



Scale: 5" / 100'
Measured Depth Log

Well Name WAAG 22

Location Sec. 19 T7N-R65W

State Colorado

County Weld

Country USA

Rig Number Patterson UTI 346

API Number 05-123-40348-00

Field Wattenberg

Region DJ Basin

Drilling Completed TBD

Spud Date 7/21/2015

Surface Coordinates SHL: 305'FSL & 2363'FWL, Sec. 19
Latitude: 40.55431°
Longitude: -104.70736°

Bottom Hole Coordinates BHL: 660' FSL & 2226'FEL, Sec.24

Ground Elevation 4,868'

K.B. Elevation 4,892.5'

Logged Interval 5,000' To 6680

Total Depth TBD

Formation Codell

Type of Drilling Fluid Water Based

Other Symbols

Oil Show

- DEAD
- EVEN
- QUESTIONABLE
- SPOTTED STAINING

Porosity

- E EARTHY
- F FENESTRAL
- F FRACTURE
- X INTERCRYSTALLINE
- Q INTEROOLITIC
- MOLDIC

ORGANIC

P PINPOINT

V VUGGY

Engineering

BIT

CASING

CONNECTION (LEFT)

CONNECTION (RIGHT)

CONNECTION GAS

CORE - LOST

CORE - RECOVERED

DST INTERVAL

FAULT

FORMATION TOP

GAS SHOW

MN DEPTH MN DEPTH

NORMAL FAULT

OIL SHOW

OVERTURNED STRATA

REVERSE FAULT

SIDEWALL CORE (LEFT)

SIDEWALL CORE (RIGHT)

SLIDE

SURVEY

TRIP GAS

WIRELINE TESTED - LEFT

WIRELINE TESTED - RT

Rounding

- ANGULAR
- ROUNDED
- SUBANG
- SUBRND

Textures

- BOUNDSTONE
- CHALKY
- CRYPTOXLN
- E EARTHY
- FINELYXLN
- GRAINSTONE

L LITHOGRAPHIC

MX MICROXLN

MS MUDSTONE

PS PACKSTONE

WS WACKESTONE

Sorting

- M MODERATE
- P POOR
- W WELL

Zone Color Coding

- Oil
- Condensate
- Gas
- Note
- Core
- Pressure
- Error
- Water
- Seal

Accessories

Fossils

ALGAE
 AMPHIPORA
 BELEMNITE
 BIOCLASTIC
 BRACHIOPOD
 BRYOZOA
 CEPHALOPOD
 CORAL
 CRINOID
 ECHINOID
 FISH
 FORAMINIFERA

F FOSSIL

GASTROPOD
 OOLITE
 OSTRACOD
 PELECYPOD
 PELLET
 PISOLITE
 PLANT REMAINS
 PLANT SPORES
 SCAPHOPOD
 STROMATOPOROID

Minerals

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

Equipment ML-339

Comments Start: 7-21-15
 Standby: N/A
 TD:

