

# KANSAS CORPORATION COMMISSION

## ONE POINT STABILIZED OPEN FLOW OR DELIVERABILITY TEST

Type Test:

- Open Flow  
 Deliverability

(See Instructions on Reverse Side)

Test Date: July, 2004

API No. 15 023-20550-0000

Company <u>NOBLE ENERGY, Inc</u>		Lease <u>Zweygardt</u>		13-33		Well Number	
County <u>Cherokee</u>	Location <u>NNSW</u>	Section <u>33</u>	TWP <u>3 S</u>	RNG (E/W) <u>4/W</u>	Acres Attributed <u>40</u>		
Field <u>Cherry Creek</u>	Reservoir <u>Niobrara</u>	Gas Gathering Connection <u>Bitter Creek</u>					
Completion Date <u>6/1/04</u>	Plug Back Total Depth <u>1513</u>	Packer Set at <u>N/A</u>					
Casing Size <u>4.5</u>	Weight <u>10.5</u>	Internal Diameter	Set at	Perforations	To	<u>1376 1410</u>	
Tubing Size <u>N/A</u>	Weight	Internal Diameter	Set at	Perforations	To		
Type Completion (Describe) <u>Gas</u>	Type Fluid Production <u>Gas</u>	Pump Unit or Traveling Plunger? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>					
Producing Thru (Annulus / Tubing) <u>Casing</u>	% Carbon Dioxide <u>0.2</u>	% Nitrogen <u>4.6</u>	Gas Gravity - G <sub>g</sub> <u>0.6</u>				
Vertical Depth(H)	Pressure Taps	(Meter Run) (Prover) Size <u>2" meter run</u>					
Pressure Buildup: Shut in <u>6/2</u> 20 <u>04</u> at <u>7</u> (AM) (PM) Taken <u>6/9</u> 20 <u>04</u> at <u>7</u> (AM) (PM)							
Well on Line: Started _____ 20____ at _____ (AM) (PM) Taken _____ 20____ at _____ (AM) (PM)							

### OBSERVED SURFACE DATA

Duration of Shut-in 154 Hours

Static / Dynamic Property	Orifice Size (inches)	Circle one: Meter Prover Pressure psig (Pm)	Pressure Differential in Inches H <sub>2</sub> O	Flowing Temperature t	Well Head Temperature t	Casing Wellhead Pressure (P <sub>w</sub> ) or (P <sub>i</sub> ) or (P <sub>c</sub> )		Tubing Wellhead Pressure (P <sub>w</sub> ) or (P <sub>i</sub> ) or (P <sub>c</sub> )		Duration (Hours)	Liquid Produced (Barrels)
						psig	psia	psig	psia		
Shut-In							<u>255</u>				
Flow	<u>0.50</u>	<u>154</u>	<u>3.75</u>	<u>74</u>	<u>74</u>				<u>154</u>	<u>744</u>	<u>0</u>

### FLOW STREAM ATTRIBUTES

Plate Coefficient (F <sub>s</sub> ) (F <sub>p</sub> ) Mcfd	Circle one: Meter or Prover Pressure psia	Press Extension $\sqrt{P_m \times h}$	Gravity Factor F <sub>g</sub>	Flowing Temperature Factor F <sub>t</sub>	Deviation Factor F <sub>pv</sub>	Metered Flow R (Mcfd)	GOR (Cubic Feet/ Barrel)	Flowing Fluid Gravity G <sub>m</sub>

### (OPEN FLOW) (DELIVERABILITY) CALCULATIONS

(P<sub>c</sub>)<sup>2</sup> = \_\_\_\_\_ : (P<sub>w</sub>)<sup>2</sup> = \_\_\_\_\_ : P<sub>d</sub> = \_\_\_\_\_ % (P<sub>c</sub> - 14.4) + 14.4 = \_\_\_\_\_ : (P<sub>s</sub>)<sup>2</sup> = 0.207  
(P<sub>d</sub>)<sup>2</sup> = \_\_\_\_\_

(P <sub>c</sub> ) <sup>2</sup> - (P <sub>s</sub> ) <sup>2</sup> or (P <sub>c</sub> ) <sup>2</sup> - (P <sub>d</sub> ) <sup>2</sup>	(P <sub>c</sub> ) <sup>2</sup> - (P <sub>w</sub> ) <sup>2</sup>	Choose formula 1 or 2: 1. P <sub>c</sub> <sup>2</sup> - P <sub>d</sub> <sup>2</sup> 2. P <sub>c</sub> <sup>2</sup> - P <sub>d</sub> <sup>2</sup> divided by: P <sub>c</sub> <sup>2</sup> - P <sub>w</sub> <sup>2</sup>	LOG of formula 1. or 2. and divide by: $\left[ \frac{P_c^2 - P_w^2}{P_c^2 - P_d^2} \right]$	Backpressure Curve Slope = "n" Assigned Standard Slope	n x LOG $\left[ \right]$	Antilog	Open Flow Deliverability Equals R x Antilog (Mcfd)
				<u>0.88</u>			
<u>SEE ATTACHED SHEET FOR JULY, 2004</u>							

Open Flow 58 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 13 day of August, 2004.

RECEIVED Scott Steink  
KANSAS CORPORATION COMMISSION For Company

Witness (if any) \_\_\_\_\_ For Commission \_\_\_\_\_ Checked by \_\_\_\_\_

**AUG 16 2004**

I declare under penalty of 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 Noble Energy, Inc. and that the foregoing pressure information and statements contained on this application form are true and correct to the best of my knowledge and belief based upon available production summaries and lease records of equipment installation and/or upon type of completion or upon use being made of the gas well herein named.

I hereby request a one-year exemption from open flow testing for the Zweygardt 13-33 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 not capable of producing at a daily rate in excess of 250 mcf/D

I further agree to supply to the best of my ability any and all supporting documents deemed by Commission staff as necessary to corroborate this claim for exemption from testing.

Date: 8/13/04

Signature: [Handwritten Signature]  
Title: ENGINEER

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AUG 16 2004  
CONSERVATION DIVISION  
WICHITA, KS

**Instructions:** If a gas well meets one of 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 claim exempt status for the gas well.

At some point during the current calendar year, wellhead shut-in pressure shall have been 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 for so long as the gas well continues to meet the eligibility criterion or until the claim of eligibility for exemption **IS** denied.

The G-2 form conveying the newest shut-in pressure reading shall be filed with the Wichita office no later than December 31 of the year for which it's intended to acquire exempt status for the subject well. The form must be signed and dated on the front side as though it was a verified report of annual test results.

