



081-06608



**CYPRESS**

# Sugarloaf Prospect

## Plan of Development

February 14, 2010

## Table of Contents

<u>Exhibits</u>	<u>Description</u>	<u>Page</u>
Land Exhibit 1	Land plat	3
Land Exhibit 2	Land plat with approximate reservoir	4
Land Exhibit 3	Land plat with 320 acre plan of development	5
Land Exhibit 4	Topography and pipeline location	6
Land Exhibit 5	McIntyre 1-3 sidetrack location and producing interval	7
Geology Exhibit 1	Niobrara structure contour with approximate reservoir	8
Geology Exhibit 2	Cross section location of B-B'	9
Geology Exhibit 3	Log cross section through Niobrara reservoir	10
Geology Exhibit 4	Type Log through Niobrara interval	11
Engineering Exhibit 1	Drainage area calculation	12
Engineering Exhibit 2	Discounted cash flow economics	13

### Samson Resources Corp. Request for Recommendation of Approval of Application Without A Hearing, February 10, 2009:

Request for approval ...	Cause no. 474 Docket no. 0902-SP-09	15
Reference map Craig Field	Cause no. 474 Docket no. 0902-SP-09	16
Land Testimony	Cause no. 474 Docket no. 0902-SP-09	17
Engineering Testimony	Cause no. 474 Docket no. 0902-SP-09	21
Drainage Area calculations	Cause no. 474 Docket no. 0902-SP-09	24
Discounted Cash Flow Economics	Cause no. 474 Docket no. 0902-SP-09	25
Geology Testimony	Cause no. 474 Docket no. 0902-SP-09	28
Craig field geology Exhibit 1	Cause no. 474 Docket no. 0902-SP-09	30
Craig field geology Exhibit 2	Cause no. 474 Docket no. 0902-SP-09	31
Craig field geology Exhibit 3	Cause no. 474 Docket no. 0902-SP-09	32
Craig field geology Exhibit 4	Cause no. 474 Docket no. 0902-SP-09	33
Craig field geology Exhibit 5	Cause no. 474 Docket no. 0902-SP-09	34
John Wright biography	Qualifications and experience	37
Michael Sullivan biography	Qualifications and experience	38
James Van Meter biography	Qualifications and experience	39

## Table of Contents

<u>Exhibits</u>	<u>Description</u>
Land Exhibit 1	Land plat
Land Exhibit 2	Land plat with approximate reservoir
Land Exhibit 3	Land plat with 320 acre plan of development
Land Exhibit 4	Topography and pipeline location
Land Exhibit 5	McIntyre 1-3 sidetrack location and producing interval
Geology Exhibit 1	Niobrara structure contour with approximate reservoir
Geology Exhibit 2	Cross section location of B-B'
Geology Exhibit 3	Log cross section through Niobrara reservoir
Geology Exhibit 4	Type Log through Niobrara interval
Engineering Exhibit 1	Drainage area calculation
Engineering Exhibit 2	Discounted cash flow economics

Samson Resources Corp. Request for Recommendation of Approval of Application  
Without A Hearing, February 10, 2009:

Request for approval ...	Cause no. 474 Docket no. 0902-SP-09
Reference map Craig Field	Cause no. 474 Docket no. 0902-SP-09
Land Testimony	Cause no. 474 Docket no. 0902-SP-09
Engineering Testimony	Cause no. 474 Docket no. 0902-SP-09
Drainage Area calculations	Cause no. 474 Docket no. 0902-SP-09
Discounted Cash Flow Economics	Cause no. 474 Docket no. 0902-SP-09
Geology Testimony	Cause no. 474 Docket no. 0902-SP-09
Craig field geology Exhibit 1	Cause no. 474 Docket no. 0902-SP-09
Craig field geology Exhibit 2	Cause no. 474 Docket no. 0902-SP-09
Craig field geology Exhibit 3	Cause no. 474 Docket no. 0902-SP-09
Craig field geology Exhibit 4	Cause no. 474 Docket no. 0902-SP-09
Craig field geology Exhibit 5	Cause no. 474 Docket no. 0902-SP-09
John Wright biography	Qualifications and experience
Michael Sullivan biography	Qualifications and experience
James Van Meter biography	Qualifications and experience





