

New Mexico Wolfcamp



Walnut Creek Wolfcamp Gas Pool

POOL RULES HEARING

20 SEPTEMBER 2007

Before the Oil Conservation Division
Exhibit No. 1
Parallel Petroleum Corp
OCD CASE 13986
Hearing: September 20, 2007

New Mexico Wolfcamp



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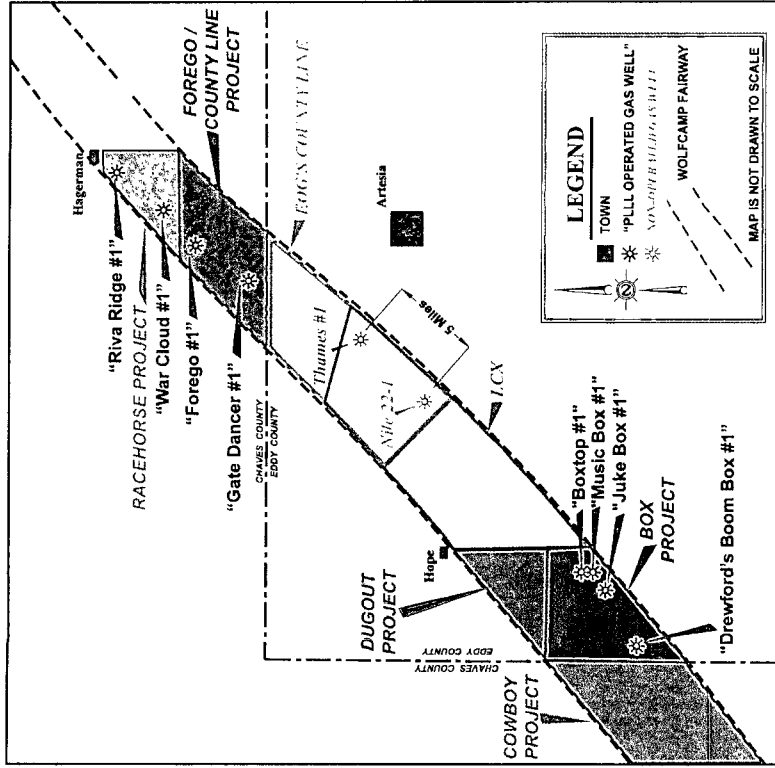
- I. Introduction**
- II. Trend History and Qualities (slides 1 – 4)**
- III. Geology (slides 5 – 13)**
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- VII. Summary (slides 22 – 26)**

Trend History and Qualities

Section

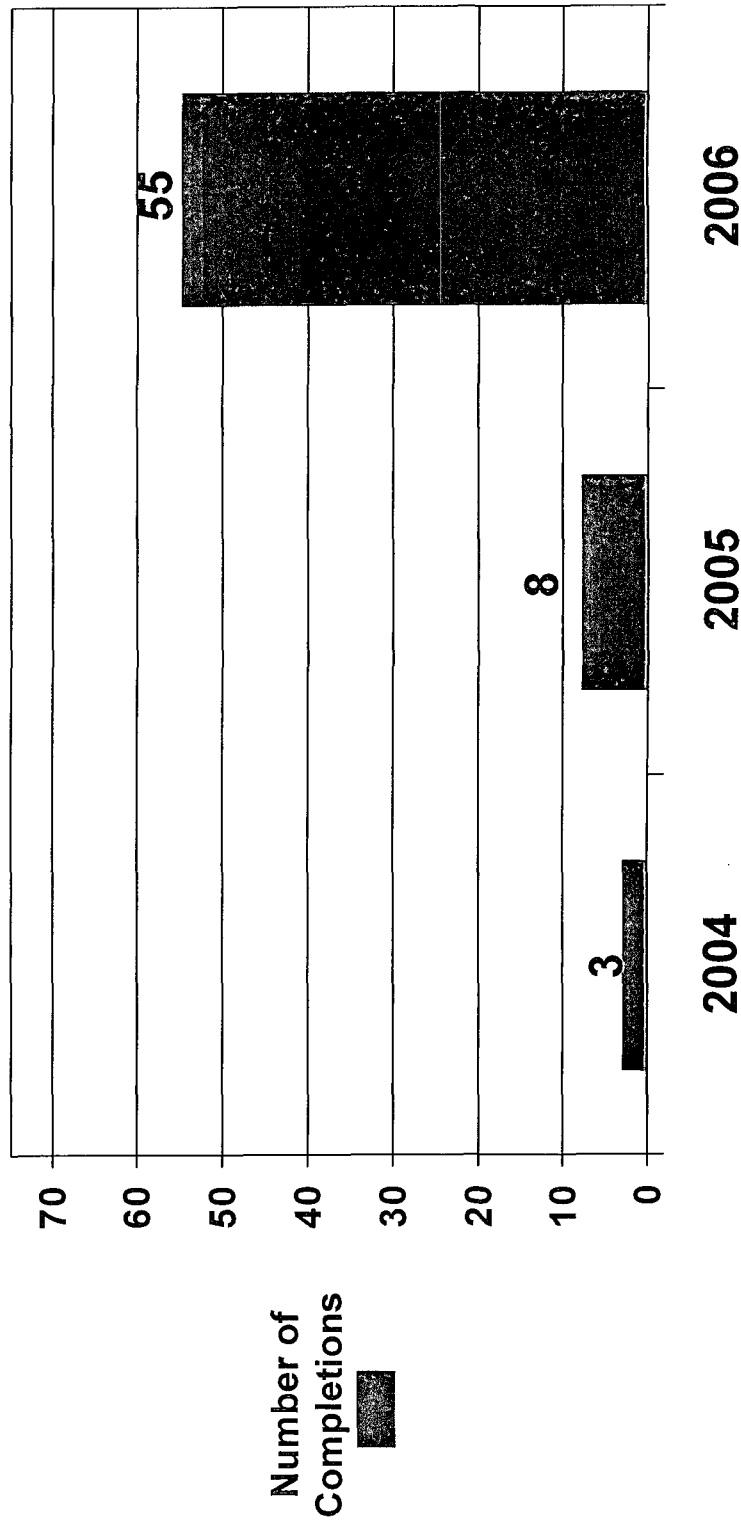
Industry History

- Late '70's to date, 19 vertical producers over a 50 mile fairway with the best vertical well recovering approximately 750 MMCF
- 2004 Parallel participated in 6 Perenco horizontal wells
 - Uncemented liners and low-volume acid stimulations produced 5 poor wells and 1 good well, the Thames 31 Federal #1, with initial rate in excess of 2000 MCFPD
- February 2005, EOG completed the Nile 22-1 with a cemented liner and multi-stage slick-water "Barnett Shale" type fracture stimulation - initial flow rate approximately 4.9 MMCFPD
- To date industry has permitted over 300 wells and completed approximately 66 with improving initial rates through time as "sweet spots" are exploited
- Lease acquisition bonuses have risen from approximately \$100 to \$2,500+ per acre.
- Active operators in the play include Parallel Petroleum Corporation, EOG Resources, LCX Energy, David Arrington, Yates Petroleum, COG, Devon and MYCO.



Industry activity through December, 2006

- Over 300 drilling permits
- 66 completions
- NMOCD Data



Exploitation Attributes

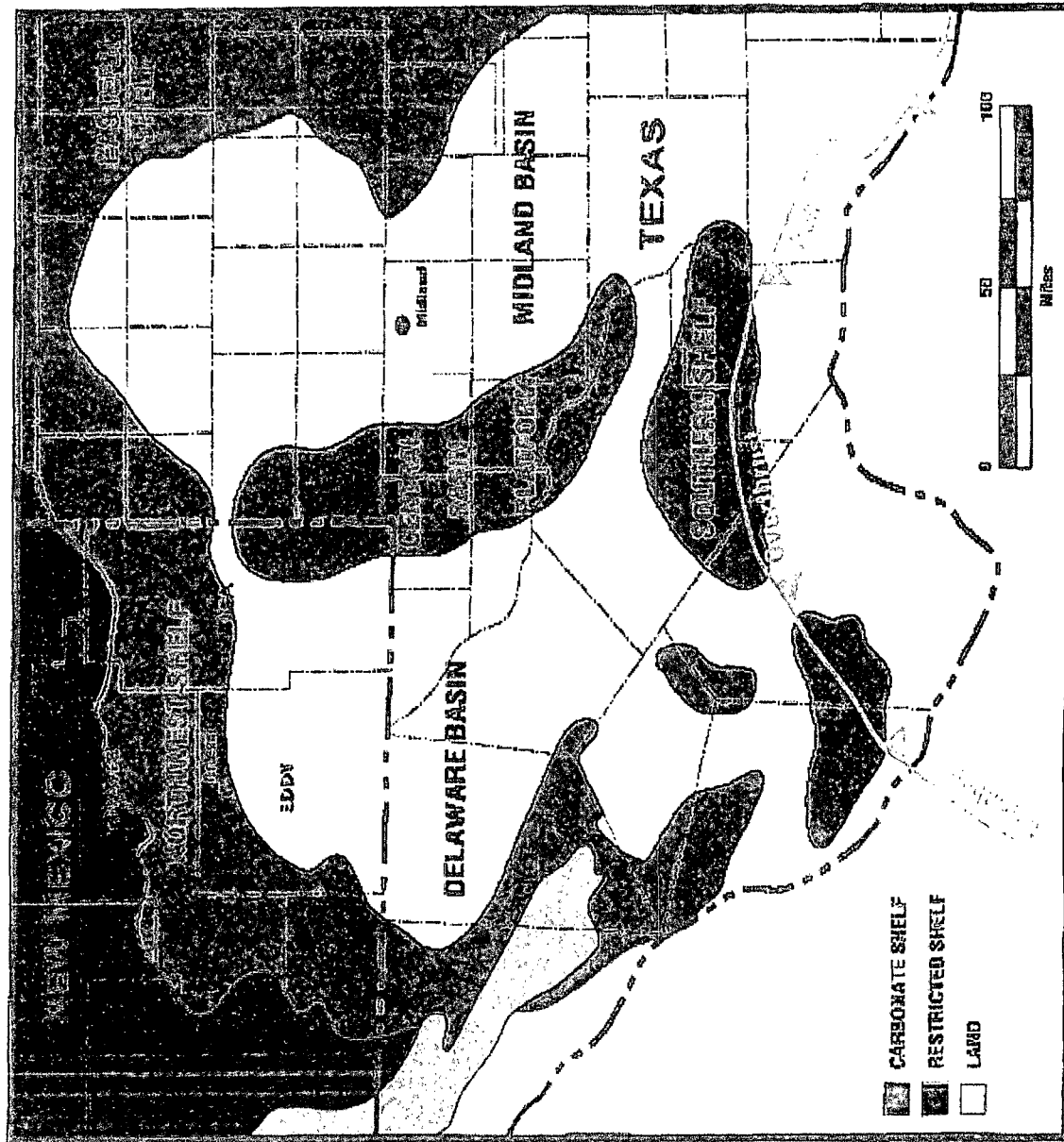
- Emerging technology driven gas manufacturing play
 - Horizontal, multi-stage Barnett type slick water fracs
- Fairway is roughly 50 miles long by 10 miles wide and encompasses over 300,000 acres with up to 3 TCF recoverable
- Parallel currently owns interest in approximately 103,000 gross and 69,000 net acres - approximately 96% undeveloped
 - Limited remaining un-leased acreage
- Acreage acquired specifically for the Wolfcamp which positions Parallel in the center of the fairway, controlling 1/3 of play
- Parallel has participated in over 75% of wells completed to date, placing it in a unique intelligence position in regard to evolving drilling and completion techniques

Geology Section

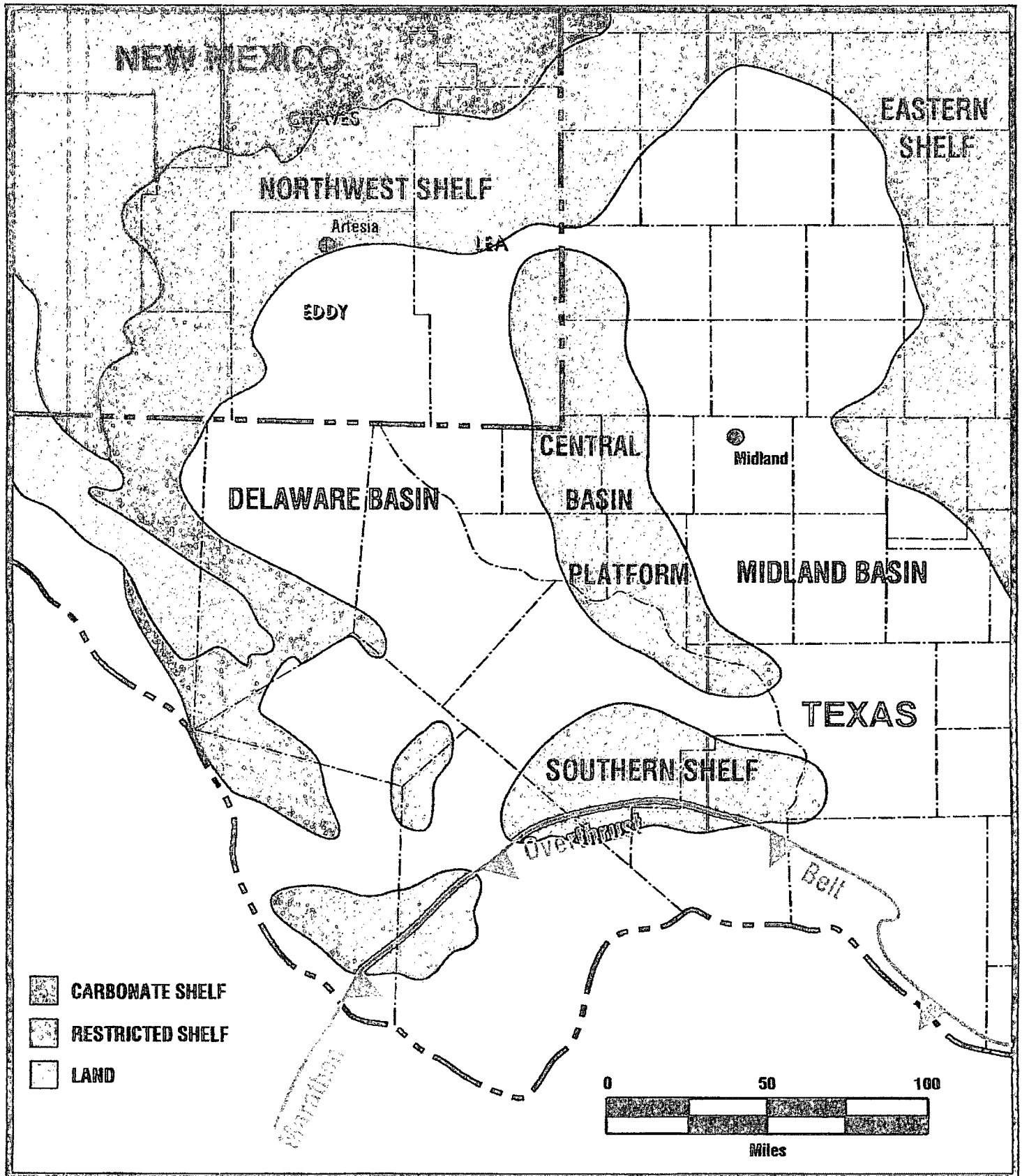
New Mexico Wolfcamp



Wolfcampian (Permian) Paleogeography of the Permian Basin



WOLFCAMPIAN (PERMIAN) PALEOGEOGRAPHY OF THE PERMIAN BASIN



New Mexico Wolfcamp

Northwest Shelf Stratigraphic Chart

Age	Unit Name	HC's	Approx. Depth
Permian 289-248 MYA	Octoan		Top Reservoir ~5000-5500'
	Rustler		
	Salado		
	Tansill		
	Yates	• *	
	Sevier Rivers	• *	
	Queen	• *	
	Grayburg	• *	
	San Andres	•	
	Glorieta	•	
Leonardian	Yeso	• *	
	Abo	• *	
	Wolfcamp	• *	
Pennsylvanian 289-320 MYA	Wolfcamp	• *	
	Cisco		
	Canyon		
	Strawn	• *	
	Aloka	• *	
Mississippian 320-363 MYA	Morrow	• *	
	Miss. Lime	• *	
	Woodford	• *	
Devonian 409-363 MYA	Devonian	• *	
Silurian 439-409 MYA	U. Silurian		
	Fuselman	•	
	Montoya	•	
	McKee	• *	
	Waddell		
Ordovician 510-439 MYA	Connell		
	Joins		
	Ellenburger	• *	
Cambrian 510-570 MYA			
Pre-Cambrian >570 MYA			

LEGEND

-  Current Active Plays
-  Oil Producing Zones
-  Gas Producing Zones

Northwest Shelf Stratigraphic Chart

Age		Unit Name		HC's	Approx. Depth
Permian 289-248 MYA	Ochoan	Rustler			Top Reservoir ~5000-5500'
		Salado			
	Guadalupian	Tansill			
		Eumont	Yates	☉ ☀	
			Seven Rivers	☉ ☀	
			Queen	☉ ☀	
			Grayburg	☉ ☀	
		San Andres		☉	
		Glorieta		☉	
	Leonardian	Yeso		☉ ☀	
		Abo		☉ ☀	
Pennsylvanian 289-320 MYA		Wolfcamp		☉ ☀	
		Cisco			
		Canyon			
		Strawn		☉ ☀	
		Atoka		☀	
Mississippian 320-363 MYA		Morrow		☉ ☀	
		Miss. Lime		☉ ☀	
Devonian 409-363 MYA		Woodford			
		Devonian		☀	
Silurian 439-409 MYA		U. Silurian			
		Fusselman		☉	
Ordovician 510-439 MYA		Montoya		☉	
		Simpson	McKee	☉ ☀	
			Waddell		
			Connell		
			Joins		
Cambrian 510-570 MYA		Ellenburger		☀	
Pre-Cambrian >570 MYA					

LEGEND



Current Active Plays

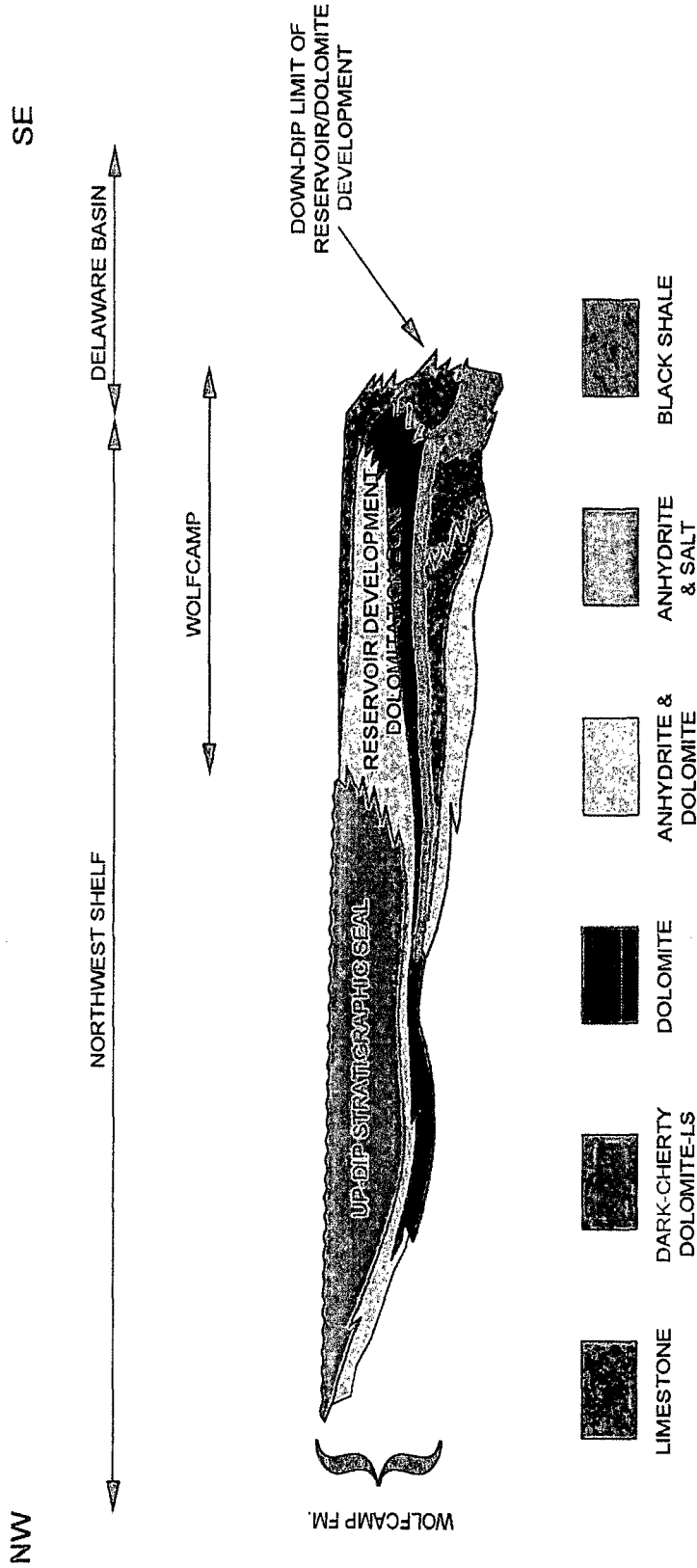
☉ Oil Producing Zones

☀ Gas Producing Zones

New Mexico Wolfcamp

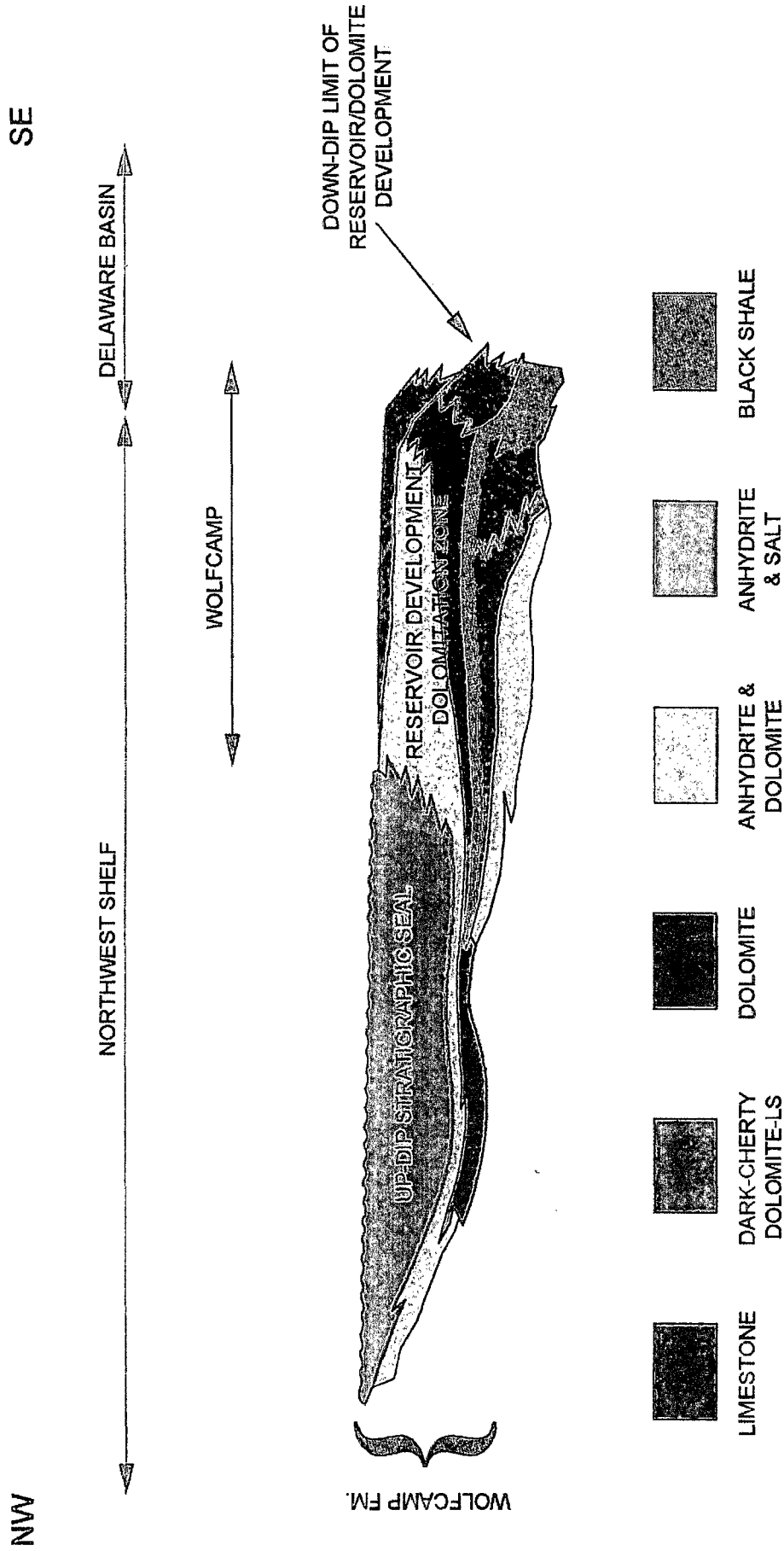
Reservoir Development Diagrammatic Cross Section

CROSS SECTION & TRAP DIAGRAM



Northwest-southeast cross section across the Northwest Shelf/Delaware Basin transition. Rock types are differentiated illustrating the trap developed within the Wolfcamp reservoir. The pervasive evaporite deposits in the northwest act as a stratigraphic seal for the dolomitized reservoir developed down-dip. Further down structure the reservoir is limited by the lack of dolomite within tighter limestone and shale deposits.

CROSS SECTION & TRAP DIAGRAM



Northwest-southeast cross section across the Northwest Shelf/Delaware Basin transition. Rock types are differentiated illustrating the trap developed within the Wolfcamp reservoir. The pervasive evaporite deposits in the northwest act as a stratigraphic seal for the dolomitized reservoir developed down-dip. Further down structure the reservoir is limited by the lack of dolomite within tighter limestone and shale deposits.

