FLOW OR DELIVERABILITY TEST

FORM G-2
(Rev.8/98)

Invoice # 3113 $ 607.00

TYPE TEST:
☒ Open Flow
☒ Deliverability

TEST DATE: 8-23-02 API No. 15-071-2073

Company	Lease	Well Number
Horsehoe Operating Inc	Wear	2

County	Location	Section	TWP	RNG(E/W)	Acres Attributed
Greeley	C NE	15	17s	40w	640

Field	Reservoir	Gas Gathering Connection
Bradshaw	Winfield	Duke Energy

Completion Date	Plug Back Total Depth	Packer Set at
9-28-00	3022	

Casing Size	Weight	Internal Diameter	Set at	Perforations	To
4.500	10.500	4.090	3020	2929	2988

Tubing Size	Weight	Internal Diameter	Set at	Perforations	To
2.000	4.700	1.995	3001		

Type Completion (Describe)	Type Fluid Production	Pump Unit or Traveling Plunger?
Single Gas	water	pumping unit

Producing Thru (Annulus/Tubing)	% Carbon Dioxide	% Nitrogen	Gas Gravity- Gg
	.025	44.449	.831

Vertical Depth (H)	Pressure Taps	Meter Run Size
2959	Flange	2

Pressure Buildup: Shut in	9-19-02 @ 9:30	TAKEN	9-22-02 @ 10:00
Well on Line: Started	9-22-02 @ 10:00	TAKEN	9-23-02 @ 14:00

OBSERVED SURFACE DATA

Static/ Dynamic Property	Orifice Size in.	Meter Pressure psig	Pressure Diff. In. H_2O	Flowing Temp. t.	WellHead Temp. t.	Casing WellHead Press. (P_w) (P_t) (P_c) psig	Casing WellHead Press. psia	Tubing WellHead Press. (P_w) (P_t) (P_c) psig	Tubing WellHead Press. psia	Duration (Hours)	Liquid Prod. Barrels
Shut-in						179	193				
Flow	1.250	65.0	29.00	68		151	165			24.0	12.9

FLOW STREAM ATTRIBUTES

COEFFICIENT (F_b) Mcfd	(METER) PRESSURE psia	EXTENSION $\sqrt{P_m \times H_w}$	GRAVITY FACTOR Fg	FLOWING TEMP FACTOR Ft	DEVIATION FACTOR Fpv	RATE OF FLOW R Mcfd	GOR	G_m
8.329	79.4	47.99	1.0970	.9924	1.0054	437	33803	.946

(OPEN FLOW)(DELIVERABILITY) CALCULATIONS

$(Pc)^2$ = 37.4 $(Pw)^2$ = 27.7 Pd = 33.6 % (Pc - 14.4) + 14.4 = $(Pa)^2$ = 0.207 $(Pd)^2$ = 4.23

$(P_c)^2 - (P_a)^2$ or $(P_c)^2 - (P_d)^2$	$(P_c)^2 - (P_w)^2$	$\frac{(P_c)^2 - (P_a)^2 \text{ or } (P_c)^2 - (P_d)^2}{(P_c)^2 - (P_w)^2}$	LOG [ ]	Backpressure Curve Slope "n" ---- or ---- Assigned Standard Slope	n x LOG [ ]	Antilog	Open Flow Deliverability = R x Antilog Mcfd
37.20	9.73	3.825	.5826	.556	.3239	2.108	922
33.18	9.73	3.412	.5330	.556	.2963	1.978	865

OPEN FLOW 922 Mcfd @ 14.65 psia DELIVERABILITY 865 Mcfd @ 14.65 psia

The undersigned authority, on behaf of the Company, states that he is duly authorized to make the above report and that he has knowledge of the facts stated herein and that said report is true and correct. Executed this the 3 day of Sept, 20 02

Witness (if any)

