

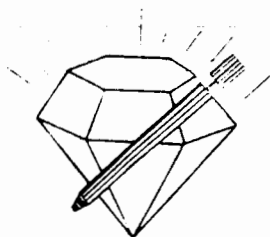
DIAMOND TESTING

P.O. Box 157
HOISINGTON, KANSAS 67544
(620) 653-7550 • (800) 542-7313
STC 21076.D18

Page 1 of 2 Pages

Company Knighton Oil Company, Inc. Lease & Well No. Healy No. 1
Elevation 2086 KB Formation Lansing/Kansas City "B" Effective Pay -- Ft. Ticket No. 1802
Date 12-1-03 Sec. 1 Twp. 27S Range 16W County Kiowa State Kansas
Test Approved By Steve Davis Diamond Representative Roger D. Friedly
Formation Test No. 1 Interval Tested from 4,022 ft. to 4,039 ft. Total Depth 4,039 ft.
Packer Depth 4,017 ft. Size 6 3/4 in. Packer Depth -- ft. Size -- in.
Packer Depth 4,022 ft. Size 6 3/4 in. Packer Depth -- ft. Size -- in.
Depth of Selective Zone Set ft.
Top Recorder Depth (Inside) 4,010 ft. Recorder Number Elec. Cap. 5,000 psi
Bottom Recorder Depth (Outside) 4,036 ft. Recorder Number 13386 Cap. 4,000 psi
Below Straddle Recorder Depth ft. Recorder Number psi
Drilling Contractor Duke Drilling Company, Inc. - Rig 1 Drill Collar Length -- ft. I.D. -- in.
Mud Type Chemical Viscosity 45 Weight Pipe Length -- ft. I.D. -- in.
Weight 9.1 Water Loss 11.2 cc. Drill Pipe Length 3,997 ft. I.D. 3 1/2 in.
Chlorides 6,000 P.P.M. Test Tool Length 25 ft. Tool Size 3 1/2 - IF in.
Jars: Make Bowen Serial Number Not Run Anchor Length 17 ft. Size 4 1/2 - FH in.
Did Well Flow? No Reversed Out No Surface Choke Size 1 in. Bottom Choke Size 5/8 in.
Main Hole Size 7 7/8 in. Tool Joint Size 4 1/2 - XH in.
Blow: 1st Open: Strong blow. Off bottom of bucket immediately. Fair, 1 1/2 in., blow back during shut-in.
2nd Open: Fair, 2 in., blow increasing. Off bottom of bucket in 8 mins. Weak, 3/4 in., blow back during shut-in.
Recovered 1,850 ft. of gas in pipe
Recovered 72 ft. of muddy water with a trace of oil = 1.022400 bbls. (Grind out: 35%-mud; 65%-water)
Recovered 372 ft. of muddy water = 5.282400 bbls. (Grind out: 15%-mud; 85%-water)
Recovered 434 ft. of gassy salt water = 6.162800 bbls. (Grind out: 10%-gas; 90%-water)
Recovered 878 ft. of TOTAL FLUID = 12.467600 bbls.
Remarks Tool Sample Grind Out: 100%-salt water with a trace of oil

Time Set Packer(s) <u>7:34</u>	<u>A.M.</u> <u>XXX</u>	Time Started Off Bottom <u>11:34</u>	<u>A.M.</u> <u>XXX</u>	Maximum Temperature <u>126°</u>
Initial Hydrostatic Pressure	(A) <u>1870</u>	P.S.I.		
Initial Flow Period	Minutes <u>30</u>	(B) <u>35</u>	P.S.I. to (C) <u>192</u>	P.S.I.
Initial Closed In Period	Minutes <u>60</u>	(D) <u>1248</u>	P.S.I.	
Final Flow Period	Minutes <u>60</u>	(E) <u>195</u>	P.S.I. to (F) <u>445</u>	P.S.I.
Final Closed In Period	Minutes <u>90</u>	(G) <u>1246</u>	P.S.I.	
Final Hydrostatic Pressure	(H) <u>1865</u>	P.S.I.		



DIAMOND TESTING
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Page 2 of 2 Pages

FLUID SAMPLE DATA

Company Knighton Oil Company, Inc.

Lease & Well No. Healy No. 1

Date 12-1-03 Sec. 1 Twp. 27 S Range 16 W

Formation Test No. 1 Interval Tested From 4,022 ft. to 4,039 ft. Total Depth 4,039 ft.

Formation Lansing/Kansas City "B"

	MUD PIT	RECOVERY	
Viscosity	<u>45</u> CP	<u>38</u> CP	
Weight	<u>9.1</u>	<u>8.6</u>	
Water Loss	<u>11.2</u> CC	<u>50+</u> CC	
PH Factor	<u>10.5</u>	<u>7.0</u>	Water <u>6.0</u>

	RESISTIVITY	CHLORIDE CONTENT
Recovery Water	<u>.07</u> @ <u>68</u> °F.	<u>110,000</u> ppm
Recovery Mud	<u>.10</u> @ <u>74</u> °F.	<u>92,000</u> ppm
Recovery Mud Filtrate	<u>.11</u> @ <u>70</u> °F.	<u>90,000</u> ppm
Mud Pit Sample	<u>.74</u> @ <u>66</u> °F.	<u>9,500</u> ppm
Mud Pit Sample Filtrate	<u>.74</u> @ <u>68</u> °F.	<u>9,000</u> ppm

Sample Taken By ROGER D. FRIEDLY

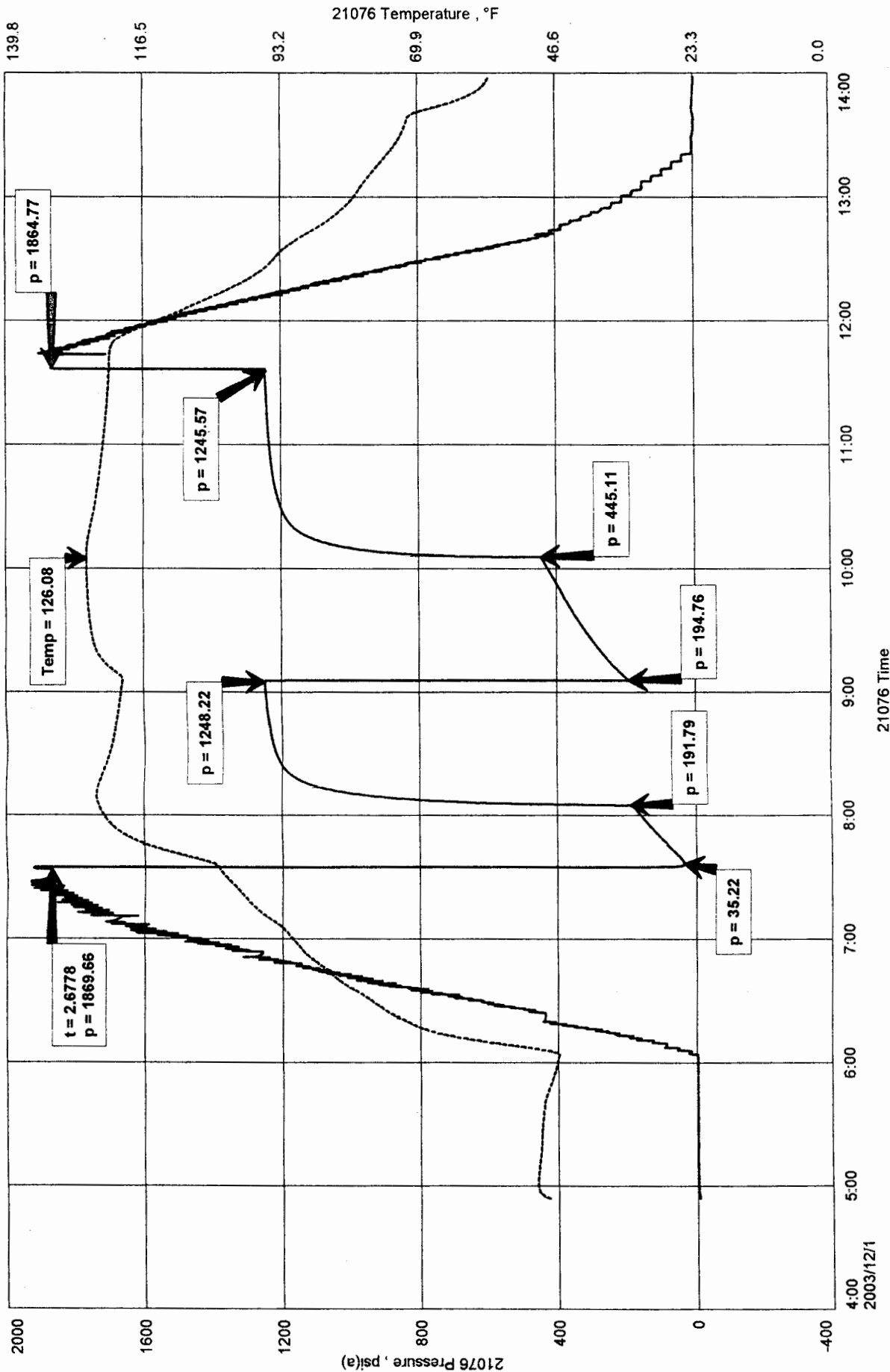
Witness By Steve Davis

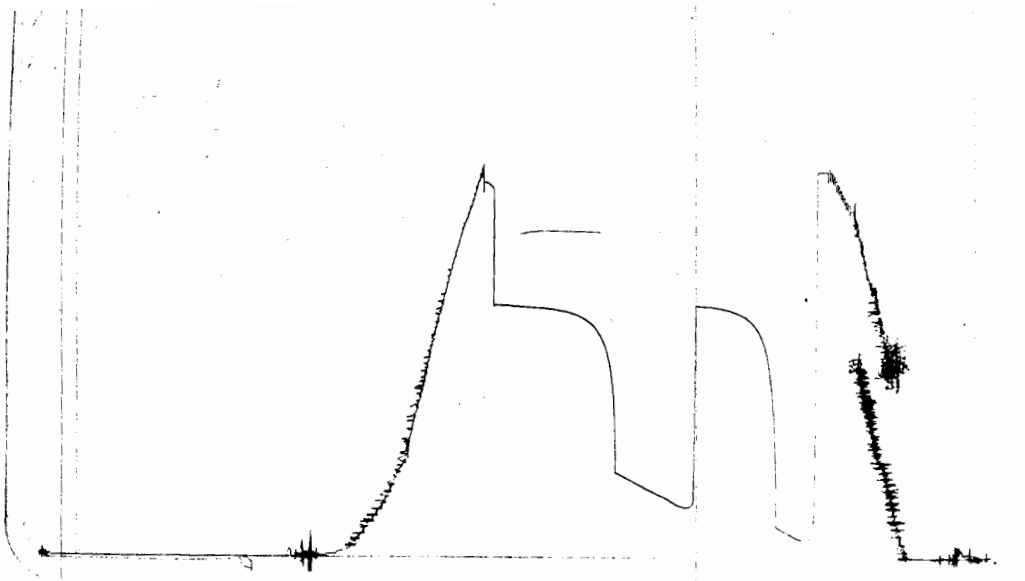
Remarks Pit filtrate triton dish chlorides were 6,000 Ppm.
Recovery filtrate triton dish chlorides were 58,500 Ppm.
Recovery water dish chlorides were 109,000 Ppm.

KNIGHTON OIL COMPANY, INC.
 DST #1 LKC "B" 4022'-4039-
 Start Test Date: 2003/12/01
 Final Test Date: 2003/12/01

HEALY #1
 Formation: DST #1 LKC "B" 4022'-4039'

HEALY #1

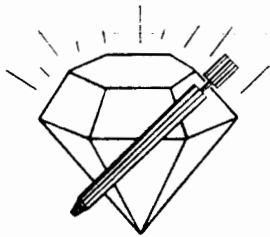




This is an actual photograph of recorder chart.