Type Log



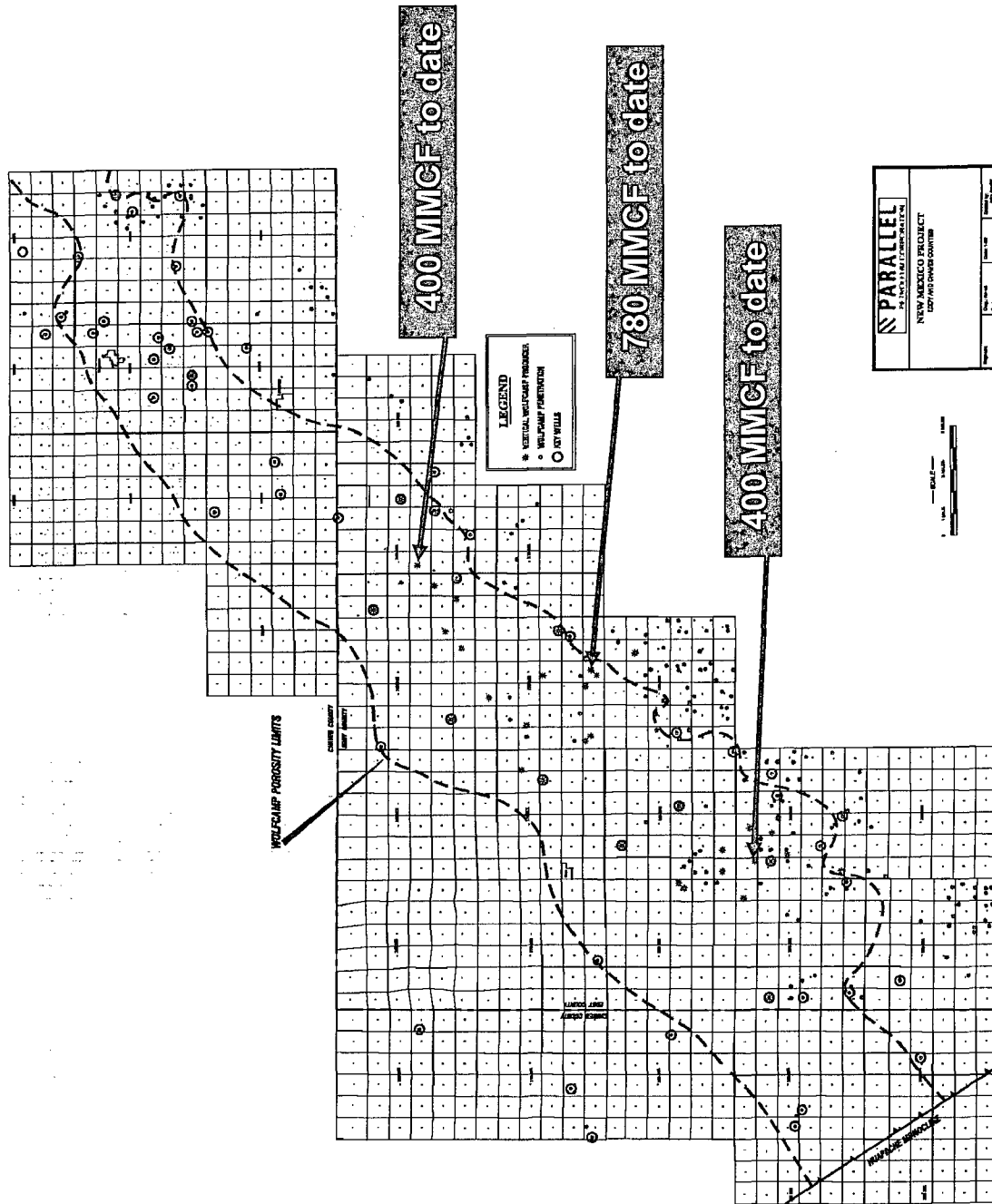
Basal Wofcamp Pay

Wolfcamp Shale

New Mexico Wolfcamp



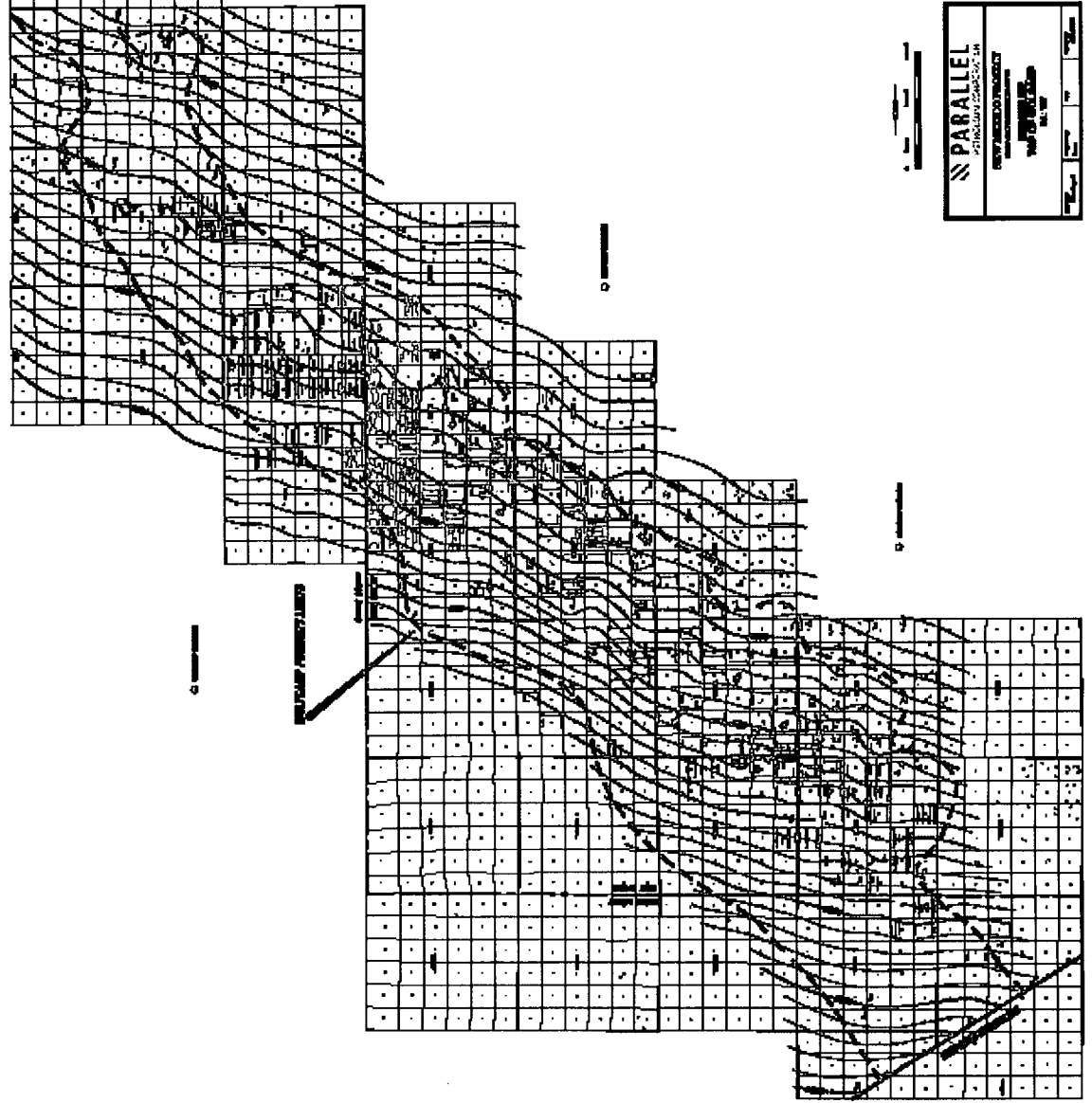
Key Wells



New Mexico Wolfcamp



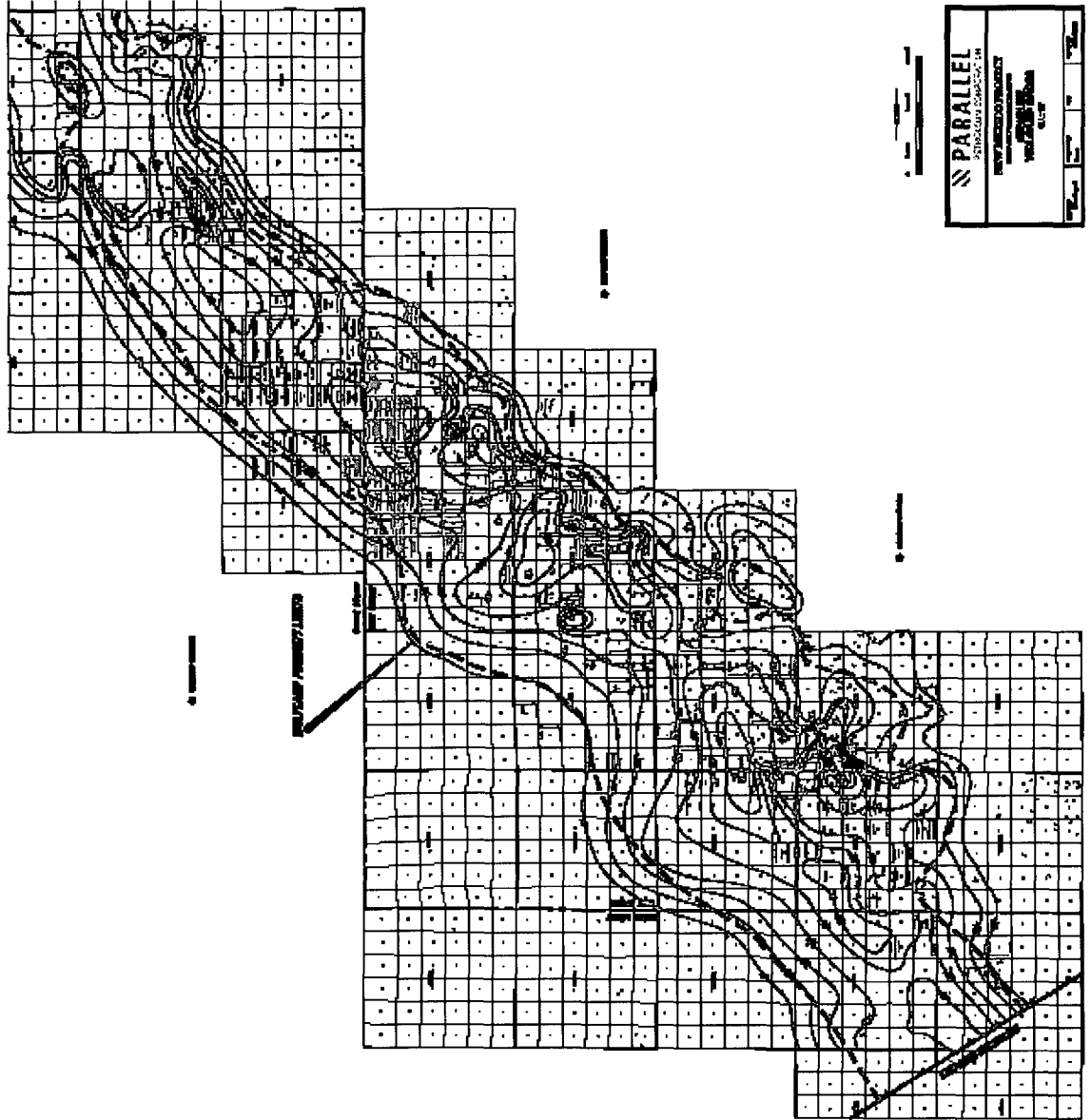
Top Wolfcamp Shale Structure Map



PARALLEL PETROLEUM CORPORATION		NEW MEXICO PROJECT	
DATE: 10/1/00		BY: J. W. W.	
Scale	Feet	Feet	Feet

New Mexico Wolfcamp

Gross Isopach Gas Zone



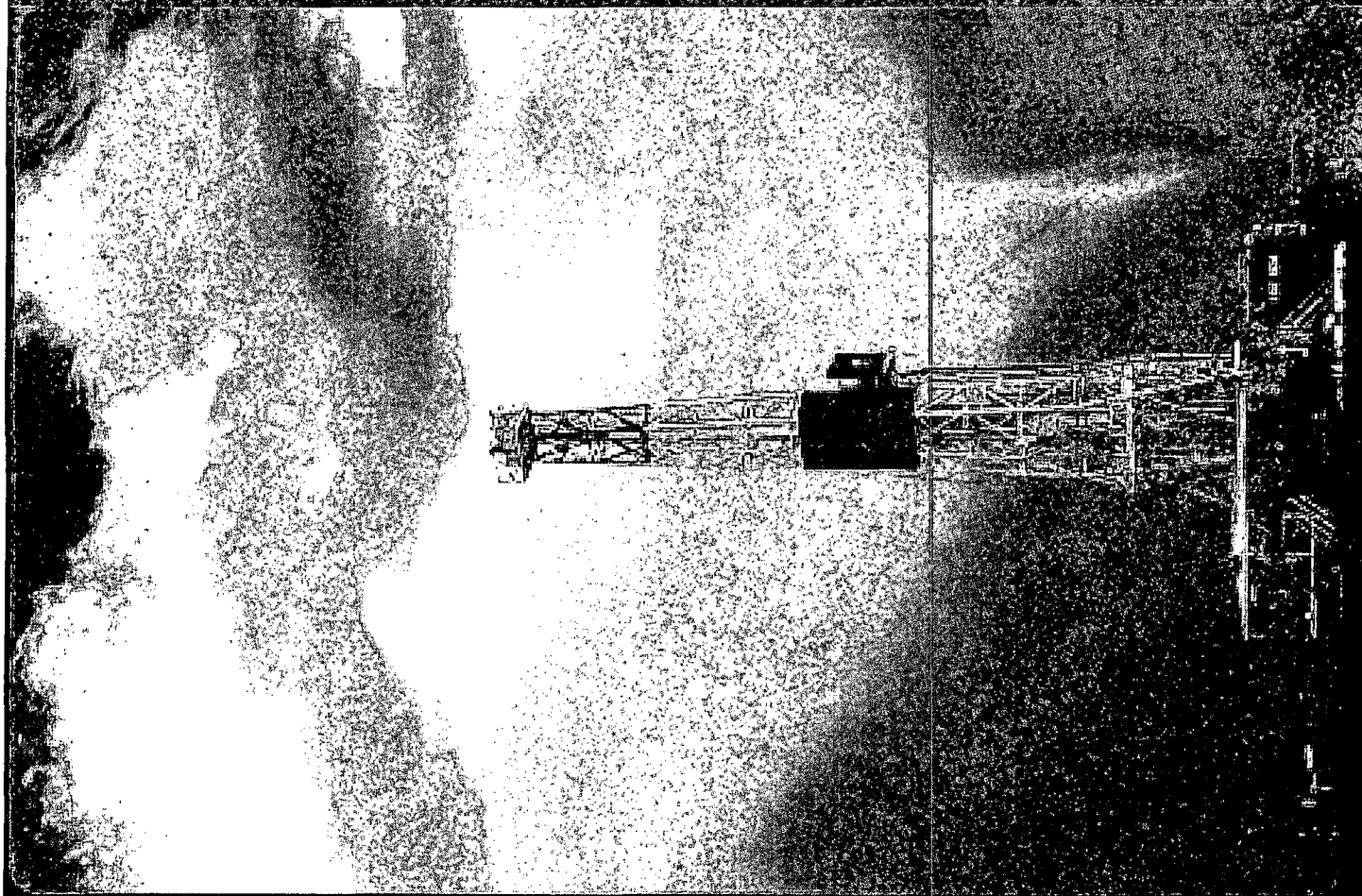
New Mexico Wolfcamp

Other Geologic Exhibits

- VI Cross-section A-A'
- VII Top of Wolfcamp structure map (RH/CL project)
- VIII Gross Isopach Wolfcamp Gas Zone (RH/CL project)
- IX Swale #1 – Forego #1 – Alysheba #1 Cross-section

Transient Pressure Data
Present Walser report here

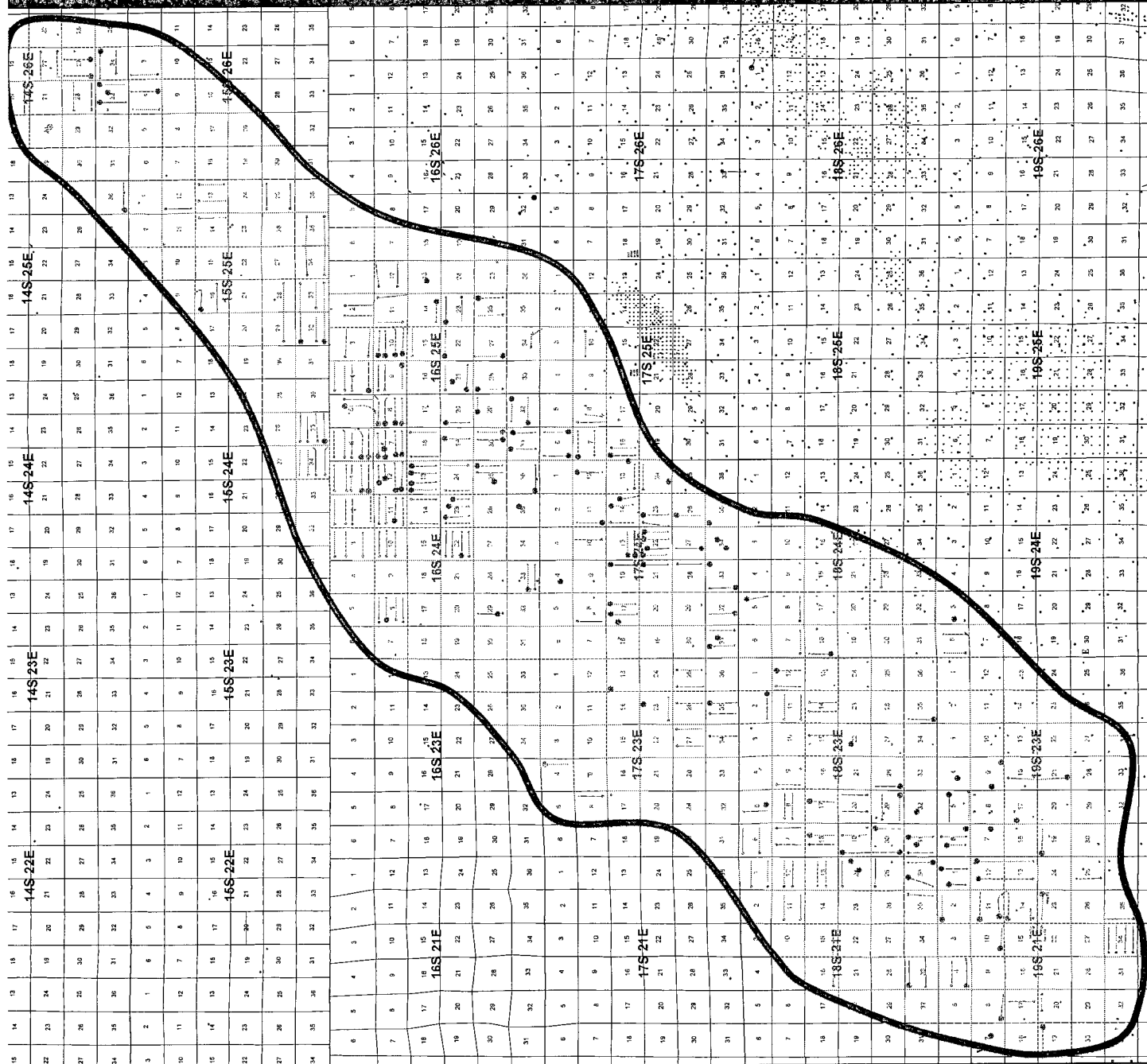
Wolfcamp Horizontal Tight Gas Play



What We'll Cover

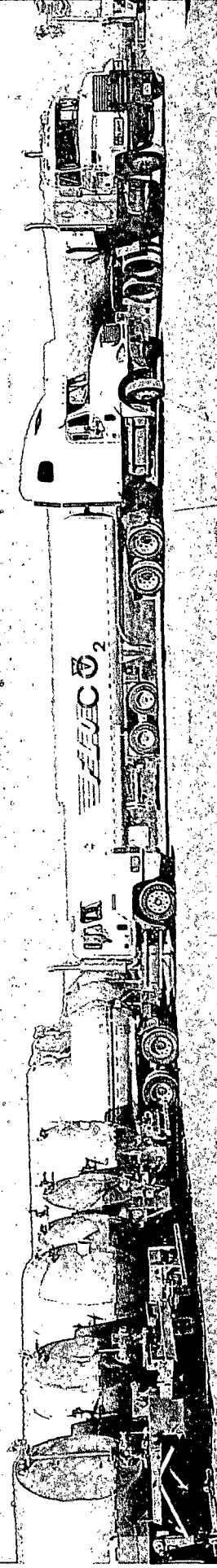
- Quick reservoir description
- Results of Transient Analysis
- Drainage and Spacing

Artesia Area Wolfcamp Horizontal Play



Wolfcamp Reservoir

• Dolomite w/ anhydrite inclusions & thin limestone interbeds



• Typically 20 to 30 ft of measurable permeability, and an additional 50 ft of "micro" and "nano" Darcy permeability

Transient Work on Existing Verticals

- Historical production transient analysis performed on 8 vertical wells:

- Hope area

- Cottonwood Creek area

- Determined permeability k

- Determined effective infinite FCD half-length X_{eff}

- Determined drained area A_d

Example of the Best Vertical Well, Hope Area

Mack Energy Snake State No. 1, drilled in 1979

$h = 31$ ft; mid-pay depth 4,421 ft; $\emptyset = 9\%$

IPF 449 MSCFD (1/10/79) Cum 155,187 MCF

0.63 BCF EUR (typical verticals are < 0.5 BCF)

$k_{trans} = 0.023$ md; $A_d = 49$ acres

Mack Energy Snake State No. 1
Sec 31 (F) T18S R23E

Vertical producer

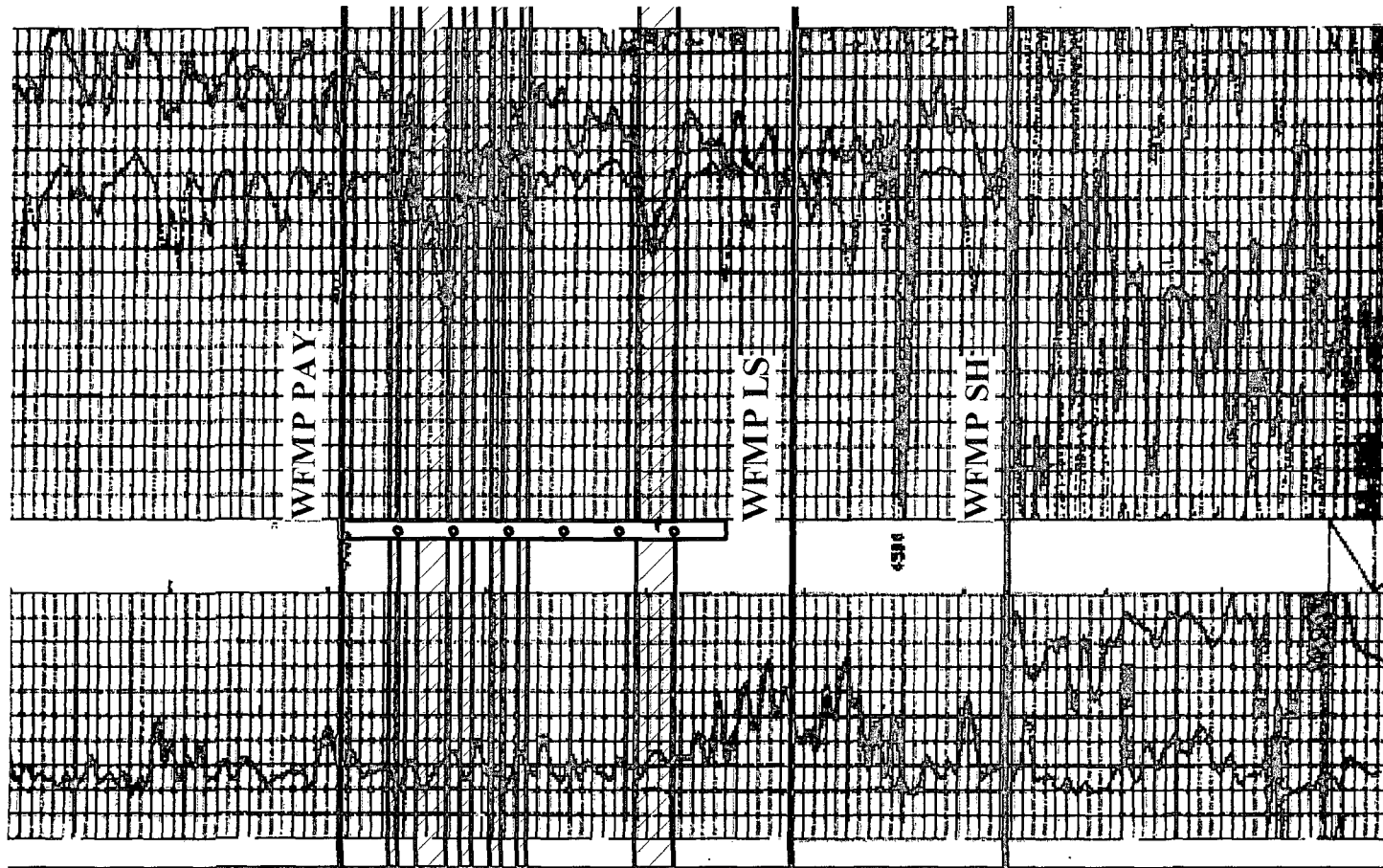
Perf 4,386 - 4,456 ft

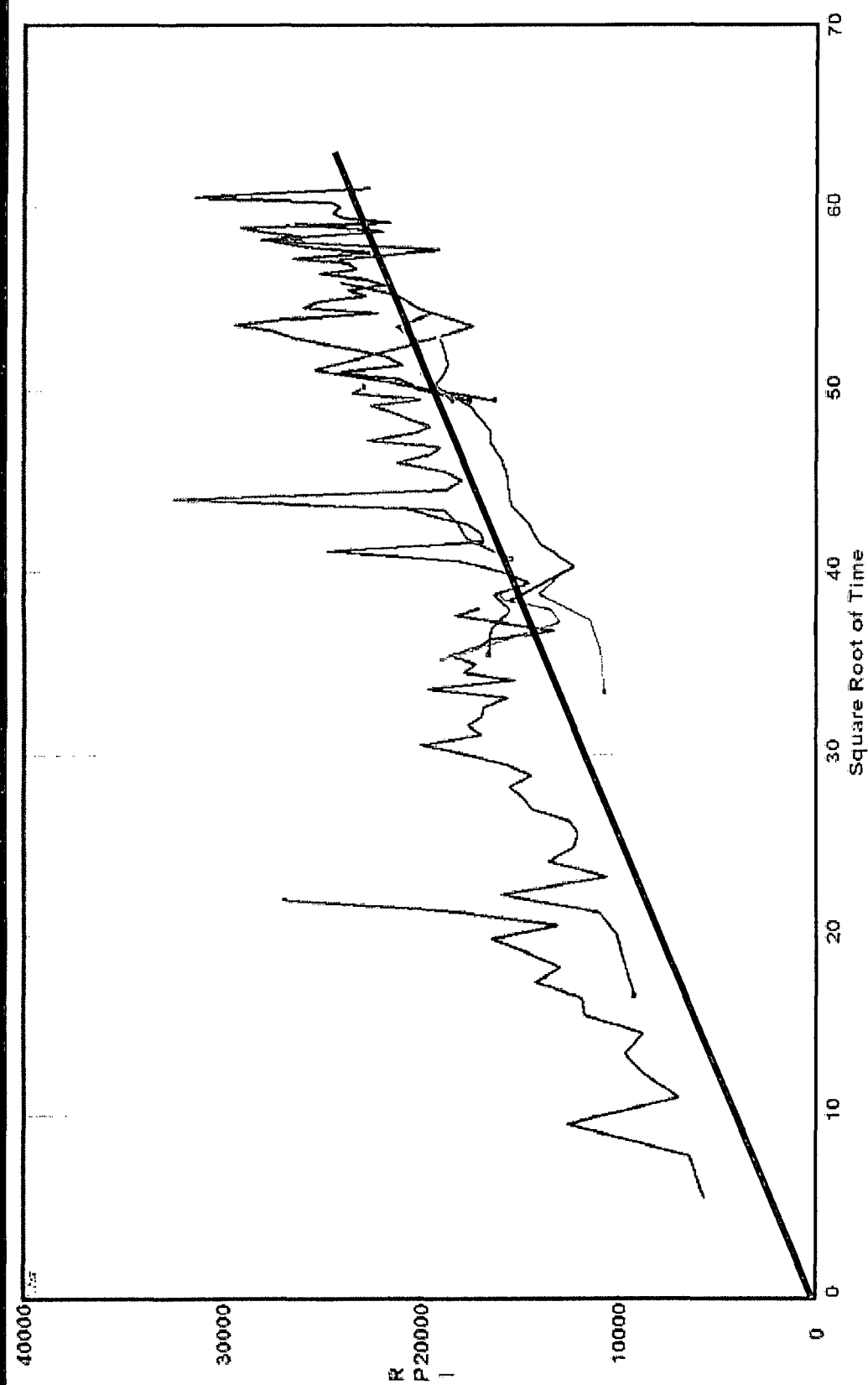
IPF 449 MSCFD (1/10/79)

Cum 155,187 MCF

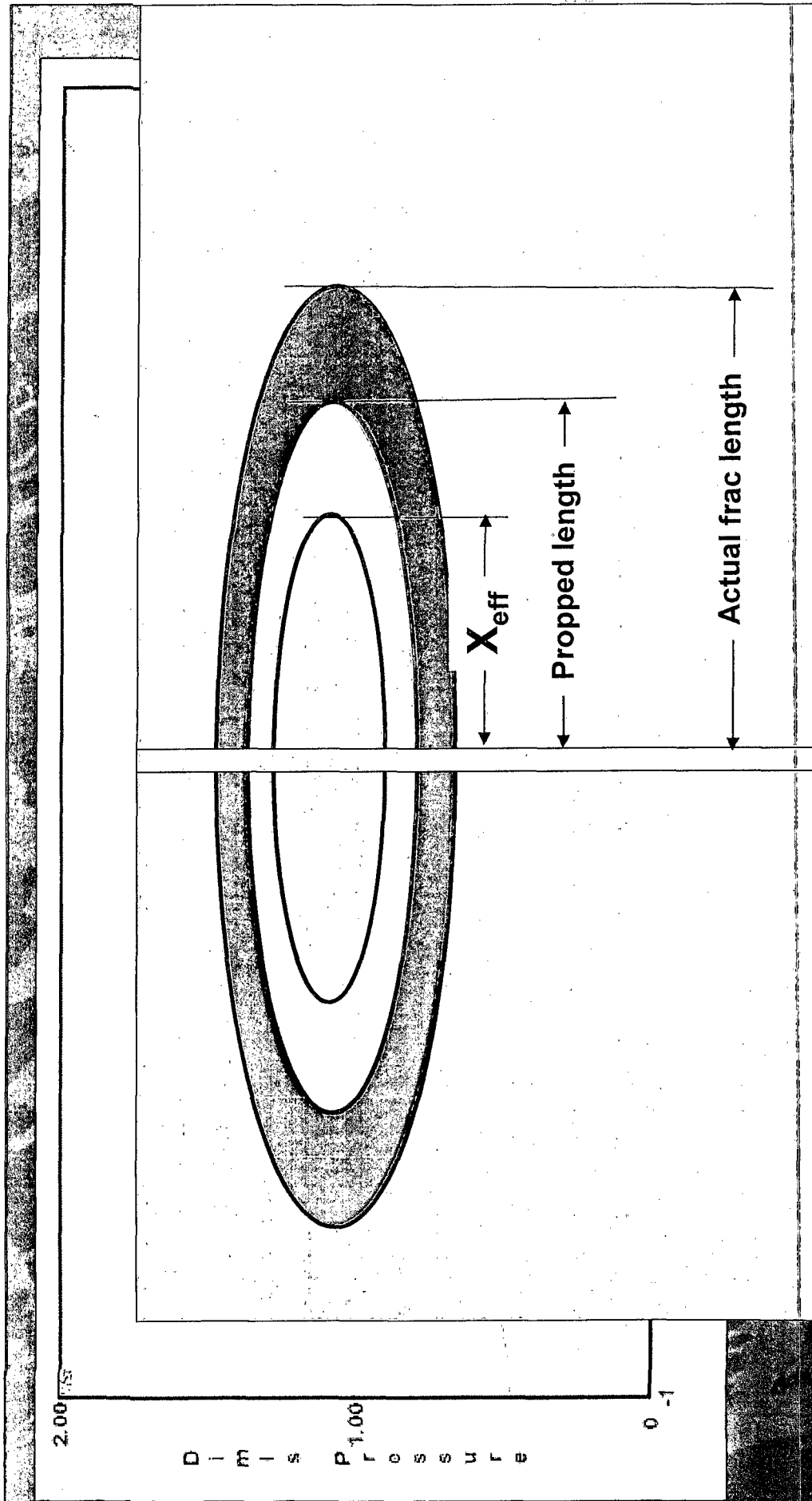
Linear flow geometry

Permeability 0.02 MD



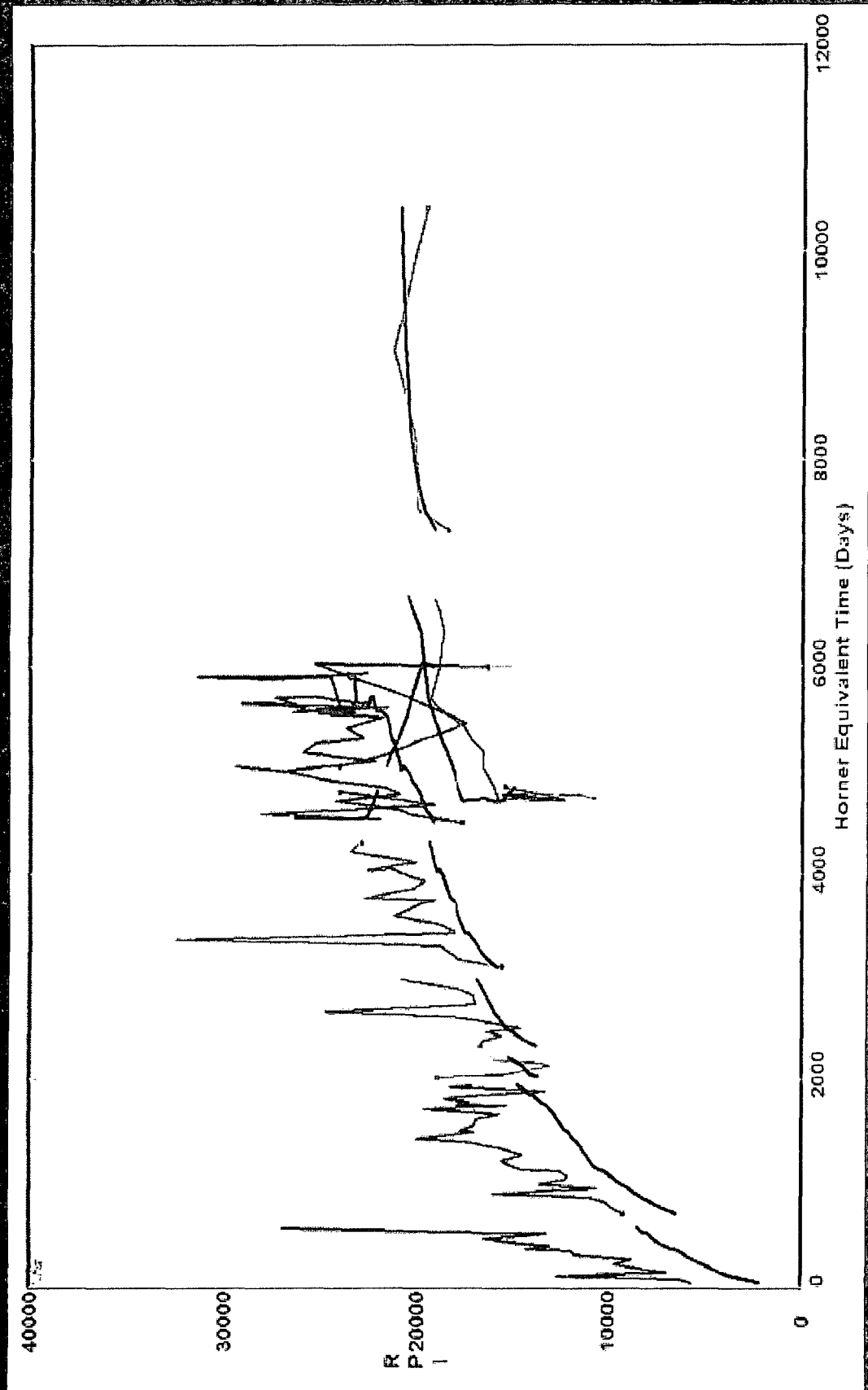


*Miller-Dyes-Hutchison square root of time vs. the Reciprocal
Productivity Index. $k = .02$ md, $X_{\text{eff}} = 122$ ft
(Snake State No. 1)*



