

ORIGINAL

SIDE ONE

OCT 09 1991

STATE CORPORATION COMMISSION OF KANSAS
OIL & GAS CONSERVATION DIVISION
WELL COMPLETION FORM
ACO-1 WELL HISTORY
DESCRIPTION OF WELL AND LEASE

Operator: License # 04782

Name: Ensign Operating Co.

Address 621 17th St., Suite 1800

Denver, Colorado 80293

City/State/Zip

Purchaser: Northern Natural Gas Co.

Operator Contact Person: L. T. Hartnett

Phone (303) 293-9999

Contractor: Name: H-30 Drilling Inc.

License: 5107

Wellsite Geologist: Duane E. Moredock

Designate Type of Completion

New Well Re-Entry Workover

Oil SWD Temp. Abd.

Gas Inj Delayed Comp.

Dry Other (Core, Water Supply, etc.)

If OWMO: old well info as follows:

Operator: _____

Well Name: _____

Comp. Date _____ Old Total Depth _____

Drilling Method:

Mud Rotary Air Rotary Cable

6/25/90 7/7/90 7/25/90

Spud Date Date Reached TD Completion Date

API NO. 15- 175-21,140-00-00
County Seward FROM CONFIDENTIAL

NW SW NE Sec. 31 Twp. 34S Rge. 33 East West

3436' Ft. North from Southeast Corner of Section

2345' Ft. West from Southeast Corner of Section

(NOTE: Locate well in section plat below.)

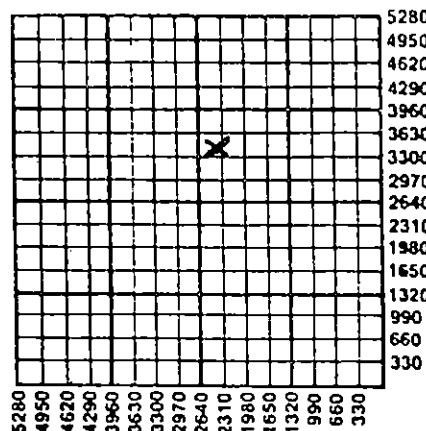
Lease Name Liberal Well # 1-31

Field Name Wildcat

Producing Formation Pennsylvanian Morrow

Elevation: Ground 2862' KB 2874'

Total Depth 6944' PBDT 6460'



Amount of Surface Pipe Set and Cemented at 1673' Feet:

Multiple Stage Cementing Collar Used? Yes No

If yes, show depth set _____ Feet

If Alternate II completion, cement circulated from _____

feet depth to _____ w/ _____ sx cnt.

INSTRUCTIONS: This form shall be completed in triplicate and filed with the Kansas Corporation Commission, 200 Colorado Derby Building, Wichita, Kansas 67202, within 120 days of the spud date of any well. Rule 82-3-130, 82-3-107 and 82-3-106 apply. Information on side two of this form will be held confidential for a period of 12 months if requested in writing and submitted with the form. See rule 82-3-107 for confidentiality in excess of 12 months. One copy of all wireline logs and drillers time log shall be attached with this form. ALL CEMENTING TICKETS MUST BE ATTACHED. Submit CP 4 form with all plugged wells. Submit CP-111 form with all temporarily abandoned wells. Any recompletion, workover or conversion of a well requires filing of ACO-2 within 120 days from commencement date of such work.

All requirements of the statutes, rules and regulations promulgated to regulate the oil and gas industry have been fully complied with and the statements herein are complete and correct to the best of my knowledge.

Signature _____

Title Production Operations Mgr. Date 9/18/90

Subscriber and sworn to before me this 18th day of SEPTEMBER, 1990

Notary Public Connie J. Smith

Date Commission Expires 5-29-91

K.C.C. OFFICE USE ONLY
F Letter of Confidentiality Attached
C Wireline Log Received
C Drillers Timelog Received
Distribution
KCC SWD/Rep _____ NGPA _____
KGS _____ Plug _____ Other _____
(Specify)

PI

SIDE TWO

Operator Name Ensign Operating Co. Lease Name Liberal Well # 1-31
 Sec. 31 Twp. 34S Rge. 33 East County Seward West

INSTRUCTIONS: Show important tops and base of formations penetrated. Detail all cores. Report all drill stem tests giving interval tested, time tool open and closed, flowing and shut-in pressures, whether shut-in pressure reached static level, hydrostatic pressures, bottom hole temperature, fluid recovery, and flow rates if gas to surface during test. Attach extra sheet if more space is needed. Attach copy of log.