POINT	PRESSURE	
	Field Reading	Elec. Office Reading
(A) Initial Hydrostatic Mud	1870	1870
(B) First Initial Flow Pressure	35	35
(C) First Final Flow Pressure	192	192
(D) Initial Closed-in Pressure	1248	1248
(E) Second Initial Flow Pressure	195	195
(F) Second Final Flow Pressure	445	445
(G) Final Closed-in Pressure	1246	1246
(H) Final Hydrostatic Mud	1865	1865

PSI
PSI
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DIAMOND TESTING

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STC 21076.D19

Page 1 of 2 Pages

Company Knighton Oil Company, Inc. Lease & Well No. Healy No. 1

Elevation 2086 KB Formation Drum Effective Pay -- Ft. Ticket No. 1803

Date 12-2-03 Sec. 1 Twp. 27S Range 16W County Kiowa State Kansas

Test Approved By Steve Davis Diamond Representative Roger D. Friedly

Formation Test No. 2 Interval Tested from 4,150 ft. to 4,165 ft. Total Depth 4,165 ft.

Packer Depth 4,145 ft. Size 6 3/4 in. Packer Depth -- ft. Size -- in.

Packer Depth 4,150 ft. Size 6 3/4 in. Packer Depth -- ft. Size -- in.

Depth of Selective Zone Set -- ft.

Top Recorder Depth (Inside) 4,158 ft. Recorder Number 13386 Cap. 4,000 psi

Bottom Recorder Depth (Outside) 4,162 ft. Recorder Number 13387 Cap. 3,900 psi

Below Straddle Recorder Depth -- ft. Recorder Number -- Cap. -- psi

Drilling Contractor Duke Drilling Company, Inc. - Rig 1 Drill Collar Length -- ft. I.D. -- in.

Mud Type Chemical Viscosity 47 Weight Pipe Length -- ft. I.D. -- in.

Weight 9.15 Water Loss 12.0 cc. Drill Pipe Length 4,125 ft. I.D. 3 1/2 in.

Chlorides 10,500 P.P.M. Test Tool Length 25 ft. Tool Size 3 1/2 - IF in.

Jars: Make Bowen Serial Number Not Run Anchor Length 15 ft. Size 4 1/2 - FH in.

Did Well Flow? No Reversed Out No Surface Choke Size 1 in. Bottom Choke Size 5/8 in.

Main Hole Size 7 7/8 in. Tool Joint Size 4 1/2 - XH in.

Blow: 1st Open: Weak, 1/2 in., blow increasing. Off bottom of bucket in 27 mins. No blow back during shut-in.

2nd Open: Weak, 1/2 in., blow increasing. Off bottom of bucket in 45 mins. No blow back during shut-in.

Recovered 247 ft. of gas in pipe

Recovered 21 ft. of gas & oil cut muddy water = .298200 bbls. (Grind out: 8%-gas; 20%-water; 28%-oil; 44%-mud)

Recovered 104 ft. of slightly oil cut muddy water = 1.476800 bbls. (Grind out: 2%-oil; 5%-mud; 93%-water)

Recovered 125 ft. of TOTAL FLUID = 1.775000 bbls.

Recovered -- ft. of --

Remarks Tool Sample Grind Out: 1%-mud; 99%-water with a scum of oil

Time Set Packer(s) 3:21 A.M. Time Started Off Bottom 7:21 A.M. Maximum Temperature 120°

Initial Hydrostatic Pressure (A) 2013 P.S.I.

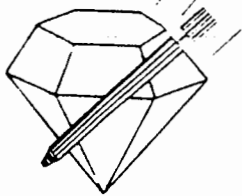
Initial Flow Period Minutes 30 (B) 62 P.S.I. to (C) 72 P.S.I.

Initial Closed In Period Minutes 60 (D) 1157 P.S.I.

Final Flow Period Minutes 60 (E) 72 P.S.I. to (F) 82 P.S.I.

Final Closed In Period Minutes 90 (G) 1041 P.S.I.

Final Hydrostatic Pressure (H) 2013 P.S.I.



DIAMOND TESTING
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Page 2 of 2 Pages

FLUID SAMPLE DATA

Company Knighton Oil Company, Inc.

Lease & Well No. Healy No. 1

Date 12-2-03 Sec. 1 Twp. 27 S Range 16 W

Formation Test No. 2 Interval Tested From 4,150 ft. to 4,165 ft. Total Depth 4,165 ft.

Formation Drum

	MUD PIT	RECOVERY	
Viscosity	<u>47</u> CP	<u>--</u> CP	
Weight	<u>9.15</u>	<u>--</u>	
Water Loss	<u>12.0</u> CC	<u>--</u> CC	
PH Factor	<u>9.5</u>	<u>--</u>	Water <u>6.5</u>

	RESISTIVITY	CHLORIDE CONTENT
Recovery Water	<u>.10</u> @ <u>46</u> °F.	<u>110,000</u> ppm
Recovery Mud	<u>--</u> @ <u>--</u> °F.	<u>--</u> ppm
Recovery Mud Filtrate	<u>--</u> @ <u>--</u> °F.	<u>--</u> ppm
Mud Pit Sample	<u>.54</u> @ <u>70</u> °F.	<u>12,500</u> ppm
Mud Pit Sample Filtrate	<u>.60</u> @ <u>68</u> °F.	<u>11,000</u> ppm

Sample Taken By ROGER D. FRIEDLY

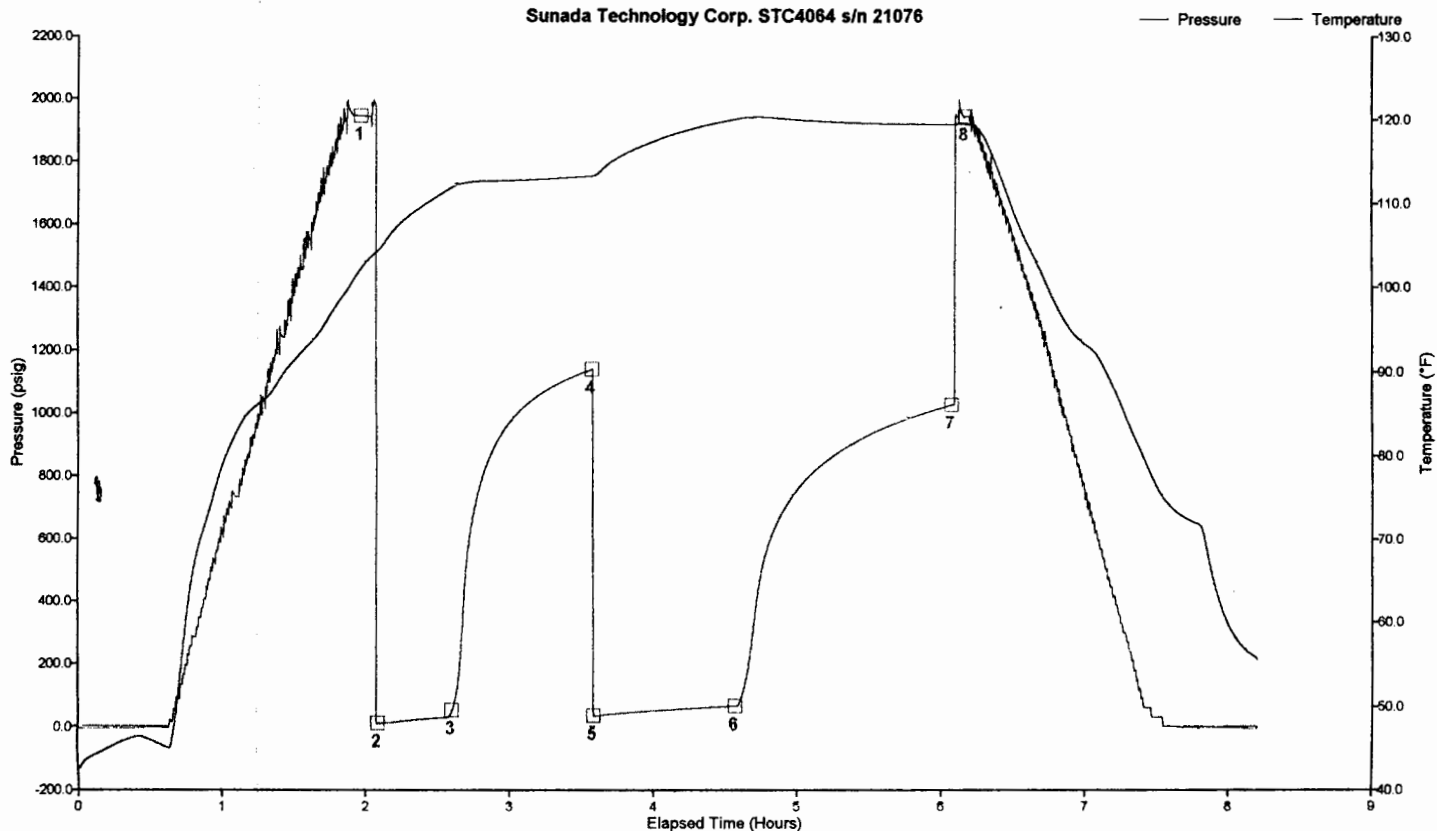
Witness By Steve Davis

Remarks Pit filtrate triton dish chlorides were 10,500 Ppm.
Recovery water dish chlorides were 100,000 Ppm.

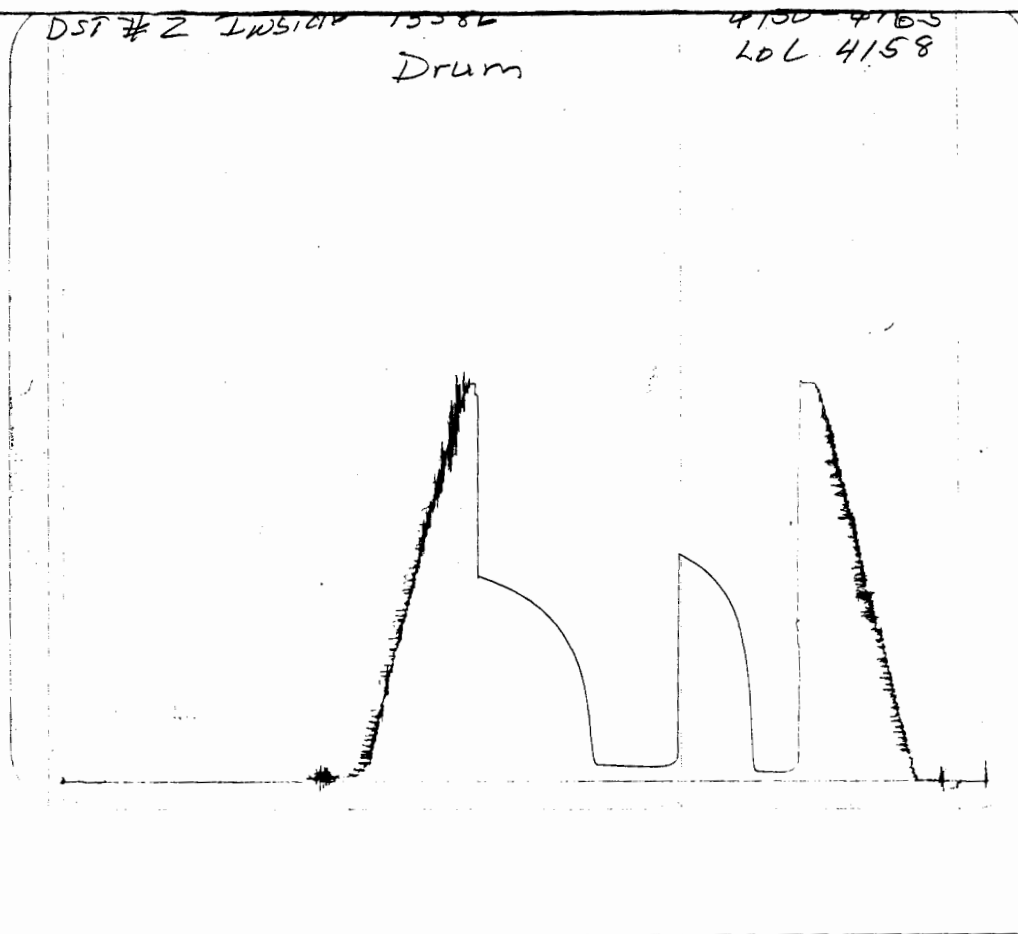
Well LSD: DST #2 Drum 4150'-4165'
 Well Name: HEALY #1
 Company: KNIGHTON OIL CO., INC.
 Dec 2, 2003 at 01:16:00
 Notes: RECOVERED 247' GIP, 21' G&OCMW, 104'SLT OCMW.

