



Scale: 5" / 100'
Measured Depth Log

Well Name Winder South 1

Location Sec. 9-T6N-R67W

State Colorado

County Weld

Country USA

Rig Number Patterson 346

API Number 05-123-43402-00

Field Wattenberg

Geographic Region DJ Basin

Drilling Completed TBD

Spud Date 8/15/2016

Surface Coordinates SHL: 2325'FSL, 603' FEL, Sec. 9

Lat: 40° 30' 9.615"
Long: 104° 53' 23.928"

Bottom Hole Coordinates PBHL: 2613' FNL & 460' FWL, Sec 8

Lat: 40° 30' 4.921"
Long: 104° 55' 29.626"

Ground Elevation 4,854'

K.B. Elevation 4,883'

Logged Interval 5,000' MD **To** 6,800'

Total Depth TBD

Formation Niobrara C Chalk

Type of Drilling Fluid Oil Based Mud

Operator

Company Extaction Oil & Gas

Address 1888 Sherman St., Suite 200
Denver, CO 80203

Geologist

Name Jared Rouse

Zone Color Coding

Oil Condensate Gas

Name

Sarah Reese

Company

Extraction Oil & Gas

Address

1888 Sherman St., Suite 200
Denver, CO 80203

Note

Error

Core

Water

Pressure

Seal

Other

Equipment

ML-574

Comments

Start: 8-16-16
Standby: 8-xx-16
TD: 8-7-16

Services Provided

2-man Logging
On Site Geosteering

Logger Names

Dominic Pitre/ Mark Gross

Address

ALS Empirica
6510 Guhn Road
Houston, Texas 77040

Rock Types

UNKNOWN

ANHYDRITE

GYPSUM

SALT

SIDERITE or LIMONITE

LIMESTONE

DOLOMITE

CHERT

COAL

MARLSTONE

CLAYSTONE

SHALE

SHALE GRAY

SHALE COLORED

SILTSTONE

SANDSTONE

CONGLOMERATE

BRECCIA

TILL

BENTONITE

TUFF

IGNEOUS

METAMORPHIC

CEMENT

Accessories

Fossils

ALGAE

AMPHIPORA

BELEMNITE

BIOCLASTIC

BRACHIOPOD

BRYOZOA

CEPHALOPOD

CORAL

CRINOID

ECHINOID

FISH

FORAMINIFERA

FOSSIL

GASTROPOD

OOLITE

OSTRACOD

PELECYPOD

PELLET

PISOLITE

PLANT REMAINS

PLANT SPORES

SCAPHOPOD

STROMATOPOROID

ANHYDRITIC

ARGILLACEOUS

ARGILLITE GRAIN

BENTONITE

BITUMENOUS SUBSTANCE

BRECCIA FRAGMENTS

CALCAREOUS

CARBONACEOUS FLAKES

CHTDK

CHTLT

COAL - THIN BEDS

DOLOMITIC

FELDSPAR

FERRUGINOUS PELLET

FERRUGINOUS

GLAUCONITE

GYPSIFEROUS

HEAVY MINERAL

KAOLIN

MARLSTONE

MINERAL CRYSTALS

NODULES

PHOSPHATE PELLETS

PYRITE

SALT CAST

SANDY

SILICEOUS

SILTY

TUFFACEOUS

Stringer

ANHYDRITE STRINGER

BENTONITE STRINGER

COAL STRINGER

DOLOMITE STRINGER

GYPSUM STRINGER

LIMESTONE STRINGER

MARLSTONE (CALC) STRG

MARLSTONE (DOL) STRG

SANDSTONE STRINGER

SHALE STRINGER

SILTSTONE STRINGER

Other Symbols

Oil Show

DEAD

EVEN

QUESTIONABLE

SPOTTED STAINING

ORGANIC

PINPOINT

VUGGY

Engineering

BIT

CASING

FORMATION TOP

GAS SHOW

MN DEPTH

NORMAL FAULT

OIL SHOW

OVERTURNED STRATA

REVERSE FAULT

Rounding

ANGULAR

ROUNDED

SUBANG

SUBRND

LITHOGRAPHIC

MICROXLN

MUDSTONE

PACKSTONE

WACKESTONE

Sorting

Porosity

- E EARTHY
- ▣ FENESTRAL
- F FRACTURE
- ✕ INTERCRYSTALLINE
- ⊕ INTEROOLITIC
- ✎ MOLDIC

Connections

- ◀ CONNECTION (LEFT)
- ▶ CONNECTION (RIGHT)
- ◀🔥 CONNECTION GAS
- ⬇ CORE - LOST
- CORE - RECOVERED
- ⋮ DST INTERVAL
- ⬇/⬆ FAULT

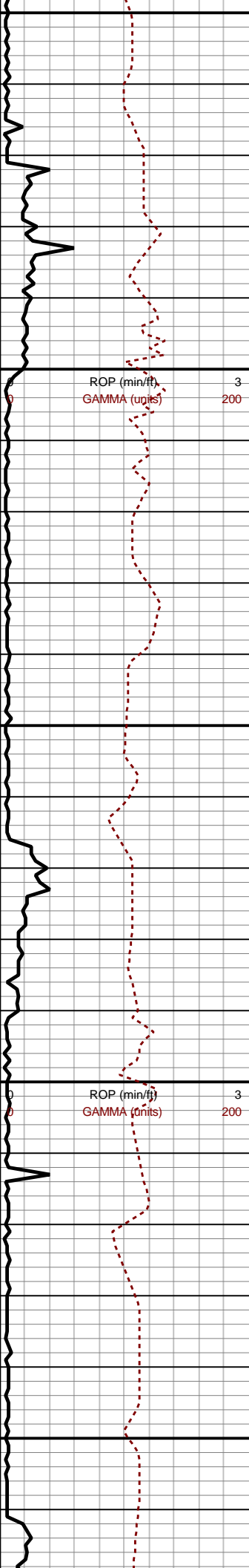
Wells

- ◀ SIDEWALL CORE (LEFT)
- ▶ SIDEWALL CORE (RIGHT)
- ▨ SLIDE
- DS SURVEY
- 🔥 TRIP GAS
- ◀ WIRELINE TESTED - LEFT
- ▶ WIRELINE TESTED - RT