# ZWEYGARDT 13-33

JULY 2004

Date	Time	Total Flow	Units	Flow Time	Units	Flow Rate	Units	DP Avg	Units	SP Avg	Units	PT Avg	Units	Sequence
04/07/01	07:00:01	45,004.90	SCF	24:00:00	hrs	45,004.90	SCFD	4.77	InH2O	154.08	psi	68.05	DegF	26
04/07/02	07:00:01	44,261.70	SCF	24:00:00	hrs	44,261.70	SCFD	4.55	InH2O	154.23	psi	60.91	DegF	27
04/07/03	07:00:01	42,479.60	SCF	24:00:00	hrs	42,479.60	SCFD	4.26	InH2O	154.62	psi	71.34	DegF	28
04/07/04	07:00:01	41,416.70	SCF	24:00:00	hrs	41,416.70	SCFD	4.06	InH2O	154.75	psi	73.68	DegF	29
04/07/05	07:00:01	41,722.20	SCF	24:00:00	hrs	41,722.20	SCFD	4.10	InH2O	154.47	psi	69.98	DegF	30
04/07/06	07:00:01	41,475.60	SCF	24:00:00	hrs	41,475.60	SCFD	4.05	InH2O	154.30	psi	68.89	DegF	31
04/07/07	07:00:01	41,336.10	SCF	24:00:00	hrs	41,336.10	SCFD	4.04	InH2O	154.34	psi	71.40	DegF	32
04/07/08	07:00:01	40,366.90	SCF	24:00:00	hrs	40,366.90	SCFD	3.91	InH2O	154.91	psi	80.24	DegF	33
04/07/09	07:00:01	40,380.20	SCF	23:59:58	hrs	40,381.10	SCFD	3.91	InH2O	154.63	psi	79.56	DegF	34
04/07/10	07:00:01	42,003.20	SCF	24:00:00	hrs	42,003.20	SCFD	4.25	InH2O	153.80	psi	79.13	DegF	35
04/07/11	07:00:02	42,192.50	SCF	24:00:00	hrs	42,192.50	SCFD	4.29	InH2O	153.36	psi	77.52	DegF	36
04/07/12	07:00:01	42,367.90	SCF	24:00:00	hrs	42,367.90	SCFD	4.33	InH2O	153.39	psi	78.76	DegF	37
04/07/13	07:00:01	41,781.50	SCF	24:00:00	hrs	41,781.50	SCFD	4.25	InH2O	153.70	psi	84.18	DegF	38
04/07/14	07:00:02	31,824.70	SCF	23:59:58	hrs	31,825.40	SCFD	2.46	InH2O	153.83	psi	86.59	DegF	39
04/07/15	07:00:01	34,087.90	SCF	24:00:03	hrs	34,086.80	SCFD	2.82	InH2O	153.22	psi	82.25	DegF	40
04/07/16	07:00:01	34,546.20	SCF	23:59:59	hrs	34,546.60	SCFD	2.87	InH2O	153.91	psi	78.93	DegF	41
04/07/17	07:00:01	35,611.90	SCF	24:00:00	hrs	35,611.90	SCFD	3.00	InH2O	154.04	psi	70.71	DegF	42
04/07/18	07:00:02	34,943.90	SCF	24:00:00	hrs	34,943.90	SCFD	2.92	InH2O	154.22	psi	76.91	DegF	43
04/07/19	07:00:01	34,324.30	SCF	24:00:00	hrs	34,324.30	SCFD	2.83	InH2O	154.09	psi	80.16	DegF	44
04/07/20	07:00:01	33,653.30	SCF	24:00:00	hrs	33,653.30	SCFD	2.74	InH2O	154.18	psi	84.28	DegF	45
04/07/21	07:00:01	33,314.10	SCF	24:00:00	hrs	33,314.10	SCFD	2.69	InH2O	154.67	psi	87.07	DegF	46
04/07/22	07:00:01	34,322.10	SCF	24:00:00	hrs	34,322.10	SCFD	2.83	InH2O	154.49	psi	80.92	DegF	47
04/07/23	07:00:01	37,390.00	SCF	24:00:00	hrs	37,390.00	SCFD	3.32	InH2O	152.94	psi	69.74	DegF	48
04/07/24	07:00:02	40,602.60	SCF	24:00:00	hrs	40,602.60	SCFD	3.82	InH2O	152.55	psi	56.18	DegF	49
04/07/25	07:00:01	41,094.40	SCF	24:00:00	hrs	41,094.40	SCFD	3.92	InH2O	152.53	psi	56.79	DegF	50
04/07/26	07:00:01	41,178.10	SCF	24:00:00	hrs	41,178.10	SCFD	3.98	InH2O	152.39	psi	61.81	DegF	51
04/07/27	07:00:02	41,145.40	SCF	24:00:00	hrs	41,145.40	SCFD	4.03	InH2O	152.10	psi	67.79	DegF	52
04/07/28	07:00:01	42,281.70	SCF	24:00:00	hrs	42,281.70	SCFD	4.31	InH2O	151.88	psi	73.62	DegF	53
04/07/29	07:00:01	42,994.60	SCF	24:00:00	hrs	42,994.60	SCFD	4.42	InH2O	151.67	psi	68.40	DegF	54
04/07/30	07:00:01	41,969.40	SCF	24:00:00	hrs	41,969.40	SCFD	4.19	InH2O	153.26	psi	70.72	DegF	55
04/07/31	07:00:01	39,716.10	SCF	24:00:00	hrs	39,716.10	SCFD	3.75	InH2O	154.35	psi	74.43	DegF	56
<b>Flow Grand Total:</b>		<b>1,221.79</b>	<b>MCF</b>											