Battery on:

Sunada Technology Corp. STC4064 s/n 21076

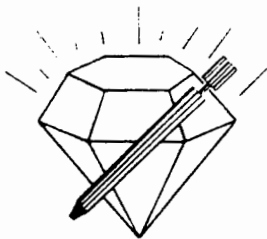


Tag	Pressure	Temperature	Comment
1	1943.43 psig	102.30 °F	2003-12-02 03:14:40
2	12.77 psig	104.36 °F	2003-12-02 03:21:40
3	52.72 psig	111.90 °F	2003-12-02 03:52:40
4	1139.77 psig	113.21 °F	2003-12-02 04:50:50
5	35.97 psig	113.25 °F	2003-12-02 04:51:40
6	67.71 psig	120.03 °F	2003-12-02 05:50:40
7	1027.60 psig	119.42 °F	2003-12-02 07:20:40
8	1942.82 psig	119.46 °F	2003-12-02 07:26:10



This is an actual photograph of recorder chart.

POINT	PRESSURE		Elec.
	Field Reading	Office Reading	
(A) Initial Hydrostatic Mud	2013	1943	PSI
(B) First Initial Flow Pressure.....	62	13	PSI
(C) First Final Flow Pressure	72	53	PSI
(D) Initial Closed-in Pressure	1157	1140	PSI
(E) Second Initial Flow Pressure	72	36	PSI
(F) Second Final Flow Pressure.....	82	68	PSI
(G) Final Closed-in Pressure.....	1041	1028	PSI
(H) Final Hydrostatic Mud	2013	1943	PSI



DIAMOND TESTING

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Page 1 of 16 Pages

Company Knighton Oil Company, Inc. Lease & Well No. Healy No. 1

Elevation 2086 KB Formation Mississippi Effective Pay 10 Ft. Ticket No. 1804

Date 12-3-03 Sec. 1 Twp. 27S Range 16W County Kiowa State Kansas

Test Approved By Steve Davis Diamond Representative Roger D. Friedly

Formation Test No. 3 Interval Tested from 4,482 ft. to 4,536 ft. Total Depth 4,536 ft.

Packer Depth 4,477 ft. Size 6 3/4 in. Packer Depth -- ft. Size -- in.

Packer Depth 4,482 ft. Size 6 3/4 in. Packer Depth -- ft. Size -- in.

Depth of Selective Zone Set -- ft.

Top Recorder Depth (Inside) 4,529 ft. Recorder Number 13386 Cap. 4,000 psi

Bottom Recorder Depth (Outside) 4,533 ft. Recorder Number 13387 Cap. 3,900 psi

Below Straddle Recorder Depth -- ft. Recorder Number -- Cap. -- psi

Drilling Contractor Duke Drilling Company, Inc. - Rig 1 Drill Collar Length -- ft. I.D. -- in.

Mud Type Chemical Viscosity 61 Weight Pipe Length -- ft. I.D. -- in.

Weight 9.35 Water Loss 8.8 cc. Drill Pipe Length 4,457 ft. I.D. 3 1/2 in.

Chlorides 12,000 P.P.M. Test Tool Length 25 ft. Tool Size 3 1/2 - IF in.

Jars: Make Bowen Serial Number Not Run Anchor Length 54 ft. Size 4 1/2 - FH in.

Did Well Flow? No Reversed Out No Surface Choke Size 1 in. Bottom Choke Size 5/8 in.

Main Hole Size 7 7/8 in. Tool Joint Size 4 1/2 - XH in.

Blow: 1st Open: Strong blow. Off bottom of bucket in 30 secs. Gas to surface in 4 mins. No blow back during shut-in.
(SEE GAS VOLUME REPORT)

2nd Open: Strong blow. Off bottom of bucket immediately. No blow back during shut-in.

Recovered 107 ft. of drilling mud = 1.519400 bbls.

Recovered 62 ft. of slightly oil specked drilling mud = .880400 bbls.

Recovered 169 ft. of TOTAL FLUID = 2.399800 bbls.

Recovered -- ft. of --

Recovered -- ft. of --

Remarks Tool Sample Grind Out: 1%- water with a few oil specks; 99%-drilling mud

Time Set Packer(s) 2:13 ~~XXX~~ P.M. Time Started Off Bottom 6:13 ~~XXX~~ P.M. Maximum Temperature 120°

Initial Hydrostatic Pressure -- (A) 2238 P.S.I.

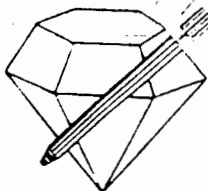
Initial Flow Period -- Minutes 30 (B) 153 P.S.I. to (C) 133 P.S.I.

Initial Closed In Period -- Minutes 60 (D) 1273 P.S.I.

Final Flow Period -- Minutes 60 (E) 163 P.S.I. to (F) 153 P.S.I.

Final Closed In Period -- Minutes 90 (G) 1176 P.S.I.

Final Hydrostatic Pressure -- (H) 2257 P.S.I.



DIAMOND TESTING
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FLUID SAMPLE DATA

Company Knighton Oil Company, Inc.

Lease & Well No. Healy No. 1

Date 12-3-03 Sec. 1 Twp. 27 S Range 16 W

Formation Test No. 3 Interval Tested From 4,482 ft. to 4,536 ft. Total Depth 4,536 ft.

Formation Mississippi

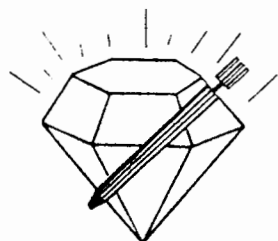
	MUD PIT	RECOVERY
Viscosity	<u>61</u> CP	<u>61</u> CP
Weight	<u>9.35</u>	<u>9.1</u>
Water Loss	<u>8.8</u> CC	<u>8.8</u> CC
PH Factor	<u>10.5</u>	<u>8.5</u>

	RESISTIVITY	CHLORIDE CONTENT
Recovery Water	<u>--</u> @ <u>--</u> °F. <u>--</u> ppm	
Recovery Mud	<u>.47</u> @ <u>68</u> °F. <u>15,000</u> ppm	
Recovery Mud Filtrate	<u>.44</u> @ <u>70</u> °F. <u>14,200</u> ppm	
Mud Pit Sample	<u>.44</u> @ <u>81</u> °F. <u>13,000</u> ppm	
Mud Pit Sample Filtrate	<u>.38</u> @ <u>74</u> °F. <u>16,000</u> ppm	

Sample Taken By ROGER D. FRIEDLY

Witness By Steve Davis

Remarks Pit filtrate triton dish chlorides were 12,000 Ppm.
Recovery filtrate triton dish chlorides were 13,500 Ppm.



DIAMOND TESTING
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GAS VOLUME REPORT

Page 3 of 16 Pages

Company Knighton Oil Company, Inc. Lease & Well No. Healy No. 1
Date 12-3-03 Sec. 1 Twp. 27 S Rge. 16 W Location NW SE SE County Kiowa State KS
Drilling Contractor Duke Drilling Company, Inc. - Rig 1 Formation Mississippi DST No. 3
Remarks: 1st Open: Gas to surface in 4 mins. Burns nicely.

INITIAL FLOW

Open Tool: 2:13 p.m.

Time O'Clock	Orifice Size	Gauge	CF/D
2:28 p.m.	1 in.	5 psi	319,000
2:33 p.m.	1 in.	5½ psi	336,000
2:38 p.m.	1 in.	5½ psi	336,000
2:43 p.m.	1 in.	5½ psi	336,000

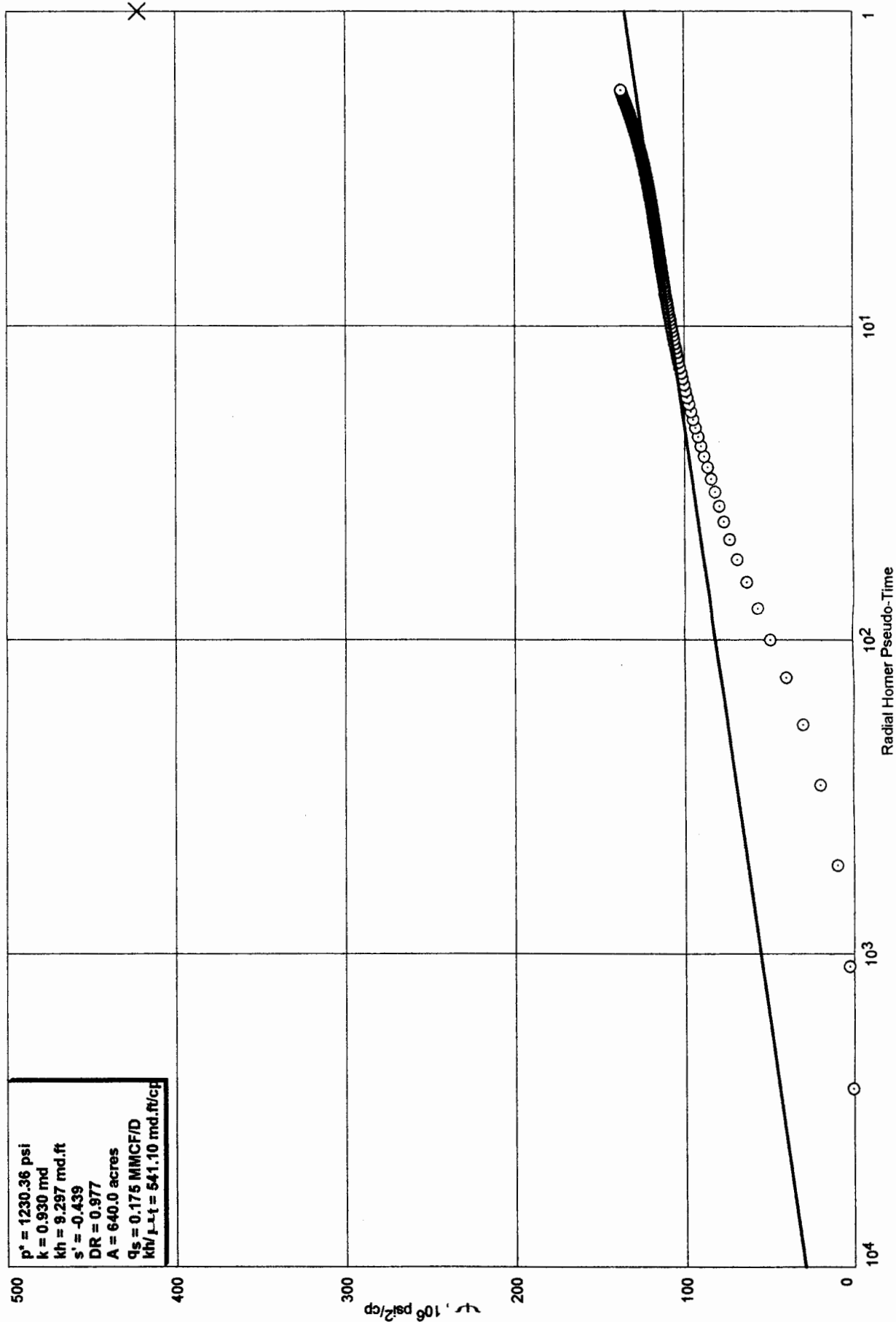
FINAL FLOW

Open Tool: 3:43 p.m.