Drill Stem Tests Taken Yes No
 (Attach Additional Sheets.)
 Samples Sent to Geological Survey Yes No
 Cores Taken Yes No
 Electric Log Run Yes No
 (Submit Copy.)
See Attached

Formation Description
 Log Sample **See Attached**
 Name Top Bottom

CASING RECORD New Used
 Report all strings set-conductor, surface, intermediate, production, etc.

Purpose of String	Size Hole Drilled	Size Casing Set (In O.D.)	Weight Lbs./ft.	Setting Depth	Type of Cement	# Sacks Used	Type and Percent Additives
Surface	12-1/4"	8-5/8"	24#	1678'	Lite Wt.	685	2% CC + 1/4#/sx Flocele
					Class H	100	2% CC " " " " "
Production	7-7/8"	4-1/2"	10.5#	6939'		370	

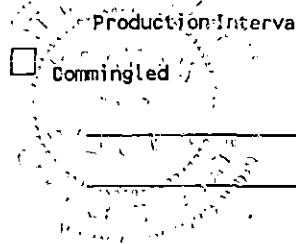
Shots Per Foot	PERFORATION RECORD Specify Footage of Each Interval Perforated	Acid, Fracture, Shot, Cement Squeeze Record (Amount and Kind of Material Used)	Depth
	SEE ATTACHED SHEET		

TUBING RECORD Size 2-3/8" Set At 6062' Packer At -- Liner Run Yes No

Date of First Production _____ Producing Method Flowing Pumping Gas Lift Other (Explain)

Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio	Gravity
	1.6	671	0	419	

Disposition of Gas: Vented Sold Used on Lease (If vented, submit ACO-18.)
 METHOD OF COMPLETION: Open Hole Perforation Dually Completed Commingled
 Other (Specify) _____



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OCT 09 1991

FORMATION TOPS

FROM CONFIDENTIAL

	G.L. 2862' K.B. 2874'	Comparison Well No. 1-36 Liberal NE SW 20 T34S R33W K.B. 2893' Surface +2887'	Drill Time & Samples Surface +2862'	Bore Hole Geophysical Logs Surface +2862'
Tertiary				
Permian				
Guadalupian				
Whitehorse		NL	NDTS	701' +2173'
Leonardian				
Nippewalla Gr.				
Blaine		NL	NDTS	916' +1958'
Cedar Hill		NL	NDTS	1079' +1795'
Salt Plain		NL	NDTS	1220' +1654'
Sumner Gr.				
Stone Corral	1600' +1293'		NDTS	1560' +1314'
Ninnescah	1668' +1225'		NDTS	1626' +1248'
Wellington	2184' +709'		NDTS	2137' +737'
Wolfcampian				
Chase Gr.				
Herington	2632' +261'		NDTS	2600' +274'
Krider	2710' +183'		NDTS	2664' +210'
Winfield	2764' +129'		NDTS	2720' +154'
Towanda	2822' +71'		NDTS	2780' +94'
Fort Riley	2880' +13'		NDTS	2838' +36'
Wreford	2986' -93'		NDTS	2944' -70'
Council Grove Gr.	3102' -209'		NDTS	3063' -189'
Admirer Gr.	3480' -587'		NDTS	3452' -578'
Pennsylvanian				
Virgilian				
Wabaunsee Gr.	3512' -619'		NDTS	3484' -610'
Douglas Gr.				
Heebner	4362' -1469'	4324' -1450'		4316' -1442'
Toronto	4380' -1487'	4339' -1465'		4334' -1460'
Missourian				
Lansing Gr.	4458' -1565'	4424' -1550'		4414' -1540'
Kansas City Gr.	4798' -1905'	4768' -1894'		4760' -1886'
Desmoinesian				
Marmaton Gr.	5211' -2318'	5186' -2312'		5178' -2304'
Cherokee Gr.	5378' -2485'	5353' -2479'		5350' -2476'
Atokian	5514' -2621'	5481' -2607'		5474' -2600'
Morrowian	5910' -2339'	5848' -2974'		5847' -2973'
Lower Morrow	6208' -3315'	6103' -3229'		6096' -3222'
*Chester	6262' -3369'	6158' -3284'		6150' -3276'
Mississippian				
Meramecian				
Ste. Genevieve-St. Louis	6634' -3741'	6473' -3599'		6450' -3576'
Spergen	NP	6820' -3946'		6812' -3938'
Total Depth	6839' -3946'	6944' -4070'		6941' -4067'