Textures

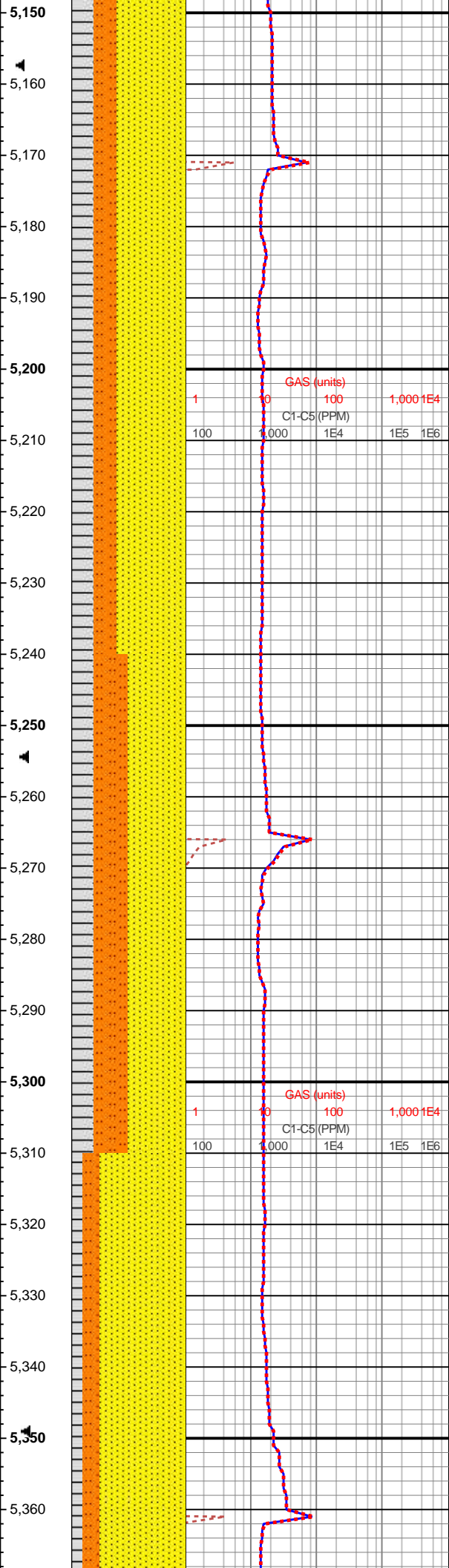
- BS BOUNDSTONE
- C CHALKY
- ✕ CRYPTOXLN
- E EARTHY
- F✕ FINELYXLN
- GS GRAINSTONE
- M MODERATE
- P POOR
- W WELL

ROP ROP — GAMMA - - -	Surveys	Depth Labels	% Lith	Total Gas & Chromatograph GAS C1 ——— C2 - - - C3 - . - . - C4 - C5 ———	Lithology Descriptions	Images
Extraction OG						
Winder South 1		4,960			Bit #: 2 Type: Reed Size: 7 7/8 Depth In: 1,582' Jets: 7*12 S/N: A230298	
Weld County, Colorado Spud Date: 8-16-16 Surface Casing @ 1,5xx' 2-man logging / Geosteering Began: 8-16-16		4,970				
100 units = 1% Methane 10000 units = 100% Methane	MD: 4,996' Azi: 3.78° Incl: 141.33° TVD: 4,974.94'	4,980				
	DVS: -236.35'	4,990				
WOB: 36Klbs Rotary: 50RPM Strokes: 240SPM Pump Rate: 698GPM		5,000				
		5,010				
		5,020				
		5,030				
		5,040				
		5,050			5000-5060 SS : pred bf-offwht- lt gy, mod trnsl grs, pred fri- frm grn sup clus, ip mtx sup clus, vf- f grd, sme uncons grs, sil- arg cmt, mod arg- dk gy slty intbds	
		5,060				
		5,070				
		5,080				
		5,090				
	MD: 5,091' Azi: 2.15° Incl: 148.07° TVD: 5,069.81' VS: -239.26'	5,100			5060-5120 SS : pred bf-offwht- lt gy, mod trnsl grs, pred fri- frm grn sup clus, ip mtx sup clus, vf- f grd, sme uncons grs, sil- arg cmt, mod arg- dk gy slty intbds	
ROP (min/ft) GAMMA(units)		5,110				
		5,120				
		5,130				
		5,140			5120-5180 SS (60%): pred medgy, bf- offwht-gy cmt	



MD: 5,187'
Azi: 3.4°
Incl: 145.45°
TVD: 5,165.7'
VS: -241.84'

MD: 5,282'
Azi: 3.93°
Incl: 151.33°
TVD: 5,260.5'
VS: -245.02'