For Company

For Commission

Checked by

KANSAS CORPORATION COMMISSION
MULTIPOINT BACK PRESSURE TEST

FORM G-1
8-7-58

TYPE TEST: ☒ Initial ☐ Annual ☐ Special				TEST DATE: 8-22-02	
COMPANY			LEASE		WELL NO.
Horsehoe Operating Inc			Wear		2
COUNTY	LOCATION		SECTION	TWP RNG	ACRES
Greeley	C NE		15	17s 40w	640
FIELD	RESERVOIR		PIPELINE CONNECTION		
Bradshaw	Winfield		Duke Energy		
COMPLETION DATE		PLUG BACK DEPTH	3022		PACKER SET AT
9-28-00		TOTAL DEPTH	3028		
CASING SIZE	WT.	ID	SET AT	PERF.	TO
4.500	10.500	4.090	3020	2929	2988
TUBING SIZE	WT.	ID	SET AT	PERF.	TO
2.000	4.700	1.995	3001		
TYPE COMPLETION (Describe)			TYPE FLUID PRODUCTION		
Single Gas			water		
PRODUCING THRU (Annulus/Tubing)			RESERVOIR TEMPERATURE F		BAR PRESS - Pa
annulus			90		14.4 psia
GAS GRAVITY - Gg	% CARBON DIOXIDE		% NITROGEN		API GRAVITY OF LIQUID
.831	.025		44.449		
VERTICAL DEPTH (H)			TYPE METER CONN.		METER RUN SIZE
2959			Flange		2
REMARKS					

OBSERVED SURFACE DATA

RATE NO.	ORIFICE SIZE in.	(METER) PRESSURE psig	DIFF. (h_w) (h_t)	FLOWING TEMP. t.	WELLHEAD TEMP. t.	CASING WELLHEAD PRESS. psig	CASING WELLHEAD PRESS. (P_w) (P_t) (P_c) psia	TUBING WELLHEAD PRESS. psig	TUBING WELLHEAD PRESS. (P_w) (P_t) (P_c) psia	DURATION HOURS	LIQUID PROD. Bbls.
SHUT-IN						179	193			72.50	
1.	1.000	65.00	50.00	65		173	187			1.00	
2.	1.000	67.00	96.00	67		167	181			1.00	
3.	1.250	70.00	70.00	70		157	171			1.00	
4.	1.250	74.00	100.00	70		146	160			1.00	

FLOW STREAM ATTRIBUTES

RATE NO.	COEFFICIENT (F_b) Mcfd	(METER) PRESSURE psia	EXTENSION $\sqrt{P_m \times H_w}$	GRAVITY FACTOR Fg	FLOWING TEMP FACTOR Ft	DEVIATION FACTOR Fpv	RATE OF FLOW Q Mcfd	GOR	G_m
1.	5.073	79.4	63.01	1.0970	.9952	1.0055	350		.831
2.	5.073	81.4	88.40	1.0970	.9933	1.0055	491		.831
3.	8.329	84.4	76.86	1.0970	.9905	1.0056	699		.831
4.	8.329	88.4	94.02	1.0970	.9905	1.0059	855		.831

PRESSURE CALCULATION

RATE NO.	Pt psia	Pc psia	Pw psia	$(Pc)^2$ Thousands	$(Pw)^2$ Thousands	PLOTTING POINTS $(P_c)^2 - (P_w)^2$ Thousands	PLOTTING POINTS Q Mcfd	% SHUT-IN $100 \left[\frac{Pw - Pa}{Pc - Pa}\right]$
1.	187.4	193.4	187.9	37.4	35.3	2.1	350.9	96.9
2.	181.4	193.4	182.4	37.4	33.3	4.1	491.4	93.8
3.	171.4	193.4	173.5	37.4	30.1	7.3	699.5	88.9
4.	160.4	193.4	163.6	37.4	26.8	10.6	855.9	83.4

INDICATED WELLHEAD OPEN FLOW 1713 Mcfd @ 14.65 psia "n" = .556

The undersigned authority, on behaf of the Company, states that he is duly authorized to make the above report and that he has knowledge of the facts stated herein and that said report is true and correct. Executed this the 3 day of Sept, 20 02

Witness (if any)

