BLANCO

Geological Services LLC

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

Well Name: Webster 31-18
Location: NW/NE Sec 18 T32S R67W — Las Animas County
Licence Number: 05-071-08497-00 — **Region:** Purgatoire River
Spud Date: 11/04/05 — **Drilling Completed:** 11/06/05
Surface Coordinates: 817' FNL 2064' FEL

Bottom Hole Coordinates:

Ground Elevation (ft): 8041' — **K.B. Elevation (ft):** 8045'
Logged Interval (ft): 437' **To:** 3295' — **Total Depth (ft):** 3295'
Formation: Poison Canyon / Raton / Vermejo / Trinidad
Type of Drilling Fluid: Air / Mud

OPERATOR

Company: Pioneer Natural Resources USA, Inc.
Address: 1401 17th Street Suite 1200
Denver CO 80202

GEOLOGIST

Name: Bob Wick / Teresa Rensink
Company: BLANCO Geological Services LLC
Address: PO Box 865
Trinidad CO 81082
(719) 846-3364

Rig

Pense Rig #17

Comments

8 5/8" #24 Surface Casing set to 483.15'

ROCK TYPES

Anhy	Clyst	Gyp	Mrlst	Shgy
Bent	Coal	Igne	Salt	Sltst
Brec	Congl	Lmst	Shale	Ss
Cht	Dol	Meta	Shcol	Till

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

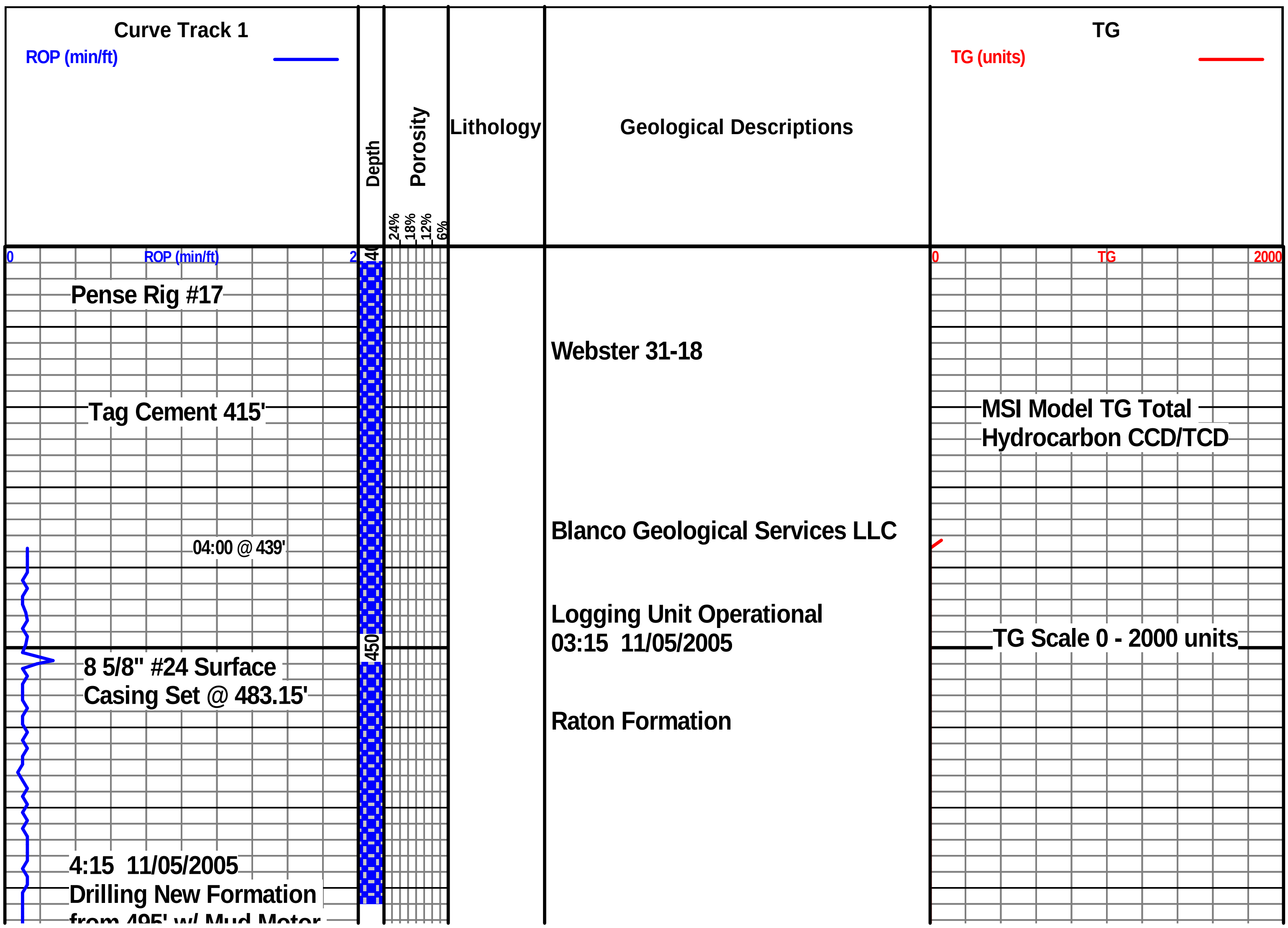
ROUNDING
- Rounded
- Subrnd
- Subang
- Angular

OIL SHOWS
- Even
- Spotted
- Ques
- Dead

INTERVALS
- Core
- Dst
- Srfcsg

(no heading)
- Cv-v
- Cv-c

EVENTS
- Rft
- Sidewall
- Srfcsg



from 495' w/ Mud Motor
and Tri-Cone

500

05:00 @ 578'
139'/hr

550

0 ROP (min/ft) 2

600

0 TG 2000

Began Sampling @ 625'

Poison Canyon Formation

SANDSTONE, milky-white clear, fg-cg, sub angular - angular, poorly sorted, mod consolidated

SANDSTONE, mulky-gray, vfg-fg, sub angular - sub rounded, well sorted, well consolidated

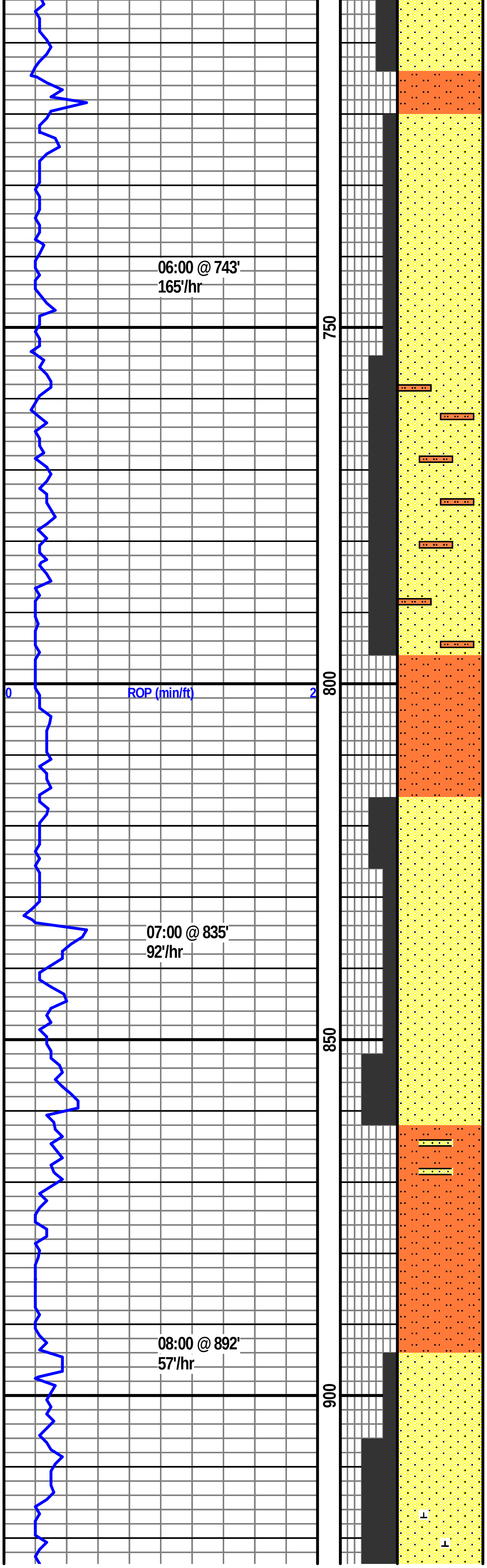
650

SANDSTONE, milky-clear orange, cg-vcg, angular - sub angular, poorly sorted, unconsolidated