AVG = 39.4 MCFPD

$P_c (6/9/4) = 242 \text{ psig}$   
 $= 255 \text{ psia}$

$P_w = 154 \text{ psia}$

$$Q = C(P_1^n - P_2^n)^{0.88}$$

755

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 WICHITA, KS

# ZWEYGARDT 13-33

JUNE 2004

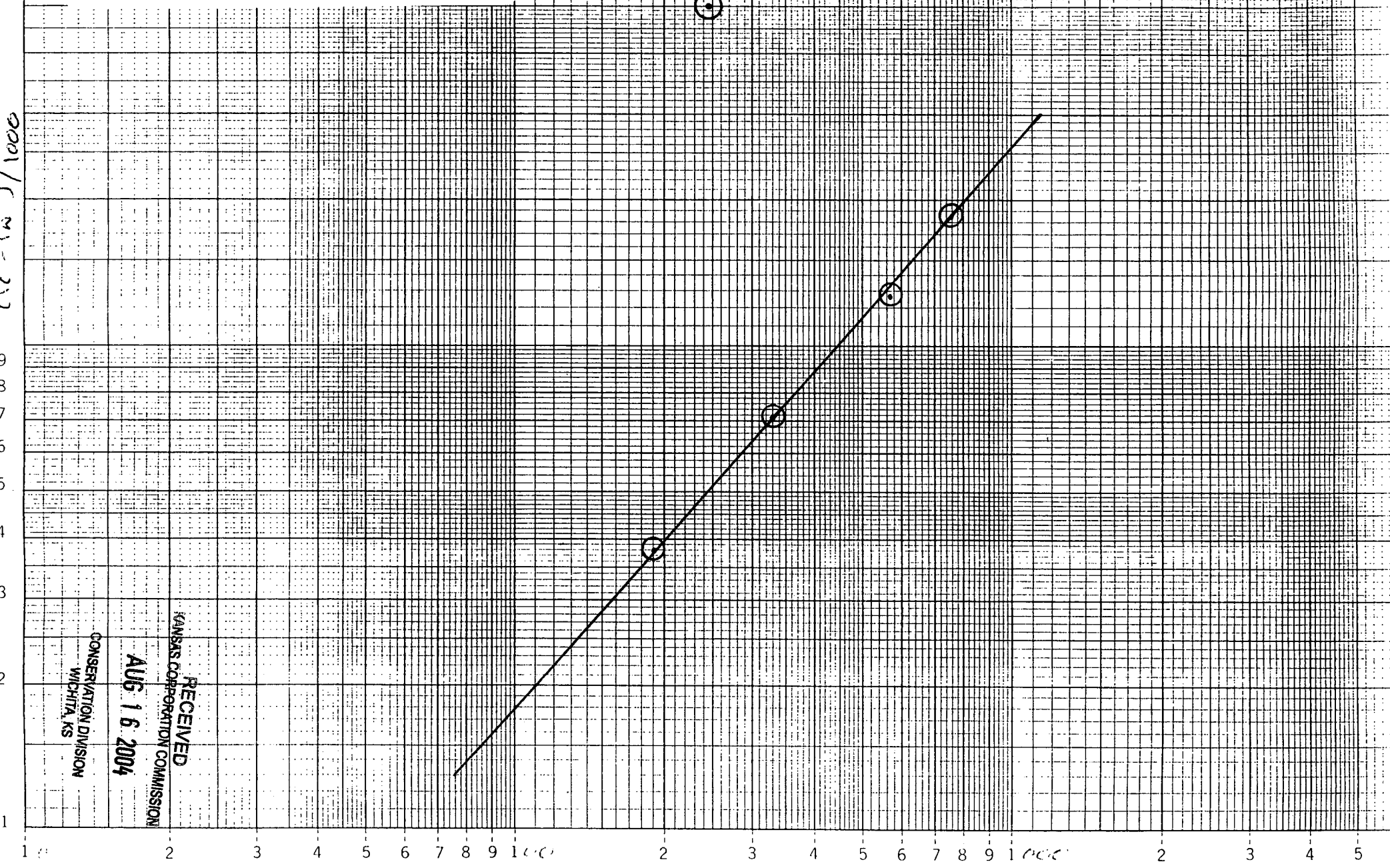
Date	Time	Total Flow	Units	Flow Time	Units	Flow Rate	Units	DP Avg	Units	SP Avg	Units	PT Avg	Units	Sequence	
04/06/07	10:22:02	0.00	SCF	00:00:00	hrs	0.00	SCFH	0.00	InH2O	40.42	psi	84.52	DegF	1	
04/06/07	10:22:28	0.00	SCF	00:00:00	hrs	0.00	SCFH	0.00	InH2O	40.46	psi	84.72	DegF	2	
04/06/08	07:00:01	8,953.42	SCF	11:35:50	hrs	18,528.80	SCFD	11.60	InH2O	-0.17	psi	100.62	DegF	3	
04/06/09	07:00:01	36.05	SCF	00:13:54	hrs	3,734.79	SCFD	0.45	InH2O	0.08	psi	75.65	DegF	4	
04/06/10	07:00:01	36,358.50	SCF	13:06:35	hrs	66,561.60	SCFD	11.03	InH2O	144.26	psi	63.03	DegF	5	
04/06/11	07:00:01	52,004.60	SCF	24:00:00	hrs	52,004.60	SCFD	6.65	InH2O	149.41	psi	71.55	DegF	6	
04/06/12	07:00:02	39,625.40	SCF	24:00:01	hrs	39,625.00	SCFD	3.75	InH2O	153.45	psi	73.27	DegF	7	
04/06/13	07:00:01	39,655.50	SCF	23:59:59	hrs	39,656.00	SCFD	3.75	InH2O	153.79	psi	74.75	DegF	8	
04/06/14	07:00:01	39,332.70	SCF	24:00:00	hrs	39,332.70	SCFD	3.72	InH2O	153.96	psi	78.41	DegF	9	
04/06/15	07:00:01	39,216.30	SCF	24:00:00	hrs	39,216.30	SCFD	3.66	InH2O	154.45	psi	75.28	DegF	10	
04/06/16	07:00:02	32,769.80	SCF	24:00:01	hrs	32,769.40	SCFD	2.58	InH2O	152.47	psi	74.16	DegF	11	
04/06/17	07:00:01	46,429.00	SCF	23:59:59	hrs	46,429.50	SCFD	5.16	InH2O	148.78	psi	59.11	DegF	12	
04/06/18	07:00:01	49,139.00	SCF	24:00:00	hrs	49,139.00	SCFD	5.78	InH2O	148.12	psi	57.09	DegF	13	
04/06/19	07:00:01	64,858.00	SCF	24:00:00	hrs	64,858.00	SCFD	9.76	InH2O	150.45	psi	48.81	DegF	14	
04/06/20	07:00:01	62,728.50	SCF	24:00:00	hrs	62,728.50	SCFD	9.22	InH2O	150.66	psi	54.42	DegF	15	
04/06/21	07:00:01	57,925.60	SCF	24:00:00	hrs	57,925.60	SCFD	7.98	InH2O	151.27	psi	63.71	DegF	16	
04/06/22	07:00:02	56,646.70	SCF	24:00:01	hrs	56,646.10	SCFD	7.51	InH2O	151.11	psi	55.15	DegF	17	
04/06/23	07:00:01	55,732.00	SCF	23:59:59	hrs	55,732.70	SCFD	7.48	InH2O	150.22	psi	66.53	DegF	18	
04/06/24	07:00:01	55,070.00	SCF	24:00:00	hrs	55,070.00	SCFD	7.39	InH2O	150.29	psi	73.13	DegF	19	
04/06/25	07:00:02	55,616.40	SCF	24:00:00	hrs	55,616.40	SCFD	7.44	InH2O	149.93	psi	65.16	DegF	20	
04/06/26	07:00:01	54,662.00	SCF	24:00:00	hrs	54,662.00	SCFD	7.16	InH2O	151.07	psi	66.66	DegF	21	
04/06/27	07:00:01	54,078.70	SCF	24:00:00	hrs	54,078.70	SCFD	6.97	InH2O	151.44	psi	65.55	DegF	22	
04/06/28	07:00:01	53,859.20	SCF	24:00:00	hrs	53,859.20	SCFD	6.85	InH2O	151.59	psi	60.88	DegF	23	
04/06/29	07:00:02	53,049.40	SCF	23:59:58	hrs	53,050.70	SCFD	6.75	InH2O	151.32	psi	68.37	DegF	24	
04/06/30	07:00:01	49,153.10	SCF	24:00:02	hrs	49,151.90	SCFD	5.77	InH2O	153.51	psi	72.44	DegF	25	
<b>Flow Grand Total:</b>		<b>1,056.90</b>	<b>MCF</b>												

