

ONE POINT STABILIZED OPEN FLOW OR DELIVERABILITY TEST

(Rev. 8/98)

TYPE TEST:

- Open Flow
- Deliverability

TEST DATE: 11/10/99

API No. 15-071-20693000

Company Horseshoe Operating Inc		Lease Wear			Well Number 1	
County Greeley	Location C - NE/SE	Section 15	TWP 17s	RNG(E/W) 40w	Acres Attributed 320	
Field Bradshaw	Reservoir Winfield		Gas Gathering Connection Heritage			
Completion Date 8/20/98	Plug Back Total Depth 3023		Packer Set at			
Casing Size 4.500	Weight 10.500	Internal Diameter 4.052	Set at 3022	Perforations 2988	To 3000	
Tubing Size 2.375	Weight 4.700	Internal Diameter 1.995	Set at	Perforations	To	
Type Completion (Describe) Single-Gas	Type Fluid Production Water		Pump Unit or Traveling Plunger? pumping unit			
Producing Thru (Annulus/Tubing) casing	% Carbon Dioxide .042	% Nitrogen 43.597	Gas Gravity- Gg .827			
Vertical Depth (H) 2994	Pressure Taps Flange		Meter Run Size 2.068			
Pressure Buildup: Shut in	11/6/99 @ 8:30am		TAKEN	11/9/99 @ 11:30am		
Well on Line: Started	11/9/99 @ 11:30am		TAKEN	11/10/99 @ 9:00am		

OBSERVED SURFACE DATA

Static/ Dynamic Property	Orifice Size in.	Meter Pressure psig	Pressure Diff. In. H ₂ O	Flowing Temp. t.	WellHead Temp. t.	Casing WellHead Press. (P _w) (P _t) (P _c)		Tubing WellHead Press. (P _w) (P _t) (P _c)		Duration (Hours)	Liquid Prod. Barrels
						psig	psia	psig	psia		
Shut-in						169	182			75.0	
Flow	1.250	56.0	27.00	45		108	121			21.5	3.0

FLOW STREAM ATTRIBUTES

COEFFICIENT (F _b) Mcf/d	(METER) 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 Mcf/d	GOR	G _m
8.330	69.4	43.29	1.0996	1.0147	1.0054	404	120799.6	.860

(OPEN FLOW)(DELIVERABILITY) CALCULATIONS

$(P_c)^2 = 33.3$ $(P_w)^2 = 15.2$ 24.7 % $(P_c - 14.4) + 14.4 =$ $(P_a)^2 = 0.207$
 $(P_d)^2 = 2.03$

$(P_c)^2 - (P_a)^2$ 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 Mcf/d
33.09	18.07	1.831	.2627	.612	.1609	1.448	585
31.24	18.07	1.729	.2378	.612	.1456	1.398	565

OPEN FLOW 585 Mcfd @ 14.65 psia DELIVERABILITY 565 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 herein and that said report is true and correct. Executed this the 22 day of Nov, 19 99

Witness (if any)

For Commission

Original - Wichita
Copy - Dodge
Copy - Horseshoe Operating Inc

For Company

Checked by

KANSAS CORPORATION COMMISSION
ONE POINT STABILIZED OPEN FLOW OR DELIVERABILITY TEST

FORM G-2
 (Rev.8/98)

TYPE TEST:

- Open Flow
 Deliverability

TEST DATE: 02-02-01 API No. 15-071-20693000

Company Horsehoe Operating Inc		Lease Wear		Well Number 1	
County Greeley	Location C - NE/SE	Section 15	TWP 17s	RNG (E/W) 40w	Acres Attributed 320
Field Bradshaw	Reservoir Winfield	Gas Gathering Connection Heritage			
Completion Date 8/20/98	Plug Back Total Depth 3023	Packer Set at			
Casing Size 4.500	Weight 10.500	Internal Diameter 4.052	Set at 3022	Perforations 2988	To 3000
Tubing Size 2.375	Weight 4.700	Internal Diameter 1.995	Set at	Perforations	To
Type Completion (Describe) Single-Gas	Type Fluid Production Water	Pump Unit or Traveling Plunger? pumping unit			
Producing Thru (Annulus/Tubing) Casing	% Carbon Dioxide .042	% Nitrogen 43.597	Gas Gravity- Gg .827		
Vertical Depth (H) 2994	Pressure Taps Flange	Meter Run Size 2.068			
Pressure Buildup: Shut in	1-29-01 @ 8:00	TAKEN	2-1-01 @ 9:00		
Well on Line: Started	2-1-01 @ 9:00	TAKEN	2-2-01 @ 8:00		