**CYPRESS**

Cypress Production, Inc

Sugarloaf Plan of Development

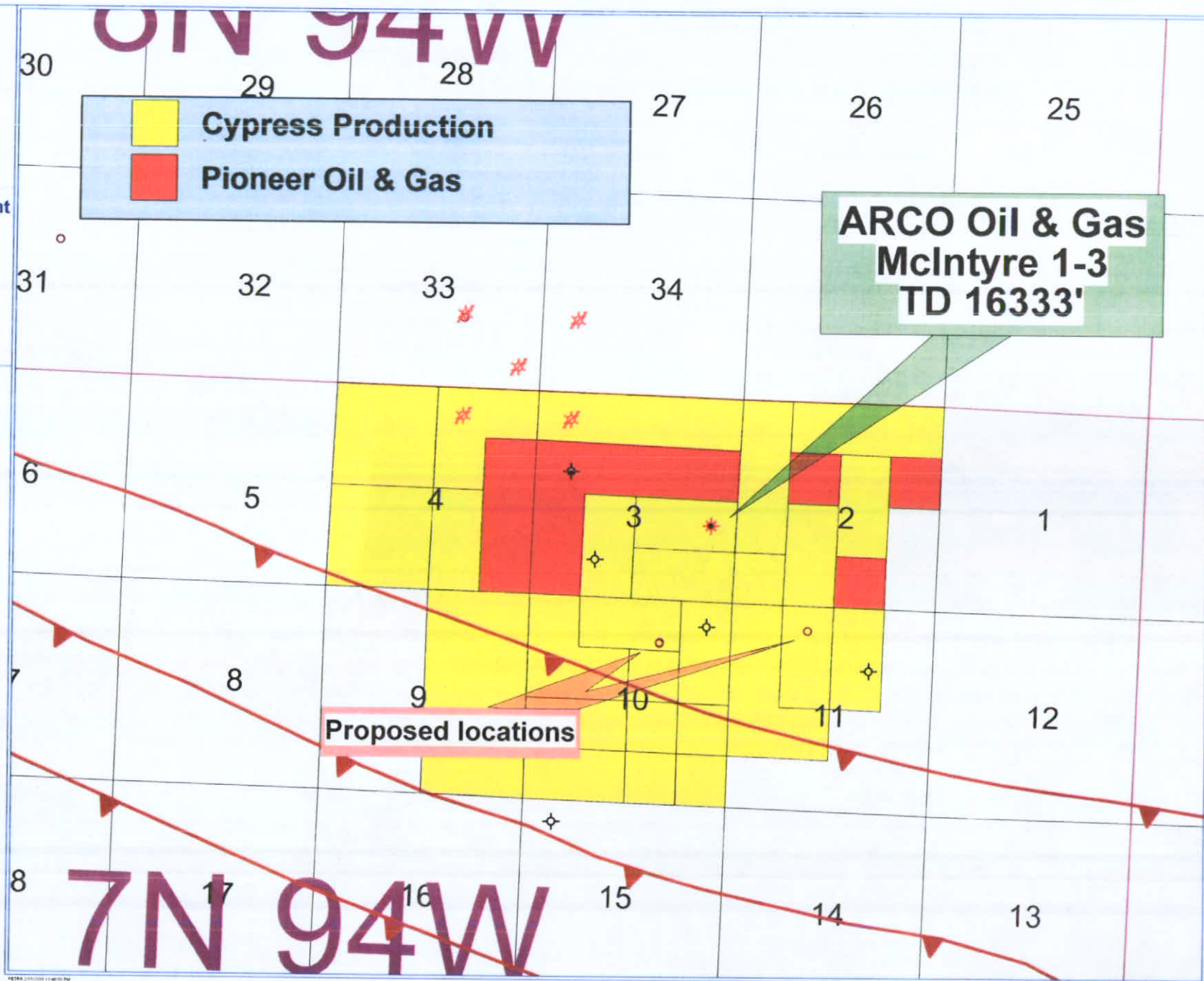
Land Exhibit 1

Land position

0 1,773 3,546 5,319  
FEET

By JRV

February 15, 2010





**CYPRESS**

Cypress Production, Inc

Sugarloaf Plan of Development

**Land Exhibit 2**

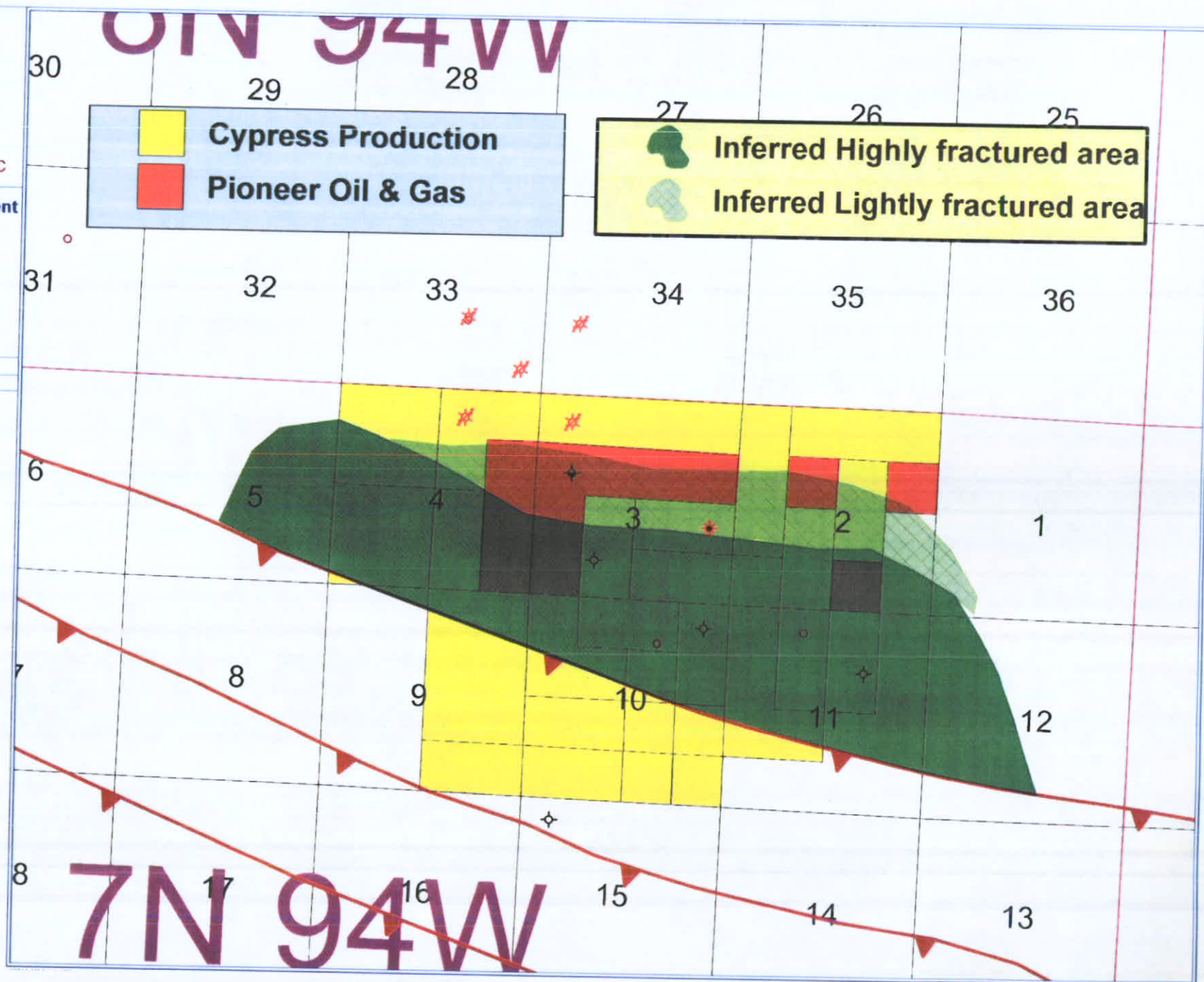
Land position

Inferred fractured Niobrara reservoir



By JRV

February 15, 2010







**CYPRESS**

Cypress Production, Inc

Sugarloaf Plan of Development

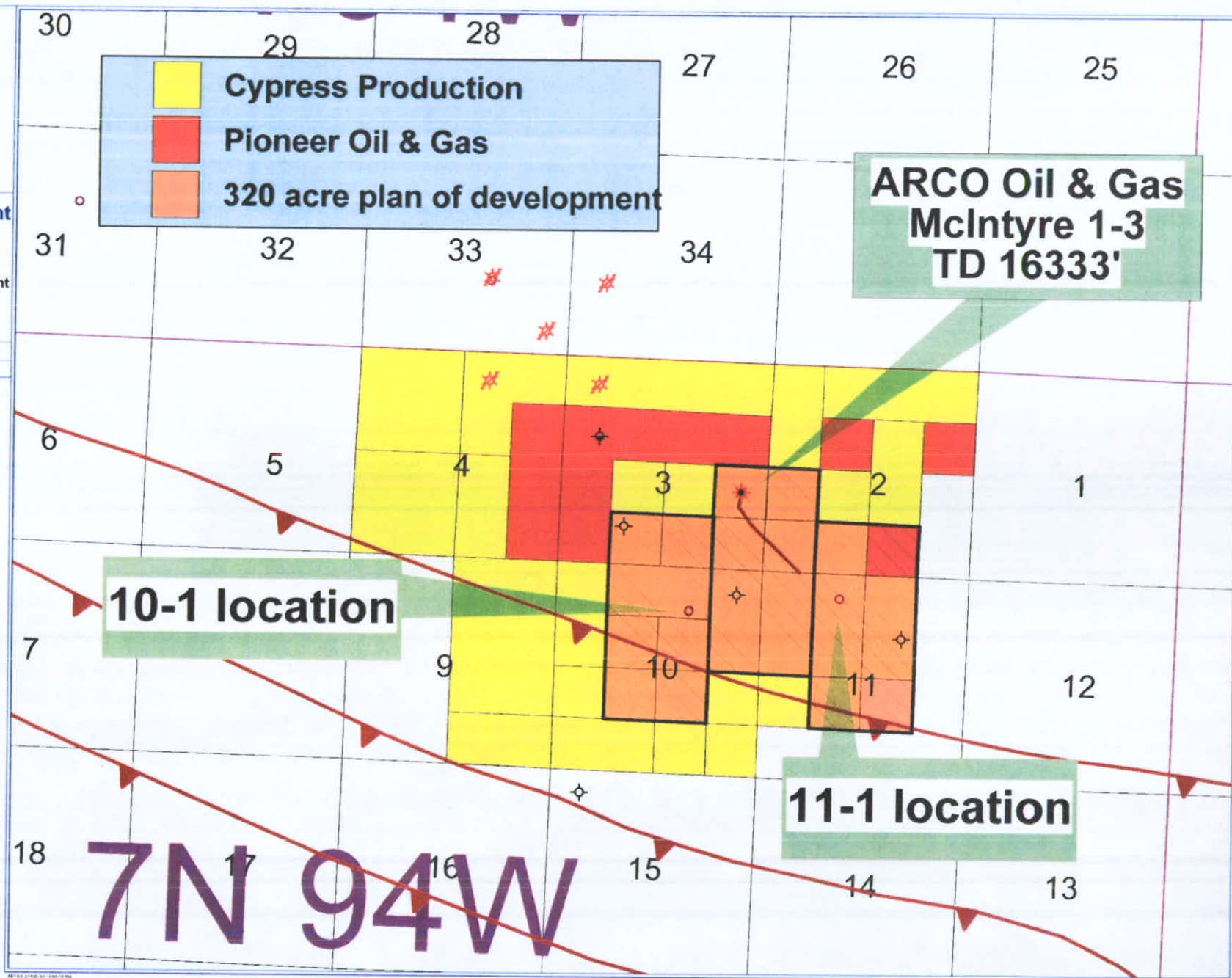
Land Exhibit 3

Land position & 320 plan of development

0 1,754 3,508 5,262  
FEET

By JRV

February 15, 2010





# CYPRESS

Cypress Production, Inc

Sugarloaf Prospect

Land Exhibit 4

Topographic map

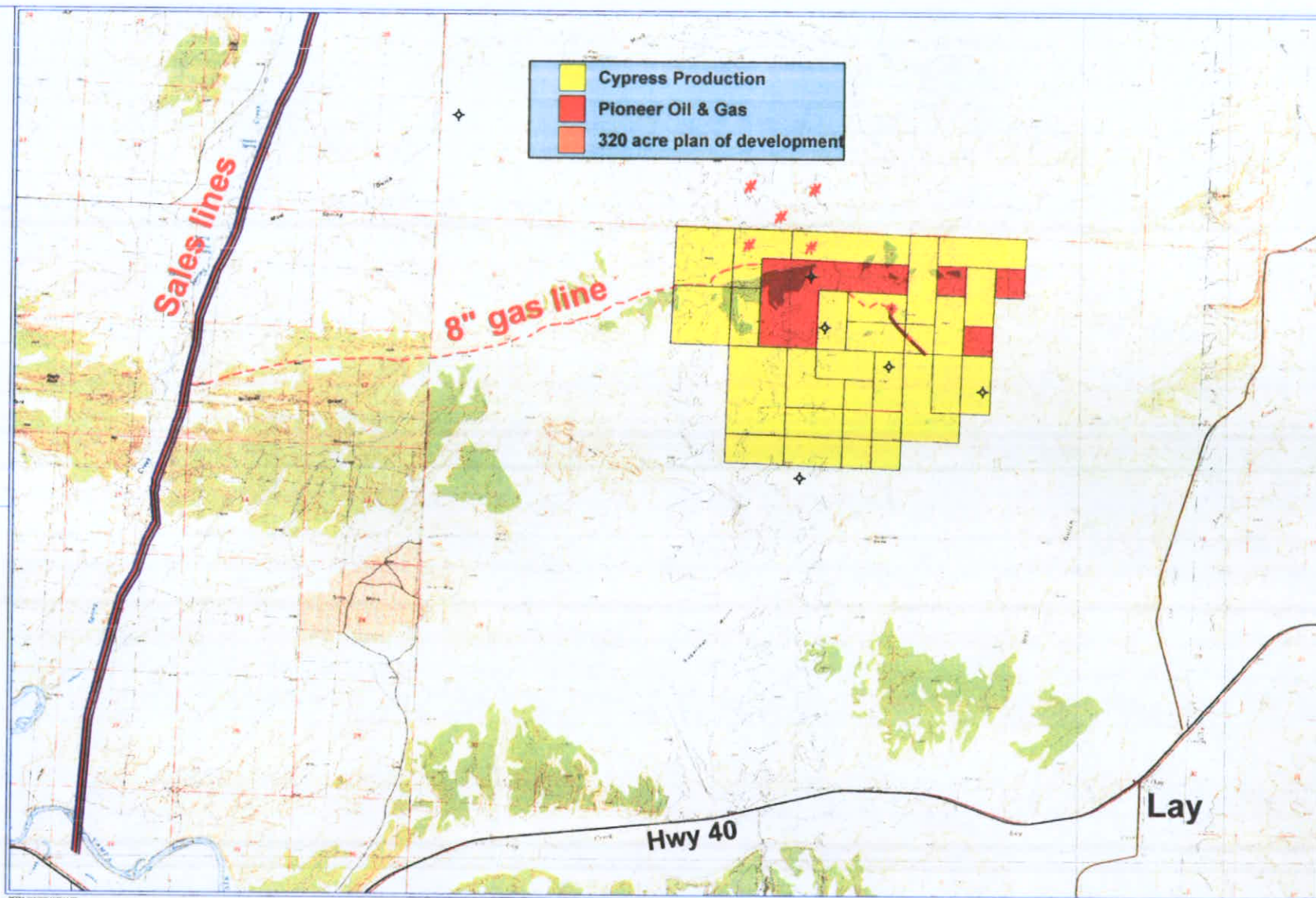
Pipeline map

0 3,365 6,732 10,098  
FEET

WELL SYMBOLS  
Gas Well  
Dry Hole  
Junked Gas Well  
Dry Hole With Show of Oil

By: JRV

February 16, 2010







# CYPRESS

Cypress Production

Sugarloaf Prospect

Land Exhibit 5

Cypress Production

McIntyre 1-3 sidetrack

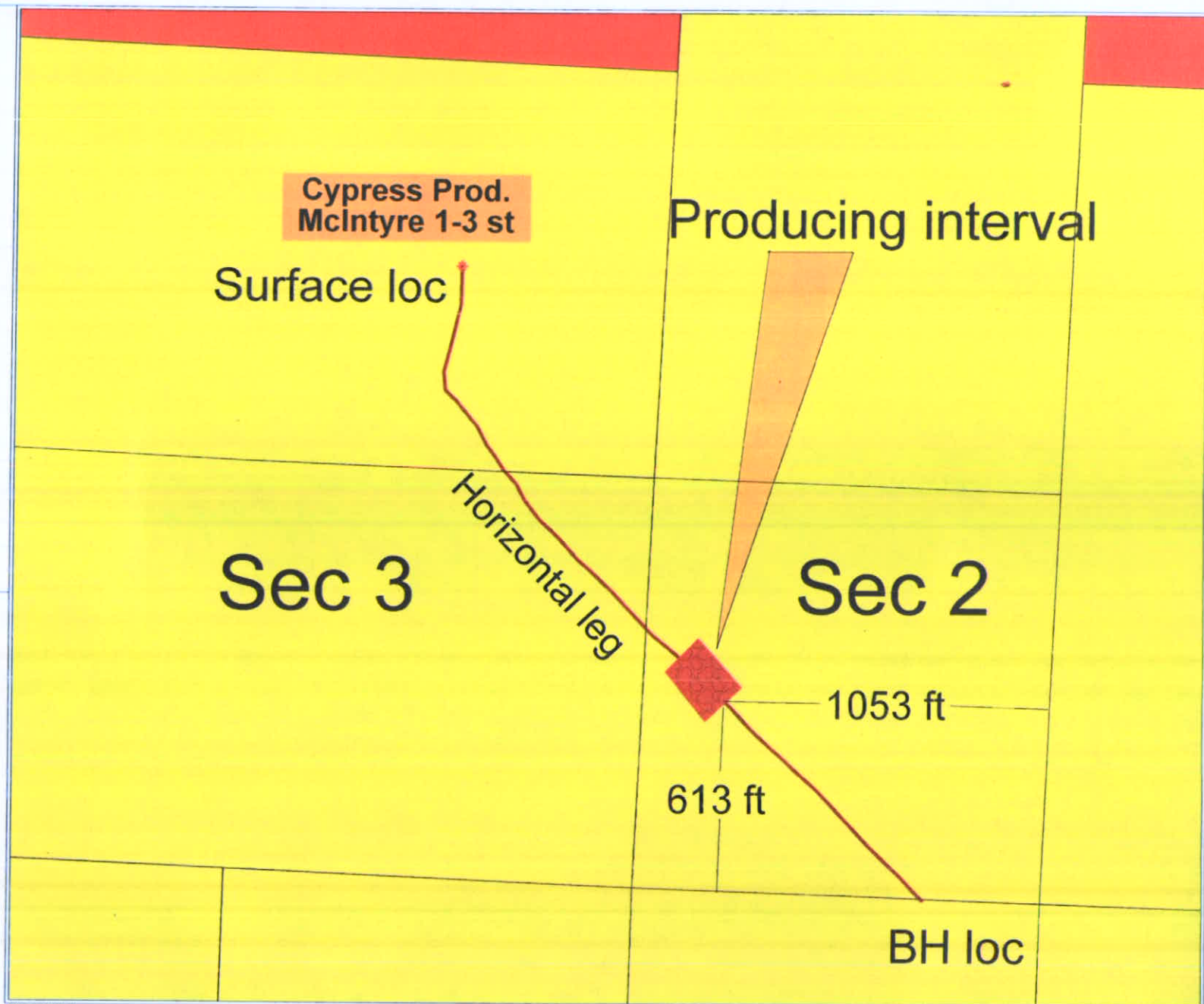


#### REMARKS

Gas and condensate producing interval is located 613 ft from Sec 11 leases.