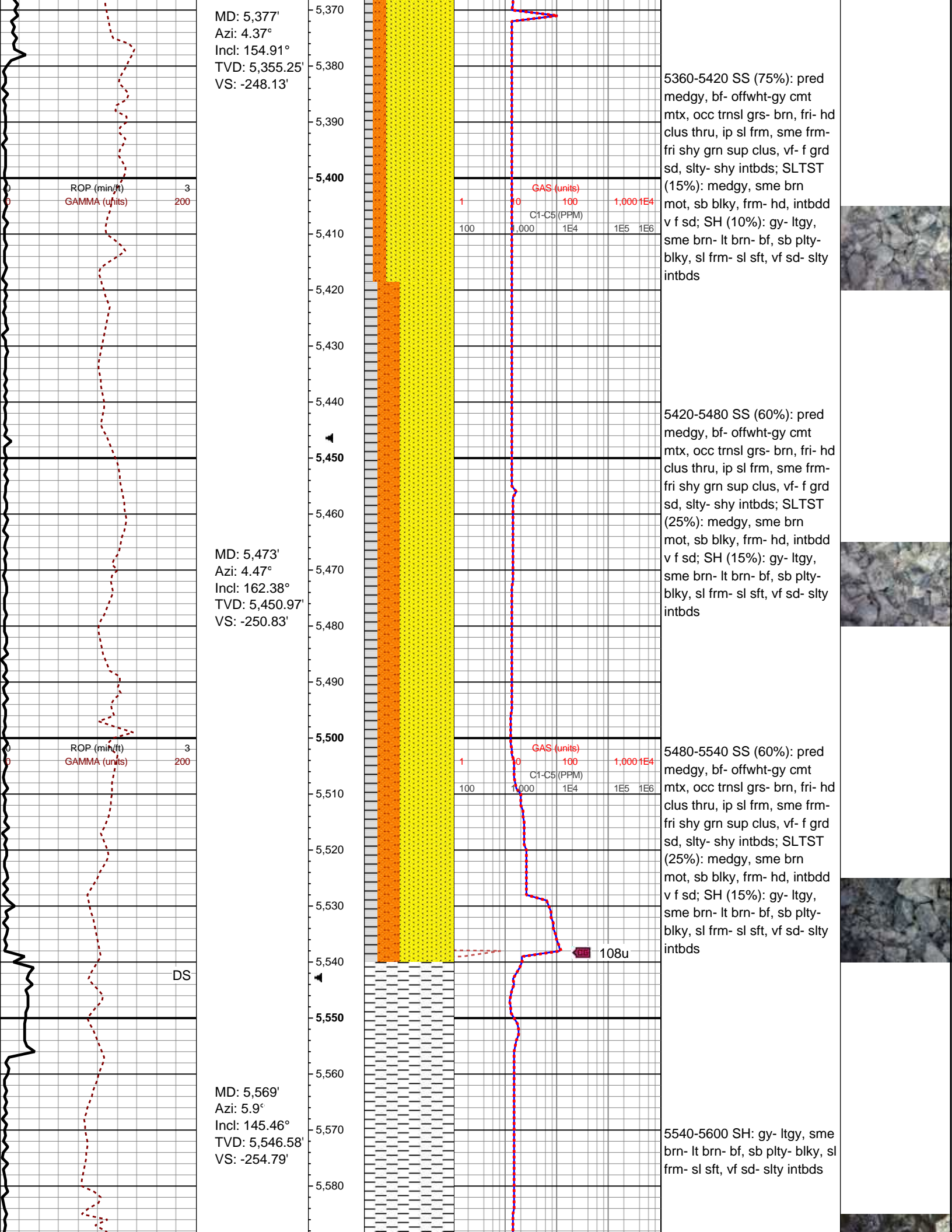
mtx, occ trnsI grs- brn, fri- hd
clus thru, ip sl frm, sme frm-
fri shy grn sup clus, vf- f grd
sd, slty- shy intbds; SLTST
(20%): medgy, sme brn
mot, sb blk, frm- hd, hi
intbdd v f sd; SH (20%): gy-
ltgy, sme brn- lt brn- bf, sb
plty- blk, sl frm- sl sft, vf sd-
slty intbds

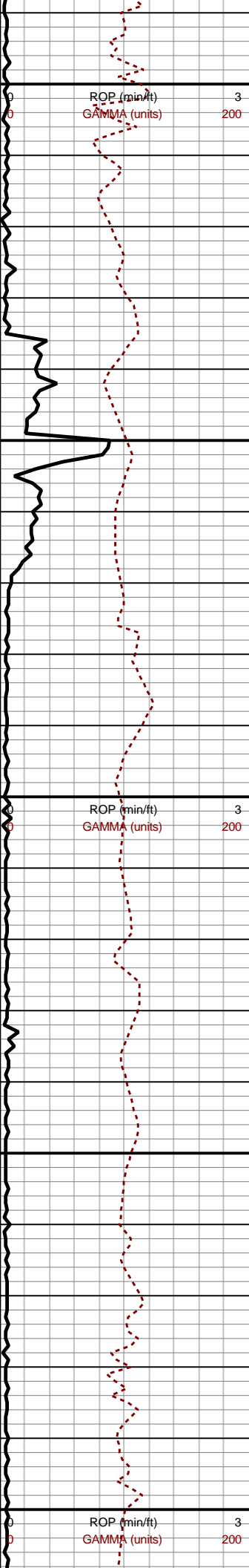
5180-5240 SS (60%): pred
medgy, bf- offwht-gy cmt
mtx, occ trnsI grs- brn, fri- hd
clus thru, ip sl frm, sme frm-
fri shy grn sup clus, vf- f grd
sd, slty- shy intbds; SLTST
(20%): medgy, sme brn
mot, sb blk, frm- hd, hi
intbdd v f sd; SH (20%): gy-
ltgy, sme brn- lt brn- bf, sb
plty- blk, sl frm- sl sft, vf sd-
slty intbds