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 CONFIDENTIAL
 64731-3599
 6820' -3946'
 OCT 09 1991
 CONSERVATION DIVISION
 Wichita, Kansas

CONFIDENTIAL

OCT 09 1991

ORIGINAL

FROM CONFIDENTIAL

Shots Per Foot	Perforation Record	Acid, Fracture, Shot, Cement Squeeze Record	Depth
4 JSPF	6536-6539 Sqz Holes	325 sx C1 H cmt 3% KCl, .7% Halad-322 & .25% CBL. Tailed in w/100 sx C1 H cmt & sqzd off perms. Rev out 55 sx cmt & circ hole clean above cmt retainer (6506')	6466-6574' Miss Fm
1 JSPF	6466', 71', 72', 74', 78', 80', 87', 90', 92', 6534', 38', 61', 64', 72, 74'	4000 gals 15% Fe-HCl acid, .2% LoSurf 300, .7% Morflo II, .1% HAI60. Displ w/26 bbls 2% KCl wtr, .2% Morflo II & .1% LoSurf 300.	6536-6539'
4 JSPF	6132-6152' (VANN Gun)	<i>CIBP 6460 (W) 1 1/4 cmt Da</i>	

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OCT 20 1990

CONSERVATION DIVISION
Wichita, Kansas

TRILOBITE TESTING COMPANY

P.O. Box 362 • Hays, Kansas 67601

CONFIDENTIAL

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Drill-Stem Test Data

Well Name & No. <u>LIBERAL #1-31</u>	Test No. <u>1</u>	Date <u>7/4/90</u>	<u>OCT 09 1991</u>
Company <u>ENSIGN OPERATING COMPANY</u>	Zone Tested <u>CHESTER</u>	FROM CONFIDENTIAL	
Address <u>621 17th ST SWT 1800 DENVER CO 80293</u>	Elevation <u>2874 KB</u>		
Co. Rep./Geo. <u>MR DUANE MOREDOCK</u>	Cont. <u>H-30 #1</u>	Est. Ft. of Pay <u>8</u>	
Location: Sec. <u>31</u>	Twp. <u>34S</u>	Rge. <u>33W</u>	Co. <u>SEWARD</u> state <u>KANSAS</u>

Interval Tested <u>6130-6250</u>	Drill Pipe Size <u>4.5" XH</u>
Anchor Length <u>120</u>	Top Choke — 1" _____ Bottom Choke — ¾" _____
Top Packer Depth <u>6125</u>	Hole Size — 77/8" _____ Rubber Size — 63/4" _____
Bottom Packer Depth <u>6130</u>	Wt. Pipe I.D. — 2.7 Ft. Run <u>0</u>
Total Depth <u>6250</u>	Drill Collar — 2.25 Ft. Run <u>335</u>
Mud Wt. <u>9.2</u> lb/gal.	Viscosity <u>46</u> Filtrate <u>8.8</u>
Tool Open @ <u>9:10 PM</u>	Initial Blow <u>STRONG BLOW-BOTTOM OF BUCKET IN 30 SECONDS</u>
	<u>GAS TO SURFACE 2 MINUTES-GAUGED 3036 MCF/D</u>
Final Blow <u>STRONG BLOW-BOTTOM OF BUCKET SOON AS TOOL</u>	
	<u>OPENED-GAUGED 3155 MCF/D</u>