Logger Names Dominic Pitre / Nicholas Watkins

Services Provided 2-man Logging: 7-21-15
 On Site Geosteering: 7-22-15

Address Empirica, LLC.
 6360 W Sam Houston Pkwy N
 Suite 100
 Houston, TX 77041

Operator

Company Extraction Oil & Gas

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

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

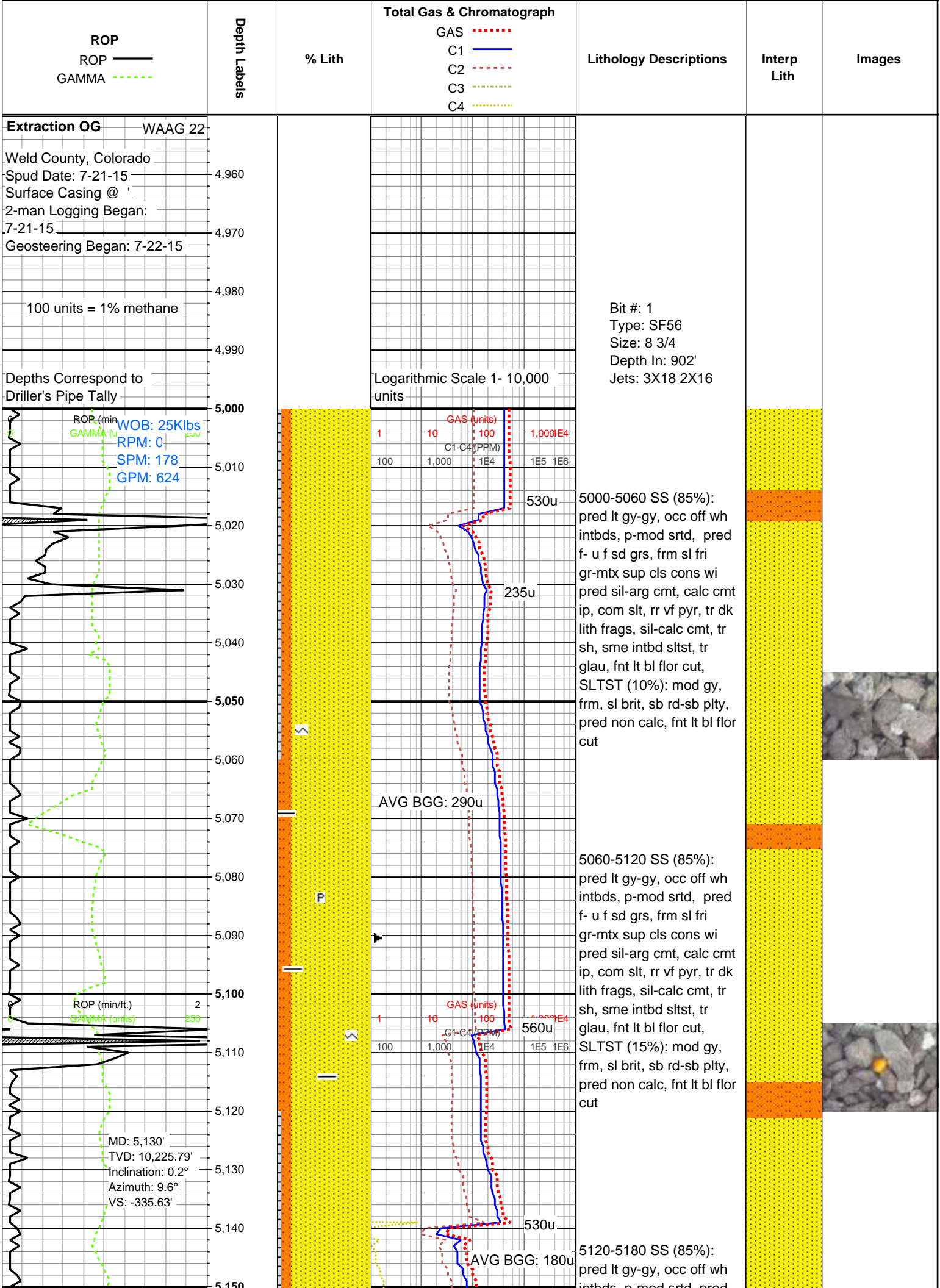
Geologist

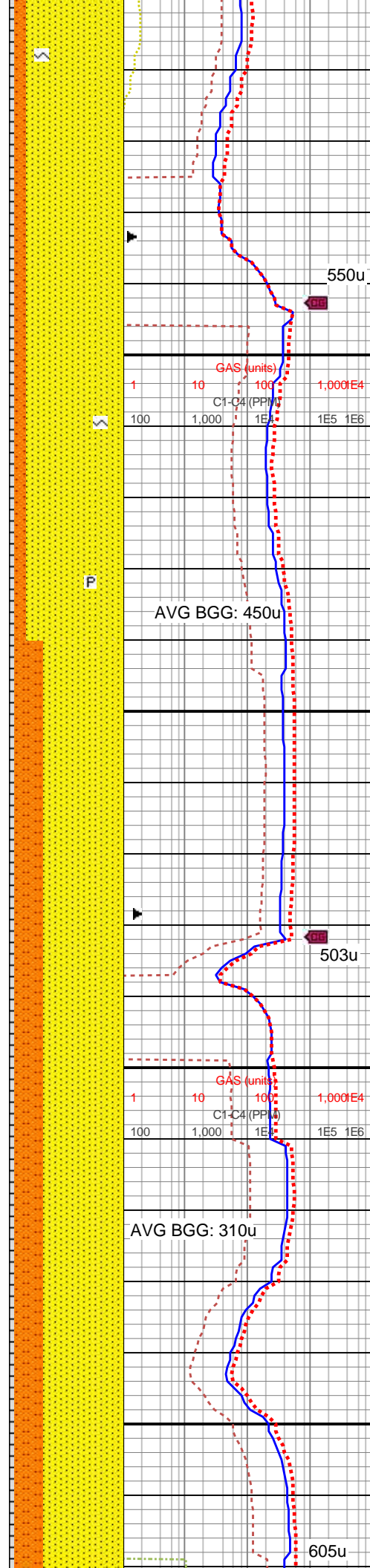
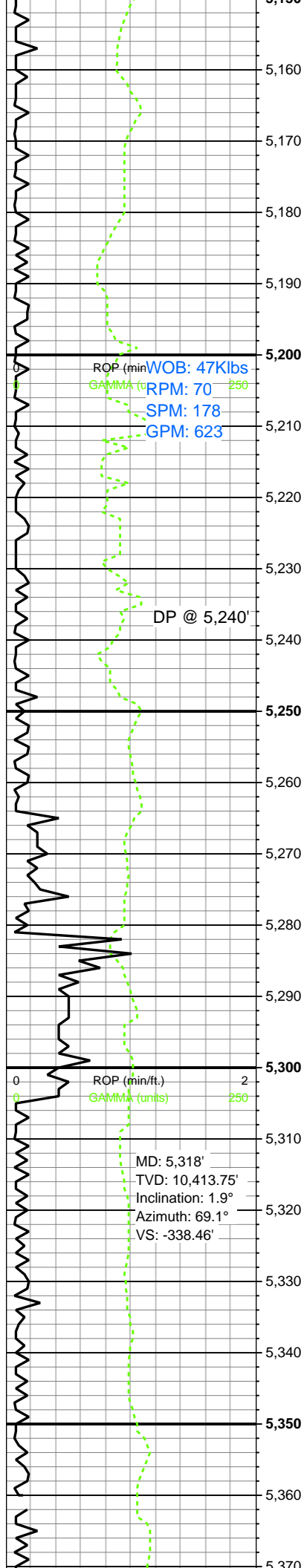
Name Jared Rouse

Company Extraction Oil & Gas

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







intbds, p-mod sltst, pred
f- u f sd grs, frm sl fri
gr-mtx sup cls cons wi
sil-arg cmt, com slt, rr vf
pyr, tr dk lith frags, tr sh,
sme intbd sltst, tr glau,
non calc, SLTST (10%):
mod gy, frm, sl brit, sb
rd-sb plty, non calc, fnt lt
bl flor cut