SANDSTONE, milky-gray clear tan, vfg-cg, sub angular, poorly sorted, mod consolidated, calcareous

SANDSTONE, milky-clear orange, mg-vcg, angular, poorly sorted, unconsolidated, SILTSTONE stringers

700



SILTSTONE, gray, mod indurated, sub blocky, rough, dull

SANDSTONE, milky clear orange, mg-vcg, angular, poorly sorted, poorly - un consolidated, weakly calcareous

SANDSTONE, gray, vfg, sub angular - sub rounded, well sorted, mod consolidated, SILTSTONE stringers, brown gray

SILTSTONE, blue-gray brown, well indurated, blocky, rough - earthy, dull

SANDSTONE, gray-brown blue-gray, vfg-mg, sub rounded - angular, mod sorted, mod consolidated

SANDSTONE, milky clear orange, mg-vcg, angular - sub angular, poorly sorted, unconsolidated

SANDSTONE, blue-gray, vfg, sub angular - sub rounded, well sorted, mod consolidated

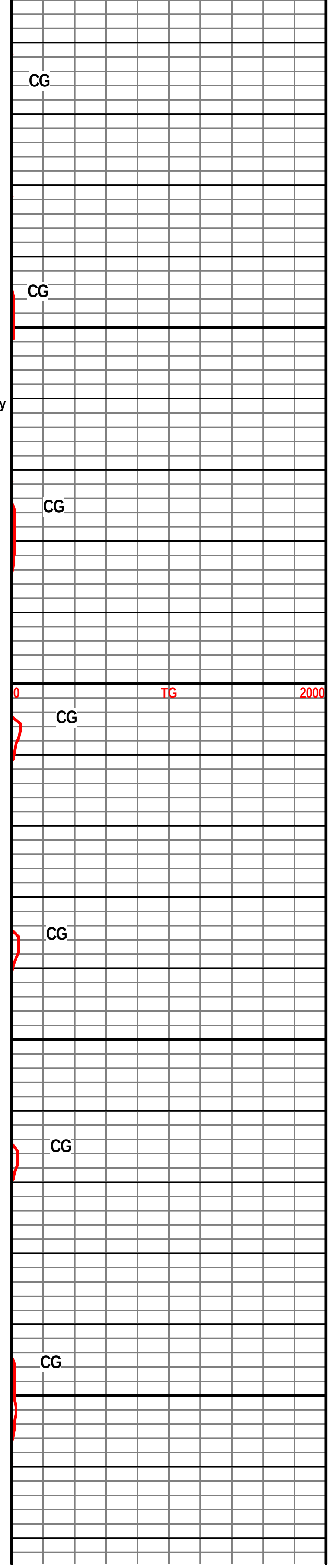
SILTSTONE, gray-brown gray, well indurated, blocky - sub blocky, gritty earthy sandy

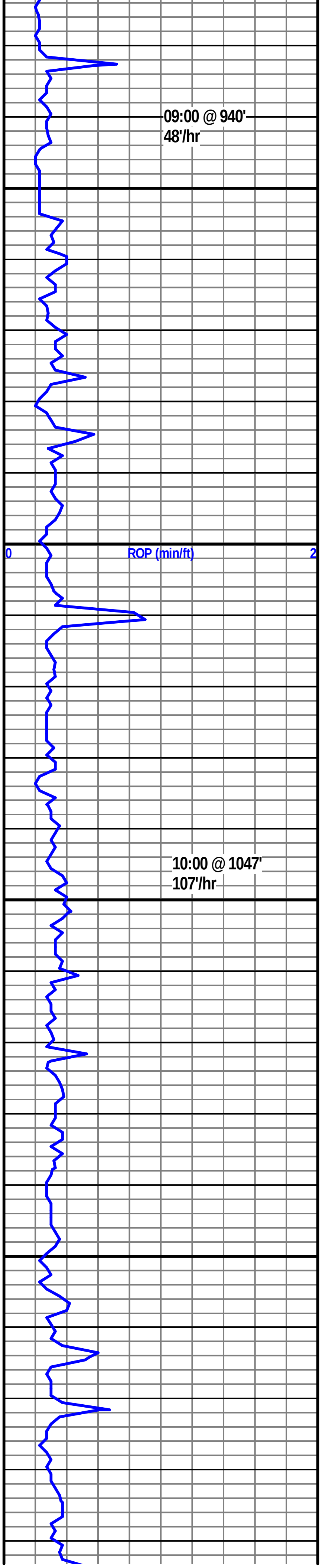
SILTSTONE, brown gray, well indurated, blocky, velvety - earthy, dull

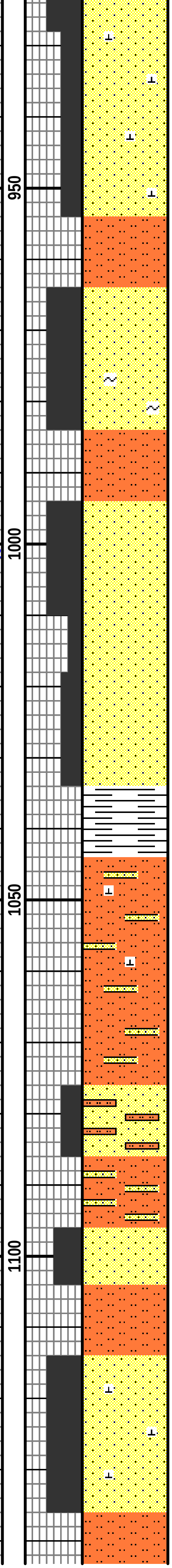
SANDSTONE, gray milky white, vfg - cg, sub rounded - angular, poorly sorted, mod consolidated

SANDSTONE, blue-gray orange, fg, sub angular - sub rounded, well sorted, mod consolidated,

SANDSTONE, milky-lt-gray orange, vfg, sub angular - sub rounded, well sorted, mod consolidated, calcareous, CALCITE







SANDSTONE, milky-clear, mg-vcg, sub angular, poorly sorted, unconsolidated, mildly calcareous, minor CALCITE

SILTSTONE, dk-brown, well indurated, sub blocky, velvety - gritty, dull

SANDSTONE, milky-white, vfg, sub angular - sub rounded, well sorted, mod consolidated, weakly calcareous

SANDSTONE, blue-gray, vfg, sub angular - sub rounded, well sorted, mod consolidated, GLAUCONITE

SILTSTONE, gray, well indurated, blocky, velvety - earthy, dull

SANDSTONE, gray, vfg, sub angular - sub rounded, well sorted, mod consolidated

SANDSTONE, milky-blue-gray clear orange, fg-cg, angular - sub angular, poorly sorted, mod - poorly consolidated, calcareous

SANDSTONE, milky-clear gray orange, mg-vcg, angular - sub angular, poorly sorted, poorly - un consolidated

SHALE, brown, firm, platey - sub platey, velevty, dull

SILTSTONE, gray, mod indurated, sub blocky, velvety sandy, dull, SANDSTONE stringers, CALCITE

SANDSTONE, milky-white gray, vfg-fg, sub angular - sub rounded, mod sorted, mod consolidated, SILTSTONE stringers