5240-5300 SS (50%): pred
medgy, bf- offwht-gy cmt
mtx, occ trnsI grs- brn, fri- hd
clus thru, ip sl frm, sme frm-
fri shy grn sup clus, vf- f grd
sd, slty- shy intbds; SLTST
(30%): medgy, sme brn
mot, sb blk, frm- hd, intbdd
v f sd; SH (20%): gy- ltgy,
sme brn- lt brn- bf, sb plty-
blk, sl frm- sl sft, vf sd- slty
intbds

5300-5360 SS (75%): pred
medgy, bf- offwht-gy cmt
mtx, occ trnsI grs- brn, fri- hd
clus thru, ip sl frm, sme frm-
fri shy grn sup clus, vf- f grd
sd, slty- shy intbds; SLTST
(15%): medgy, sme brn
mot, sb blk, frm- hd, intbdd
v f sd; SH (10%): gy- ltgy,
sme brn- lt brn- bf, sb plty-
blk, sl frm- sl sft, vf sd- slty
intbds

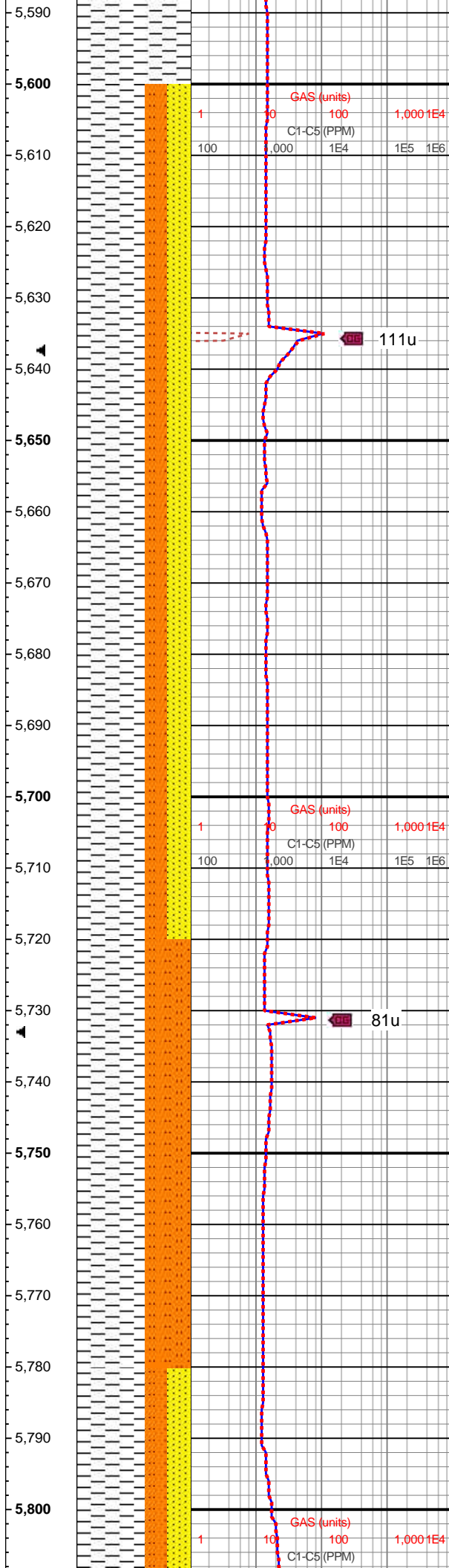






MD: 5,664'
Azi: 7.06°
Incl: 165.19°
TVD: 5,640.98'
VS: -259.07'

MD: 5,760'
Azi: 6.04°
Incl: 167.28°
TVD: 5,736.35'
VS: -261.72'



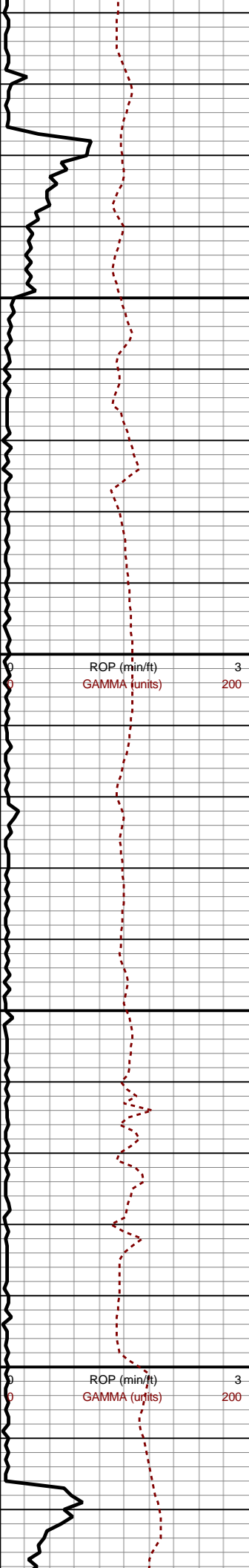
5600-5660 SS (20%): pred medgy, bf- offwht-gy cmt mtx, occ trnsl grs- brn, fri- hd clus thru, ip sl frm, sme frm- fri shy grn sup clus, vf- f grd sd, slty- shy intbds; SLTST (20%): medgy, sme brn mot, sb blkly, frm- hd, intbdd v f sd; SH (60%): gy- ltgy, sme brn- lt brn- bf, sb plty- blkly, sl frm- sl sft, vf sd- slty intbds