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NOBLE ENERGY, INC.  
ZWEYGARDT 13-33 TEST 6/1/04

"n" = 0.88    "θ" = 48.6°

$(P_c^2 - P_w^2) / 1000$



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AUG 16 2004  
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WICHITA, KS

# MULTIPOINT BACK PRESSURE TEST

Test Type ;	INITIAL	State ;	Kansas	Test Date:	06/01/04
Company ;	Noble Energy Inc.	Lease ;	Zweggart	Well No. ;	13 33
County ;	Cheyenne	Location ;	NWSW/4,SEC.33-T3S-R41W	Acres ;	
Field ;	Cherry Creek	Reservoir ;	Niobrara	Pipeline Conn.	None
Completion Date ;		PBTD ;	1513	Packer Set ;	
Casing Size ;	4 1/2" Wt ; 10.5#	Set @ ;	1556	Perfs. ;	N/A
Tubing Size ;	None Wt ;	Set @ ;		Perfs. ;	N/A
Type of Completion ;	Single Gas	Type Fluid Prod ;	None		
Producing Thru ; Casing		Reservoir Temp. F ;	-	Bar. Press. ;	13 PSI
Gas Gravity ; .8 (est)		% CO2 ;	-- % N2 ; --	Liquid API Grav	N/A
Vertical Depth ;	1412	Type Meter Conn. ;	None	Prover Size ;	2"

Remarks: Used 2" critical flow prover & dead weight tester.

### OBSERVED DATA

Rate No.	Orifice Size in.	Prover Press. psig	Flowing Temp. deg. F	Casing Wellhead Pressure		Shut-In Hrs.:	
				psig	psia	Duration hrs.	Liquid Prod. bbls.
Shut-in	blank	230	--	230	243	0	0
1	3/16	222	68	222	235	1	0
2	1/4	215	68	215	228	1	0
3	11/32	202	67	202	215	1	0
4	13/32	188	67	188	201	1	0
5	11/32	80	70	80	93	24	0

### RATE OF FLOW CALCULATIONS

Rate No.	Coefficient mcf/d	Prover Press. psia	Gravity Factor Fg	Temp. Factor Ft	Deviation Factor Fpv	Rate of Flow Q mcf/d
1	0.6237	235	1.281	0.9924	1.0189	191
2	1.1150	228	1.291	0.9824	1.0164	331
3	2.0350	215	1.291	0.9933	1.0154	570
4	2.9088	201	1.291	0.9933	1.0144	760
5	2.0350	83	1.291	0.9905	1.0088	244

### PRESSURE CALCULATIONS

Rate No.	Pc psia	Pw psia	Pc^2 /1000	Pw^2 /1000	Pc^2-Pw^2 /1000	Q mcf/d	Shut-in %
1	243	235	59.0	55.2	3.8	191	96.52
2	243	228	59.0	52.0	7.1	331	93.48
3	243	215	59.0	46.2	12.8	570	87.83
4	243	201	59.0	40.4	18.6	760	81.74
5	243	83	59.0	8.8	50.4	244	34.78

INDICATED WELLHEAD OPEN FLOW = 279.31 Mcfd      "n" = 0.88

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 3rd day of June, 2004.

Wayne Mahon                      For Excell Drilling Co.

Signed: Wayne Mahon                      Title: Field Technician

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AUG 16 2004  
CONSERVATION DIVISION  
WICHITA, KS

David Ledet

08/12/2004 04:05 PM

To: Scott Steinke/Production/Houston\_Onshore/Samedan@Samedan  
cc:  
Subject: one-pt test for KS wells

Scott,

Here is the pressure info on the 4 KS wells in question:

Zweygardt 13-33    SIFBU on 6-2-04    SICP on 6-9-04 at 242 psi    Turned on to sales 6-10-04 , -  
.500 orifice plate -

Production for 6-11-04 = 52 mcf  
"                    6-12-04 = 52 mcf  
"                    6-13-04 = 39 mcf

Zweygardt 22-5    SIFBU on 6-3-04    SICP on 6-7-04 at 272 psi    Turned on to sales 6-7-04 -  
.500 orifice plate

Production for 6-8-04 = 29 mcf  
"                    6-9-04 = 57 mcf  
"                    6-10-04 = 57 mcf  
"                    6-11-04 = 57 mcf

Zweygardt 31-5    SIFBU on 6-1-04    SICP on 6-7-04 at 265 psi    Turned on to sales 6-7-04 -  
.500 orifice plate

Production for 6-8-04 = 31 mcf  
"                    6-9-04 = 31 mcf  
"                    6-10-04 = 55 mcf  
"                    6-11-04 = 46 mcf

Zweygardt 13-32    SIFBU on 6-4-04    SICP on 6-9-04 at 262 psi    Turned on to sales on 6-9-04 -  
.500 orifice plate

Production for 6-10-04 = 35 mcf  
"                    6-11-04 = 54 mcf  
"                    6-12-04 = 54 mcf  
"                    6-13-04 = 54 mcf

If you need anything else, please call

David

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AUG 16 2004  
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WICHITA, KS

# KANSAS CORPORATION COMMISSION ONE POINT STABILIZED OPEN FLOW OR DELIVERABILITY TEST

Type Test:

- Open Flow  
 Deliverability

(See Instructions on Reverse Side)

Test Date: July, 2004

API No. 15 023-20550

Company <u>NOBLE ENERGY, INC</u>		Lease <u>Zweygardt 13-33</u>		Well Number	
County <u>Cheyenne</u>	Location <u>NNSW</u>	Section <u>33</u>	TWP <u>3 S</u>	RNG (E/W) <u>41W</u>	Acres Attributed <u>40</u>
Field <u>Cherry Creek</u>		Reservoir <u>Niobrara</u>	Gas Gathering Connection <u>Bitter Creek</u>		
Completion Date <u>6/1/04</u>		Plug Back Total Depth <u>1513</u>	Packer Set at <u>N/A</u>		
Casing Size <u>4.5</u>	Weight <u>10.5</u>	Internal Diameter	Set at	Perforations	To <u>1376</u> To <u>1410</u>
Tubing Size <u>N/A</u>	Weight	Internal Diameter	Set at	Perforations	To
Type Completion (Describe) <u>Gas</u>		Type Fluid Production <u>Gas</u>	Pump Unit or Traveling Plunger? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Producing Thru (Annulus / Tubing) <u>Casing</u>		% Carbon Dioxide <u>0.2</u>	% Nitrogen <u>4.6</u>	Gas Gravity - G <sub>g</sub> <u>0.6</u>	
Vertical Depth(H)		Pressure Taps		(Meter Run) (Prover) Size <u>2" meter run</u>	
Pressure Buildup: Shut in <u>6/2</u> 20 <u>04</u> at <u>7</u> (AM) (PM) Taken <u>6/9</u> 20 <u>04</u> at <u>7</u> (AM) (PM)					
Well on Line: Started _____ 20____ at _____ (AM) (PM) Taken _____ 20____ at _____ (AM) (PM)					