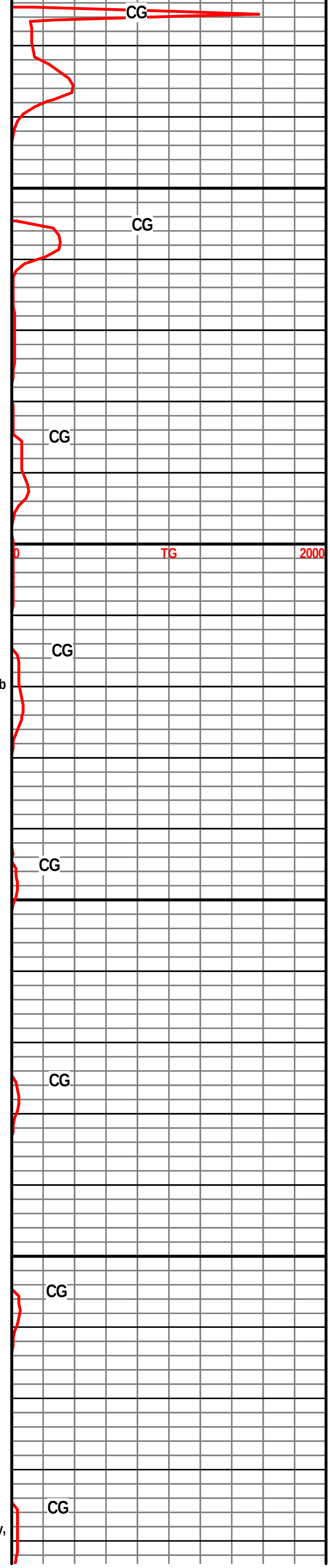
SILTSTONE, gray, mod indurated, sub blocky, velvety, dull, SANDSTONE stringers, milky clear, vcg

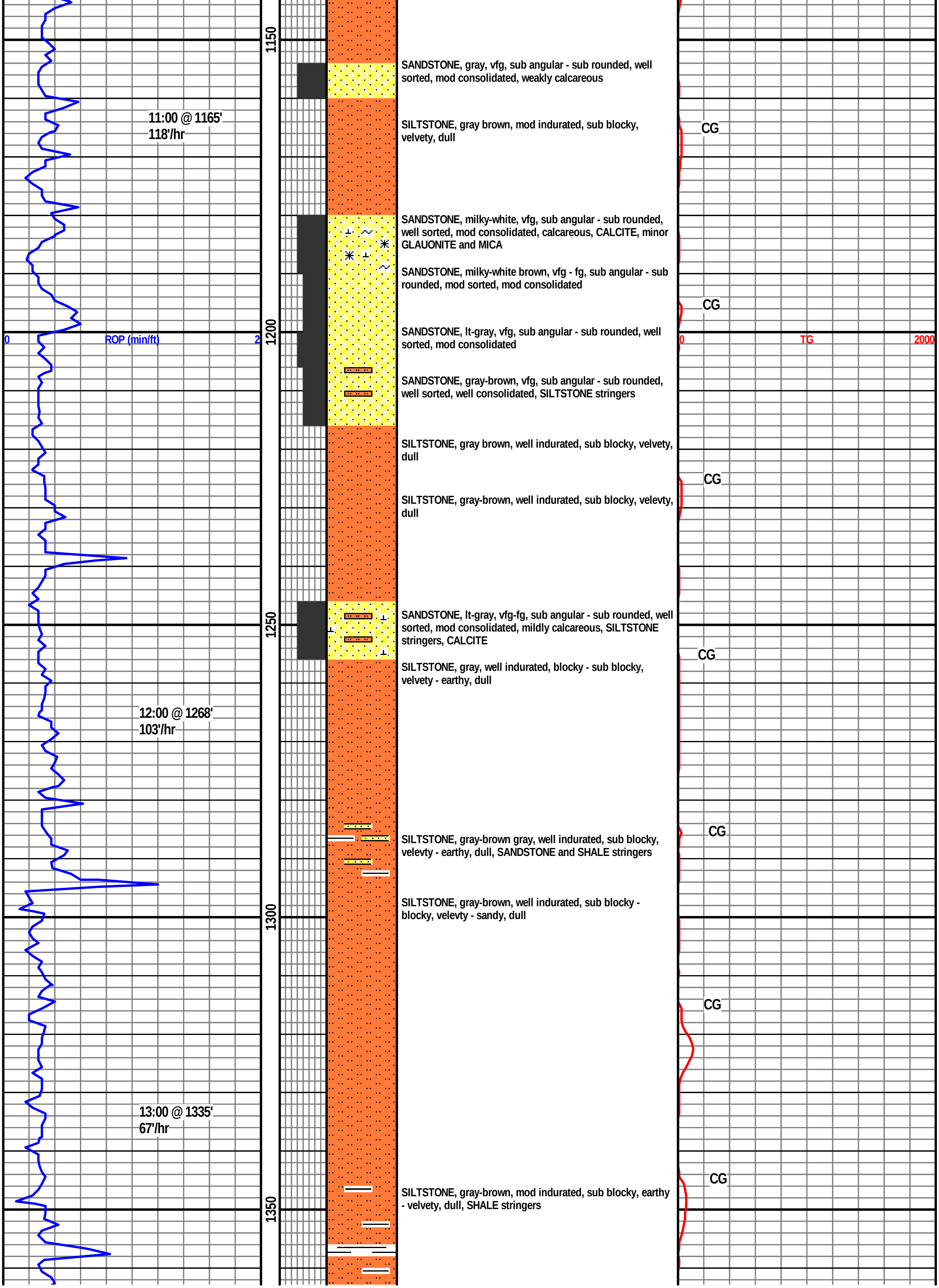
SANDSTONE, gray, vfg, sub angular - sub rounded, well sorted, well consolidated

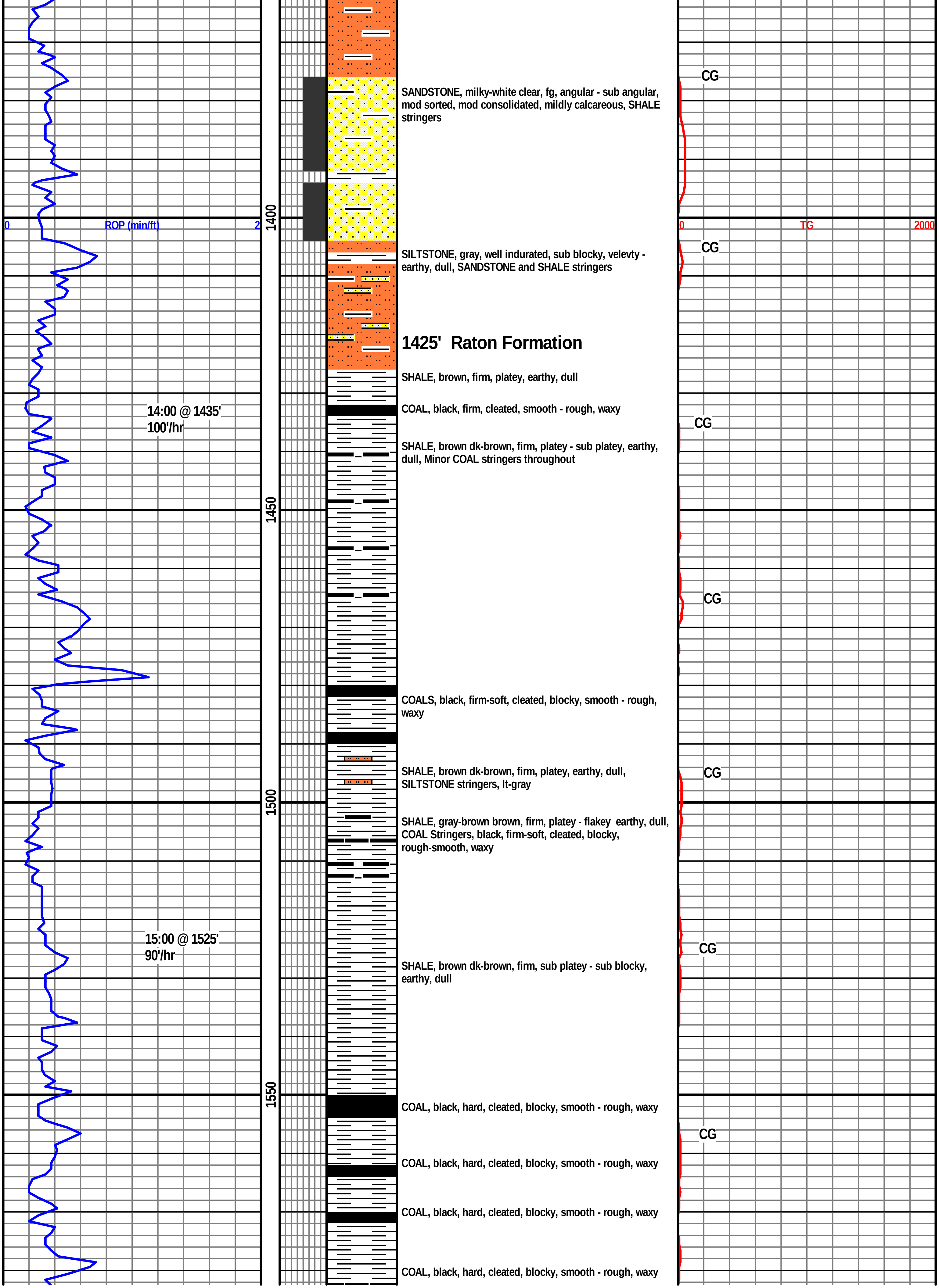
SHALE, gray brown, well indurated, blocky, velevty, dull