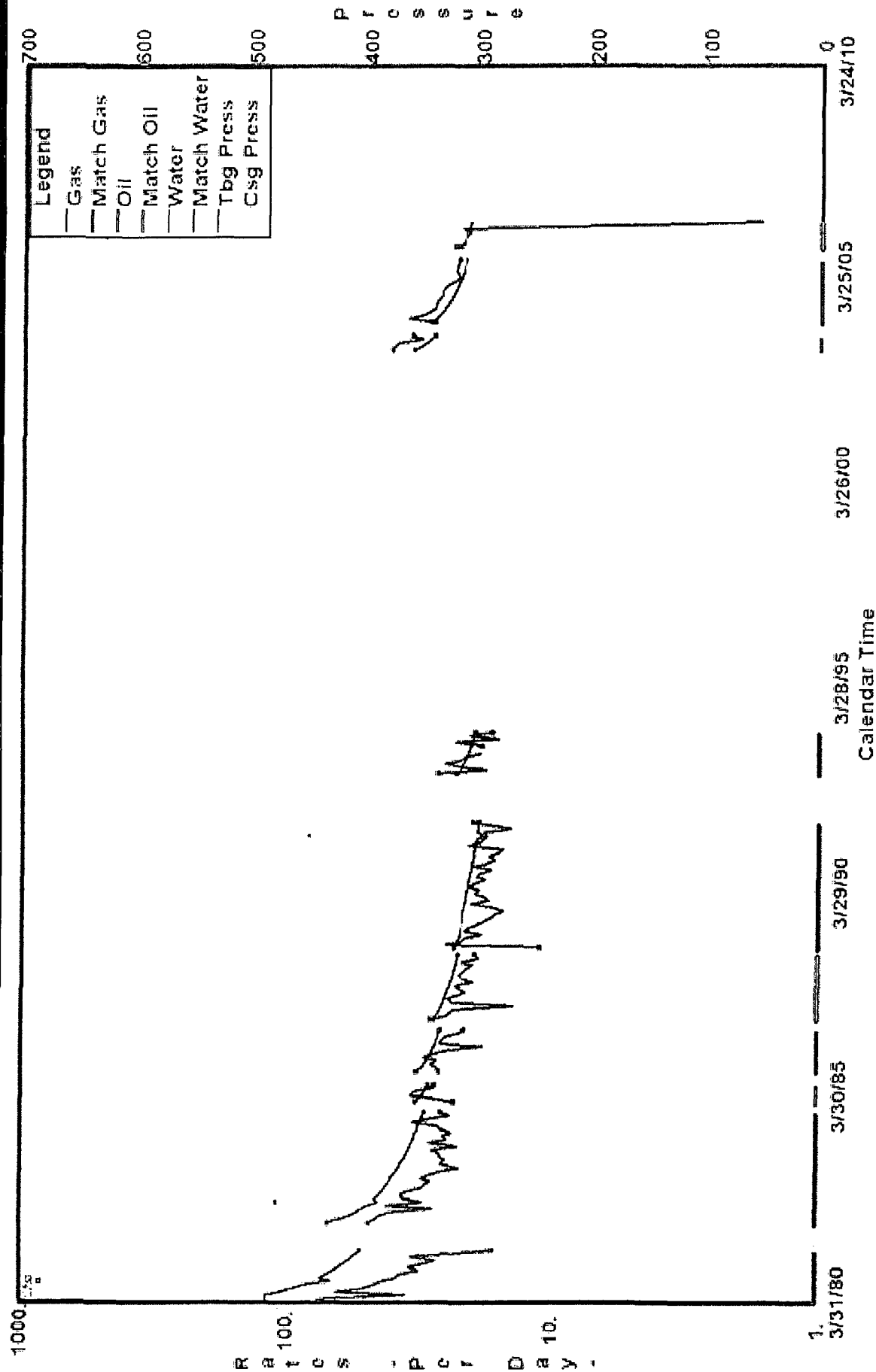
Agarwal-Gringarten type-curve indicates $k = .02$ md, $X_{eff} = 122$ ft, and a linear reservoir geometry

(Snake State No. 1)



Pseudo-steady state plot indicates that about 49 acres have been drained.

Snake State No. 1



**Production match with model
Snake State No. 1**

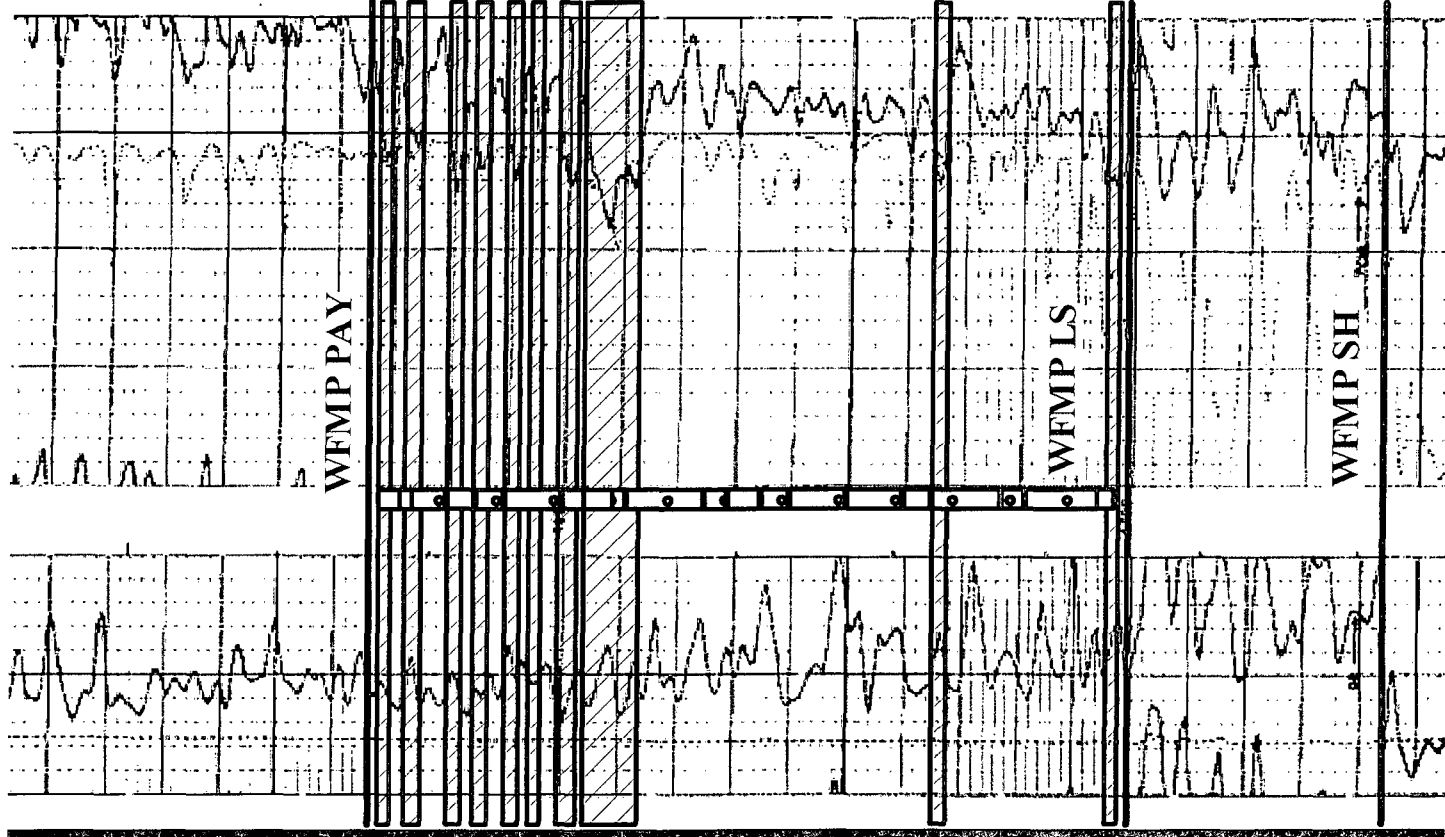
Kaiser-Francis Antelope Fed No. 1
Sec 22 (F) T18S R23E

Vertical producer

Perf 4,568 - 4,697 ft

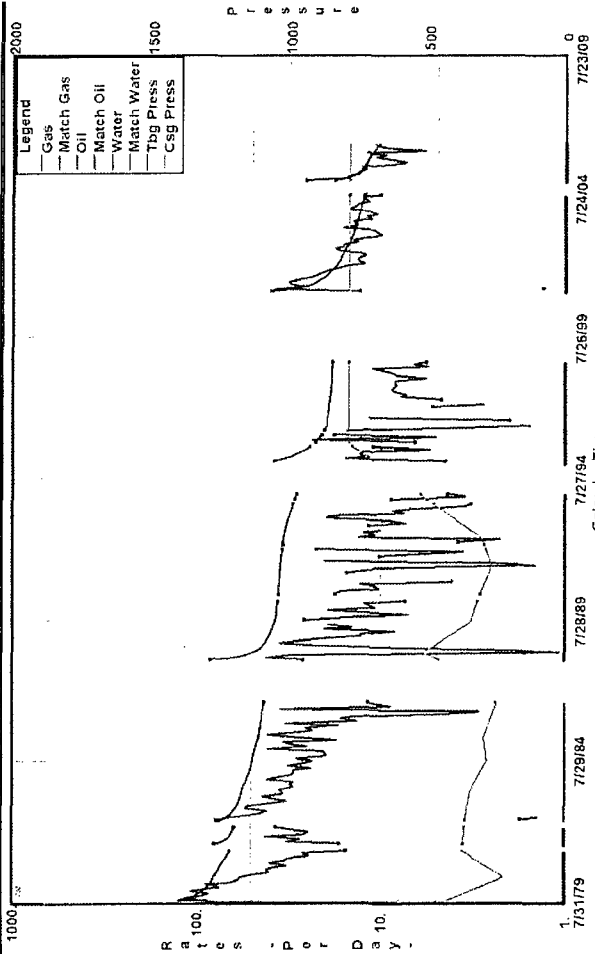
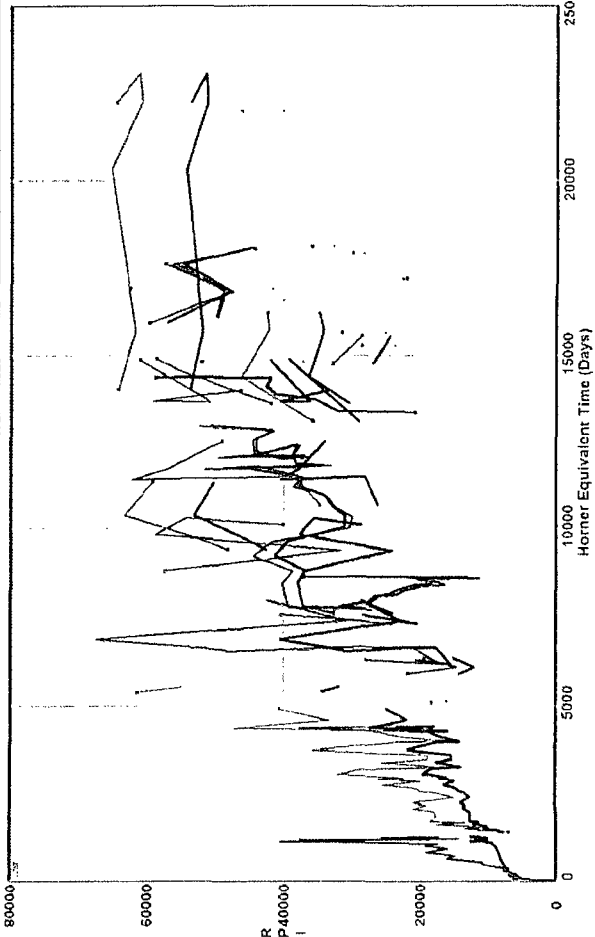
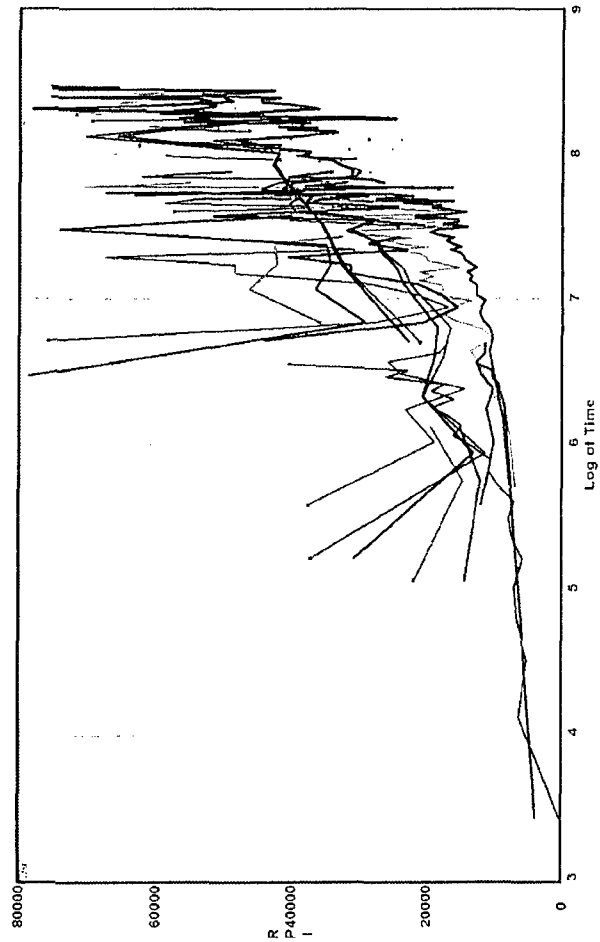
IPF 294 MSCFD (6/13/80)
Cum 167,723 MCF
0.4 BCF GIP

Permeability 0.006 MD
 A_d = 29.3 acres drained



Example of typical vertical well, Cottonwood Creek

- Yates Lizzie Howard 'HK' No. 1 (March 1979)
- $h = 21$ ft; mid-pay depth 5,064 ft; $\emptyset = 14.5\%$
- $k = 0.018$ md; $X_{\text{eff}} = 69$ ft; $A_d = 21$ acres
- 0.33 BCF GIP



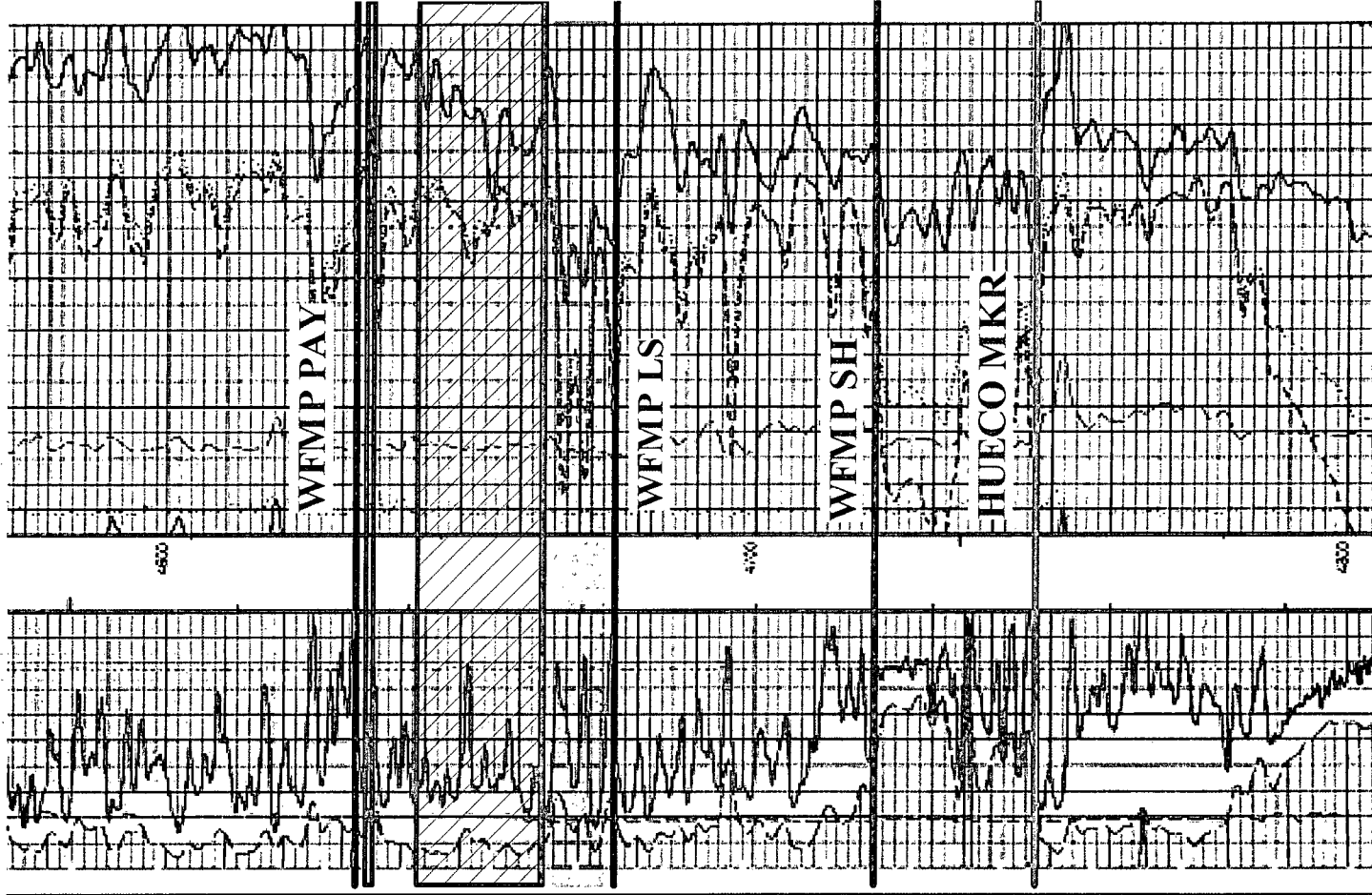
Match is consistent with $k = .018$ md, $X_{\text{eff}} = 69$ ft, $A_d = 21$ acres; mild liquid loading is indicated, and radial drainage pattern is evident

EOG Yellow 'A-7' Fee No. 1H
Sec 7 (A) T16S R25E
(Horizontal)

Azimuth E-W, length 3,637 ft

Perf 5,100 - 8,100 ft MD

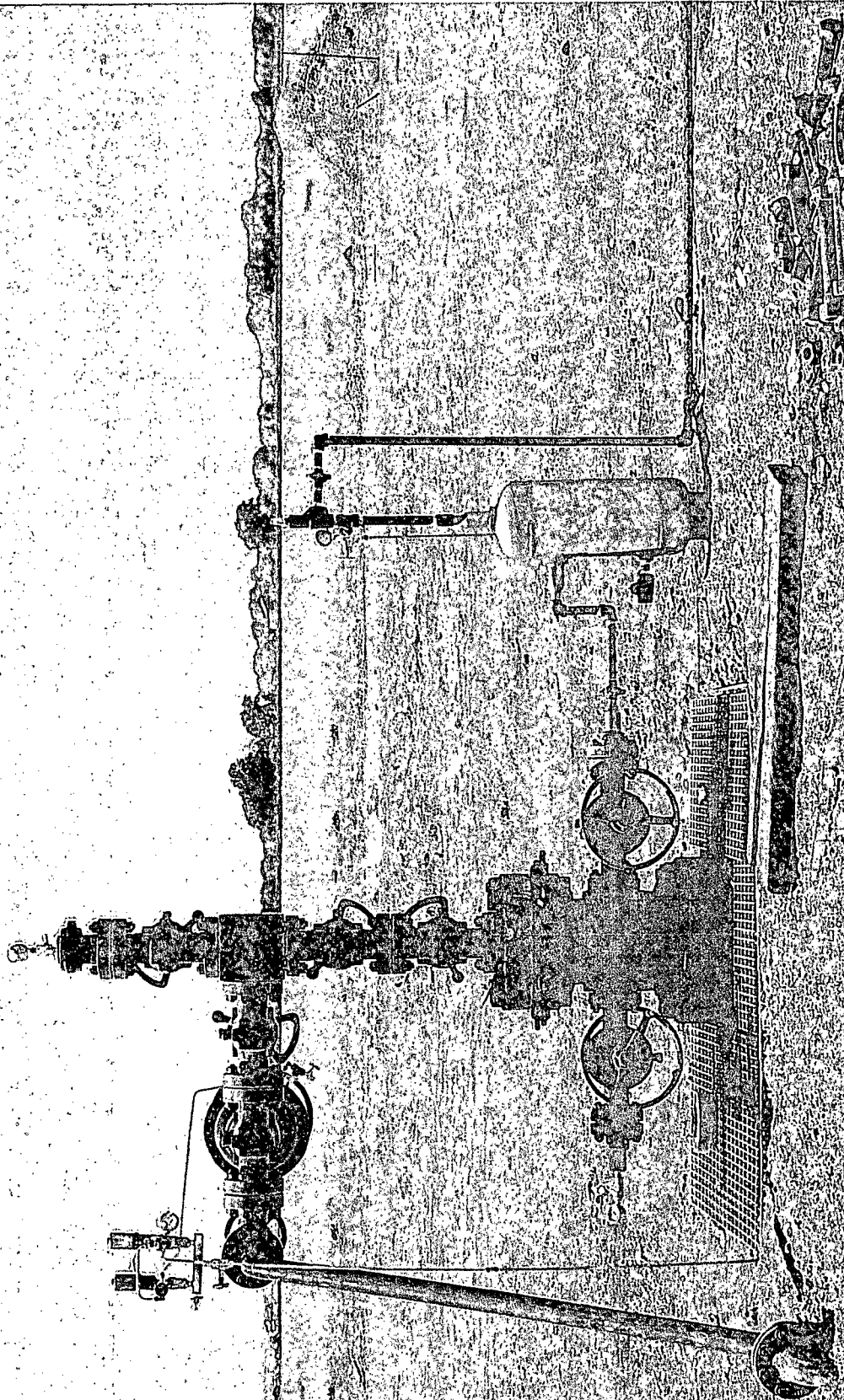
IPF 1,193 MSCFD (3/21/06)
180-day Cum 135,271 MCF



Summary of Historical Transient Analysis

- *Transient permeabilities < 0.01 are the norm*
- *Vertical wells typically drain 20 – 40 acres in 20 to 25 years*

X_f Recommendations



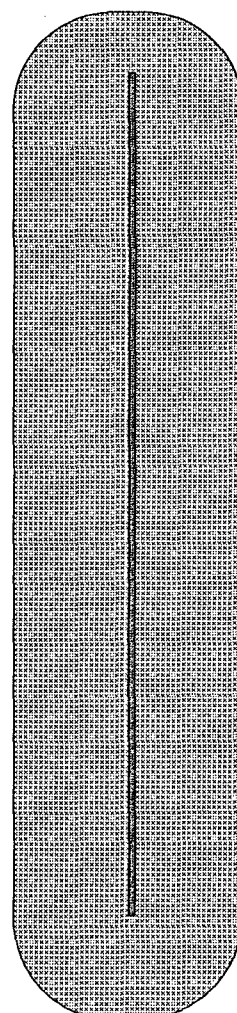
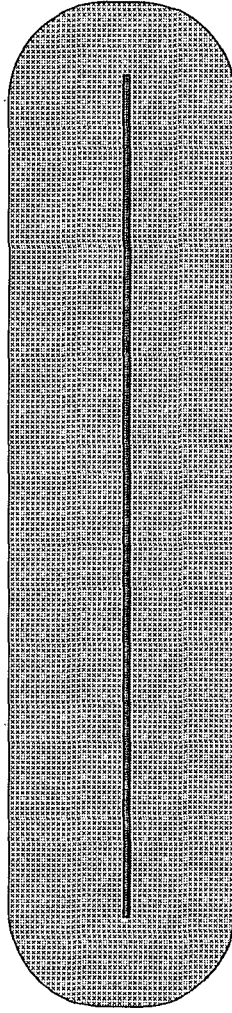
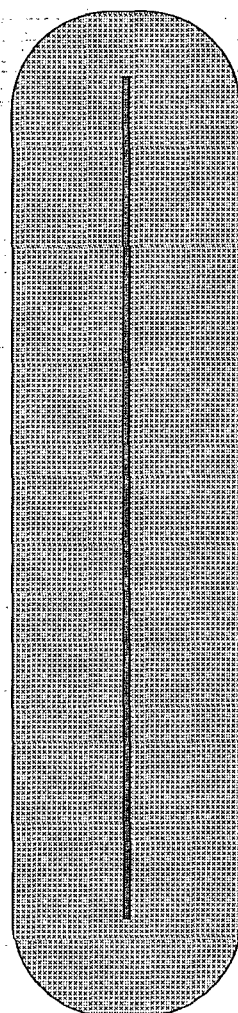
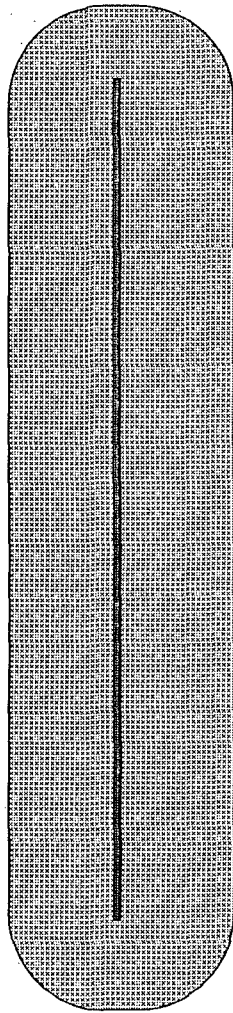
X_f Recommendations

- X_f Recommendations
- OK to overlap created fracture length X_{prop} slightly
 - OK to overlap propped fracture length X_{prop}
 - OK to overlap X_{eff} (shorter than X_{prop})
 - Not OK to overlap X_f for 4 transverse wells to
 - Goal --- 1,100 ft of X_f for 4 transverse wells to the section
 - Goal --- 500 - 600 ft of X_{prop} for 4 transverse wells to the section (≅ 300 - 400 ft of X_{eff})

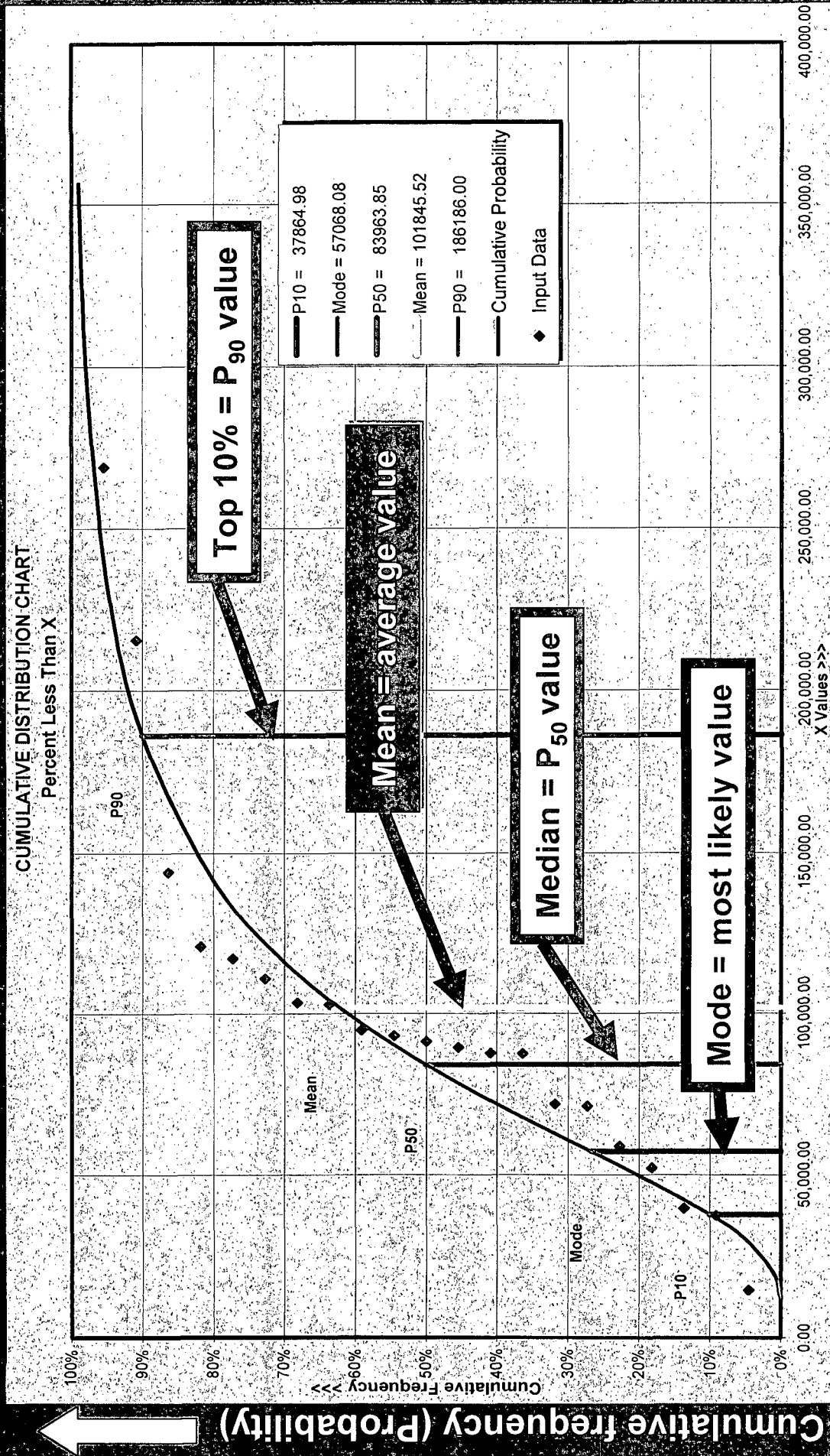
*Typical drainage
pattern at onset of
radial flow*

Source

*Combination of
typical
microseismic
monitoring results
and historical
pressure transient
analysis*