OBSERVED SURFACE DATA

Static/ Dynamic Property	Orifice Size in.	Meter Pressure psig	Pressure Diff. In. H ₂ O	Flowing Temp. t.	WellHead Temp. t.	Casing WellHead Press. (P _w) (P _t) (P _c)		Tubing WellHead Press. (P _w) (P _t) (P _c)		Duration (Hours)	Liquid Prod. Barrels
						psig	psia	psig	psia		
Shut-in						191	204			97.0	
Flow	1.000	55.0	22.00	90		171	184			23.0	

FLOW STREAM ATTRIBUTES

COEFFICIENT (F _b) Mcf/d	(METER) 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 Mcf/d	GOR	G _m
5.070	68.4	38.79	1.0996	.9723	1.0040	211		.827

(OPEN FLOW)(DELIVERABILITY) CALCULATIONS

(P_c)² = 41.8 (P_w)² = 34.1 19.6 % (P_c - 14.4) + 14.4 = (P_a)² = 0.207
 (P_d)² = 1.60

$(P_c)^2 - (P_a)^2$ or $(P_c)^2 - (P_d)^2$	$(P_c)^2 - (P_w)^2$	$\frac{(P_c)^2 - (P_a)^2}{(P_c)^2 - (P_d)^2}$ or $\frac{(P_c)^2 - (P_a)^2}{(P_c)^2 - (P_w)^2}$	LOG []	Backpressure Curve Slope "n" ---- or ---- Assigned Standard Slope	n x LOG []	Antilog	Open Flow Deliverability = R x Antilog Mcf/d
41.60	7.65	5.439	.7356	.612	.4502	2.819	595
40.18	7.65	5.254	.7205	.612	.4409	2.760	582

OPEN FLOW 595 Mcfd @ 14.65 psia DELIVERABILITY 582 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 herein and that said report is true and correct. Executed this the 13 day of Feb, 2001

 Witness (if any)

 For Company

 For Commission

 Checked by

I declare under penalty or perjury under the laws of the state of Kansas that I am authorized to request exempt status under rule K.A.R. 82-3-304 on behalf of the operator Horsehoe Operating Inc and that the foregoing information and statements contained on this application form are true and correct to the best of my knowledge and belief based upon gas production records and records of equipment installation and/or of type completion or upon use of the gas well herein named.

I hereby request a permanent exemption from open flow testing for the Wear gas well on the grounds that said well:

(check one)

- is a coalbed methane producer
- is cycled on plunger lift due to water
- is a source of natural gas for injection into an oil reservoir undergoing ER
- is on vacuum at the present time; KCC approval Docket No. _____
- is incapable of producing at a daily rate in excess of 150 mcf/D