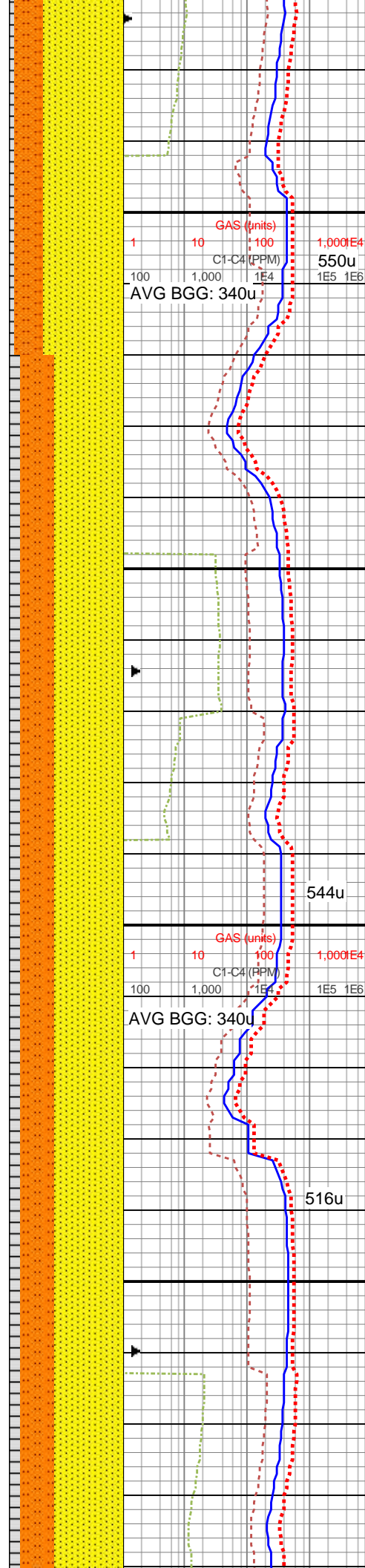
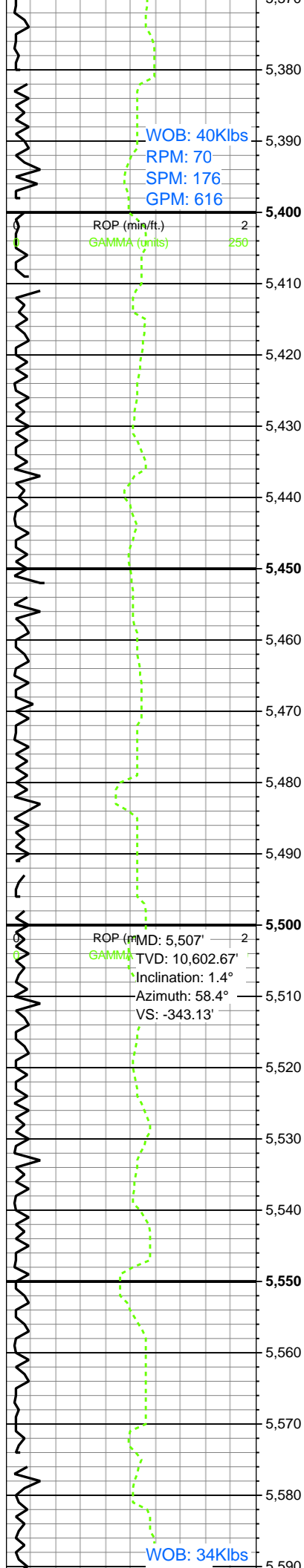
5180-5240 SS (85%): It
gy-gy, occ off wh, p-mod
srted, pred f-u f sd grs, frm
sl fri gr-mtx sup cls cons
wi pred sil-arg cmt, calc
cmt ip, com slt, rr vf pyr, tr
dk lith frags, sil cmt, tr sh,
sme intbd sltst, tr glau,
fnt lt bl flor cut, SLTST
(10%): mod gy, frm, sl
brit, sb rd-sb plty, pred
non calc

5240-5300 SS: pred gy-
med gy, ip medgy brn,
sme wh- offwht, pred sb
blky, ip sb plty, mod- p
srted, pred vf gr clus, occ
wh u f clus, frm sl fri sd
cls thru, arg- slty thru, occ
vf pyr, dk lith frag thru, sil-
cal cmt, ip sl calc, tr plty
sh intbds, incrg intbd
sltst, sltst grdng, rr glau, tr
bent, fnt lt bl flor cut, lt gn
resd cut

MW: 8.9

5300-5360 75% SS 25%
SLTST: pred gy- med gy,
ip medgy brn, sme wh-
offwht, pred sb blky, ip sb
plty, mod- p srted, pred vf
gr clus, occ wh u f clus,
frm sl fri sd cls thru, arg-
slty thru, occ vf pyr, dk lith
frag thru, sil- cal cmt, ip sl
calc, tr plty sh intbds,
incrg intbd sltst, sltst
grdg, rr glau, tr bent, fnt lt
bl flor cut, lt gn resd cut





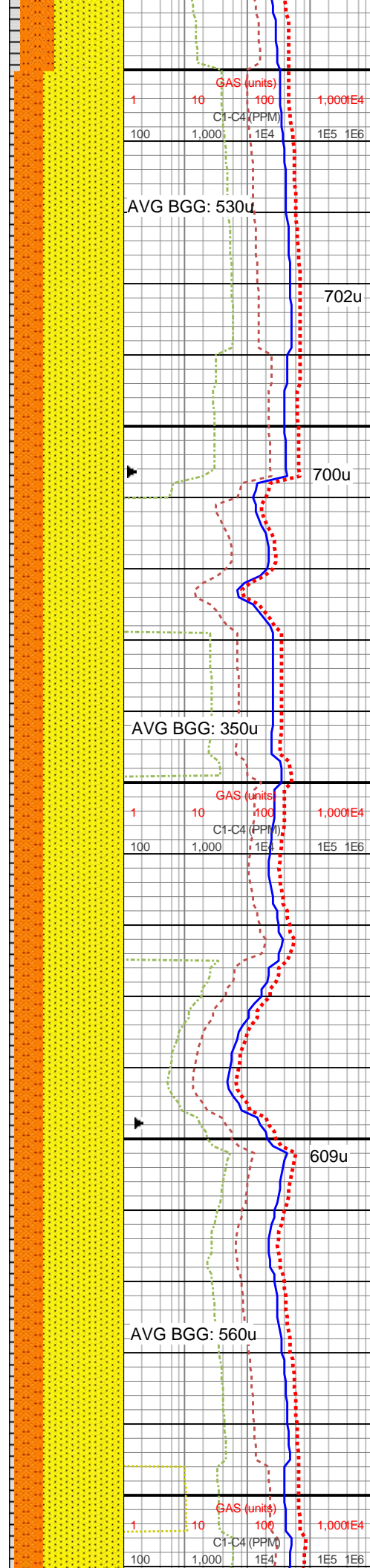
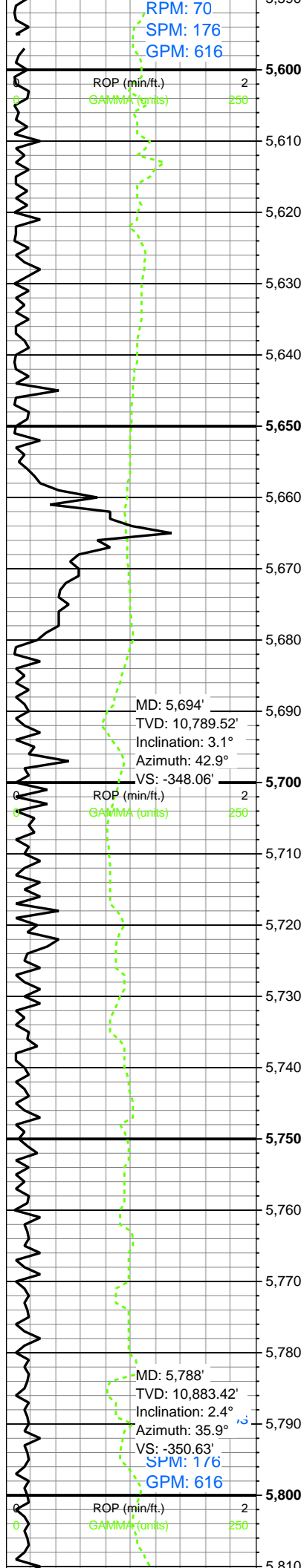
5360-5420 75% SS 25%
SLTST: pred gy- med gy,
ip medgy brn, sme wh-
offwht, pred sb blk, ip sb
plty, mod- p srt, pred vf
gr clus, occ wh u f clus,
frm sl fri sd cls thru, arg-
sly thru, occ vf pyr, dk lith
frag thru, sil- cal cmt, ip sl
calc, tr plty sh intbds,
incrg intbd sltst, sltst
grdg, rr glau, tr bent, fnt lt
bl flor cut, lt gn resd cut