Cottonwood Creek 90-day Production 20-well Sample



Best 90-day production after cleanup



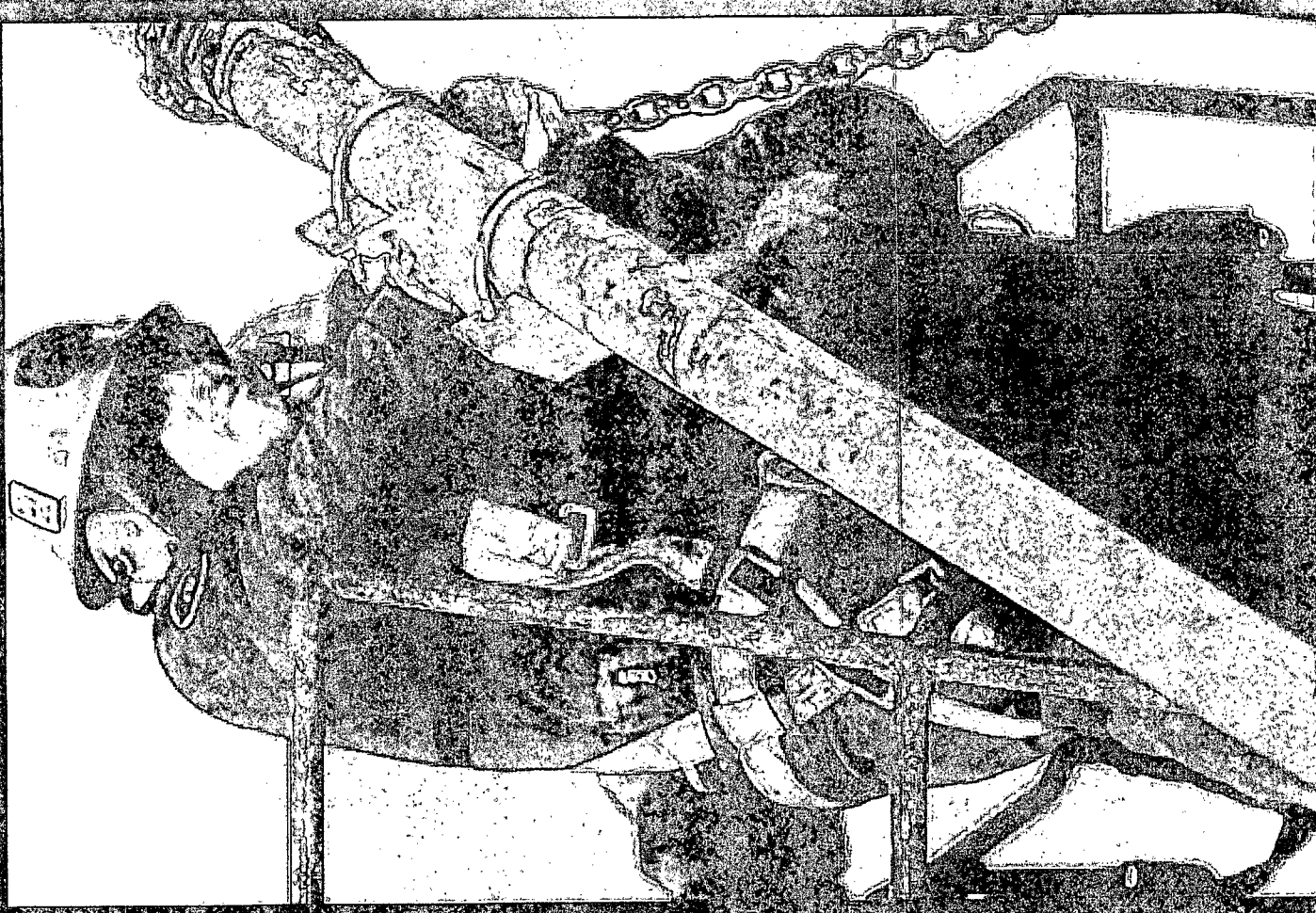
Conclusions

• Vertical wells typically drain 20 – 40 acres in 20 to 25 years

• Effective permeability is typically < 0.01 md

• This is a "tight gas" play that is only fiscally viable with:

- Application of new technology
- Horizontal wellbores
- Spacing of 4 wells to the section





SCAL, Inc

Page 1 of 1

Drilled Plug Analysis Report

Company: Parallel Petroleum
File No.: 07708
Well: Delilah State #1
Location:

Field:
Formation: Wolfcamp
County: Eddy County, New Mexico

Sample Number	Depth	Air Permeability	Klinkenberg Permeability	Porosity	Grain Density	Sw	So	Gas Units	Fluorescence	Sample Description
	ft	mD	mD	%	g/cc	%	%		%	Description

Confining Pressure 1,425psi

1	4,320.00	0.0050	0.0020	0.66	2.72				0	Light nvp sl dol sl chl foss
2	4,328.00	0.0053	0.0022	0.46	2.73				0	Light nvp sl dol sl chl foss
3	4,333.00	0.0104	0.0048	3.54	2.80				0	Dolomite inbed por xln
4	4,338.00	0.0041	0.0015	0.61	2.74				0	Light nvp v sl dol sl anhy xln v sl chl
5	4,338.00	0.0048	0.0019	0.56	2.75				0	Dolomite nvp calc styl v sl anhy v sl chl xln
6	4,344.00	0.0047	0.0018	2.44	2.79				0	Dolomite inbed por v sl chl styl xln

Drilled Plug Analysis Report

Company: Parallel Petroleum
File No.: 07708
Well : Delilah State #1
Location:

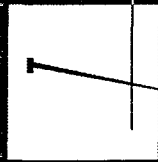
Field:
Formation: Wolfcamp
County: Eddy County, New Mexico

Sample Number	Depth ft	Air		Klinkenberg		Porosity %	Grain Density g/cc	Sw %	So %	Gas Units	Fluorescence		Sample Description
		Permeability mD		Permeability mD							%	Description	

Confining Pressure 1,425psi

1	4,320.00	0.0050		0.0020		0.66	2.72				0		Ls:tn nvp sl dol sl cht foss
2	4,328.00	0.0053		0.0022		0.46	2.73				0		Ls:brn nvp sl dol sl cht foss
3	4,333.00	0.0104		0.0048		3.54	2.80				0		Dol:brn sl intxn por xln
4	4,336.00	0.0041		0.0015		0.61	2.74				0		Ls:brn nvp v sl dol sl anhy xln v sl cht
5	4,338.00	0.0048		0.0019		0.56	2.75				0		Dol:brn nvp calc styl v sl anhy v sl cht xln
6	4,344.00	0.0047		0.0018		2.44	2.79				0		Dol:tn sl intxn por v sl cht styl xln

Micro-seismic Data
Present Alysheba report here



Pinnacle Technologies

Real-time Engineering Solutions

Fracture Mapping Reservoir Monitoring Engineering Services Modeling Software

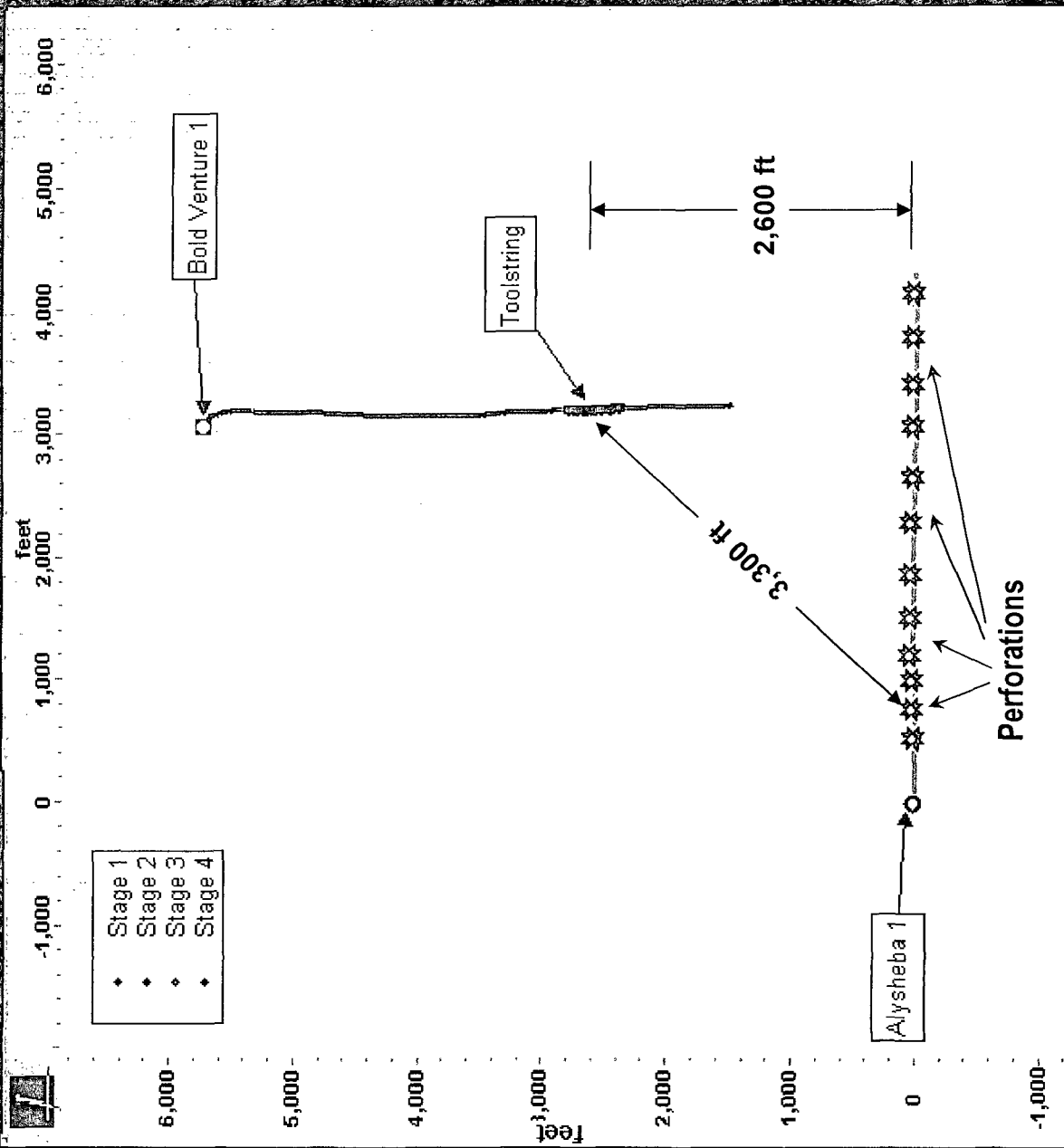
Microseismic Fracture Mapping

Results

Alysheba No. 1

Parallel Petroleum
Chaves Co, NM

Alysheba No. 1 Project Setup - Map View

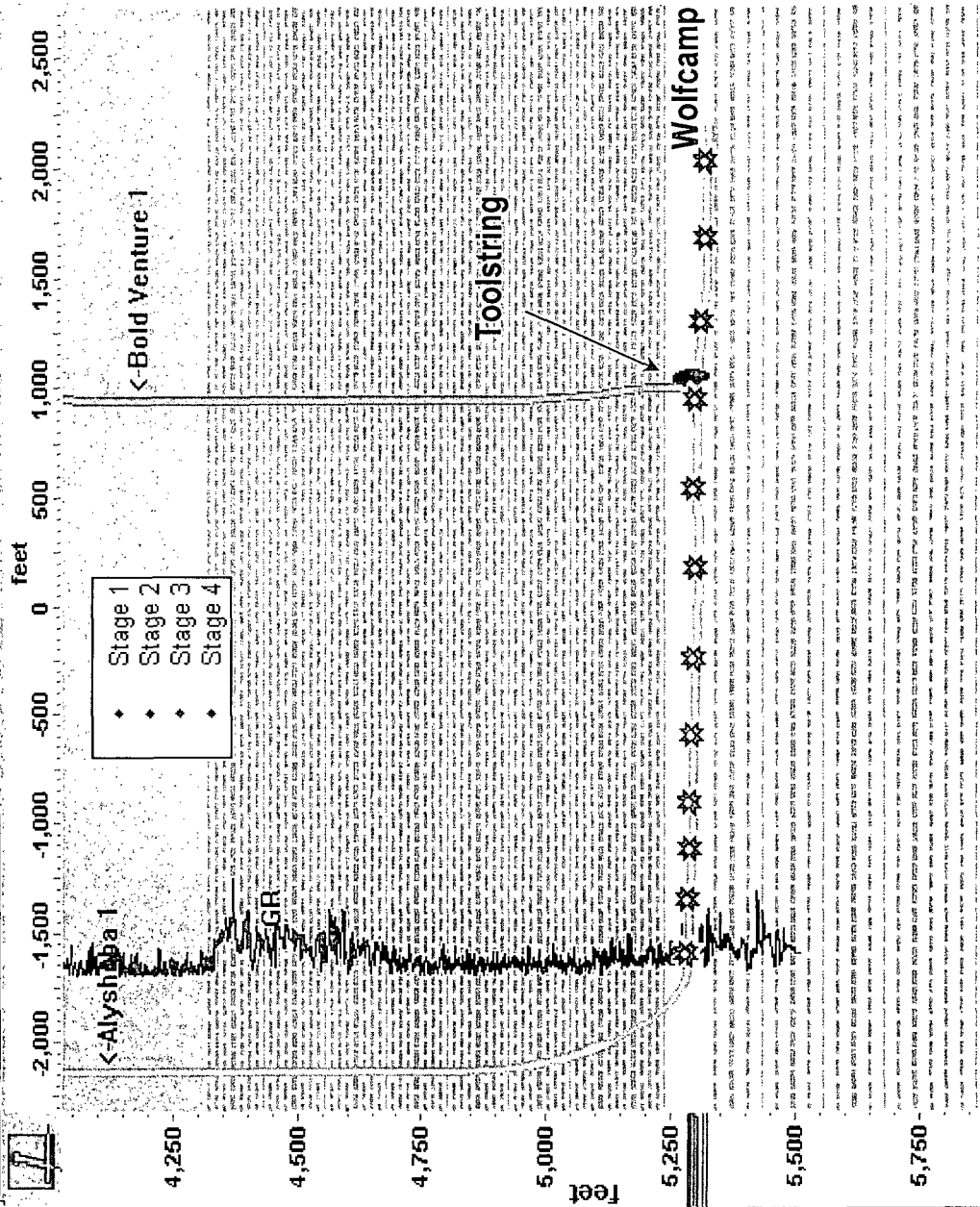


•Toolstring tractorred in

•Tractor was not able to pull past ~8285' MD due to a wellbore restriction

•Perforations are shown as stars along the wellbore.

Alysheba No. 1 Project Setup - Side View



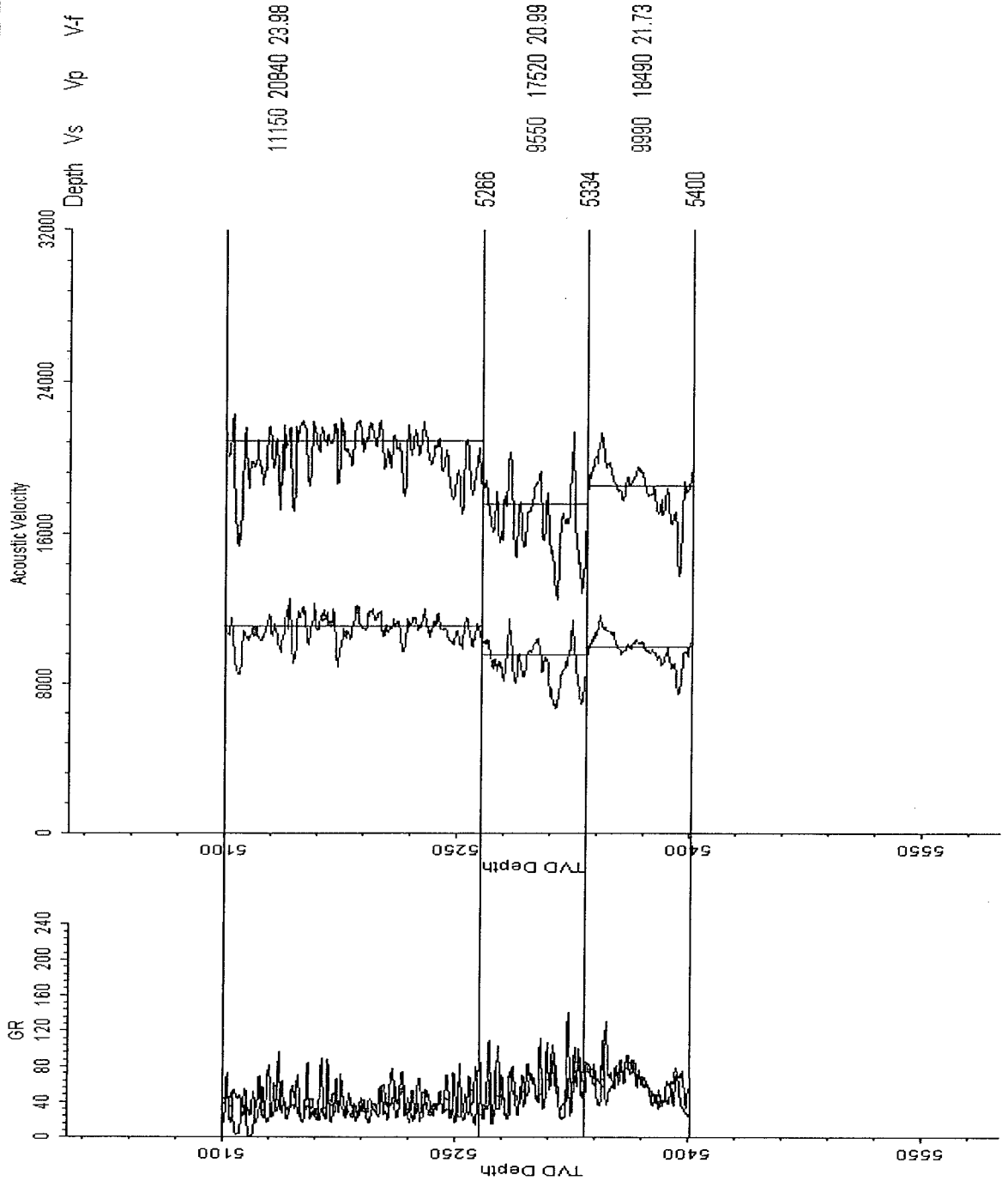
	Layer	Top	Bottom	Pay
1	Glorieta	0.00	3565.00	
2	Tubb	3565.00	4312.00	
3	Abo shale	4312.00	5240.00	
4	Wolfcamp	5240.00	5314.00	X
5	Wolfcamp	5314.00	5868.00	
6	Glorieta	5868.00		

Looking North

Oblique View : Lateral:Depth ratio is 2.32:1



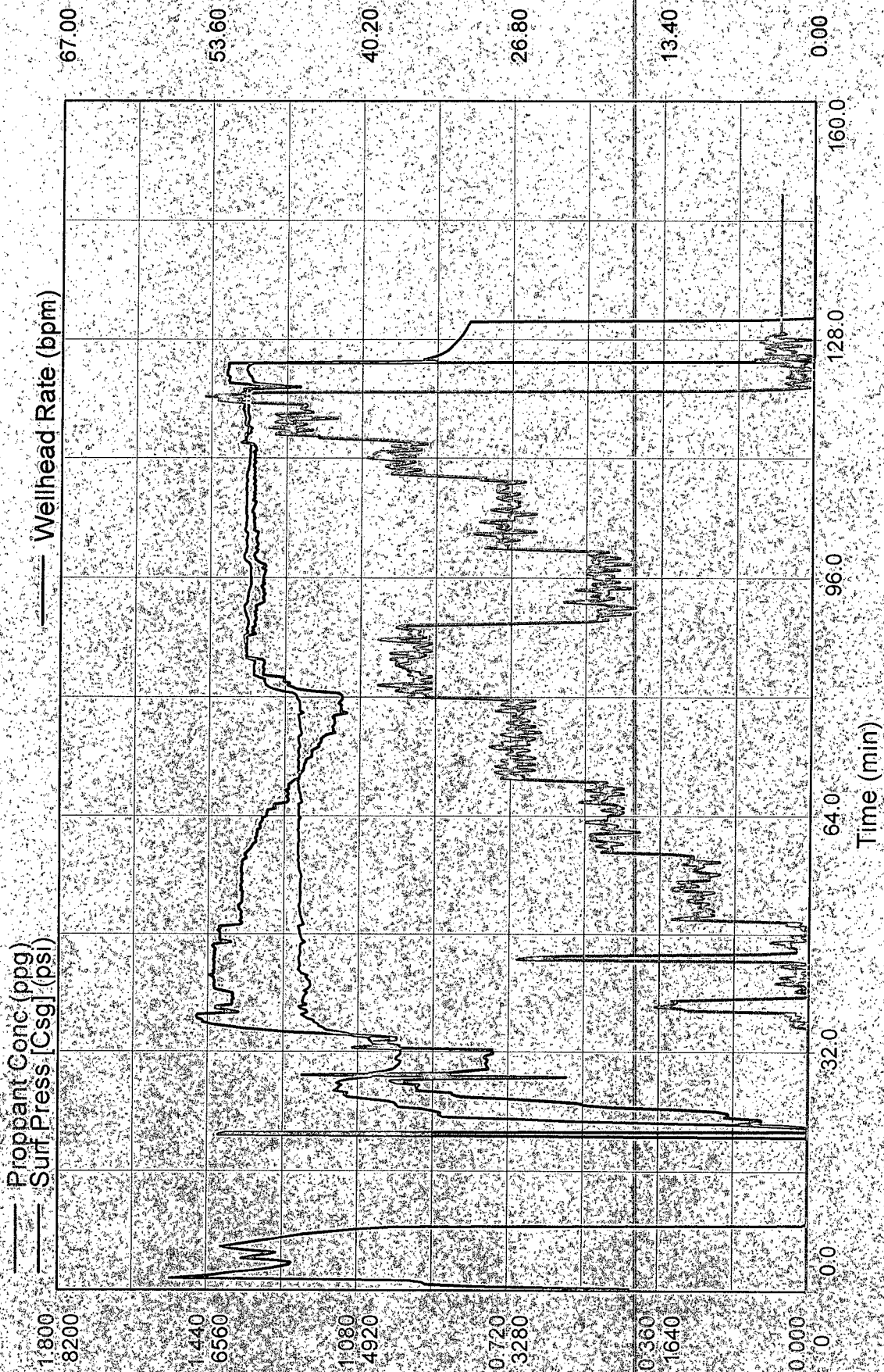
Alysheba No. 1 Velocity Model



• Velocity model was derived from the dipole sonic log information from the Bold Venture No. 1 and perforation-timing shots from the Alysheba No. 1.

Pinnacle

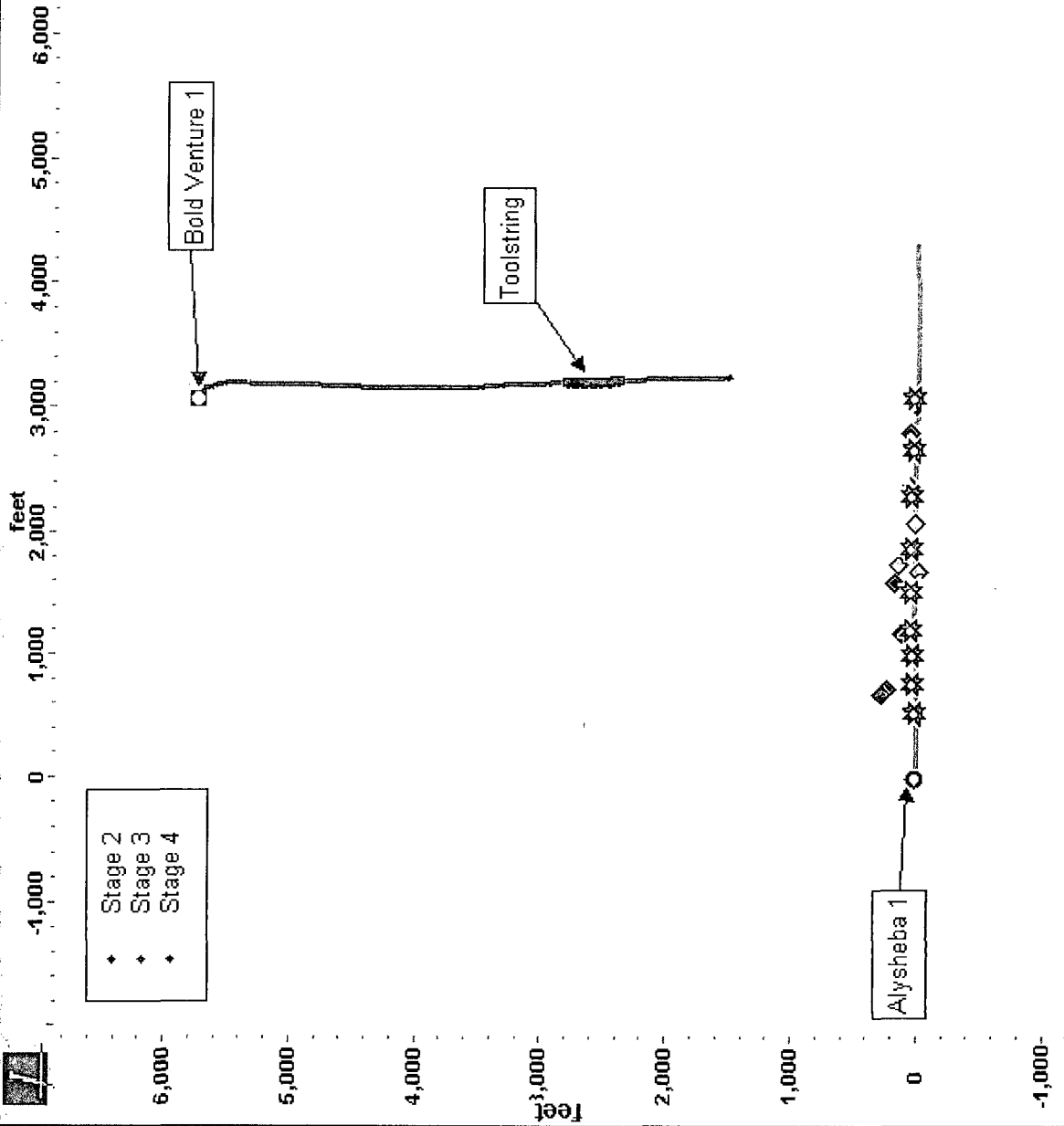
Parallel Petroleum Alysheba No. 1



Stage 1

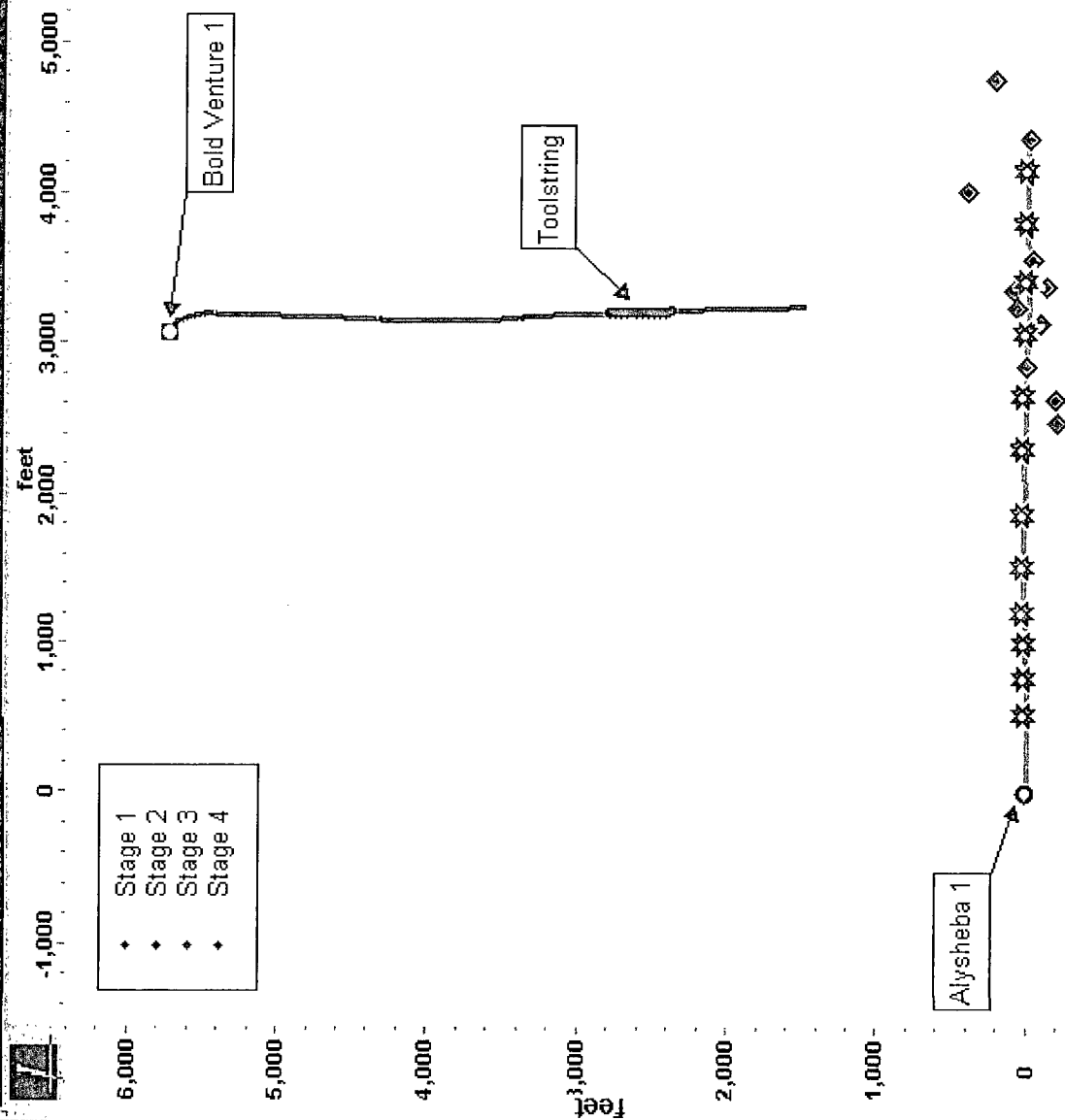


Alysheba No. 1 Perf Calibration - Map View

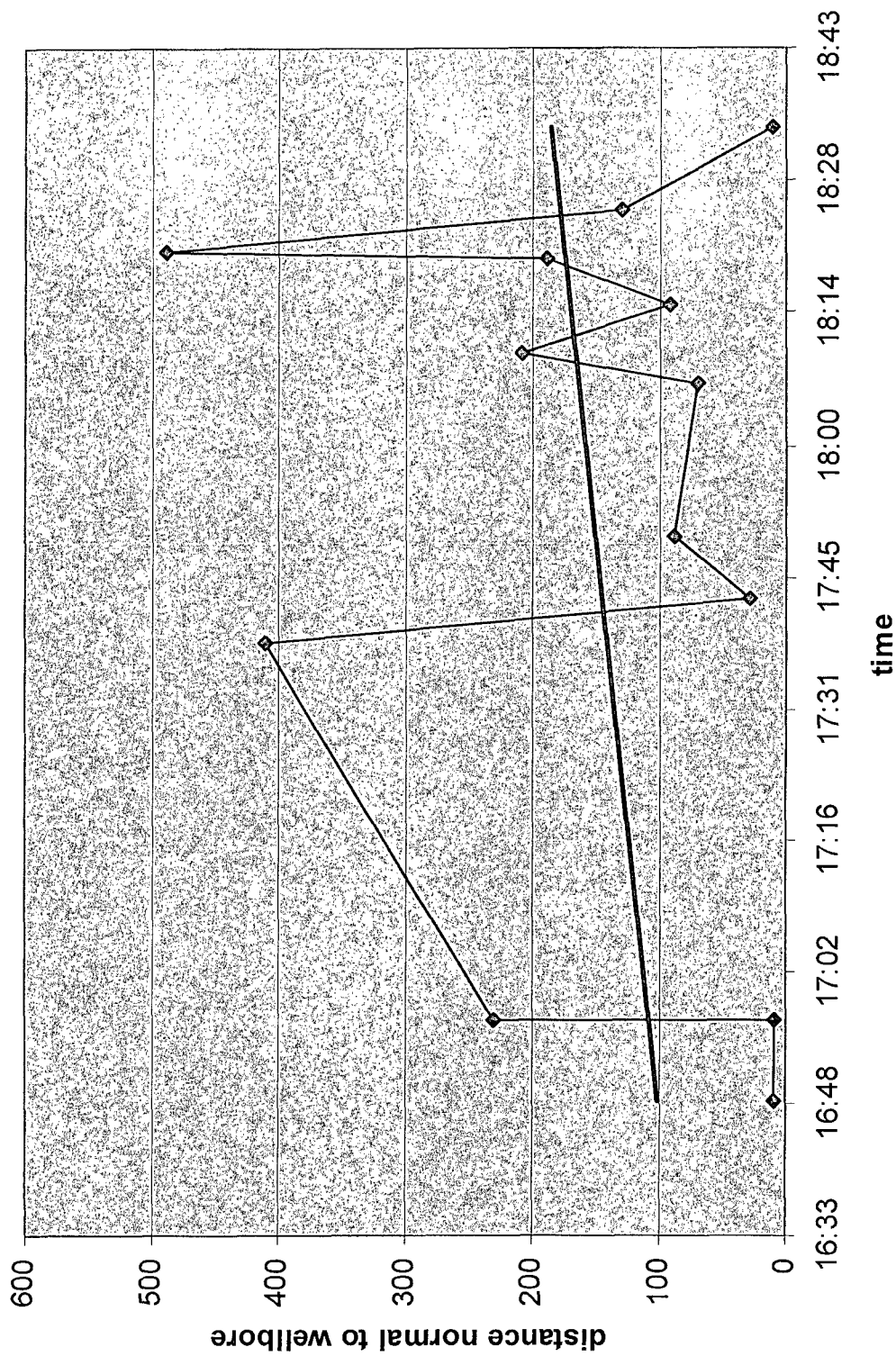


- The perforation shots locate close to the known points of detonation – velocity model and tool orientations are accurate.
- Stage 1 perfs shot prior to rig-up.
- Stringshot event shown in blue.