5660-5720 SS (20%): pred medgy, bf- offwht-gy cmt mtx, occ trnsl grs- brn, fri- hd clus thru, ip sl frm, sme frm- fri shy grn sup clus, vf- f grd sd, slty- shy intbds; SLTST (20%): medgy, sme brn mot, sb blkly, frm- hd, intbdd v f sd; SH (60%): gy- ltgy, sme brn- lt brn- bf, sb plty- blkly, sl frm- sl sft, vf sd- slty intbds

5720-5780 SLTST (40%): medgy, sme brn mot, sb blkly, frm- hd, intbdd v f sd; SH (60%): gy- ltgy, sme brn- lt brn- bf, sb plty- blkly, sl frm- sl sft, vf sd- slty intbds

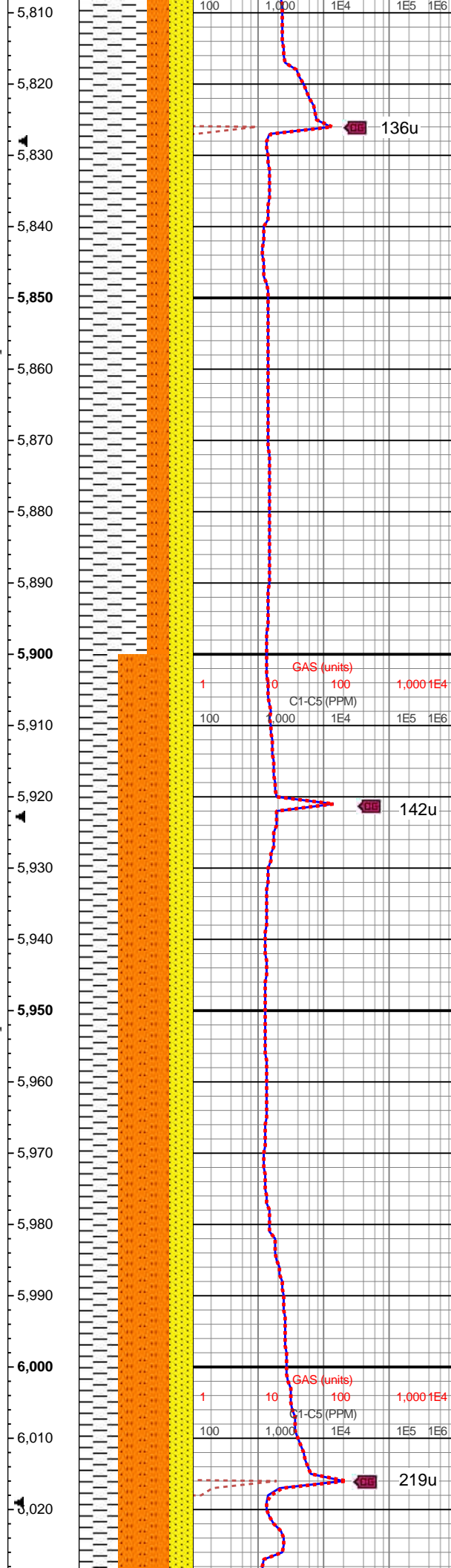
5780-5840 SS (20%): pred medgy, bf- offwht-gy cmt mtx, occ trnsl grs- brn, fri- hd





MD: 5,855'
Azi: 6.91°
Incl: 147.66°
TVD: 5,830.76'
VS: -265.9'

MD: 5,950'
Azi: 4.57°
Incl: 152.25°
TVD: 5,925.28'
VS: -270.75'



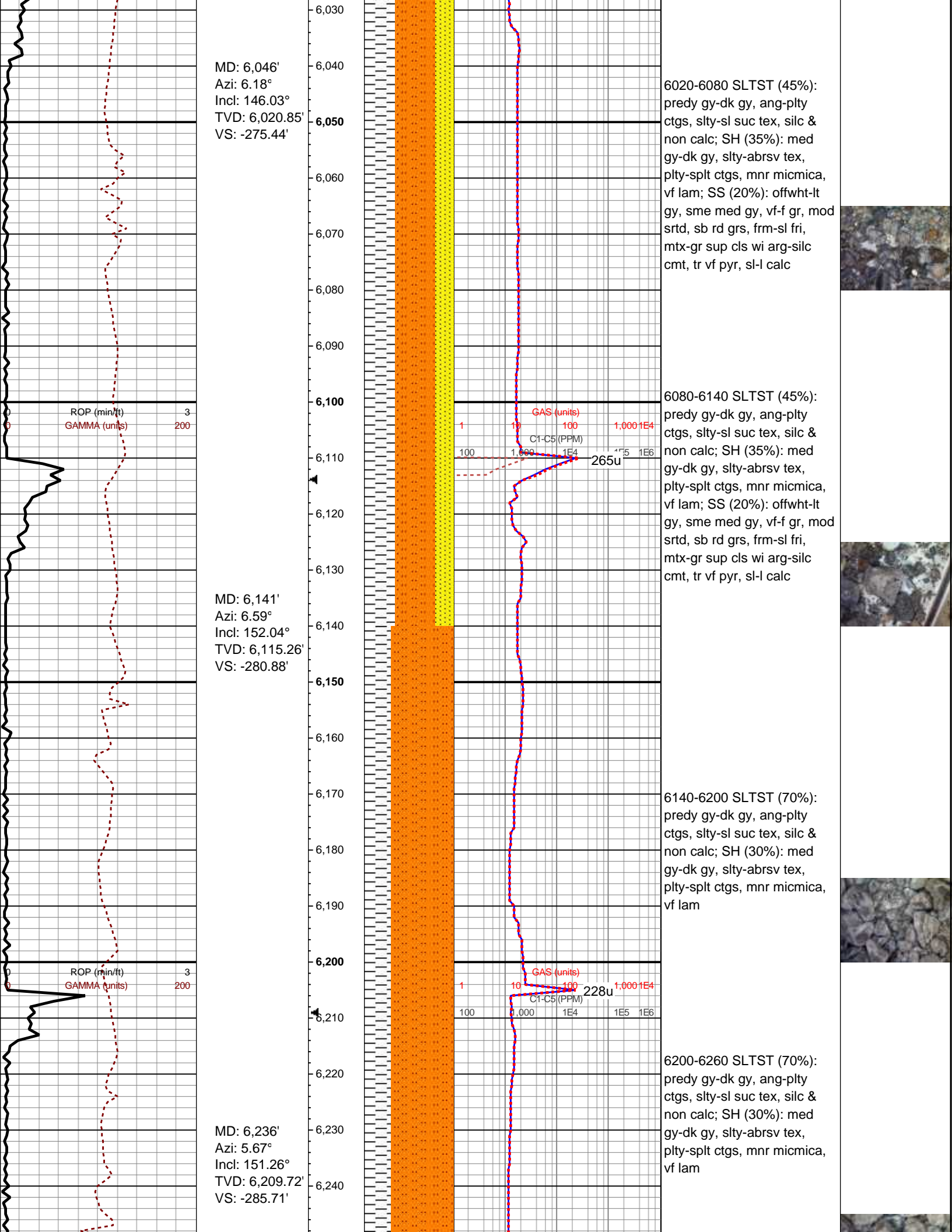
clus thru, ip sl frm, sme frm-
fri shy grn sup clus, vf- f grd
sd, slty- shy intbds; SLTST
(20%): medgy, sme brn
mot, sb blkly, frm- hd, intbdd
v f sd; SH (60%): gy- ltgy,
sme brn- lt brn- bf, sb plty-
blkly, sl frm- sl sft, vf sd- slty
intbds

