LITHOLOGY STRIP LOG

WellSight Systems

Scale 1:240 (5"=100') Imperial
Measured Depth Log

Well Name:	**HIGH SIERRA WATER SERVICES SWD C7B**		
Location:	**Sec. 34, T7N, R63W, Weld County, Colorado**		
License Number:	**API No. 05-123-34520 0000**	**Region:**	**DJ Basin**
Spud Date:	**10/2/13**	**Drilling Completed:**	**10/30/13**
Surface Coordinates:	**2,526' FSL, 188' FEL (SESE)**		
Bottom Hole Coordinates:	**2,444' FSL, 180' FEL (NESE)**		
Ground Elevation (ft):	**4,715'**	**K.B. Elevation (ft):**	**4,732'**
Logged Interval (ft):	**6,387'** **To: 10,169'DTL**	**Total Depth (ft):**	**10,169' LTD**
Formation:	**Niobrara - Fountain Fm**		
Type of Drilling Fluid:	**Chemical-Gel**		

Printed by WellSight Log Viewer from WellSight Systems 1-800-447-1534 www.WellSight.com

OPERATOR

Company: High Sierra Water Services, LLC
Address: 8207 W. 20th Street - Suite B
Greeley, CO 80634
USA

GEOLOGIST

Name: Louise Kiteley
Company: Louise M. Kiteley, PG-1715, (WY) Professional Geologist
Address: 5221 WCR 16 3/4, Longmont, CO 80504, Ph: 303-263-5122, Email: l.kiteley@gmail.com

Comments

1) Mud data in Geologic Descriptions Track, Format: mw-vis-f-pH-chlor-%solids.
2) Open hole logs by SCHLUMBERGER (INTERMED CSG PT) GR, DCAL, SP, RLL3, RILM, RILD, DPOR, CNPOR) & SWS (TD) (GR, HCAL, SP, AHT10, AHT30, AHT90, DPHZ, NPOR, PEFZ)
3) Vertical Injection Well, ROP shifted ___' above intermediate casing pt (not shifted below casing pt), and is on depth with open hole logs, which is on depth with this striplog. Formation tops correlate with formations and E-log curves identified in the High Sierra C7A well.
4) Contractor: Kauffman No. 2 drilling rig.

ROCK TYPES

ACCESSORIES

MINERAL
- Anhy
- Arggrn
- Arg
- Bent
- Bit
- Brecfrag
- Calc
- Carb
- Chtdk
- Chtlt
- Dol
- Feldspar
- Ferrpel
- Ferr
- Glau
- Gyp
- Hvymin
- Kaol
- Marl
- Minxl
- Nodule
- Phos
- Pyr
- Salt
- Sandy
- Silt
- Sil
- Sulphur
- Tuff

FOSSIL
- Algae
- Amph
- Belm
- Bioclst
- Brach
- Bryozoa
- Cephal
- Coral
- Crin
- Echin
- Fish
- Foram
- Fossil
- Gastro
- Oolite
- Ostra
- Pelec
- Pellet
- Pisolite
- Plant
- Strom

STRINGER
- Anhy
- Arg
- Bent
- Coal
- Dol
- Gyp
- Ls
- Mrst
- Sltstrg
- Ssstrg

TEXTURE
- Boundst
- Chalky
- Cryxln
- Earthy
- Finexln
- Grainst
- Lithogr
- Microxln
- Mudst
- Packst
- Wackest

OTHER SYMBOLS

POROSITY TYPE
- Earthy
- Fenest
- Fracture
- Inter
- Moldic
- Organic
- Pinpoint
- Vuggy

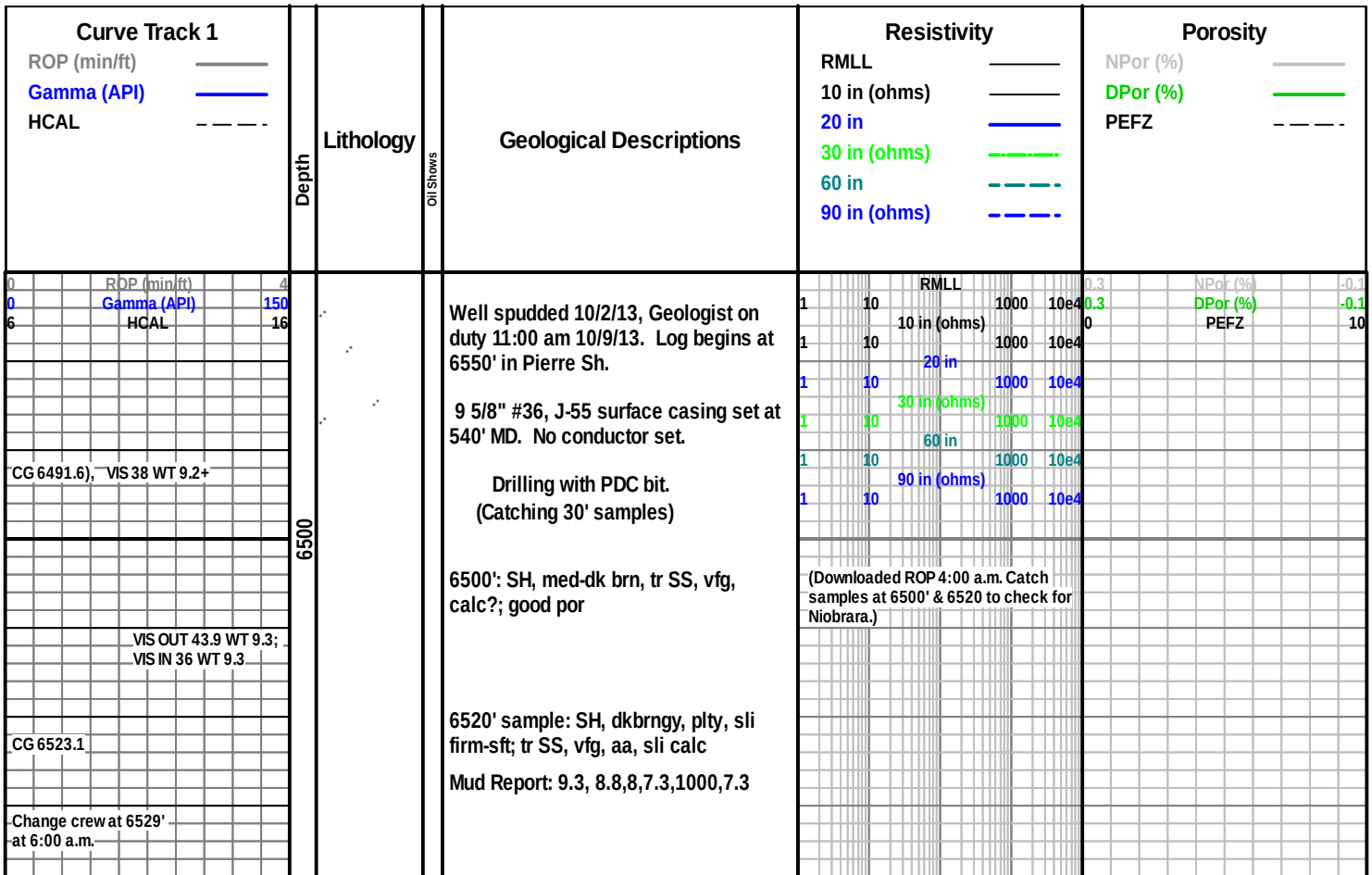
SORTING
- Well
- Moderate
- Poor

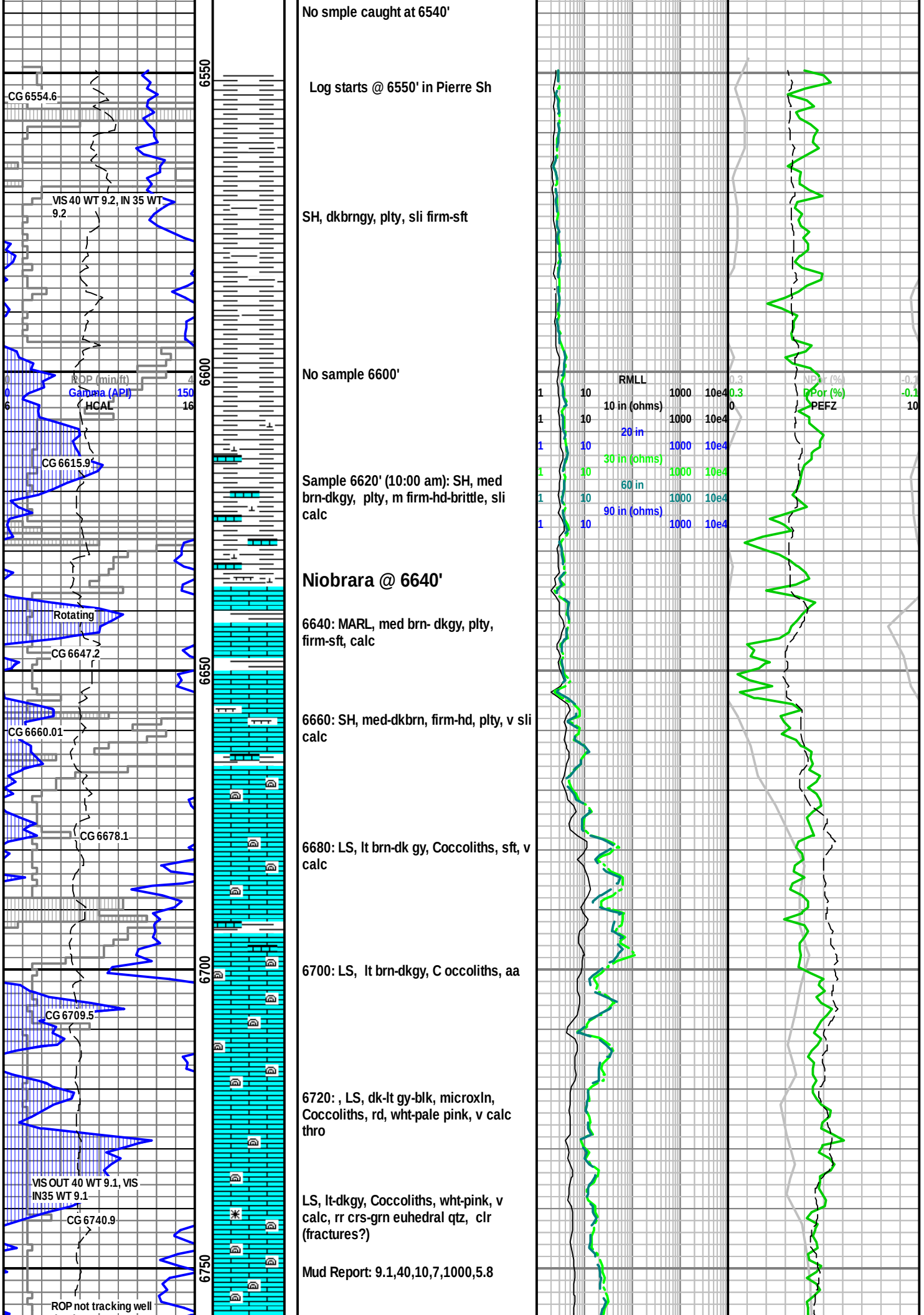
ROUNDING
- Rounded
- Subrnd
- Subang
- Angular

OIL SHOWS
- Even
- Spotted
- Ques
- Dead

INTERVALS
- Core
- Dst

EVENTS
- Rft
- Sidewall





No smple caught at 6540'

Log starts @ 6550' in Pierre Sh

SH, dkbrngy, plty, sli firm-sft

No sample 6600'

Sample 6620' (10:00 am): SH, med brn-dkgy, plty, m firm-hd-brittle, sli calc

Niobrara @ 6640'

6640: MARL, med brn- dkgy, plty, firm-sft, calc

6660: SH, med-dkbrn, firm-hd, plty, v sli calc

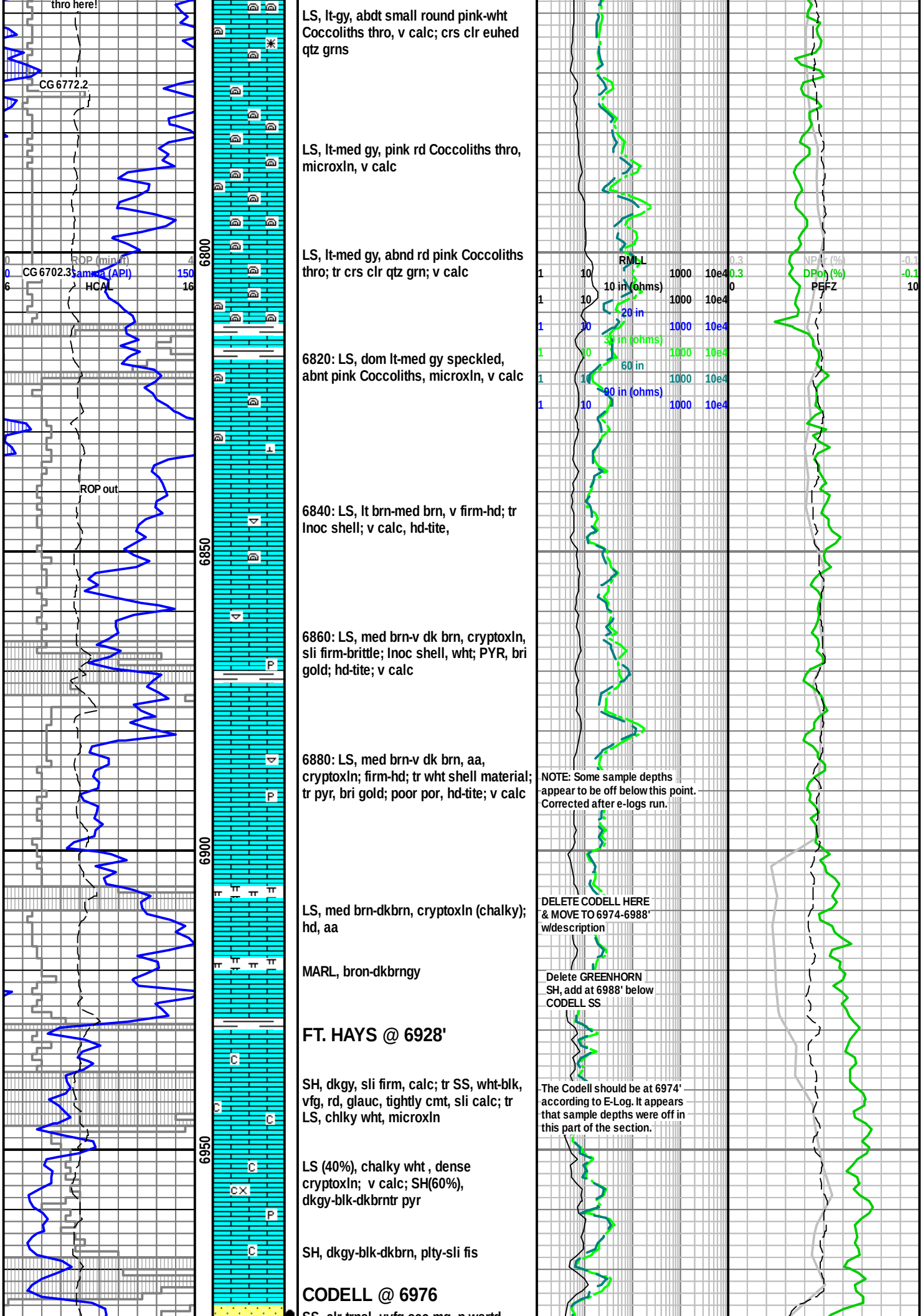
6680: LS, lt brn-dk gy, Coccoliths, sft, v calc

