



ENDURING RESOURCES

332 CR 3100 Aztec NM 87410
Telephone: 505 636 9720 Facsimile: 505 334 1979

Monica Kuehling
NMOCD – District 3, Aztec
1000 Rio Brazos Rd.
Aztec, NM 87410

RE: Kline 10-4 (30-045-33545) Plan of Action, RBDMS MPK1810956049

Ms. Kuehling,

This action plan is in response to the *2018 Bradenhead Test* letter received by Enduring Resources, LLC on June 14, 2018. Due to an initial bradenhead pressure of 45 psi, collected on March 20, 2018, a gas sample was collected from the tubing, casing and bradenhead of this well string on April 12, 2018. An outline of the results are represented in *Table I*.

Based on the results presented, Enduring Resources does not believe that the gas in the bradenhead definitively matches the gas in the casing and tubing for this well. The casing and tubing analysis shows a carbon dioxide percentage of 2.5 and 6.7 percent respectively, while the sample for the bradenhead shows a carbon dioxide percentage of 0. Perhaps more telling is the extreme difference in the percentage of ethane in the bradenhead gas when compared to the casing and tubing gas. The bradenhead gas shows an ethane percentage of 2.064 percent, while the gas in the casing and tubing showed ethane percentages of 0.09773 and 0.07953 percent respectively. The gas in the bradenhead shows an ethane concentration 21 times the concentration shown in the casing (0.09773 %). Additionally, the Kline 10-4 wellsite is completed into the Fruitland Coal formation, which is not typically associated with heavier gases like ethane.

Additionally, the pressure difference between the casing and braden head is not indicative of a casing leak. The casing pressure at this location has been historically documented at 10.3 PSI in 2012, and 9 PSI in 2018, while the bradenhead pressure was recorded at 27.9 in 2012, and 45 PSI in 2018. The fact that the pressure is higher in the bradenhead than in the casing, and that the bradenhead pressure builds back up to pressures above the casing pressure after being relieved, indicates that the gas is not coming from the casing, as a more equalized pressure would be expected if the gas was leaking into the bradenhead from the casing.

Due to Enduring's belief that the gas is not coming from the well casing, Enduring proposes to tie the bradenhead into the production line, alleviating pressure on the bradenhead. This will help prevent any potential effects on groundwater from the unknown gas by venting it out of the bradenhead. Additionally, Enduring proposes to perform bradenhead testing on the Kline 10-4 on an annual basis in order to monitor the condition at this well site. Thank you for your time in regards to this matter.

James McDaniel
HSE Supervisor
Enduring Resources, LLC
San Juan Basin Operations

NMOCD
JUN 22 2018
DISTRICT III

Table I
Kline 10-4 Gas Analysis Results

Description	Date	Nitrogen %	Methane %	CO2 %	Ethane %	H2S %	Propane %	i-butane %	n-butane %	i-Pentane %	n-Pentane %	Hexanes +
Casing	4/12/2018	0.9696	95.81153	2.5971	0.09773	0	0.29318	0.13141	0.01008	0.07891	0.00426	0.00624
Tubing	4/12/2018	1.3781	90.93038	6.72299	0.07953	0	0.54951	0.19208	0.02442	0.09462	0.01132	0.01698
BradenHead	4/12/2018	1.1517	96.06944	0	2.064	0	0.35916	0.11648	0.19065	0.05545	0.03352	0.04024



NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
AZTEC DISTRICT OFFICE
1000 RIO BRAZOS ROAD
AZTEC NM 87410
(505) 334-6178 FAX: (505) 334-6170
[http://emrpd.state.nm.us/ocd/District III/district.htm](http://emrpd.state.nm.us/ocd/District%20III/district.htm)

BRADENHEAD TEST REPORT

(submit 1 copy to above address)

Date of Test 6-27-12 Operator Cherion API #30-0 45-03545

Property Name Kline 10 Well No. 4 Location: Unit Section 10 Township 3N Range 13W