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### OBSERVED SURFACE DATA

Duration of Shut-in 154 Hours

Static / Dynamic Property	Orifice Size (inches)	Circle one: Meter Prover Pressure psig (Pm)	Pressure Differential in Inches H <sub>2</sub> O	Flowing Temperature t	Well Head Temperature t	Casing Wellhead Pressure (P <sub>w</sub> ) or (P <sub>t</sub> ) or (P <sub>c</sub> )		Tubing Wellhead Pressure (P <sub>w</sub> ) or (P <sub>t</sub> ) or (P <sub>c</sub> )		Duration (Hours)	Liquid Produced (Barrels)
						psig	psia	psig	psia		
Shut-In											
Flow	<u>0.50</u>	<u>154</u>	<u>3.75</u>	<u>74</u>	<u>74</u>		<u>255</u>		<u>154</u>	<u>744</u>	<u>0</u>

### FLOW STREAM ATTRIBUTES

Plate Coefficient (F <sub>b</sub> ) (F <sub>v</sub> ) Mcfd	Circle one: Meter or Prover Pressure psia	Press Extension $\sqrt{P_m \times h}$	Gravity Factor F <sub>g</sub>	Flowing Temperature Factor F <sub>11</sub>	Deviation Factor F <sub>pv</sub>	Metered Flow R (Mcf/d)	GOR (Cubic Feet/ Barrel)	Flowing Fluid Gravity G <sub>m</sub>

### (OPEN FLOW) (DELIVERABILITY) CALCULATIONS

(P<sub>c</sub>)<sup>2</sup> = \_\_\_\_\_ : (P<sub>w</sub>)<sup>2</sup> = \_\_\_\_\_ : P<sub>d</sub> = \_\_\_\_\_ % (P<sub>c</sub> - 14.4) + 14.4 = \_\_\_\_\_ : (P<sub>a</sub>)<sup>2</sup> = 0.207  
(P<sub>d</sub>)<sup>2</sup> = \_\_\_\_\_

(P <sub>c</sub> ) <sup>2</sup> - (P <sub>a</sub> ) <sup>2</sup> or (P <sub>c</sub> ) <sup>2</sup> - (P <sub>d</sub> ) <sup>2</sup>	(P <sub>c</sub> ) <sup>2</sup> - (P <sub>w</sub> ) <sup>2</sup>	Choose formula 1 or 2: 1. P <sub>c</sub> <sup>2</sup> - P <sub>a</sub> <sup>2</sup> 2. P <sub>c</sub> <sup>2</sup> - P <sub>d</sub> <sup>2</sup> divided by: P <sub>c</sub> <sup>2</sup> - P <sub>w</sub> <sup>2</sup>	LOG of formula 1. or 2. and divide by: $\frac{P_c^2 - P_w^2}{P_c^2 - P_a^2}$	Backpressure Curve Slope = "n" ----- or ----- Assigned Standard Slope	n x LOG [ ]	Antilog	Open Flow Deliverability Equals R x Antilog (Mcf/d)
				<u>0.88</u>			
<u>SEE ATTACHED SHEET FOR JULY, 2004</u>							

Open Flow 58 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 13 day of August, 2004.

Scott Steinke  
For Company

\_\_\_\_\_  
Witness (if any)

\_\_\_\_\_  
For Commission

\_\_\_\_\_  
Checked by



100 Glenborough Drive  
Suite 100  
Houston, TX 77067-3610



Tel: 281.872.3100  
Fax: 281.872.3111  
www.nobleenergyinc.com

August 13, 2004

Jim Hemmen  
Kansas Corporation Commission  
130 S. Market  
Room 2078  
Wichita, KS 67202-3802

Subject: Open flow test of Noble Energy gas wells  
Cheyenne County, KS

Dear Mr. Hemmen:

This letter is in response to correspondence dated July 16, 2004 from the KCC. The four wells in question produce from the Niobrara formation. The Niobrara is a chalk with very low permeability, usually 1 md or less. In order for a Niobrara gas well to produce, it must be stimulated with a hydraulic fracture treatment that uses proppant to keep the fracture open.

These four wells were all perforated and frac'd in the Niobrara. Following the frac treatments, the wells were flowed to atmosphere for about 5 days to recover load fluid from the frac and ensure that the wells were not flowing back excessive sand. They were then shut in for 3 days. After 72 hours, a 2" orifice plate tester was installed and a four-point test with a 24-hour extended flow test was conducted. A copy of these results were reported to KCC and are referenced in the 7/16/04 letter.

This initial four-point test is used by Noble only as a qualitative assessment of the well's potential. We look at the initial shut in pressure and whether or not the well is misting or producing water during the test. We typically take the 24-hour one-point rate and divide it by four as an initial estimate of what the well will first produce for plate sizing and pipeline nominations. We do not believe the initial four-point test is indicative of the long term performance of the Niobrara reservoir. The well is producing in linear flow from the hydraulic fracture during the four-point test. The true reservoir performance is not observed until the well begins flowing in radial flow and that does not occur until the well has produced for more than 2-3 days.

We believe a 30-day average rate of production provides the best value to use in the potential test and we have attached those values for these wells. We use the shut-in casing pressure prior to the well being turned on, the average flowing pressure and the slope of the 4-point test above to determine the value of "C". We then calculate the AOF using a flowing pressure of 14.65 psia. Those calculations are attached, also.

We are also enclosing production graphs of offset wells in the area. The graphs show that no well has ever produced over 250 MCFPD. Thus, we feel that Niobrara gas wells in Cheyenne County, KS should be considered exempt from testing.

Should you have any questions, please contact the undersigned at 281-874-6773.

Sincerely,  
Noble Energy, Inc.

A handwritten signature in black ink that reads "Scott Steinke".

Scott Steinke  
Petroleum Engineer

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I declare under penalty of 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 Noble Energy, Inc. and that the foregoing pressure information and statements contained on this application form are true and correct to the best of my knowledge and belief based upon available production summaries and lease records of equipment installation and/or upon type of completion or upon use being made of the gas well herein named.

I hereby request a one-year exemption from open flow testing for the Zweygardt 13-33 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 not capable of producing at a daily rate in excess of 250 mcf/D

I further agree to supply to the best of my ability any and all supporting documents deemed by Commission staff as necessary to corroborate this claim for exemption from testing.

Date: 8/13/04

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Signature: [Handwritten Signature]

Title: ENGINEER

**Instructions:** If a gas well meets one of 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 claim exempt status for the gas well.