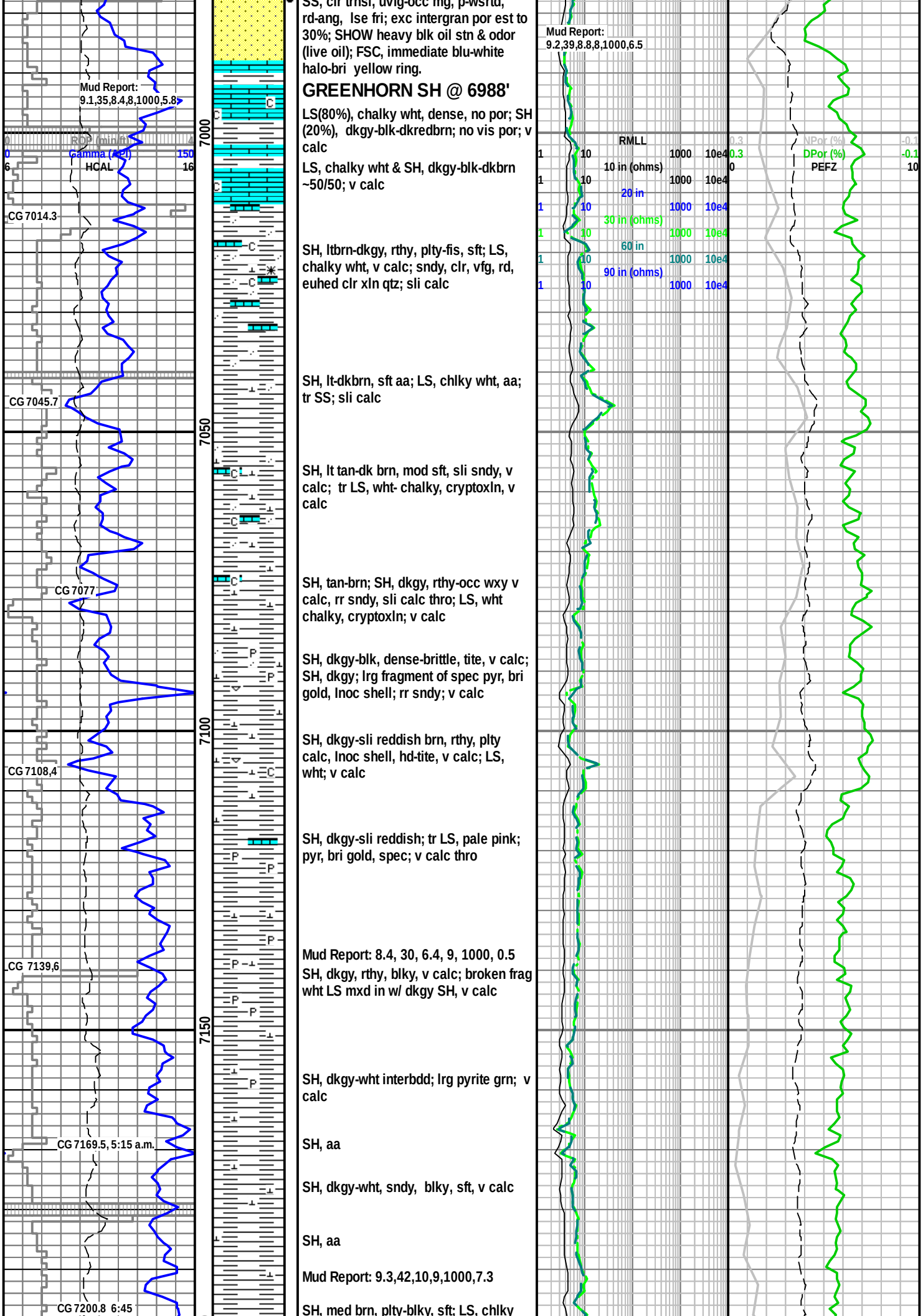
6700: LS, lt brn-dkgy, C occoliths, aa

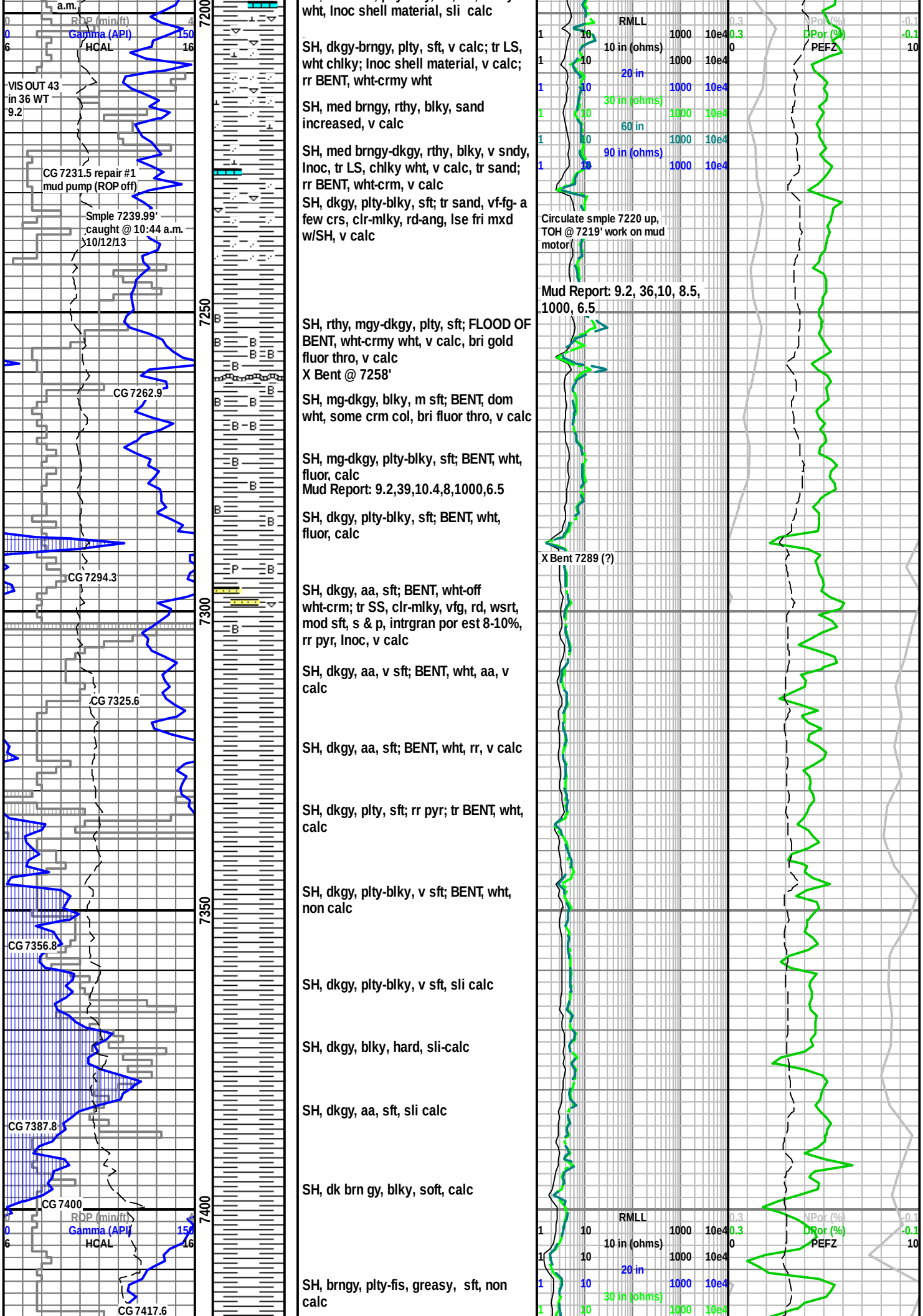
6720: , LS, dk-lt gy-blk, microxln, Coccoliths, rd, wht-pale pink, v calc thro

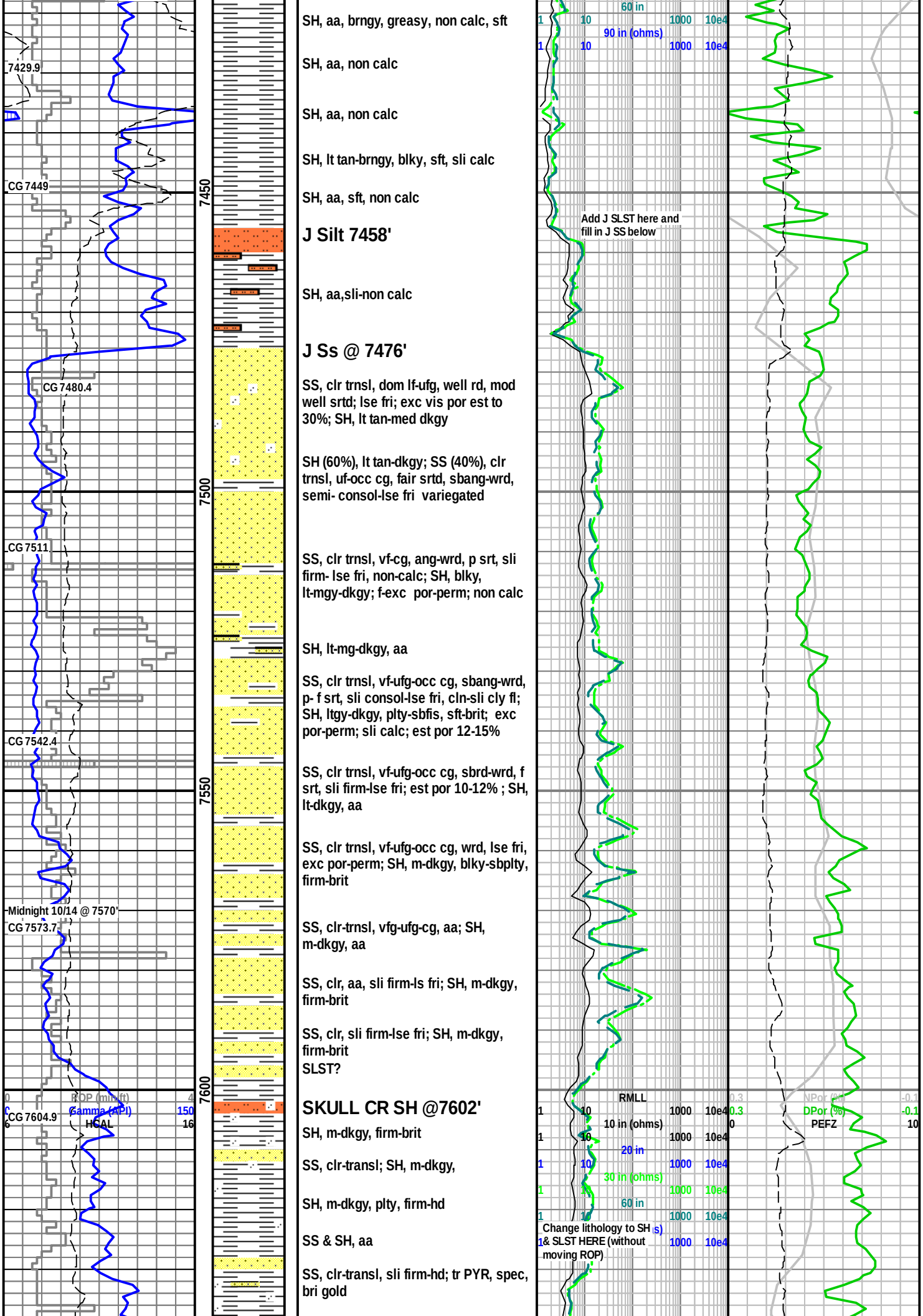
LS, lt-dkgy, Coccoliths, wht-pink, v calc, rr crs-grn euhedral qtz, clr (fractures?)