By: JRV

February 16, 2010







# CYPRESS

Cypress Production, Inc

Sugarloaf Prospect

Geology Exhibit 1

Structure contour on top of Niobrara

Highly fractured area in green

0 1,500 3,100 4,700  
FEET

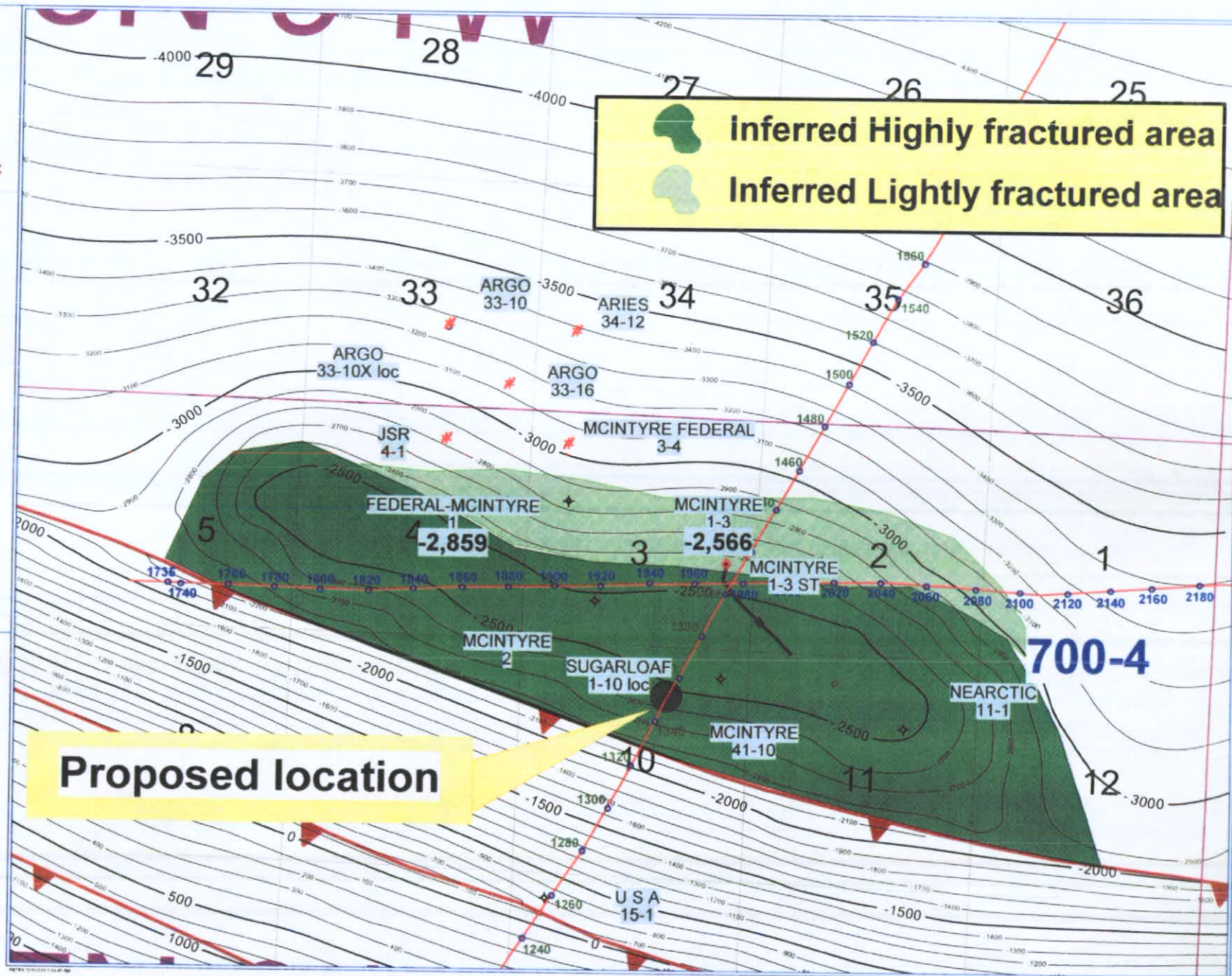
POSTED WELL DATA

Well Name  
Well Number  
FMTOPS - NIOBRARA[JRV] (SS)

WELL SYMBOLS  
LOCATION  
Gas Well  
Dry Hole  
Junked Gas Well  
Shut In Oil and Gas  
Dry Hole With Show of Oil

REMARKS  
100' contours in subsea elevation

By JRV  
February 16, 2010







**CYPRESS**

Cypress Production

Sugarloaf Prospect

Geology Exhibit 2

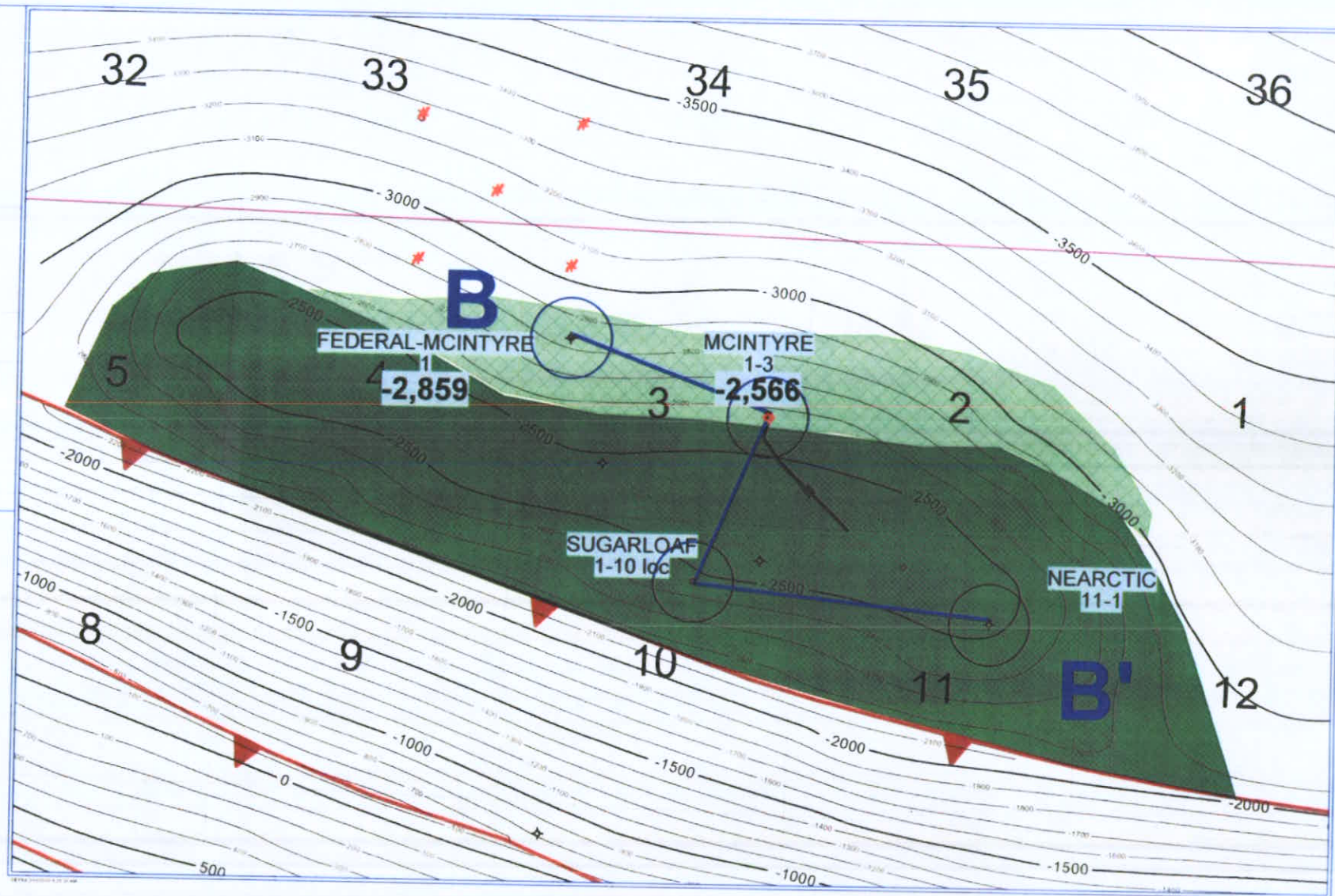
B - B' Log cross section location



POSTED WELL DATA

Well Name  
Well Number  
FMTOPS - NIOBRARA[JRV] (SS)

By JRV  
February 16, 2010







**CYPRESS**

Cypress Production

Sugarloaf Prospect

Geology Exhibit 3

Sugarloaf well log cross section

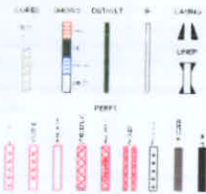
Mancos to base of Niobrara

Horizontal Scale = 319.1  
Vertical Scale = 100.0  
Vertical Exaggeration = 1.2x



Well Name  
Well Number

Well - TD



Highly fractured shale is green.  
Lightly fractured shale is light green.

Well - TD

FEDERAL MCINTYRE 1

MCINTYRE 1-3

MCINTYRE 10-1

NEARCTIC 11-1

B'

MANCOS

MORAPOS

NIOBRARA

CARLILE

MANCOS

MORAPOS

1-3 sidetrack

DST 3 Recovers  
1937 GCM  
Est. rate of 670 MCFD

DST 4 Recovers  
30.8 bbls Condensate  
8969 Gall  
Est. rate of 3.1 MMCFD

DST 5 Recovers  
295 G  
200 M  
1 CFG  
350 cc C

TEST TYPE: PDU  
TRT: Frac 36860 gal  
PRP: 120370 lb sand

DST Recovers  
170 Mud

TEST TYPE: PDU  
TRT: Acid 1200 gal

Highly fractured  
shale

Lightly fractured  
shale

12,312

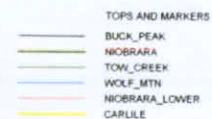
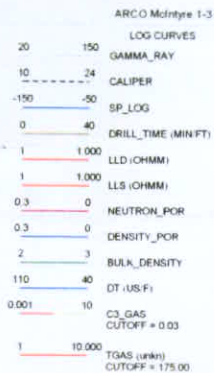
16,333