Well Status (Shut-In or Producing) Initial PSI: Tubing 34 Intermediate X Casing 10.3 Bradenhead 27.9

OPEN BRADENHEAD AND INTERMEDIATE TO ATMOSPHERE INDIVIDUALLY FOR 15 MINUTES EACH

Testing	PRESSURE			INTERM	
	BH	Bradenhead	Csg	Int	Csg
TIME					
5 min	<u>Ø</u>	<u>Y</u>	<u>10.2</u>		
10 min	<u>Ø</u>	<u>Y</u>	<u>10.2</u>		
15 min	<u>Ø</u>		<u>10.2</u>		
20 min					
25 min					
30 min					

FLOW CHARACTERISTICS	
BRADENHEAD	INTERMEDIATE
Steady Flow	
Surges	
Down to Nothing	<u>X 10sec</u>
Nothing	
Gas	
Gas & Water	
Water	

If bradenhead flowed water, check all of the descriptions that apply below:

CLEAR FRESH SALTY SULFUR BLACK

5 MINUTE SHUT-IN PRESSURE BRADENHEAD 0.5 INTERMEDIATE

REMARKS:

By Randy Caldeira

Witness

caldeira services
(Position)

E-mail address Randy.C@caldeiraservices.com

Oil Cons. Div
District III

JUL 05 2012



NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
AZTEC DISTRICT OFFICE
1000 RIO BRAZOS ROAD
AZTEC, NM 87410
(505) 334-6170 FAX: (505) 334-6170
[http://emned.state.nm.us/ocd/District III/3district.htm](http://emned.state.nm.us/ocd/District%20III/3district.htm)

BRADENHEAD TEST REPORT

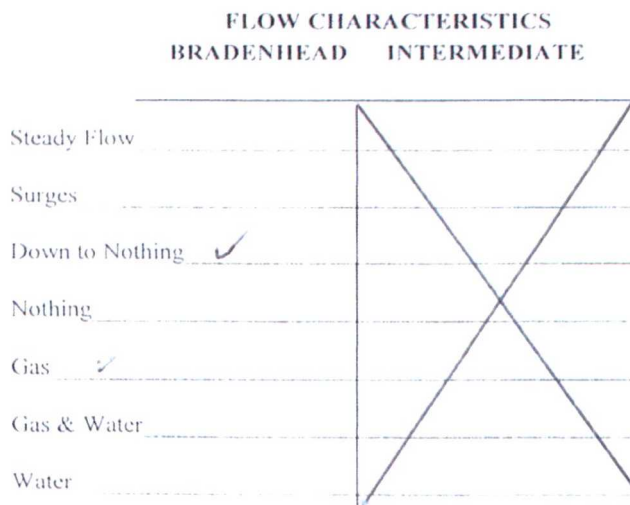
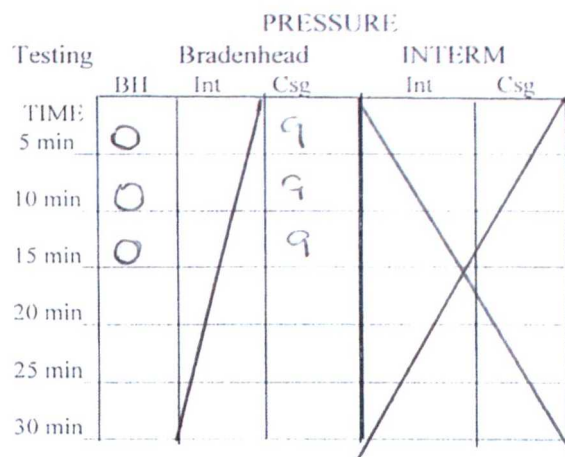
(submit 1 copy to above address)

Date of Test 3-20-18 Operator Enduring Resources API # 30-045-33545

Property Name CLINE Well No. 10-4 Location: Unit Section 10 Township 31N Range 13W

Well Status (Shut-In or Producing) Initial PSI: Tubing 3 Intermediate N/A Casing 9 Bradenhead 45