Pinnacle

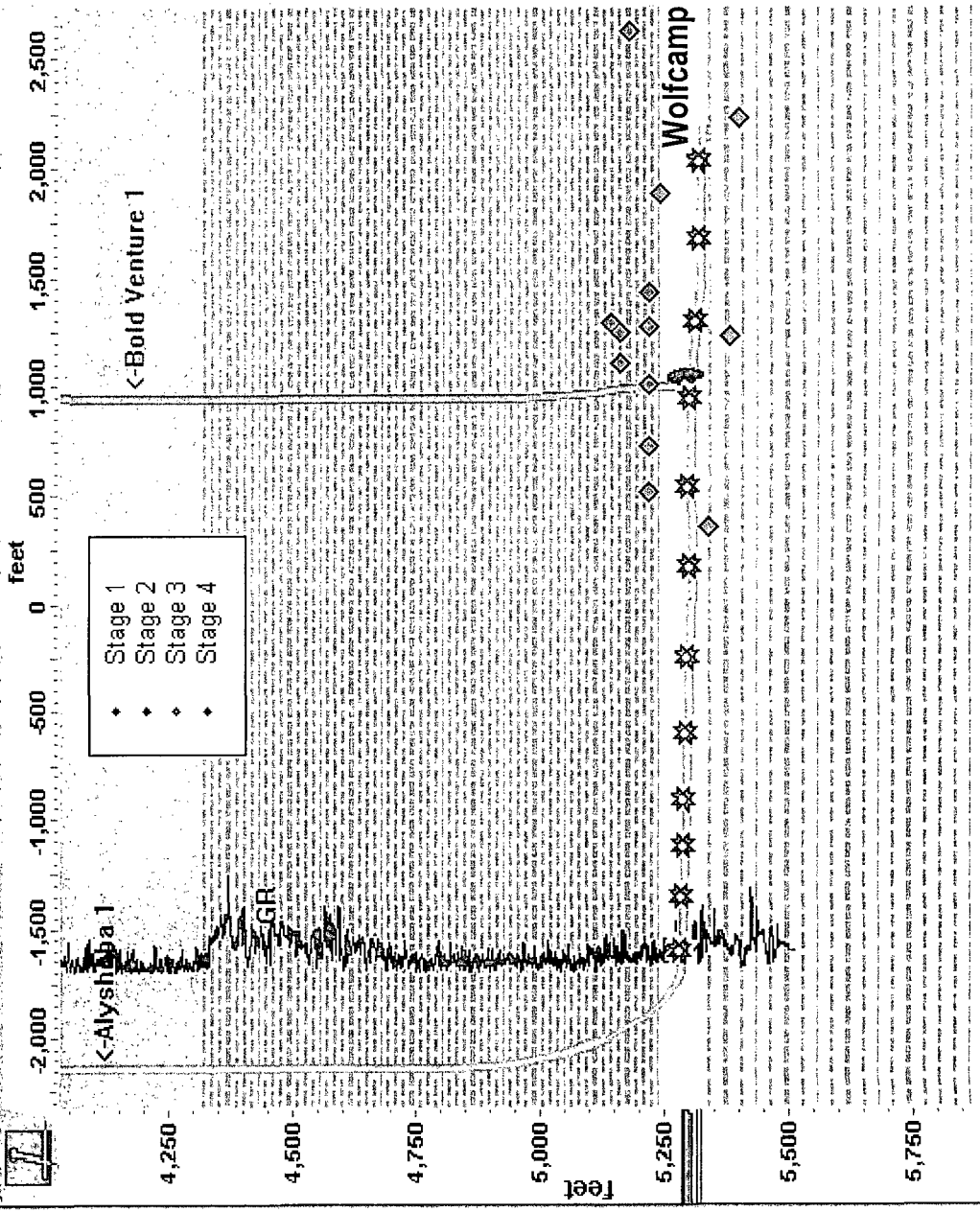


Alysheba No. 1 Stage 1



Alysheba No. 1 Stage 1 - Side View

• Fracture Height: ~250'



Looking North

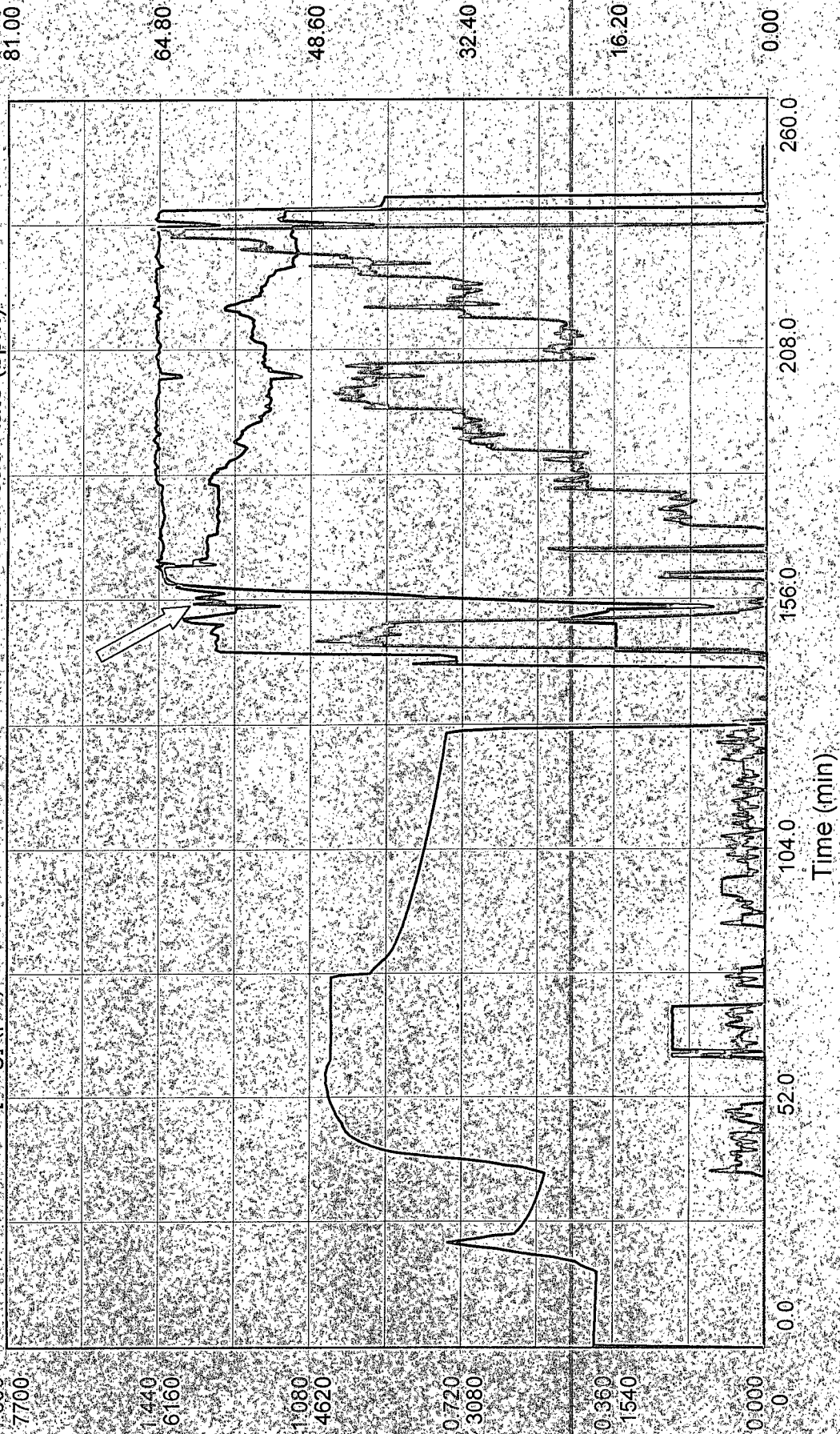
Oblique View : Lateral:Depth ratio is 2.32:1



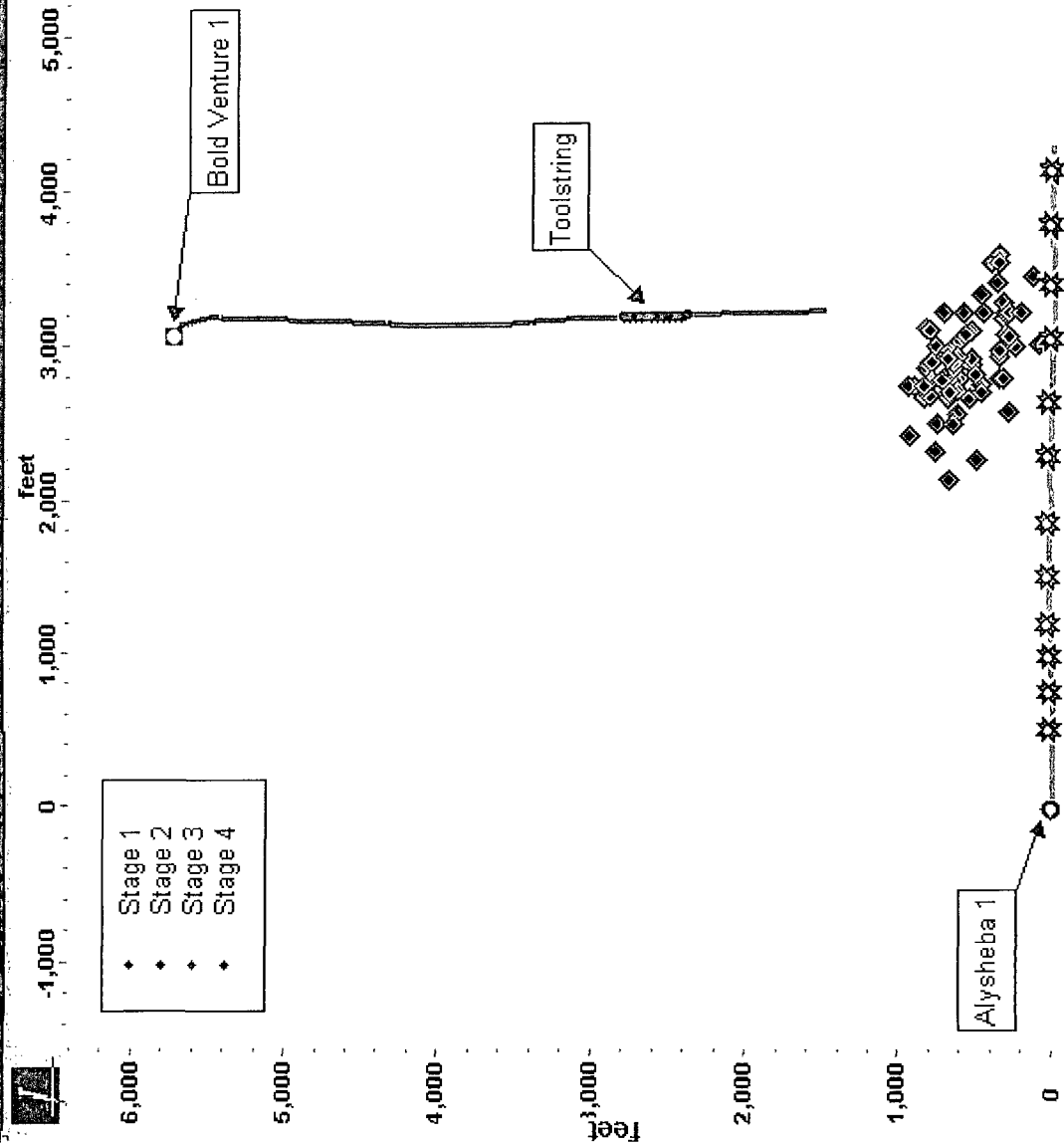
Parallel Petroleum Alysheba No. 1

Proppant Conc (ppg)
Surf Press [Csg] (psi)

Wellhead Rate (bpm)



Alysheba No. 1 Stage 2 – Map View

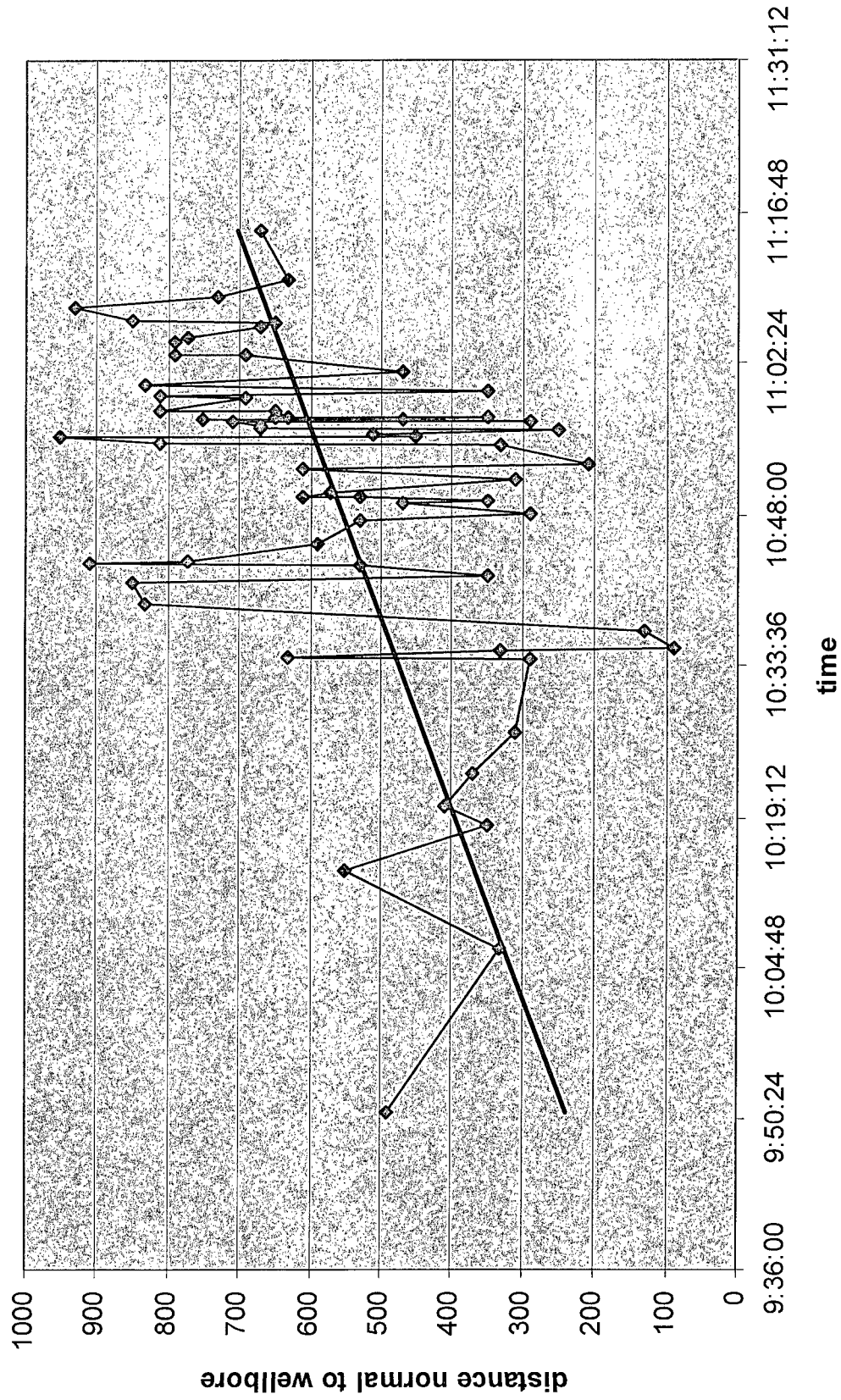


• Fracture Azimuths:
Difficult to determine, possibly N-S.

• Fracture Half-Lengths: ~900'
(measured North from wellbore)

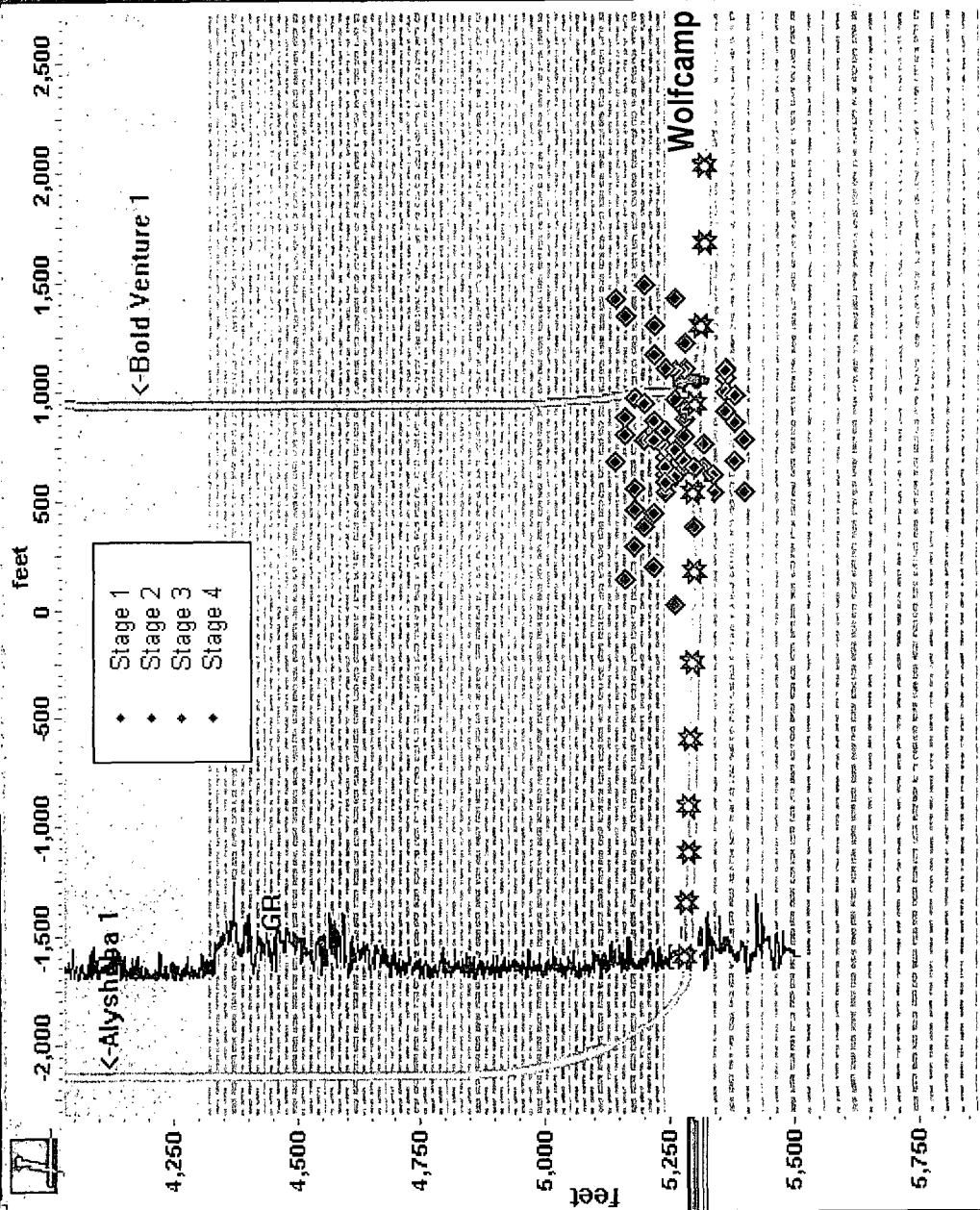
• Unclear why Stage 2 produced the majority of the events recorded during the project, perhaps interaction with faulting or fracture swarm near wellbore?

Alysheba No. 1 Stage 2 - Map View



Alysheba No. 1 Stage 2 - Side View

• Fracture Height: ~250'



Looking North

Oblique View : Lateral:Depth ratio is 2.32:1

Pinnacle

- Fracture Height: ~250'
- Fracture Half-Lengths: ~900' (measured North from wellbore)



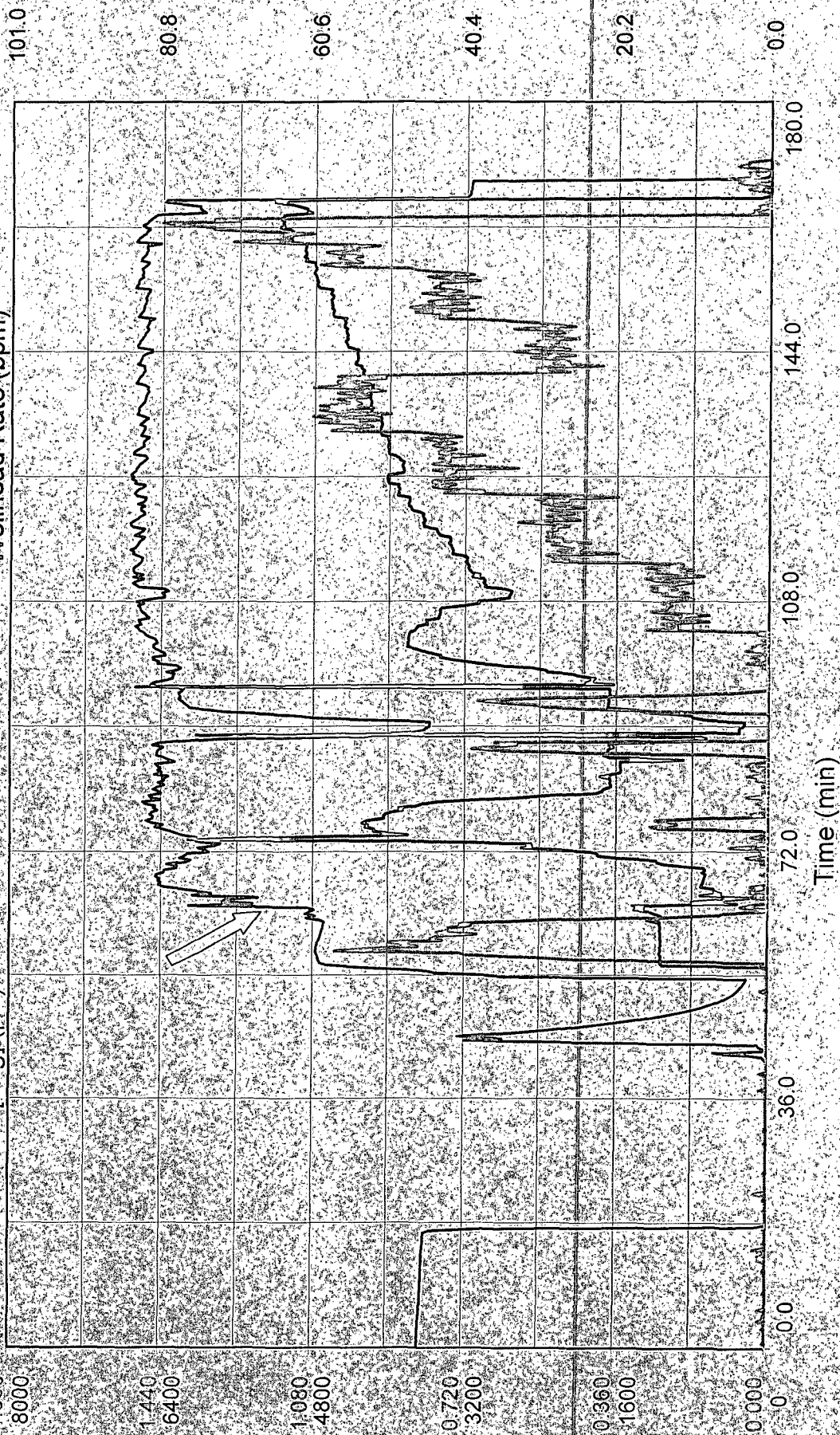
Oblique View : Lateral:Depth ratio is 2.32:1

The Pinnacle

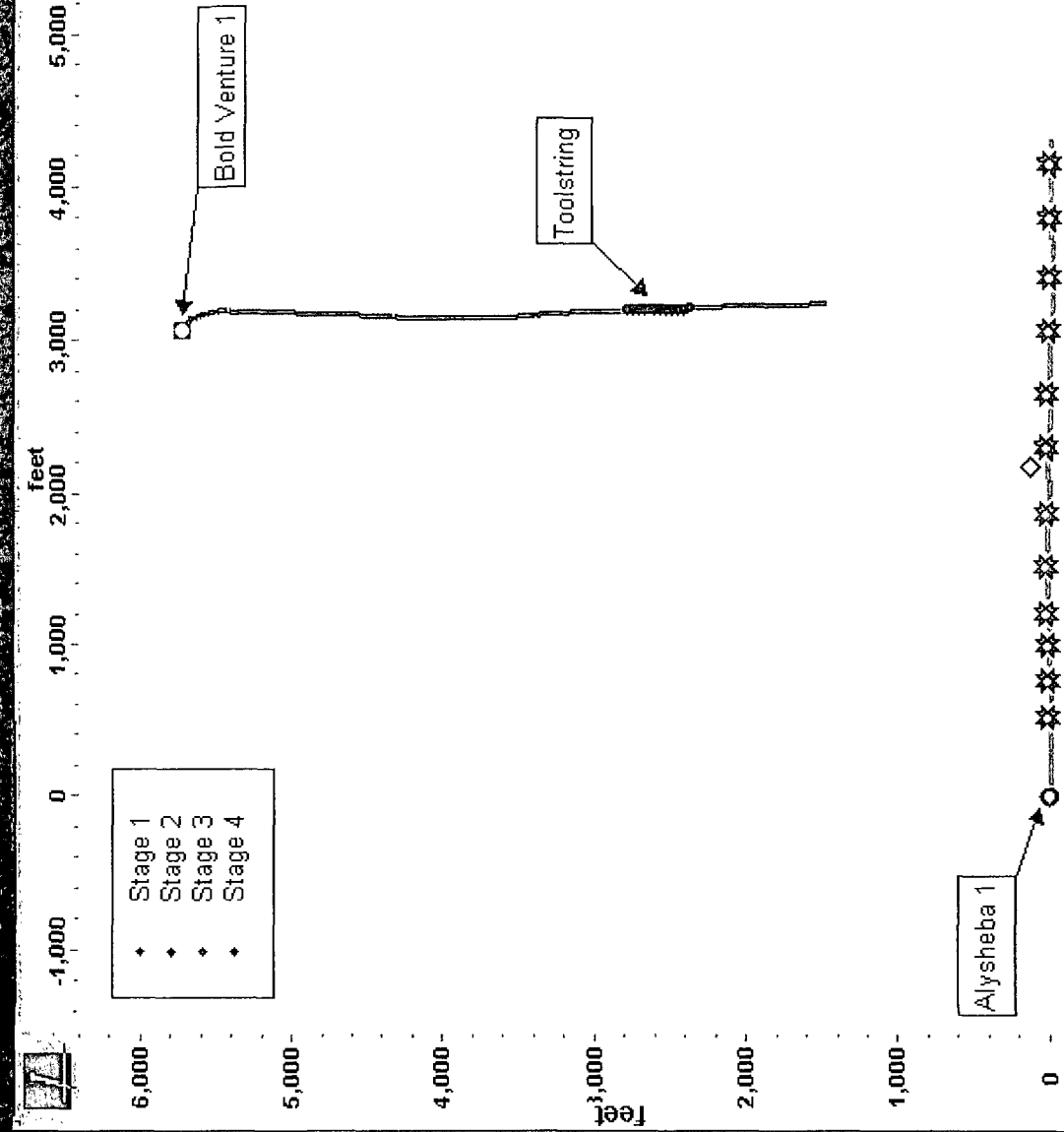
Parallel Petroleum Alysheba No. 1

— Proppant Conc. (ppg)
— Surf Press. [Csg] (psi)

— Wellhead Rate (bpm)

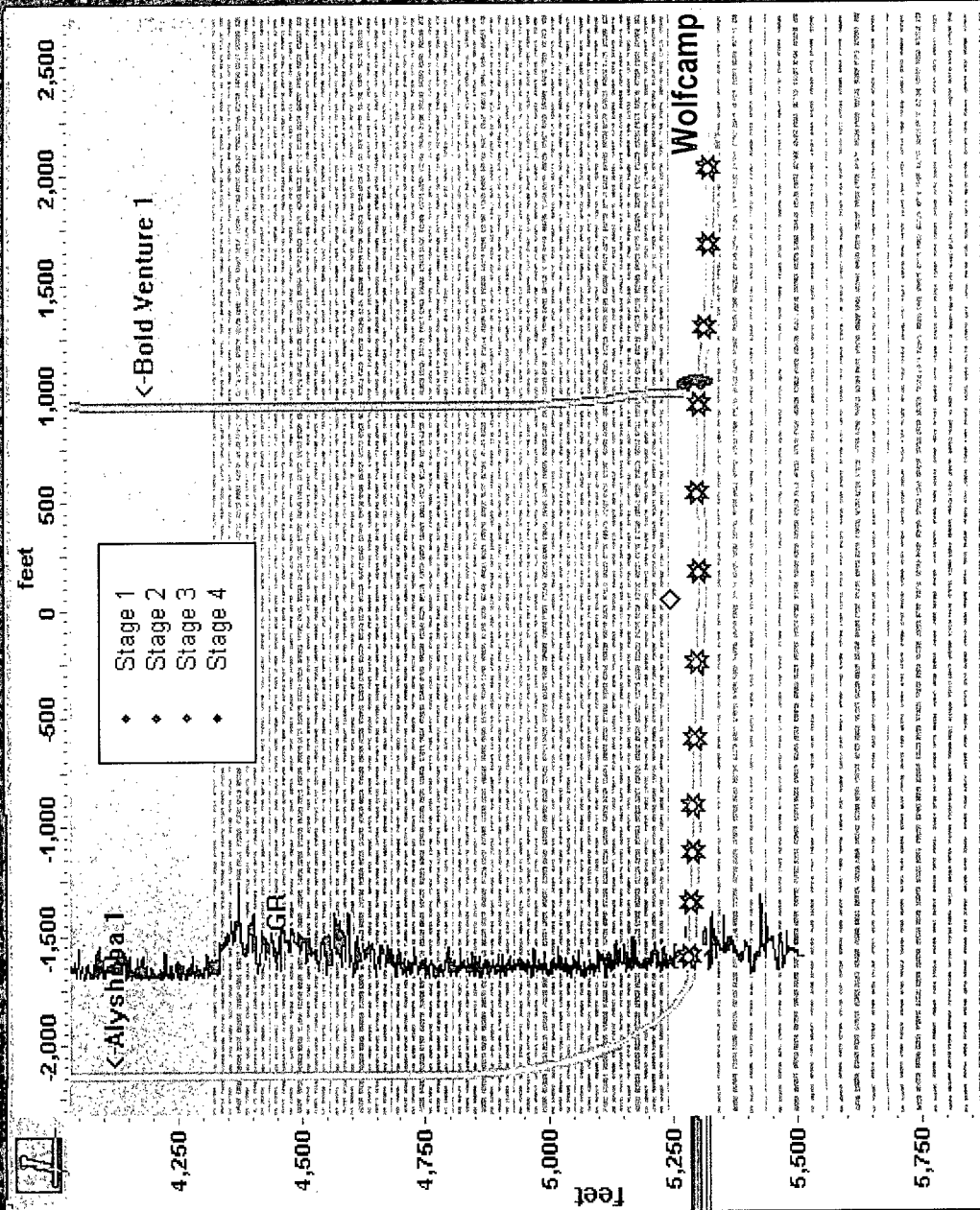


Alysheba No. 1 Stage 3 - Map View



- Drilling noise from nearby rig to the west was detected during Stage 3 but did not adversely impact ability to hear frac.
- Only one microseismic event was recorded.