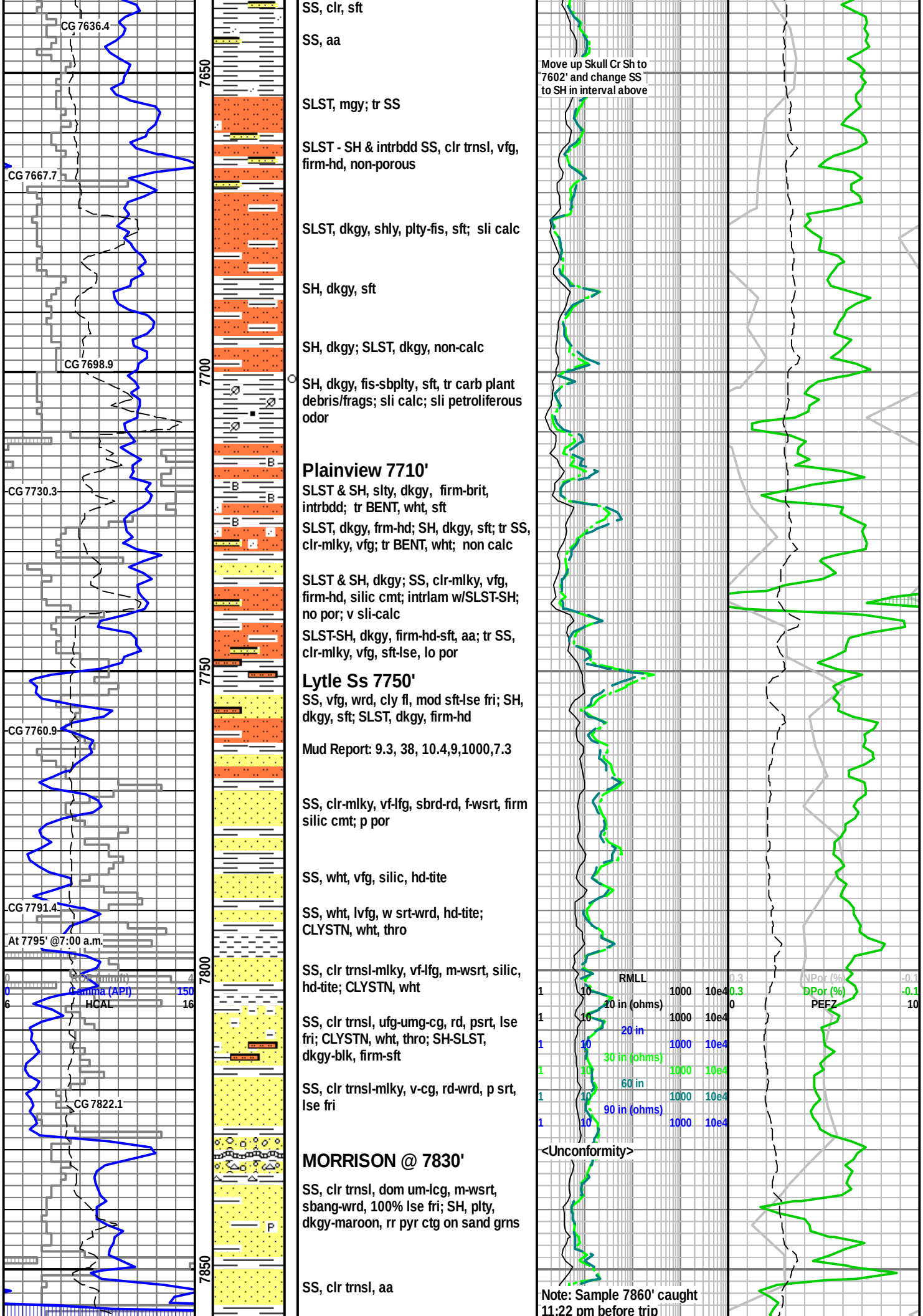
Mud Report: 9.1,40,10,7,1000,5.8

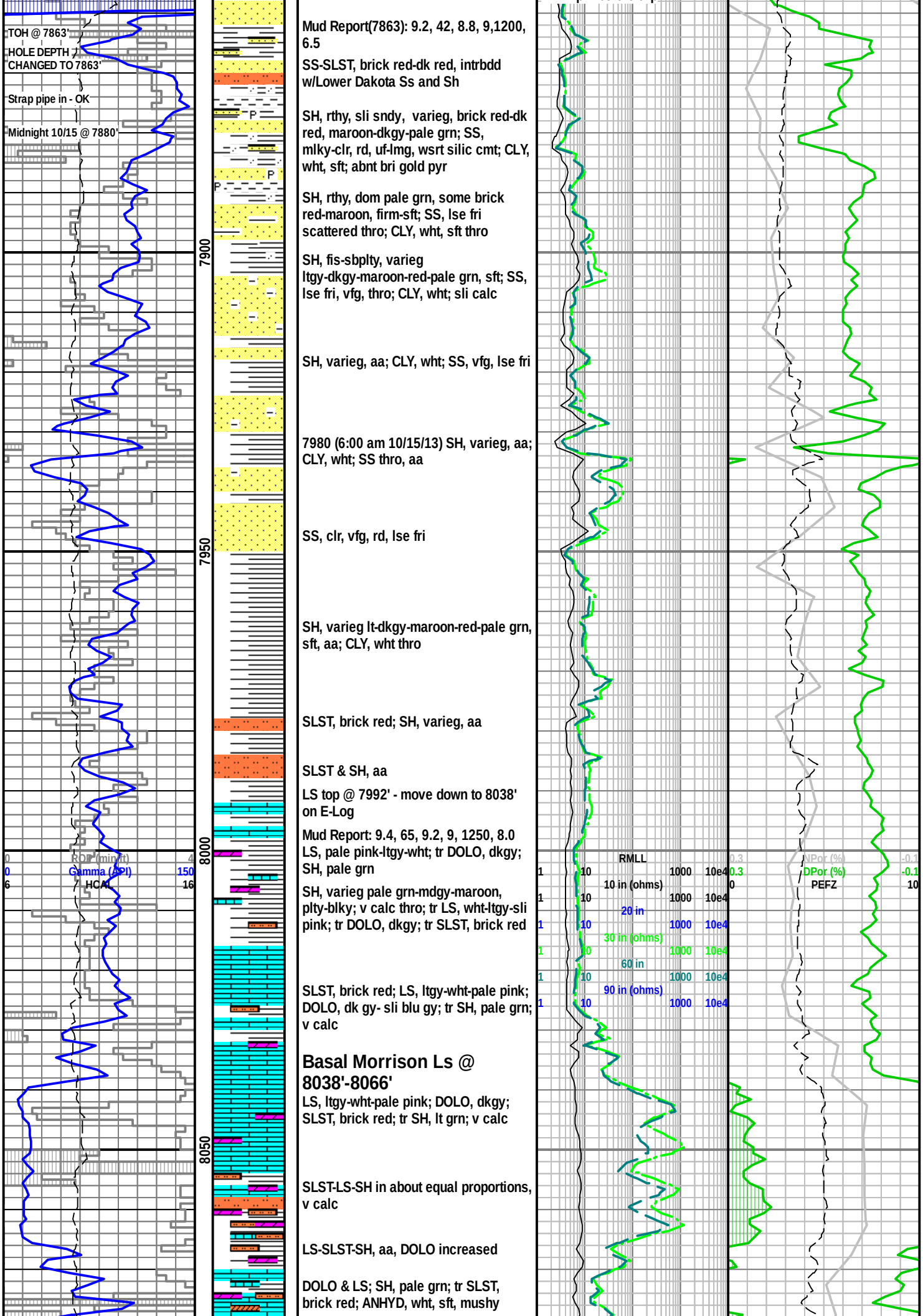

thro here!
CG 6772.2
ROP (min/ft)
CG 6702.3
Gamma (API)
HCAL
ROP out
6800
6850
6900
6950
RMLL
10 in (ohms)
20 in
30 in (ohms)
60 in
90 in (ohms)
NPHI (%)
DPOR (%)
PEFZ
LS, lt-gy, abdt small round pink-wht Coccoliths thro, v calc; crs clr euhed qtz grns
LS, lt-med gy, pink rd Coccoliths thro, microxln, v calc
LS, lt-med gy, abnd rd pink Coccoliths thro; tr crs clr qtz grn; v calc
6820: LS, dom lt-med gy speckled, abnt pink Coccoliths, microxln, v calc
6840: LS, lt brn-med brn, v firm-hd; tr Inoc shell; v calc, hd-tite,
6860: LS, med brn-v dk brn, cryptoxln, sli firm-brittle; Inoc shell, wht; PYR, bri gold; hd-tite; v calc
6880: LS, med brn-v dk brn, aa, cryptoxln; firm-hd; tr wht shell material; tr pyr, bri gold; poor por, hd-tite; v calc
LS, med brn-dkbrn, cryptoxln (chalky); hd, aa
MARL, bron-dkbrngy
FT. HAYS @ 6928'
SH, dkgy, sli firm, calc; tr SS, wht-blk, vfg, rd, glauc, tightly cmt, sli calc; tr LS, chlky wht, microxln
LS (40%), chalky wht , dense cryptoxln; v calc; SH(60%), dkgy-blk-dkbrntr pyr
SH, dkgy-blk-dkbrn, plty-sli fis
CODELL @ 6976
NOTE: Some sample depths appear to be off below this point. Corrected after e-logs run.
DELETE CODELL HERE & MOVE TO 6974-6988' w/description
Delete GREENHORN SH, add at 6988' below CODELL SS
The Codell should be at 6974' according to E-Log. It appears that sample depths were off in this part of the section.


Mud Report:
9.1,35,8.4,8,1000,5.8
ROP (min/ft)
0
Gamma (API)
150
6
HCAL
16
CG 7014.3
CG 7045.7
CG 7077
CG 7108,4
CG 7139,6
CG 7169.5, 5:15 a.m.
CG 7200.8 6:45
7000
7050
7100
7150
SS, clr trnsl, dvlg-occ mg, p-wsrtd, rd-ang, lse fri; exc intergran por est to 30%; SHOW heavy blk oil stn & odor (live oil); FSC, immediate blu-white halo-bri yellow ring.
GREENHORN SH @ 6988'
LS(80%), chalky wht, dense, no por; SH (20%), dkgy-blk-dkredbrn; no vis por; v calc
LS, chalky wht & SH, dkgy-blk-dkbrn ~50/50; v calc
SH, ltbrn-dkgy, rthy, plty-fis, sft; LS, chalky wht, v calc; sndy, clr, vfg, rd, euhed clr xln qtz; sli calc
SH, lt-dkbrn, sft aa; LS, chlky wht, aa; tr SS; sli calc
SH, lt tan-dk brn, mod sft, sli sndy, v calc; tr LS, wht- chalky, cryptoxln, v calc
SH, tan-brn; SH, dkgy, rthy-occ wxy v calc, rr sndy, sli calc thro; LS, wht chalky, cryptoxln; v calc
SH, dkgy-blk, dense-brittle, tite, v calc; SH, dkgy; lrg fragment of spec pyr, bri gold, lnoc shell; rr sndy; v calc
SH, dkgy-sli reddish brn, rthy, plty calc, lnoc shell, hd-tite, v calc; LS, wht; v calc
SH, dkgy-sli reddish; tr LS, pale pink; pyr, bri gold, spec; v calc thro
Mud Report: 8.4, 30, 6.4, 9, 1000, 0.5
SH, dkgy, rthy, blky, v calc; broken frag wht LS mxd in w/ dkgy SH, v calc
SH, dkgy-wht interbdd; lrg pyrite grn; v calc
SH, aa
SH, dkgy-wht, sndy, blky, sft, v calc
SH, aa
Mud Report: 9.3,42,10,9,1000,7.3
SH, med brn, plty-blky, sft; LS, chlky
Mud Report:
9.2,39,8.8,8,1000,6.5
RMLL
1
10
1000
10e4
10 in (ohms)
20 in
30 in (ohms)
60 in
90 in (ohms)
0.3
0
NPor (%)
-0.1
DPor (%)
PEFZ
10


a.m.
ROP (min/ft)
Gamma (API)
HCAL
VIS OUT 43
in 36 WT
9.2
CG 7231.5 repair #1
mud pump (ROP off)
Smple 7239.99'
caught @ 10:44 a.m.
10/12/13
CG 7262.9
CG 7294.3
CG 7325.6
CG 7356.8
CG 7387.8
CG 7400
CG 7417.6
7200
7250
7300
7350
7400
wht, lnoc shell material, sli calc
SH, dkgy-brngy, plty, sft, v calc; tr LS, wht chlky; lnoc shell material, v calc; rr BENT, wht-crmy wht
SH, med brngy, rthy, blky, sand increased, v calc
SH, med brngy-dkgy, rthy, blky, v sndy, lnoc, tr LS, chlky wht, v calc, tr sand; rr BENT, wht-crm, v calc
SH, dkgy, plty-blky, sft; tr sand, vf-fg- a few crs, clr-mlky, rd-ang, lse fri mxd w/SH, v calc
RMLL
10 in (ohms)
20 in
30 in (ohms)
60 in
90 in (ohms)
NPor (%)
DPor (%)
PEFZ
Circulate smple 7220 up, TOH @ 7219' work on mud motor
Mud Report: 9.2, 36,10, 8.5, 1000, 6.5
SH, rthy, mgy-dkgy, plty, sft; FLOOD OF BENT, wht-crmy wht, v calc, bri gold fluor thro, v calc
X Bent @ 7258'
SH, mg-dkgy, blky, m sft; BENT, dom wht, some crm col, bri fluor thro, v calc
SH, mg-dkgy, plty-blky, sft; BENT, wht, fluor, calc
Mud Report: 9.2,39,10.4,8,1000,6.5
SH, dkgy, plty-blky, sft; BENT, wht, fluor, calc
X Bent 7289 (?)
SH, dkgy, aa, sft; BENT, wht-off wht-crm; tr SS, clr-mlky, vfg, rd, wsrt, mod sft, s & p, intrgran por est 8-10%, rr pyr, lnoc, v calc
SH, dkgy, aa, v sft; BENT, wht, aa, v calc
SH, dkgy, aa, sft; BENT, wht, rr, v calc
SH, dkgy, plty, sft; rr pyr; tr BENT, wht, calc
SH, dkgy, plty-blky, v sft; BENT, wht, non calc
SH, dkgy, plty-blky, v sft, sli calc
SH, dkgy, blky, hard, sli-calc
SH, dkgy, aa, sft, sli calc
SH, dk brn gy, blky, soft, calc
SH, brngy, plty-fis, greasy, sft, non calc