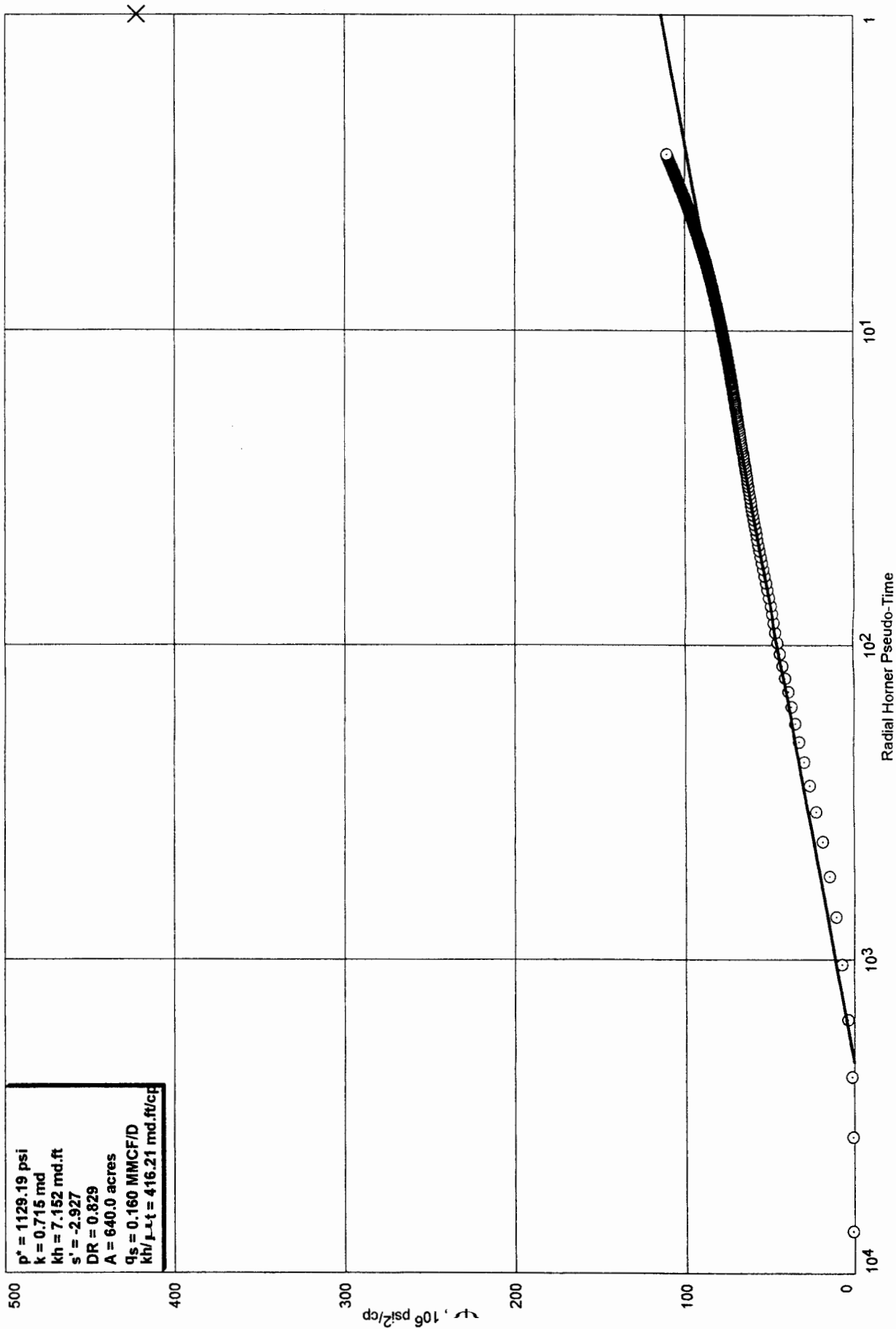
Time O'Clock	Orifice Size	Gauge	CF/D
3:48 p.m.	3/4 in.	17 psi	357,000
3:53 p.m.	3/4 in.	18 psi	370,000
3:58 p.m.	3/4 in.	17 psi	357,000
4:03 p.m.	3/4 in.	16 psi	344,000
4:08 p.m.	3/4 in.	14 psi	317,000
4:13 p.m.	3/4 in.	13 psi	303,000
4:18 p.m.	3/4 in.	12½ psi	295,500
4:23 p.m.	3/4 in.	12 psi	288,000
4:28 p.m.	3/4 in.	11½ psi	281,000
4:33 p.m.	3/4 in.	11 psi	274,000
4:38 p.m.	3/4 in.	10½ psi	266,500
4:43 p.m.	3/4 in.	10 psi	259,000

KNIGHTON OIL COMPANY, INC.
 HEALY #1
 DST #3 MISS 4482'-4536'

HORNER PLOT INITIAL SHUT IN



HORNER PLOT FINAL SHUT IN



Gas Well Test - Buildup

Radial Flow Analysis



Page 6 of 16 Pages

KNIGHTON OIL COMPANY, INC.

DST #3 MISS 4482'-4536'

HEALY #1

Analysis Results

Total Sandface Rate ($q_t B_t$)	266.027 bbl/d	Apparent Skin (s')	-2.927
Semilog Slope (m)	34.277	Skin - Damage	-2.927
Gas Permeability (k_g)	0.715 md	Skin - Inclination	0.000
Oil Permeability (k_o)	md	Skin - Partial Penetration	
Water Permeability (k_w)	md	Pressure Drop Due to Skin (Δp_s)	psi
Flow Capacity (kh)	7.152 md.ft	Damage Ratio (DR)	0.829
Total Mobility (k/μ_t)	41.62 md/cp	Flow Efficiency (FE)	1.207
Total Transmissivity (kh/μ_t)	416.21 md.ft/cp		

Reservoir Parameters

Net Pay (h)	10.000 ft
Total Porosity (ϕ_t)	0.15 %
Water Saturation (S_w)	20.00 %
Oil Saturation (S_o)	0.00 %
Gas Saturation (S_g)	80.00 %
Wellbore Radius (r_w)	0.30 ft
Formation Temperature (T)	120.0 °F
Formation Compressibility (c_f)	2.778e-5 psi ⁻¹
Total Compressibility (c_t)	3.870e-4 psi ⁻¹

Pressures

Initial Pressure (p_i)	2265.22 psi
Extrapolated Pressure (p^*)	1129.19 psi
Ave. Reservoir Press	1128.23 psi
Final Flowing Pressure (p_{wfo})	99.85 psi

Production and Times

Corrected Flow Time (t_c)	1.4861 hr
Cumulative Gas Production	0.016 MMCF
Final Gas Rate	0.259 MMCF/D

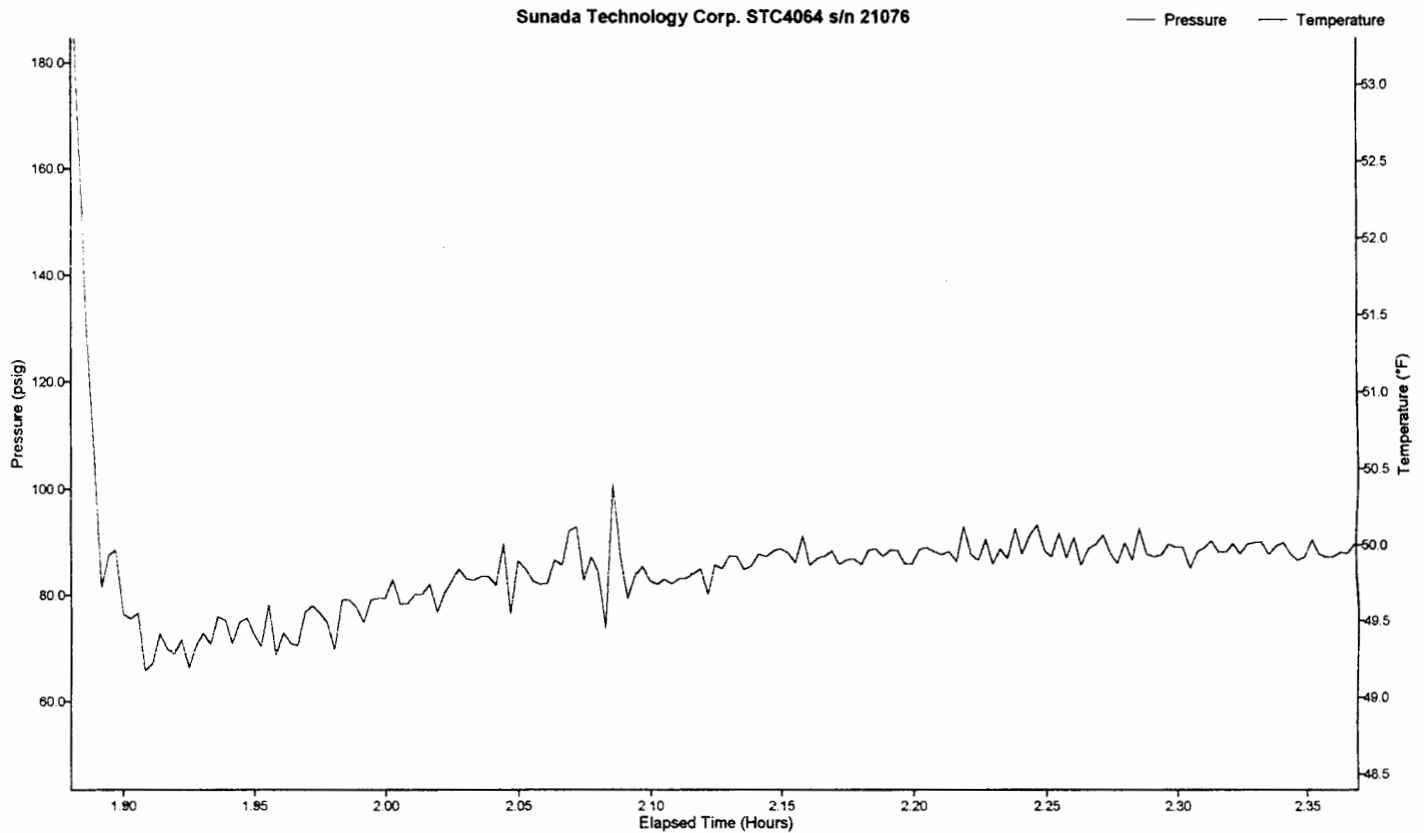
Fluid Properties

Gas Gravity (G)	0.650
N ₂	0.00 %
CO ₂	0.00 %
H ₂ S	0.00 %
Critical Pressure (P_c)	670.91 psi
Critical Temperature (T_c)	373.97 R
PVT Reference Pressure (p_{pVT})	2265.22 psi
Gas Compressibility (c_g)	4.48264e-4 psi ⁻¹
Gas Compressibility Factor (z)	0.799
Gas Viscosity (μ_g)	0.0172 cp
Gas Formation Volume Factor (B_g)	0.001027 bbl/scf