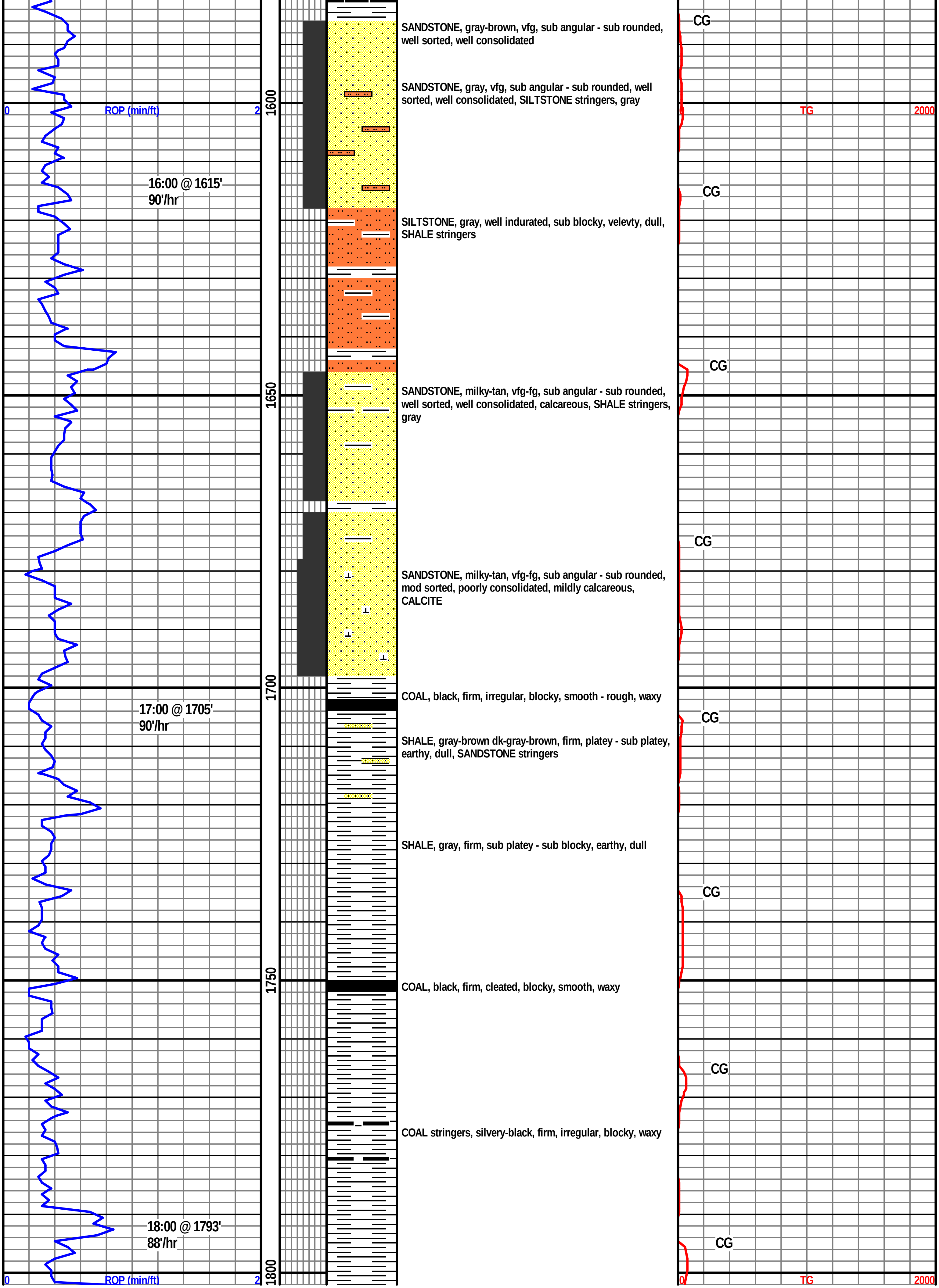
SANDSTONE, gray, vfg, sub angular - sub rounded, well sorted, mod consolidated, mildly calcareous, CALCITE