7,238



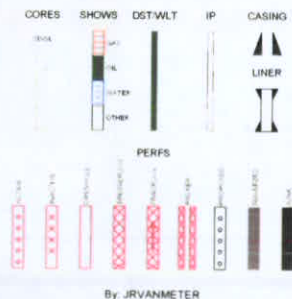
Sugarloaf Prospect

Geology Exhibit 4



Well Name  
Well Number  
Hist.Operator

TEXT BELOW TRACKS  
WELL - TD

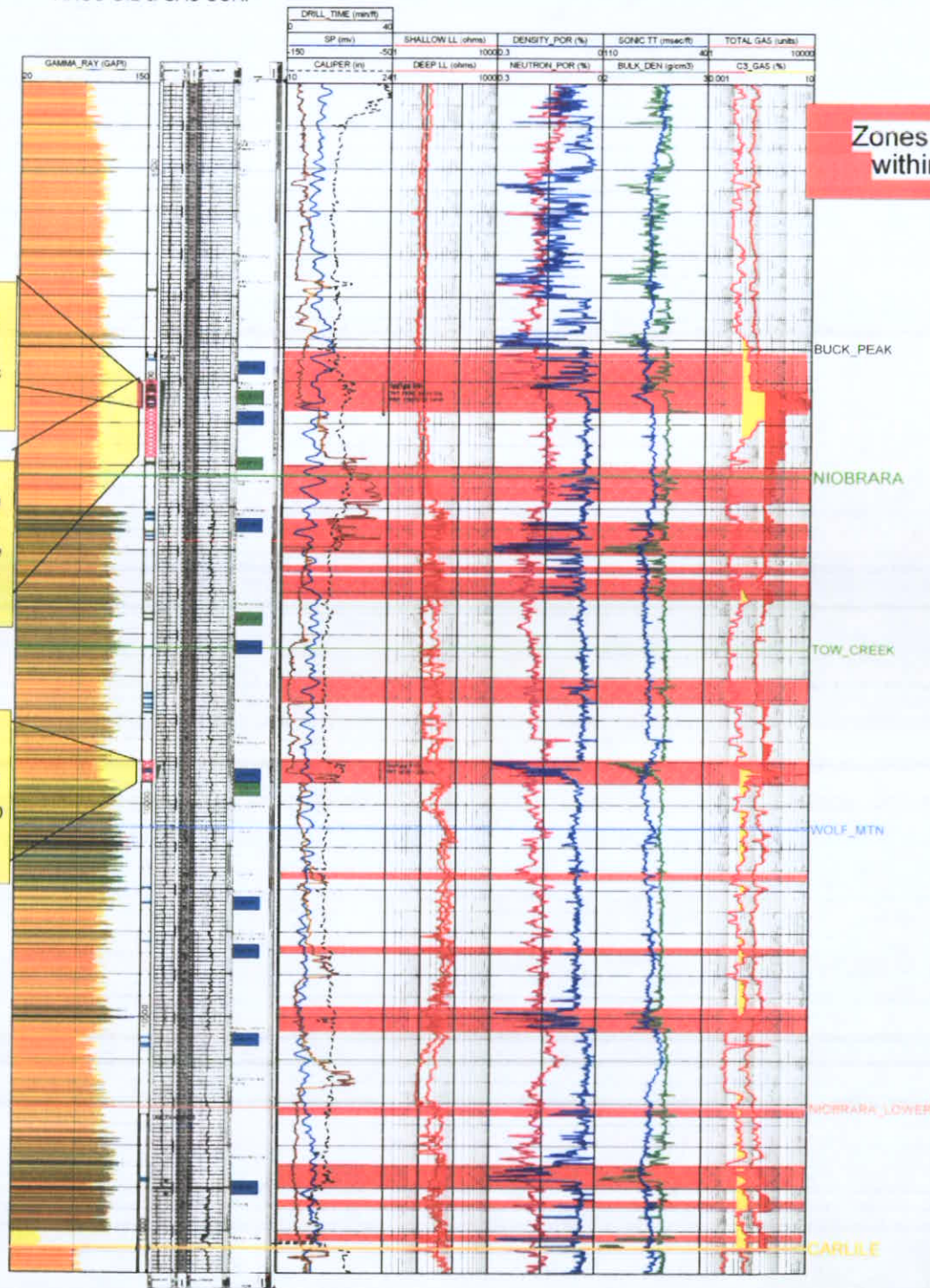


MCINTYRE  
1-3  
ARCO OIL & GAS CORP

**TEST #3 9018-9059'**  
Partially successful test. Tool did not open for second flow test. Interval shows good effective permeability to gas and exhibits some wellbore damage. Recovered 107 cc Condensate, 1.35 SCF Gas. 642 ft fresh water, 1937 ft GCM. Shut-In 4645#

**TEST #4 8998-9174'**  
Completely successful test. Relatively high gas flow suggest a high effect perm to gas and general character of the shut-in suggests only a fair perm, typical of fracture porosity. Recovered 30.8 bbl Condensate, 2150 cc Mud, 17.44 cc Gas & Condensate, 8969 ft Gas. Shut-In 4452#

**TEST #5 9910-9948'**  
Partially successful test. Invalid shut-in pressure. Test suggests low to fair effective permeability to gas or deep wellbore damage. Recovered 235 ft Condensate, 200 cc Mud, 1 SCF gas, 350 cc Condensate. Shut-In 2713#



Zones of fracturing within the shale



Exhibit No E-1  
Docket No \_\_\_\_\_  
Cause No \_\_\_\_\_

Drainage Area Calculation

Well	Units	McIntyre 1-3*	Unnamed	Unnamed
Surface Location		Sec 3 T7N R94W	Sec 10 T7N R94W	Sec 11 T7N R94W
EUR	MBO	100	100	100
Thickness	ft	251	251	251
Estimated Fracture Porosity		1%	1%	1%
Estimated Water Saturation		15%	15%	15%
Formation Volume Factor	RB /STB	1.38	1.38	1.38
Estimated Recovery Factor		5%	5%	5%
Estimated Drainage Area	Acres	167	167	167

Note: All values except thickness assumed to be the same as Samson  
State 33-15 #1 474-7

\* EUR assumes well will be able to be cleaned up once it is on production

Exhibit No E-2  
Docket No \_\_\_\_\_  
Cause No \_\_\_\_\_

Results of Economic Analysis

Oil EUR	BO	100,000	
Gas Sales		None	
Wellhead Oil Price	\$/bbl	65	flat
Completed Well Cost		\$ 2,000,000	
Initial Production Rate	bopd	80	
Effective Exponential Decline Rate	1/yr	25%	
Working Interest		100%	
Net Revenue Interest		75%	
Severance & Advalorem Tax Rate		6.55%	
Operating Cost	\$/Well/Mo	\$ 2,000	
Discounted (10%) Net Cash Flow		\$ 1,261,210	
Payout	Years	1.72	
Discounted (10%) Return on Investment		1.63	



*SAMSON RESOURCES  
COMPANY*

**RECEIVED**

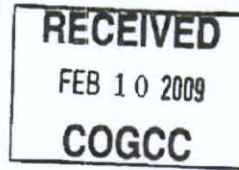
FEB 10 2009

**COGCC**

Cause No 474  
Docket No 0902-SP-09



BEFORE THE OIL & GAS CONSERVATION COMMISSION  
OF THE STATE OF COLORADO



IN THE MATTER OF THE APPLICATION OF )  
SAMSON RESOURCES COMPANY FOR AN )  
ORDER ESTABLISHING SPACING AND WELL )  
LOCATION RULES FOR THE NIOBRARA )  
FORMATION FOR CERTAIN DESCRIBED LANDS )  
IN CRAIG FIELD, MOFFAT COUNTY, )  
COLORADO )

Cause No 474

Docket No 0902-SP-09

REQUEST FOR RECOMMENDATION OF  
APPROVAL OF APPLICATION WITHOUT A HEARING

Samson Resources Company ("Applicant") by and through its undersigned attorneys, hereby requests pursuant to Rule 511b of the Rules and Regulations of the Colorado Oil and Gas Conservation Commission for the Director to recommend approval of the verified application and the supporting exhibits without a hearing

Applicant requests that the captioned matter be so approved based upon the merits of the Application and exhibits to be submitted since it is a straight forward application to establish 320-acre drilling and spacing unit for production from the Niobrara Formation. The only protest to this Application has been withdrawn

Applicant will provide sworn written testimony verifying sufficient facts along with exhibits that adequately support the relief requested in the Application for a Commission order

In the event that this request is denied, Applicant requests that the administrative hearing for this matter occur at a convenient time prior to the Commission hearing on February 23 and 24, 2009

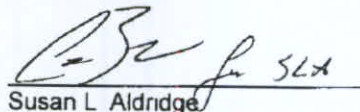
WHEREFORE, Applicant requests that its request for a recommendation for approval of its Application without a hearing be granted

DATED this 10<sup>th</sup> day of February, 2009

Respectfully submitted,

SAMSON RESOURCES, INC

By



Susan L. Aldridge  
BEATTY & WOZNIAK, P C  
216 16<sup>th</sup> Street, Suite 1100  
Denver, CO 80202  
(303) 407-4499





01408696

474-7

RECEIVED

JAN 05 2009

COGCC

## Reference Map

7N 92W

7N 91W

7N 90W

7N 89W

6N 92W

6N 91W

6N 90W

6N 89W

## COGCC Spacing

□ 274 1-3

□ 474-3

□ 445-1

□ 103-7

□ 1-123

□ 199-4

□ 474-4

5N 91W

5N 90W

5N 89W

## Land Testimony

My name is Michael Horton, and I am employed as a Sr District Landman for Samson Resources Corporation ("Samson"). I have my bachelor's degree in Business Administration in Energy Management from the University of Oklahoma. I have 8 years experience as a Landman and have been with Samson since January of 2006 working directly with the properties that are the subject of today hearing. My curriculum vitae is attached to Samson's Exhibit Booklet.

In support of our application today, I have prepared one exhibit. The exhibit is attached to my sworn testimony and forms the basis for our application to obtain orders to establish a 320-acre drilling and spacing unit in Moffat County, Colorado.

1 Exhibit No. 1 Lease Map

Exhibit No. 1 graphically depicts the proposed 320 acre spacing unit. Lease boundaries are set forth on this map as well as the location for the State 33-15 #1 Well (the location of this well and its proposed drainage are the basis for the boundary of our proposed spacing unit).

The proposed 320 acre spacing unit is made up entirely of State mineral interests, which have been leased to Samson's partner Ponder Exploration Ltd d/b/a Lynn Properties.

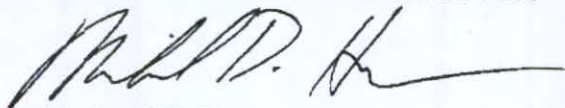
In accordance with the provisions of Rule 530 of the Rules and Regulations of the Colorado Oil & Gas Conservation Commission, at least 30 days have elapsed since the written notice has been provided to the interested parties. Moreover, based upon my experience, I believe that the proposed spacing unit will equitably divide proceeds and will protect correlative rights.

The matters described herein were all conducted under my direction and control. To the best of my knowledge and belief, all of the matters set forth herein, my testimony and in the exhibits are true, correct and accurate.

Dated this 9th day of February, 2009

Respectfully submitted,

SAMSON RESOURCES COMPANY

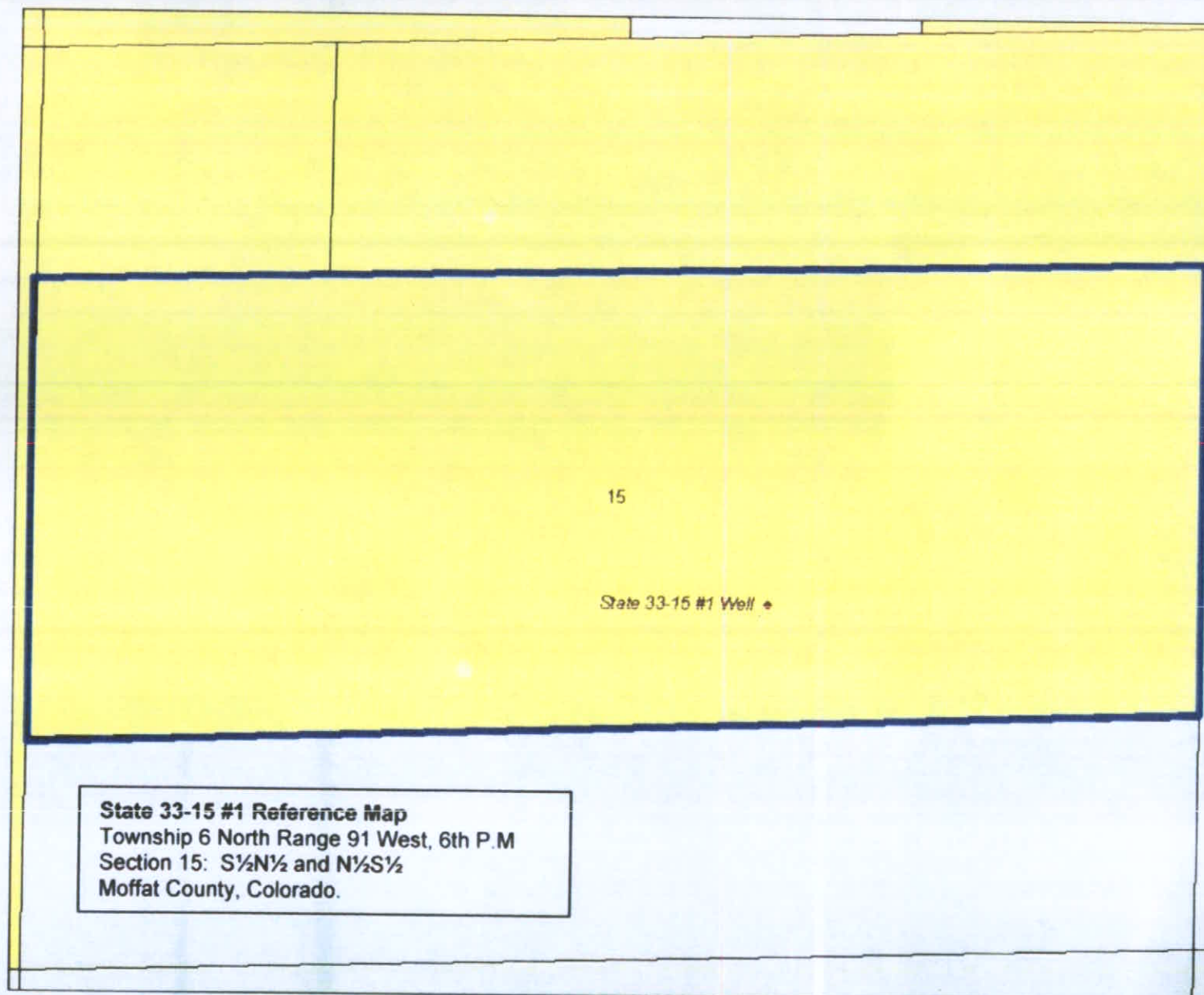


Michael D. Horton  
Sr District Landman



474-7

Exhibit No. 1  
Lease Map



**State 33-15 #1 Reference Map**  
Township 6 North Range 91 West, 6th P.M  
Section 15: S½N½ and N½S½  
Moffat County, Colorado.