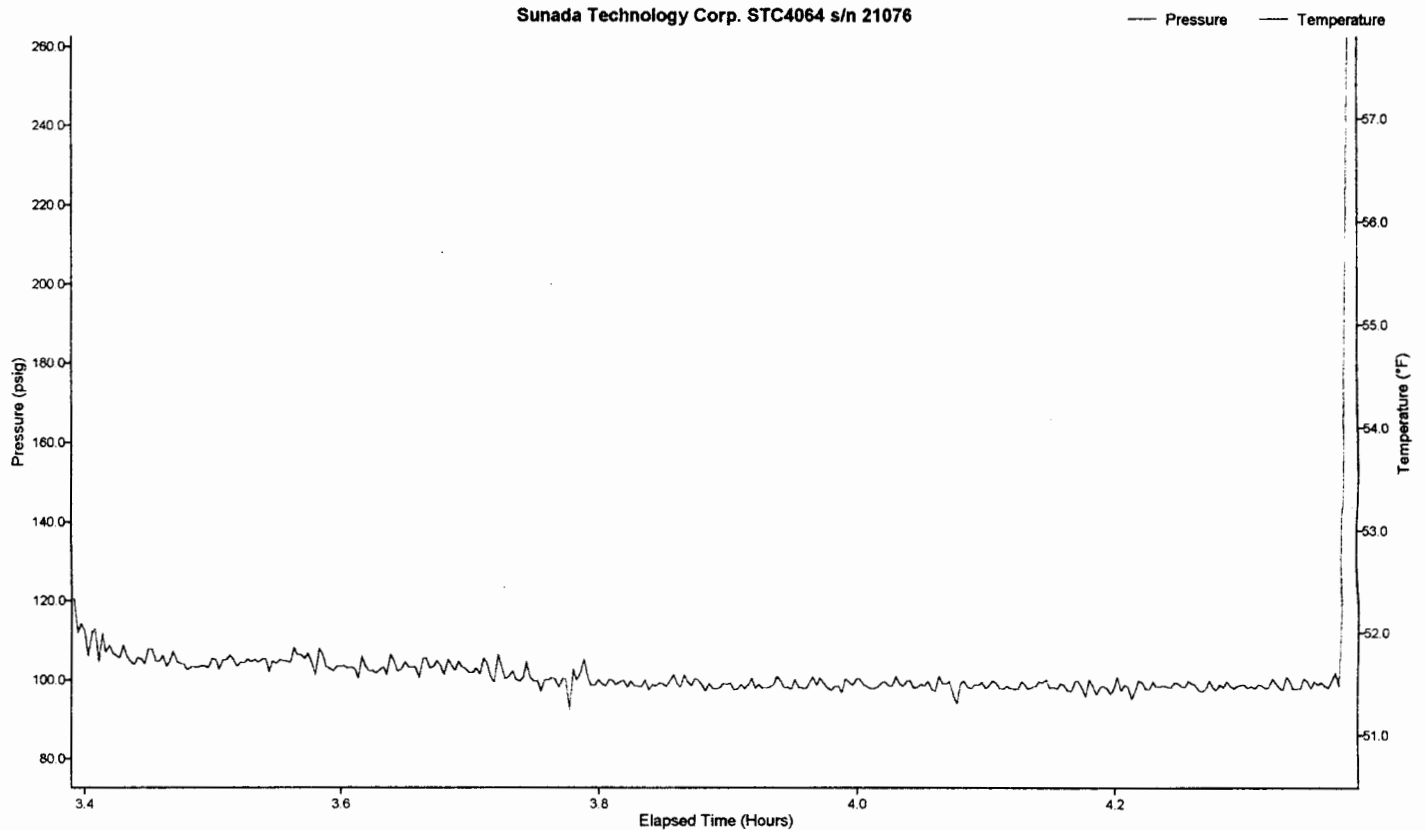
Extended Rates Calculations

Drainage Area	640.0 acres
Specified Flowing Pressure	99.85 psi
Specified Reservoir Pressure	1128.23 psi
3 - Month Constant Rate	MMCF/D
6 - Month Constant Rate	MMCF/D
Stabilized Rate @ Current Skin	0.160 MMCF/D
Stabilized Rate @ Skin of 0	0.108 MMCF/D
Stabilized Rate @ Skin of -4	0.193 MMCF/D

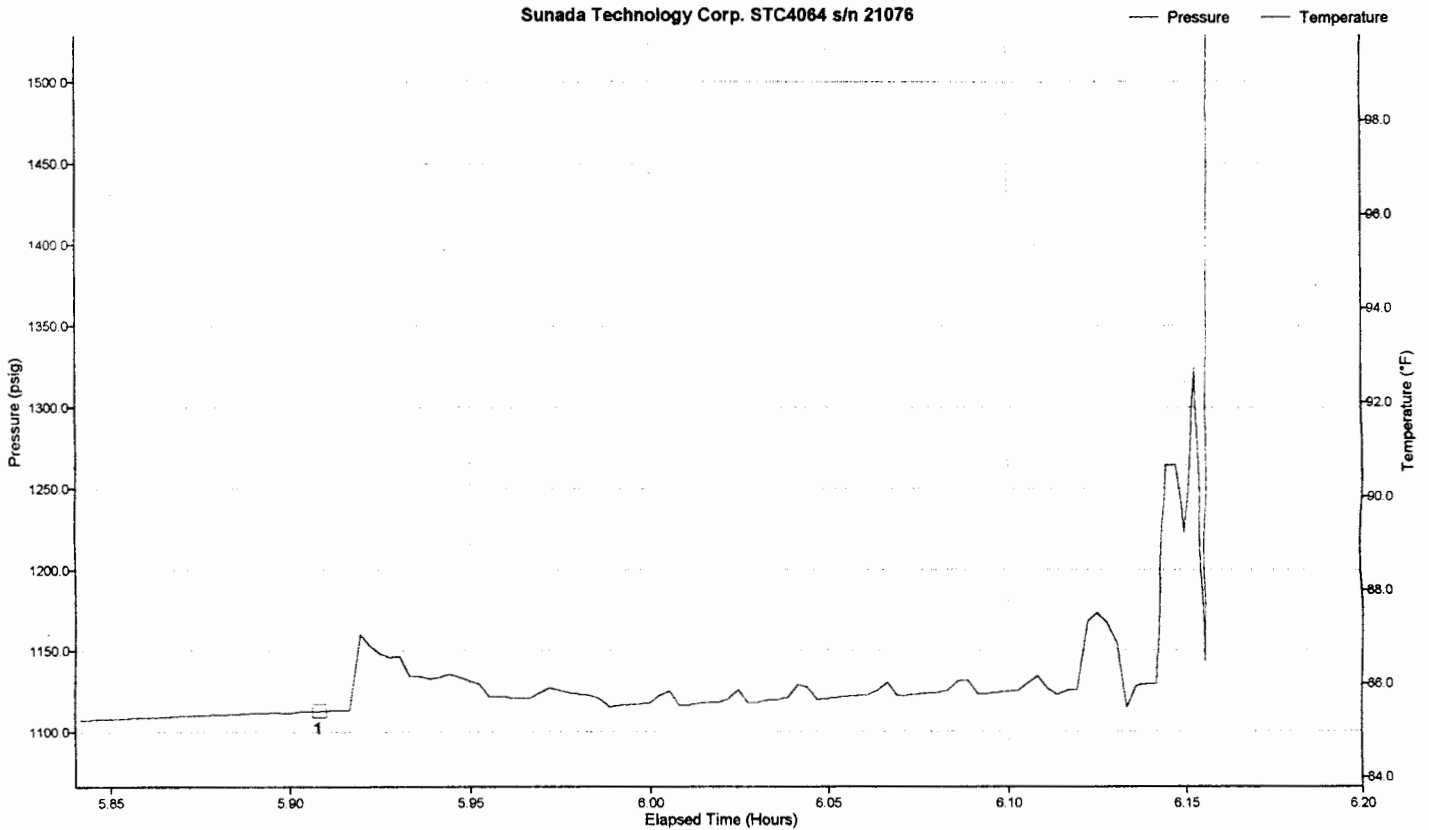
Well LSD: DST #3 MISS 4482'-4536'
Well Name: HEALY #1
Company: KNIGHTON OIL COMPANY, INC.
Battery on: Dec 3, 2003 at 12:20:00
Notes: INITIAL FLOW PERIOD.



Well LSD: DST #3 MISS 4482'-4536'
Well Name: HEALY #1
Company: KNIGHTON OIL COMPANY, INC.
Battery on: Dec 3, 2003 at 12:20:00
Notes: FINAL FLOW PERIOD



Well LSD: DST #3 MISS 4482'-4536'
 Well Name: HEALY #1
 Company: KNIGHTON OIL COMPANY, INC.
 Battery on: Dec 3, 2003 at 12:20:00
 Notes: PULLING PACKERS OFF BTM



Tag	Pressure	Temperature	Comment
1	1112.76 psig	118.78 °F	2003-12-03 18:14:30

Knighton Oil Co., Inc.
Healy #1, Dst #3

Comments relative to analysis of the drill stem test which was run in the Mississippian formation by Diamond Testing, Inc.

This analysis is based upon the gas recovery and equations applicable to gas recovery tests, radial flow and derivative analysis techniques. It has been assumed, for purposes of this analysis, that the tested reservoir system consisted of a single porosity zone 10 feet in thickness with an average porosity of 15 percent. A Linear or $\frac{1}{2}$ slope flow regime is noted on the derivative plot of the final shut-in. This type of flow regime is generally associated with a bounded reservoir system. Therefore, a vertical gas well model with boundaries was used for history matching and non-linear regression analysis.

The semi-log plots indicate a maximum initial reservoir pressure of 1313 psi and a maximum final reservoir pressure of 1269 psi, which is equivalent to a subsurface pressure gradient of 0.28 psi/ft at gauge depth. The difference between the extrapolated initial and final reservoir pressures, 44 psi, is equivalent to a 3.4% draw-down caused by the final flowing period and suggests the tested reservoir system may be of limited extent.

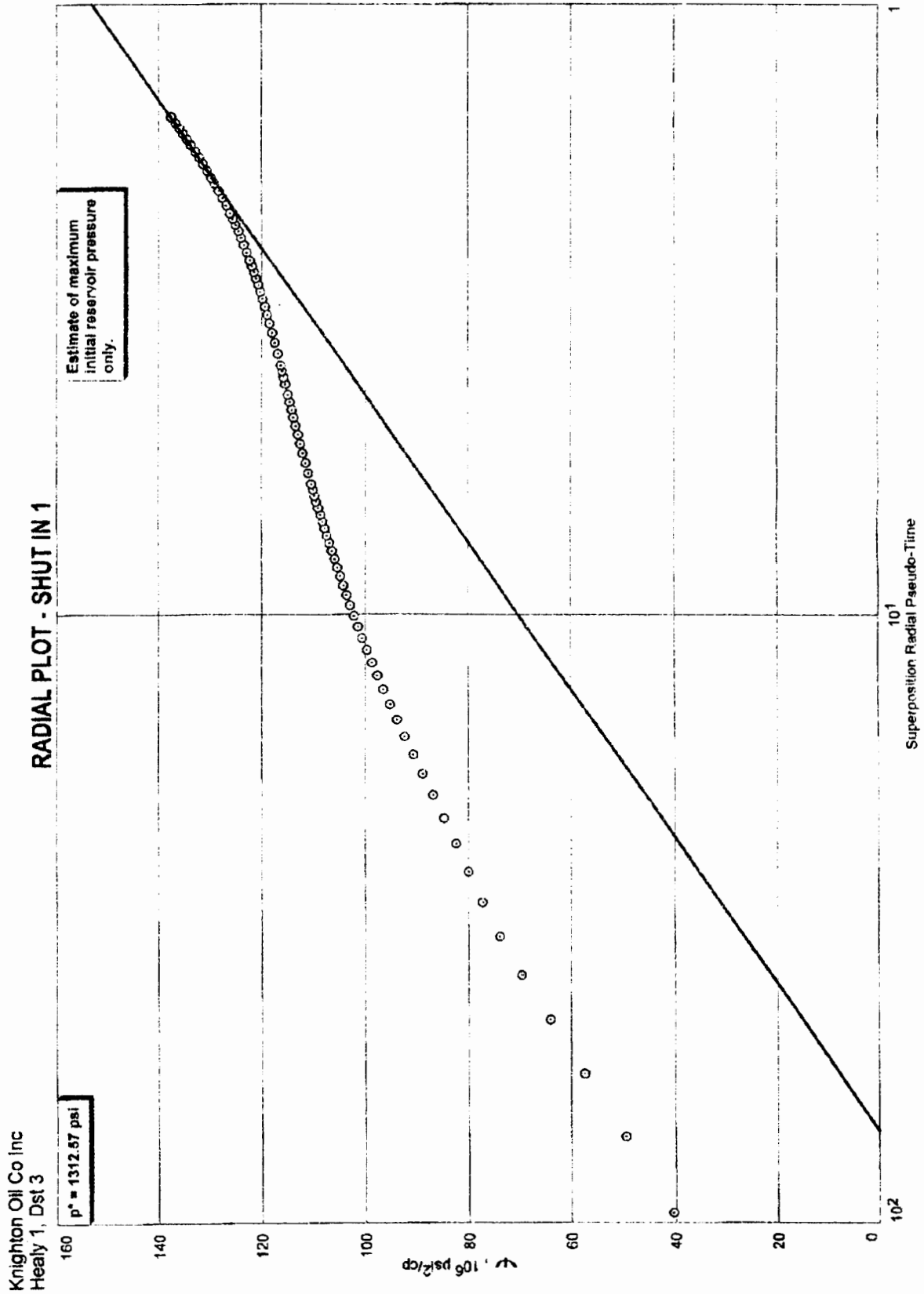
The Average Production Rate that was used in this analysis, is the last gas flow rate which was gauged during the final flowing period.

