

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

(See Instructions on Reverse Side)

Type Test:

- Open Flow
- Deliverability

Test Date:  
7/12 to 7/13/12

API No. 15  
007-23790-00-00

Company M&M Exploration, Inc.		Lease Z-Bar		Well Number 16-4	
County Barber	Location NWNW	Section 16	TWP 34S	RNG (E/W) 14W	Acres Attributed
Field Aetna Gas Area		Reservoir Miss.		Gas Gathering Connection Oneok	
Completion Date 1/27/12		Plug Back Total Depth 4900		Packer Set at none	
Casing Size 4.5	Weight	Internal Diameter	Set at 4940	Perforations 4680	To 4740
Tubing Size none	Weight	Internal Diameter	Set at	Perforations	To
Type Completion (Describe) single		Type Fluid Production none		Pump Unit or Traveling Plunger? Yes / No No	
Producing Thru (Annulus / Tubing) annulus		% Carbon Dioxide		% Nitrogen .0276	
Vertical Depth(H)		Pressure Taps flange		(Meter Run) (Prover) Size 3"	
Pressure Buildup: Shut in 7/09 20 12 at 9:30 am (AM) (PM) Taken 7/12 20 12 at 9:30 am (AM) (PM)					
Well on Line: Started 7/12 20 12 at 9:45 am (AM) (PM) Taken 7/13 20 12 at 10:30 am (AM) (PM)					

### OBSERVED SURFACE DATA

Duration of Shut-in 72 Hours

Static / Dynamic Property	Orifice Size (inches)	Circle one: Meter or 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>c</sub> ) or (P <sub>1</sub> ) or (P <sub>2</sub> )		Tubing Wellhead Pressure (P <sub>w</sub> ) or (P <sub>1</sub> ) or (P <sub>2</sub> )		Duration (Hours)	Liquid Produced (Barrels)
						psig	psia	psig	psia		
Shut-in						975	989.4	n/a		72	
Flow	1.000	27	176	92		903	917.4	n/a		24.75	0

### FLOW STREAM ATTRIBUTES

Plate Coefficient (F <sub>s</sub> ) (F <sub>a</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>tt</sub>	Deviation Factor F <sub>dv</sub>	Metered Flow R (Mcfd)	GOR (Cubic Feet/ Barrel)	Flowing Fluid Gravity G <sub>m</sub>
4.912	41.4	85.36	1.252	.9706	-----	509		.638

### (OPEN FLOW) (DELIVERABILITY) CALCULATIONS

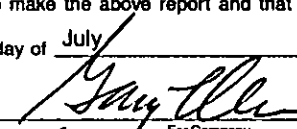
(P<sub>c</sub>)<sup>2</sup> = 978.912 ; (P<sub>w</sub>)<sup>2</sup> = 841.622 ; P<sub>a</sub> = \_\_\_\_\_ % (P<sub>c</sub> - 14.4) + 14.4 = \_\_\_\_\_ ; (P<sub>a</sub>)<sup>2</sup> = 0.207 ; (P<sub>d</sub>)<sup>2</sup> = \_\_\_\_\_

(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: $\frac{P_c^2 - P_a^2}{P_c^2 - P_w^2}$	Backpressure Curve Slope = "n" or Assigned Standard Slope	n x LOG [ ]	Antilog	Open Flow Deliverability Equals R x Antilog (Mcfd)
978.705	137.29	7.129	.8530	.757	.6457	4.42	2250

Open Flow **2250** Mcfd @ 14.65 psia X .50 = Deliverability **1125** 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 23rd day of July, 20 12.

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

  
 For Company  
 COLM, INC.  
 Checked by

**RECEIVED**  
**JUL 27 2012**

**KCC WICHITA**

STATE OF KANSAS - CORPORATION COMMISSION  
MULTIPOINT BACK PRESSURE TEST

FORM CG-1 Rev.