Alysheba No. 1 Stage 3 - Side View

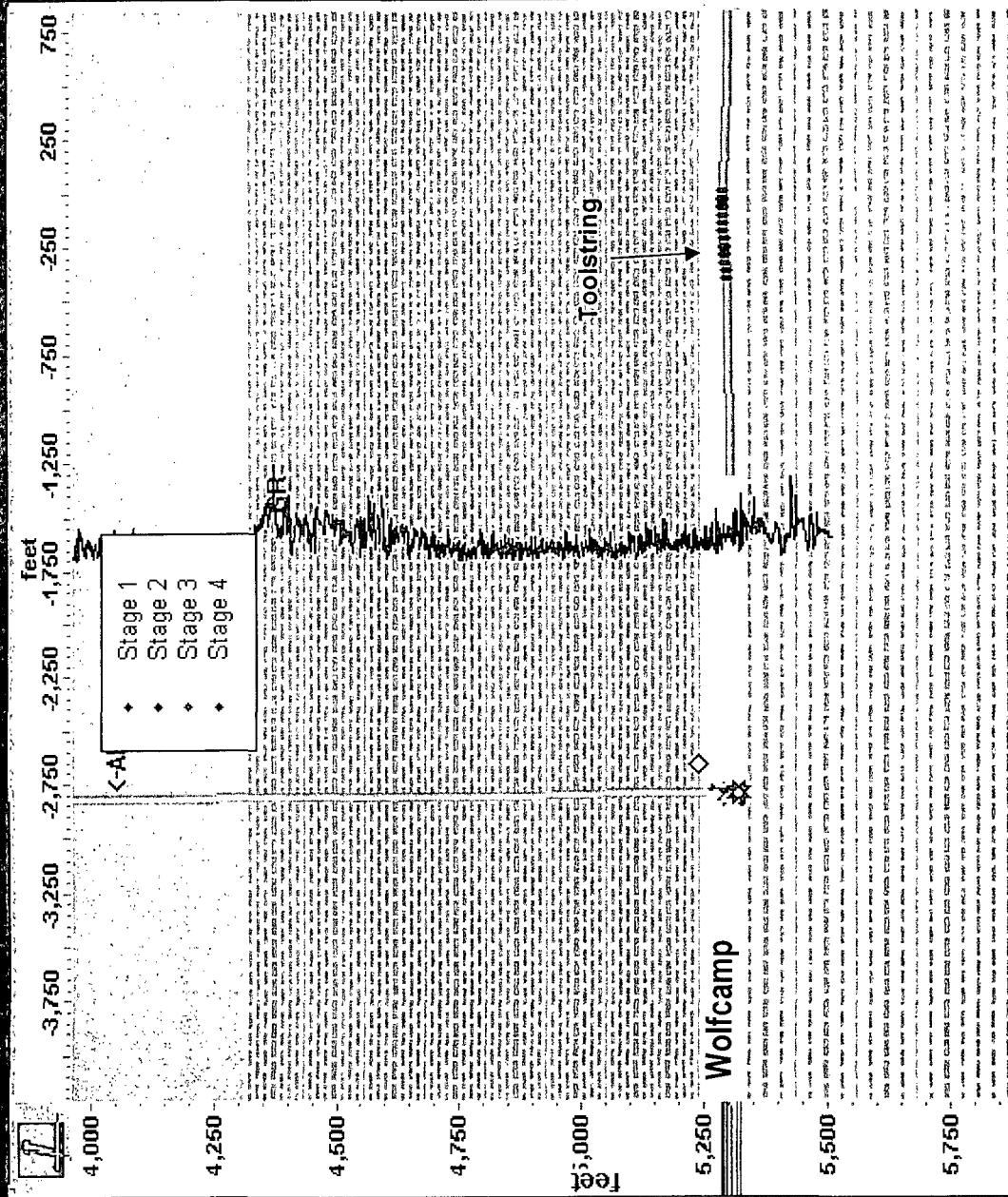


Looking North

Oblique View : Lateral:Depth ratio is 2.32:1



Alysheba No. 1 Stage 3 -- Edge View

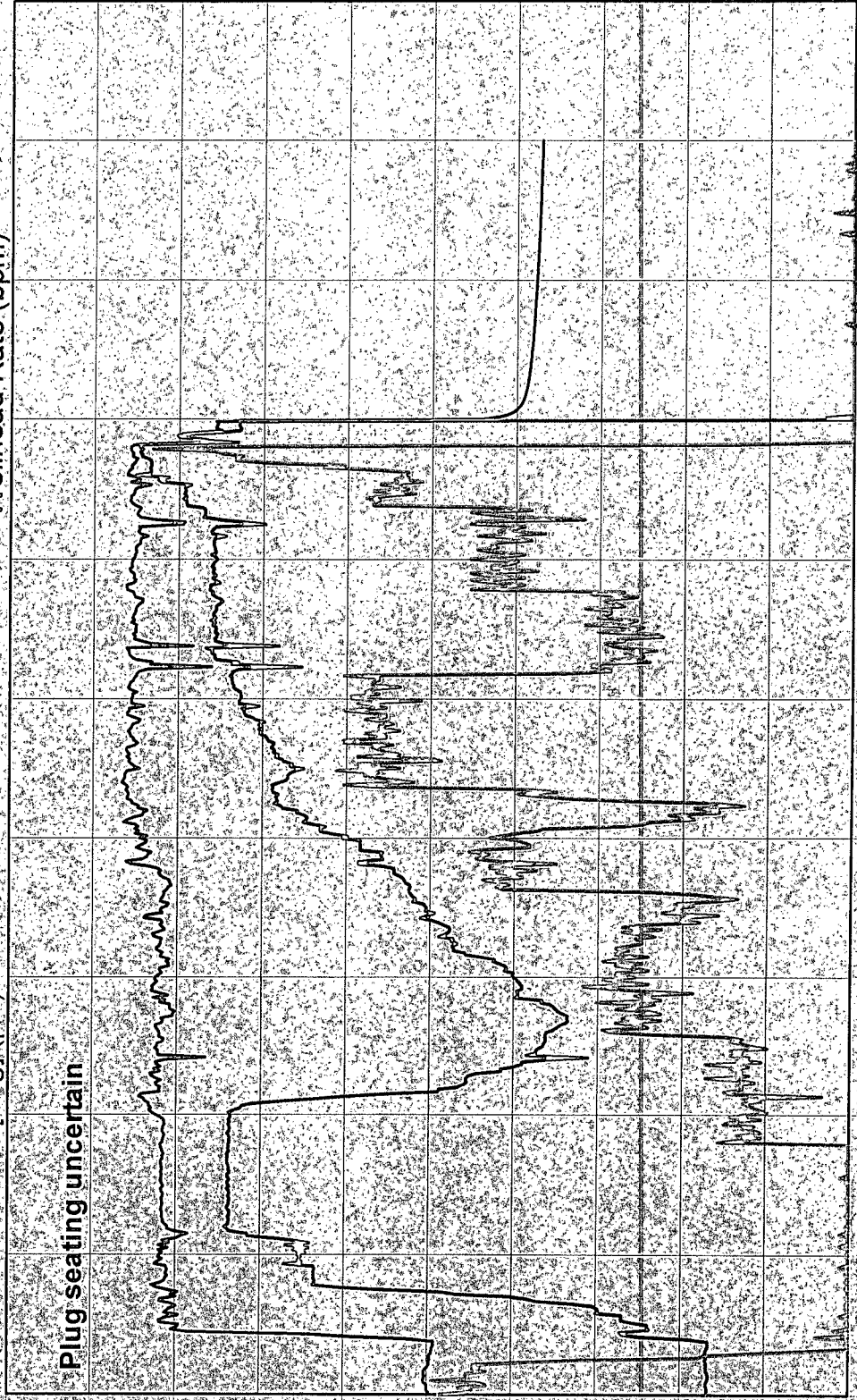


Oblique View : Lateral:Depth ratio is 2.32:1

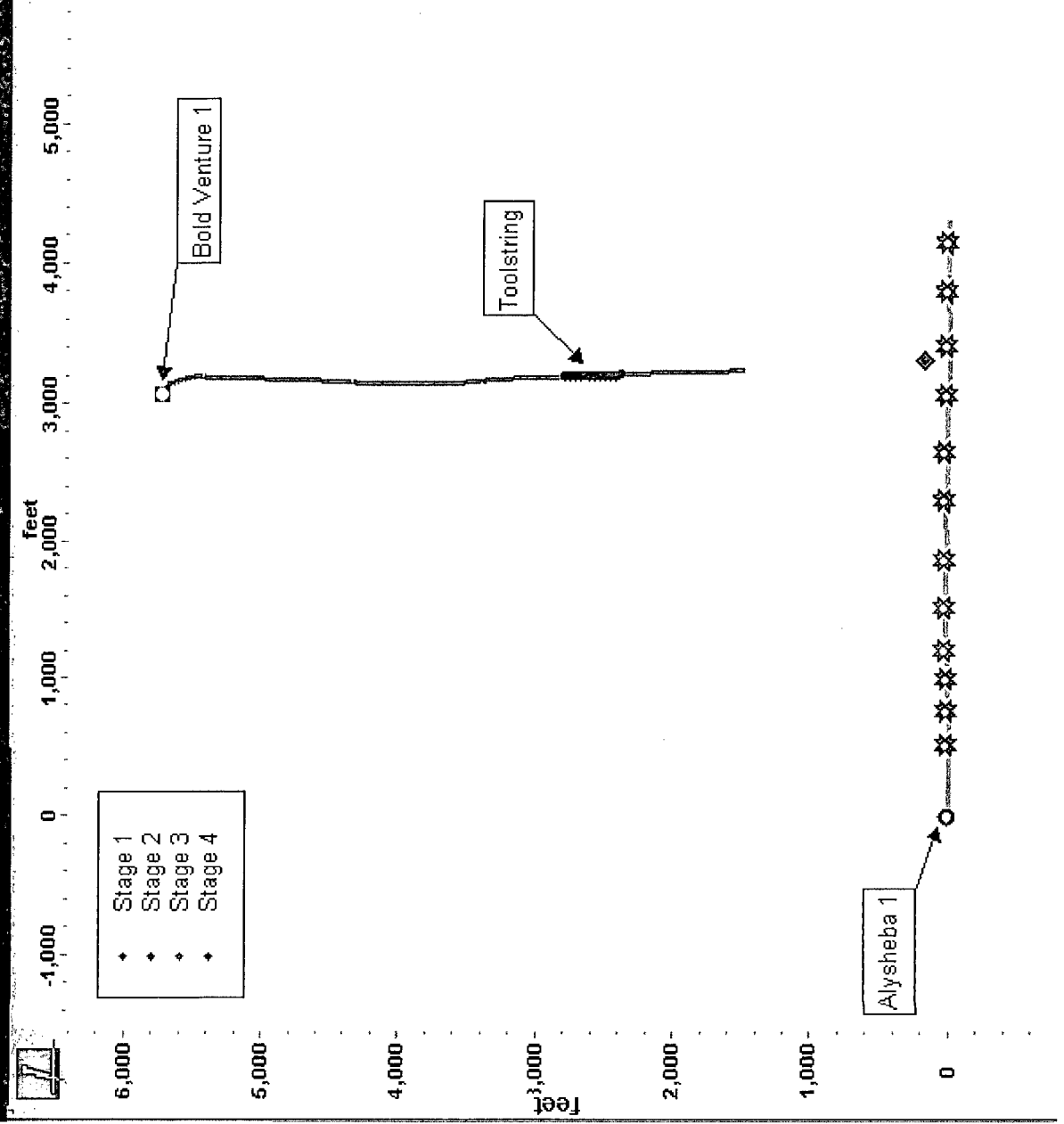
Parallel Petroleum Alysheba No. 1

Proppant Conc (ppg)
Surf Press [Csg] (psi)

Wellhead Rate (bpm)

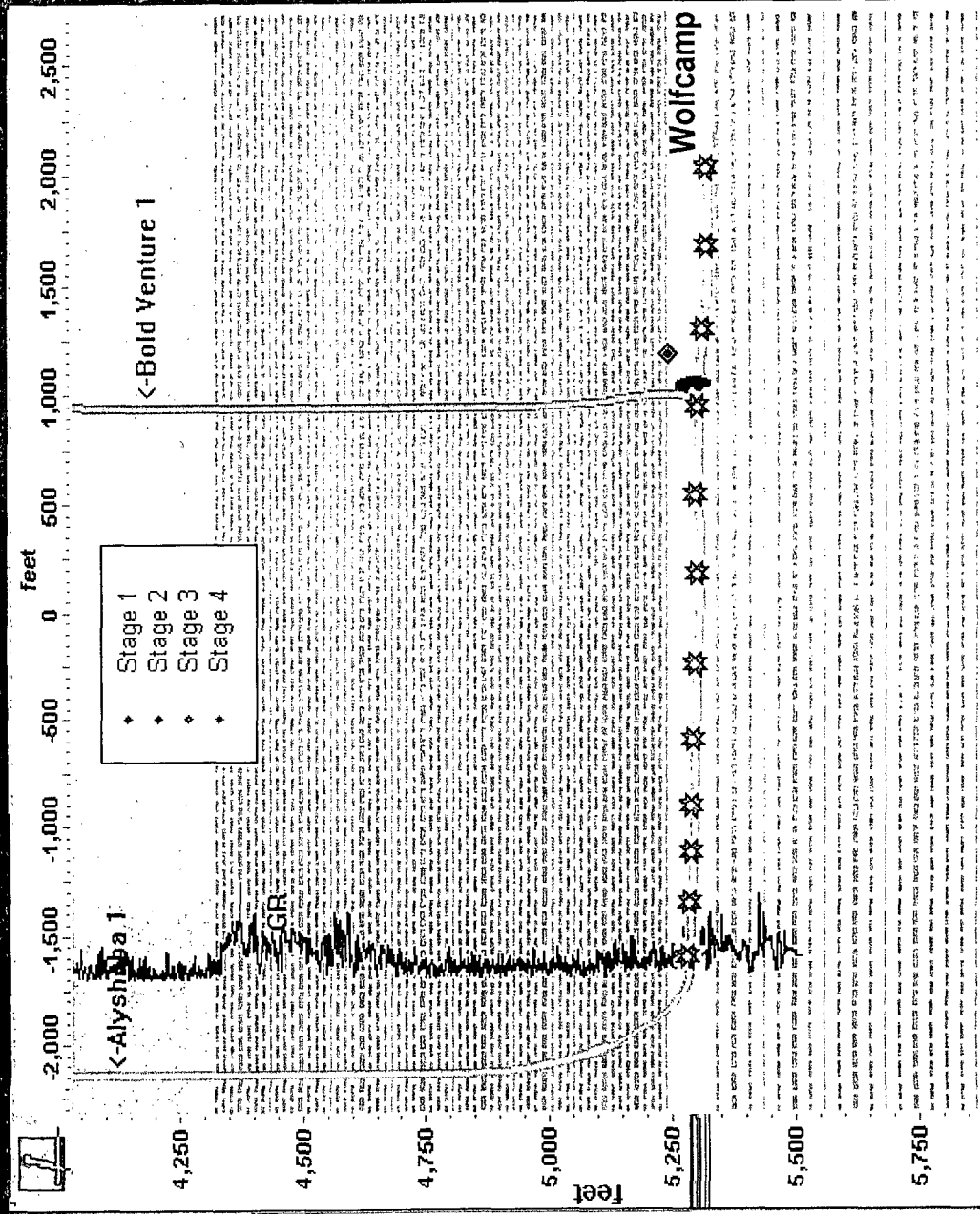


Alysheba No. 1 Stage 4 – Map View



- Drilling noise from nearby rig to the west was detected during Stage 4 but did not adversely impact ability to hear frac.
- Only one microseismic event was recorded. It was located near Stage 1-2 perfs.

Alysheba No. 1 Stage 4 - Side View

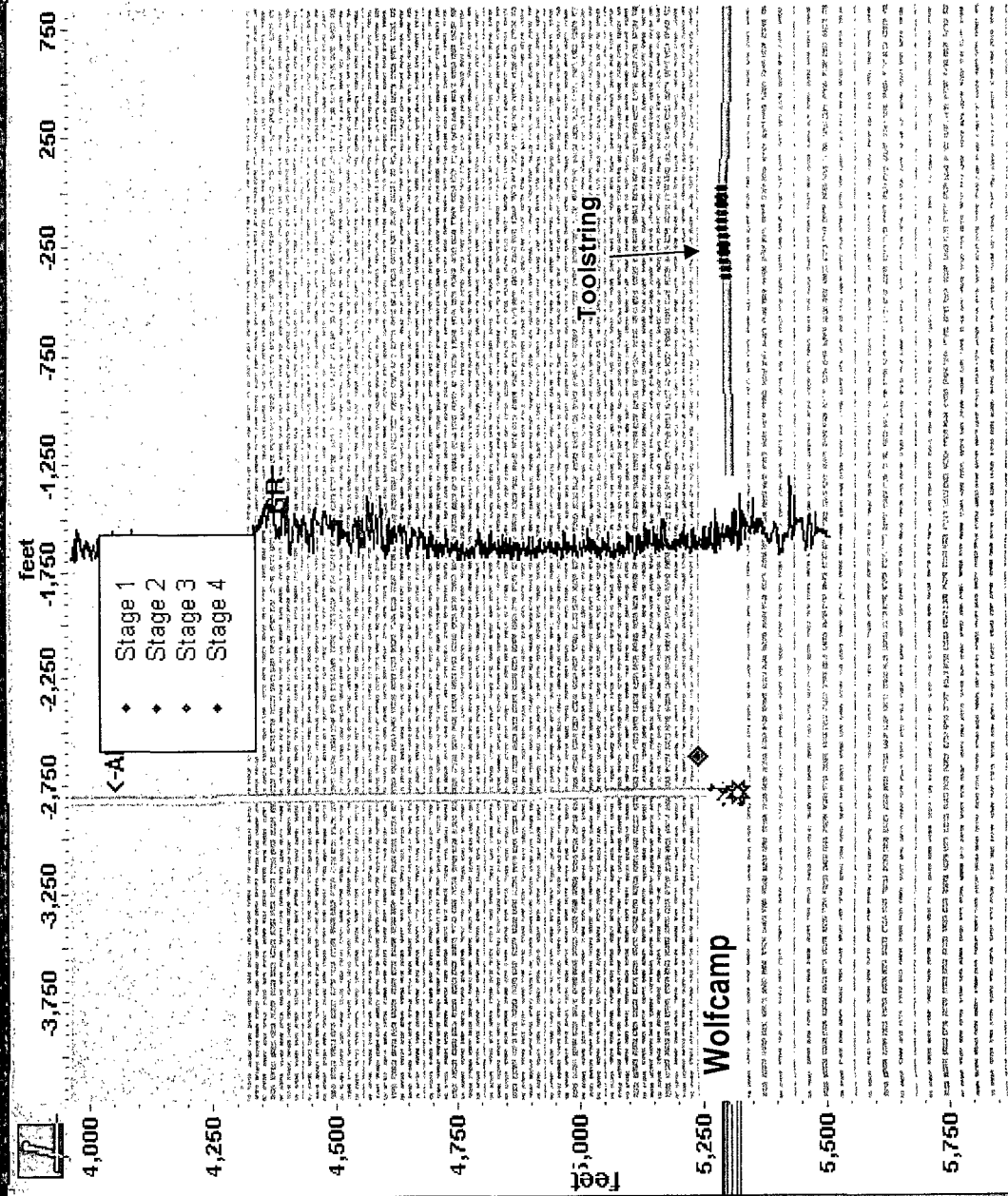


Looking North

Oblique View : Lateral:Depth ratio is 2.32:1



Alysheba No. 1 Stage 4 - Edge View

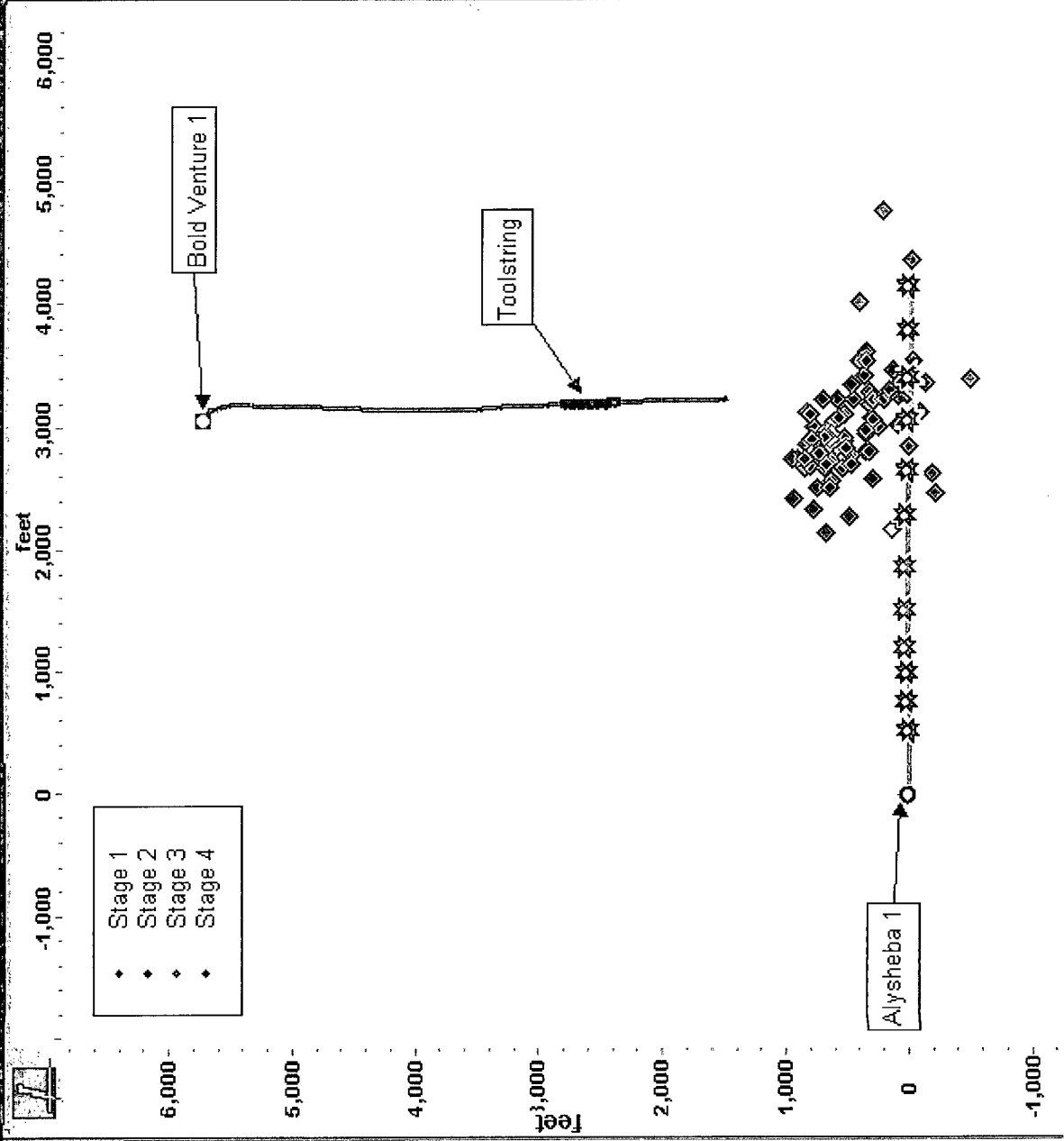


Looking West

Oblique View : Lateral:Depth ratio is 2.32:1

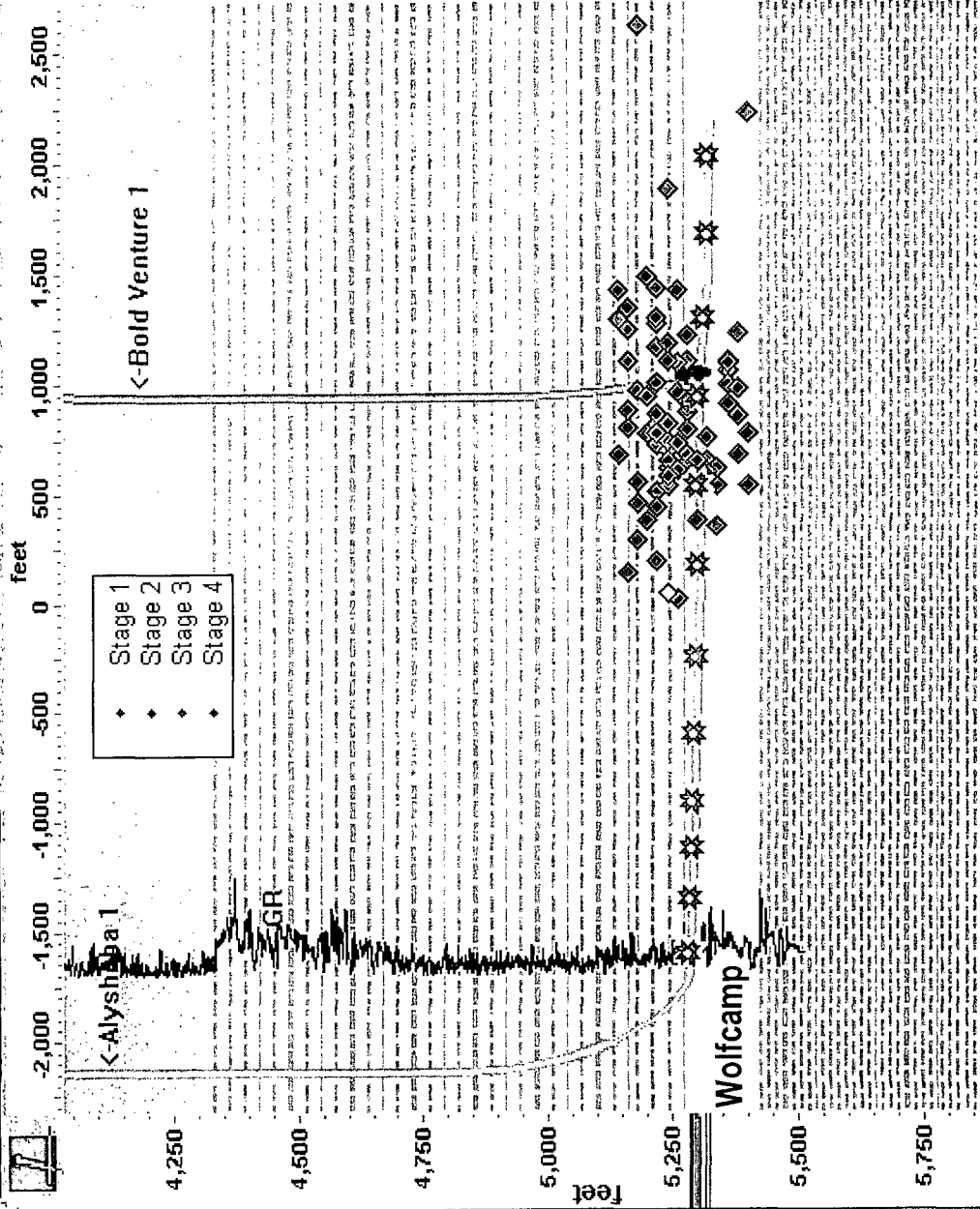


Alysheba No. 1 – Map View



- Fracture Azimuths: Difficult to determine, possibly N-S.
- Fracture Half-Lengths: ~900' (measured North from wellbore)
- Most of the microseismic events were recorded during Stage 2. Only one event was detected during both Stages 3 and 4.
- Unclear why Stage 2 produced the majority of the events; perhaps interaction with faulting or fracture swarm near wellbore?