Date: _____

Signature: _____

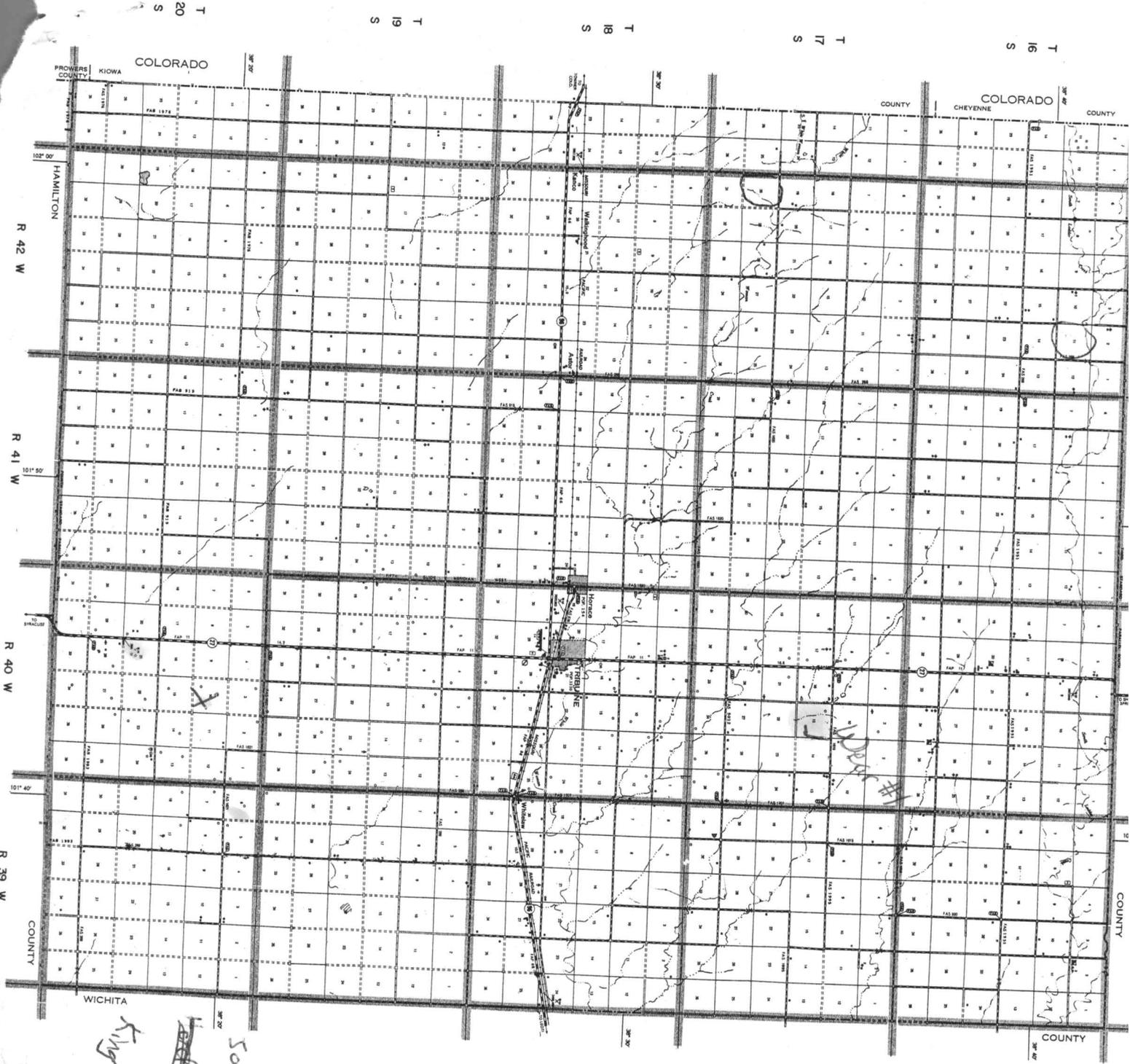
Title: _____

Instructions:

All active gas wells must have at least an original G-2 form on file with the conservation division. If a gas well meets the eligibility criteria set out in KCC regulation K.A.R. 82-3-304, the operator may complete the statement provided above in order to obtain a testing exemption.

At some point during the succeeding calendar year, wellhead shut-in pressure shall be measured after a minimum of 24 hours shut-in/buildup time and shall be reported on the front side of this form under "observed surface data." Shut-in pressure shall thereafter be reported yearly in the same manner.

The G-2 form conveying the newest shut-in pressure reading shall be filed with the Wichita office no later than thirty (30) days after the taking of the pressure reading. The form must be signed and dated on the front side as though it was a verified report of test results.