SILTSTONE, gray-brown, well indurated, sub blocky, velvety, dull

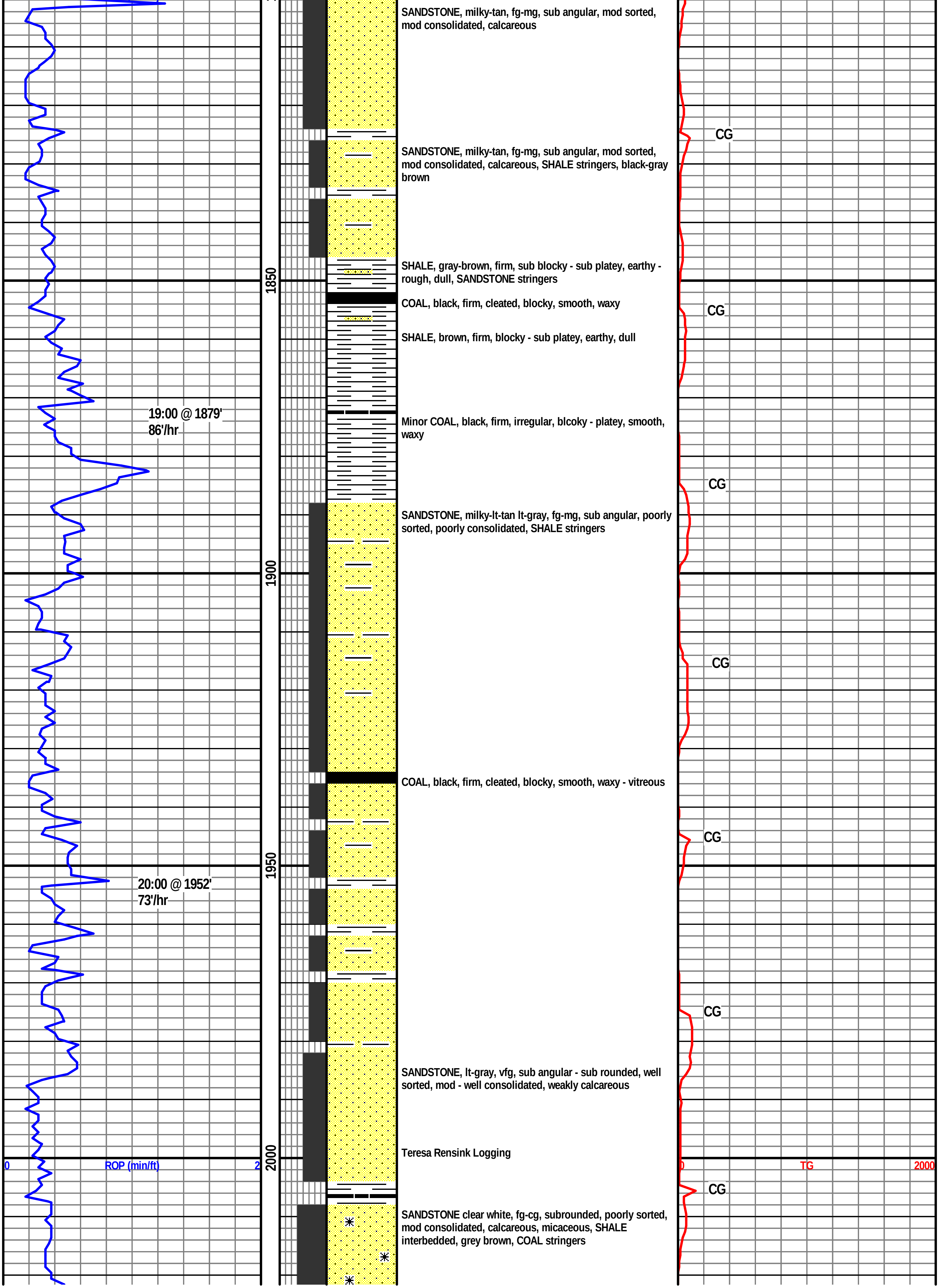



1150
SANDSTONE, gray, vfg, sub angular - sub rounded, well sorted, mod consolidated, weakly calcareous
11:00 @ 1165'
118'/hr
SILTSTONE, gray brown, mod indurated, sub blocky, velvety, dull
CG
SANDSTONE, milky-white, vfg, sub angular - sub rounded, well sorted, mod consolidated, calcareous, CALCITE, minor GLAUONITE and MICA
SANDSTONE, milky-white brown, vfg - fg, sub angular - sub rounded, mod sorted, mod consolidated
CG
0
ROP (min/ft)
2
1200
0
TG
2000
SANDSTONE, lt-gray, vfg, sub angular - sub rounded, well sorted, mod consolidated
SANDSTONE, gray-brown, vfg, sub angular - sub rounded, well sorted, well consolidated, SILTSTONE stringers
SILTSTONE, gray brown, well indurated, sub blocky, velvety, dull
CG
SILTSTONE, gray-brown, well indurated, sub blocky, velevty, dull
SANDSTONE, lt-gray, vfg-fg, sub angular - sub rounded, well sorted, mod consolidated, mildly calcareous, SILTSTONE stringers, CALCITE
1250
CG
SILTSTONE, gray, well indurated, blocky - sub blocky, velvety - earthy, dull
12:00 @ 1268'
103'/hr
CG
SILTSTONE, gray-brown gray, well indurated, sub blocky, velevty - earthy, dull, SANDSTONE and SHALE stringers
SILTSTONE, gray-brown, well indurated, sub blocky - blocky, velevty - sandy, dull
1300
CG
13:00 @ 1335'
67'/hr
CG
SILTSTONE, gray-brown, mod indurated, sub blocky, earthy - velvety, dull, SHALE stringers
1350

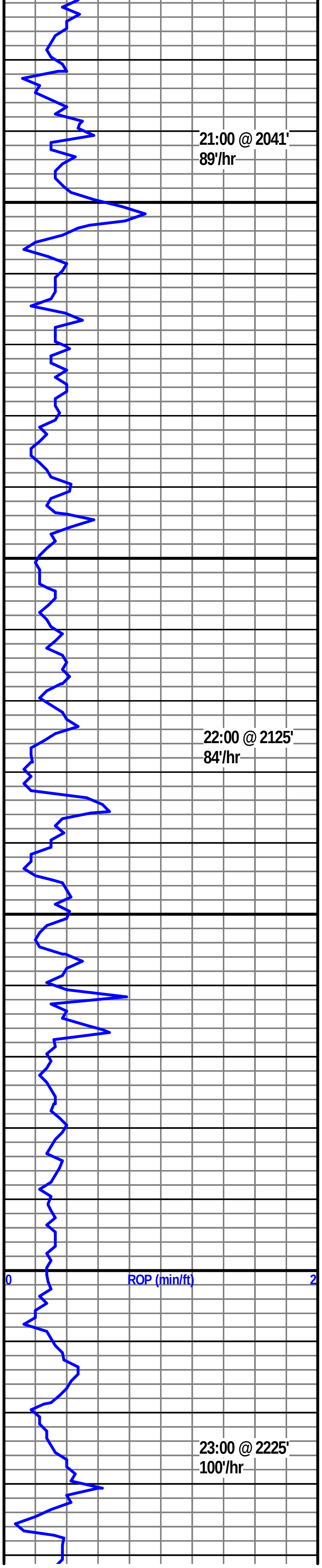

SANDSTONE, milky-white clear, fg, angular - sub angular, mod sorted, mod consolidated, mildly calcareous, SHALE stringers
CG
0
ROP (min/ft)
2
1400
0
TG
2000
CG
SILTSTONE, gray, well indurated, sub blocky, velevty - earthy, dull, SANDSTONE and SHALE stringers
1425' Raton Formation
SHALE, brown, firm, platey, earthy, dull
14:00 @ 1435'
100'/hr
COAL, black, firm, cleated, smooth - rough, waxy
CG
SHALE, brown dk-brown, firm, platey - sub platey, earthy, dull, Minor COAL stringers throughout
1450
CG
COALS, black, firm-soft, cleated, blocky, smooth - rough, waxy
SHALE, brown dk-brown, firm, platey, earthy, dull, SILTSTONE stringers, lt-gray
CG
1500
SHALE, gray-brown brown, firm, platey - flakey earthy, dull, COAL Stringers, black, firm-soft, cleated, blocky, rough-smooth, waxy
15:00 @ 1525'
90'/hr
CG
SHALE, brown dk-brown, firm, sub platey - sub blocky, earthy, dull
1550
COAL, black, hard, cleated, blocky, smooth - rough, waxy
CG
COAL, black, hard, cleated, blocky, smooth - rough, waxy
COAL, black, hard, cleated, blocky, smooth - rough, waxy
COAL, black, hard, cleated, blocky, smooth - rough, waxy

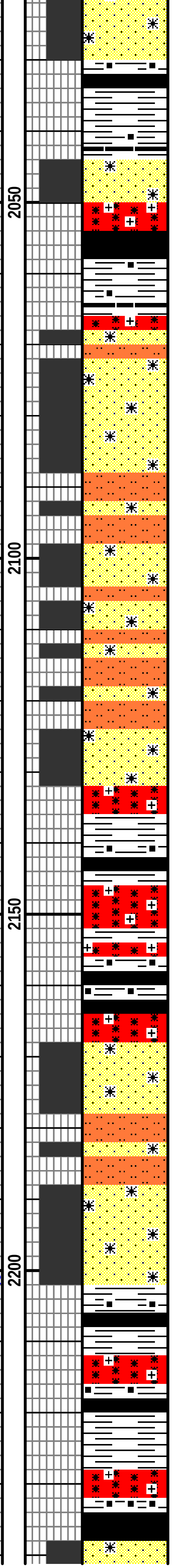


CG
SANDSTONE, gray-brown, vfg, sub angular - sub rounded, well sorted, well consolidated
SANDSTONE, gray, vfg, sub angular - sub rounded, well sorted, well consolidated, SILTSTONE stringers, gray
0
ROP (min/ft)
2
1600
0
TG
2000
16:00 @ 1615'
90'/hr
CG
SILTSTONE, gray, well indurated, sub blocky, velevty, dull, SHALE stringers
CG
1650
SANDSTONE, milky-tan, vfg-fg, sub angular - sub rounded, well sorted, well consolidated, calcareous, SHALE stringers, gray
CG
SANDSTONE, milky-tan, vfg-fg, sub angular - sub rounded, mod sorted, poorly consolidated, mildly calcareous, CALCITE
1700
COAL, black, firm, irregular, blocky, smooth - rough, waxy
17:00 @ 1705'
90'/hr
CG
SHALE, gray-brown dk-gray-brown, firm, platey - sub platey, earthy, dull, SANDSTONE stringers
SHALE, gray, firm, sub platey - sub blocky, earthy, dull
CG
1750
COAL, black, firm, cleated, blocky, smooth, waxy
CG
COAL stringers, silvery-black, firm, irregular, blocky, waxy
18:00 @ 1793'
88'/hr
CG
0
ROP (min/ft)
2
1800
0
TG
2000