For Company

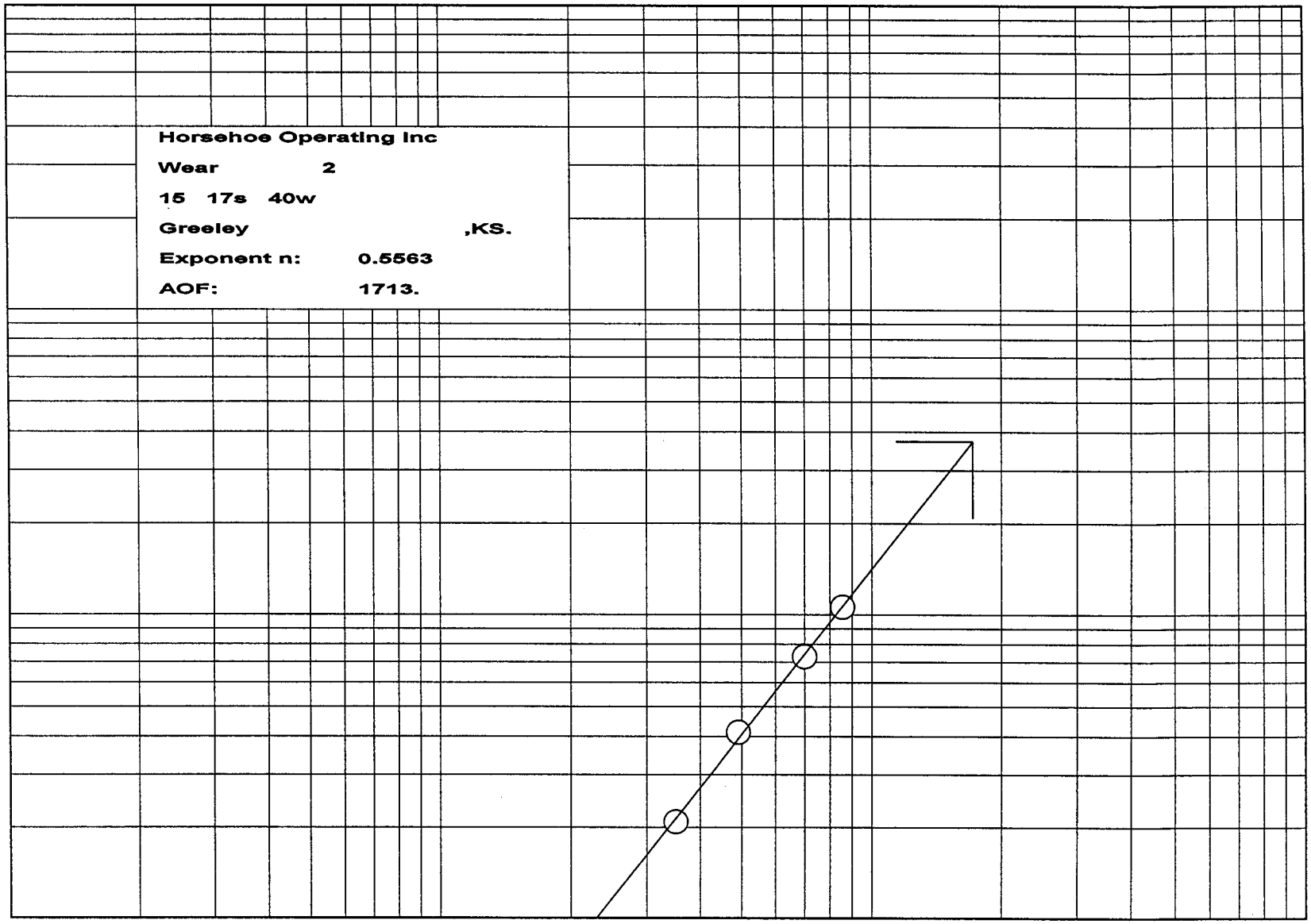
For Commission

Checked by

GAS WELL BACK PRESSURE CURVE

WELL TESTER: Trilobite Testing

TEST DATE: 8-22-02



GAS ANALYTICAL SERVICES LLC
ON SITE GAS ANALYSIS
JOSEPH GRAVES
(620) 428-6069 Fax
(620) 428-6053 Office
(620) 428-2277 Cellular
PO Box 253
Hugoton, Kansas 67951
Email: jogfss@pld.com

Sample ID:	28079		
Station #:	141417	Sampled Date:	09/02/2002
Name:	WEAR #2	Effective Date:	09/02/2002
Code:	TRILOBITE	Analysis File:	141417.BDF

Components	Mole %	Btu	Gravity	GPM
Helium:	0.964	0.000	0.001	0.000
Hydrogen:	0.000	0.000	0.000	0.000
Oxygen:	0.000	0.000	0.000	0.000
Nitrogen:	44.449	0.000	0.430	0.000
Methane:	44.264	448.101	0.245	0.000
Carbon Dioxide:	0.025	0.000	0.000	0.000
Hydrogen Sulfide:	0.000	0.000	0.000	0.000
Ethane:	4.396	77.972	0.046	1.176
Propane:	3.289	82.946	0.050	0.906
i-Butane:	0.506	16.493	0.010	0.166
n-Butane:	1.226	40.088	0.025	0.387
i-Pentane:	0.288	11.549	0.007	0.105
n-Pentane:	0.310	12.456	0.008	0.112
Hexanes+C6:	0.283	14.549	0.009	0.116
Ideal Total:	100.000	704.154	0.831	2.968

