Marc A. Downing

Consulting Petroleum Geologist

Geologic Report

Drilling Time and Sample Log

Operator **Downing-Nelson Oil Co., Inc.**

Lease **Heberlein** No. **1-25**

API # **15-195-23048-0000**

Field **Flax**

Location **1662' FSL & 335' FWL**

Sec. **25** Twp. **13s** Rge. **21w**

County **Trego** State **Kansas**

Elevation

KB	**2335**
DF	**2333**
GL	**2327**

Casing Record

Surface
8 5/8" @ 220'
Production
5 1/2" @ 4106'

Electrical Surveys

CNDL, DIL
MEL, Sonic

Formation	Sample tops	Log Tops	Datum	Struct Comp
Top Anhydrite	1678	1676	+659	-4
Base Anhydrite	1720	1717	+618	FL
Topeka	3366	3364	-1029	+2
Heebner	3598	3598	-1263	FL
Toronto	3616	3614	-1279	-1
LKC	3636	3635	-1300	+1
BKC	3884	3880	-1545	+2
Marmaton	3949	3946	-1611	+3
Cherokee Sh	3988	3986	-1651	+3
Re-worked Arbuckle	3998	3998	-1663	Absent
Arbuckle	4013	4011	-1676	-1
Total Depth	4108	4107	-1772	

Reference Well For Structural Comparison **Landes Exploration & Sentinel Resources**
Dinkel #1_____SE NW SW_____Sec. 25-13s-21w

Drilling Contractor		**Discovery Drilling, Rig #4**		
Commenced	**6-2-18**	Completed		**6-9-18**
Samples Saved From		**3350**	To	**RTD**
Drilling Time Kept From		**3250**	To	**RTD**
Samples Examined From		**3350**	To	**RTD**
Geological Supervision From		**3350**	To	**RTD**

Summary and Recommendations

Due to structural position, DST recovery, and log evaluation, it was decid
to set 5 1/2" production casing for completion.

Respectfully Submitted,

Marc A. Downing

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ROCK TYPES

▨ Dolprim	▨ Lmst fw7>	▨ Carbon Sh
▨ Dolsec	▨ shale, gry	▨ shale, red

ACCESSORIES

MINERAL
- ▲ Chert, dark
- △ Chert White

STRINGER
- ▬ Limestone
- ▬ Shale
- ▬ red shale

OTHER SYMBOLS

OIL SHOWS
- ● Even Stn
- ● Spotted Stn 50 - 75 %
- ◑ Spotted Stn 25 - 50 %
- ◔ Spotted Stn 1 - 25 %
- ○ Questionable Stn
- D Dead Oil Stn
- ■ Fluorescence

MISC
- Daily Report
- Digital Photo
- Document
- Folder
- Link
- Vertical Log File
- Horizontal Log File
- Core Log File
- Drill Cuttings Rpt