TYPE TEST:  Initial  Annual  Special TEST DATE: 7/12/12  
 COMPANY: M&M Exploration, Inc. LEASE: Z-Bar WELL NO: 16-4  
 COUNTY: Barber LOCATION: NWNW SECTION: 16 TWP: 34S RNG (E/W): 14W ACRES:  
 API WELL NUMBER: 15-007-23790-00-00 RESERVOIR: Miss. PIPELINE CONNECTION: ONEOK  
 COMPLETION DATE: 1/27/12 PLUG BACK TOTAL DEPTH: 4900 PACKER SET AT: none  
 CASING SIZE: 4.5 WT. ID. SET AT: 4940 PERF: 4680 TO: 4740  
 TUBING SIZE: n/a WT. ID. SET AT: PERF: TO:  
 TYPE COMPLETION (Describe): single TYPE FLUID PRODUCTION: none  
 PRODUCING THRU: casing RESERVOIR TEMPERATURE °F: BAR PRESS - P<sub>s</sub>: 14.4 Psia  
 GAS GRAVITY - G<sub>s</sub>: 638 % CARBON DIOXIDE: .0276 % NITROGEN: 2.0805 API GRAVITY OF LIQUID:  
 VERTICAL DEPTH (H): TYPE METER CONNECTION: flange (METER RUN) (PROVER) SIZE: 3"  
 REMARKS: Tested into Oneok pipeline (250" EFM)

RATE NO.	ORIFICE SIZE in	(METER) (PROVER) PRESSURE Psig	DIFF. (h <sub>w</sub> ) (h <sub>s</sub> )	FLOWING TEMP t	WELL-HEAD TEMP. t	CSG WELLHEAD PRESS. Psig (P <sub>w</sub> )(P <sub>c</sub> )(P <sub>s</sub> )		TBG WELLHEAD PRESS. Psig (P <sub>w</sub> )(P <sub>c</sub> )(P <sub>s</sub> )		FLOW DURATION (HOURS)	LIQUID PROD. Bbl.
						P <sub>w</sub>	P <sub>c</sub>	P <sub>w</sub>	P <sub>c</sub>		
SHUT IN						975	989.4			72	
1	1.000	23	73.4	89		932	946.4			.75	0
2	"	24	160.3	90		901	915.4			.75	0
3	"	25	264.7	92		865	879.4			.75	0
4	ENDED TEST		METER OVERRANGED								
5											

RATE NO.	COEFFICIENT (F <sub>1</sub> ) (F <sub>2</sub> ) Mcfd	(METER) (PROVER) PRESSURE Psia	PRESS EXTENSION $\sqrt{P_w \cdot h_w}$	GRAVITY FACTOR F <sub>g</sub>	FLOWING TEMP FACTOR F <sub>t</sub>	DEVIATION FACTOR F <sub>pr</sub>	RATE OF FLOW Q Mcfd	GOR (ft <sup>3</sup> /Bbl)	G <sub>m</sub>
2	"	38.4	78.46	"	.9723	---	469		
3	"	39.4	102.12	"	.9706	---	610		
4									
5									

RATE NO.	P <sub>i</sub> Psia	P <sub>c</sub> Psia	P <sub>w</sub> Psia	(P <sub>w</sub> ) <sup>2</sup> THOUSANDS	(P <sub>c</sub> ) <sup>2</sup> THOUSANDS	PLOTTING POINTS		% SHUT-IN (P <sub>w</sub> - P <sub>c</sub> ) / (P <sub>c</sub> - P <sub>s</sub> )
						(P <sub>w</sub> ) <sup>2</sup> - (P <sub>c</sub> ) <sup>2</sup> THOUSANDS	Q Mcfd	
1		989.4	946.4	978.9	895.6	83.3	313	95.6
2		"	915.4	"	837.9	141.0	469	92.5
3		"	879.4	"	773.3	205.6	610	88.8
4								
5								