ACKNOWLEDGMENT

STATE OF COLORADO )  
 ) ss  
CITY AND COUNTY OF DENVER )

The foregoing instrument was acknowledged before me this 9<sup>th</sup> day of February, 2009,  
by Michael Horton

Witness my hand and official seal

My commission expires

6/11/2010

JANET C WILLSON  
NOTARY PUBLIC  
STATE OF COLORADO

My Commission Expires 06/11/2010

(SEAL)

Janet C. Willson  
Notary Public  
Address 8147 W. Virginia Ave.  
Lakewood, CO 80226

**MICHAEL HORTON  
SR. DISTRICT LANDMAN**

**EXPERIENCE**

SAMSON RESOURCES COMPANY, DENVER, CO  
SR DISTRICT LANDMAN, JANUARY 2006-PRESENT

ANADARKO PETROLEUM CORPORATION, HOUSTON, TX  
LANDMAN, JUNE 2002-DECEMBER 2005

**EDUCATION**

UNIVERSITY OF OKLAHOMA, NORMAN, OK  
BACHELOR OF BUSINESS ADMINISTRATION, ENERGY MANAGEMENT, MAY 2002



## Engineering Testimony

My name is Kimberly Sands, and I am employed by Samson Resources Corporation ("Samson") as an Asset Engineer, Rocky Mountains Division. I have my Bachelor of Science Degree in Petroleum Engineering from Colorado School of Mines. I have 9 years experience as a Petroleum Engineer and have been with Samson since 2005 and have been working directly with the properties that are the subject of today hearing since August of 2006. My curriculum vitae is attached to Samson's Exhibit Booklet.

In support of our application today, I have prepared four exhibits. The exhibits are attached to my sworn testimony and form the basis for our application to obtain orders to establish a 320-acre drilling and spacing unit in Moffat County, Colorado.

1 Exhibit No. 1 Zimmerman-Chamberlin Decline Curve

Exhibit No. 1 depicts a decline curve for the Zimmerman-Chamberlin well which was selected for the drainage analogy as it is one of the two wells with significant Niobrara production on the Craig Dome structure.

2 Exhibit No. 2 Allen 44-8 #1 Decline Curve

Exhibit No. 2 depicts a decline curve for the Allen well which was selected for the drainage analogy as it is one of the two wells with significant Niobrara production on the Craig Dome structure.

3 Exhibit No. 3 Drainage Area Calculation

Exhibit No. 3 projects a drainage area radius for the State 33-15 #1 well based on fracture porosity in the brittle calcareous intervals of the Niobrara formation. Matrix porosity and permeability are assumed to be minimal contributors to production.

4 Exhibit No. 4 Discounted Cash Flow Economics

Exhibit No. 4 projects the economic impact of the State 33-15 #1 well based on the estimated ultimate recovery of 100,000 barrels of oil.

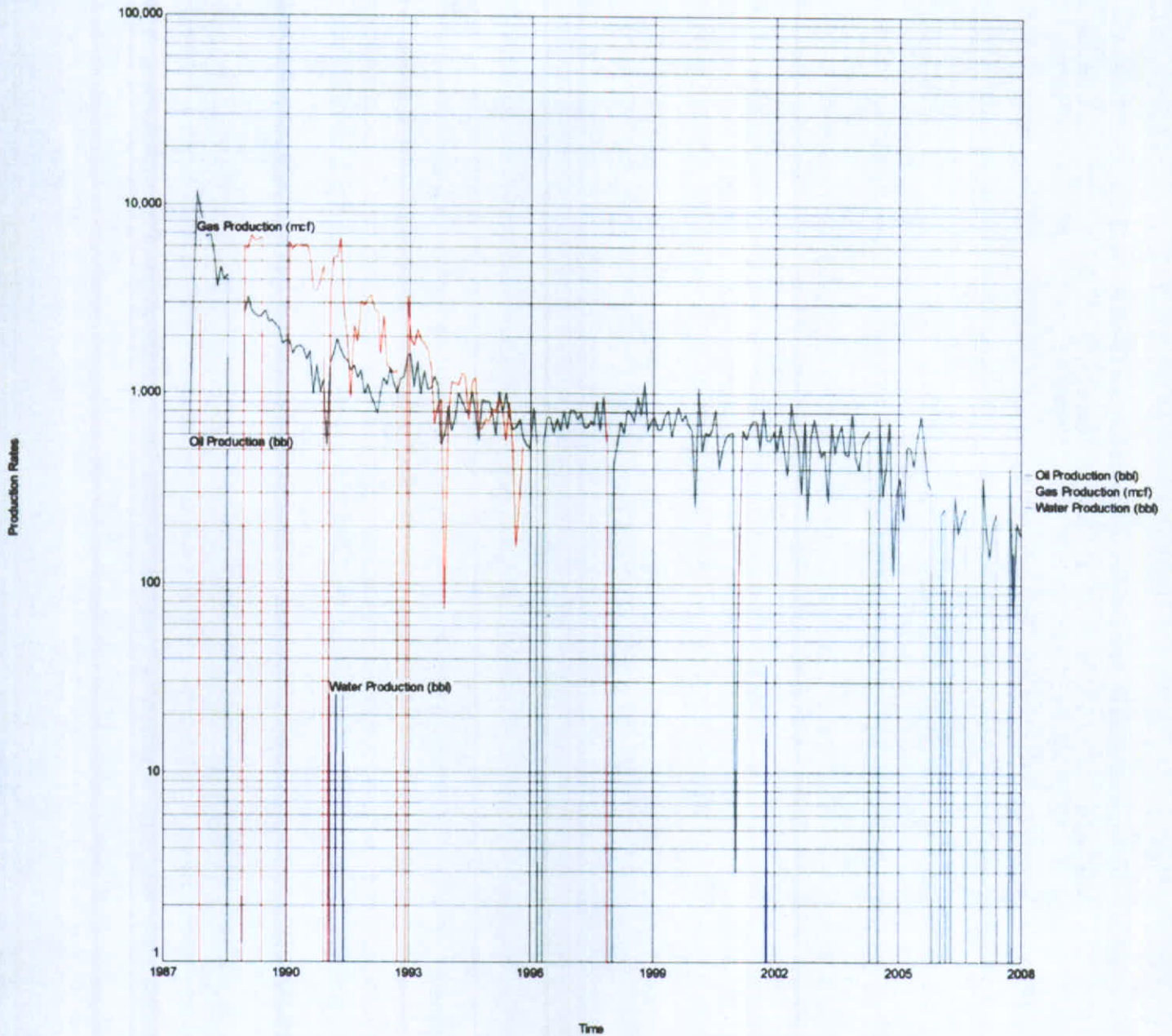
Based upon my analysis, I believe that creation of a 320-acre drilling and spacing unit will economically and efficiently drain the Niobrara formation in this area. Three hundred and twenty acre unit is not smaller than the maximum area that can be drained by this well. Depending upon the actual results of the State 33-15 #1 well, we are requesting the optional right to drill one additional well in this drilling and spacing unit.

The matters described herein were all conducted under my direction and control.

474-7

Exhibit No. 1  
Zimmerman-Chamberlain #1 Decline Curve

ZIMMERMAN CHAMBERLAIN#1 - CRAIG





474-7

Exhibit No. 2  
Allen 44-8 #1 Decline Curve

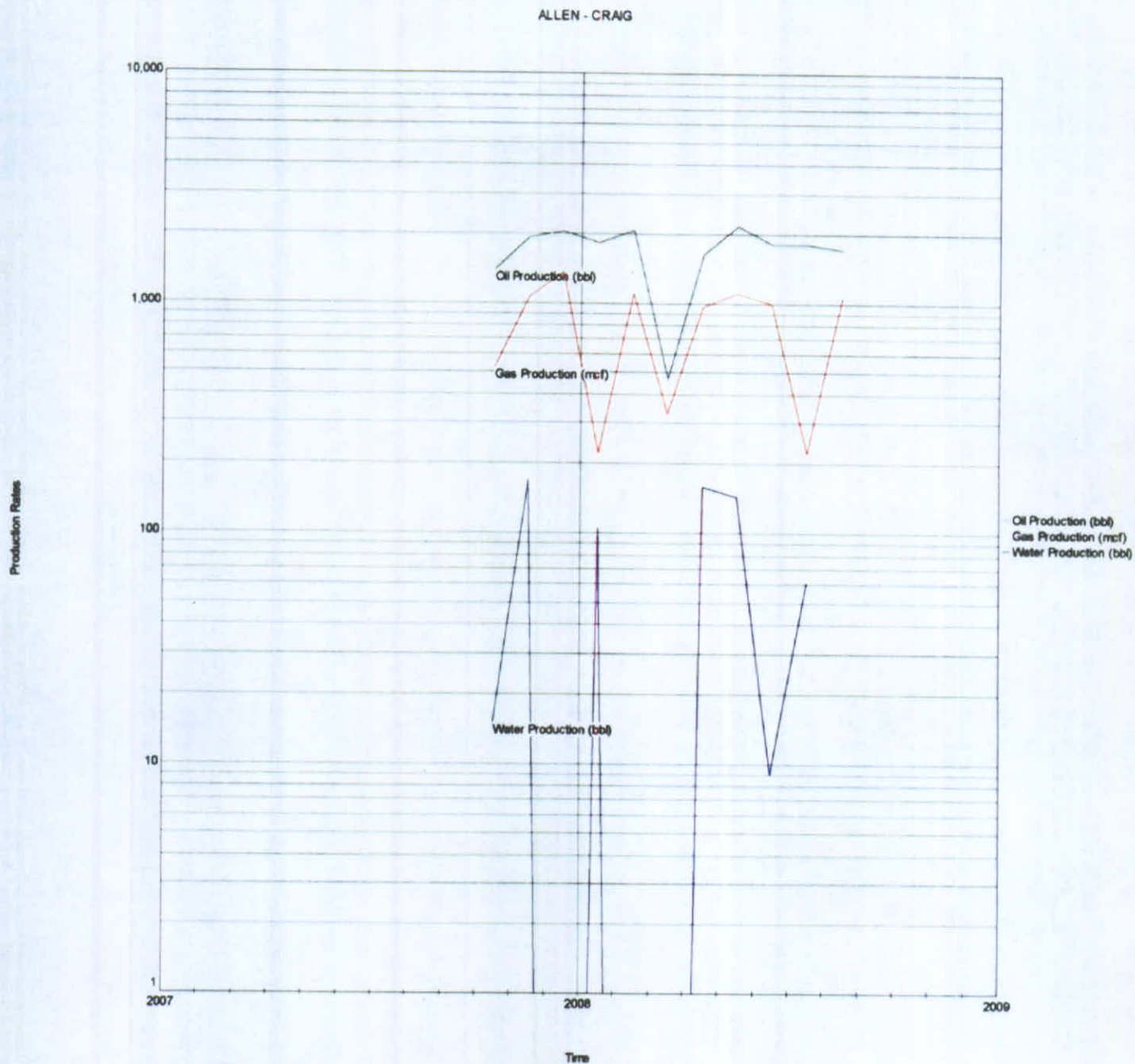


Exhibit No 3  
 Drainage Area Calculations  
 Niobrara Formation, Craig Field, Moffat County, Colorado  
 Docket #  
 Cause #

Drainage area calculations are based on fracture porosity in the brittle calcareous intervals of the Niobrara formation. Matrix porosity and permeability are assumed to be minimal contributors to production. The Zimmerman-Chamberlain well and the Allen 44-8 #1 wells were selected for the drainage analogies as they are the only other wells with significant Niobrara production on the Craig Dome structure.