Surveying and Mapping
S/I

TOPOGRAPHIC
OKLAHOMA C17
PH. (405) 8

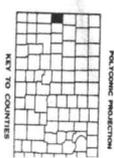
TOPOGRAPHIC I
MIDLAND, TEX.
PH. (915) 687

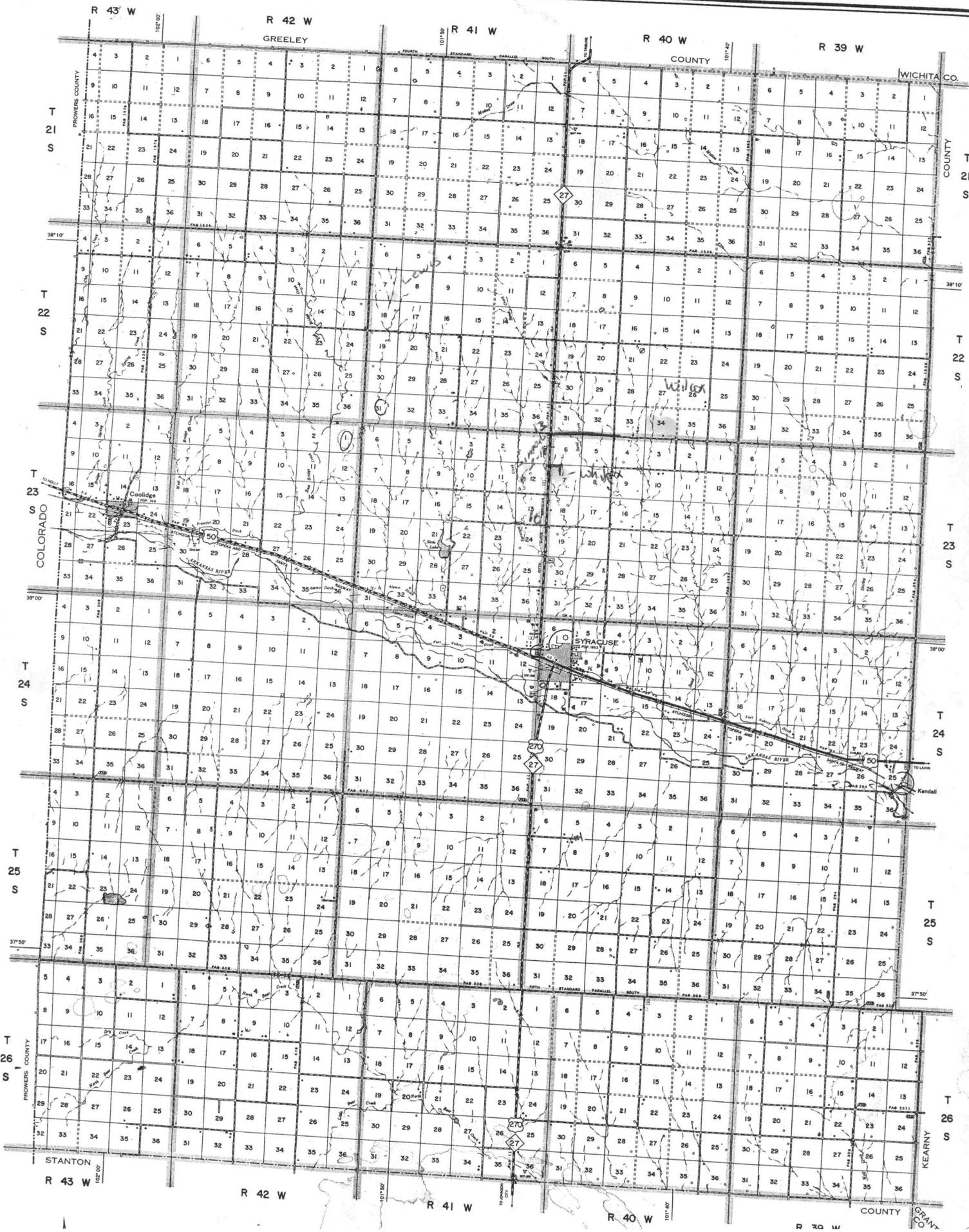
TOPOGRAPHIC I
PAMPA, TEXAS
PH. (806) 665-

