

GEOLOGICAL DEPARTMENT
SOUTHWESTERN GAS COMPANY
INDEPENDENCE, KANSAS

Company

S. T. R. 34-10-15 W.
County Osborne
State Kansas
Lease and Well No. Liggett #1
Worley farm

Contractor

Drilling
Commenced

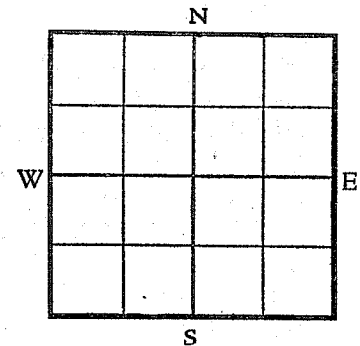
Drilling
Completed

Initial
Production

Initial Rock
Pressure

Location

Casing 481'-15 1/2" 826'-12 1/2"
1620'-10" set 2606'-8 1/2"
set 3507'-6-5/8"



Driller's Record of Formations

soapstone yellow soft	45	45	shale red	105	1192
shale blue soft	130	175	shale blue soft	38	1230
lime shale hard	2	177	shale red soft	74	1304
soapstone yellow soft	8	185	shale brown soft	26	1335
shale blue soft	45	230	shale blue soft	70	1345
shale gray soft	30	250	shells blue hard	3	1348
shale blue soft	55	315	shale blue soft	12	1360
sand gray soft	6	321	IBW		
lime white hard	9	330	shells blue hard	5	1365
shale gray soft	12	342	shale & salt blue soft	60	1425
lime white hard	3	345	salt light soft	57	1482
sand brown soft	6	405	shale salt blue soft	7	1495
lime shells white hard	2	406	salt light soft	115	1610
shale white soft	5	412	shale blue soft	30	1640
lime shells white hard	2	414	lime grey	3	1643
soapstone white soft	12	426	shale blue	5	1648
red rock soft	20	446	lime grey	2	1650
sand gray soft	8	454	shale light	18	1668
red shale hard shells	21	475	lime grey	4	1672
shale light soft	15	490	shale light	6	1678
shale red soft	20	510	lime and shale white	64	1742
sandy shale light soft	15	525	shale red	18	1760
shale blue soft	5	530	lime shells & shale		
lime white soft	31	568	white	85	1845
lime gritty light medium	12	580	shale red	30	1875
shale blue soft	10	590	lime shells white	50	1925
sand gray soft	15	605	sand grey soft IBW		
lime grey medium	5	610	per hour	15	1940
lime and Pyritese iron hard	33	643	lime blue & grey hard	55	1995
sand brown hard	7	650	shale blue soft	30	2025
lime and iron hard	10	660	red rock hard	45	2070
sandy shale brown	35	695	lime gritty black hard	10	2080
lime gritty white hard	15	710	shale & shells red soft		
sand brown soft	10	720		85	2165
blue shale 20-1 BW at 900'	29	740	shale light soft	40	2205
red rock hard	5	745	shale red bad cave	20	2225
lime and Pyritese gray hard	52	750	shale red soft	10	2235
shale red soft water at 980	20	770	shale light soft	10	2245
lime gray hard 4B per hr. 25%	1027		shells gritty	12	2258

over

shale light 42
 shale red 7
 shale gray soft 85
 shale white 8
 shale blue soft 55
 shale grey soft 10
 shale grey soft 15
 shells light medium 8
 shale thin shells gray 117
 lime white hard 10
 shale blue soft 40
 shale & lime shells 15
 shale blue soft 27
 lime shale 53
 shale dard 5
 shale blue 39
 shale & lime shells 35
 lime white hard 66
 sandy lime 14
 lime white hard 15
 shale blue 5
 lime 30
 at 2930 1BW per hour
 shale blue 12
 sandy lime 33
 sand light 15
 sand dark 16
 sandy lime 9
 shale black 5
 sandy lime 6
 shale light 8
 lime 5
 shale pink 10
 lime 1 1/2
 lime 10
 shale brown 13
 lime 17
 shale brown 10
 from 3120 to 3125
 lime 32
 lime and shale 23
 lime gritty 11
 shale 4
 lime grey 35
 shale blue 5
 at & oil at 3170-3175
 lime shale 10
 shale black 15
 lime 11
 shale black 6
 lime 30

2300
 2307
 2400
 2315
 2455
 2465
 2480
 2488
 2605
 2615
 2655
 2670
 2697
 2750
 2755
 2785
 2820
 2886
 2900
 2915
 2920
 2950
 2962
 2994
 3010
 3026
 3035
 3040
 3046
 3054
 3059
 3069
 3070
 3080
 3093
 3110
 3120
 3152
 3175
 3186
 3190
 3225
 3228
 3238
 3263
 3264
 3270
 3300

shale blue 10
 lime 17
 shale blue 9
 lime 14
 shale blue 14
 lime 6
 shale blue 24
 lime 5
 shale brown cave 8
 lime 5
 shale pink 25
 shell 2
 shale pink 3
 sand water 7
 shale 2 BW per M.
 shale white 2
 sand hard gritty 7
 sand pink 21
 broken rock 29
~~broken rock~~
 shells & brown rock 13
 green hard rock 10
 sand gray 8
 shale green with lime
 shells 30
 sandy lime 30
 shale brown 4
 total depth 3602
 abandoned.

Note: Run 826'-15 1/2" casing &
 Underreamed at 1034

show of oil and gas

2 1/2 BW 3141
 HPW
 good show gas
 & oil 3145 to 3155
 good show gas

3310
 3327
 3336
 3350
 3364
 3371
 3395
 3400
 3402 c
 34
 3434
 3436
 3439
 34
 3448
 3455
 3476
 3505
 3518
 3528 s
 3536
 3566
 3596
 3600
 3602 dry &