7429.9
CG 7449
CG 7480.4
CG 7511
CG 7542.4
Midnight 10/14 @ 7570'
CG 7573.7
CG 7604.9
7450
7500
7550
7600
SH, aa, brngy, greasy, non calc, sft
SH, aa, non calc
SH, aa, non calc
SH, lt tan-brngy, blky, sft, sli calc
SH, aa, sft, non calc
J Silt 7458'
SH, aa,sli-non calc
J Ss @ 7476'
SS, clr trnsl, dom lf-ufg, well rd, mod well srtd; lse fri; exc vis por est to 30%; SH, lt tan-med dkgy
SH (60%), lt tan-dkgy; SS (40%), clr trnsl, uf-occ cg, fair srtd, sbang-wrd, semi- consol-lse fri variegated
SS, clr trnsl, vf-cg, ang-wrd, p srt, sli firm- lse fri, non-calc; SH, blky, lt-mgy-dkgy; f-exc por-perm; non calc
SH, lt-mg-dkgy, aa
SS, clr trnsl, vf-ufg-occ cg, sbang-wrd, p- f srt, sli consol-lse fri, cln-sli cly fl; SH, ltgy-dkgy, plty-sbfis, sft-brit; exc por-perm; sli calc; est por 12-15%
SS, clr trnsl, vf-ufg-occ cg, sbrd-wrd, f srt, sli firm-lse fri; est por 10-12% ; SH, lt-dkgy, aa
SS, clr trnsl, vf-ufg-occ cg, wrd, lse fri, exc por-perm; SH, m-dkgy, blky-sbplty, firm-brit
SS, clr-trnsl, vfg-ufg-cg, aa; SH, m-dkgy, aa
SS, clr, aa, sli firm-ls fri; SH, m-dkgy, firm-brit
SS, clr, sli firm-lse fri; SH, m-dkgy, firm-brit
SLST?
SKULL CR SH @7602'
SH, m-dkgy, firm-brit
SS, clr-transl; SH, m-dkgy,
SH, m-dkgy, plty, firm-hd
SS & SH, aa
SS, clr-transl, sli firm-hd; tr PYR, spec, bri gold
60 in
90 in (ohms)
Add J SLST here and fill in J SS below
RMLL
10 in (ohms)
20 in
30 in (ohms)
60 in
Change lithology to SH
& SLST HERE (without moving ROP)
ROP (min/ft)
Gamma (API)
HCAL
NPor (%)
DPor (%)
PEFZ


CG 7636.4
CG 7667.7
CG 7698.9
CG 7730.3
CG 7760.9
CG 7791.4
At 7795' @7:00 a.m.
CG 7822.1
ROP (min/ft)
0
4
Gamma (API)
0
150
HCAL
6
16
7650
7700
7750
7800
7850
SS, clr, sft
SS, aa
SLST, mgy; tr SS
SLST - SH & intrbdd SS, clr trnsl, vfg, firm-hd, non-porous
SLST, dkgy, shly, plty-fis, sft; sli calc
SH, dkgy, sft
SH, dkgy; SLST, dkgy, non-calc
SH, dkgy, fis-sbplty, sft, tr carb plant debris/frags; sli calc; sli petroliferous odor
Plainview 7710'
SLST & SH, slty, dkgy, firm-brit, intrbdd; tr BENT, wht, sft
SLST, dkgy, frm-hd; SH, dkgy, sft; tr SS, clr-mlky, vfg; tr BENT, wht; non calc
SLST & SH, dkgy; SS, clr-mlky, vfg, firm-hd, silic cmt; intrlam w/SLST-SH; no por; v sli-calc
SLST-SH, dkgy, firm-hd-sft, aa; tr SS, clr-mlky, vfg, sft-lse, lo por
Lytle Ss 7750'
SS, vfg, wrd, cly fl, mod sft-lse fri; SH, dkgy, sft; SLST, dkgy, firm-hd
Mud Report: 9.3, 38, 10.4,9,1000,7.3
SS, clr-mlky, vf-lfg, sbrd-rd, f-wsrt, firm silic cmt; p por
SS, wht, vfg, silic, hd-tite
SS, wht, lvfg, w srt-wrd, hd-tite; CLYSTN, wht, thro
SS, clr trnsl-mlky, vf-lfg, m-wsrt, silic, hd-tite; CLYSTN, wht
SS, clr trnsl, ufg-umg-cg, rd, psrt, lse fri; CLYSTN, wht, thro; SH-SLST, dkgy-blk, firm-sft
SS, clr trnsl-mlky, v-cg, rd-wrd, p srt, lse fri
MORRISON @ 7830'
SS, clr trnsl, dom um-lcg, m-wsrt, sbang-wrd, 100% lse fri; SH, plty, dkgy-maroon, rr pyr ctg on sand grns
SS, clr trnsl, aa
Move up Skull Cr Sh to 7602' and change SS to SH in interval above
RMLL
1
10
1000
10e4
10 in (ohms)
20 in
30 in (ohms)
60 in
90 in (ohms)
<Unconformity>
Note: Sample 7860' caught 11:22 pm before trip
0.3
0
NPor (%)
-0.1
DPor (%)
PEFZ
10



Mud Report(7863): 9.2, 42, 8.8, 9,1200, 6.5

SS-SLST, brick red-dk red, intrbdd w/Lower Dakota Ss and Sh

SH, rthy, sli sndy, varieg, brick red-dk red, maroon-dkgy-pale grn; SS, mlky-clr, rd, uf-lmg, wsrt silic cmt; CLY, wht, sft; abnt bri gold pyr

SH, rthy, dom pale grn, some brick red-maroon, firm-sft; SS, lse fri scattered thro; CLY, wht, sft thro

SH, fis-sbplty, varieg ltgy-dkgy-maroon-red-pale grn, sft; SS, lse fri, vfg, thro; CLY, wht; sli calc

SH, varieg, aa; CLY, wht; SS, vfg, lse fri

7980 (6:00 am 10/15/13) SH, varieg, aa; CLY, wht; SS thro, aa

SS, clr, vfg, rd, lse fri

SH, varieg lt-dkgy-maroon-red-pale grn, sft, aa; CLY, wht thro

SLST, brick red; SH, varieg, aa

SLST & SH, aa

LS top @ 7992' - move down to 8038' on E-Log

Mud Report: 9.4, 65, 9.2, 9, 1250, 8.0

LS, pale pink-ltgy-wht; tr DOLO, dkgy; SH, pale grn

SH, varieg pale grn-mdgy-maroon, plty-blky; v calc thro; tr LS, wht-ltgy-sli pink; tr DOLO, dkgy; tr SLST, brick red

SLST, brick red; LS, ltgy-wht-pale pink; DOLO, dk gy- sli blu gy; tr SH, pale grn; v calc

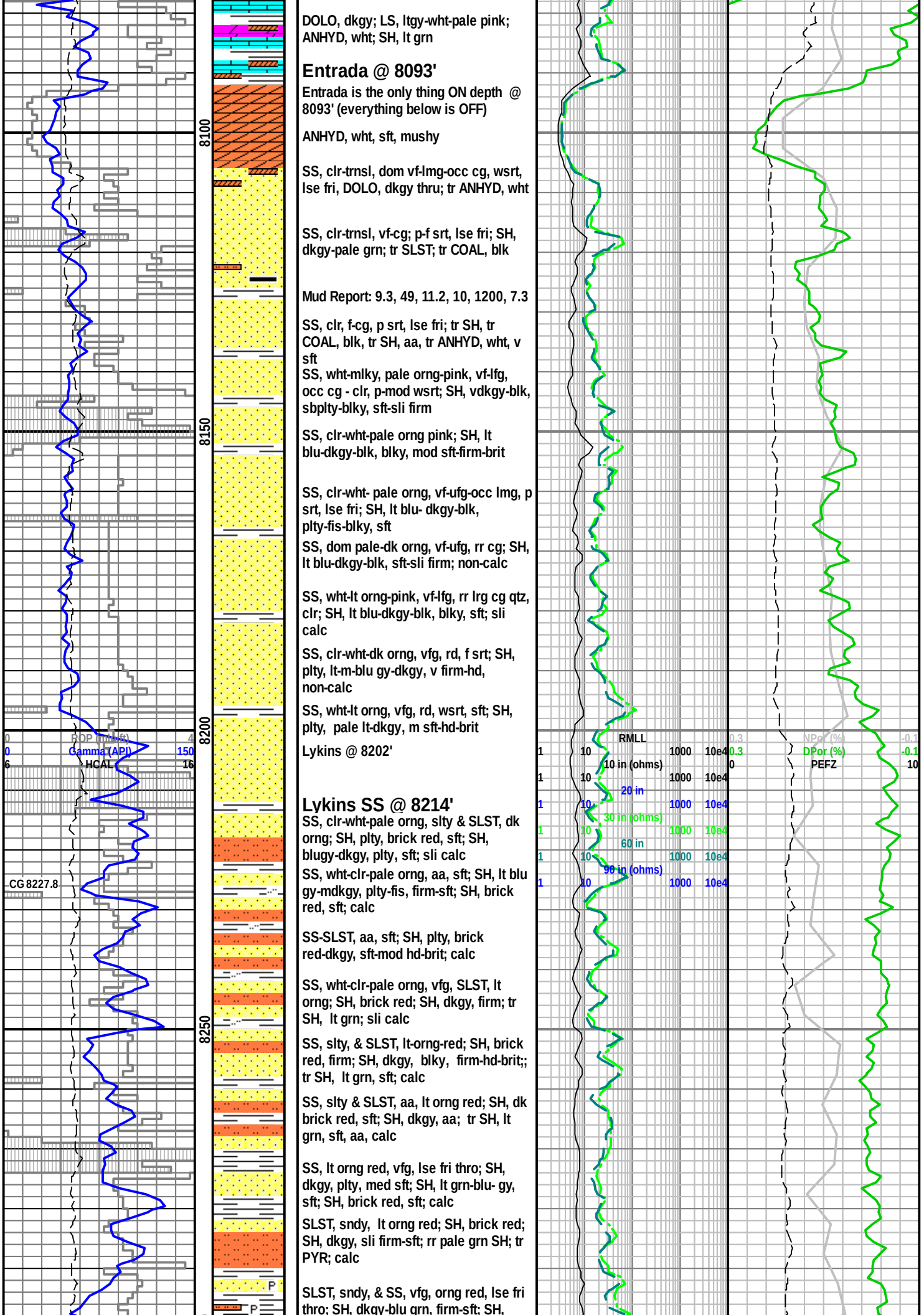
Basal Morrison Ls @ 8038'-8066'

LS, ltgy-wht-pale pink; DOLO, dkgy; SLST, brick red; tr SH, lt grn; v calc

SLST-LS-SH in about equal proportions, v calc

LS-SLST-SH, aa, DOLO increased

DOLO & LS; SH, pale grn; tr SLST, brick red; ANHYD, wht, sft, mushy



DOLO, dkgy; LS, ltgy-wht-pale pink; ANHYD, wht; SH, lt grn

Entrada @ 8093'

Entrada is the only thing ON depth @ 8093' (everything below is OFF)

ANHYD, wht, sft, mushy

SS, clr-trnsl, dom vf-lmg-occ cg, wsrt, lse fri, DOLO, dkgy thru; tr ANHYD, wht

SS, clr-trnsl, vf-cg; p-f srt, lse fri; SH, dkgy-pale grn; tr SLST; tr COAL, blk

Mud Report: 9.3, 49, 11.2, 10, 1200, 7.3

SS, clr, f-cg, p srt, lse fri; tr SH, tr COAL, blk, tr SH, aa, tr ANHYD, wht, v sft

SS, wht-mlky, pale orng-pink, vf-lfg, occ cg - clr, p-mod wsrt; SH, vdkgy-blk, sbplty-blky, sft-sli firm

SS, clr-wht-pale orng pink; SH, lt blu-dkgy-blk, blky, mod sft-firm-brit

SS, clr-wht- pale orng, vf-ufg-occ lmg, p srt, lse fri; SH, lt blu- dkgy-blk, plty-fis-blky, sft

SS, dom pale-dk orng, vf-ufg, rr cg; SH, lt blu-dkgy-blk, sft-sli firm; non-calc

SS, wht-lt orng-pink, vf-lfg, rr lrg cg qtz, clr; SH, lt blu-dkgy-blk, blky, sft; sli calc

SS, clr-wht-dk orng, vfg, rd, f srt; SH, plty, lt-m-blu gy-dkgy, v firm-hd, non-calc

SS, wht-lt orng, vfg, rd, wsrt, sft; SH, plty, pale lt-dkgy, m sft-hd-brit

Lykins @ 8202'

Lykins SS @ 8214'

SS, clr-wht-pale orng, slty & SLST, dk orng; SH, plty, brick red, sft; SH, blugy-dkgy, plty, sft; sli calc

SS, wht-clr-pale orng, aa, sft; SH, lt blu gy-mdkgy, plty-fis, firm-sft; SH, brick red, sft; calc

SS-SLST, aa, sft; SH, plty, brick red-dkgy, sft-mod hd-brit; calc

SS, wht-clr-pale orng, vfg, SLST, lt orng; SH, brick red; SH, dkgy, firm; tr SH, lt grn; sli calc