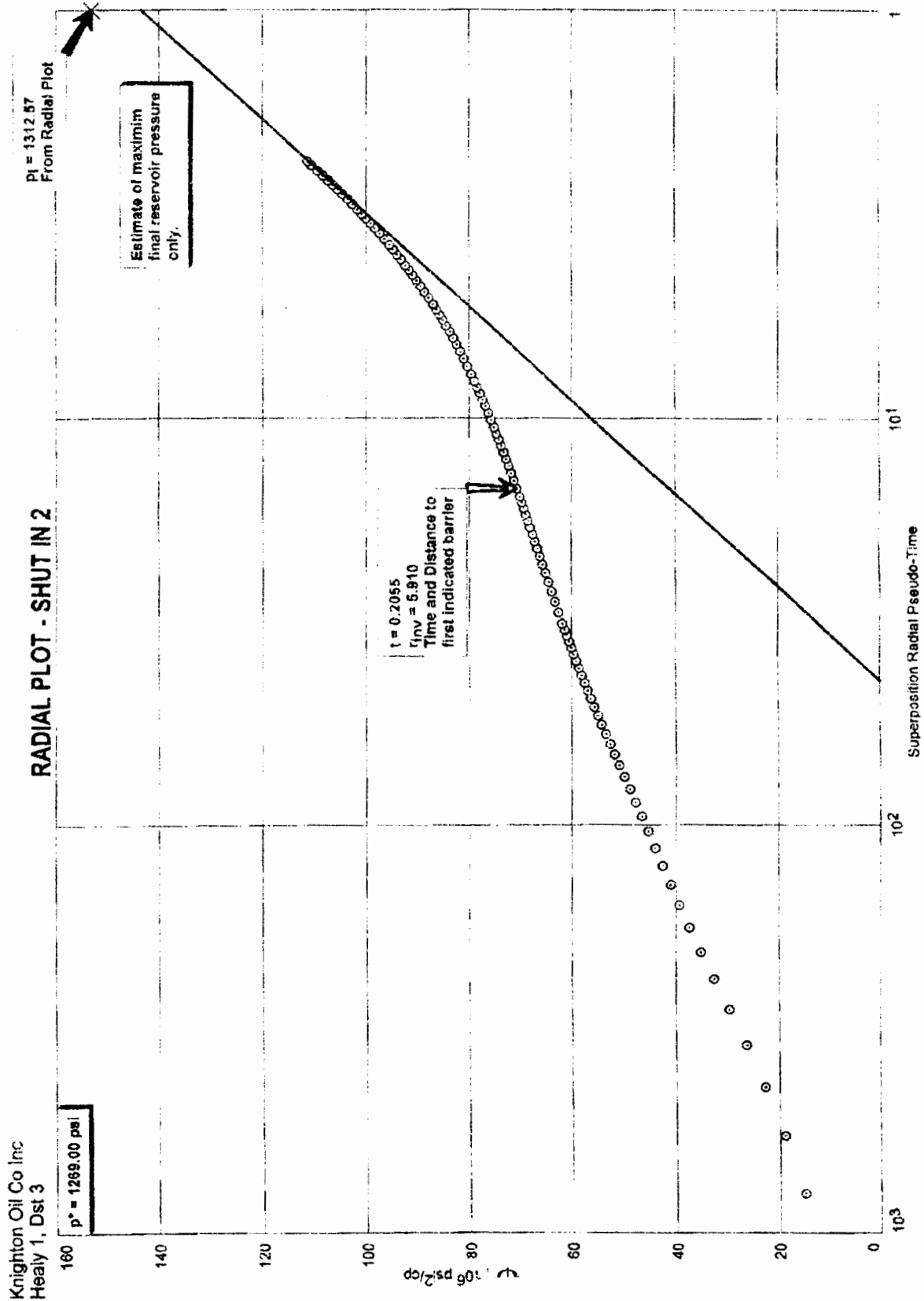
The calculated Skin Factors indicate no well-bore damage was present at the time of this formation test.

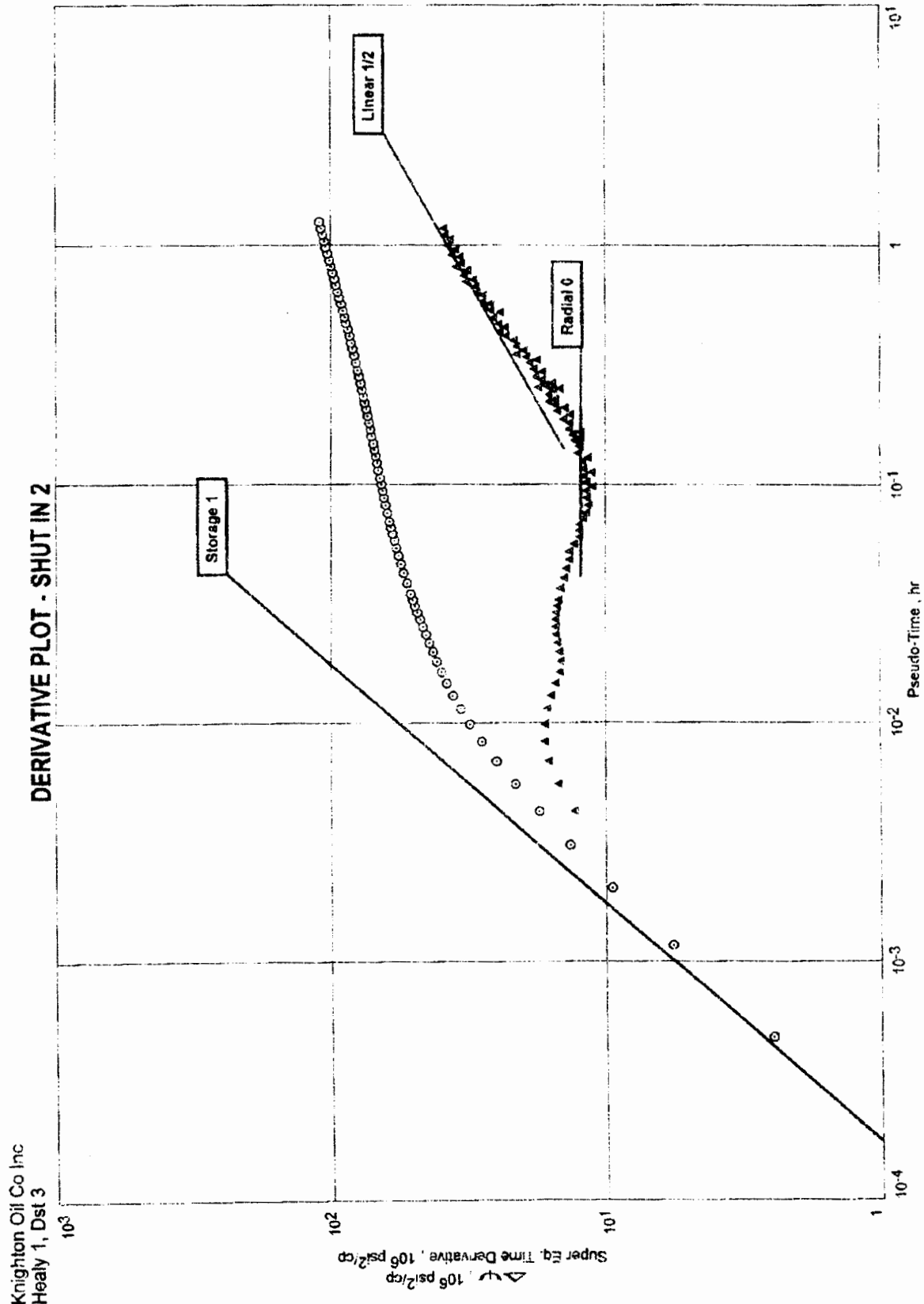
The evaluation criteria used in the drill stem test analysis system indicate this is a good mechanical test and the results obtained in this analysis should be reliable with reasonable limits relative to the assumptions which have been made.