Gasoline Content

Propane GPM:	0.906
Butane GPM:	0.553
Gasoline GPM:	0.333
26# Gasoline GPM:	0.500

Gross BTU/Real Cu. Ft. (@ 60 deg F, 14.730 PSIA)

Dry: 705.3

Sat: 694.1

(1.000 lbs. water/MMCF)

Gas Compressibility:	0.9983
Real Gravity Calculated:	0.831
H2S PPM:	0

Comments: HORSESHOE OPERATIONS

Analyst: Joseph H. Graves

Horseshoe Operating Inc
C NE 15 17s 40w Greeley co Kansas
Start Test Date: 2002/08/22

FieldNotes
Field Measurements

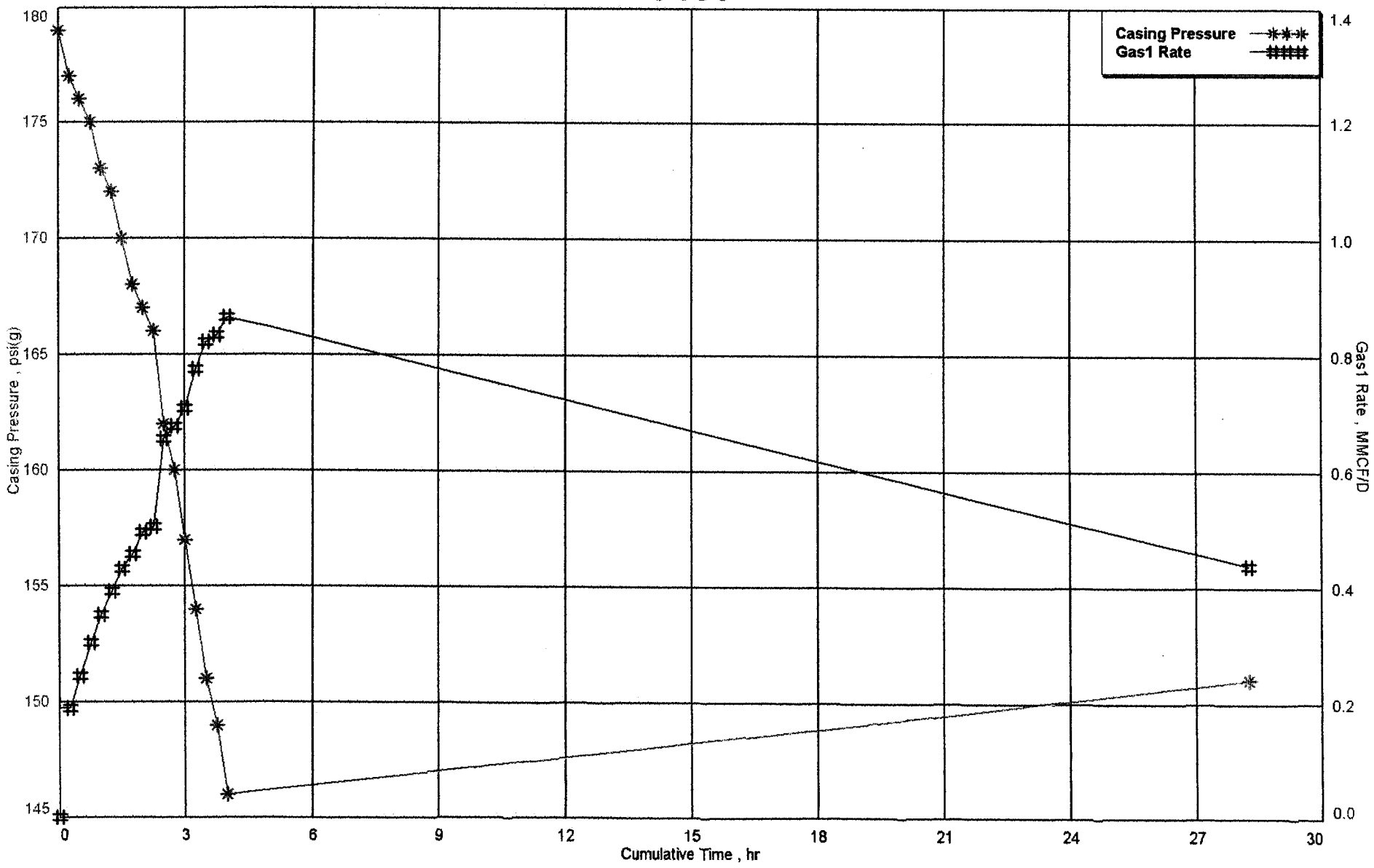
	Date	Clock Time	Comments	Casing Pres	Diff1 Pres	Meter1 Temp	Static1 Pres	Gas1 Rate	Orifice1
	yyyy/mm/dd	hh:mm:ss		psi(g)	in of H2O	°F	psi(g)	MMCF/D	in
1	2002/08/22	09:45:00	Shutin						
2		09:45:00		179.00	0.00	0.00	0.00	0.000	
3		10:00:00		177.00	15.00	70.00	64.00	0.189	
4		10:15:00		176.00	25.00	69.00	64.00	0.244	
5		10:30:00		175.00	38.00	67.00	64.00	0.302	
6		10:45:00	1st point						
7		10:45:00		173.00	50.00	64.00	65.00	0.350	
8		11:00:00		172.00	62.00	64.00	65.00	0.390	
9		11:15:00		170.00	75.00	65.00	65.00	0.429	
10		11:30:00		168.00	82.00	65.00	67.00	0.455	
11		11:45:00	2nd point						
12		11:45:00		167.00	96.00	65.00	67.00	0.493	
13		12:00:00		166.00	100.00	65.00	67.00	0.503	
14		12:15:00		162.00	60.00	65.00	70.00	0.654	1.250
15		12:30:00		160.00	64.00	65.00	70.00	0.675	
16		12:45:00	3rd point						
17		12:45:00		157.00	70.00	65.00	70.00	0.706	
18		13:00:00		154.00	82.00	65.00	72.00	0.774	
19		13:15:00		151.00	90.00	65.00	74.00	0.821	
20		13:30:00		149.00	93.00	68.00	74.00	0.832	
21		13:45:00	4th point						
22		13:45:00		146.00	100.00	68.00	74.00	0.864	
23	2002/08/23	14:00:00	1 point						
24		14:00:00		151.00	29.00	68.00	65.00	0.438	