INDICATED WELLHEAD OPEN FLOW 2,000 Mcfd @ 14.65 Psia "n" = .757

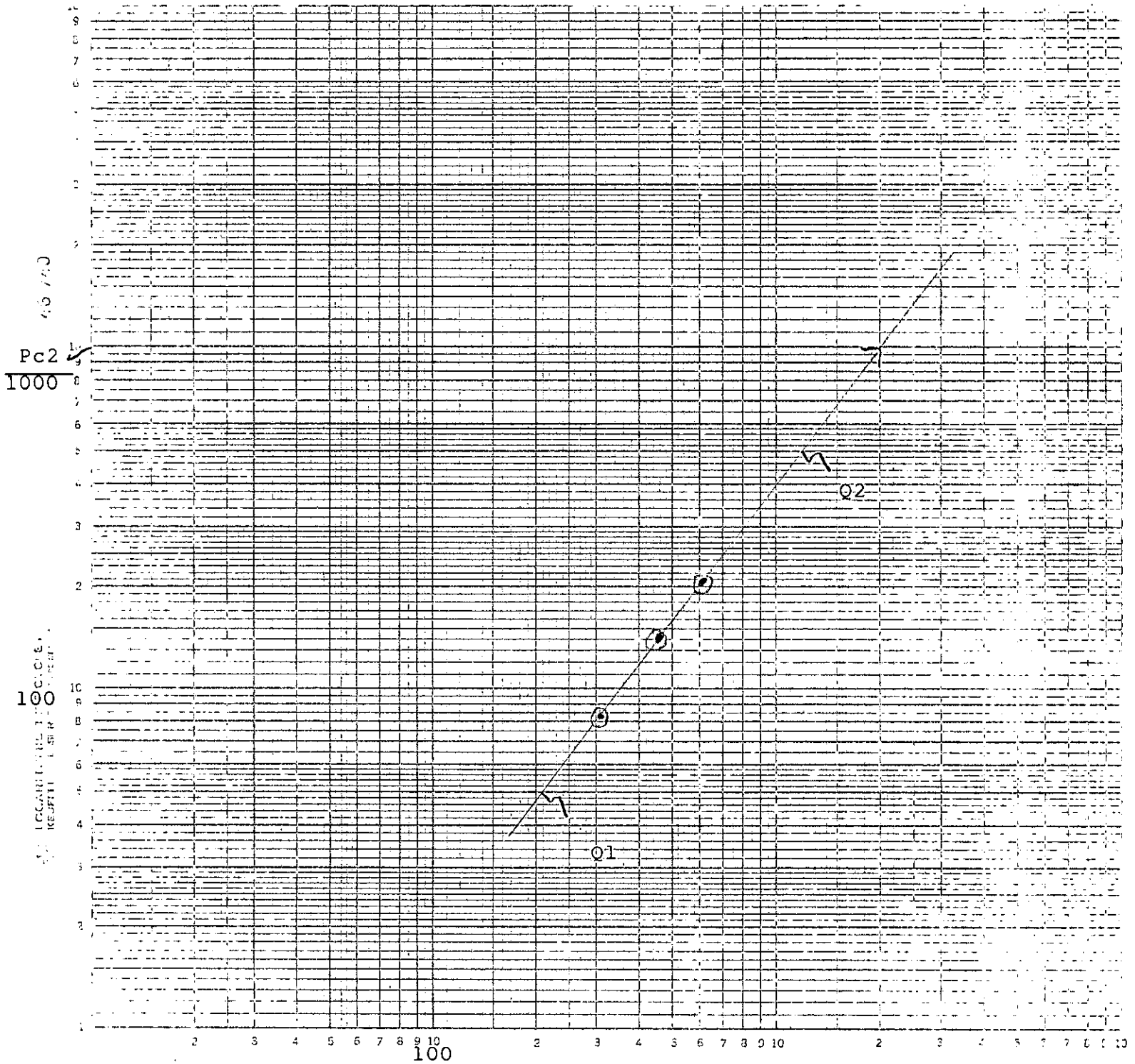
The undersigned authority, on behalf of the Company, states that he is duly authorized to make the above report and that he has knowledge of the facts stated herein, and that said report is true and correct. Executed this the 23rd day of July 2012.