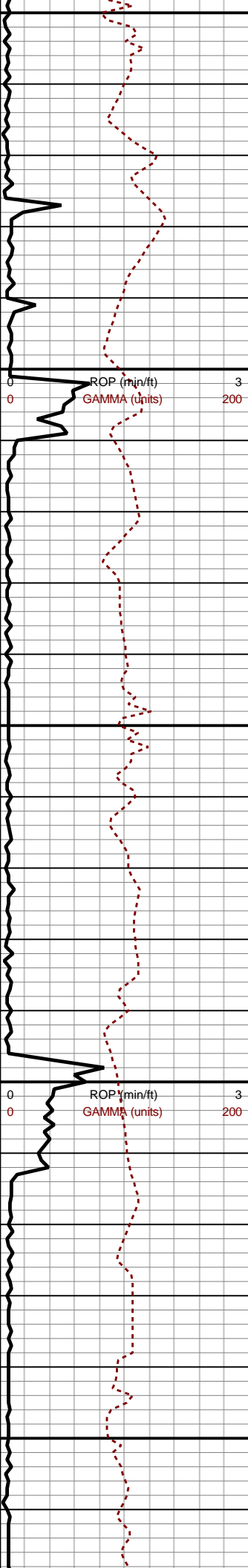
5840-5900 SS (20%): pred
medgy, bf- offwht-gy cmt
mtx, occ trnsl grs- brn, fri- hd
clus thru, ip sl frm, sme frm-
fri shy grn sup clus, vf- f grd
sd, slty- shy intbds; SLTST
(20%): medgy, sme brn
mot, sb blkly, frm- hd, intbdd
v f sd; SH (60%): gy- ltgy,
sme brn- lt brn- bf, sb plty-
blkly, sl frm- sl sft, vf sd- slty
intbds

5900-5960 SLTST (45%):
predy gy-dk gy, ang-plty
ctgs, slty-sl suc tex, silc &
non calc; SH (35%): med
gy-dk gy, slty-abrsv tex,
plty-splt ctgs, mnv micmica,
vf lam; SS (20%): offwht-lt
gy, sme med gy, vf-f gr, mod
srttd, sb rd grs, frm-sl fri,
mtx-gr sup cls wi arg-silc
cmt, tr vf pyr, sl-l calc

5960-6020 SLTST (45%):
predy gy-dk gy, ang-plty
ctgs, slty-sl suc tex, silc &
non calc; SH (35%): med
gy-dk gy, slty-abrsv tex,
plty-splt ctgs, mnv micmica,
vf lam; SS (20%): offwht-lt
gy, sme med gy, vf-f gr, mod
srttd, sb rd grs, frm-sl fri,
mtx-gr sup cls wi arg-silc
cmt, tr vf pyr, sl-l calc