At some point during the current calendar year, wellhead shut-in pressure shall have been 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 for so long as the gas well continues to meet the eligibility criterion or until the claim of eligibility for exemption **IS** denied.

The G-2 form conveying the newest shut-in pressure reading shall be filed with the Wichita office no later than December 31 of the year for which it's intended to acquire exempt status for the subject well. The form must be signed and dated on the front side as though it was a verified report of annual test results.

# ZWEYGARDT 13-33

JULY 2004

Date	Time	Total Flow	Units	Flow Time	Units	Flow Rate	Units	DP Avg	Units	SP Avg	Units	PT Avg	Units	Sequence	
04/07/01	07:00:01	45,004.90	SCF	24:00:00	hrs	45,004.90	SCFD	4.77	InH2O	154.08	psi	68.05	DegF	26	
04/07/02	07:00:01	44,261.70	SCF	24:00:00	hrs	44,261.70	SCFD	4.55	InH2O	154.23	psi	60.91	DegF	27	
04/07/03	07:00:01	42,479.60	SCF	24:00:00	hrs	42,479.60	SCFD	4.26	InH2O	154.62	psi	71.34	DegF	28	
04/07/04	07:00:01	41,416.70	SCF	24:00:00	hrs	41,416.70	SCFD	4.06	InH2O	154.75	psi	73.68	DegF	29	
04/07/05	07:00:01	41,722.20	SCF	24:00:00	hrs	41,722.20	SCFD	4.10	InH2O	154.47	psi	69.98	DegF	30	
04/07/06	07:00:01	41,475.60	SCF	24:00:00	hrs	41,475.60	SCFD	4.05	InH2O	154.30	psi	68.89	DegF	31	
04/07/07	07:00:01	41,336.10	SCF	24:00:00	hrs	41,336.10	SCFD	4.04	InH2O	154.34	psi	71.40	DegF	32	
04/07/08	07:00:01	40,366.90	SCF	24:00:00	hrs	40,366.90	SCFD	3.91	InH2O	154.91	psi	80.24	DegF	33	
04/07/09	07:00:01	40,380.20	SCF	23:59:58	hrs	40,381.10	SCFD	3.91	InH2O	154.63	psi	79.56	DegF	34	
04/07/10	07:00:01	42,003.20	SCF	24:00:00	hrs	42,003.20	SCFD	4.25	InH2O	153.80	psi	79.13	DegF	35	
04/07/11	07:00:02	42,192.50	SCF	24:00:00	hrs	42,192.50	SCFD	4.29	InH2O	153.36	psi	77.52	DegF	36	
04/07/12	07:00:01	42,367.90	SCF	24:00:00	hrs	42,367.90	SCFD	4.33	InH2O	153.39	psi	78.76	DegF	37	
04/07/13	07:00:01	41,781.50	SCF	24:00:00	hrs	41,781.50	SCFD	4.25	InH2O	153.70	psi	84.18	DegF	38	
04/07/14	07:00:02	31,824.70	SCF	23:59:58	hrs	31,825.40	SCFD	2.46	InH2O	153.83	psi	86.59	DegF	39	
04/07/15	07:00:01	34,087.90	SCF	24:00:03	hrs	34,086.80	SCFD	2.82	InH2O	153.22	psi	82.25	DegF	40	
04/07/16	07:00:01	34,546.20	SCF	23:59:59	hrs	34,546.60	SCFD	2.87	InH2O	153.91	psi	78.93	DegF	41	
04/07/17	07:00:01	35,611.90	SCF	24:00:00	hrs	35,611.90	SCFD	3.00	InH2O	154.04	psi	70.71	DegF	42	
04/07/18	07:00:02	34,943.90	SCF	24:00:00	hrs	34,943.90	SCFD	2.92	InH2O	154.22	psi	76.91	DegF	43	
04/07/19	07:00:01	34,324.30	SCF	24:00:00	hrs	34,324.30	SCFD	2.83	InH2O	154.09	psi	80.16	DegF	44	
04/07/20	07:00:01	33,653.30	SCF	24:00:00	hrs	33,653.30	SCFD	2.74	InH2O	154.18	psi	84.28	DegF	45	
04/07/21	07:00:01	33,314.10	SCF	24:00:00	hrs	33,314.10	SCFD	2.69	InH2O	154.67	psi	87.07	DegF	46	
04/07/22	07:00:01	34,322.10	SCF	24:00:00	hrs	34,322.10	SCFD	2.83	InH2O	154.49	psi	80.92	DegF	47	
04/07/23	07:00:01	37,390.00	SCF	24:00:00	hrs	37,390.00	SCFD	3.32	InH2O	152.94	psi	69.74	DegF	48	
04/07/24	07:00:02	40,602.60	SCF	24:00:00	hrs	40,602.60	SCFD	3.82	InH2O	152.55	psi	56.18	DegF	49	
04/07/25	07:00:01	41,094.40	SCF	24:00:00	hrs	41,094.40	SCFD	3.92	InH2O	152.53	psi	56.79	DegF	50	
04/07/26	07:00:01	41,178.10	SCF	24:00:00	hrs	41,178.10	SCFD	3.98	InH2O	152.39	psi	61.81	DegF	51	
04/07/27	07:00:02	41,145.40	SCF	24:00:00	hrs	41,145.40	SCFD	4.03	InH2O	152.10	psi	67.79	DegF	52	
04/07/28	07:00:01	42,281.70	SCF	24:00:00	hrs	42,281.70	SCFD	4.31	InH2O	151.88	psi	73.62	DegF	53	
04/07/29	07:00:01	42,994.60	SCF	24:00:00	hrs	42,994.60	SCFD	4.42	InH2O	151.67	psi	68.40	DegF	54	
04/07/30	07:00:01	41,969.40	SCF	24:00:00	hrs	41,969.40	SCFD	4.19	InH2O	153.26	psi	70.72	DegF	55	
04/07/31	07:00:01	39,716.10	SCF	24:00:00	hrs	39,716.10	SCFD	3.75	InH2O	154.35	psi	74.43	DegF	56	
<b>Flow Grand Total:</b>		<b>1,221.79</b>	<b>MCF</b>												