5420-5480 65% SS 35%
SLTST: pred gy- med gy,
ip medgy brn, occ wh-
offwht, pred sb blk, ip sb
plty, mod- p srt, pred vf
gr clus, tr wh u f clus, frm
sl fri sd cls thru, v arg-
sly thru, occ vf pyr, dk lith
frag thru, sil- cal cmt, ip sl
calc, tr plty sh intbds,
intbd sltst, rr glau, tr bent,
fnt lt bl flor cut, lt gn resd
cut

5480-5540 65% SS 35%
SLTST: pred gy- med gy,
ip medgy brn, occ wh-
offwht, pred sb blk, ip sb
plty, mod- p srt, pred vf
gr clus, tr wh u f clus, frm
sl fri sd cls thru, v arg-
sly thru, occ vf pyr, dk lith
frag thru, sil- cal cmt, ip sl
calc, tr plty sh intbds,
intbd sltst, rr glau, tr bent,
fnt lt bl flor cut, lt gn resd
cut

5540-5600 65% SS 35%
SLTST: pred gy- med gy,
ip medgy brn, occ wh-
offwht, pred sb blk, ip sb
plty, mod- p srt, pred vf
gr clus, tr wh u f clus, frm
sl fri sd cls thru, v arg-
sly thru, occ vf pyr, dk lith
frag thru, sil- cal cmt, ip sl
calc, tr plty sh intbds,





intbd sltst, rr glau, tr bent,
fnt lt bl flor cut, lt gn resd
cut

5600-5660 65% SS 35%
SLTST: pred gy- med gy,
occ medgy brn, tr wh-
offwht, pred sb blk, ip sb
ppty, mod- p srted, pred vf
gr clus, tr wh u f clus, frm
sl fri sd cls thru, v arg-
sly thru, occ vf pyr, dk lith
frag thru, sil- cal cmt, ip sl
calc, tr ppty sh intbds,
intbd sltst, rr glau, tr pyr,
p- g lt bl flor cut, fr lt gn
resd cut

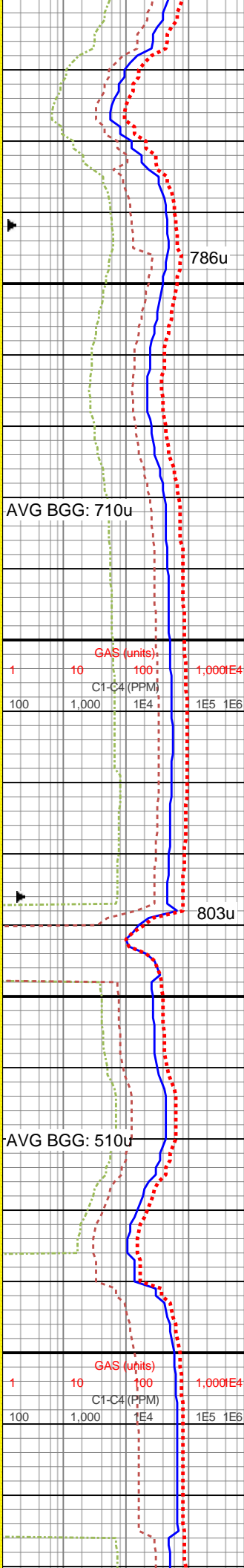
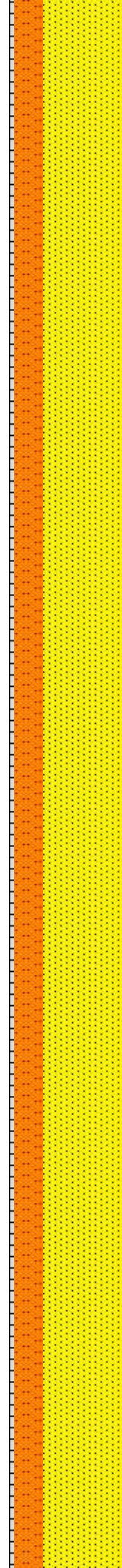
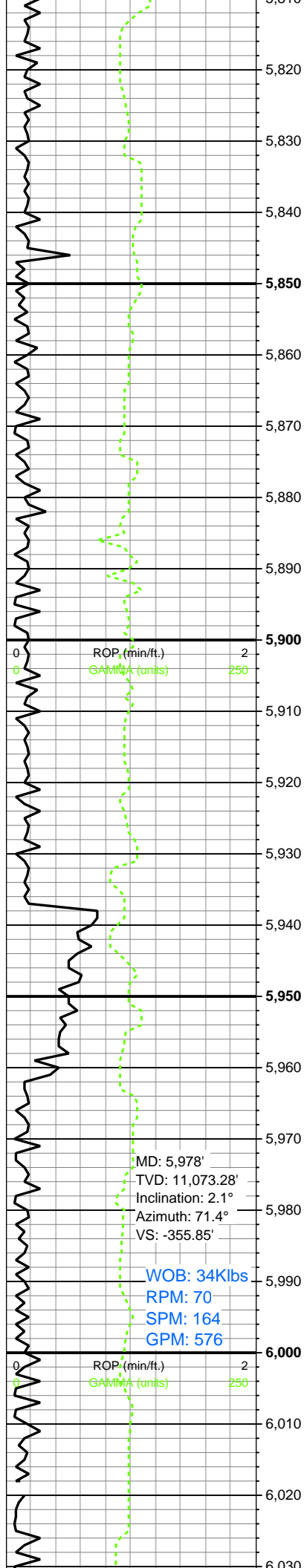
MW: 8.9
VIS: 34