Well	Zimmerman Chamberlain #1	Allen 44-8 #1	State 33-15 #1
Location	NW SW Sec 4, 6N-91W	SE Sec 8, 6N-91W	Sec 8, 6N-91W
Recovery as of 1-1-09	254 565 MBO	26 198 MBO	
EUR	260 MBO	100 MBO	100 MBO
Productive Thickness*	280 ft	280 ft	280 ft
Initial Potential (first 30 days)	350 BOPD	80 BOPD	80 BOPD
Estimated Fracture Porosity	2%	1%	1%
Water Saturation	15%	15%	15%
Oil Gravity	37 degrees API	37 degrees API	37 degrees API
Original Reservoir Pressure	2430 psi	2430 psi	2430 psi
Formation Volume Factor	1.38 rb/bbl	1.38 rb/bbl	1.38 rb/bbl
Reservoir Temperature	194 degrees F	194 degrees F	194 degrees
Estimated Recovery Factor	5%	5%	5%
Estimated Drainage Area	194 acres	194 acres	194 acres

\*Thicknesses are estimated to be equivalent between the two wells. No electric logs were available for the Zimmerman-Chamberlain well. The amount of section within the total thickness of the calcareous intervals which is actually fractured and contributing to production is unknown.



Exhibit No 4  
Discounted Cash Flow Economics

Estimated Ultimate Recovery	100,000 BO
Gas Sales	None
Wellhead Oil Price	\$50 00/BO flat
Completed Well Cost	\$2,300,000
Initial Production Rate	80 BOPD
Exponential Decline Rate	25% per year
Net Revenue Interest	77 5%
Severance and Ad Valorem Taxes	6 55%
Operating Cost	\$3,000 per month
Discounted Cash Flow at 10% Discount	\$ 195,000
Discounted Return on Investment (ROI)	1 08
Discounted Payout	3 74 years

To the best of my knowledge and belief, all of the matters set forth herein, my testimony and in the exhibits are true, correct and accurate

Dated this 5<sup>th</sup> day of February 2009

Respectfully submitted,

SAMSON RESOURCES COMPANY

*Kimberly Sands*

Kimberly Sands  
Asset Engineer, Rocky Mountain Division

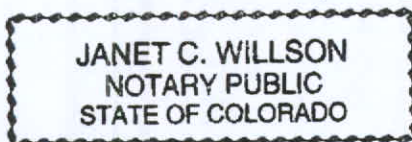
**ACKNOWLEDGMENT**

STATE OF COLORADO                    )  
  ) ss  
CITY AND COUNTY OF DENVER        )

The foregoing instrument was acknowledged before me this 5<sup>th</sup> day of February, 2009, by Kimberly Sands

Witness my hand and official seal

My commission expires 6/11/2010



My Commission Expires 06/11/2010

(S E A L)

Janet C. Willson  
Notary Public  
Address 8147 W. Virginia Ave.  
Lakewood, CO 80226



Kimberly Sands  
Asset Engineer

**Experience**

Samson Resources Company, Denver, CO  
Asset Engineer, April 2005 – Present

EnCana USA, Denver, CO  
Completions Engineer, June 2004 – April 2005

BP America, Houston, TX  
Consulting Drilling Engineer, March 2004 – May 2004

BP America, Houston, TX  
Drilling Engineer, January 2001 – March 2004

Vastar Resources, Houston, TX  
Production Engineer, June 2000 – January 2001

**Education**

Colorado School of Mines, Golden, CO  
Bachelor of Science, Petroleum Engineering, May 2000

Geology Testimony  
Cause No 474  
Docket No 0902-SP-07

My name is Rusty Kelly, and I am employed as a Sr District Geologist for Samson Resources Company ("Samson"). I have BS and MS degrees in Geological Sciences from Ohio University. I have eight years experience as a Geologist and have been with Samson since October of 2002, and have been working the Niobrara Formation or equivalent intervals in Colorado for the past 2 years, with a specific concentration on the northwest Colorado area for the past 15 months. My qualifications are attached to Samson's Exhibit Booklet.

In support of our application today, I have prepared five exhibits. The exhibits are attached to my sworn testimony and form the basis for our application to obtain orders to establish a 320-acre drilling and spacing unit in Moffat County, Colorado.

1 Exhibit No. 1 Location Map

Exhibit No. 1 depicts the proposed 320 acre spacing unit in a red dashed outline. The subject unit is located in Section 15, township 6 North, Range 91 West.

All wells drilled in the surrounding sections are displayed. A producing formation color code has been applied to indicate which zone(s), if any are productive. Five wells have produced from the Niobrara Formation, one well has produced from the Frontier formation, and one well has produced (water only) from the Williams Fork Coal. A cross-section index line is posted on the map to indicate the location of the fourth geologic exhibit.

2 Exhibit No. 2 Type Log

Exhibit No. 2 is a type log for the Niobrara Formation in the application area. The well used for this type log is the Samson Resources Company Allen 44-8#1 well in section 8, Township 6N, Range 91W. The log types on this exhibit include a gamma ray, deep induction, and conductivity logs. The shale dominated Niobrara Formation is indicated on this log along with three calcareous rich intervals which are designated by blue shading and are labeled with industry nomenclature. The thickness of these units is indicated to the left of underlying shales within the Niobrara Formation and therefore have a greater ability to fracture. Fractures within these brittle calcareous intervals are the reservoir target within the Niobrara Formation in this area.

3 Exhibit No. 3 Structure Map

Exhibit No. 3 is a structure map constructed on top of the Niobrara Formation in the application area. The foundation of this map is from wireline log tops picked in the application area. Mapping of this structural surface reveals that there is a fault bounded anticlinal structure underlying the application area. Steep dips and faulting indicate an area of greater fracture development and dilation, which allows for greater fractured reservoir storage. The area of our application, has been identified due to this increased fracturing within the brittle



calcareous intervals This "fracture fairway" allows for increased deliverability from an otherwise impermeable and uneconomic reservoir

4 Exhibit No 4 Cross-Section

Exhibit No 4 is an Isopach map for the calcareous rich intervals within the Niobrara Formation Wireline logs were reviewed to identify the three reservoir units, the gross interval was then calculated and summed together for a gross thickness of these brittle units These values were then posted on the map and an isopach map was created to display the thickness of the brittle calcareous units within the Niobrara

5 Exhibit No 5 Isopach Map

Exhibit No 5 is an Isopach map for the calcareous rich intervals within the Niobrara Formation Wireline logs were reviewed to identify the three reservoir units, the gross interval was then calculated and summed together for a gross thickness of these brittle units These values were then posted on the map and an isopach map was created to display the thickness of the brittle calcareous units within the Niobrara This map indicates a minimum thickness of 280' of brittle calcareous rich Niobrara beneath the application lands

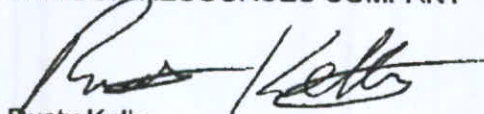
The Geology exhibits attached and described above demonstrate that the Niobrara formation is present, and fractured, beneath the application lands The presence of fractures allows for the economic extraction of oil from this reservoir Based upon my experience, I believe that the proposed spacing unit will equitably divide proceeds and will protect correlative rights

The matters described herein were all conducted under my direction and control To the best of my knowledge and belief, all of the matters set forth herein, my testimony and in the exhibits are true, correct and accurate

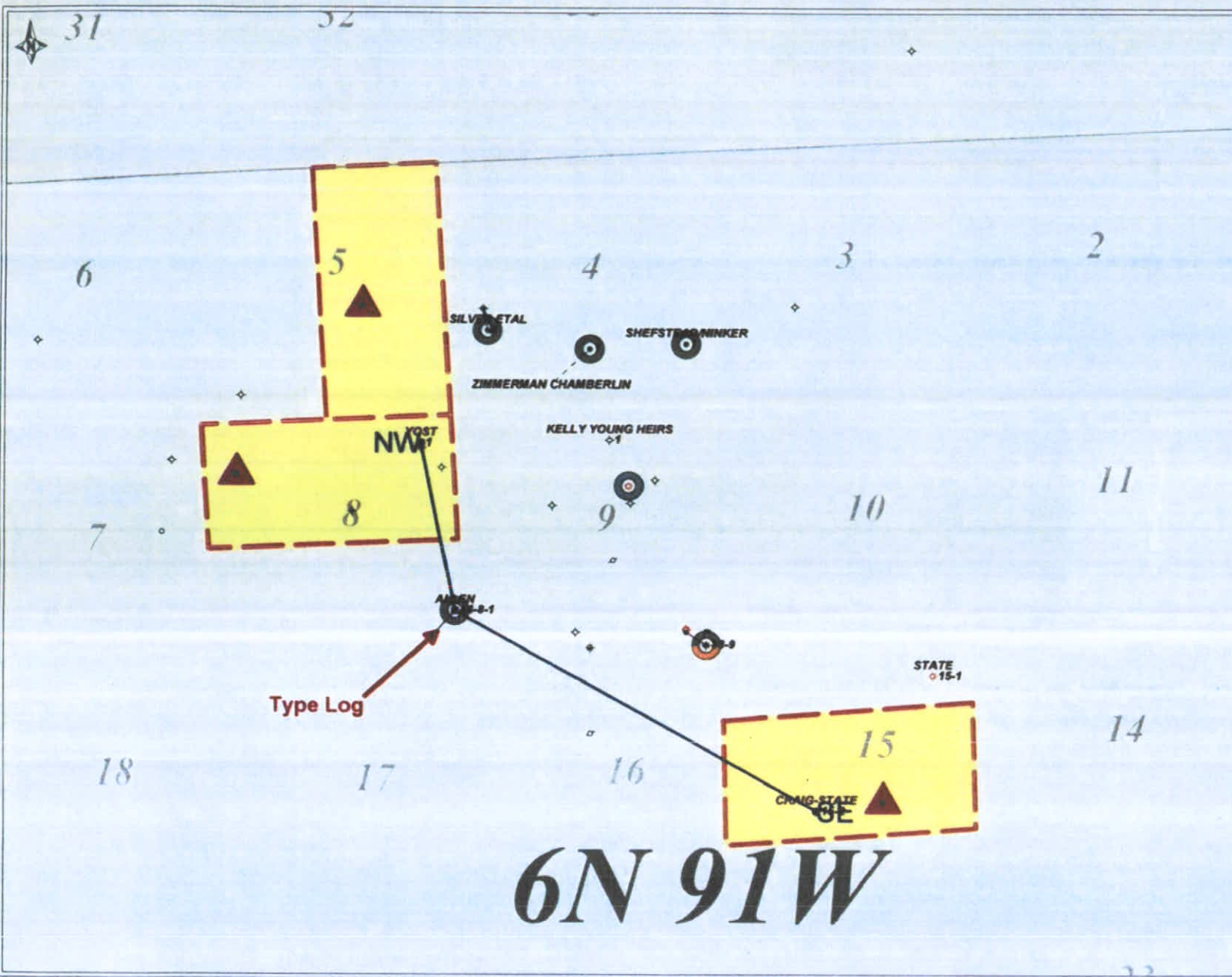
Dated this 9<sup>th</sup> Day of February, 2009

Respectfully submitted,

SAMSON RESOURCES COMPANY



Rusty Kelly  
Sr District Geologist

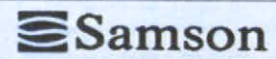


Type Log

NW 1

STATE  
15-1

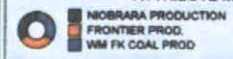
Craig State  
GE



**GEOLOGY EXHIBIT #1**  
**LOCATION MAP-CRAIG FIELD**



### ATTRIBUTE MAP



**SYMBOL HIGHLIGHT**

 CRAIG DOME LOGS

### WELL SYMBOLS

- Location Only
- Oil Well
- ⊙ Gas Well
- ◇ Dry Hole
- ⊘ Abandoned Well
- ⊕ Dry Hole, With Show of Oil

REMARKS  
WAVE 6-8000'