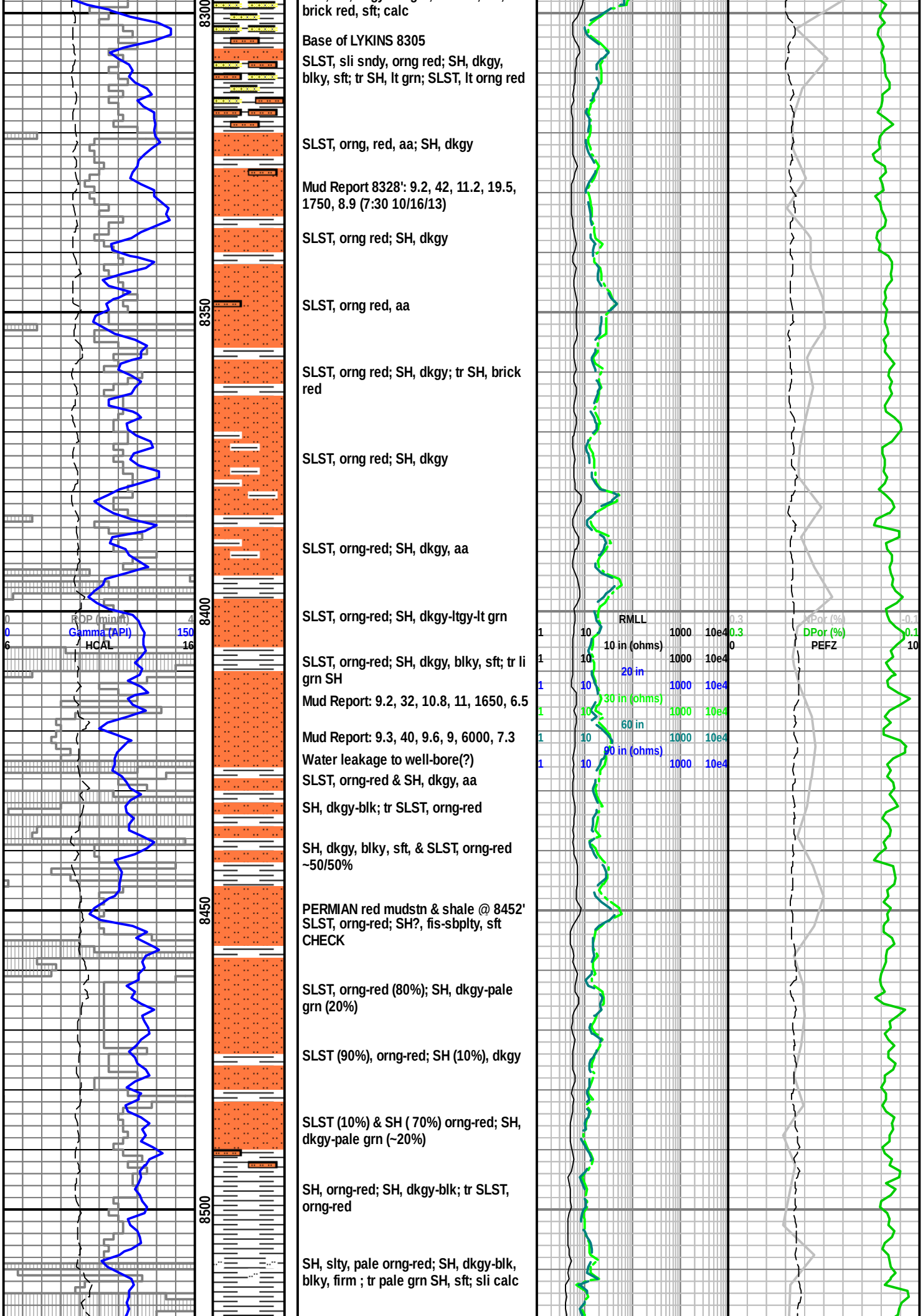
SS, slty, & SLST, lt-orng-red; SH, brick red, firm; SH, dkgy, blky, firm-hd-brit;; tr SH, lt grn, sft; calc

SS, slty & SLST, aa, lt orng red; SH, dk brick red, sft; SH, dkgy, aa; tr SH, lt grn, sft, aa, calc

SS, lt orng red, vfg, lse fri thro; SH, dkgy, plty, med sft; SH, lt grn-blu- gy, sft; SH, brick red, sft; calc

SLST, sndy, lt orng red; SH, brick red; SH, dkgy, sli firm-sft; rr pale grn SH; tr PYR; calc

SLST, sndy, & SS, vfg, orng red, lse fri thro; SH, dkgy-blu grn, firm-sft; SH,



brick red, sft; calc

Base of LYKINS 8305

SLST, sli sndy, orng red; SH, dkgy, blky, sft; tr SH, lt grn; SLST, lt orng red

SLST, orng, red, aa; SH, dkgy

Mud Report 8328': 9.2, 42, 11.2, 19.5, 1750, 8.9 (7:30 10/16/13)

SLST, orng red; SH, dkgy

SLST, orng red, aa

SLST, orng red; SH, dkgy; tr SH, brick red

SLST, orng red; SH, dkgy

SLST, orng-red; SH, dkgy, aa

SLST, orng-red; SH, dkgy-ltgy-lt grn

SLST, orng-red; SH, dkgy, blky, sft; tr li grn SH

Mud Report: 9.2, 32, 10.8, 11, 1650, 6.5

Mud Report: 9.3, 40, 9.6, 9, 6000, 7.3

Water leakage to well-bore(?)

SLST, orng-red & SH, dkgy, aa

SH, dkgy-blk; tr SLST, orng-red

SH, dkgy, blky, sft, & SLST, orng-red ~50/50%

PERMIAN red mudstn & shale @ 8452'

SLST, orng-red; SH?, fis-sbplty, sft CHECK

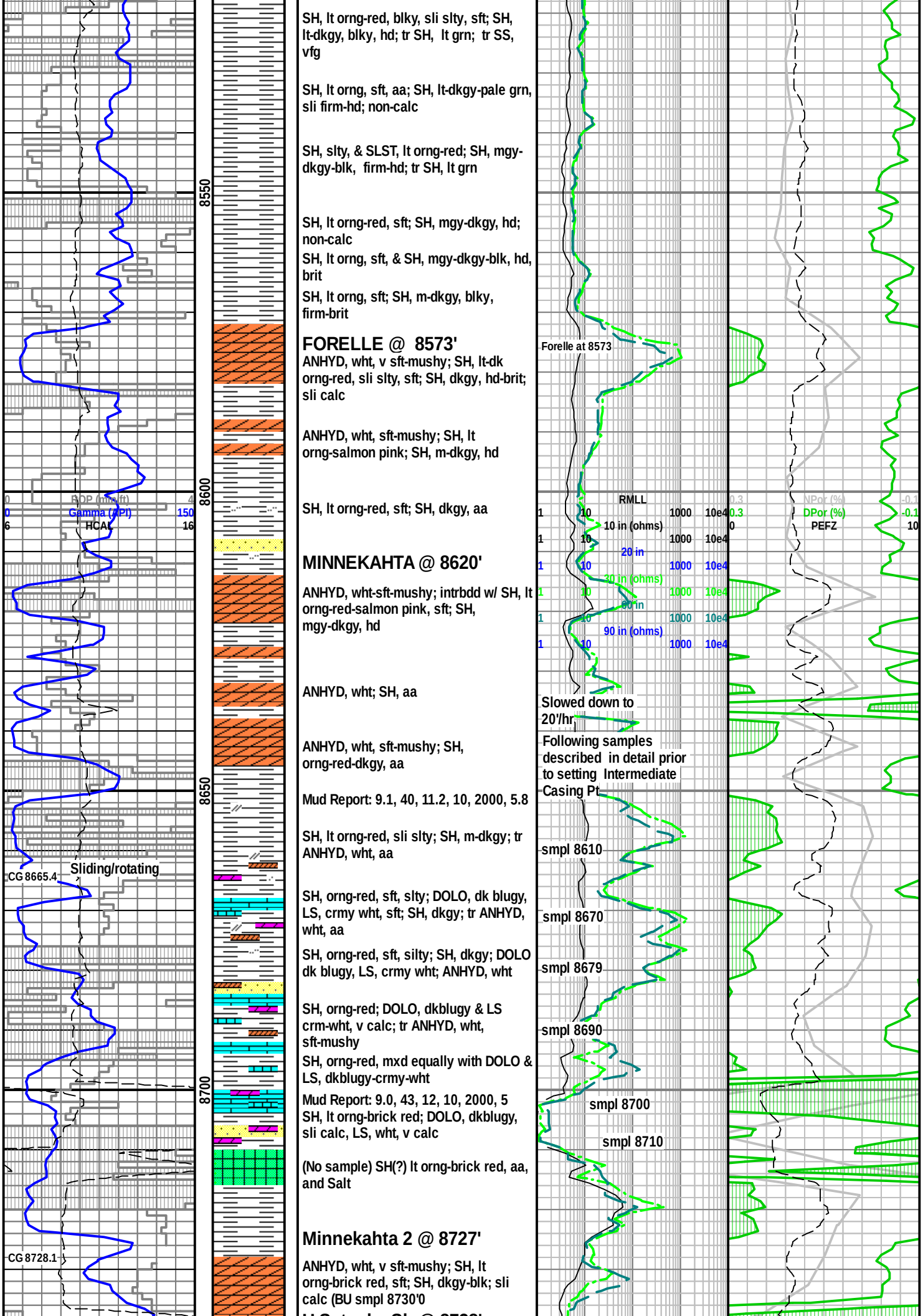
SLST, orng-red (80%); SH, dkgy-pale grn (20%)