OPEN BRADENHEAD AND INTERMEDIATE TO ATMOSPHERE INDIVIDUALLY FOR 15 MINUTES EACH



If bradenhead flowed water, check all of the descriptions that apply below:

CLEAR FRESH SALTY SULFUR BLACK

5 MINUTE SHUT-IN PRESSURE BRADENHEAD 0 INTERMEDIATE N/A

REMARKS:

By [Signature]

Witness

AIR QUALITY SPECIALIST
(Position)

E-mail address sbarrette@enduringresources.com

Diablo Analytical BTU Report

GPA 2145-03 Analysis

Sample Information

Sample Information	
Sample Name	Kline 10-4 Tubing
Station Number	2300450187
Taken By	Alpine Analysis LLC
Operator	Travis Tapp
Method Name	StandardNatGas.met
Injection Date	2018-04-12 12:15:13
Report Date	2018-04-12 12:19:07
EZReporter Configuration File	default Standard Sample.cfgx
Source Data File	2018-04-12 12-15-02 (GMT -06-00)Kline 10-4 Tubing.dat
EZReporter Data File	Kline 10-4 Tubing-20180412-121907.ezrx
Data Source	Agilent EZChrom Connector

Component Results

Component Name	Ret. Time	Peak Area	Norm%	Gross HV (Dry) (BTU / Ideal cu.ft.)	Relative Gas Density (Dry)	GPM (Dry) (Gal. / 1000 cu.ft.)
Nitrogen	0.320	938376.0	1.37817	0.0	0.01333	0.152
Methane	0.325	42629528.0	90.93038	920.5	0.50366	15.446
Carbon Dioxide	0.375	4528637.0	6.72299	0.0	0.10216	1.150
Ethane	0.430	56487.0	0.07953	1.4	0.00083	0.021
Hydrogen Sulfide	0.601	0.0	0.00000	0.0	0.00000	0.000
Propane	0.524	1064912.0	0.54951	13.9	0.00837	0.152
i-Butane	0.565	433501.0	0.19208	6.3	0.00385	0.063
n-Butane	0.611	56240.0	0.02442	0.8	0.00049	0.008
i-Pentane	0.707	242270.0	0.09462	3.8	0.00236	0.035
n-Pentane	0.758	30123.0	0.01132	0.5	0.00028	0.004
Hexanes Plus	0.000	55021.0	0.01698	0.0	0.00000	0.000
Water	0.000	0.0	0.00000	0.0	0.00000	0.000
Total:			100.00000	947.1	0.63532	17.030

Results Summary

Result	Dry	Sat. (Base)
Total Raw Mole% (Dry)	95.43070	
Pressure Base (psia)	14.730	
Temperature Base	60.0	
Water Mole%	-	1.74067
Gross Heating Value (BTU / Ideal cu.ft.)	947.1	930.6
Gross Heating Value (BTU / Real cu.ft.)	949.2	933.0
Relative Density (G), Real	0.6365	0.6365
Compressibility (Z) Factor	0.9978	0.9974
Total GPM	17.030	16.839

Diablo Analytical BTU Report

GPA 2145-03 Analysis

Sample Information

Sample Information	
Sample Name	Kline 10-4 Casing
Station Number	2300450187
Taken By	Alpine Analysis LLC
Operator	Travis Tapp
Method Name	StandardNatGas.met
Injection Date	2018-04-12 12:00:52
Report Date	2018-04-12 12:05:12
EZReporter Configuration File	default Standard Sample.cfgx
Source Data File	2018-04-12 12-00-41 (GMT -06-00)Kline 10-4 Casing
EZReporter Data File	Kline 10-4 Casing-20180412-120512.ezrx
Data Source	Agilent EZChrom Connector