2002/08/22 09:45:00 To 2002/08/23 14:00:00
Gas 0.087 Cum. 0.087 MMCF

Horseshoe Operating Inc
C NE 15 17s 40w Greeley co Kansas
Start Test Date: 2002/08/22

Wear #2

Plot



Company:	Horseshoe Operating Inc.								
Address:	500 W. Texas Ste 1190 Midland, TX 79701								
Wellname:	Wear #2								
Legal:	C NE			Sec: 15		Twp: 17S		Rge: 40W	
Formation:	Winfield	Field/Pool:	Bradshaw		County: Greeley		St: KS.		
Casing size:	4 1/2"	Feet of:	3020	Wt: 10.5		Meter run size: 2		SI:	179
Tubing Size:	2 3/8"	Feet of:	3001	Wt:		Orif (in): 1"		95%	170
TD:		Pluged back depth:		Packer depth:				90%	161
Type Test:	4 Point	Tap Type:		Gravity:				85%	152
Type Completion:		Producing through:						80%	143

Date	Clk Tim	Tbg Pres	Csg Pres	Diff	Temp	Line Static/Prover	Wat Vol1	Oil Vol	Comment
mm/dd	clock	psi	psi	in of H20	F	PSI	inch	inch	
9.22.02	(CDT) 9:45						7'2"	Tank Gauge on 200 bbl.	
	00		177	15	70	64			
	15		176	25	69	64			
	30		175	38	67	64			
1 pt.	10:45		173	50	64	65			
	00		172	62	64	65			
	15		170	75	65	65			
	30		168	82	65	67			
2 pt	11:45		167	96	65	67			
	00		166	100	65	67			12:00 Changed 1" to 1.25"
	15		162	60	65	70			
	30		160	64	65	70			
3 pt	12:45		157	70	65	70			
	00		154	82	65	72			
	15		151	90	65	78			
	30		149	93	68	74			
4 pt	13:45		146	100	68	74			
9.23.02	14:00		151	29	68	65	7'3 3/4"	Tank Gauge	
									1.67 bbls/in.

Date	Miles	Name	Date	Miles	Name	Date	Miles	Name
9.22	58	Rod						
9.23	58	Rod						