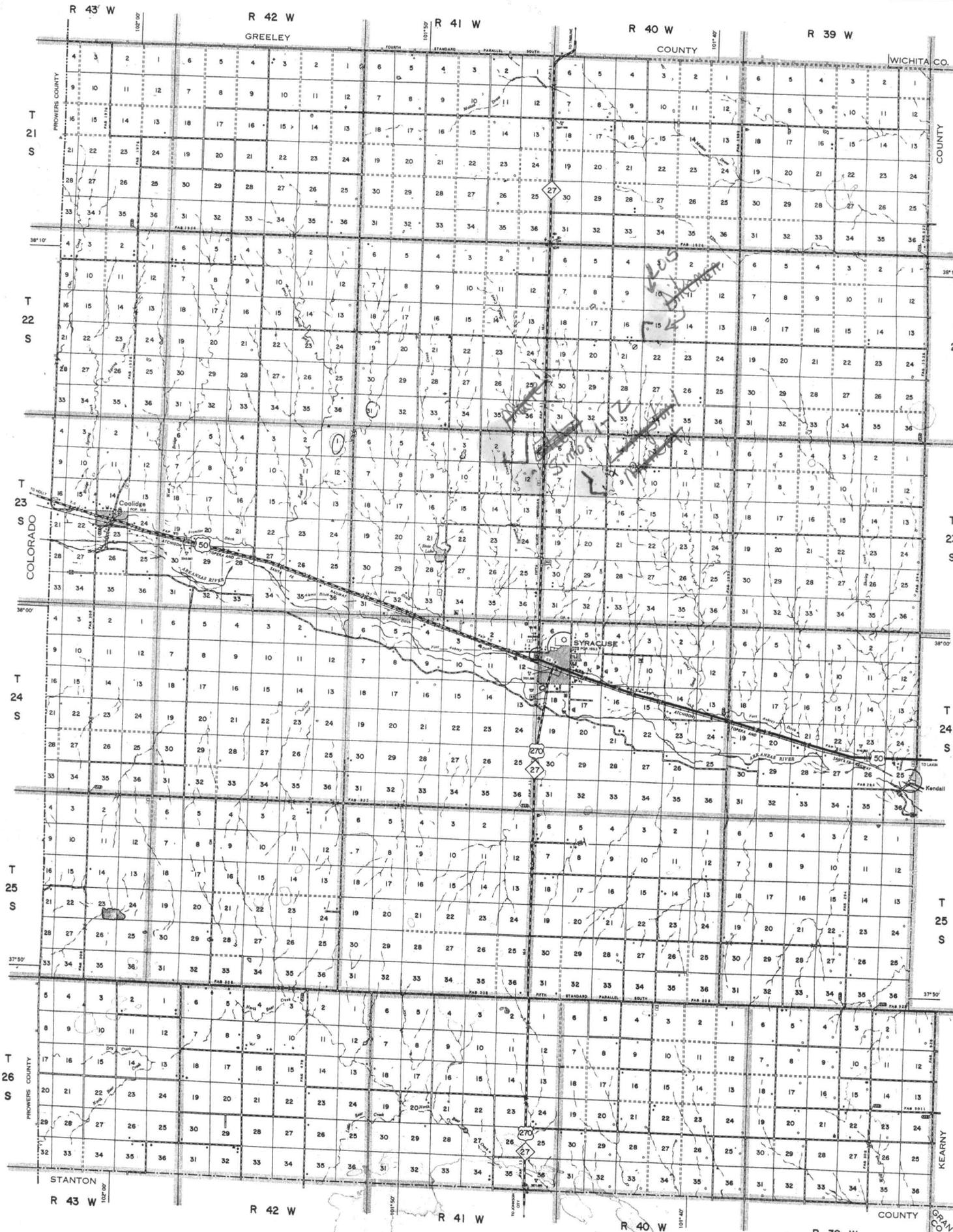
TOPOGRAPHIC I
LIBERAL, KANS.
PH. (316) 624-1

GENERAL HIGHWAY
GRELLEY C
KANSAS

PREPARED BY THE
KANSAS DEPARTMENT OF TRANSPORTATION
PLANNING AND DEVELOPMENT
IN COOPERATION WITH THE
U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION







R 43 W

R 42 W
GREELEY

R 41 W

R 40 W
COUNTY

R 39 W
WICHITA CO.

T 21 S

T 21 S

T 22 S

T 22 S

T 23 S
COLORADO

T 23 S

T 24 S

T 24 S

T 25 S

T 25 S

T 26 S
PROWERS COUNTY

T 26 S
KEARNY

STANTON
R 43 W

R 42 W

R 41 W

R 40 W
COUNTY

R 39 W
GRANT CO.