5660-5720 65% SS 35%
SLTST: pred gy- med gy,
occ medgy brn, tr wh-
offwht, pred sb blk, ip sb
ppty, mod- p srted, pred vf
gr clus, tr wh u f clus, frm
sl fri sd cls thru, v arg-
sly thru, occ vf pyr, dk lith
frag thru, sil- cal cmt, ip sl
calc, tr ppty sh intbds,
intbd sltst, rr glau, tr pyr,
p- g lt bl flor cut, fr lt gn
resd cut

5720-5780 65% SS 35%
SLTST: pred gy- med gy,
occ medgy brn, tr wh-
offwht, pred sb blk, ip sb
ppty, mod- p srted, pred vf
gr clus, tr wh u f clus, frm
sl fri sd cls thru, v arg-
sly thru, occ vf pyr, dk lith
frag thru, sil- cal cmt, ip sl
calc, tr ppty sh intbds,
intbd sltst, rr glau, tr pyr,
p- g lt bl flor cut, fr lt gn
resd cut

5780-5840 75% SS 25%
SLTST: pred gy- med gy,
occ medgy brn- tn, sme
wh- offwht, pred sb blk,





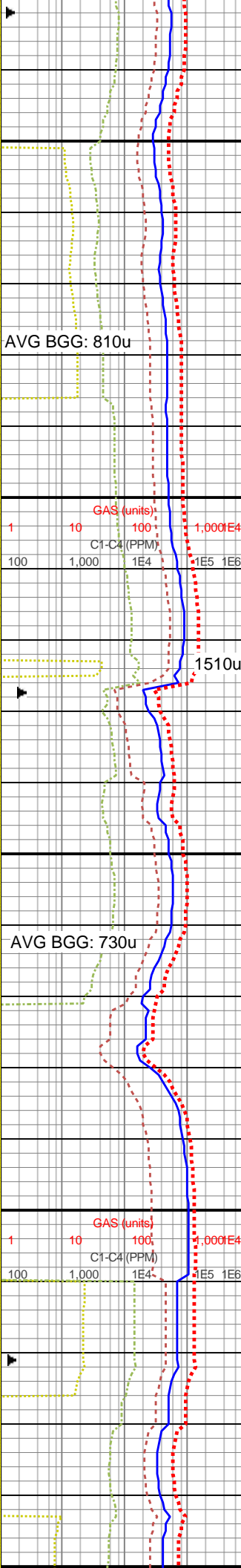
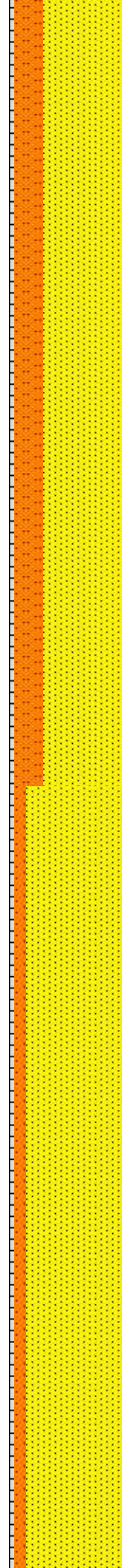
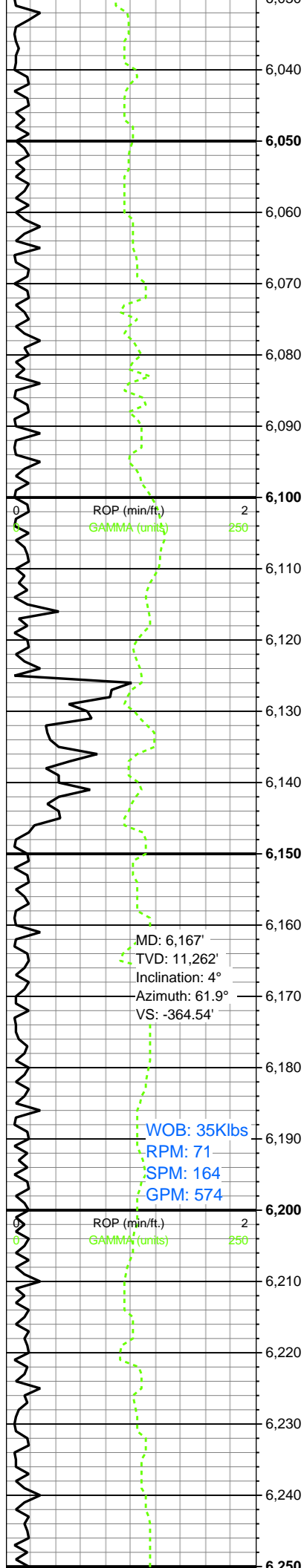
ip sb plty, mod- p srted,
pred f- vf gr clus, occ wh
u f clus, frm sl fri sd cls
thru, v arg- slty thru, occ vf
pyr, dk lith frag thru, sil-
cal cmt, ip sl calc, tr plty
sh intbds, sme intbd
sltst, rr glau, tr pyr, p- g lt
bl flor cut, fr lt gn resd cut