SANDSTONE, milky-tan, fg-mg, sub angular, mod sorted, mod consolidated, calcareous
CG
SANDSTONE, milky-tan, fg-mg, sub angular, mod sorted, mod consolidated, calcareous, SHALE stringers, black-gray brown
1850
SHALE, gray-brown, firm, sub blocky - sub platey, earthy - rough, dull, SANDSTONE stringers
COAL, black, firm, cleated, blocky, smooth, waxy
CG
SHALE, brown, firm, blocky - sub platey, earthy, dull
19:00 @ 1879'
86'/hr
Minor COAL, black, firm, irregular, blcoky - platey, smooth, waxy
CG
SANDSTONE, milky-lt-tan lt-gray, fg-mg, sub angular, poorly sorted, poorly consolidated, SHALE stringers
1900
CG
COAL, black, firm, cleated, blocky, smooth, waxy - vitreous
CG
1950
20:00 @ 1952'
73'/hr
CG
SANDSTONE, lt-gray, vfg, sub angular - sub rounded, well sorted, mod - well consolidated, weakly calcareous
Teresa Rensink Logging
0
ROP (min/ft)
2
2000
0
TG
2000
CG
SANDSTONE clear white, fg-cg, subrounded, poorly sorted, mod consolidated, calcareous, micaceous, SHALE interbedded, grey brown, COAL stringers





COAL black, mod bright, firm, mod smooth, pearly- vitreous, conchoidal, cleated

SANDSTONE brown, vfg-fg, subrounded, mod sorted, mod-well consolidated, calcareous, micaceous

INTRUSIVE clear tan, aphanitic, Feldspar, Quartz, strongly calcareous, micaceous, Calcite

COAL black, mod bright, firm, mod smooth, vesicular-vitreous, granular, cleated

INTRUSIVE clear tan, aphanitic, Feldspar, Quartz, strongly calcareous, micaceous, Calcite

SANDSTONE tan brown, vfg-fg, subrounded, mod sorted, mod- well consolidated, calcareous, micaceous, SILTSTONE interbedded, brown, blocky, firm, mod smooth, earthy

SANDSTONE tan brown, vfg-fg, subrounded, mod sorted, mod- well consolidated, calcareous, micaceous, SILTSTONE interbedded, brown, blocky, firm, mod smooth, earthy

INTRUSIVE clear tan, aphanitic, Feldspar, Quartz, strongly calcareous, micaceous, Calcite

COAL black, mod bright, firm, mod smooth, vesicular-vitreous, granular, cleated

INTRUSIVE clear tan, aphanitic, Feldspar, Quartz, strongly calcareous, micaceous, Calcite

COAL black, mod bright, firm, mod smooth, vesicular-vitreous, granular, cleated

INTRUSIVE white grey tan, aphanitic, Feldspar, Quartz, strongly calcareous, micaceous, Calcite

SANDSTONE tan white brown, vfg-fg, subrounded, mod sorted, mod- well consolidated, calcareous, micaceous, SILTSTONE interbedded, brown, blocky, firm, mod smooth, earthy

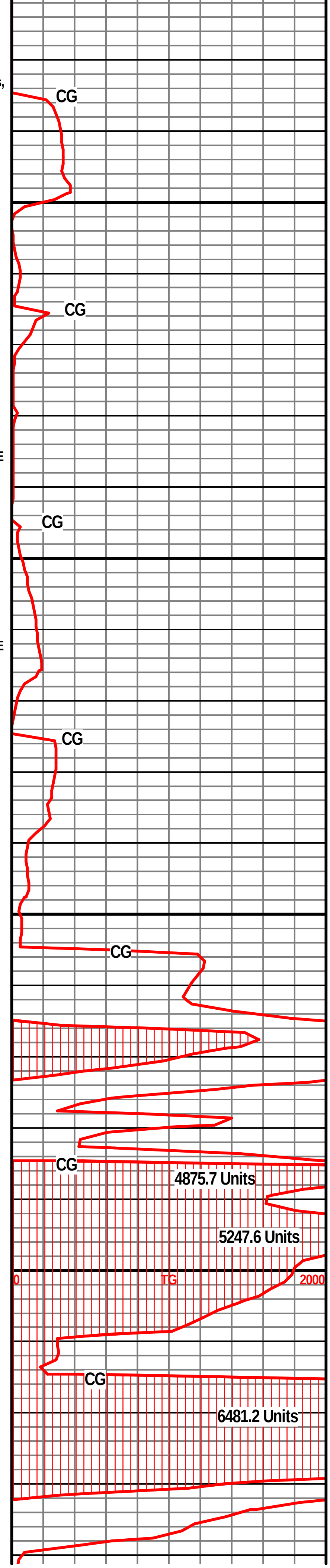
COAL black, mod bright, firm, mod smooth, vesicular-vitreous, granular, cleated

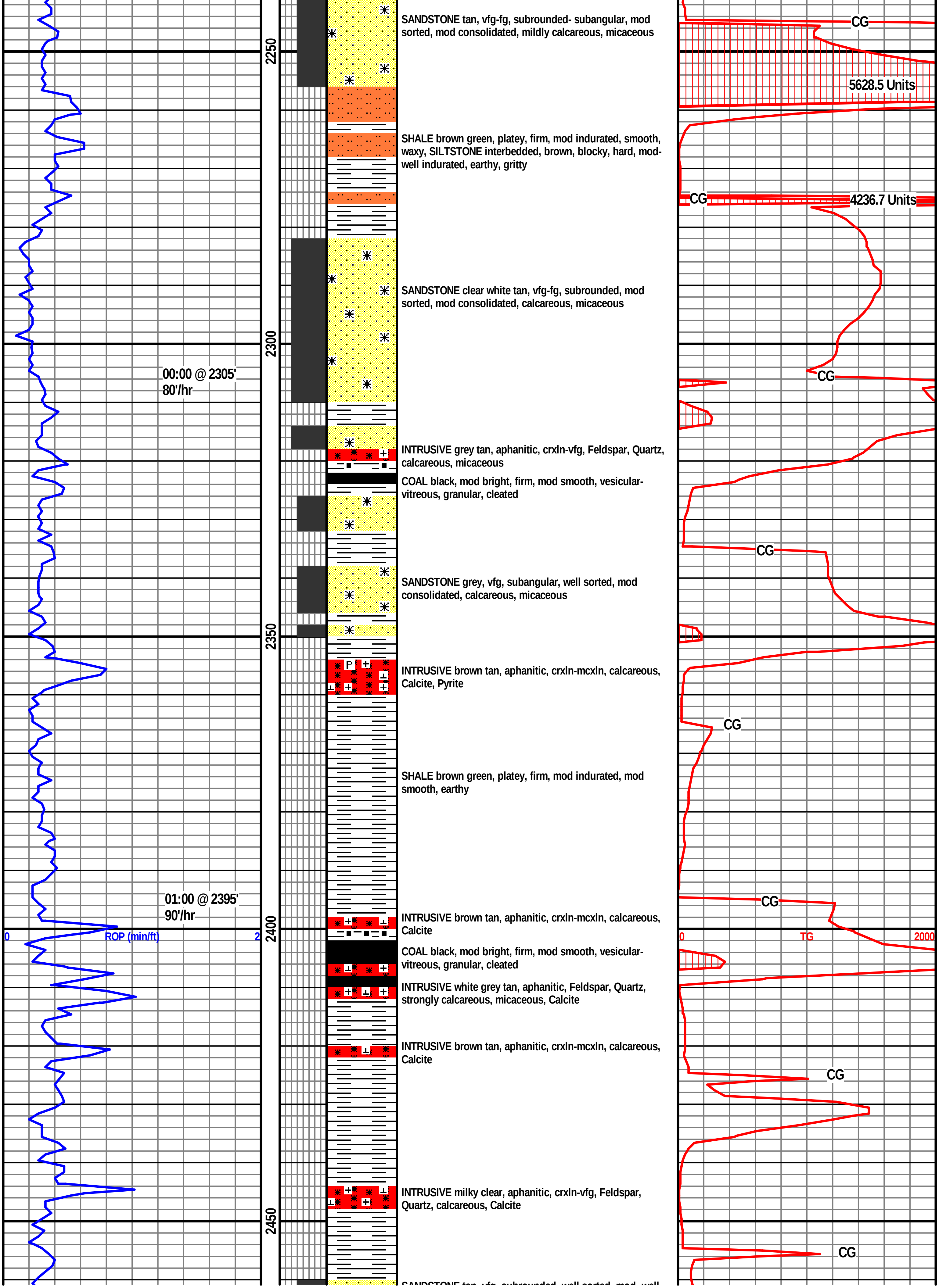
INTRUSIVE white grey tan, aphanitic, Feldspar, Quartz, strongly calcareous, micaceous, Calcite