Recovery — Total Feet <u>60</u>	Flush Tool? <u>NO</u>
Rec. <u>60</u> Feet of <u>DRILLING MUD</u>	
Rec. <u>0</u> Feet of _____	
Rec. <u>0</u> Feet of _____	
Rec. <u>0</u> Feet of _____	
Rec. <u>0</u> Feet of _____	
BHT <u>123</u> °F Gravity _____ °API @ <u>0</u>	°F Corrected Gravity <u>0</u> °API

RW _____ @ _____ °F	Chlorides _____ ppm Recovery	Chlorides <u>1600</u> ppm System
(A) Initial Hydrostatic Mud <u>3050.2</u> PSI	AK1 Recorder No. <u>5495</u>	Range <u>4200</u>
(B) First Initial Flow Pressure <u>629.9</u> PSI	@ (depth) <u>6133</u>	w/Clock No. <u>8376</u>
(C) First Final Flow Pressure <u>706.7</u> PSI	AK1 Recorder No. <u>13337</u>	Range <u>3975</u>
(D) Initial Shut-In Pressure <u>1194.2</u> PSI	@ (depth) <u>6247</u>	w/Clock No. <u>25814</u>
(E) Second Initial Flow Pressure <u>701.4</u> PSI	AK1 Recorder No. <u>0</u>	Range <u>0</u>
(F) Second Final Flow Pressure <u>730.1</u> PSI	@ (depth) <u>0</u>	w/Clock No. <u>0</u>
(G) Final Shut-In Pressure <u>1176.3</u> PSI	Initial Opening <u>30</u>	
(H) Final Hydrostatic Mud <u>2966.8</u> PSI	Initial Shut-In <u>60</u>	
	Final Flow <u>30</u>	
	Final Shut-In <u>120</u>	

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STATE OF KANSAS COMMISSION

CONSERVATION DIVISION
Wichita, Kansas

MR TOM HORACEK

800

Our Representative _____

TOTAL PRICE \$ _____

TRILOBITE TESTING COMPANY

RELEASED

P.O. Box 362 • Hays, Kansas 67601

CONFIDENTIAL 9 1991

Drill-Stem Test Data

FROM CONFIDENTIAL

Well Name & No.	LIBERAL #1-31	Test No.	2	Date	7/8/90
Company	ENSIGN OPERATING CO	Zone Tested	MISSISSIPPI		
Address	621 17th SWT 1800 DENVER CO 80293			Elevation	2874 KB
Co. Rep./Geo.	MR DUANE MOREDOCK	Cont.	H-30 DRLG	Est. Ft. of Pay	10
Location: Sec.	31	Twp.	34S	Rge.	33W
				Co.	SEWARD
				State	KANSAS

Interval Tested	6467-6662	Drill Pipe Size	4.5" XH
Anchor Length	195	Top Choke - 1"	Bottom Choke - 3/4"
Top Packer Depth	6467	Hole Size - 7 7/8"	Rubber Size - 6 3/4"
Bottom Packer Depth	6662	Wt. Pipe I.D. - 2.7 Ft. Run	0
Total Depth	6944	Drill Collar - 2.25 Ft. Run	150
Mud Wt.	9.3	lb/gal.	Viscosity 65
			Filtrate 6.0
Tool Open @	11:20 AM	Initial Blow	STRONG BLOW - OFF BOTTOM OF BUCKET IN 30 SECONDS - ISI: BLEED OFF BLOW - BOTTOM OF BUCKET THROUGHOUT
Final Blow	STRONG BLOW - OFF BOTTOM THROUGHOUT - GAS TO SURFACE IN 10 MINUTES - GAUGED 13.1 MCF - FSI: OFF BOTTOM THROUGHOUT		

Recovery - Total Feet	1090	Flush Tool?	NO
Rec.	1090	Feet of	GASSY DRILLING MUD
Rec.	0	Feet of	
Rec.	0	Feet of	
Rec.	0	Feet of	
Rec.	0	Feet of	