Witness (if any)  
For Commission

RECEIVED  
JUL 27 2012  
KCC WICHITA

*[Signature]*  
For Company  
Checked By (Rev. 10/96)

M&M Exploration, Inc - Z-Bar 16-4  
 NWNW 16-34S-14W  
 Barber County  
 Tested 7/12/12



Q2 - 1200 - Log: 3.079  
 Q1 - 210 - Log: 2.322  
 "n" = .757

RECEIVED  
 JUL 27 2012  
 KCC WICHITA

# FIELD DATA SHEET

Pumper:

Phone#:

Type Test: <input checked="" type="checkbox"/> Initial <input type="checkbox"/> Annual <input type="checkbox"/> Special				Test Date: <b>7/12/12</b>	
Company: <b>MGM EXPL</b>		Connection: <b>ONEOK</b>			
Field: <b>MISS</b>		Reservoir: <b>MISS</b>		Location: <b>NW</b>	
Completion Date:		Total Depth:		Plug Back TD:	
Elevation:		Form or Lease Name: <b>L. BAR</b>		Well No.: <b>16-4</b>	
Csg. Size: <b>4.5</b> W. d		Set At:		Perforations: From To	
Tbg. Size: <b>None</b> W. d		Set At:		Perforations: From To	
Type Completion (Describe): <b>Single</b>				Packer Set At:	
Producing Thru: <b>196</b>		Reservoir Temp. F:		Mean Annual Temp. F: <b>60</b>	
Daro. Press. - P: <b>14.4</b>		State: <b>KS</b>		Prover: <b>3" JLB</b>	
G <sub>g</sub>		% CO <sub>2</sub>		% N <sub>2</sub>	
% H <sub>2</sub> S		Prover		Meter Run	

DATE	ELAP. TIME	WELLHEAD WORKING PRESSURE			METER OR PROVER				REMARKS <small>(Include liquid production data: Type - API Gravity - Amount)</small>
		Tbg. Psig	Csg. Psig	Δ P	Pressure Psig	Diff.	Temp. F	Orifice	
9:30	72		975						LIT BURNER IN LINE HEATER
9:45							1.000		CONFERENCE TEST INTO ONEOK
1:00		-	958		22	73.0	89	1.000	
1:15		-	944		22	73.6	89		
1:30		-	932		23	73.4	89		2.500 950
1:45		-	920		23	158.9	90		5.000 926
2:00		-	910		24	161.1	90		7.500 902
2:15		-	901		24	160.3	90		10.000 877
2:30		-	886		24	245.3	91		12.500 853
2:45		-	873		25	264.9	92		15.000 829
3:00		-	865		25	264.7	92		17.500 804
3:15		-							20.000 780
3:30		-							25.000 731
12:45		-							ENDED 9 PT TEST - ONEOK ORIFICE TOO SMALL TO CONTINUE COULD NOT GET CHANGED TODAY
1:00		-	923		26	194.1	93		SET FLOW RATE FOR 1PT TEST WELL GETTING STRONGER / RECOVERING PRESSURE FASTER THAN EXPECTED
10:30		-	903		27	176.0	92		> 7/13/12
	0.0								Begin 30 minute wellhead buildup
	0.5								
	1.0								
	1.5								
	2.0								
	3.0								
	4.0								
	5.0								
	6.0								
	7.0								
	8.0								
	9.0								
	10.0								
	15.0								
	20.0								
	25.0								
	30.0								

RECEIVED  
 JUL 27 2012  
 KCC WICHITA