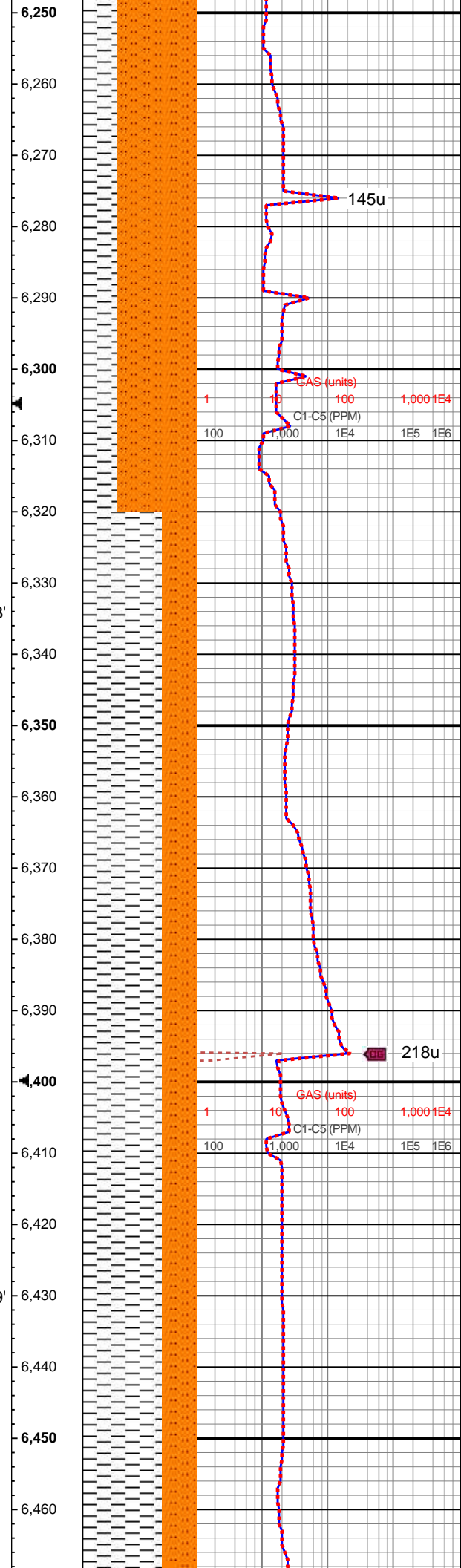






MD: 6,331'
Azi: 4.72°
Incl: 152.82°
TVD: 6,304.33'
VS: -289.78'

MD: 6,427'
Azi: 4.87°
Incl: 149.35°
TVD: 6,399.99'
VS: -293.68'

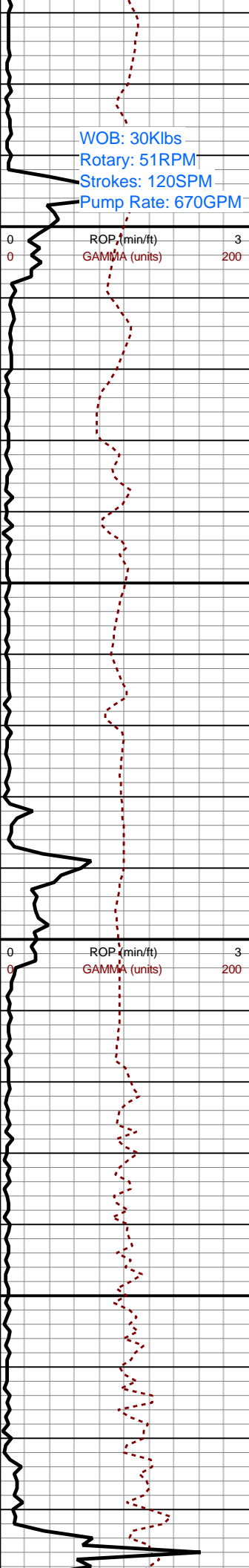


6260-6320 SLTST (70%):
predy gy-dk gy, ang-plty
ctgs, slty-sl suc tex, silc &
non calc; SH (30%): med
gy-dk gy, slty-abrsv tex,
plty-splt ctgs, mnr micmica,
vf lam

6320-6380 SLTST (30%):
predy gy-dk gy, ang-plty
ctgs, slty-sl suc tex, silc &
non calc; SH (70%): med
gy-dk gy, slty-abrsv tex,
plty-splt ctgs, mnr micmica,
vf lam

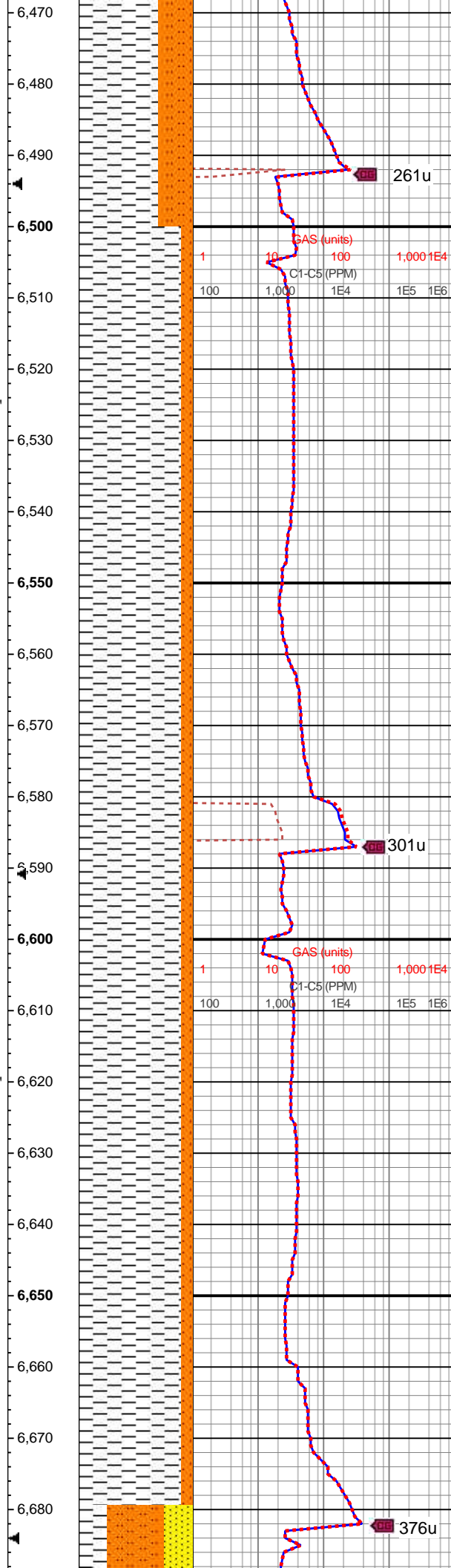
6380-6440 SLTST (30%):
predy gy-dk gy, ang-plty
ctgs, slty-sl suc tex, silc &
non calc; SH (70%): med
gy-dk gy, slty-abrsv tex,
plty-splt ctgs, mnr micmica,
vf lam