DOCKET #: 0902-SP-07  
DOCKET #: 0902-SP-08  
DOCKET #: 0902-SP-09  
CAUSE #: 474

By: RKELLY



474-7



# Type Log-Geology Exhibit 2



474-7

05081073990000

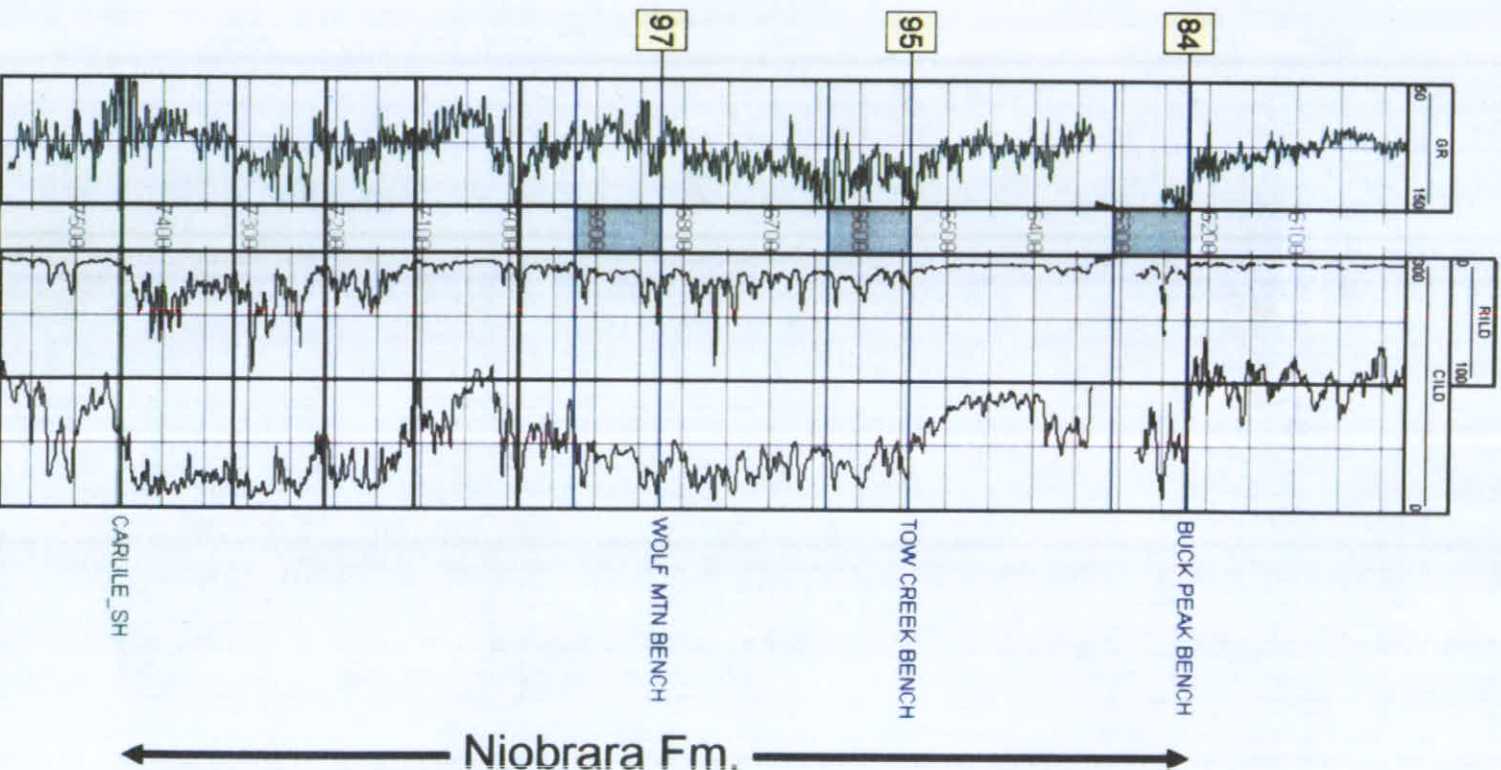
SAMSON RESOURCES CO

ALLEN

• 44-8-1

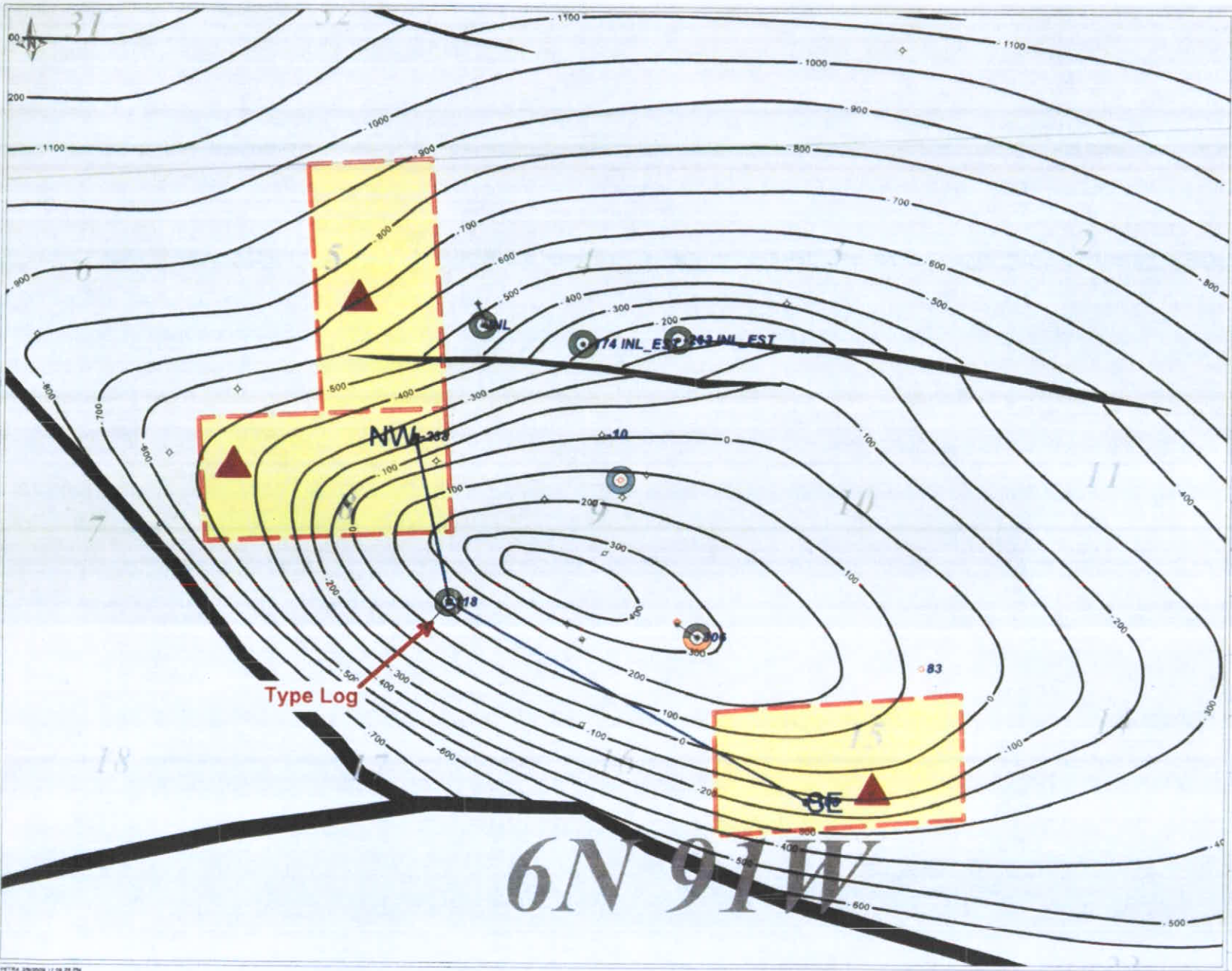
T6N R91W S8

SE SE



TD : 7,629

Docket # 0902-SP-07  
Docket # 0902-SP-08  
Docket # 0902-SP-09  
Cause # 474

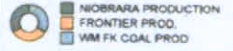


**Samson**

GEOLOGY EXHIBIT #3  
**NIOBARRA STRUCTURE MAP**



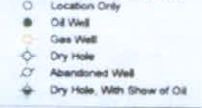
ATTRIBUTE MAP



SYMBOL HIGHLIGHT



WELL SYMBOLS



REMARKS

DOCKET #: 0902-SP-07  
 DOCKET #: 0902-SP-08  
 DOCKET #: 0902-SP-09  
 CAUSE #: 474

By RKELLY



474-7

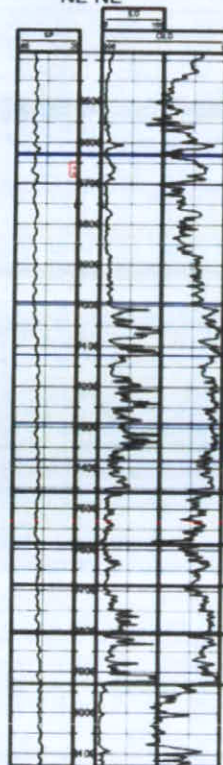


NW

SE

05081053450000  
CONTINENTAL OIL CO  
YOST

• 1  
T6N R91W S8  
NE NE



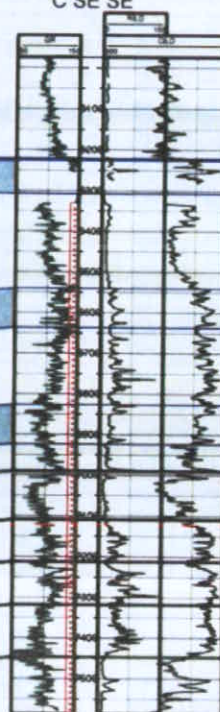
TD : 9,569

<3.823FT>

05081073990000  
SAMSON RESOURCES COMPANY

ALLEN  
24,396  
12,117

• 44-8-1  
T6N R91W S8  
C SE SE

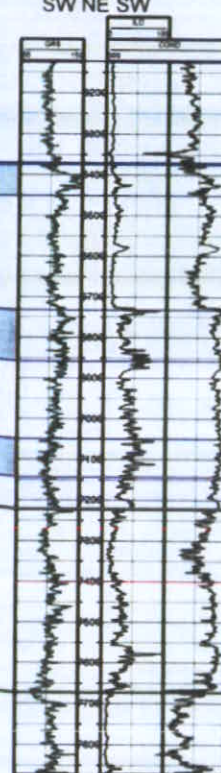


24,396  
12,117  
TD : 7,637

<8.480FT>

05081066720000  
K-N OPRTRNG CORPRTN  
CRAIG-STATE

• 15-2  
T6N R91W S15  
SW NE SW



TD : 8,088

BUCK PEAK BENCH

TOW CREEK BENCH

WOLF MTN BENCH

CARLILE\_SH

**Samson**

GEOLOGY EXHIBIT #4

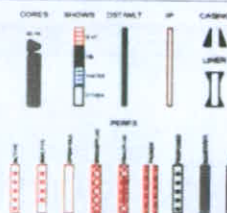
Stratigraphic Section

DATUM: TOP OF NUBRAKA

Horizontal Scale = 500.0

Vertical Scale = 100.0

Vertical Exaggeration = 3.0x



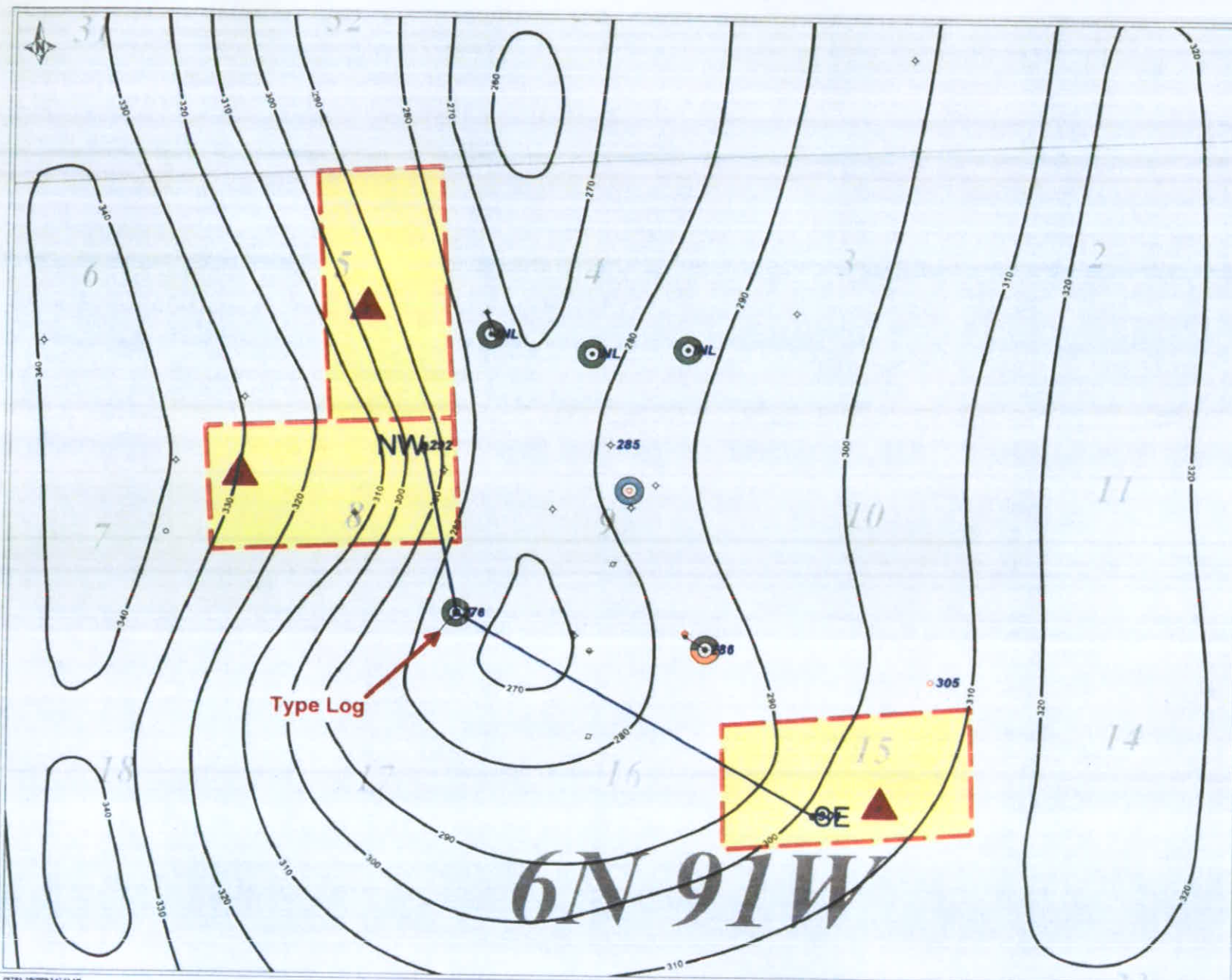
DOCKET # 0902-SP-07  
DOCKET # 0902-SP-08  
DOCKET # 0902-SP-09  
CAUSE # 474

By: RRELLY



01408692

474-7



**Samson**

GEOLOGY EXHIBIT #5

NIORARA CALCAREOUS BENCH ISOPACH

GROSS INTERVAL MAP (10' C.I.)

0 2,000 4,000  
FEET

ATTRIBUTE MAP

NIORARA PRODUCTION  
FRONTIER PROD.  
WM FK COAL PROD.

SYMBOL HIGHLIGHT

▲ CRAIG DOME LOCS

WELL SYMBOLS

○ Location Only  
● Oil Well  
○ Gas Well  
◇ Dry Hole  
□ Abandoned Well  
⊕ Dry Hole, With Show of Oil

REMARKS

DOCKET #: 0902-SP-07  
DOCKET #: 0902-SP-08  
DOCKET #: 0902-SP-09  
CAUSE #: 474

By RKELLY



01408693

474-7

ACKNOWLEDGMENT

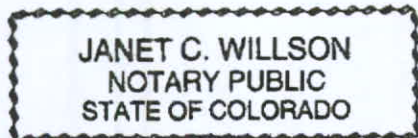
STATE OF COLORADO )  
 ) ss  
CITY AND COUNTY OF DENVER )

The foregoing instrument was acknowledged before me this 9<sup>th</sup> day of February, 2009, by Rusty Kelly

Witness my hand and official seal

My commission expires

6/11/2010



My Commission Expires 06/11/2010

(S E A L)

Address

Janet C. Willson

Notary Public

8147 W. Virginia Ave.

Lakewood, CO 80226



## Geological Witness

Russell (Rusty) Kelly

### Education:

MS Geology Ohio University 2002

BS Geology Ohio University 1999

### Work Experience:

Geologist-Samson Resources Company

Denver CO.

1/2005-Present

Tulsa OK.

10/2002-1/2005

Geologist-Texas Keystone Inc.

Pittsburgh PA.

3/2001-10/2002

**John D. Wright, PhD, P.E.**

John D. Wright is Chief Engineer of Wright Consulting Company in Golden, Colorado. He has more than 40 years of domestic and international oil and gas experience in reservoir engineering, coalbed natural gas development, and property evaluation and has been an expert witness in more than 40 oil and gas industry cases. He has testified in front of conservation commissions, state courts, federal courts, and arbitrations.