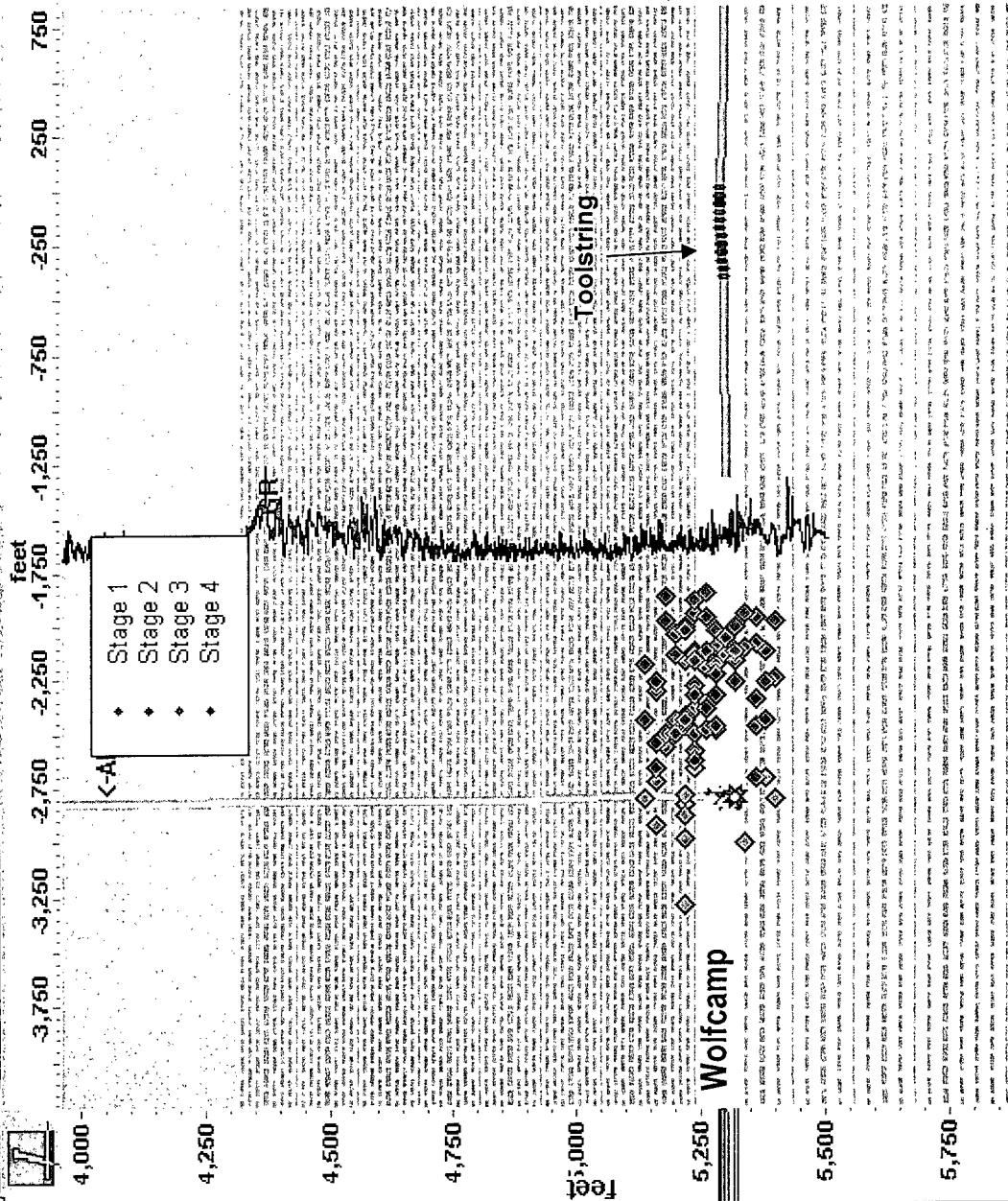
Alysheba No. 1 – Side View



- Fracture Heights: ~250'
- Appears to be some upwards height growth out of Wolfcamp

Pinnacle

Alysheba No. 1 - Edge View



• Fracture Heights: ~250'

• Fracture Half-Lengths: ~900' (measured North from wellbore)

• Majority of microseisms were detected on North side of wellbore (closer to observation well) - no clear evidence to suggest asymmetry

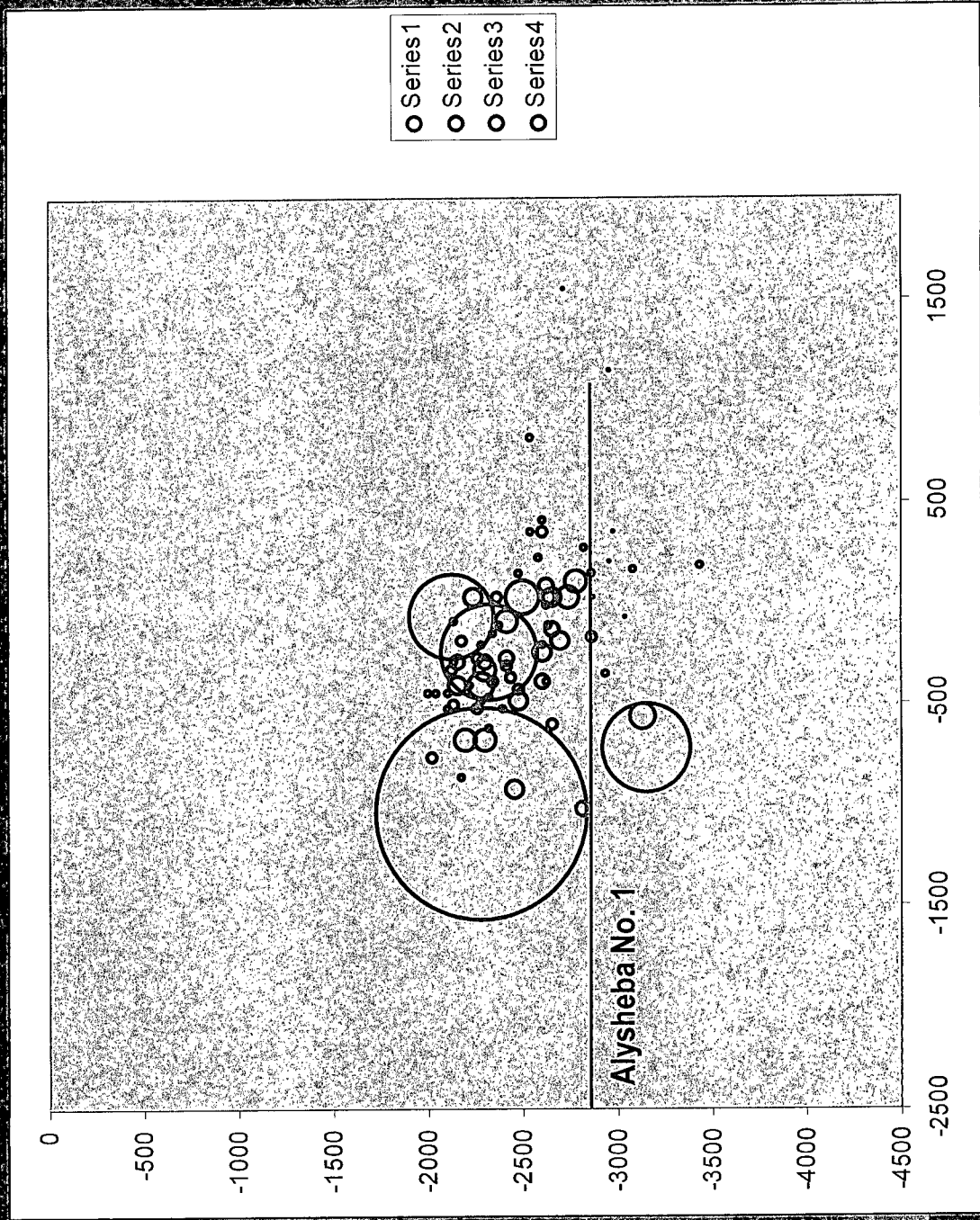
Looking West

Oblique View : Lateral:Depth ratio is 2.32:1

Pinnacle

Alysheba No. 1 Event Amplitudes

- This figure shows the relative measured amplitude of the events from this project. Bubble width represents event amplitude.
- The majority of the largest events occurred during Stage 2.

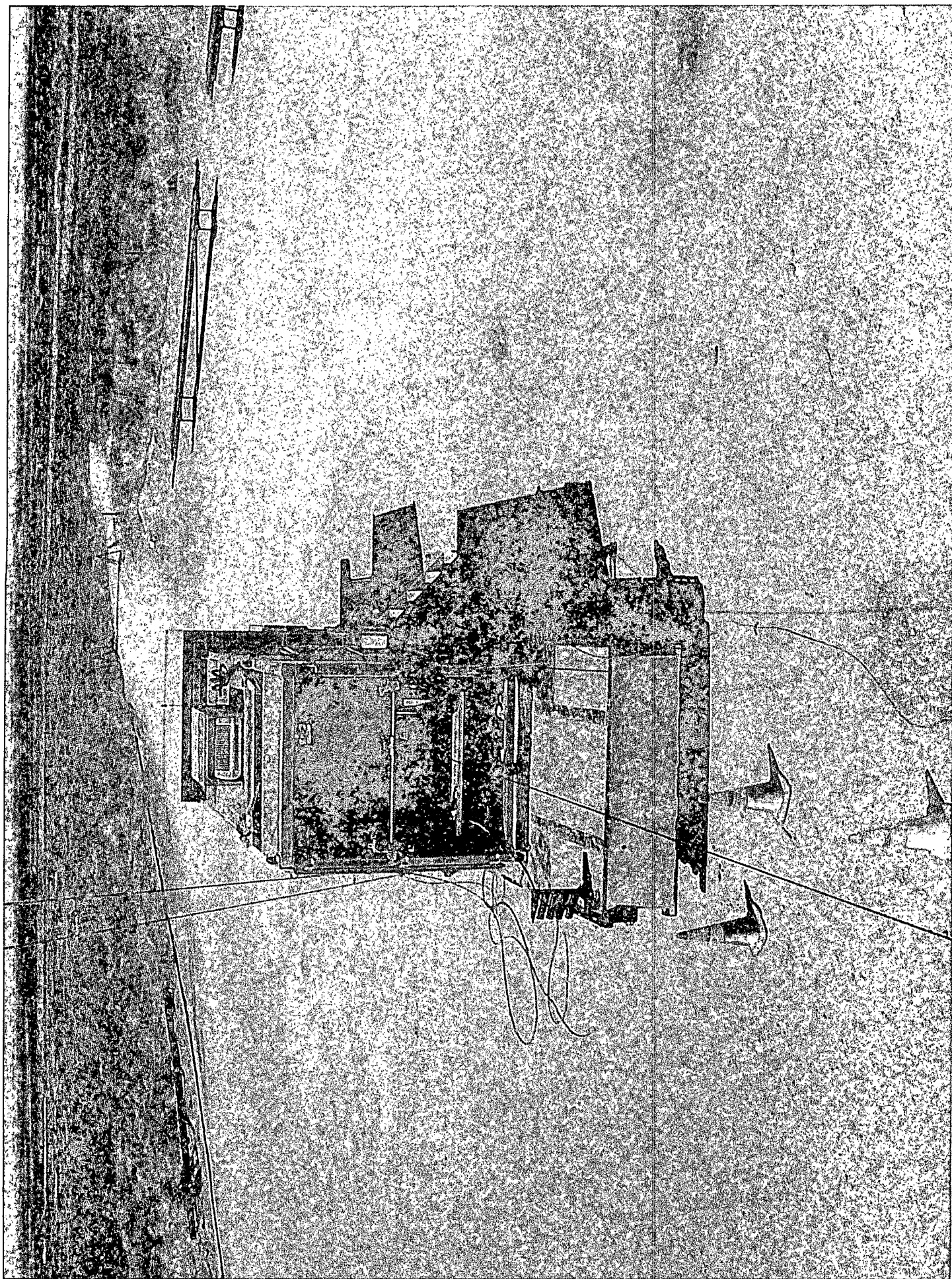


Conclusions

- *Azimuth uncertain, but has a strong N-S component*
- *Possibility of a N35°E secondary component*
- *250 ft of height*
- *900 ft of half-length, longer than Seabiscuit, but still shorter than competitors*
- *Low degree of complexity*
- *Higher pressures may not be related to oblique initiation (all stages lack of tortuosity, presence of perf friction)*

Recommendations

- *Treat azimuth choice as a statistical decision*
- *Consider more liquid volume, prop OK as is (1,100 ft)*
- *WB cleanliness fanaticism – minimize the P_{perf} component. Tortuosity may not be an issue*
- *De-emphasize slugging, move toward sweeps*





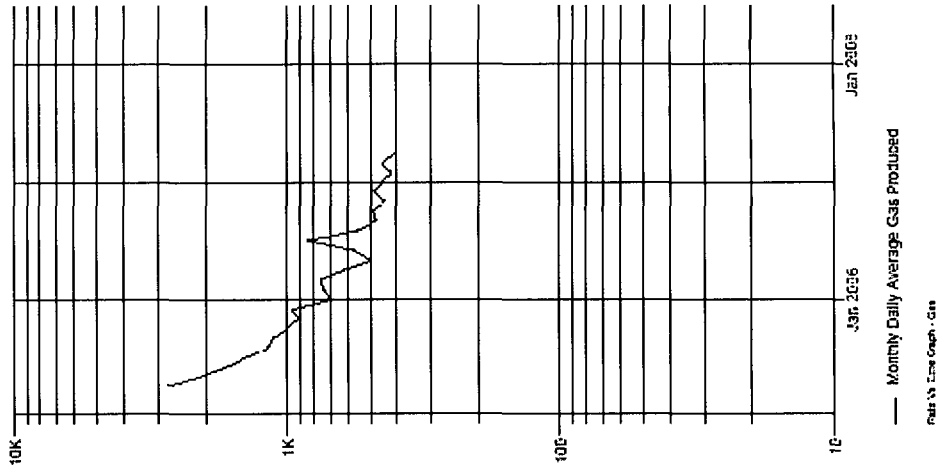
Production Data

New Mexico Wolfcamp



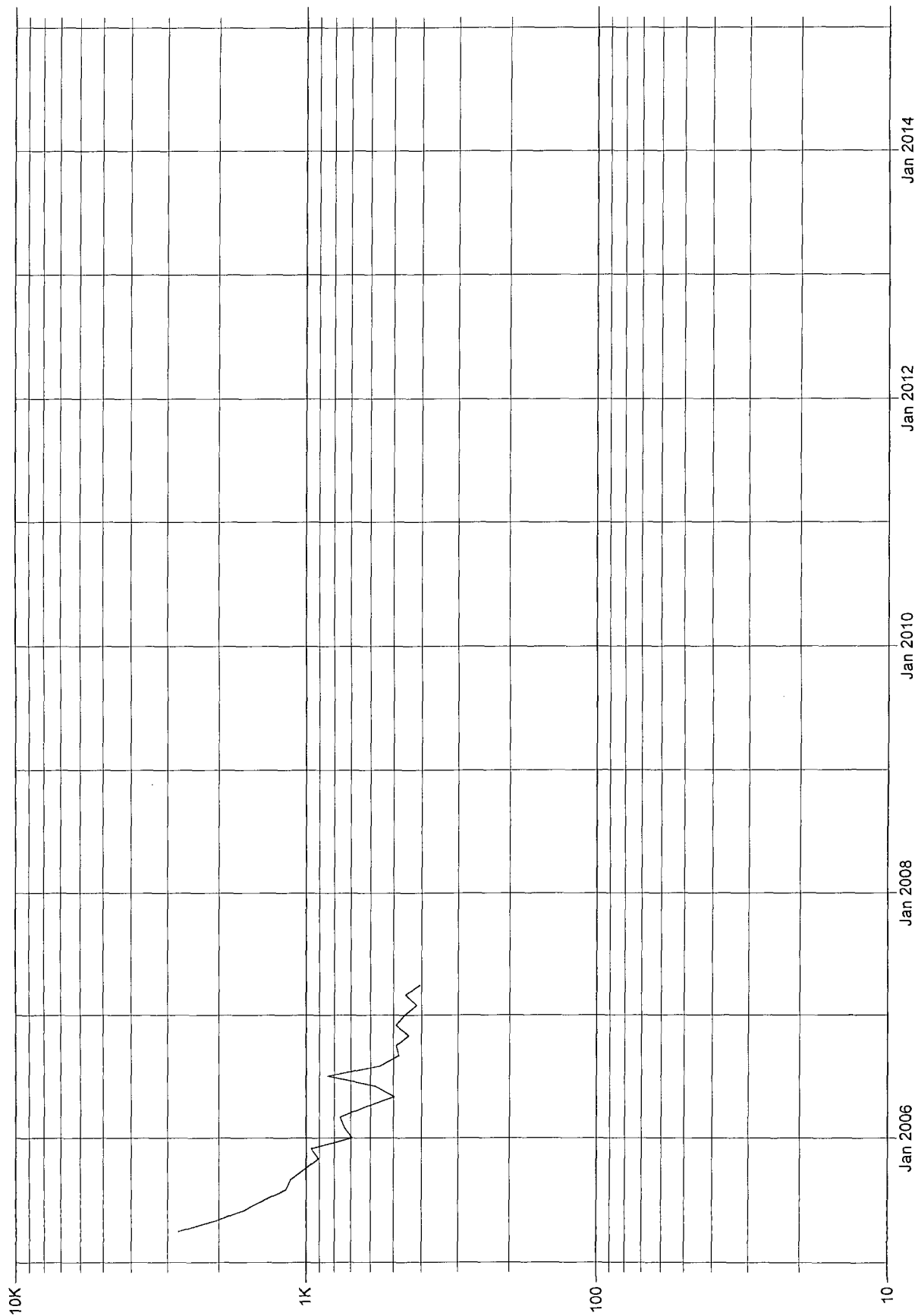
Nile #1 Production

Field: Collins Ranch (Wolfcamp Gas)
Operator: EOG Resources
Lease Name: Nile 22 State Com 001
Location: 17S24E22N



Field: COLLINS RANCH (WOLFCAMP (GAS)) 75010
Operator: EOG RESOURCES INC 007377
Lease Name: NILE 22 STATE COM 001
LPD ID: 300153359775010
Location: 17S24E22N

County, State: EDDY, NM
Status and Date: ACT 2004/08/31
District: 2, Phase: GAS
Gas Cum: 668692, Oil Cum: 288



— Monthly Daily Average Gas Produced

Rate Vs Time Graph - Gas

OD Date: 200704

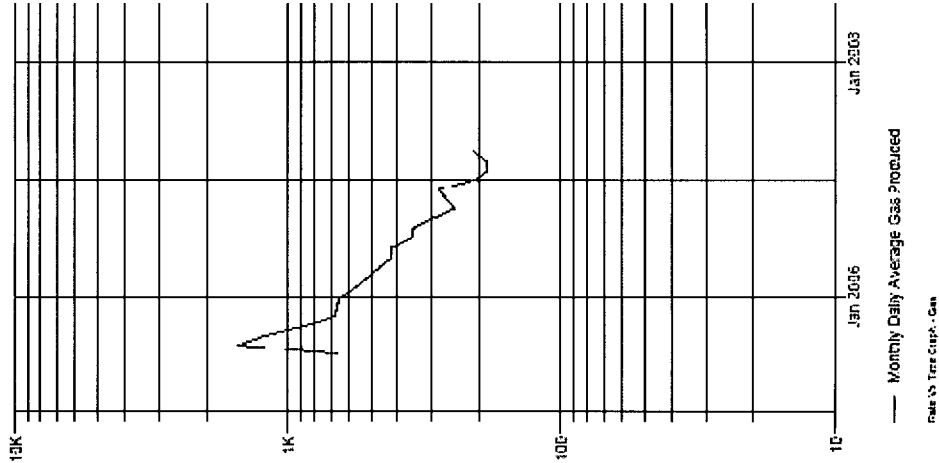
Copyright 09:50:54 09/11/07, Lasser, Inc.

New Mexico Wolfcamp



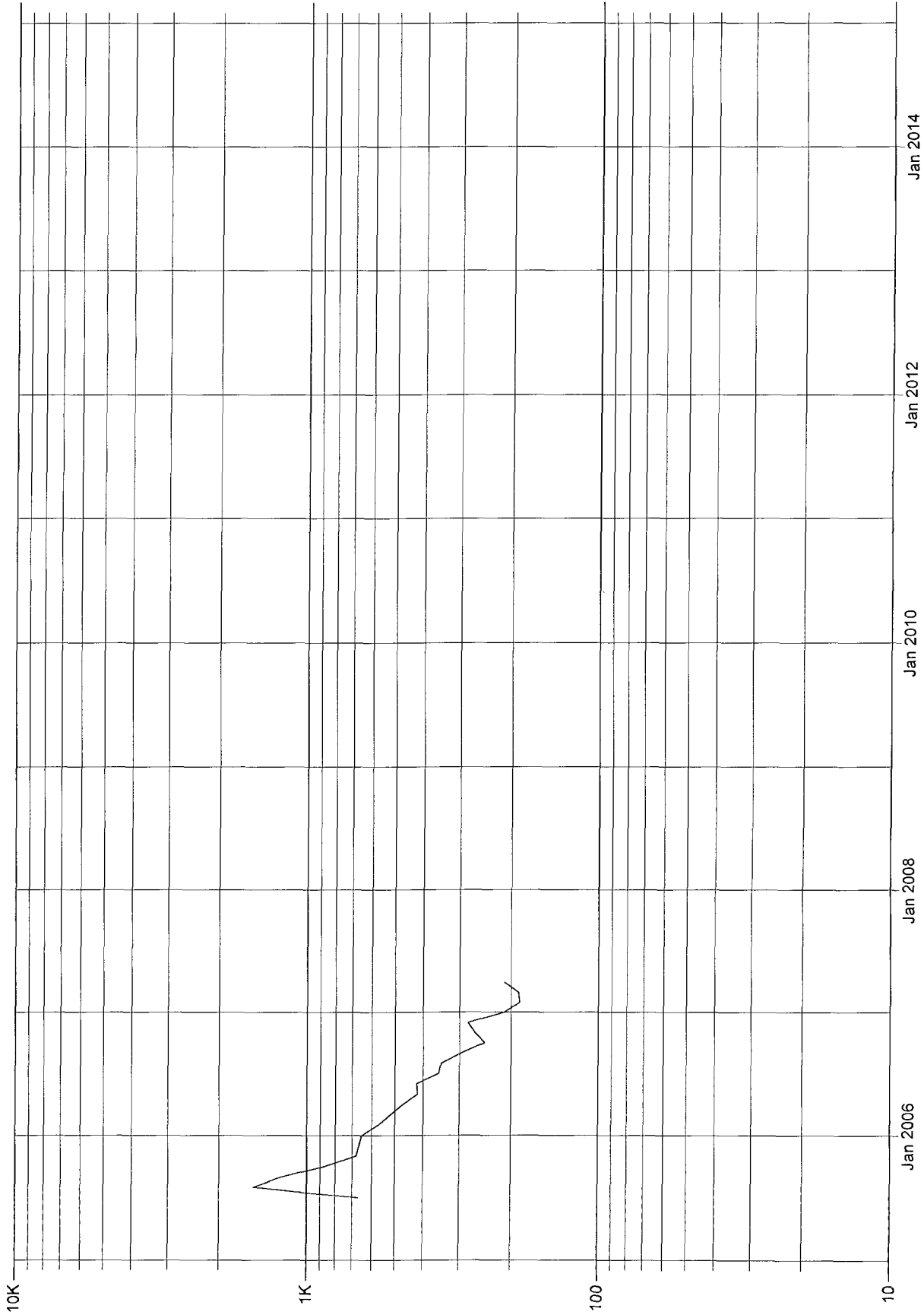
Jordan #1 Production

Field: Collins Ranch (Wolfcamp Gas)
Operator: EOG Resources
Lease Name: Jordan 22 Fee Com 001H
Location: 17S24E22P



Field: COLLINS RANCH (WOLFCAMP (GAS)) 75010
Operator: EOG RESOURCES INC 007377
Lease Name: JORDAN 22 FEE COM 001H
LPD ID: 300153404875010
Location: 17S24E22P

County, State: EDDY, NM
Status and Date: ACT 2005/04/12
District: 2, Phase: GAS
Gas Cum: 343042, Oil Cum: 827



— Monthly Daily Average Gas Produced

Rate Vs Time Graph - Gas

CD Date: 200704

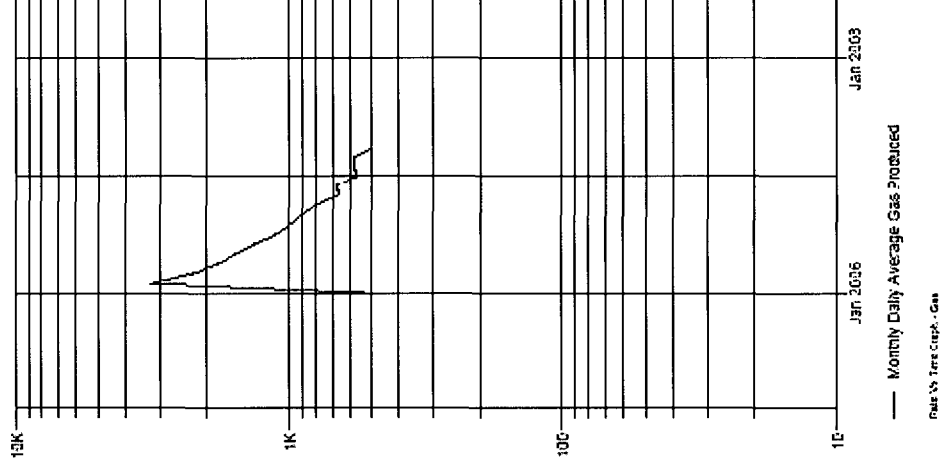
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New Mexico Wolfcamp



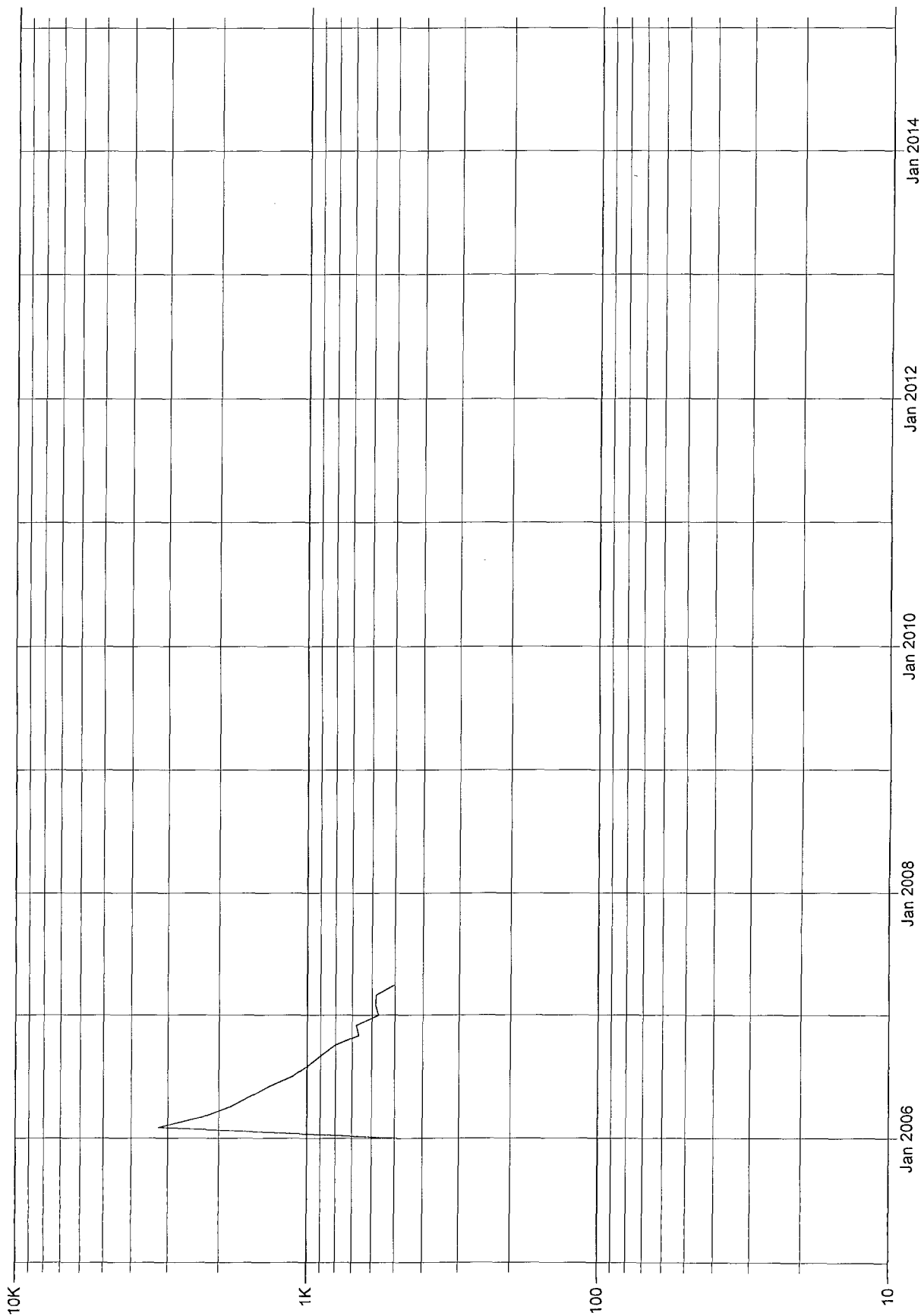
Jordan #2 Production

Field: Collins Ranch (Wolfcamp Gas)
Operator: EOG Resources
Lease Name: Jordan 22 Fee Com 002H
Location: 17S24E22O



Field: COLLINS RANCH (WOLFCAMP (GAS)) 75010
Operator: EOG RESOURCES INC 007377
Lease Name: JORDAN 22 FEE COM 002H
LPD ID: 300153442675010
Location: 17S24E22O

County, State: EDDY, NM
Status and Date: ACT 2006/01/28
District: 2, Phase: GAS
Gas Cum: 545315, Oil Cum: 845



--- Monthly Daily Average Gas Produced

Rate Vs Time Graph - Gas

CD Date: 200704

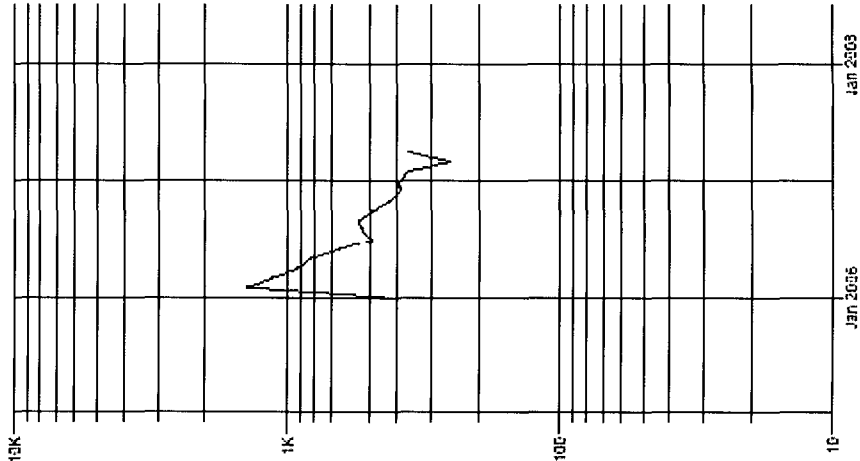
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New Mexico Wolfcamp