5840-5900 75% SS 25%
SLTST: pred gy- med gy,
occ medgy brn- tn, sme
wh- offwht, pred sb blkly,
ip sb plty, mod- p srted,
pred f- vf gr clus, occ wh
u f clus, frm sl fri sd cls
thru, v arg- slty thru, occ vf
pyr, dk lith frag thru, sil-
cal cmt, ip sl calc, tr plty
sh intbds, sme intbd
sltst, rr glau, tr pyr, p- g lt
bl flor cut, fr lt gn resd cut

5900-5960 75% SS 25%
SLTST: gy- med gy, occ
medgy brn- tn, sme wh-
offwht, pred sb blkly, ip sb
plty, mod- p srted, pred f- vf
gr clus, occ wh u f clus,
frm sl fri sd cls thru, v
arg- slty thru, occ vf pyr,
dk lith frag thru, sil- cal
cmt, ip sl calc, tr plty sh
intbds, sme intbd sltst, rr
glau, tr pyr, p- g lt bl flor
cut, occ sl stmg, fr lt gn
resd cut

5960-6020 75% SS 25%
SLTST: gy- med gy, occ
medgy brn- tn, sme wh-
offwht, pred sb blkly, ip sb
plty, mod- p srted, pred f- vf
gr clus, sme wh u f clus,
frm sl fri sd cls thru, v
arg- slty thru, occ vf pyr,
dk lith frag thru, sil- cal
cmt, ip sl calc, tr plty sh
intbds, sme intbd sltst, rr
glau, tr pyr, p- g lt bl flor
cut, occ sl stmg, fr lt gn
resd cut





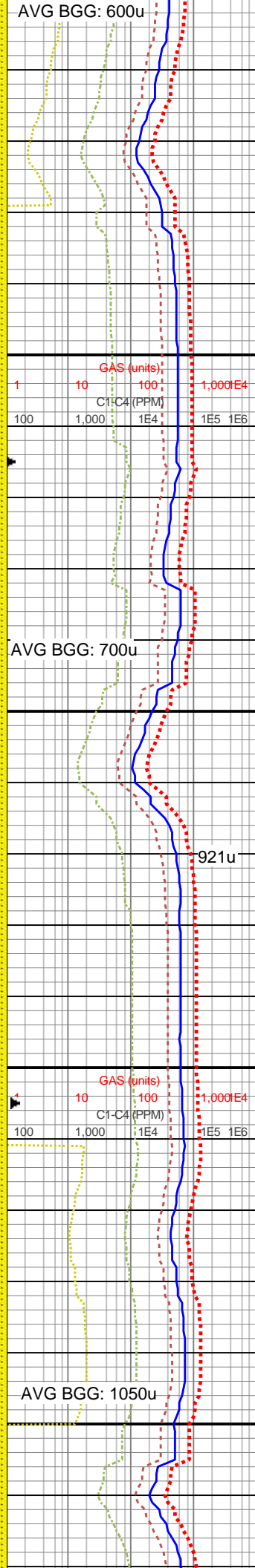
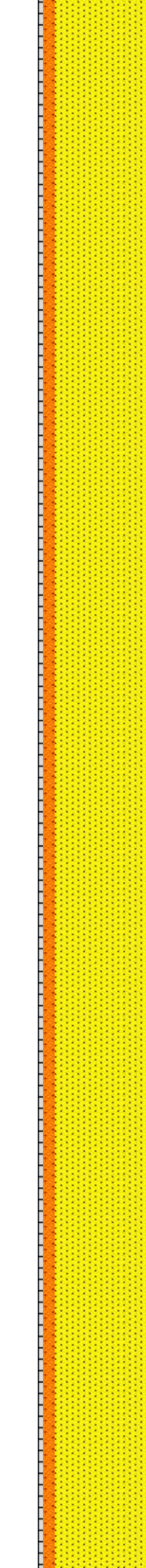
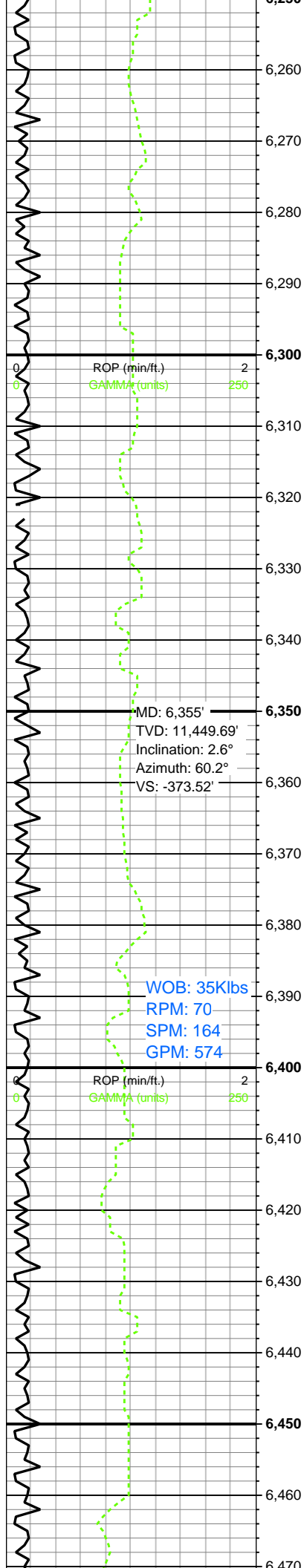
6020-6080 75% SS 25%
SLTST: gy- med gy, occ medgy brn- tn, sme wh-offwht, pred sb blk, ip sb plty, mod- p srt, pred f- vf gr clus, occ wh u f clus, frm sl fri sd cls thru, v arg- slty thru, occ vf pyr, dk lith frag thru, sil- cal cmt, ip sl calc, tr plty sh intbds, sme intbd sltst, rr glau, tr pyr, p- g lt bl flor cut, occ sl stmg, fr lt gn resd cut