BHT	132	°F Gravity	88	°API @	0	°F Corrected Gravity	0	°API
RW	.28	@	88	°F Chlorides	19000	ppm Recovery	Chlorides 1300	ppm System 4200
(A) Initial Hydrostatic Mud	3405	PSI	Ak1 Recorder No.	5495	Range			
(B) First Initial Flow Pressure	468.4	PSI	@ (depth)	6470	w/Clock No.	8376		
(C) First Final Flow Pressure	597.3	PSI	Ak1 Recorder No.	13337	Range	3975		
(D) Initial Shut-In Pressure	3027.5	PSI	@ (depth)	6647	w/Clock No.	25814		
(E) Second Initial Flow Pressure	592.3	PSI	Ak1 Recorder No.	2023	Range	4000		
(F) Second Final Flow Pressure	653.2	PSI	@ (depth)	6941	w/Clock No.	17640		
(G) Final Shut-In Pressure	2944.2	PSI	Initial Opening	30				
(H) Final Hydrostatic Mud	3113.2	PSI	Initial Shut-In	60				
			Final Flow	120				
			Final Shut-In					

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STATE CORPORATION COMMISSION

CONSERVATION DIVISION
Wichita, Kansas

MR TOM HORACEK

1050

Our Representative _____

TOTAL PRICE \$ _____

INVOICE TO:
 P.O. BOX 951046
 DALLAS, TX 75395-1046

HALLIBURTON SERVICES

A Halliburton Company

INVOICE

INVOICE NO.	DATE
990408	07/09/1990

WELL LEASE NO./PLANT NAME		WELL/PLANT LOCATION		STATE	WELL/PLANT OWNER
LIBERAL 1-31		SEWARD		KS	SAME
SERVICE LOCATION	CONTRACTOR	JOB PURPOSE		TICKET DATE	
LIBERAL	H-30 DRLG #1	CEMENT PRODUCTION CASING		07/09/1990	
ACCT. NO.	CUSTOMER AGENT	VENDOR NO.	CUSTOMER P.O. NUMBER	SHIPPED VIA	FILE NO.
273943	V W MCKNAB II			COMPANY TRUCK	98128

CONFIDENTIAL

ENSIGN OPERATING COMPANY
 P O BOX 937
 GARDEN CITY, KS 67846

DIRECT CORRESPONDENCE TO:
 SUITE 600
 COLORADO DERBY BUILDING
 WICHITA, KS 67202-0000

RELEASED

PRICE REF. NO.	DESCRIPTION	QUANTITY	U/M	UNIT PRICE	AMOUNT
	PRICING AREA - MID CONTINENT				
000-117	MILEAGE FROM CONFIDENTIAL	5	MI	2.35	11.75
		1	UNT		
001-016	CEMENTING CASING	6938	FT	1,550.00	1,550.00
		1	UNT		
5A	FLOAT SHOE 4-1/2" 8RD SS II	1	EA	168.00	168.00
837.00100	FLUIDMASTER CENTRALIZER 4 1/2"	10	EA	42.00	420.00
807.93504	FASGRIP LIMIT CLAMP 4 1/2"	1	EA	9.60	9.60
807.64021	HALLIBURTON WELD-A	1	LB	11.00	11.00
890.10802	4 1/2" LATCH DOWN BAFFLE	1	EA	100.00	100.00
801.03734	3-WIPER L-D PLUG - 4 1/2"	1	EA	159.00	159.00
801.0373	SUPER FLUSH	10	SK	74.00	740.00
8-317	CLAYFIX II	3	GAL	20.00	60.00
4-163	PREMIUM CEMENT	370	SK	6.85	2,534.50
4-043	HALAD-322	244	LB	5.75	1,403.00
7-775	POTASSIUM CHLORIDE	400	LB	.25	100.00
8-002	SUPER CBL	87	LB	21.50	1,870.50
0-959	BULK SERVICE CHARGE	370	CFT	1.10	407.00
0-207	MILEAGE CMTG MAT DEL OR RETURN	532.680	TMI	.75	399.51
0-306					