Michael Hudson
Analyst
(928) 505-8389



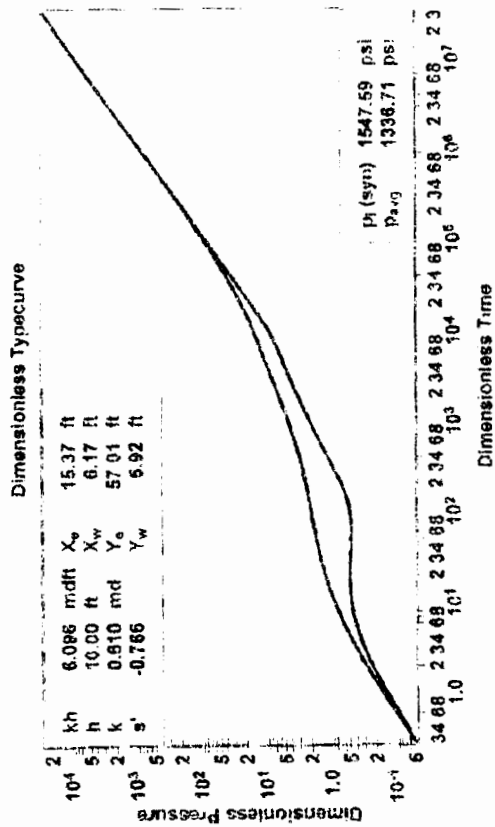




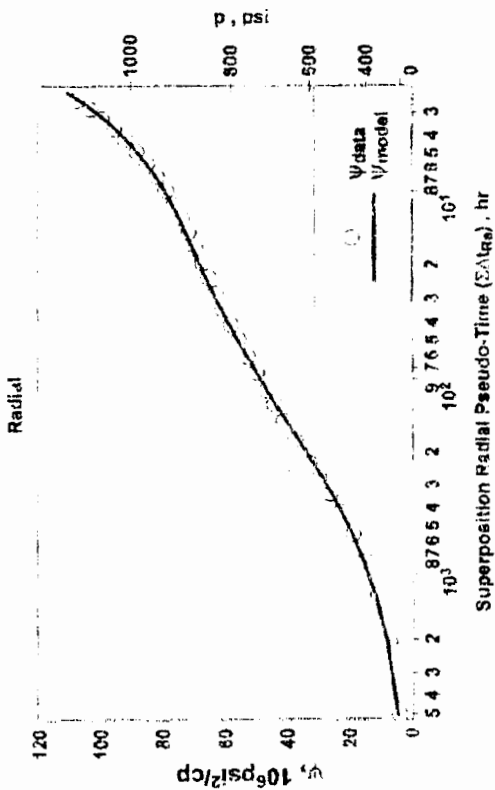


Knighton Oil Co Inc
Healy 1, Dst 3

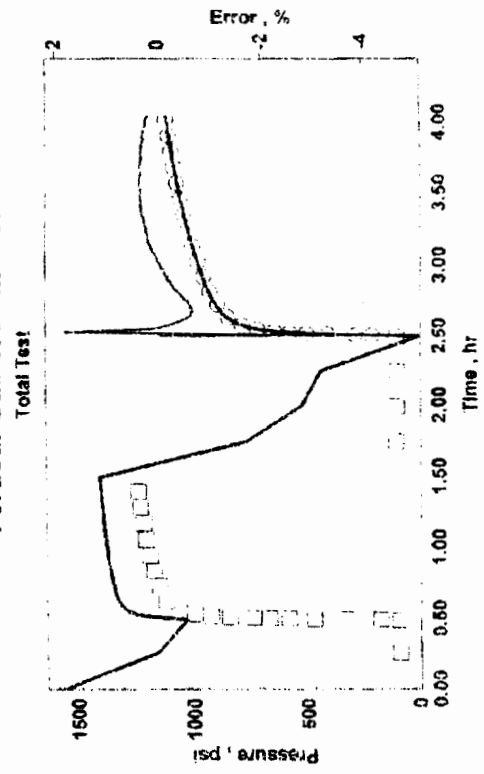
Vertical Gas-Well Model



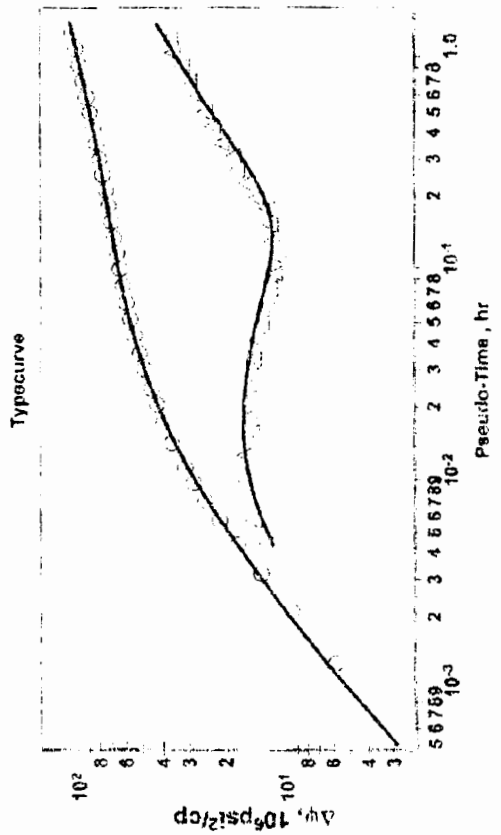
Vertical Gas-Well Model



Vertical Gas-Well Model



Vertical Gas-Well Model



Vertical Gas Well Model

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Knighton Oil Co Inc
Heavy 1, Dst 3

Model Parameters

Permeability (k)	0.610 md	Reservoir Length (X_e)	15,370 ft
Wellbore Storage Constant Dim (C_D)	5.06	Reservoir Width (Y_e)	57,009 ft
Skin (s)	-0.766	Active Well At (X_w)	6,173 ft
Turbulence Factor (D)	0.00 (MMCF/D) ⁻¹	Active Well At (Y_w)	5,917 ft

Formation Parameters

Net Pay (h)	10,000 ft
Total Porosity (ϕ_t)	15.00 %
Gas Saturation (S_g)	80.00 %
Water Saturation (S_w)	20.00 %
Oil Saturation (S_o)	0.00 %
Wellbore Radius (r_w)	0.33 ft
Formation Temperature (T)	118.8 °F
Formation Compressibility (c_f)	4.109e-6 psi ⁻¹
Total Compressibility (c_t)	7.368e-4 psi ⁻¹

Production and Pressure

Final Gas Rate	0.259 MMCF/D
Cumulative Gas Production	0.019 MMCF
Final Measured Pressure	1113.55 psi

Synthesis Results

Average Error	-0.08 %
Synthetic Initial Pressure (p_i)	1547.56 ps.
Average Reservoir Pressure	1336.71 psi

Fluid Properties

Gas Gravity (G)	0.650
N ₂	0.00 %
H ₂ S	0.00 %
CO ₂	0.00 %
Critical Pressure (P_c)	670.91 psi
Critical Temperature (T_c)	373.97 R
PVT Reference Pressure (ppVT)	1242.25 psi
Gas Compressibility (c_g)	9.15040e-4 psi ⁻¹
Gas Compressibility Factor (z)	0.850
Gas Viscosity (μ_g)	0.0136 cp
Gas Formation Volume Factor (B_g)	0.001983 bbl/scf

Forecasts

Forecast Flowing Pressure (P_{flow})	125.02 psi
3 - Month Constant Rate Forecast @ Curr. Skin	0.001 MMCF/D
6 - Month Constant Rate Forecast @ Curr. Skin	0.000 MMCF/D
Forecast Flow Duration (t_{flow})	12.00 month
Constant Rate Forecast @ Curr. Skin	0.000 MMCF/D
Constant Rate Forecast @ Skin=0	0.000 MMCF/D
Constant Rate Forecast @ Skin=-4	0.000 MMCF/D

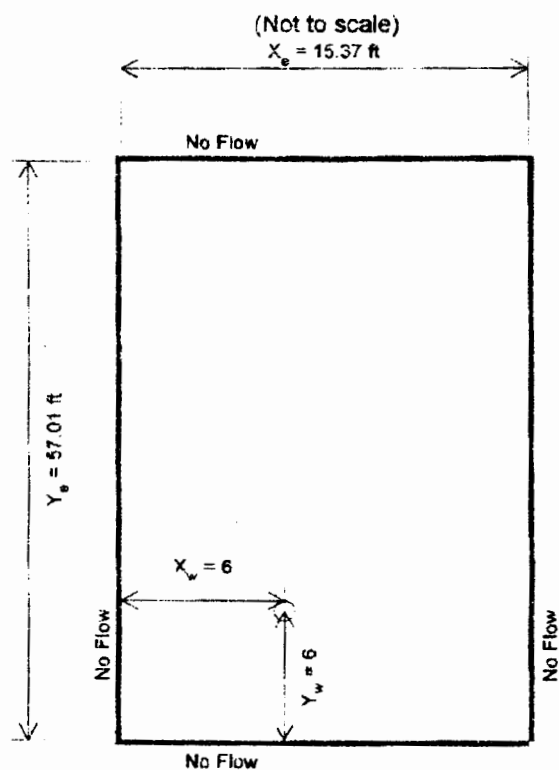
Vertical Gas-Well Model

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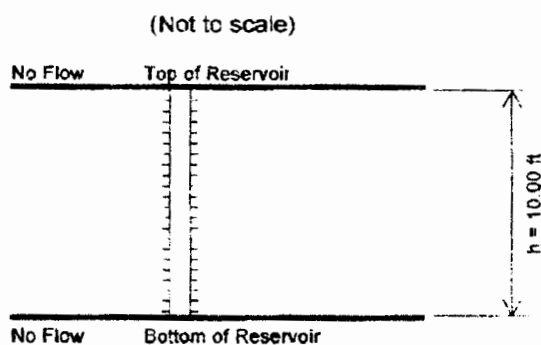
Knighton Oil Co Inc
Healy 1, Dst 3

$k = 0.610$ md
 $s = -0.766$
 $GIP_{model} = 0$ MMcf

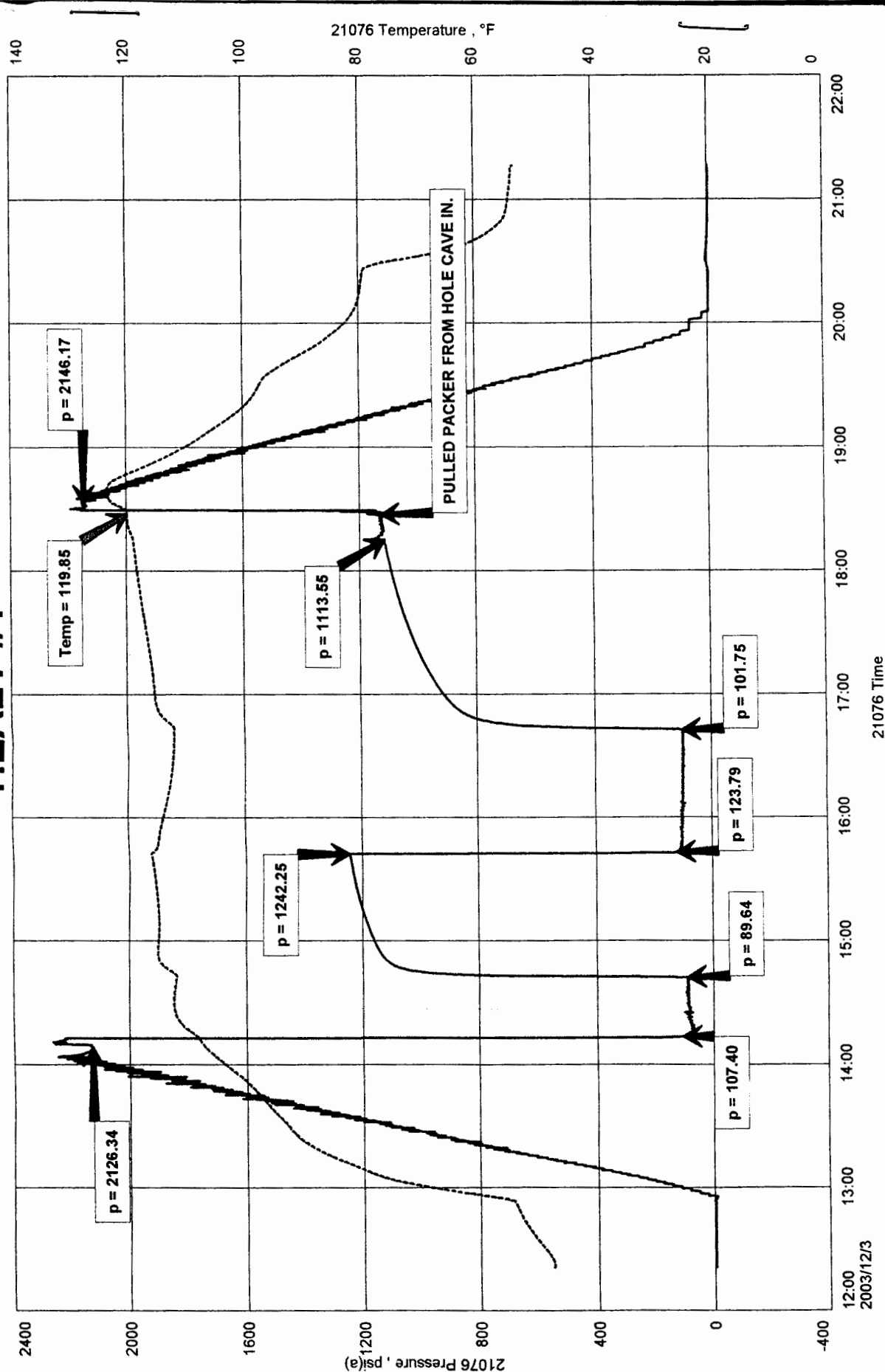
Plan View



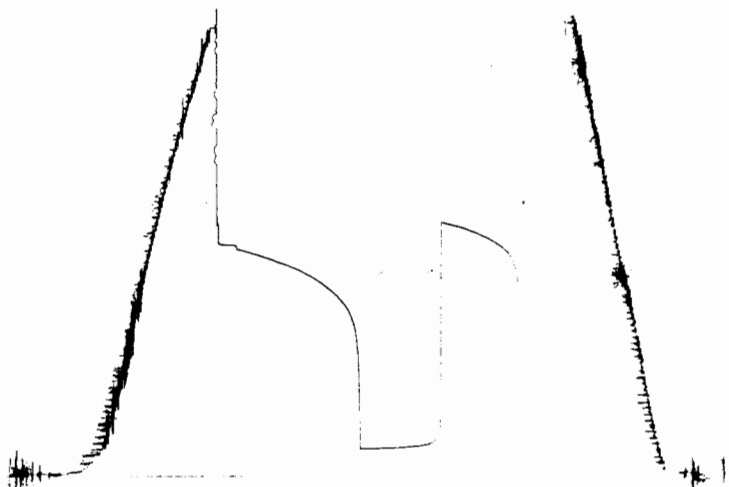
Side View



HEALY #1



DST # 3 Inside 13586 4482-4536
Miss 4529



This is an actual photograph of recorder chart.