AVG = 39.4 MCFPD

$$P_c (6/9/4) = 242 \text{ psig}$$

$$= 255 \text{ psia}$$

$$P_{11} = 154 \text{ psia}$$

$$Q = C(P_c^2 - P_b^2)^n$$

$$4 = C(255^2 - 154^2)^{0.88}$$

$$C = 0.0034$$

$$AOF = 0.0034(255^2 - 14.65^2)^{0.88}$$

$$AOF = 58.56 \text{ MCFPD}$$

CONSERVATION DIVISION  
WICHITA, KS

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# ZWEYGARDT 13-33

JUNE 2004

Date	Time	Total Flow	Units	Flow Time	Units	Flow Rate	Units	DP Avg	Units	SP Avg	Units	PT Avg	Units	Sequence
04/06/07	10:22:02	0.00	SCF	00:00:00	hrs	0.00	SCFH	0.00	InH2O	40.42	psi	84.52	DegF	1
04/06/07	10:22:28	0.00	SCF	00:00:00	hrs	0.00	SCFH	0.00	InH2O	40.46	psi	84.72	DegF	2
04/06/08	07:00:01	8,953.42	SCF	11:35:50	hrs	18,528.80	SCFD	11.60	InH2O	-0.17	psi	100.62	DegF	3
04/06/09	07:00:01	36.05	SCF	00:13:54	hrs	3,734.79	SCFD	0.45	InH2O	0.08	psi	75.65	DegF	4
04/06/10	07:00:01	36,358.50	SCF	13:06:35	hrs	66,561.60	SCFD	11.03	InH2O	144.26	psi	63.03	DegF	5
04/06/11	07:00:01	52,004.60	SCF	24:00:00	hrs	52,004.60	SCFD	6.65	InH2O	149.41	psi	71.55	DegF	6
04/06/12	07:00:02	39,625.40	SCF	24:00:01	hrs	39,625.00	SCFD	3.75	InH2O	153.45	psi	73.27	DegF	7
04/06/13	07:00:01	39,655.50	SCF	23:59:59	hrs	39,656.00	SCFD	3.75	InH2O	153.79	psi	74.75	DegF	8
04/06/14	07:00:01	39,332.70	SCF	24:00:00	hrs	39,332.70	SCFD	3.72	InH2O	153.96	psi	78.41	DegF	9
04/06/15	07:00:01	39,216.30	SCF	24:00:00	hrs	39,216.30	SCFD	3.66	InH2O	154.45	psi	75.28	DegF	10
04/06/16	07:00:02	32,769.80	SCF	24:00:01	hrs	32,769.40	SCFD	2.58	InH2O	152.47	psi	74.16	DegF	11
04/06/17	07:00:01	46,429.00	SCF	23:59:59	hrs	46,429.50	SCFD	5.16	InH2O	148.78	psi	59.11	DegF	12
04/06/18	07:00:01	49,139.00	SCF	24:00:00	hrs	49,139.00	SCFD	5.78	InH2O	148.12	psi	57.09	DegF	13
04/06/19	07:00:01	64,858.00	SCF	24:00:00	hrs	64,858.00	SCFD	9.76	InH2O	150.45	psi	48.81	DegF	14
04/06/20	07:00:01	62,728.50	SCF	24:00:00	hrs	62,728.50	SCFD	9.22	InH2O	150.66	psi	54.42	DegF	15
04/06/21	07:00:01	57,925.60	SCF	24:00:00	hrs	57,925.60	SCFD	7.98	InH2O	151.27	psi	63.71	DegF	16
04/06/22	07:00:02	56,646.70	SCF	24:00:01	hrs	56,646.10	SCFD	7.51	InH2O	151.11	psi	55.15	DegF	17
04/06/23	07:00:01	55,732.00	SCF	23:59:59	hrs	55,732.70	SCFD	7.48	InH2O	150.22	psi	66.53	DegF	18
04/06/24	07:00:01	55,070.00	SCF	24:00:00	hrs	55,070.00	SCFD	7.39	InH2O	150.29	psi	73.13	DegF	19
04/06/25	07:00:02	55,616.40	SCF	24:00:00	hrs	55,616.40	SCFD	7.44	InH2O	149.93	psi	65.16	DegF	20
04/06/26	07:00:01	54,662.00	SCF	24:00:00	hrs	54,662.00	SCFD	7.16	InH2O	151.07	psi	66.66	DegF	21
04/06/27	07:00:01	54,078.70	SCF	24:00:00	hrs	54,078.70	SCFD	6.97	InH2O	151.44	psi	65.55	DegF	22
04/06/28	07:00:01	53,859.20	SCF	24:00:00	hrs	53,859.20	SCFD	6.85	InH2O	151.59	psi	60.88	DegF	23
04/06/29	07:00:02	53,049.40	SCF	23:59:58	hrs	53,050.70	SCFD	6.75	InH2O	151.32	psi	68.37	DegF	24
04/06/30	07:00:01	49,153.10	SCF	24:00:02	hrs	49,151.90	SCFD	5.77	InH2O	153.51	psi	72.44	DegF	25
<b>Flow Grand Total:</b>		<b>1,056.90</b>	<b>MCF</b>											