COAL black, mod bright, firm, mod smooth, vesicular-vitreous, granular, cleated

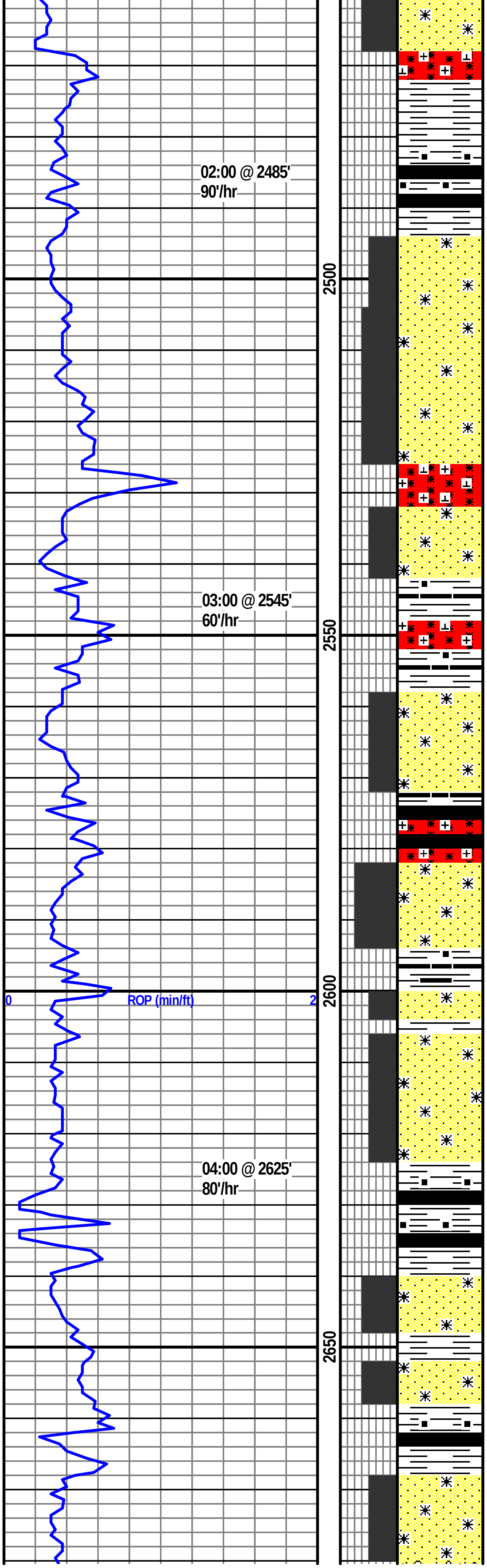
INTRUSIVE white grey tan, aphanitic, Feldspar, Quartz, strongly calcareous, micaceous, Calcite

COAL black, mod bright, firm, mod smooth, vesicular-vitreous, granular, cleated





2250
2300
2350
2400
2450
SANDSTONE tan, vfg-fg, subrounded- subangular, mod sorted, mod consolidated, mildly calcareous, micaceous
CG
5628.5 Units
SHALE brown green, platey, firm, mod indurated, smooth, waxy, SILTSTONE interbedded, brown, blocky, hard, mod-well indurated, earthy, gritty
CG
4236.7 Units
SANDSTONE clear white tan, vfg-fg, subrounded, mod sorted, mod consolidated, calcareous, micaceous
00:00 @ 2305'
80'/hr
CG
INTRUSIVE grey tan, aphanitic, crxln-vfg, Feldspar, Quartz, calcareous, micaceous
COAL black, mod bright, firm, mod smooth, vesicular-vitreous, granular, cleated
CG
SANDSTONE grey, vfg, subangular, well sorted, mod consolidated, calcareous, micaceous
INTRUSIVE brown tan, aphanitic, crxln-mcxln, calcareous, Calcite, Pyrite
CG
SHALE brown green, platey, firm, mod indurated, mod smooth, earthy
01:00 @ 2395'
90'/hr
CG
INTRUSIVE brown tan, aphanitic, crxln-mcxln, calcareous, Calcite
0
ROP (min/ft)
2
0
TG
2000
COAL black, mod bright, firm, mod smooth, vesicular-vitreous, granular, cleated
INTRUSIVE white grey tan, aphanitic, Feldspar, Quartz, strongly calcareous, micaceous, Calcite
INTRUSIVE brown tan, aphanitic, crxln-mcxln, calcareous, Calcite
CG
INTRUSIVE milky clear, aphanitic, crxln-vfg, Feldspar, Quartz, calcareous, Calcite
CG



SANDSTONE tan, vfg, subrounded, well sorted, mod- well consolidated, mildly calcareous, micaceous

INTRUSIVE milky clear, aphanitic, crxln-vfg, Feldspar, Quartz, calcareous, Calcite

COAL black, mod bright, hard, mod smooth, pearly- vitreous, conchoidal, cleated

SANDSTONE milky clear tan, vfg-mg, subangular, poorly sorted, mod- poorly consolidated, calcareous, micaceous

SANDSTONE grey tan, vfg-fg, subrounded, mod sorted, well consolidated, calcareous, micaceous

INTRUSIVE milky clear, aphanitic, crxln-vfg, Feldspar, Quartz, calcareous, Calcite

SANDSTONE clear milky tan green, fg-cg, subangular, poorly sorted, poorly consolidated, calcareous, micaceous

INTRUSIVE brown tan, aphanitic, Feldspar, Quartz, calcareous, Calcite

SANDSTONE grey tan, vfg-fg, subrounded, mod sorted, well consolidated, calcareous, micaceous

INTRUSIVE greenish grey tan, aphanitic, Quartz, Feldspar, calcareous, micaceous, Intruded COAL grey black, firm, mod bright, rough, vesicular, cindery

SANDSTONE grey tan, vfg-fg, subrounded, mod sorted, poorly consolidated, calcareous, micaceous

SHALE brown green, platey, firm, mod indurated, mod smooth, earthy- waxy, COAL stringers, black, mod bright, firm, mod smooth, conchoidal, cleated

SANDSTONE milky clear tan, vfg-mg, subangular, poorly sorted, mod- poorly consolidated, calcareous, micaceous