POINT	PRESSURE		Elec. Office Reading	
	Field Reading			
(A) Initial Hydrostatic Mud	2238	2126	PSI	
(B) First Initial Flow Pressure	153	107	PSI	
(C) First Final Flow Pressure	133	90	PSI	
(D) Initial Closed-in Pressure	1273	1242	PSI	
(E) Second Initial Flow Pressure	163	124	PSI	
(F) Second Final Flow Pressure	153	102	PSI	
(G) Final Closed-in Pressure	1176	1114	PSI	
(H) Final Hydrostatic Mud	2257	2146	PSI	



DIAMOND TESTING

P.O. Box 157
HOISINGTON, KANSAS 67544
(620) 653-7550 • (800) 542-7313
STC 21076.D21

Page 1 of 2 Pages

Company Knighton Oil Company, Inc. Lease & Well No. Healy No. 1

Elevation 2086 KB Formation Kinderhook Effective Pay -- Ft. Ticket No. 1805

Date 12-4-03 Sec. 1 Twp. 27S Range 16W County Kiowa State Kansas

Test Approved By Steve Davis Diamond Representative Roger D. Friedly

Formation Test No. 4 Interval Tested from 4,536 ft. to 4,558 ft. Total Depth 4,558 ft.

Packer Depth 4,531 ft. Size 6 3/4 in. Packer Depth -- ft. Size -- in.

Packer Depth 4,536 ft. Size 6 3/4 in. Packer Depth -- ft. Size -- in.

Depth of Selective Zone Set ft.

Top Recorder Depth (Inside) 4,517 ft. Recorder Number Elec. Cap. 5,000 psi

Bottom Recorder Depth (Outside) 4,555 ft. Recorder Number 13386 Cap. 4,000 psi

Below Straddle Recorder Depth ft. Recorder Number Cap. psi

Drilling Contractor Duke Drilling Company, Inc. - Rig 1 Drill Collar Length -- ft. I.D. -- in.

Mud Type Chemical Viscosity 62 Weight Pipe Length -- ft. I.D. -- in.

Weight 9.3 Water Loss 10.0 cc. Drill Pipe Length 4,504 ft. I.D. 3 1/2 in.

Chlorides 12,000 P.P.M. Test Tool Length 32 ft. Tool Size 3 1/2 - IF in.

Jars: Make Bowen Serial Number No. 1 Anchor Length 22 ft. Size 4 1/2 - FH in.

Did Well Flow? No Reversed Out No Surface Choke Size 1 in. Bottom Choke Size 5/8 in.

Main Hole Size 7 7/8 in. Tool Joint Size 4 1/2 - XH in.

Blow: 1st Open: Weak, 1/8 in., blow increasing to 3/4 in. Decreasing in 19 mins. to, 1/2 in., at end. No blow back
during shut-in.
2nd Open: No blow.

Recovered 10 ft. of drilling mud = .142000 bbls.

Recovered ft. of

Recovered ft. of

Recovered ft. of

Recovered ft. of

Remarks Tool Sample Grind Out: No show

Time Set Packer(s) 1:44 ~~AM~~ P.M. Time Started Off Bottom 4:44 ~~AM~~ P.M. Maximum Temperature 119°

Initial Hydrostatic Pressure (A) 2130 P.S.I.

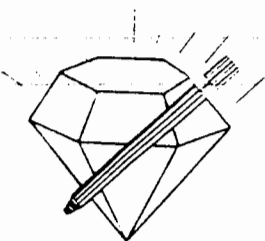
Initial Flow Period Minutes 30 (B) 8 P.S.I. to (C) 10 P.S.I.

Initial Closed In Period Minutes 60 (D) 30 P.S.I.

Final Flow Period Minutes 30 (E) 9 P.S.I. to (F) 10 P.S.I.

Final Closed In Period Minutes 60 (G) 22 P.S.I.

Final Hydrostatic Pressure (H) 2132 P.S.I.



DIAMOND TESTING
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Page 2 of 2 Pages

FLUID SAMPLE DATA

Company Knighton Oil Company, Inc.

Lease & Well No. Healy No. 1

Date 12-4-03 Sec. 1 Twp. 27 S Range 16 W

Formation Test No. 4 Interval Tested From 4,536 ft. to 4,558 ft. Total Depth 4,558 ft.

Formation Kinderhook

	MUD PIT	RECOVERY
Viscosity	<u>62</u> CP	<u>66</u> CP
Weight	<u>9.3</u>	<u>9.4</u>
Water Loss	<u>10.0</u> CC	<u>10.0</u> CC
PH Factor	<u>9.5</u>	<u>10.5</u>

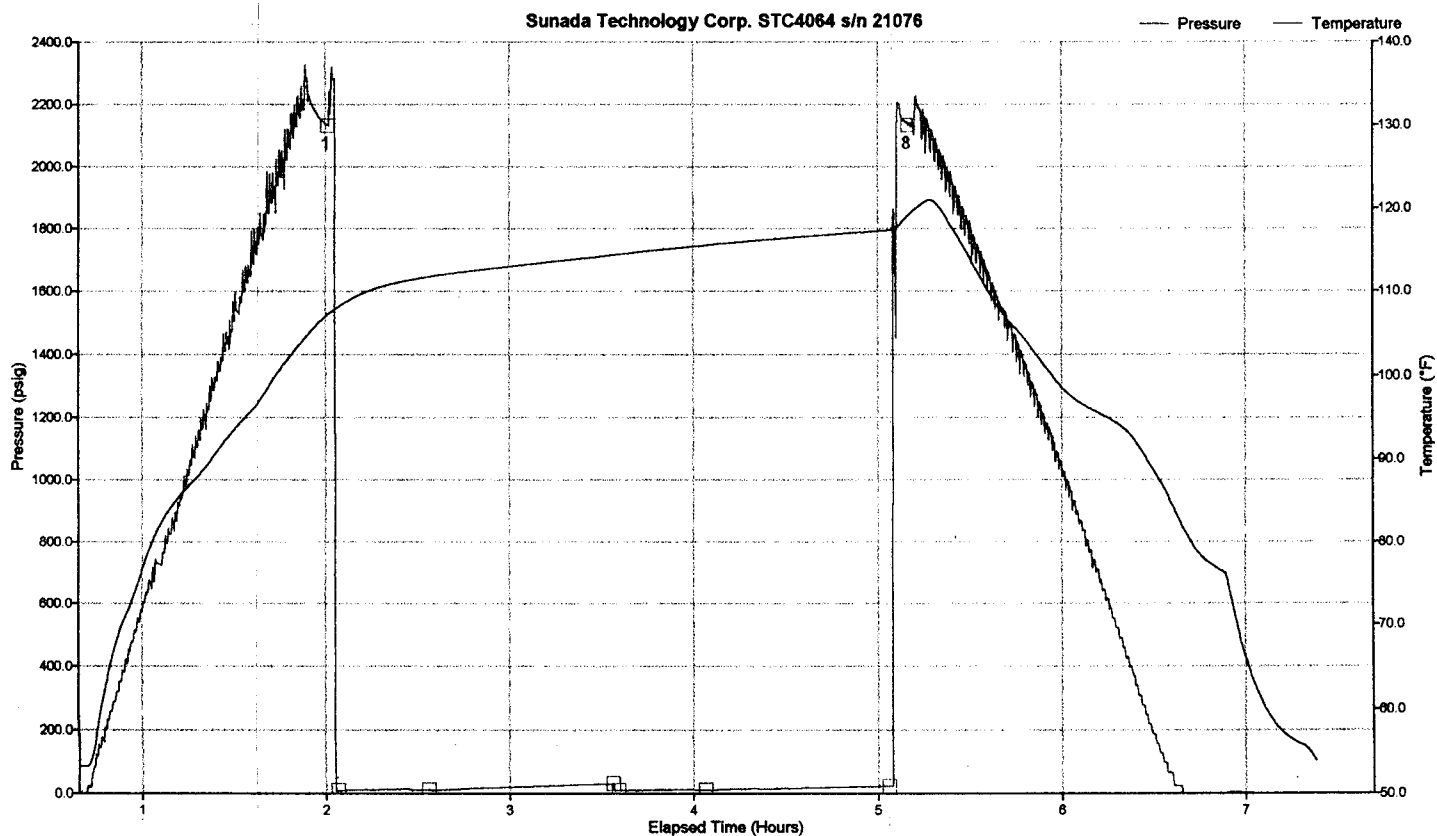
	RESISTIVITY	CHLORIDE CONTENT
Recovery Water	<u>--</u> @ <u>--</u> °F. <u>--</u> ppm	
Recovery Mud	<u>.62</u> @ <u>52</u> °F. <u>16,000</u> ppm	
Recovery Mud Filtrate	<u>.63</u> @ <u>50</u> °F. <u>15,000</u> ppm	
Mud Pit Sample	<u>.55</u> @ <u>64</u> °F. <u>15,500</u> ppm	
Mud Pit Sample Filtrate	<u>.50</u> @ <u>66</u> °F. <u>14,000</u> ppm	

Sample Taken By ROGER D. FRIEDLY

Witness By Steve Davis

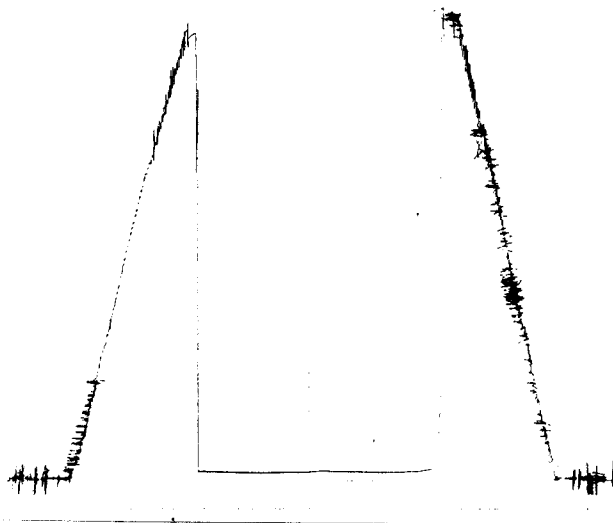
Remarks Pit filtrate triton dish chlorides were 12,000 Ppm.
Recovery filtrate triton dish chlorides were 13,500 Ppm.

Well LSD: DST #4 KINDERHOOK 4536'-4558'
 Well Name: HEALY #1
 Company: KNIGHTON OIL COMPANY, INC.
 Battery on: Dec 4, 2003 at 11:41:00
 Notes: RECOVERED 10' DM



Tag	Pressure	Temperature	Comment
1	2130.21 psig	107.25 °F	2003-12-04 13:42:00
2	7.87 psig	108.08 °F	2003-12-04 13:45:10
3	10.07 psig	111.74 °F	2003-12-04 14:14:50
4	30.13 psig	114.33 °F	2003-12-04 15:15:00
5	9.13 psig	114.41 °F	2003-12-04 15:16:40
6	10.07 psig	115.48 °F	2003-12-04 15:45:10
7	22.32 psig	117.28 °F	2003-12-04 16:44:50
8	2131.88 psig	119.17 °F	2003-12-04 16:51:10

Rinderhook *ho 2* *4555*



This is an actual photograph of recorder chart.

POINT	PRESSURE		Elec.
	Field Reading	Office Reading	
(A) Initial Hydrostatic Mud	2130	2130	PSI
(B) First Initial Flow Pressure	8	8	PSI
(C) First Final Flow Pressure	10	10	PSI
(D) Initial Closed-in Pressure	30	30	PSI
(E) Second Initial Flow Pressure	9	9	PSI
(F) Second Final Flow Pressure	10	10	PSI
(G) Final Closed-in Pressure	22	22	PSI
(H) Final Hydrostatic Mud	2132	2132	PSI