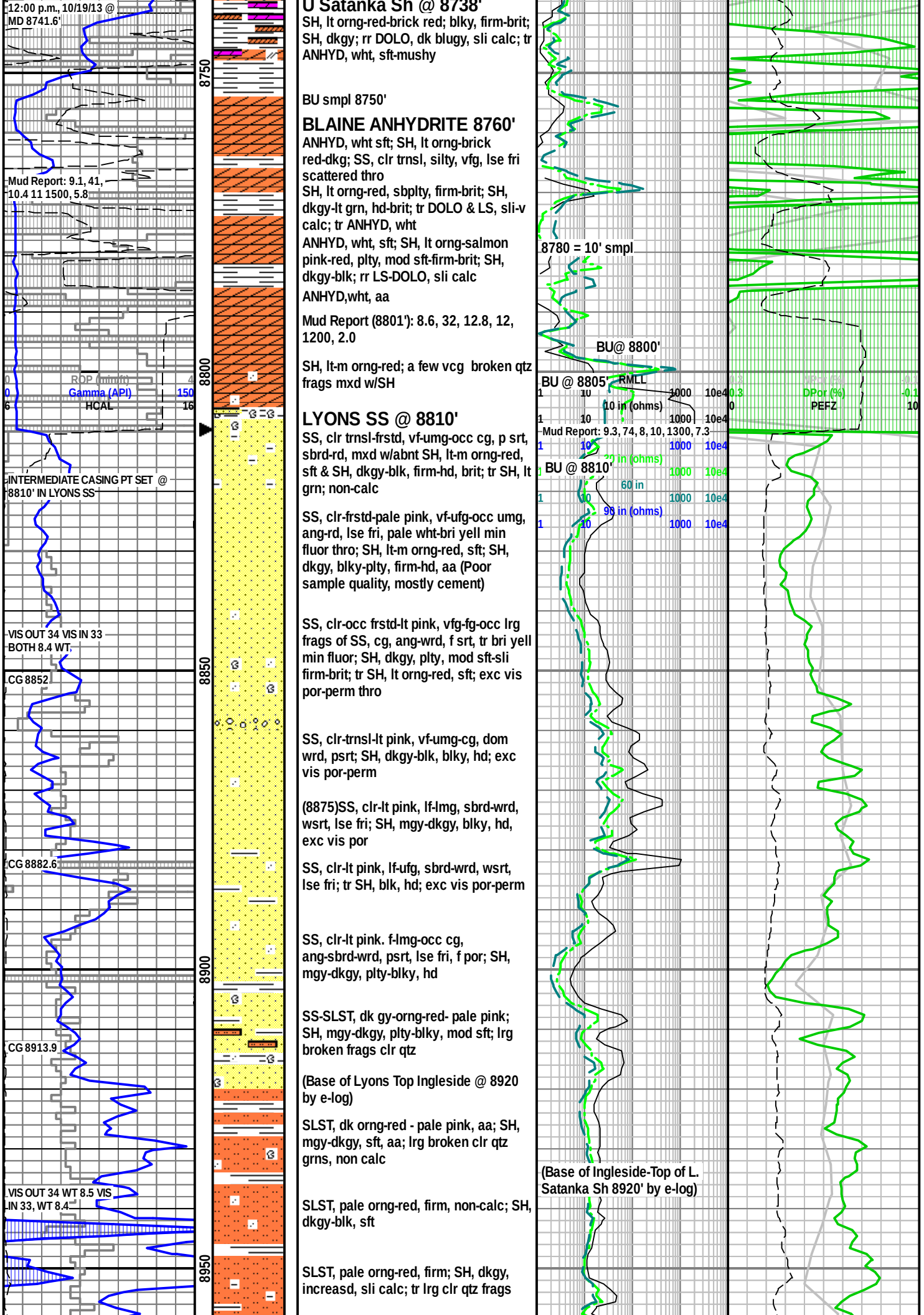
SLST (90%), orng-red; SH (10%), dkgy

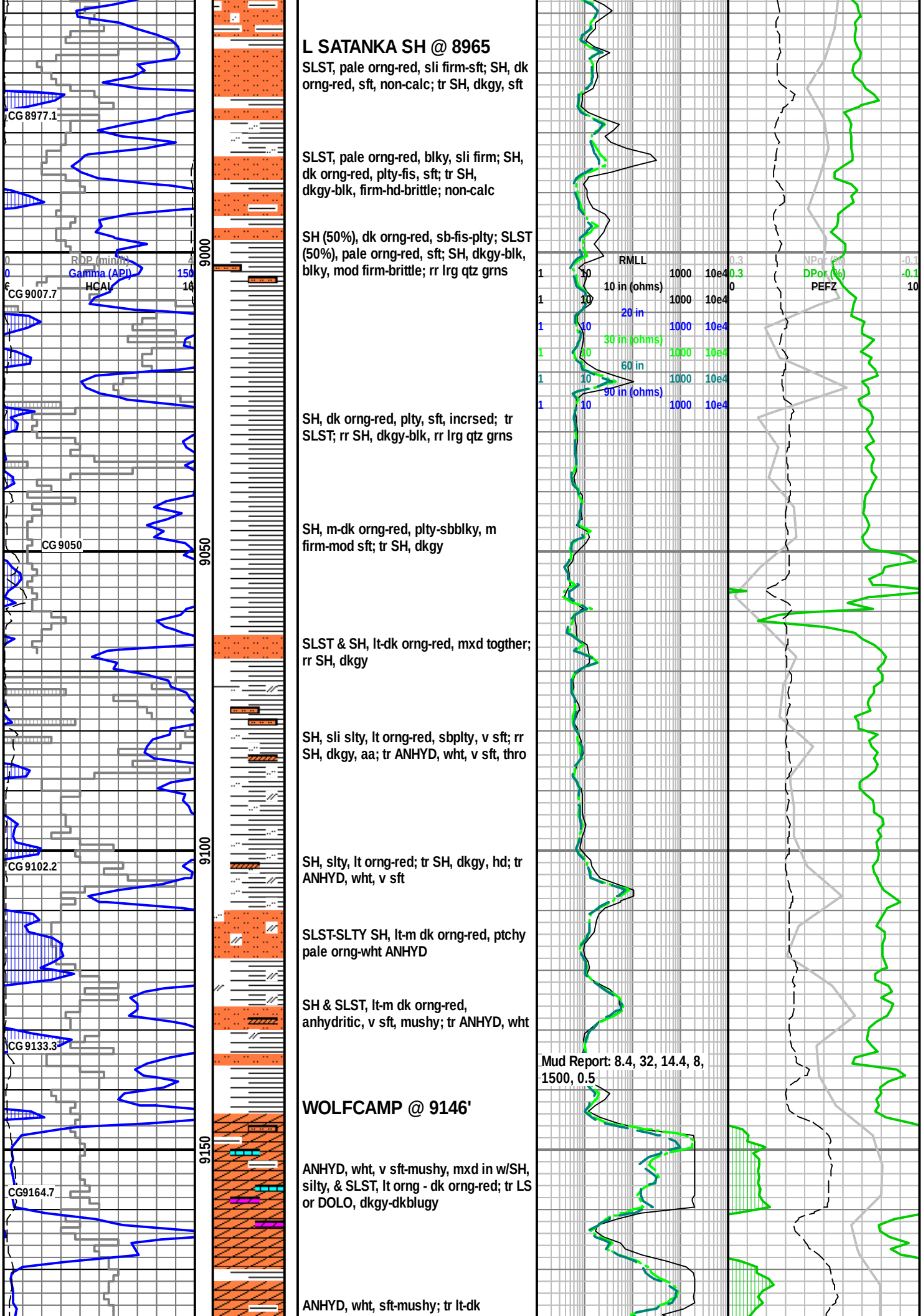
SLST (10%) & SH (70%) orng-red; SH, dkgy-pale grn (~20%)

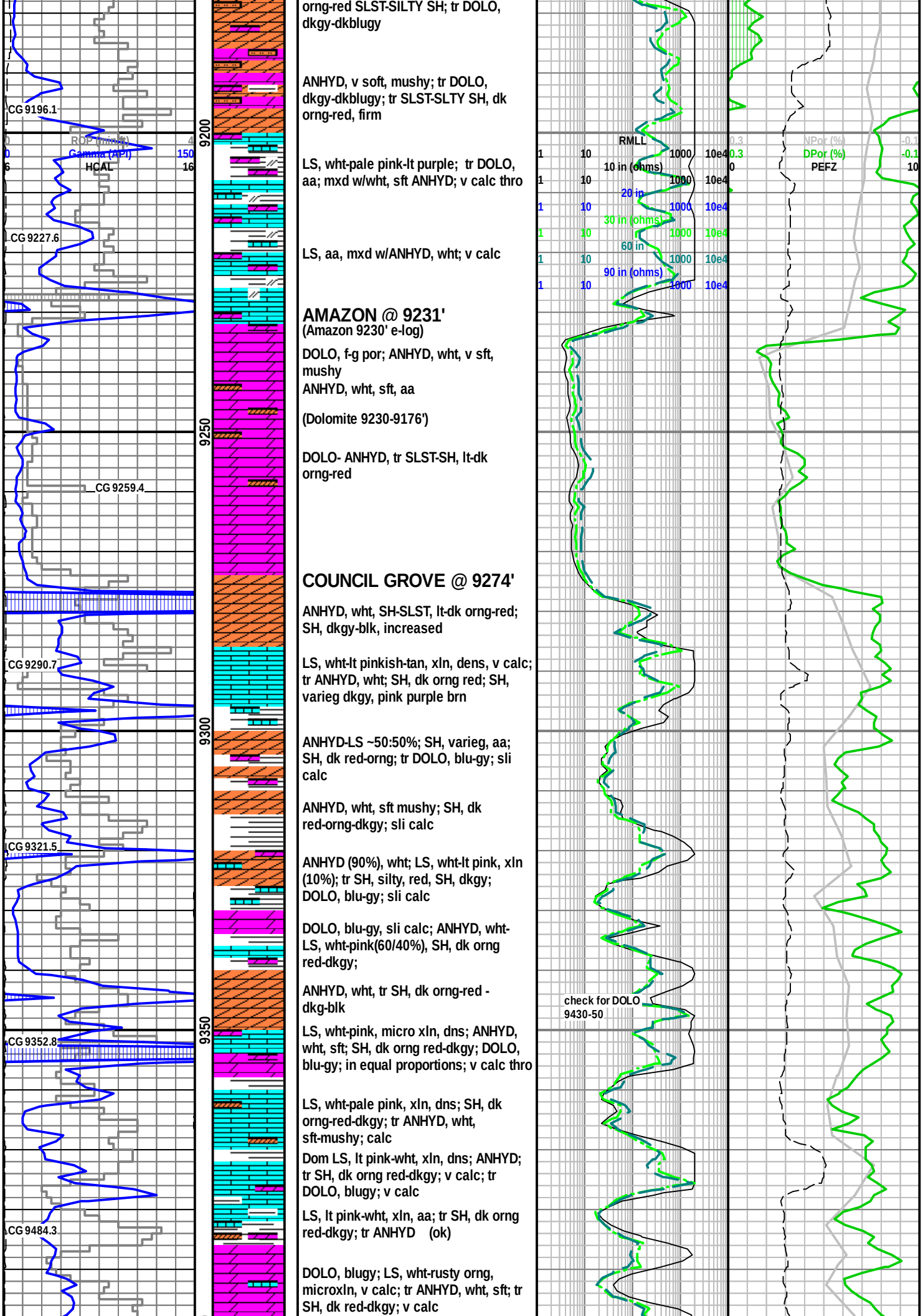
SH, orng-red; SH, dkgy-blk; tr SLST, orng-red

SH, slty, pale orng-red; SH, dkgy-blk, blky, firm ; tr pale grn SH, sft; sli calc


8550
8600
8650
8700
ROP (min/ft)
0
4
Gamma (API)
0
150
HCAL
6
16
CG 8665.4
Sliding/rotating
CG 8728.1
SH, lt orng-red, blky, sli slty, sft; SH, lt-dkgy, blky, hd; tr SH, lt grn; tr SS, vfg
SH, lt orng, sft, aa; SH, lt-dkgy-pale grn, sli firm-hd; non-calc
SH, slty, & SLST, lt orng-red; SH, mgy-dkgy-blk, firm-hd; tr SH, lt grn
SH, lt orng-red, sft; SH, mgy-dkgy, hd; non-calc
SH, lt orng, sft, & SH, mgy-dkgy-blk, hd, brit
SH, lt orng, sft; SH, m-dkgy, blky, firm-brit
FORELLE @ 8573'
ANHYD, wht, v sft-mushy; SH, lt-dk orng-red, sli slty, sft; SH, dkgy, hd-brit; sli calc
ANHYD, wht, sft-mushy; SH, lt orng-salmon pink; SH, m-dkgy, hd
SH, lt orng-red, sft; SH, dkgy, aa
MINNEKAHTA @ 8620'
ANHYD, wht-sft-mushy; intrbdd w/ SH, lt orng-red-salmon pink, sft; SH, mgy-dkgy, hd
ANHYD, wht; SH, aa
ANHYD, wht, sft-mushy; SH, orng-red-dkgy, aa
Mud Report: 9.1, 40, 11.2, 10, 2000, 5.8
SH, lt orng-red, sli slty; SH, m-dkgy; tr ANHYD, wht, aa
SH, orng-red, sft, slty; DOLO, dk blugy, LS, crmy wht, sft; SH, dkgy; tr ANHYD, wht, aa
SH, orng-red, sft, silty; SH, dkgy; DOLO dk blugy, LS, crmy wht; ANHYD, wht
SH, orng-red; DOLO, dkblugy & LS crm-wht, v calc; tr ANHYD, wht, sft-mushy
SH, orng-red, mxd equally with DOLO & LS, dkblugy-crmy-wht
Mud Report: 9.0, 43, 12, 10, 2000, 5
SH, lt orng-brick red; DOLO, dkblugy, sli calc, LS, wht, v calc
(No sample) SH(?) lt orng-brick red, aa, and Salt
Minnekahta 2 @ 8727'
ANHYD, wht, v sft-mushy; SH, lt orng-brick red, sft; SH, dkgy-blk; sli calc (BU smpl 8730'0
Forelle at 8573
RMLL
1
10
1000
10e4
10 in (ohms)
20 in
20 in (ohms)
60 in
90 in
90 in (ohms)
Slowed down to 20'/hr
Following samples described in detail prior to setting Intermediate Casing Pt
smpl 8610
smpl 8670
smpl 8679
smpl 8690
smpl 8700
smpl 8710
0.3
0
NPor (%)
DPor (%)
PEFZ
-0.1
10


12:00 p.m., 10/19/13 @ MD 8741.6'
Mud Report: 9.1, 41, 10.4 11 1500, 5.8
ROP (min/ft)
Gamma (API)
HCAL
INTERMEDIATE CASING PT SET @ 8810' IN LYONS SS
VIS OUT 34 VIS IN 33 BOTH 8.4 WT.
CG 8852
CG 8882.6
CG 8913.9
VIS OUT 34 WT 8.5 VIS IN 33, WT 8.4
8750
8800
8850
8900
8950
U Satanka Sh @ 8738'
SH, lt orng-red-brick red; blky, firm-brit; SH, dkgy; rr DOLO, dk blugy, sli calc; tr ANHYD, wht, sft-mushy
BU smpl 8750'
BLAINE ANHYDRITE 8760'
ANHYD, wht sft; SH, lt orng-brick red-dkg; SS, clr trnsl, silty, vfg, lse fri scattered thro
SH, lt orng-red, sbplty, firm-brit; SH, dkgy-lt grn, hd-brit; tr DOLO & LS, sli-v calc; tr ANHYD, wht
ANHYD, wht, sft; SH, lt orng-salmon pink-red, plty, mod sft-firm-brit; SH, dkgy-blk; rr LS-DOLO, sli calc
ANHYD,wht, aa
Mud Report (8801'): 8.6, 32, 12.8, 12, 1200, 2.0
SH, lt-m orng-red; a few vcg broken qtz frags mxd w/SH
LYONS SS @ 8810'
SS, clr trnsl-frstd, vf-umg-occ cg, p srt, sbrd-rd, mxd w/abnt SH, lt-m orng-red, sft & SH, dkgy-blk, firm-hd, brit; tr SH, lt grn; non-calc
SS, clr-frstd-pale pink, vf-ufg-occ umg, ang-rd, lse fri, pale wht-bri yell min fluor thro; SH, lt-m orng-red, sft; SH, dkgy, blky-plty, firm-hd, aa (Poor sample quality, mostly cement)
SS, clr-occ frstd-lt pink, vfg-fg-occ lrg frags of SS, cg, ang-wrd, f srt, tr bri yell min fluor; SH, dkgy, plty, mod sft-sli firm-brit; tr SH, lt orng-red, sft; exc vis por-perm thro
SS, clr-trnsl-lt pink, vf-umg-cg, dom wrd, psrt; SH, dkgy-blk, blky, hd; exc vis por-perm
(8875)SS, clr-lt pink, lf-lmg, sbrd-wrd, wsrt, lse fri; SH, mgy-dkgy, blky, hd, exc vis por
SS, clr-lt pink, lf-ufg, sbrd-wrd, wsrt, lse fri; tr SH, blk, hd; exc vis por-perm
SS, clr-lt pink. f-lmg-occ cg, ang-sbrd-wrd, psrt, lse fri, f por; SH, mgy-dkgy, plty-blky, hd
SS-SLST, dk gy-orng-red- pale pink; SH, mgy-dkgy, plty-blky, mod sft; lrg broken frags clr qtz
(Base of Lyons Top Ingleside @ 8920 by e-log)
SLST, dk orng-red - pale pink, aa; SH, mgy-dkgy, sft, aa; lrg broken clr qtz grns, non calc
SLST, pale orng-red, firm, non-calc; SH, dkgy-blk, sft
SLST, pale orng-red, firm; SH, dkgy, increasd, sli calc; tr lrg clr qtz frags
8780 = 10' smpl
BU@ 8800'
BU @ 8805'
RMLL
10 in (ohms)
Mud Report: 9.3, 74, 8, 10, 1300, 7.3
20 in (ohms)
BU @ 8810'
60 in
90 in (ohms)
(Base of Ingleside-Top of L. Satanka Sh 8920' by e-log)
DPor (%)
PEFZ


ROP (min/ft)
0
4
Gamma (API)
0
150
HCAL
6
16
RMLL
1
10
1000
10e4
10 in (ohms)
20 in
30 in (ohms)
60 in
90 in (ohms)
0.3
NPor (%)
-0.1
DPor (%)
0
PEFZ
10
CG 8977.1
CG 9007.7
CG 9050
CG 9102.2
CG 9133.3
CG9164.7
9000
9050
9100
9150
L SATANKA SH @ 8965
SLST, pale orng-red, sli firm-sft; SH, dk orng-red, sft, non-calc; tr SH, dkgy, sft
SLST, pale orng-red, blky, sli firm; SH, dk orng-red, plty-fis, sft; tr SH, dkgy-blk, firm-hd-brittle; non-calc
SH (50%), dk orng-red, sb-fis-plty; SLST (50%), pale orng-red, sft; SH, dkgy-blk, blky, mod firm-brittle; rr lrg qtz grns
SH, dk orng-red, plty, sft, incrsed; tr SLST; rr SH, dkgy-blk, rr lrg qtz grns
SH, m-dk orng-red, plty-sbblky, m firm-mod sft; tr SH, dkgy
SLST & SH, lt-dk orng-red, mxd togther; rr SH, dkgy
SH, sli slty, lt orng-red, sbplty, v sft; rr SH, dkgy, aa; tr ANHYD, wht, v sft, thro
SH, slty, lt orng-red; tr SH, dkgy, hd; tr ANHYD, wht, v sft
SLST-SLTY SH, lt-m dk orng-red, ptchy pale orng-wht ANHYD
SH & SLST, lt-m dk orng-red, anhydritic, v sft, mushy; tr ANHYD, wht
Mud Report: 8.4, 32, 14.4, 8, 1500, 0.5
WOLFCAMP @ 9146'
ANHYD, wht, v sft-mushy, mxd in w/SH, silty, & SLST, lt orng - dk orng-red; tr LS or DOLO, dkgy-dkblugy
ANHYD, wht, sft-mushy; tr lt-dk



orng-red SLST-SILTY SH; tr DOLO, dkgy-dkblugy

ANHYD, v soft, mushy; tr DOLO, dkgy-dkblugy; tr SLST-SLTY SH, dk orng-red, firm

LS, wht-pale pink-lt purple; tr DOLO, aa; mxd w/wht, sft ANHYD; v calc thro

LS, aa, mxd w/ANHYD, wht; v calc

AMAZON @ 9231'