INVOICE SUBTOTAL	9,943.86
DISCOUNT-(BID)	1,988.77-
INVOICE BID AMOUNT	7,955.09
*-KANSAS STATE SALES TAX	257.79
***** CONTINUED ON NEXT PAGE *****	

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 STATE OF KANSAS COMMISSION
 SEP 6 1990
 CONSERVATION DIVISION
 Wichita, Kansas

TERMS INVOICES PAYABLE NET BY THE 20TH OF THE FOLLOWING MONTH AFTER DATE OF INVOICE. UPON CUSTOMER'S DEFAULT IN PAYMENT OF CUSTOMER'S ACCOUNT BY THE LAST DAY OF THE MONTH FOLLOWING THE MONTH IN WHICH THE INVOICE IS DATED, CUSTOMER AGREES TO PAY INTEREST THEREON AFTER DEFAULT AT THE HIGHEST LAWFUL CONTRACT RATE APPLICABLE BUT NEVER TO EXCEED 18% PER ANNUM. IN THE EVENT IT BECOMES NECESSARY TO EMPLOY AN ATTORNEY TO ENFORCE COLLECTION OF SAID ACCOUNT, CUSTOMER AGREES TO PAY ALL COLLECTION COSTS AND ATTORNEY FEES IN THE AMOUNT OF 20% OF THE AMOUNT OF THE UNPAID ACCOUNT.

ORIGINAL



P.O. BOX 951046
DALLAS, TX 75395-1046

INVOICE

HALLIBURTON SERVICES

CONFIDENTIAL

A Halliburton Company

INVOICE NO.	DATE
990408	07/09/1990

WELL LEASE NO./PLANT NAME		WELL/PLANT LOCATION		STATE	WELL/PLANT OWNER
LIBERAL 1-31		SEWARD		KS	SAME
SERVICE LOCATION		CONTRACTOR	JOB PURPOSE		TICKET DATE
LIBERAL		H-30 DRLG #1	CEMENT PRODUCTION CASING		07/09/1990
ACCT. NO.	CUSTOMER AGENT	VENDOR NO.	CUSTOMER P.O. NUMBER	SHIPPED VIA	FILE NO.
273943	V W MCKNAB II			COMPANY TRUCK	98128

ENSIGN OPERATING COMPANY
P O BOX 937
GARDEN CITY, KS 67846

PAID
AUG 23 1990

DIRECT CORRESPONDENCE TO:
SUITE 600
COLORADO DERBY BUILDING
WICHITA, KS 67202-0000

PRICE REF. NO.	DESCRIPTION	QUANTITY	U/M	UNIT PRICE	AMOUNT
	*-SEWARD COUNTY SALES TAX				60.66
	<p>RECEIVED JUL 20 1990 ENSIGN OIL & GAS INC.</p> <p>ORIGINAL</p> <p>957.070 900018</p> <p>RECEIVED STATE CORPORATION COMMISSION JUL 20 1990 CONSERVATION DIVISION Wichita, Kansas</p> <p>LT# 7/20/90 7070</p>			4-848	<p>RELEASED OCT 09 1991 FROM CONFIDENTIAL</p>
INVOICE TOTAL - PLEASE PAY THIS AMOUNT =====>					\$8,273.54

TERMS INVOICES PAYABLE NET BY THE 20TH OF THE FOLLOWING MONTH AFTER DATE OF INVOICE. UPON CUSTOMER'S DEFAULT IN PAYMENT OF CUSTOMER'S ACCOUNT BY THE LAST DAY OF THE MONTH FOLLOWING THE MONTH IN WHICH THE INVOICE IS DATED, CUSTOMER AGREES TO PAY INTEREST THEREON AFTER DEFAULT AT THE HIGHEST LAWFUL CONTRACT RATE APPLICABLE BUT NEVER TO EXCEED 18% PER ANNUM. IN THE EVENT IT BECOMES NECESSARY TO EMPLOY AN ATTORNEY TO ENFORCE COLLECTION OF SAID ACCOUNT, CUSTOMER AGREES TO PAY ALL COLLECTION COSTS AND ATTORNEY FEES IN THE AMOUNT OF 20% OF THE AMOUNT OF THE UNPAID ACCOUNT.