DST
- ■ DST Int
- ■ DST alt
- ■ Core
- ‖ tail pipe

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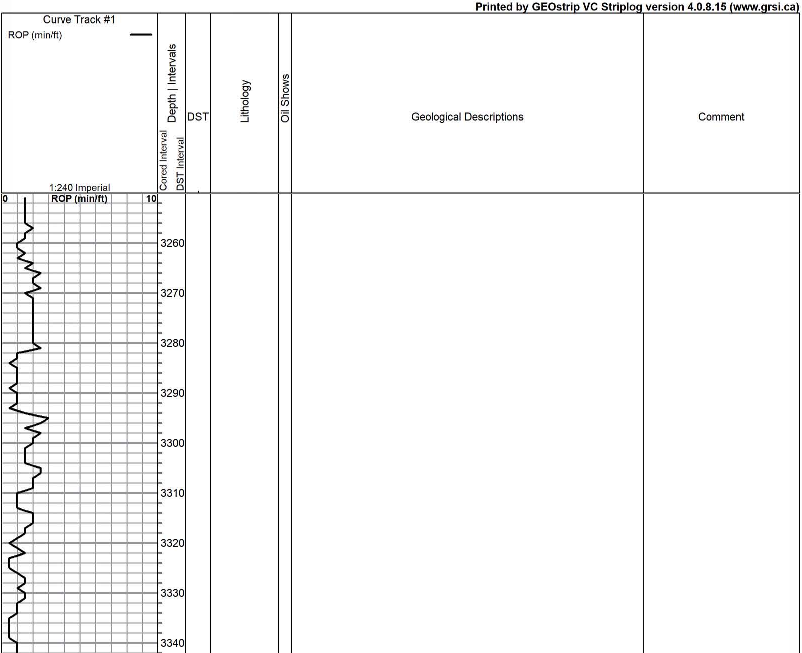
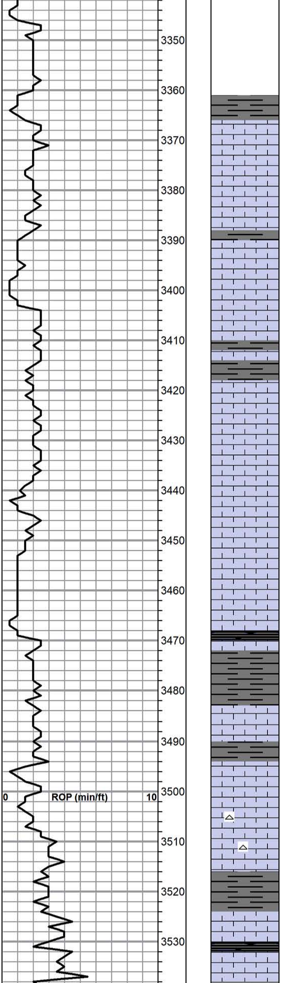




Topeka 3366 (-1031)

LS: wht-tan, md xln, scat foss. Sub-xln in prt, mostly pr por and dns. All NS, no od.

Sh: gry

LS: wht, fn xln. Scat int xln por, many chlky rx. Totally barren, no od.

LS: trng pr por and dns.

Sh: drk gry

Sh: gry

LS: tan-wht, fn-md xln, subxln in prt. Scat foss, trng pr por and dns. All NS.

LS: wht, fn xln, v chlky, NS. Trng tan-brn, foss and dns w/ pr por.

LS: tan-wht, fn-md xln, suc in prt, scat foss, few mtld rx. Gd int xln por w/ scat vugs, chlky in prt. All totally barren, no od.

Sh: Black Carb

Sh: gry w/ brn

LS: tan, fn xln, pr por and dns. Tan-brn foss cht.

Sh: gry

LS: wht, fn-vfn xln, subxln-chlky, scat fr ooc por, all NS and no od.

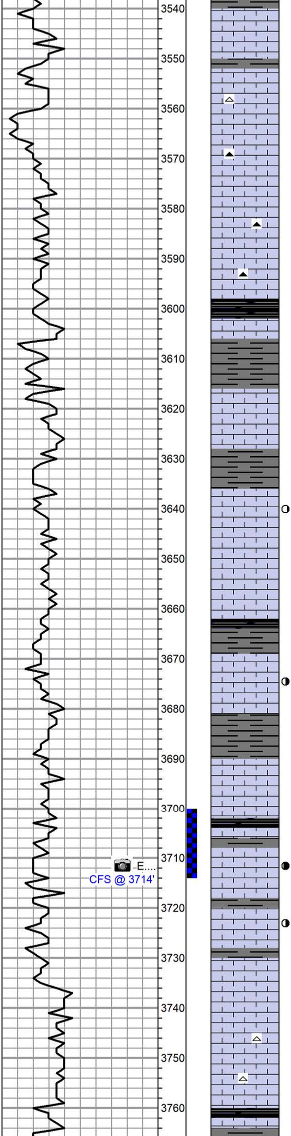
LS: wht, fn xln. Trng pr por and dns, scat foss and tan cht. NS.