(Amazon 9230' e-log)

DOLO, f-g por; ANHYD, wht, v sft, mushy

ANHYD, wht, sft, aa

(Dolomite 9230-9176')

DOLO- ANHYD, tr SLST-SH, lt-dk orng-red

COUNCIL GROVE @ 9274'

ANHYD, wht, SH-SLST, lt-dk orng-red; SH, dkgy-blk, increased

LS, wht-lt pinkish-tan, xln, dens, v calc; tr ANHYD, wht; SH, dk orng red; SH, varieg dkgy, pink purple brn

ANHYD-LS ~50:50%; SH, varieg, aa; SH, dk red-orng; tr DOLO, blu-gy; sli calc

ANHYD, wht, sft mushy; SH, dk red-orng-dkgy; sli calc

ANHYD (90%), wht; LS, wht-lt pink, xln (10%); tr SH, silty, red, SH, dkgy; DOLO, blu-gy; sli calc

DOLO, blu-gy, sli calc; ANHYD, wht-LS, wht-pink(60/40%), SH, dk orng red-dkgy;

ANHYD, wht, tr SH, dk orng-red - dkg-blk

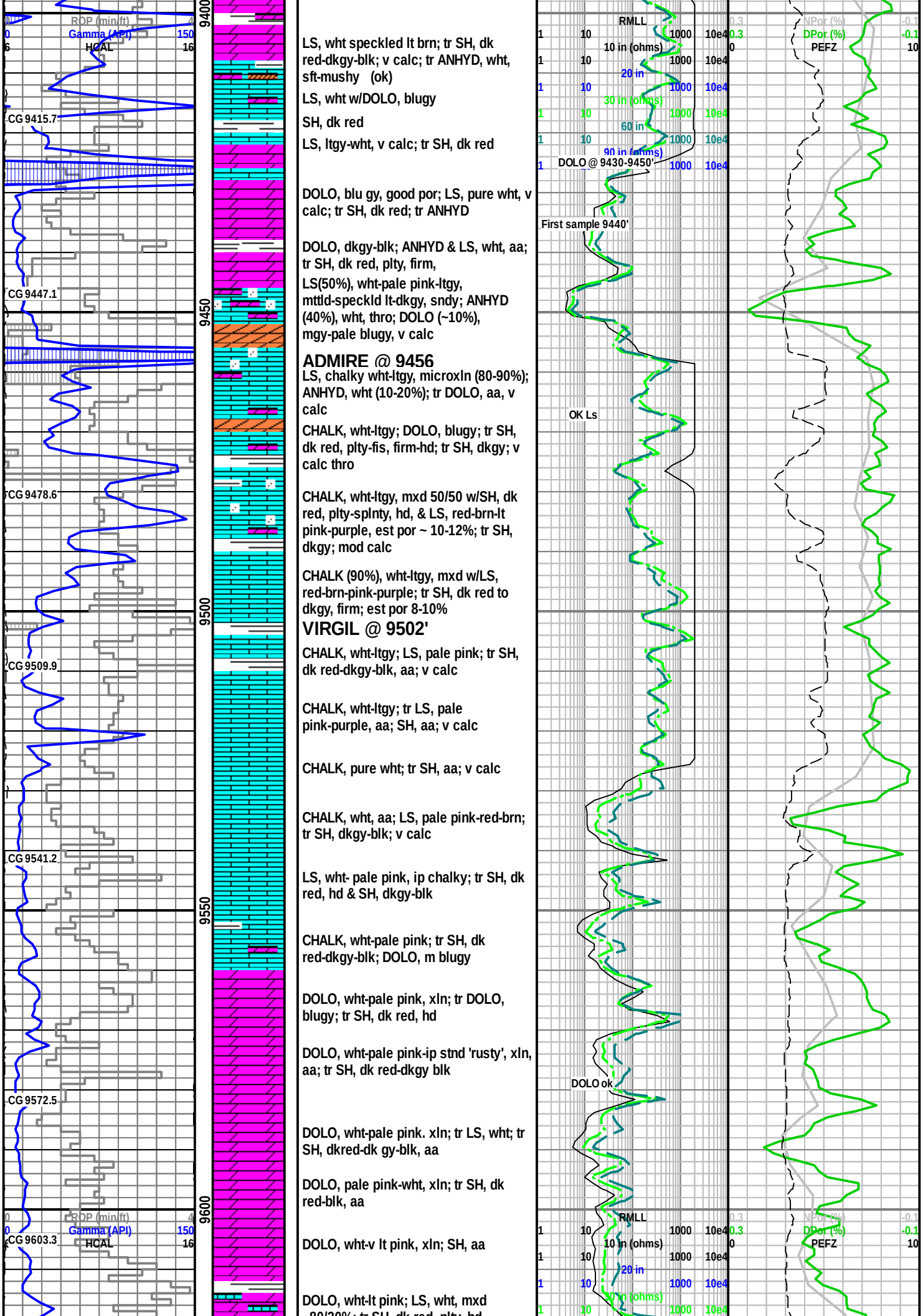
LS, wht-pink, micro xln, dns; ANHYD, wht, sft; SH, dk orng red-dkgy; DOLO, blu-gy; in equal proportions; v calc thro

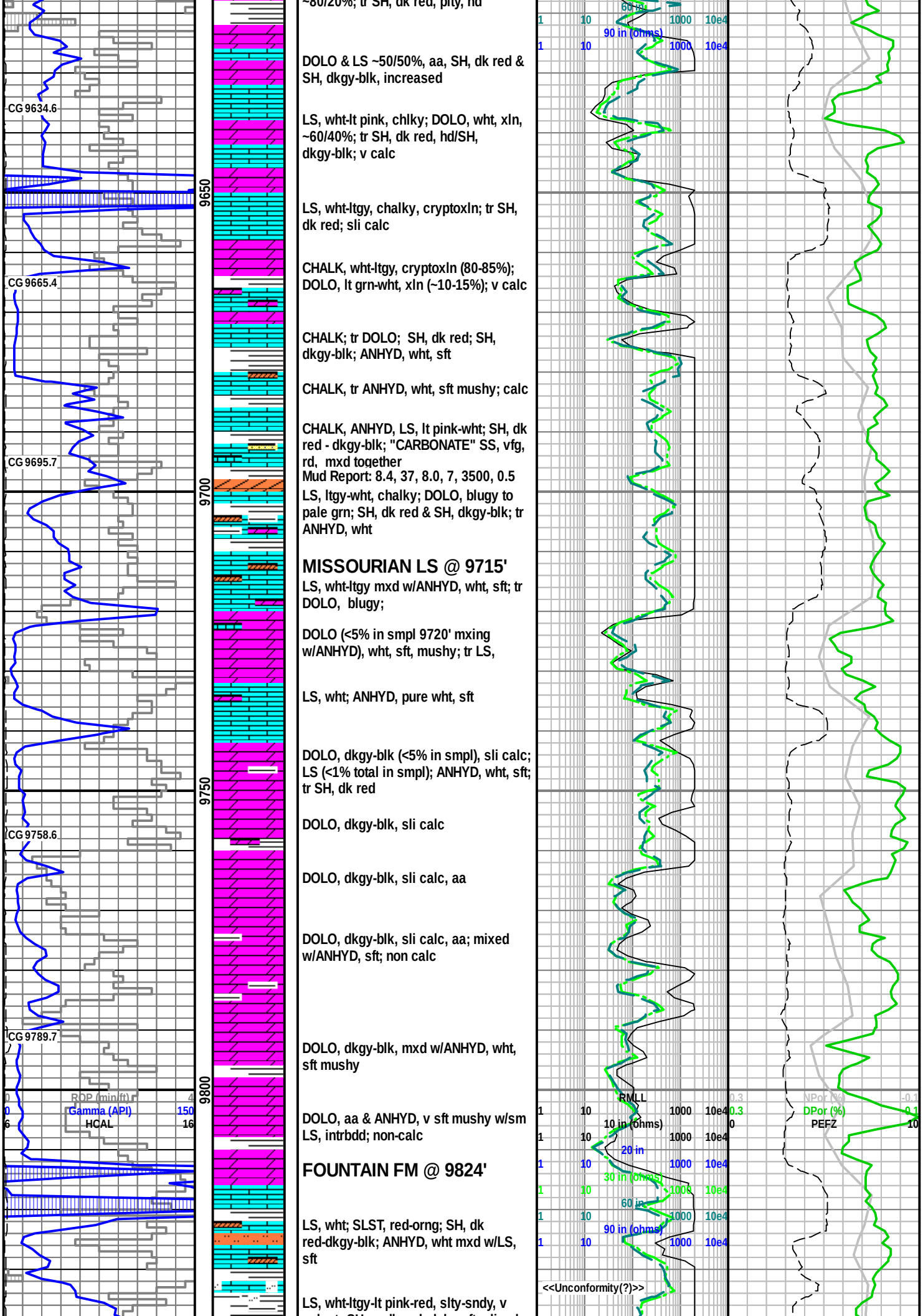
LS, wht-pale pink, xln, dns; SH, dk orng-red-dkgy; tr ANHYD, wht, sft-mushy; calc

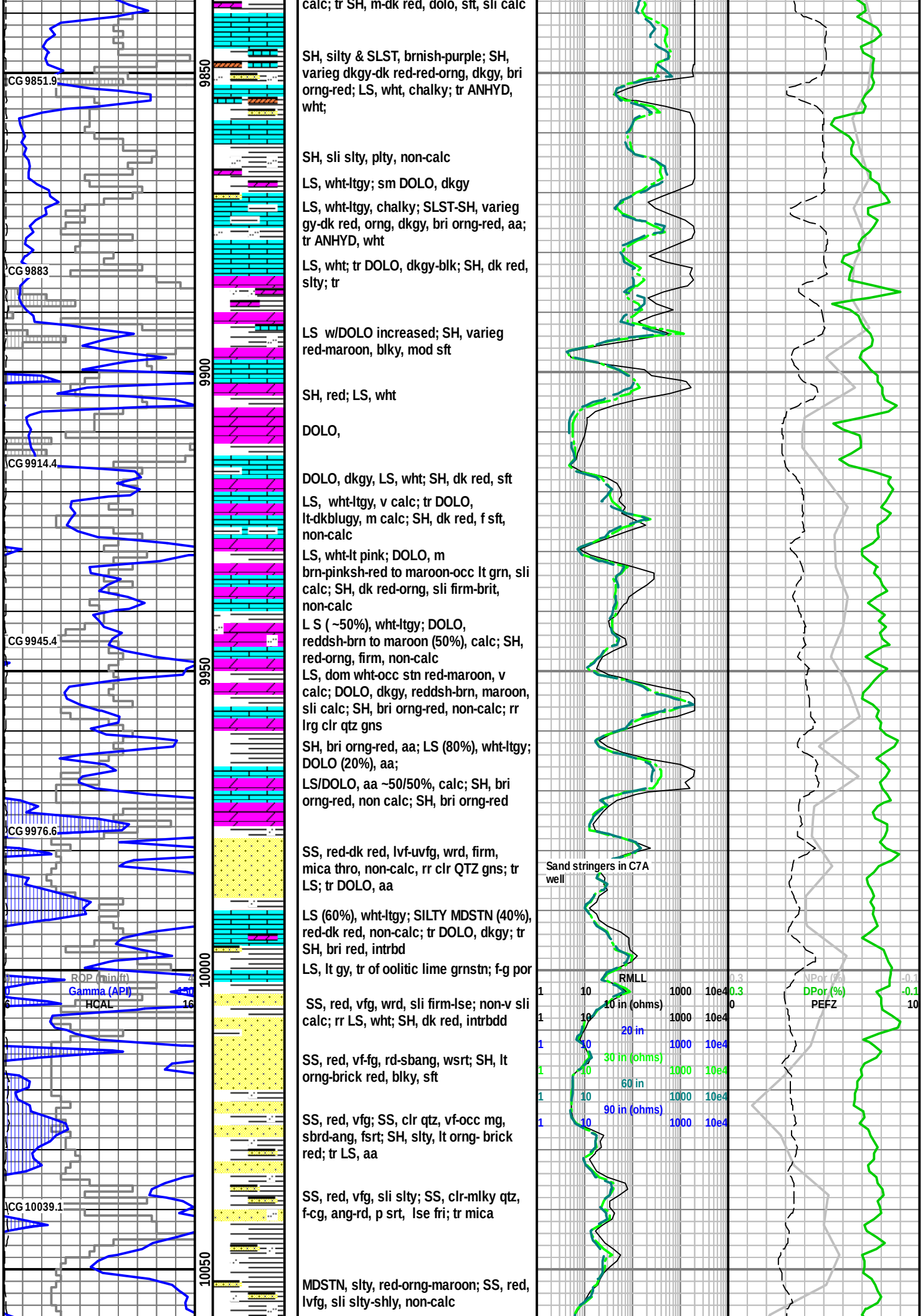
Dom LS, lt pink-wht, xln, dns; ANHYD; tr SH, dk orng red-dkgy; v calc; tr DOLO, blugy; v calc