MD: 6,522'
Azi: 4.61°
Incl: 143.73°
TVD: 6,494.67'
VS: -298.01'

MD: 6,617'
Azi: 159.12°
Incl: 4.84°
TVD: 6,683.11'
VS: -301.67'



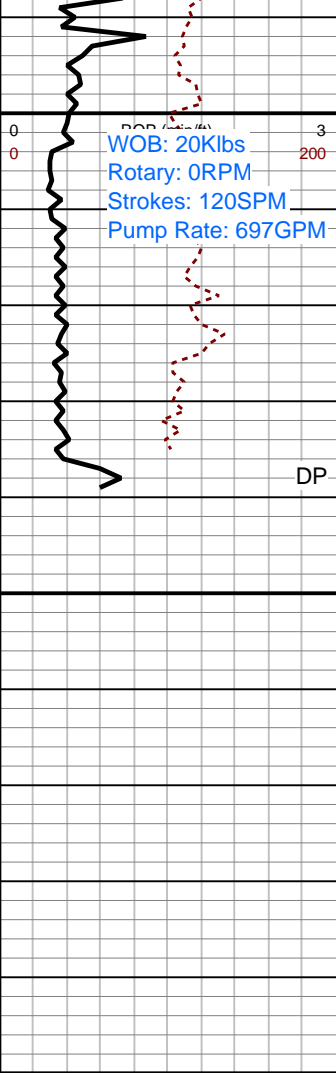
6440-6500 SLTST (30%):
predy gy-dk gy, ang-plty
ctgs, slty-sl suc tex, silc &
non calc; SH (70%): med
gy-dk gy, slty-abrsv tex,
plty-splt ctgs, mnr micmica,
vf lam

6500-6560 SLTST (10%):
predy gy-dk gy, ang-plty
ctgs, slty-sl suc tex, silc &
non calc; SH (90%): med
gy-dk gy, slty-abrsv tex,
plty-splt ctgs, mnr micmica,
vf lam

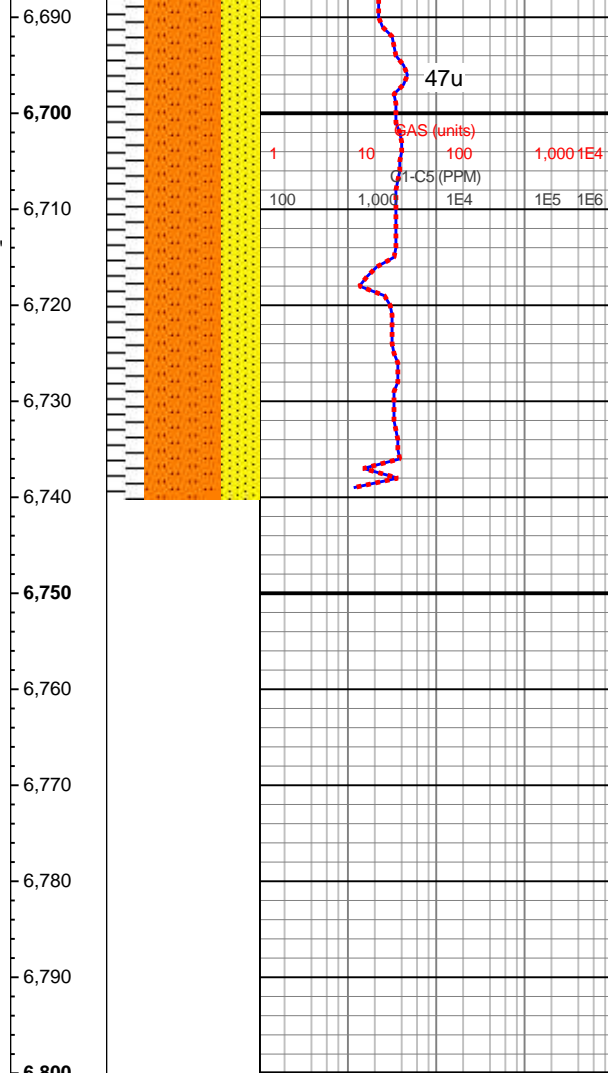
6560-6620 SLTST (10%):
predy gy-dk gy, ang-plty
ctgs, slty-sl suc tex, silc &
non calc; SH (90%): med
gy-dk gy, slty-abrsv tex,
plty-splt ctgs, mnr micmica,
vf lam

6620-6680 SLTST (10%):
predy gy-dk gy, ang-plty
ctgs, slty-sl suc tex, silc &
non calc; SH (90%): med
gy-dk gy, slty-abrsv tex,
plty-splt ctgs, mnr micmica,
vf lam





MD: 6,711'
Azi: 270.65°
Incl: 6.13°
TVD: 6,683.11'
VS: -298.07'



6680-6740 SLTY SH/SH
(75%): medgy- gy, sme brn
mot, sb blk- sb plty, sme
plty, frm- hd, ip sl frm, sme
intbdd wi v f sd- slt; SS
(25%): pred medgy- gy, bf-
offwht-gy cmt mtx, occ trns
grs- brn, fri- hd grn- mtx sup
clus, ip sl frm, sme frm- fri
shy grn sup clus, vf- f grd
sd, slty- shy intbds



Log Continued in
Horizontal Format