6080-6140 75% SS 25%
SLTST: gy- med gy, occ dk gy- tn, sme wh- offwht, pred sb blk, ip sb plty, p srt, pred f- vf gr clus, occ wh u f clus, frm sl fri sd cls thru, v arg- slty thru, occ vf pyr, dk lith frag thru, sil- cal cmt, ip sl calc, tr plty- sb plty sh intbds, sme intbd sltst, rr glau, tr pyr, p- g lt bl flor cut, occ sl stmg, fr lt gn resd cut

6140-6200 90% SS 10%
SLTST: pred wh-offwht-tn, sme gy- med gy, pred sb blk, ip sb plty, p srt, pred f- u f gr clus, occ wh u f clus, frm sl fri sd cls thru, mod arg- slty thru, occ vf pyr, dk lith frag thru, sil- cal cmt, ip sl calc, tr plty- sb plty sh intbds, sme intbd sltst lamn, rr glau, tr pyr, g lt bl flor cut, occ sl stmg- op, fr- g lt gn resd cut

6200-6260 90% SS 10%
SLTST: pred wh-offwht-tn, sme gy- med gy, pred sb blk, ip sb plty, p srt, pred f- u f gr clus, occ wh u f clus, frm sl fri sd cls thru, mod arg- slty thru, occ vf pyr, dk lith frag thru, sil- cal cmt, ip sl calc, tr plty- sb plty sh intbds, sme intbd sltst lamn, rr





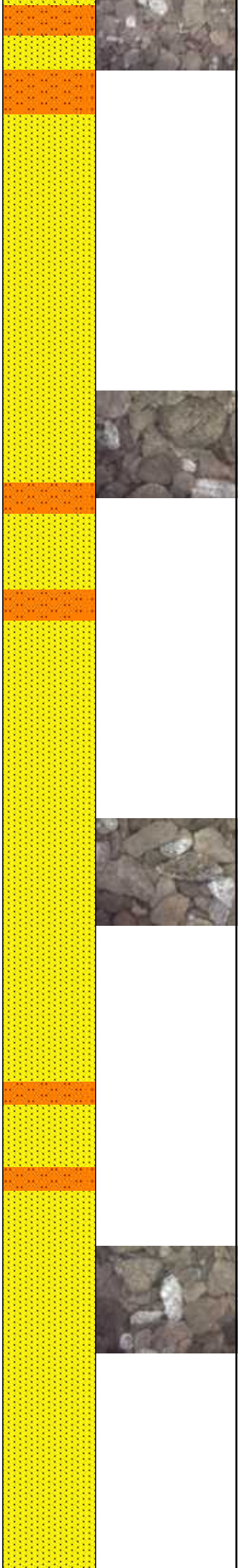
glau, tr pyr, g lt bl flor cut,
occ sl stmg- op, fr- g lt gn
resd cut

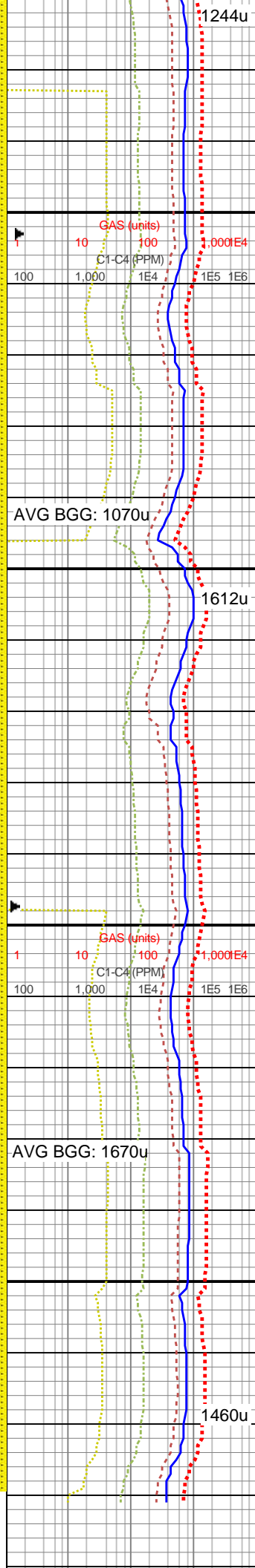
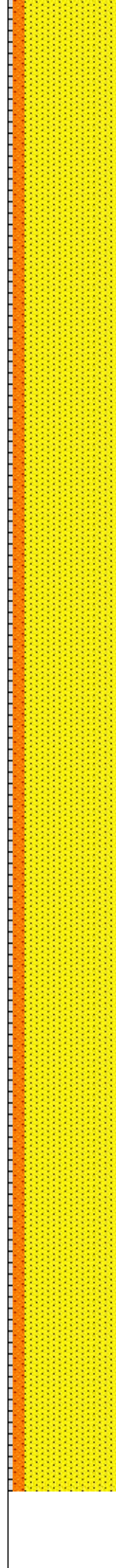
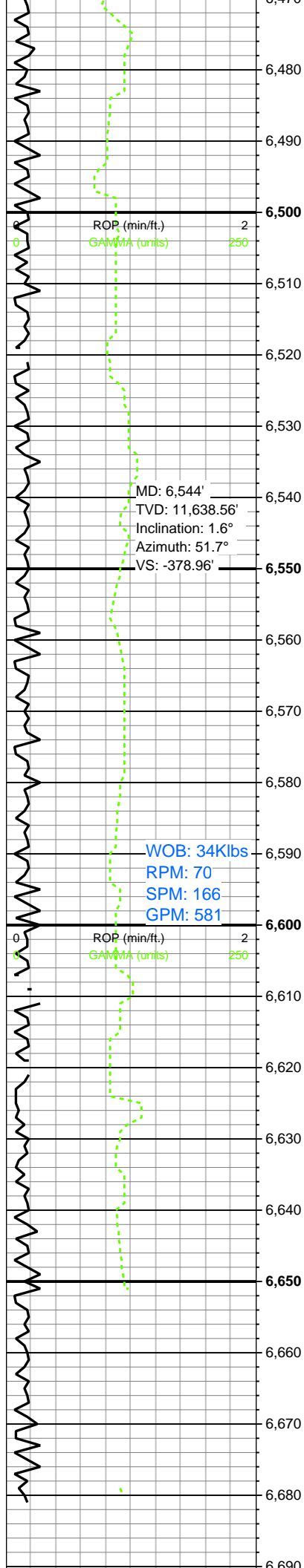
6260-6320 90% SS 10%
SLTST: pred wh-offwht-
tn, sme gy- med gy, pred
sb blk, ip sb pty, p srt,
pred f- u f gr clus, occ wh
u f clus, frm sl fri sd cls
thru, mod arg- slty thru,
occ vf pyr, dk lith frag thru,
sil- cal cmt, ip sl calc, tr
pty- sb pty sh intbds,
sme intbd sltst lamn, rr
glau, tr pyr, g lt bl flor cut,
occ sl stmg- op, fr- g lt gn
resd cut