Dr. Wright has been a principal in two petroleum engineering consulting firms for a total of 25 years and taught Petroleum Engineering at the Colorado School of Mines for eight years. He co-authored a book titled Oil Property Evaluation and has taught numerous short courses domestically and internationally. Dr. Wright is active in a number of professional societies and is a registered professional engineer in three states. He is a member of a number of professional societies including SPE, SPEE, SIPES, and SPWLA. He served on the Board of Directors for the Society of Petroleum Evaluation Engineers.

MICHAEL T. SULLIVAN  
6371 Lemon Gulch Drive  
Castle Rock, Colorado 80108

**PERSONAL:** Age: 63

Married, Three Children  
Health: Excellent

**Education:**

A.S. Civil Engineering, 1969 Otero Jr. College  
B.S. Chemistry, 1975, University of Denver

**WORK EXPERIENCE:**

1970-1975 Bell Surveying and Engineering  
Registered Land Surveyor

1975-1977 Chemical Analyst, Melcor Labs, Denver, Colorado  
1977-1980 Amoco Production Company, Denver, Colorado

Area Landman  
1980-1982 Dome Petroleum Corporation, Denver, Colorado

District Manager, Rocky Mountain Region  
1982-1983 DMC Corporation, Denver, Colorado

District Manager  
1983-1985 Amerada Hess Corporation, Denver, Colorado

Area Landman, California and Rocky Mountains  
1985-1986 Arco Oil and Gas Company, Denver, Colorado

Land Manager, Denver Office  
1986-1987 Arco Oil and Gas Company, Midland, Texas

Property Sales Manager, Central District  
1987-1991 El Paso Mineral Company, Midland, Texas

Vice President of Acquisitions, Division Orders  
1991-2000 Santa Fe Natural Resources, Inc. and Santa Fe Royalties, Inc.

Sr. Vice President of Land, Acquisitions and Division Orders.  
2000- Present President and CFO Durango Pipeline Corp. and Durango LLC.



James R. Van Meter  
10826 Elder Ave.  
Conifer, CO 80433  
AAPG Certified Geologist #4813

Education:

1980 BA degree Geology Western State College, Gunnison CO  
1990 MS degree Geology Colorado School of Mines, Golden CO

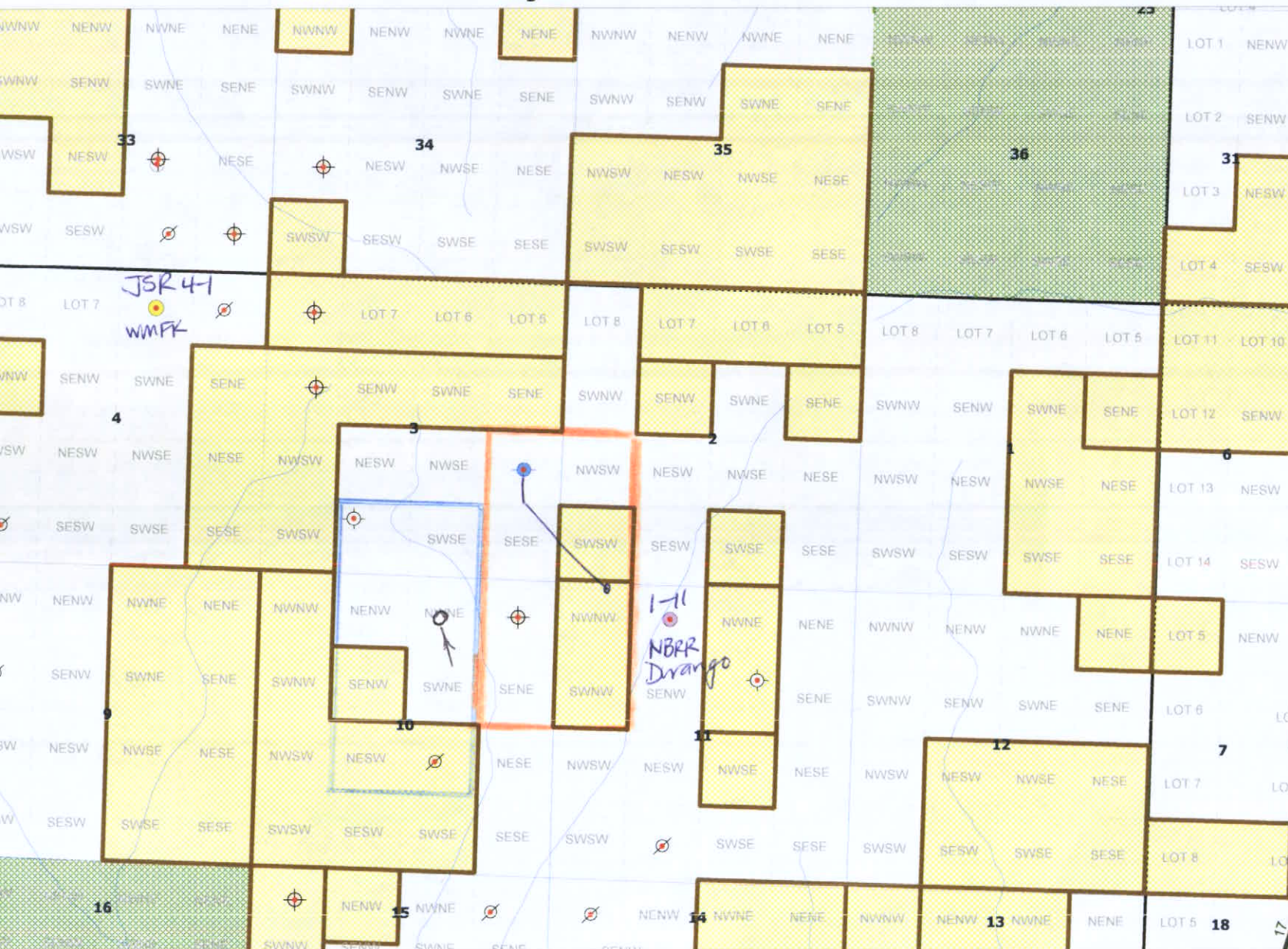
Work Experience:

1980-1981 Geologist Rocky Mountain Geo-Engineering Grand Junction, CO  
1981-1982 Geologist Gustavson Associates, Boulder CO  
1983-1986 Geologist Steven D. Reynolds Exploration, Denver CO  
1987-1990 Graduate Student Colorado School of Mines  
1990- 1993 Senior Geological Engineer, Tenneco Gas Pipeline, Houston, TX  
1993-1995 Chief Geologist, DNR Oil & Gas, Denver, CO  
1995-Present Consulting Petroleum Geologist, Van Meter Geosciences, Inc.  
Conifer, CO

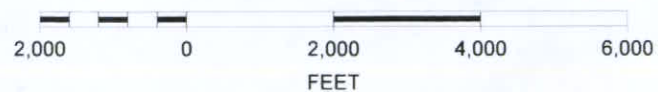
AAPG certified petroleum geologist, over 29 years of domestic/international experience in exploration/development geology. Proficiency at log analysis, prospect generation/evaluation, reserves estimation and net pay analysis, field/regional studies, well site operations. Experienced with 2-D/3-D seismic modeling/interpretation, geochem and E-M field data retrieval, data digitization and various other engineering and geologic duties and have worked for consulting firms, oil companies and a gas pipeline company since 1980. Areas of experience include Rocky Mountain oil and gas basins including Powder River, San Juan, Greater Green River, Williston, Piceance, Uinta, as well as Mid-Continent region, Gulf Coast (on & off-shore), Appalachia, California, and overseas (Myanmar, Mexico, FSU). Projects included an array of structural and stratigraphic tectonic regimes, involving conventional/non-conventional reservoirs including basin centered gas, fractured shale reservoirs and coal bed methane.



CYPRESS McIntyre 3-1 ST 7N 94W



SCALE 1 : 31,658





# Mc Inytre # 1-3 ST      Sec 3    7N 94W