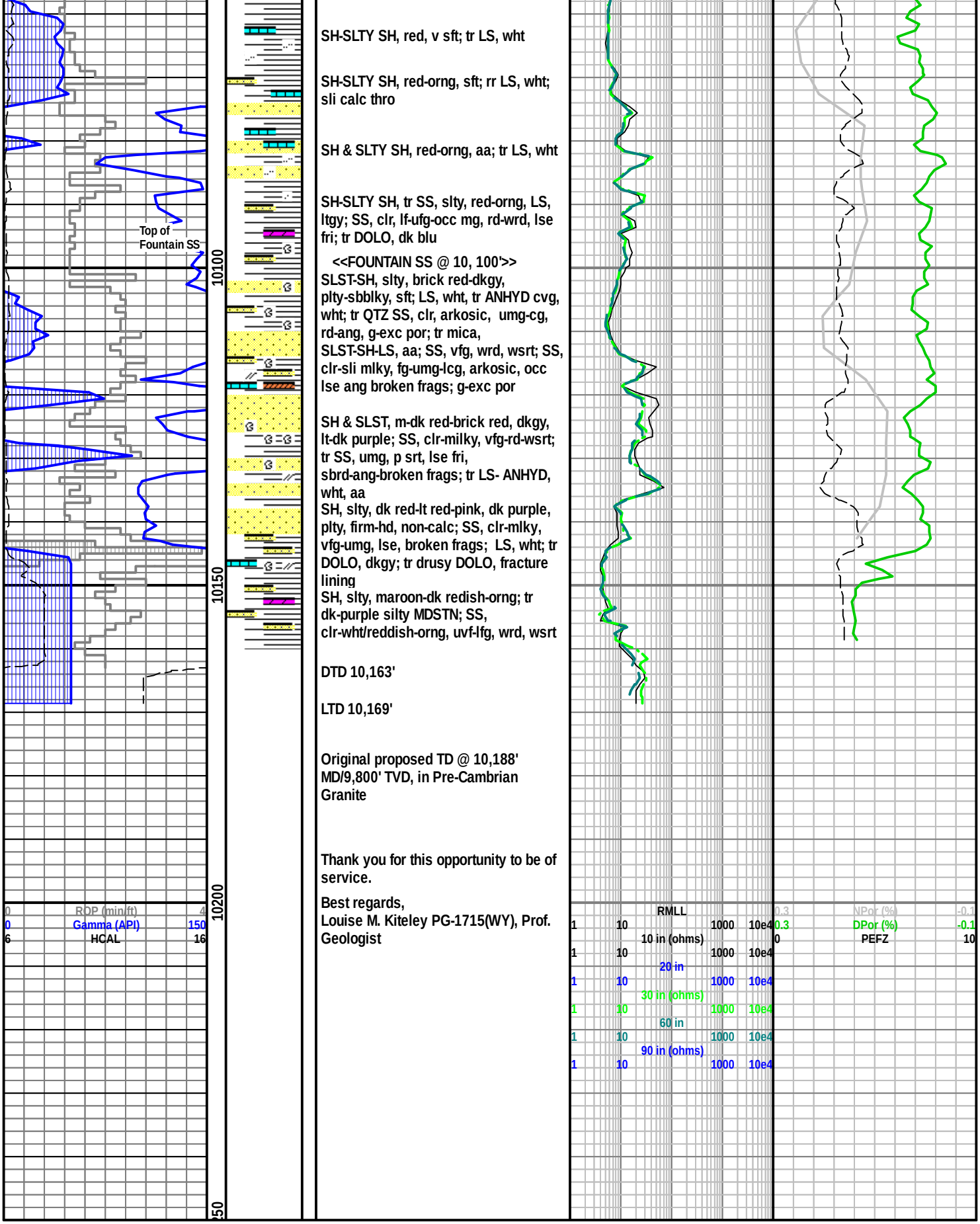
LS, lt pink-wht, xln, aa; tr SH, dk orng red-dkgy; tr ANHYD (ok)

DOLO, blugy; LS, wht-rusty orng, microxln, v calc; tr ANHYD, wht, sft; tr SH, dk red-dkgy; v calc


ROP (min/ft)
Gamma (API)
HCAL
RMLL
10 in (ohms)
20 in
30 in (ohms)
60 in
90 in (ohms)
NPor (%)
DPor (%)
PEFZ
DOLO @ 9430-9450'
First sample 9440'
OK Ls
DOLO ok
CG 9415.7
CG 9447.1
CG 9478.6
CG 9509.9
CG 9541.2
CG 9572.5
CG 9603.3
9400
9450
9500
9550
9600
LS, wht speckled lt brn; tr SH, dk red-dkgy-blk; v calc; tr ANHYD, wht, sft-mushy (ok)
LS, wht w/DOLO, blugy
SH, dk red
LS, ltgy-wht, v calc; tr SH, dk red
DOLO, blu gy, good por; LS, pure wht, v calc; tr SH, dk red; tr ANHYD
DOLO, dkgy-blk; ANHYD & LS, wht, aa; tr SH, dk red, plty, firm,
LS(50%), wht-pale pink-ltgy, mttld-speckld lt-dkgy, sndy; ANHYD (40%), wht, thro; DOLO (~10%), mgy-pale blugy, v calc
ADMIRE @ 9456
LS, chalky wht-ltgy, microxln (80-90%); ANHYD, wht (10-20%); tr DOLO, aa, v calc
CHALK, wht-ltgy; DOLO, blugy; tr SH, dk red, plty-fis, firm-hd; tr SH, dkgy; v calc thro
CHALK, wht-ltgy, mxd 50/50 w/SH, dk red, plty-splnty, hd, & LS, red-brn-lt pink-purple, est por ~ 10-12%; tr SH, dkgy; mod calc
CHALK (90%), wht-ltgy, mxd w/LS, red-brn-pink-purple; tr SH, dk red to dkgy, firm; est por 8-10%
VIRGIL @ 9502'
CHALK, wht-ltgy; LS, pale pink; tr SH, dk red-dkgy-blk, aa; v calc
CHALK, wht-ltgy; tr LS, pale pink-purple, aa; SH, aa; v calc
CHALK, pure wht; tr SH, aa; v calc
CHALK, wht, aa; LS, pale pink-red-brn; tr SH, dkgy-blk; v calc
LS, wht- pale pink, ip chalky; tr SH, dk red, hd & SH, dkgy-blk
CHALK, wht-pale pink; tr SH, dk red-dkgy-blk; DOLO, m blugy
DOLO, wht-pale pink, xln; tr DOLO, blugy; tr SH, dk red, hd
DOLO, wht-pale pink-ip stnd 'rusty', xln, aa; tr SH, dk red-dkgy blk
DOLO, wht-pale pink. xln; tr LS, wht; tr SH, dkred-dk gy-blk, aa
DOLO, pale pink-wht, xln; tr SH, dk red-blk, aa
DOLO, wht-v lt pink, xln; SH, aa
DOLO, wht-lt pink; LS, wht, mxd


CG 9634.6
CG 9665.4
CG 9695.7
CG 9758.6
CG 9789.7
9650
9700
9750
9800
ROP (min/ft)
Gamma (API)
HCAL
RMLL
10 in (ohms)
20 in
30 in (ohms)
60 in
90 in (ohms)
NPor (%)
DPor (%)
PEFZ
~80/20%; tr SH, dk red, plty, hd
DOLO & LS ~50/50%, aa, SH, dk red & SH, dkgy-blk, increased
LS, wht-lt pink, chlky; DOLO, wht, xln, ~60/40%; tr SH, dk red, hd/SH, dkgy-blk; v calc
LS, wht-ltgy, chalky, cryptoxln; tr SH, dk red; sli calc
CHALK, wht-ltgy, cryptoxln (80-85%); DOLO, lt grn-wht, xln (~10-15%); v calc
CHALK; tr DOLO; SH, dk red; SH, dkgy-blk; ANHYD, wht, sft
CHALK, tr ANHYD, wht, sft mushy; calc
CHALK, ANHYD, LS, lt pink-wht; SH, dk red - dkgy-blk; "CARBONATE" SS, vfg, rd, mxd together
Mud Report: 8.4, 37, 8.0, 7, 3500, 0.5
LS, ltgy-wht, chalky; DOLO, blugy to pale grn; SH, dk red & SH, dkgy-blk; tr ANHYD, wht
MISSOURIAN LS @ 9715'
LS, wht-ltgy mxd w/ANHYD, wht, sft; tr DOLO, blugy;
DOLO (<5% in smpl 9720' mxing w/ANHYD), wht, sft, mushy; tr LS,
LS, wht; ANHYD, pure wht, sft
DOLO, dkgy-blk (<5% in smpl), sli calc; LS (<1% total in smpl); ANHYD, wht, sft; tr SH, dk red
DOLO, dkgy-blk, sli calc
DOLO, dkgy-blk, sli calc, aa
DOLO, dkgy-blk, sli calc, aa; mixed w/ANHYD, sft; non calc
DOLO, dkgy-blk, mxd w/ANHYD, wht, sft mushy
DOLO, aa & ANHYD, v sft mushy w/sm LS, intrbdd; non-calc
FOUNTAIN FM @ 9824'
LS, wht; SLST, red-orng; SH, dk red-dkgy-blk; ANHYD, wht mxd w/LS, sft
<<Unconformity(?)>>
LS, wht-ltgy-lt pink-red, slty-sndy, v


CG 9851.9
CG 9883
CG 9914.4
CG 9945.4
CG 9976.6
CG 10039.1
9850
9900
9950
10000
10050
ROP (min/ft)
Gamma (API)
HCAL
RMLL
10 in (ohms)
20 in
30 in (ohms)
60 in
90 in (ohms)
Sand stringers in C7A well
NPor (%)
DPor (%)
PEFZ
calc; tr SH, m-dk red, dolo, sft, sli calc
SH, silty & SLST, brnish-purple; SH, varieg dkgy-dk red-red-orng, dkgy, bri orng-red; LS, wht, chalky; tr ANHYD, wht;
SH, sli slty, plty, non-calc
LS, wht-ltgy; sm DOLO, dkgy
LS, wht-ltgy, chalky; SLST-SH, varieg gy-dk red, orng, dkgy, bri orng-red, aa; tr ANHYD, wht
LS, wht; tr DOLO, dkgy-blk; SH, dk red, slty; tr
LS w/DOLO increased; SH, varieg red-maroon, blky, mod sft
SH, red; LS, wht
DOLO,
DOLO, dkgy, LS, wht; SH, dk red, sft
LS, wht-ltgy, v calc; tr DOLO, lt-dkblugy, m calc; SH, dk red, f sft, non-calc
LS, wht-lt pink; DOLO, m brn-pinksh-red to maroon-occ lt grn, sli calc; SH, dk red-orng, sli firm-brit, non-calc
L S (~50%), wht-ltgy; DOLO, reddsh-brn to maroon (50%), calc; SH, red-orng, firm, non-calc
LS, dom wht-occ stn red-maroon, v calc; DOLO, dkgy, reddsh-brn, maroon, sli calc; SH, bri orng-red, non-calc; rr lrg clr qtz gns
SH, bri orng-red, aa; LS (80%), wht-ltgy; DOLO (20%), aa;
LS/DOLO, aa ~50/50%, calc; SH, bri orng-red, non calc; SH, bri orng-red
SS, red-dk red, lvf-uvfg, wrd, firm, mica thro, non-calc, rr clr QTZ gns; tr LS; tr DOLO, aa
LS (60%), wht-ltgy; SILTY MDSTN (40%), red-dk red, non-calc; tr DOLO, dkgy; tr SH, bri red, intrbd
LS, lt gy, tr of oolitic lime grnstn; f-g por
SS, red, vfg, wrd, sli firm-lse; non-v sli calc; rr LS, wht; SH, dk red, intrbdd
SS, red, vf-fg, rd-sbang, wsrt; SH, lt orng-brick red, blky, sft
SS, red, vfg; SS, clr qtz, vf-occ mg, sbrd-ang, fsrt; SH, slty, lt orng- brick red; tr LS, aa
SS, red, vfg, sli slty; SS, clr-mlky qtz, f-cg, ang-rd, p srt, lse fri; tr mica
MDSTN, slty, red-orng-maroon; SS, red, lvfg, sli slty-shly, non-calc



SH-SLTY SH, red, v sft; tr LS, wht

SH-SLTY SH, red-orng, sft; rr LS, wht; sli calc thro

SH & SLTY SH, red-orng, aa; tr LS, wht

SH-SLTY SH, tr SS, slty, red-orng, LS, ltgy; SS, clr, lf-ufg-occ mg, rd-wrd, lse fri; tr DOLO, dk blu

<<FOUNTAIN SS @ 10, 100'>>
SLST-SH, slty, brick red-dkgy, plty-sbblky, sft; LS, wht, tr ANHYD cvg, wht; tr QTZ SS, clr, arkosic, umg-cg, rd-ang, g-exc por; tr mica,
SLST-SH-LS, aa; SS, vfg, wrd, wsrt; SS, clr-sli mlky, fg-umg-lcg, arkosic, occ lse ang broken frags; g-exc por

SH & SLST, m-dk red-brick red, dkgy, lt-dk purple; SS, clr-milky, vfg-rd-wsrt; tr SS, umg, p srt, lse fri, sbrd-ang-broken frags; tr LS- ANHYD, wht, aa
SH, slty, dk red-lt red-pink, dk purple, plty, firm-hd, non-calc; SS, clr-mlky, vfg-umg, lse, broken frags; LS, wht; tr DOLO, dkgy; tr drusy DOLO, fracture lining
SH, slty, maroon-dk redish-orng; tr dk-purple silty MDSTN; SS, clr-wht/reddish-orng, uvf-lfg, wrd, wsrt

DTD 10,163'

LTD 10,169'

Original proposed TD @ 10,188' MD/9,800' TVD, in Pre-Cambrian Granite

Thank you for this opportunity to be of service.

Best regards,
Louise M. Kiteley PG-1715(WY), Prof. Geologist