Sh: gry

LS: tan, md xln, dns.

Sh: Black Carb

LS: tan, md xln and dns, scat tan cht.



LS: wht, md xln. Fr vug and int xln por, chlky in prt. All NS, no od.

Sh: gry

LS: wht-tan, much ala, fr-gd vug por, chlky, NS. Scat tan foss cht.

LS: wht, fn-md xln. Scat int xln por, mostly subxln-chlky. tan shp cht, foss in prt. All NS, no od.

LS: trng tan-brn, fn-md xln, pr por and dns. Foss in prt w/ scat tan and brn cht.

LS: ala, few rx sltly mtld.

__Heebner 3598 (-1263)__

Sh: Black Carb

Sh: gry

__Toronto 3616 (-1281)__

LS: wht, md xln, mostly dns. Few subxln rx, all NS w/ no od.

Sh: gry

__LKC 3636 (-1301)__

LS: wht, md xln, ool. Fr int ool por, 3-4 rx w/ pr stn in por, NSFO, no od.

LS: wht, fn xln, pr por and v dns. All NS.

Sh: Black Carb

Sh: gry

LS: wht, md-lrg ool and frag foss. Pr-fr int ool por, few sml vugs. Pr-fr stn in por, rare SFO, fnt-no od. Scat chlky rx w/ NS.

Sh: gry

LS: 1-2 rx ala, poss carry. Trng pr por and dns, mostly barren w/ no od.

DST #1
3700-3714
30-30-30-30
I.F. - Surf, flush, surf
F.F. - surf, flush, surf
IFP: 37-38
FFP: 40-54
SIP: 330-327
HP: 1789-1756
Rec:
80' mud
BHT: 113

Sh: Black Carb

LS: wht-tan, fn-md xln, few frag foss, dolomitic in prt. Fr intxln por, 3-4 rx w/ fr lt brn sat stn and spttd SFO. Many subxln-chlky barren rx. Fr-gd od.

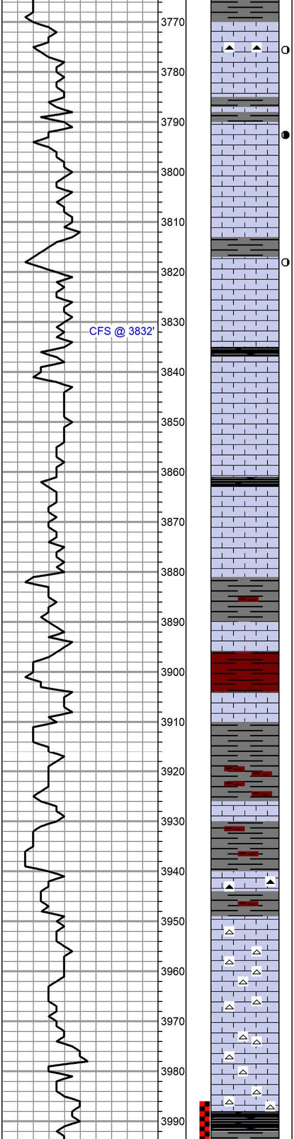
LS: wht, fn suc xln. Fr-gd int xln por, hvy black stn w/ spttd SFO. Fr amt barren chlky rx, Fr-gd od.

Sh: gry

LS: wht, fn xln, mostly subxln-chlky and barren. Scat gd vug por w/ fr sat stn and fr SFO. 1-2 rx w/ dead blk stn, gd od.

LS: wht, fn xln. Pr por and dns, scat wht-tan shp cht. All NS and no od.

Sh: Black Carb



Sh: gry w/ brn

LS: tan-wht, fn-md xln. Mostly dns w/ pr por and barren. 2-3 rx w/ hvy blk stn, NSFO, no od. Fr amt tan-gry foss cht, shp.