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**WICHITA, KS**

NOBLE ENERGY, INC.  
ZWEYGARDT 13-33 TEST 6/1/04

"n" = 0.88 "θ" = 48.6°

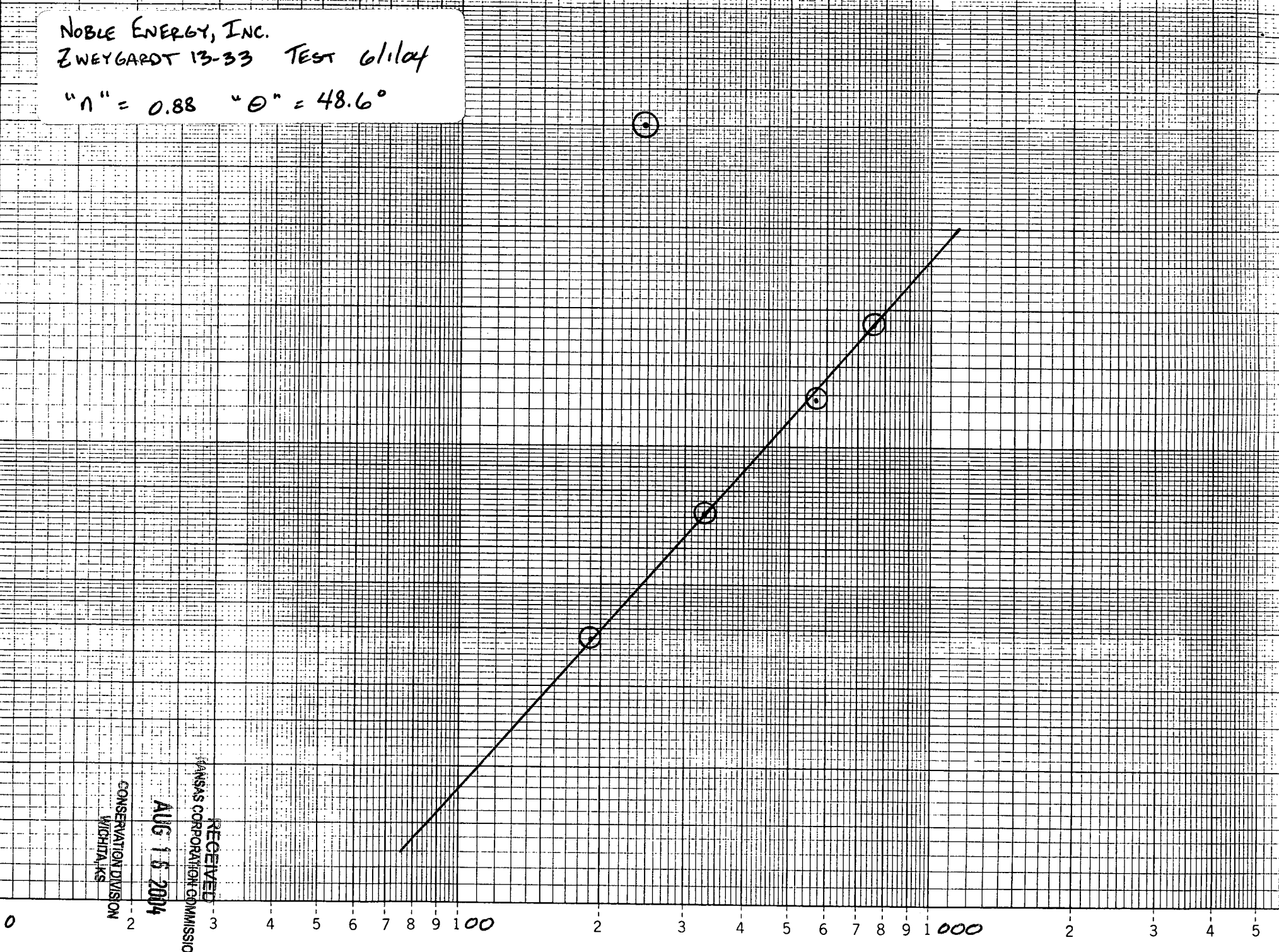
$(P_c^2 - P_w^2) / 1000$

9  
8  
7  
6  
5  
4  
3  
2  
1

1 0 2 3 4 5 6 7 8 9 100 2 3 4 5 6 7 8 9 1000 2 3 4 5

Q, MCFPD

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## MULTIPOINT BACK PRESSURE TEST

Test Type ; INITIAL	State ; Kansas	Test Date: 05/01/04
Company ; Noble Energy Inc.	Lease ; Zweggart	Well No. ; 13 33
County ; Cheyenne	Location ; NWSW/4,SEC.33-T3S-R41W	Acres ;
Field ; Cherry Creek	Reservoir ; Niobrara	Pipeline Conn. None
Completion Date ;	PBTD ; 1513	Packer Set ;
Casing Size ; 4 1/2" Wt. ; 10.5#	Set @ ; 1556	Perfs. ; N/A
Tubing Size ; None Wt. ;	Set @ ;	Perfs ; N/A
Type of Completion ; Single Gas	Type Fluid Prod ; None	
Producing Thru ; Casing	Reservoir Temp. F ; -	Bar. Press. ; 13 PSI
Gas Gravity ; .6 (est)	% CO2 ; -- % N2 ; --	Liquid API Grav N/A
Vertical Depth ; 1412	Type Motor Conn. ; None	Prover Size ; 2"

Remarks: Used 2" critical flow prover & dead weight tester.

Rate No.	Orifice Size in.	Prover Press. psig	Flowing Temp. deg. F	OBSERVED DATA		Shut-In Hrs.:	
				Casing Wellhead Pressure psig	psia	Duration hrs.	Liquid Prod. bbls.
Shut-in	blank	230	--	230	243	0	0
1	3/16	222	68	222	235	1	0
2	1/4	215	68	215	228	1	0
3	1 1/32	202	67	202	215	1	0
4	13/32	188	67	188	201	1	0
5	1 1/32	80	70	80	93	24	0

Rate No.	Coefficient mcf/d	Prover Press. psia	Gravity Factor Fg	Temp. Factor Ft	Deviation Factor Fpv	Rate of Flow Q mcf/d
1	0.6237	235	1.291	0.9924	1.0169	191
2	1.1150	228	1.291	0.9924	1.0164	331
3	2.0350	215	1.291	0.9933	1.0154	570
4	2.9066	201	1.291	0.9933	1.0144	760
5	2.0350	93	1.291	0.9905	1.0066	244

Rate No.	Pc psia	Pw psia	Pc^2 /1000	Pw^2 /1000	Pc^2-Pw^2 /1000	Q mcf/d	Shut-in %
1	243	235	59.0	55.2	3.8	191	96.52
2	243	228	59.0	52.0	7.1	331	93.48
3	243	215	59.0	46.2	12.8	570	87.83
4	243	201	59.0	40.4	18.6	760	81.74
5	243	93	59.0	8.6	50.4	244	34.78

INDICATED WELLHEAD OPEN FLOW = 279.31 Mcf/d "n" = 0.88

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 3rd day of June, 2004.

Wayne Mahon For Excell Drilling Co.

Signed: Wayne Mahon Title: Field Technician

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KANSAS CORPORATION COMMISSION

AUG 16 2004

CONSERVATION DIVISION  
WICHITA, KS

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JUN 21 2004  
KCC WICHITA



David Ledet

08/12/2004 04:05 PM

To: Scott Steinke/Production/Houston\_Onshore/Samedan@Samedan  
cc:  
Subject: one-pt test for KS wells

Scott,

Here is the pressure info on the 4 KS wells in question:

Zweygardt 13-33 SIFBU on 6-2-04 SICP on 6-9-04 at 242 psi Turned on to sales 6-10-04 -  
.500 orifice plate -

Production for 6-11-04 = 52 mcf  
" 6-12-04 = 52 mcf  
" 6-13-04 = 39 mcf

Zweygardt 22-5 SIFBU on 6-3-04 SICP on 6-7-04 at 272 psi Turned on to sales 6-7-04 -  
.500 orifice plate

Production for 6-8-04 = 29 mcf  
" 6-9-04 = 57 mcf  
" 6-10-04 = 57 mcf  
" 6-11-04 = 57 mcf

Zweygardt 31-5 SIFBU on 6-1-04 SICP on 6-7-04 at 265 psi Turned on to sales 6-7-04 -  
.500 orifice plate

Production for 6-8-04 = 31 mcf  
" 6-9-04 = 31 mcf  
" 6-10-04 = 55 mcf  
" 6-11-04 = 46 mcf

Zweygardt 13-32 SIFBU on 6-4-04 SICP on 6-9-04 at 262 psi Turned on to sales on 6-9-04 -  
.500 orifice plate

Production for 6-10-04 = 35 mcf  
" 6-11-04 = 54 mcf  
" 6-12-04 = 54 mcf  
" 6-13-04 = 54 mcf

If you need anything else, please call

David

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CONSERVATION DIVISION  
WICHITA, KS

Lease Name: ZWEYGARDT  
County, State: CHEYENNE, KS  
Operator: SAMEDAN OIL CORPORATION  
Field: CHERRY CREEK NIOBRARA  
Reservoir: NIOBRARA  
Location: 33 3S 41W S2 NW SW

ZWEYGARDT - SAMEDAN OIL CORPORATION NIOBRARA as of 04/2004 CHERRY CREEK NIOBRARA