6320-6380 90% SS 10%
SLTST: pred wh-offwht-
tn, sme gy- med gy, pred
sb blk, ip sb pty, p srt,
pred f- u f gr clus, occ wh
u f clus, frm sl fri sd cls
thru, mod arg- slty thru,
occ vf pyr, dk lith frag thru,
sil- cal cmt, ip sl calc, tr
pty- sb pty sh intbds,
sme intbd sltst lamn, rr
glau, tr pyr, g lt bl flor cut,
occ sl stmg- op, fr- g lt gn
resd cut

6380-6440 90% SS 10%
SLTST: pred wh-offwht-
tn, ip gy- med gy, pred sb
blk, ip sb pty, p srt,
pred f- u f gr clus, occ wh
u f clus, frm sl fri sd cls
thru, mod arg- slty thru,
occ vf pyr, dk lith frag thru,
sil- cal cmt, ip sl calc, tr
pty- sb pty sh intbds,
sme intbd sltst lamn, rr
glau, tr pyr, g lt bl flor cut,
occ sl stmg- op, fr- g lt gn
resd cut

6440-6500 90% SS 10%
SLTST: pred wh-offwht-
tn, ip gy- med gy, pred sb
blk, ip sb pty, p srt,
pred f- u f gr clus, occ wh



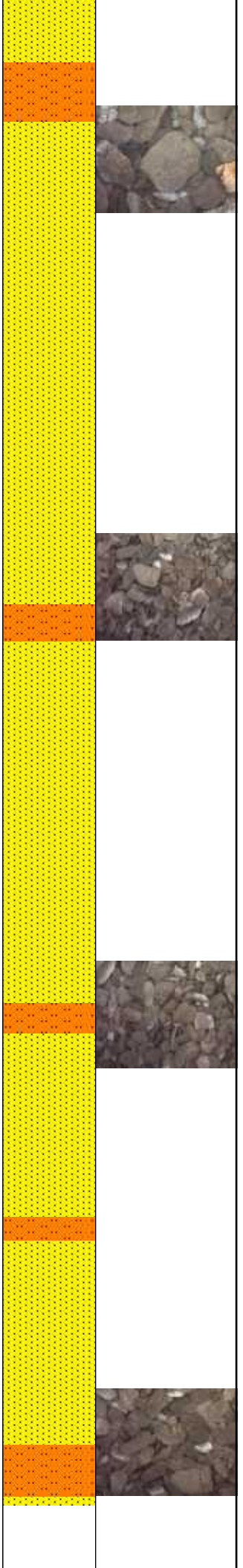


u f clus, frm sl fri sd cls
thru, mod arg- slty thru,
occ vf pyr, dk lith frag thru,
sil- cal cmt, ip sl calc, tr
pty- sb pty sh intbds,
sme intbd sltst lamn, rr
glau, tr pyr, g lt bl flor cut,
occ sl stmg- op, fr- g lt gn
resd cut

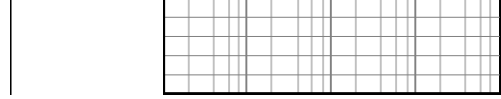
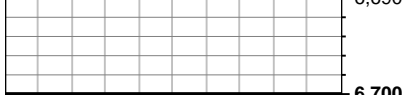
6500-6560 80% SS 20%
SLTST: pred gy- med gy,
sme wh- offwht- gy brn,
pred sb blk, ip sb pty, p
srt, pred vf- f gr clus, occ
wh u f clus, frm sl fri sd
cls thru, mod arg- slty
thru, occ vf pyr, dk lith frag
thru, sil- cal cmt, ip sl
calc, tr pty- sb pty sh
intbds, sme intbd sltst
lamn, rr glau, tr pyr, g lt bl
flor cut, occ sl stmg- op,
fr- g lt gn resd cut

6560-6620 80% SS 20%
SLTST: pred gy- med gy,
sme wh- offwht- gy brn,
pred sb blk, ip sb pty, p
srt, pred vf- f gr clus, occ
wh u f clus, frm sl fri sd
cls thru, mod arg- slty
thru, occ vf pyr, dk lith frag
thru, sil- cal cmt, ip sl
calc, tr pty- sb pty sh
intbds, sme intbd sltst
lamn, rr glau, tr pyr, g lt bl
flor cut, occ sl stmg- op,
fr- g lt gn resd cut

6620-6680 80% SS 20%
SLTST: pred gy- med gy,
sme wh- offwht- gy brn,
pred sb blk, ip sb pty, p
srt, pred vf- f gr clus, occ
wh u f clus, frm sl fri sd
cls thru, mod arg- slty
thru, occ vf pyr, dk lith frag
thru, sil- cal cmt, ip sl
calc, tr pty- sb pty sh
intbds, sme intbd sltst
lamn, rr glau, tr pyr, g lt bl
flor cut, occ sl stmg- op,
fr- g lt gn resd cut



Log Continued in
Horizontal Format



Horizontal Format