Sh: drk gry

LS: wht-tan, fn xln. 3-4 rx w/ fr-gd sat stn and fr SFO in fr pp por. 2-3 rx w/ md ool, fr int ool por, uneven stn and sptd SFO. Lt-fr od. Trng dns w/ pr por.

Sh: gry

LS: wht, fn-vfn xln. 2-3 rx w/ pr vug por, fr hvy blk stn and sptd SFO w/ no od. Mostly subxln-chlky and totally barren.

Sh: Black Carb

LS: wht, vfn xln, chlky, NS. Trng v dns w/ no vis por, all totally barren.

LS: wht-lt tan, fn xln and v dns. NS.

Sh: Black Carb

LS: wht-tan, some lt gry, fn xln. V dns w/ no vis por, all NS.

BKC 3881 (-1546)

Sh: gry w/ brn

LS: wht, fn xln, dns.

Sh: brn w/ gry

LS: ala, no vis por.

Sh: gry and trng brn, some arg in prt.

LS: tan, md xln, pr por.

Sh: gry w/ brn.

LS: ala w/ scat org cht.

Marmaton 3949 (-1614)

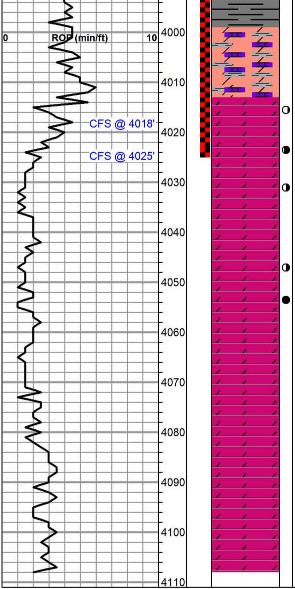
LS: wht, fn xln. Scat org and wht cht, shp. All pr por and v dns. Few rx w/ sptd stn, NSFO, no od.

LS: ala, cht trng wht and org. Scat frac por and pp por w/ uneven stn, rare sptd SFO, fnt-no od.

Cherokee Sh 3988 (-1653)

Sh: Black Carb

DST #2
3986-4025
15-30-15-30



Re-worked Arbuckle 3998 (-1663)

1-2 pcs dolomite, md rhom xln. Mostly wht LS w/ much gry sh, scat cht. All NS.

Arbuckle 4013 (-1678)

Dolo: wht, mostly fn suc xln w/ scat sml-md rhombs, fr amt wht LS. 2-3 rx w/ fr stn and spttd SFO in fr vug por, rest barren, some resid stn. Fnt od.

Dolo: wht, md-crs rhom xln. Fr-gd int xln por w/ scat vugs, Fr lt brn sat stn, fr SFO. Many rx w/ pr shows, fr od.

Dolo: wht, md-crs rhom xln, trng sandy in prt. Gd vug por, scat fr sat stn w/ fr SFO, many rx w/ pr show, fr amt barren. lt od.

Dolo: wht, trng fn-md suc xln, sndy in prt. Fr-gd int xln por, sml vugs. Moslty barren, scat pr stn and SFO, lt-fnt od. Scat md rhombs.

Dolo: wht, fn-md suc xln, v sandy. 2-3 SS clust, fn grain, fr rnd, well sort. Gd int gran and vug por, fr-gd sat stn w/ gd SFO. Scat crs rhomb rx w/ fr show, fnt od. Many chlky rx w/ depth.

Dolo: wht, fn-vfn suc xln, sndy in prt. Scat int xln por, mostly tight and dns. Trng totally barren w/ no od, scat wht shp cht.

Dolo: Mostly ala, pr por and dns, vfn suc xln, totally barren.

Dolo: ala, chlky in prt.

Total Depth 4108 (-1773)

I.F. - BOB 1 min / No SIB
F.F. - BOB 2 min / No SIB
IFP: 120-369
FFP: 348-547
SIP: 1187-1176
HP: 2006-1925
Rec:
95' GIP
1236' GWMCO (15%g, 40% o, 30%w)
BHT: 127 G = 32 Chlor: 14K