Component Results

Component Name	Ret. Time	Peak Area	Norm%	Gross HV (Dry) (BTU / Ideal cu.ft.)	Relative Gas Density (Dry)	GPM (Dry) (Gal. / 1000 cu.ft.)
Nitrogen	0.320	665415.0	0.96956	0.0	0.00938	0.107
Methane	0.325	45274374.0	95.81153	969.9	0.53070	16.273
Carbon Dioxide	0.376	1763326.0	2.59710	0.0	0.03946	0.444
Ethane	0.430	69956.0	0.09773	1.7	0.00101	0.026
Hydrogen Sulfide	0.601	0.0	0.00000	0.0	0.00000	0.000
Propane	0.525	572598.0	0.29318	7.4	0.00446	0.081
i-Butane	0.564	298973.0	0.13141	4.3	0.00264	0.043
n-Butane	0.609	23469.0	0.01008	0.3	0.00020	0.003
i-Pentane	0.706	203490.0	0.07891	3.2	0.00197	0.029
n-Pentane	0.756	11570.0	0.00426	0.2	0.00011	0.002
Hexanes Plus	0.000	20508.0	0.00624	0.0	0.00000	0.000
Water	0.000	0.0	0.00000	0.0	0.00000	0.000
Total:			100.00000	987.0	0.58993	17.007

Results Summary

Result	Dry	Sat. (Base)
Total Raw Mole% (Dry)	96.18810	
Pressure Base (psia)	14.730	
Temperature Base	60.0	
Water Mole%	-	1.74067
Gross Heating Value (BTU / Ideal cu.ft.)	987.0	969.8
Gross Heating Value (BTU / Real cu.ft.)	989.1	972.2
Relative Density (G), Real	0.5909	0.5917
Compressibility (Z) Factor	0.9979	0.9976
Total GPM	17.007	16.817

Diablo Analytical BTU Report

GPA 2145-03 Analysis

Sample Information

Sample Information	
Sample Name	Kline 10-4 Braden Head
Station Number	2300450187
Taken By	Alpine Analysis LLC
Operator	Travis Tapp
Method Name	StandardNatGas.met
Injection Date	2018-04-12 11:49:30
Report Date	2018-04-12 11:53:20
EZReporter Configuration File	default Standard Sample.cfgx
Source Data File	2018-04-12 11-48-54 (GMT -06-00)Kline 10-4 Braden Head
EZReporter Data File	Kline 10-4 Braden Head-20180412-115320.ezrx
Data Source	Agilent EZChrom Connector

Component Results

Component Name	Ret. Time	Peak Area	Norm%	Gross HV (Dry) (BTU / Ideal cu.ft.)	Relative Gas Density (Dry)	GPM (Dry) (Gal. / 1000 cu.ft.)
Nitrogen	0.320	794382.0	1.15174	0.0	0.01114	0.127
Methane	0.324	45624232.0	96.06944	972.5	0.53213	16.317
Carbon Dioxide	0.377	0.0	0.00000	0.0	0.00000	0.000
Ethane	0.427	1485421.0	2.06432	36.6	0.02143	0.553
Hydrogen Sulfide	0.601	0.0	0.00000	0.0	0.00000	0.000
Propane	0.529	705101.0	0.35916	9.1	0.00547	0.099
i-Butane	0.576	266123.0	0.11648	3.8	0.00234	0.038
n-Butane	0.610	255638.0	0.10965	3.6	0.00220	0.035
i-Pentane	0.714	143879.0	0.05545	2.2	0.00138	0.020
n-Pentane	0.757	90399.0	0.03352	1.3	0.00084	0.012
Hexanes Plus	0.000	132331.0	0.04024	0.0	0.00000	0.000
Water	0.000	0.0	0.00000	0.0	0.00000	0.000
Total:			100.00000	1029.2	0.57692	17.201

Results Summary

Result	Dry	Sat. (Base)
Total Raw Mole% (Dry)	96.67110	
Pressure Base (psia)	14.730	
Temperature Base	60.0	
Water Mole%	-	1.74067
Gross Heating Value (BTU / Ideal cu.ft.)	1029.2	1011.3
Gross Heating Value (BTU / Real cu.ft.)	1031.3	1013.7
Relative Density (G), Real	0.5779	0.5789
Compressibility (Z) Factor	0.9979	0.9976
Total GPM	17.201	17.007