Nile #2 Production

Field: Collins Ranch (Wolfcamp Gas)
Operator: EOG Resources
Lease Name: Nile 22 State Com 002H
Location: 17S24E22M

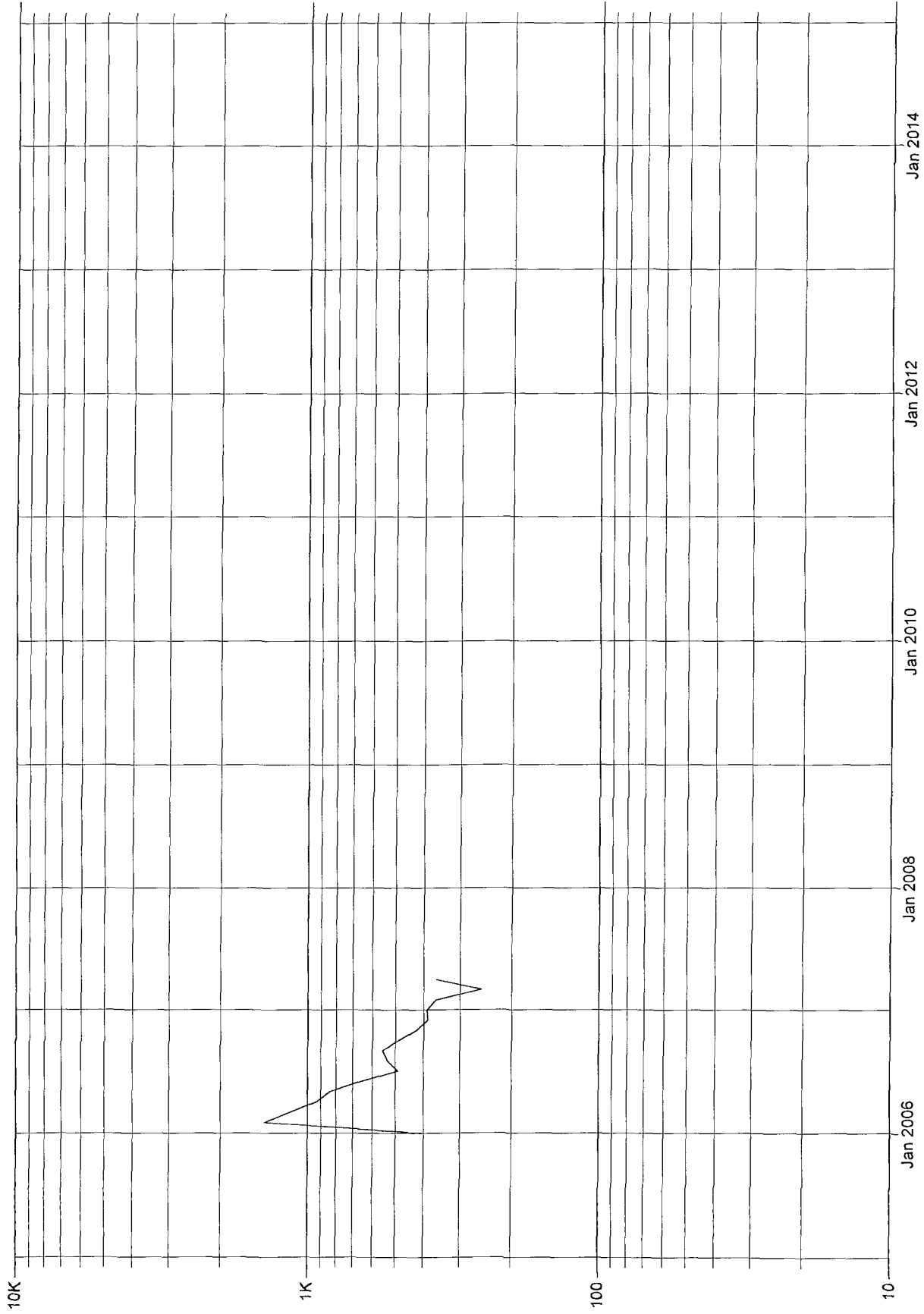


— Monthly Daily Average Gas Produced

Prod'n Test Graph - Gas

Field: COLLINS RANCH (WOLFCAMP (GAS)) 75010
Operator: EOG RESOURCES INC 007377
Lease Name: NILE 22 STATE COM 002H
LPD ID: 300153442275010
Location: 17S24E22M

County, State: EDDY, NM
Status and Date: ACT 2006/01/25
District: 2, Phase: GAS
Gas Cum: 290134, Oil Cum: 12



— Monthly Daily Average Gas Produced

Rate Vs Time Graph - Gas

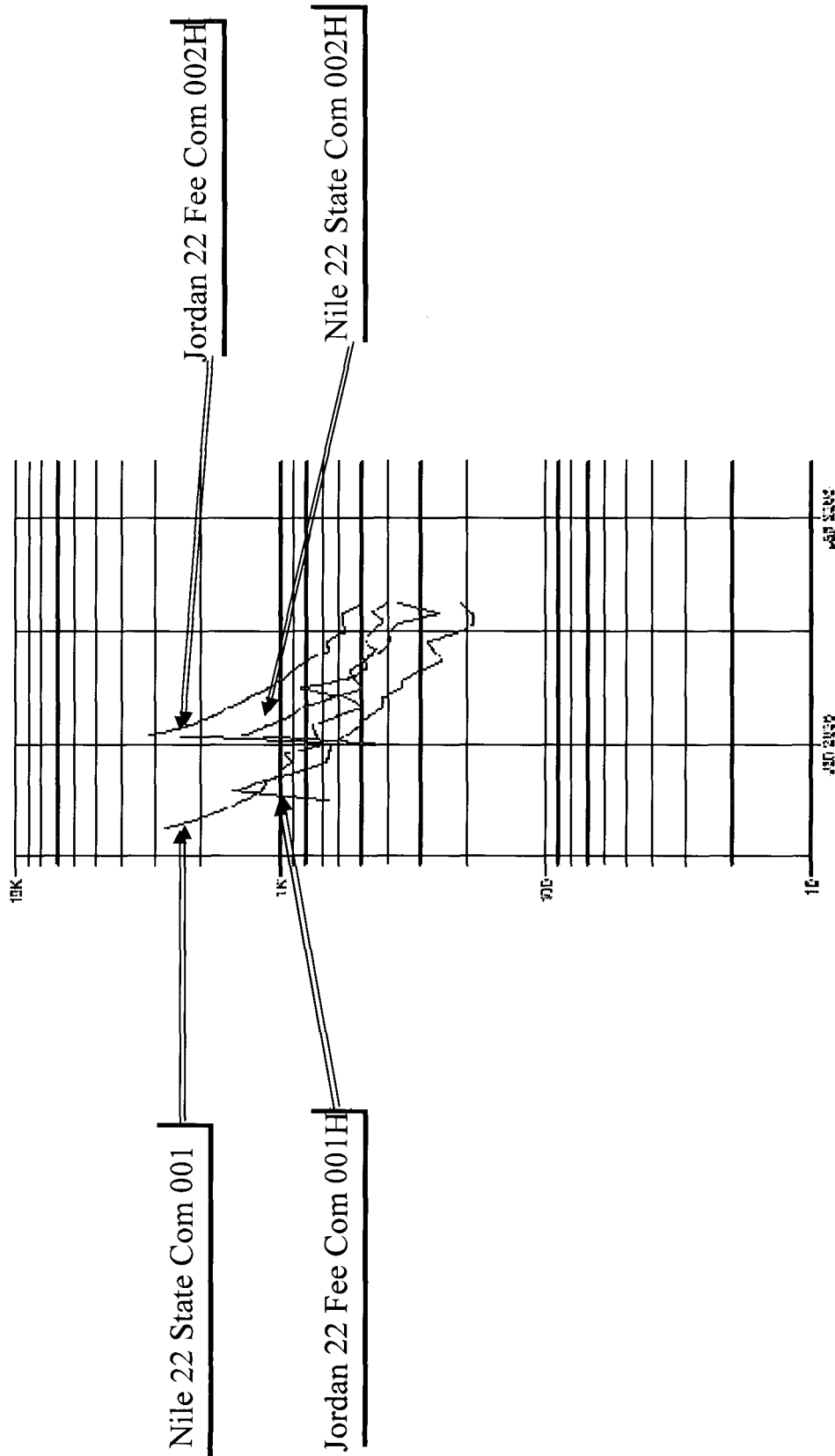
CD Date: 200704

Copyright 09:51:48 09/11/07, Lasser, Inc.

New Mexico Wolfcamp



4-well production per section



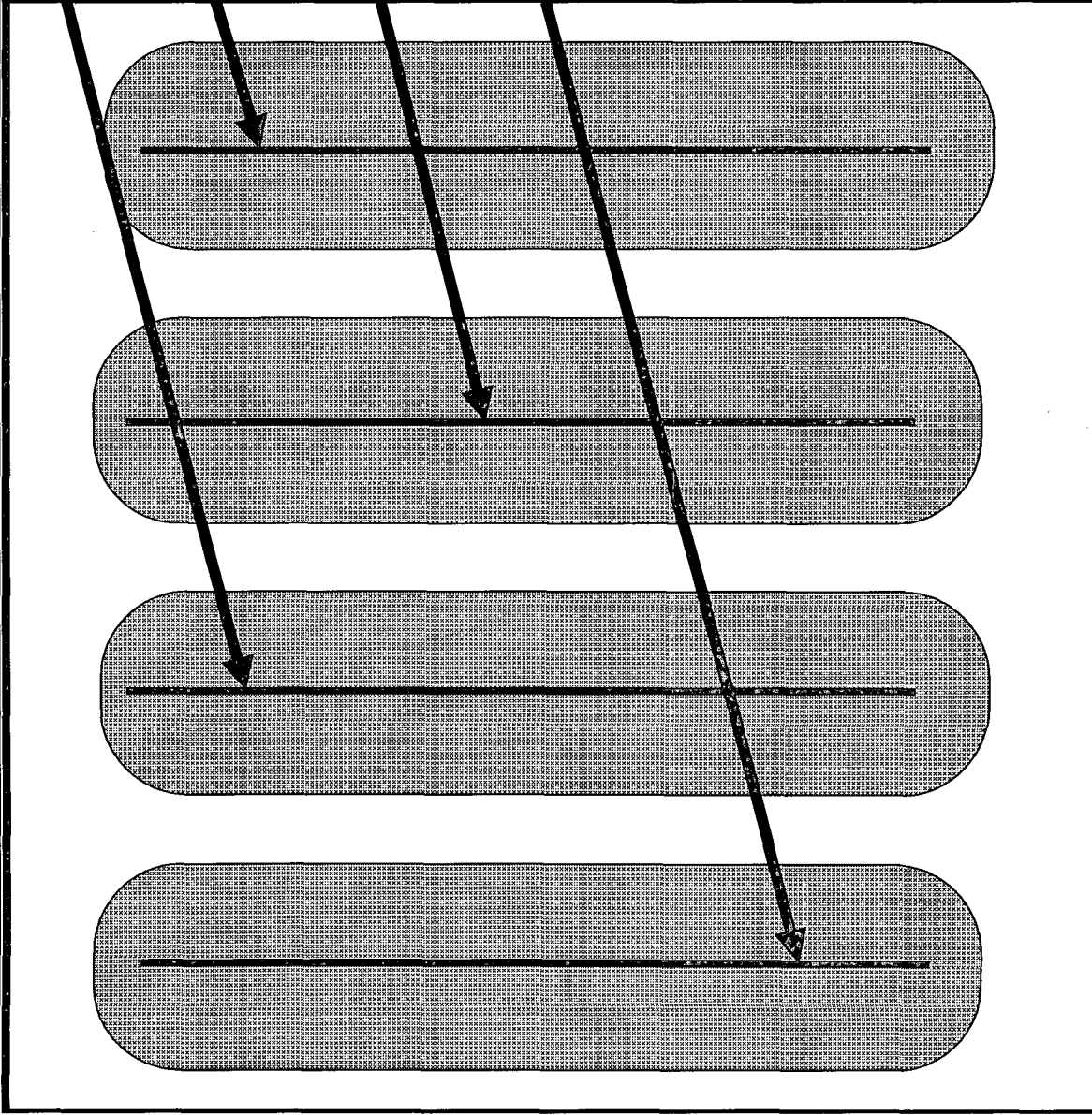
- Monthly Daily Average Gas Produced

New Mexico Wolfcamp



Drainage pattern for Section 22, T17S, R24E

- Nile #1 Completed Q1 '05
 - EUR = 1.83 BCF
- Jordan #1 Completed Q2 '05
 - EUR = 0.55 BCF
- Jordan #2 Completed Q1 '06
 - EUR = 1.76 BCF
- Nile #2 Completed Q1 '06
 - EUR = 1.13 BCF
- Combined EUR = 5.27 BCF
- Volumetric GLIP for entire section = 8.8 BCF
- Recovery factor = 59.9%



New Mexico Wolfcamp



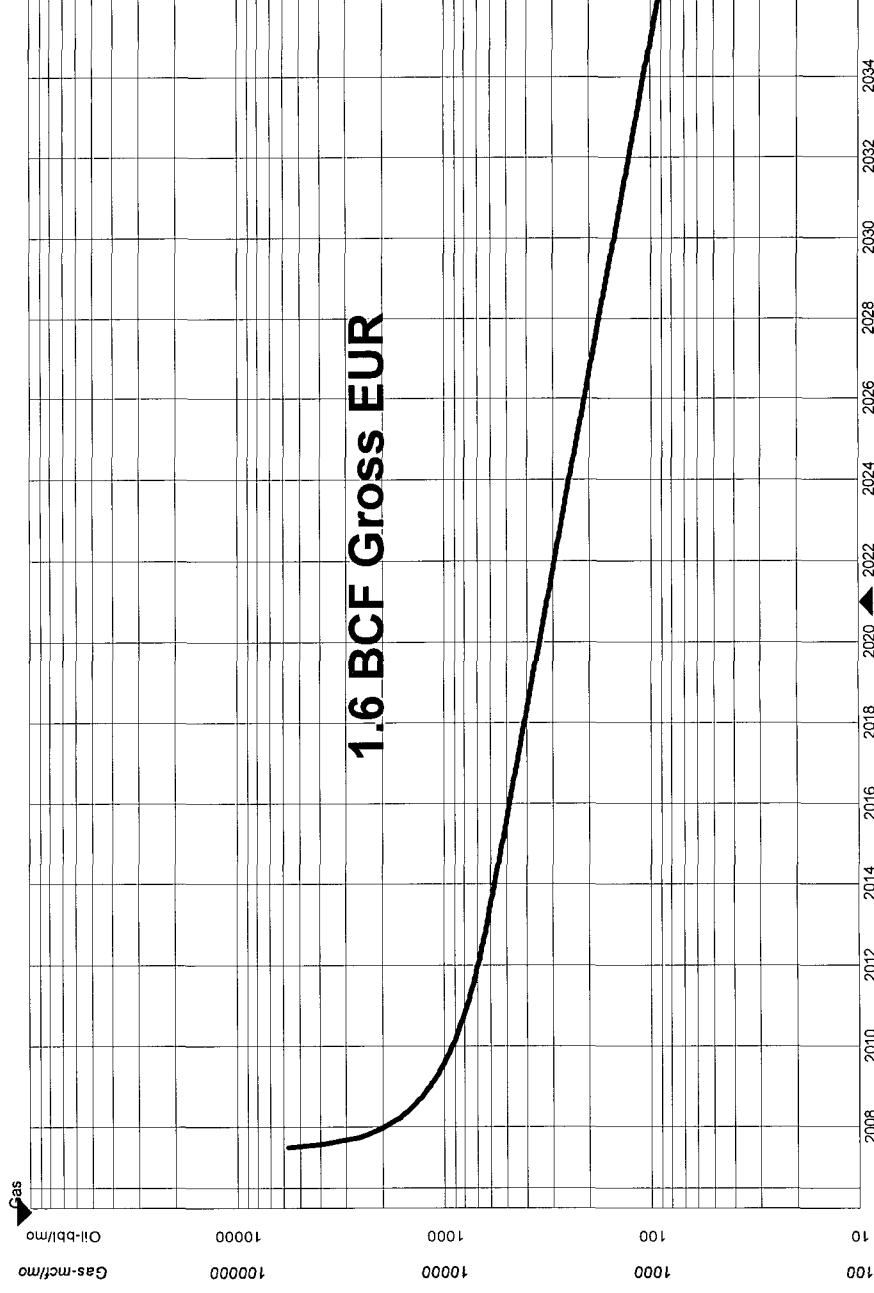
Single Well Drilling Economics @ 5 Year Strip

GROSS INPUT

Q_i = 1900 MCFPD
De = 75%
Hyp Exp = 2.00
CAPEX = 2.2 \$MM
LOE = 1500 \$/month
WI = 70 %
NRI = 54 %

NET OUTPUT

Gp = 863 MMCF
PO = 2.19 Undisc, years
ROR = 42.48 %
N/I = 3.27 Undiscounted
N/I = 1.88 10% discount
PV0 = 3489 \$M
PV10 = 1361 \$M



Type Curve Basis: 47 well average zero-time monthly production, public data

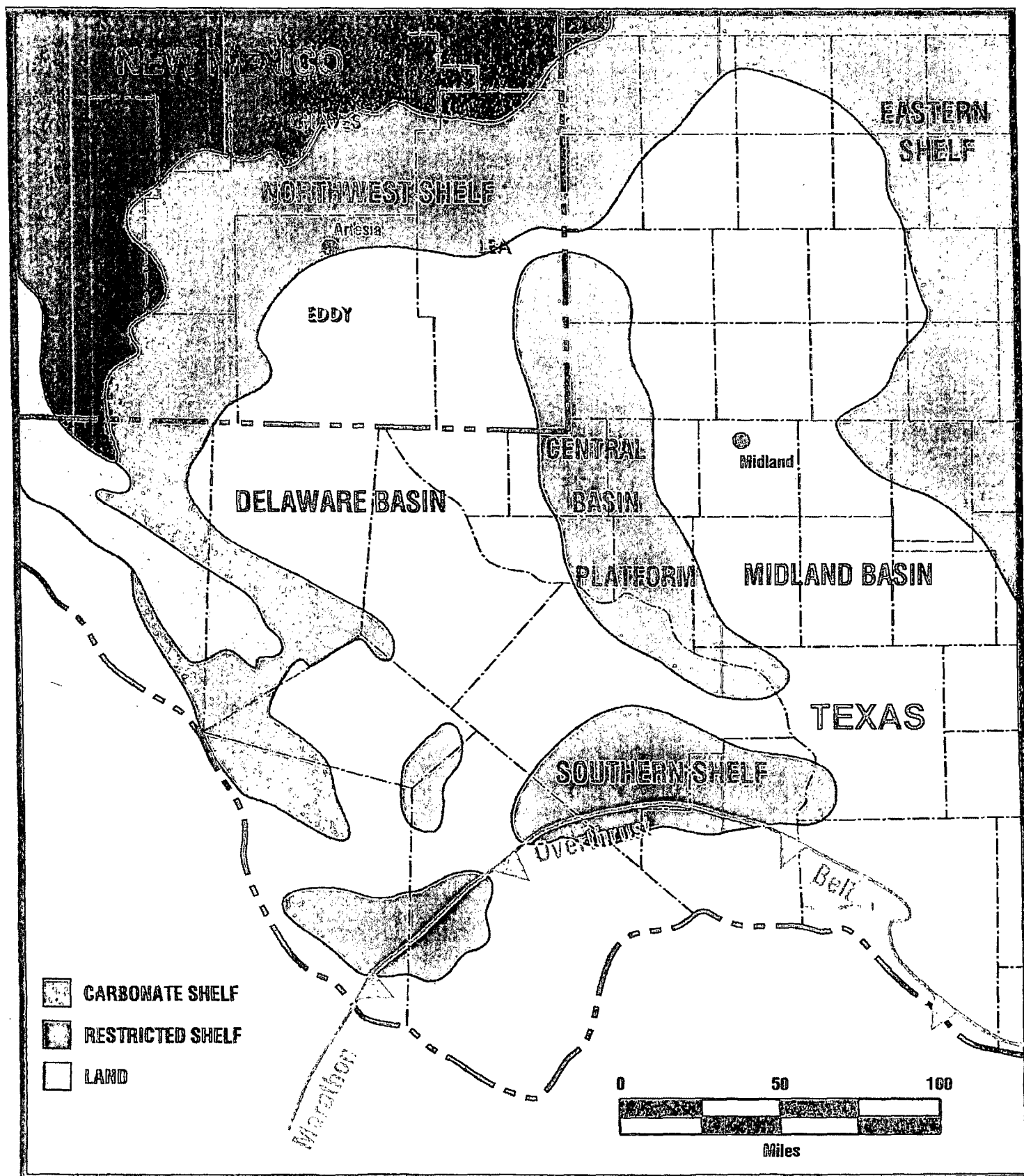
320-Acre Production Unit GIIP

- From open-hole log on Swale #1
 - BHT = 110 F = 570 R
 - Top Wolfcamp @ 4842 (-1328)
 - Base Wolfcamp @ 4903 (-1389)
 - $H_{\text{GROSS}} = 61'$ $H_{\text{NET}} = 33'$
 - Cross-plot porosity weighted avg = 5%
- From gas analysis on Forego #1
 - $Z = 0.9974$
- From 4-point back pressure test on Forego #1 and SITP at toe perforations
 - SITP = 1300 psig
 - TVD = 4900'
- Assumption
 - $S_{\text{WC}} = 0.12$ in dry-gas reservoir
- 320 Acres = 13,939,200 SF
- $V = 13,939,200 \times 33 = 459,993,600 \text{ CF}$
- $\text{HCVP} = V \times \text{Phi} (1 - S_{\text{WC}})$
 - $459,993,600 \times .05 (1 - .12) = 20,239,718 \text{ CF}$
- $P_i = 1300 + 4900 \times .052 \times 8.6 = 3491$
- $\text{GIIP} = \text{HCPV} (35.37 P_i / Z T)$
 - $= 20,239,718 \times 35.37 \times 3491 / (0.9974 \times 570) = 4.4$
- 4.4 BCF per 320 Acres
- 2 wells at 1.6 BCF / well = 3.2 BCF
- Recovery for 2 well = 73%
- Recovery for 1 wells = 36%
- 1.5 TCF recoverable gas lost in entire play by drilling only 1 well per producing unit

Summary

- The Wolfcamp formation of SE New Mexico is productive and very similar over the entire 300,000 acre fairway and can be economically produced using horizontal drilling and multi-stage, “slick-water” fracture completion methods.
- Data indicates that 160-acre spacing is needed to achieve reasonable recovery.
 - Transient pressure and core analysis confirm low permeability and porosity. Recommend 1100’ fracture half length for 160-acre spacing.
 - Micro-seismic data shows fracture half lengths less than the 1100’ recommended.
 - Production data from Nile and Jordan wells support recovery factor for 4 wells in section.
 - Volumetric calculations require 160-acre spacing to achieve economic recovery.
- Using two horizontal drain holes per 320-Acre producing unit should be utilized to properly take advantage of this natural resource.
- Revenues from approximately 1.5 TCF gas could be lost to mineral owners, operators and the public by drilling only 1 well per producing unit over the entire area of the play.

WOLFCAMPIAN (PERMIAN) PALEOGEOGRAPHY OF THE PERMIAN BASIN



Northwest Shelf Stratigraphic Chart

Age		Unit Name	HC's	Approx. Depth
Permian 289-248 MYA	Ochoan	Rustler		Top Reservoir ~5000-5500'
		Salado		
	Guadalupian	Tansill		
		Eumont Yates	☉ ☀	
		Seven Rivers	☉ ☀	
		Queen	☉ ☀	
		Grayburg	☉ ☀	
		San Andres	☉	
		Glorieta	☉	
	Leonardian	Yeso	☉ ☀	
		Abo	☉ ☀	
	Wolfcampian	Wolfcamp	☉ ☀	
Pennsylvanian 289-320 MYA		Cisco		
		Canyon		
		Strawn	☉ ☀	
		Atoka	☀	
		Morrow	☉ ☀	
Mississippian 320-363 MYA		Miss. Lime	☉ ☀	
		Woodford		
Devonian 409-363 MYA		Devonian	☀	
Silurian 439-409 MYA		U. Silurian		
		Fusselman	☉	
Ordovician 510-439 MYA		Montoya	☉	
		Simpson McKee	☉ ☀	
		Waddell		
		Connell		
		Joins		
		Ellenburger	☀	
Cambrian 510-570 MYA				
Pre-Cambrian >570 MYA				

LEGEND

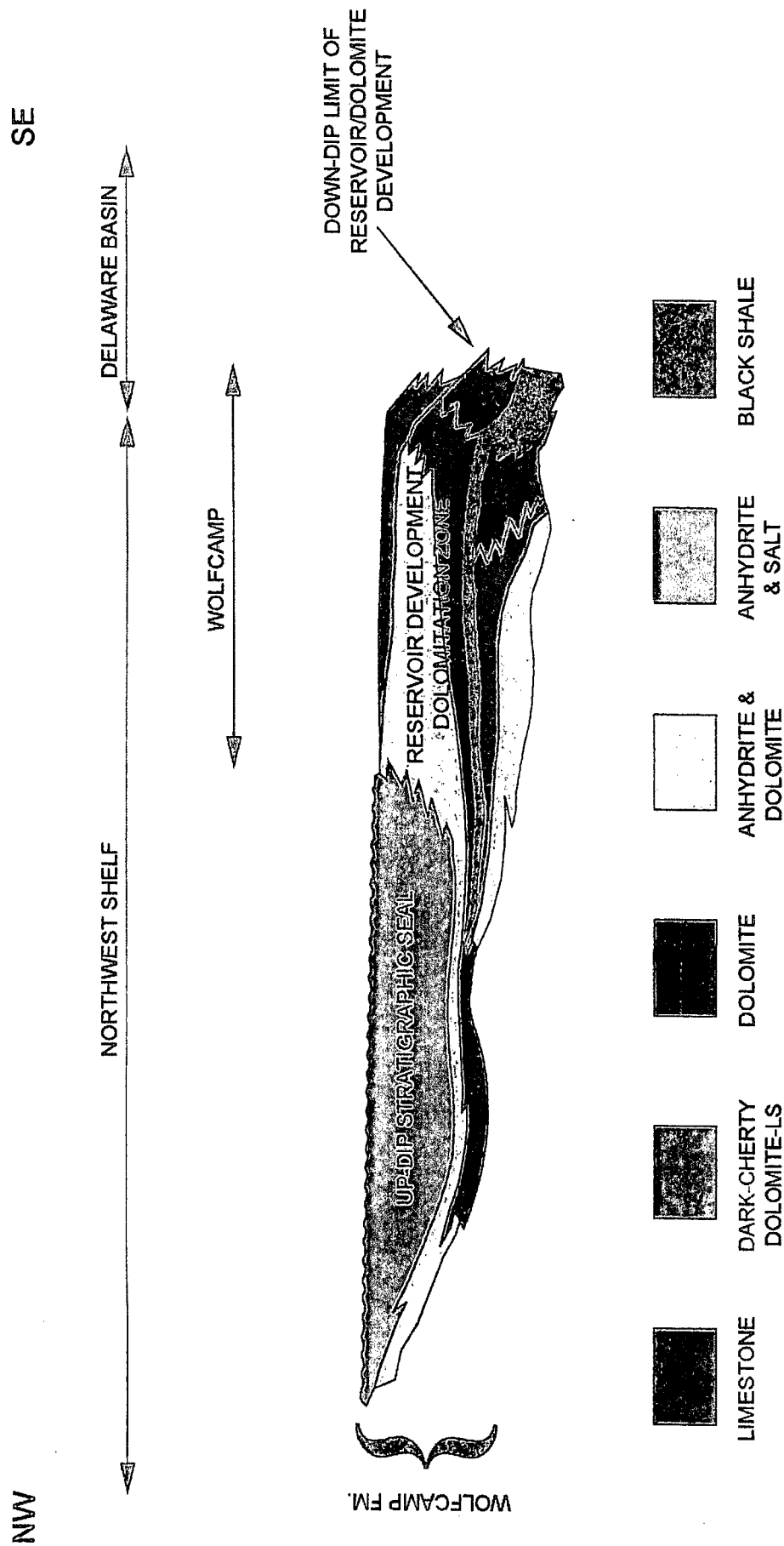


Current Active Plays

☉ Oil Producing Zones

☀ Gas Producing Zones

CROSS SECTION & TRAP DIAGRAM



Northwest-southeast cross section across the Northwest Shelf/Delaware Basin transition. Rock types are differentiated illustrating the trap developed within the Wolfcamp reservoir. The pervasive evaporite deposits in the northwest act as a stratigraphic seal for the dolomitized reservoir developed down-dip. Further down structure the reservoir is limited by the lack of dolomite within tighter limestone and shale deposits.

COMPANY: Parallel Petroleum Corporation			
WELL:	Music Box Federal #1		
FIELD:	Wildcat		
COUNTY:	Eddy	STATE:	New Mexico
Platform Express Schlumberger Three Detector Litho Density Compensated Neutron / HNG			
COUNTRY: Eddy Field: Wildcat Location: 300' FSL & 1780' FWL Well: Music Box Federal #1 Company: Parallel Petroleum Corporation		LOCATION 300' FSL & 1780' FWL Permanent Datum: _____ Log Measured From: _____ Drilling Measured From: _____	
API Serial No. 30-015-34726 SECTION 12 TOWNSHIP 19S RANGE 21E		Ground Level _____ Kelly Bushing _____ Kelly Bushing _____ Elev.: 4187 ft 12.0 ft above Perm. Datum K.B. 4199 ft G.L. 4187 ft D.F. 4198 ft	
Logging Date 5-Jul-2006 Run Number One Depth Driller 4600 ft Schlumberger Depth 4599 ft Bottom Log Interval 4596 ft Top Log Interval 200 ft Casing Driller Size @ Depth 9.625 in @ 1403 ft Casing Schlumberger 1400 ft Bit Size 8.750 in Type Fluid in Hole Brine / Starch / Sait Gel Density 9.6 lbm/gal 40 s Viscosity _____ Fluid Loss PH 9 Source Of Sample Circulation Tank RM @ Measured Temperature 0.019 ohm.m @ 82 degF RMF @ Measured Temperature @ @ RMC @ Measured Temperature @ @ Source RMF @ Measured Temperature @ @ RM @ MPT RMF @ MPT 0.016 @ 100 @ 100 Maximum Recorded Temperatures 100 degF @ 100 Circulation Stopped Time 4:15 Logger On Bottom 5-Jul-2006 13:33 Unit Number 3049 Recorded By D. Martinez & J. Lighner Witnessed By Mike Moylett			