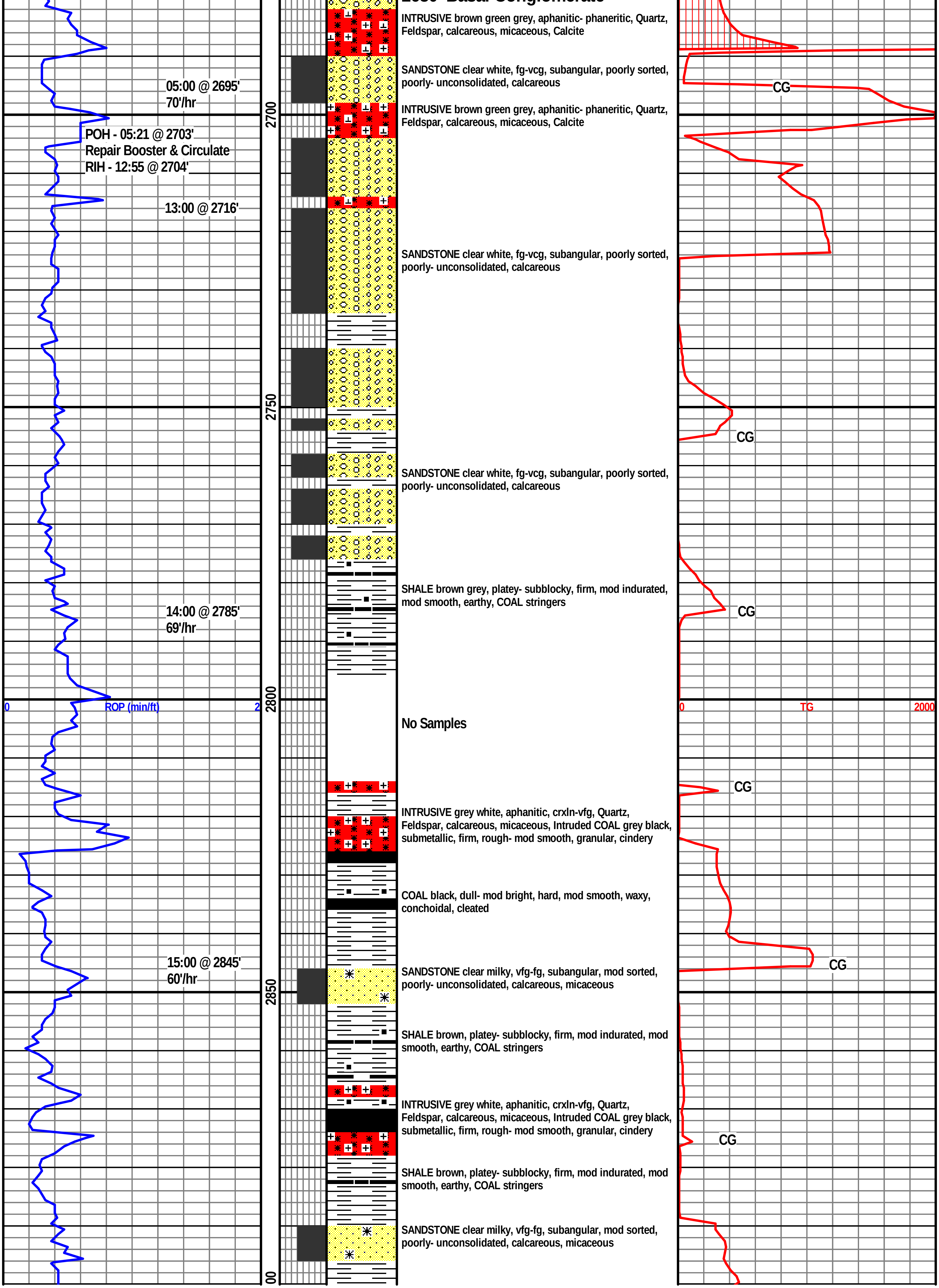
COAL black, bright, firm, smooth, vitreous, conchoidal

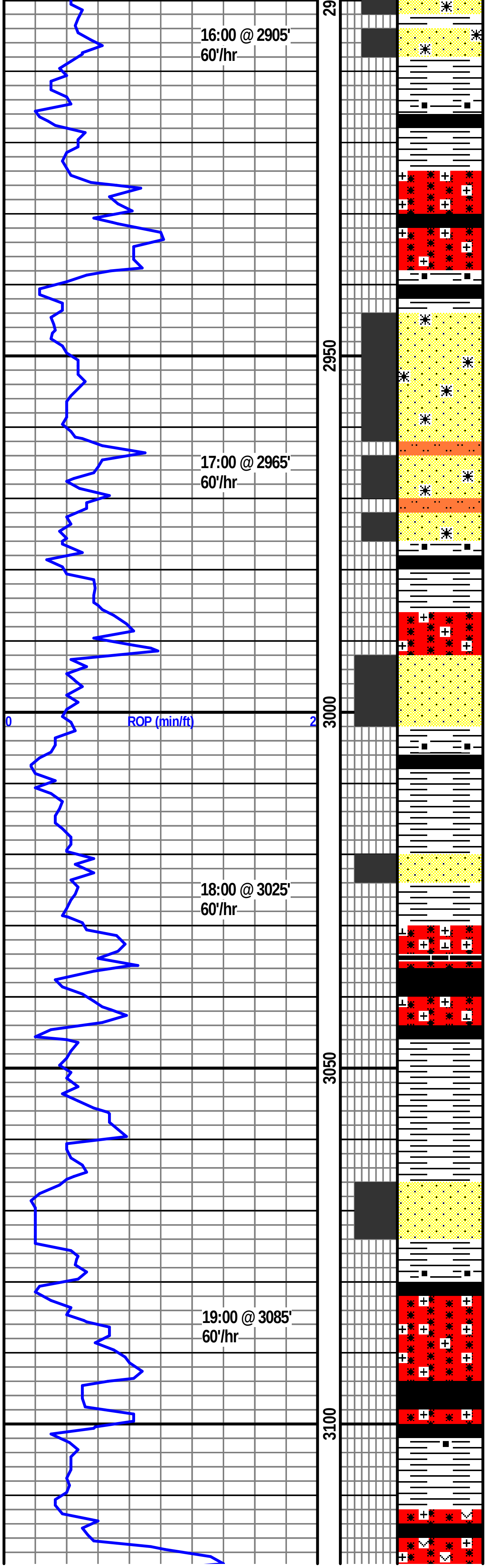
SANDSTONE grey tan, vfg-fg, subrounded, mod sorted, poorly consolidated, calcareous, micaceous

COAL black, mod bright, firm, mod smooth, waxy- vitreous, conchoidal, irregular

SANDSTONE milky clear tan, vfg-mg, subangular, poorly sorted, mod- poorly consolidated, calcareous, micaceous

2680' Basal Conglomerate


Basal Conglomerate
INTRUSIVE brown green grey, aphanitic- phaneritic, Quartz, Feldspar, calcareous, micaceous, Calcite
05:00 @ 2695'
70'/hr
SANDSTONE clear white, fg-vcg, subangular, poorly sorted, poorly- unconsolidated, calcareous
CG
2700
INTRUSIVE brown green grey, aphanitic- phaneritic, Quartz, Feldspar, calcareous, micaceous, Calcite
POH - 05:21 @ 2703'
Repair Booster & Circulate
RIH - 12:55 @ 2704'
13:00 @ 2716'
SANDSTONE clear white, fg-vcg, subangular, poorly sorted, poorly- unconsolidated, calcareous
2750
CG
SANDSTONE clear white, fg-vcg, subangular, poorly sorted, poorly- unconsolidated, calcareous
SHALE brown grey, platey- subblocky, firm, mod indurated, mod smooth, earthy, COAL stringers
14:00 @ 2785'
69'/hr
CG
2800
0
ROP (min/ft)
2
0
TG
2000
No Samples
CG
INTRUSIVE grey white, aphanitic, crxln-vfg, Quartz, Feldspar, calcareous, micaceous, Intruded COAL grey black, submetallic, firm, rough- mod smooth, granular, cindery
COAL black, dull- mod bright, hard, mod smooth, waxy, conchoidal, cleated
15:00 @ 2845'
60'/hr
SANDSTONE clear milky, vfg-fg, subangular, mod sorted, poorly- unconsolidated, calcareous, micaceous
CG
2850
SHALE brown, platey- subblocky, firm, mod indurated, mod smooth, earthy, COAL stringers
INTRUSIVE grey white, aphanitic, crxln-vfg, Quartz, Feldspar, calcareous, micaceous, Intruded COAL grey black, submetallic, firm, rough- mod smooth, granular, cindery
CG
SHALE brown, platey- subblocky, firm, mod indurated, mod smooth, earthy, COAL stringers
SANDSTONE clear milky, vfg-fg, subangular, mod sorted, poorly- unconsolidated, calcareous, micaceous
00



COAL black, mod bright, hard, brittle, mod smooth, waxy- vitreous, conchoidal, cleated

INTRUSIVE clear white tan, aphanitic, crxln-fg, Quartz, Feldspar, calcareous, micaceous, Intruded COAL grey black, submetallic, firm, rough- mod smooth, granular, cindery

COAL grey black, submetallic, firm, rough- mod smooth, granular- waxy

SANDSTONE clear milky grey tan, vfg-fg, subangular- subrounded, well- mod sorted, mod- poorly consolidated, calcareous, micaceous, SILTSTONE interbedded, brown, blocky, gritty

COAL grey black, submetallic, dull- mod bright, firm, mod smooth- rough, waxy, flaky, cindery, vesicular

INTRUSIVE grey clear greenish, aphanitic, Feldspar, Quartz, calcareous

SANDSTONE clear white, vfg-fg, subrounded, mod sorted, poorly- unconsolidated, calcareous

COAL black, bright, hard, mod smooth, vitreous- pearly, conchoidal, cleated

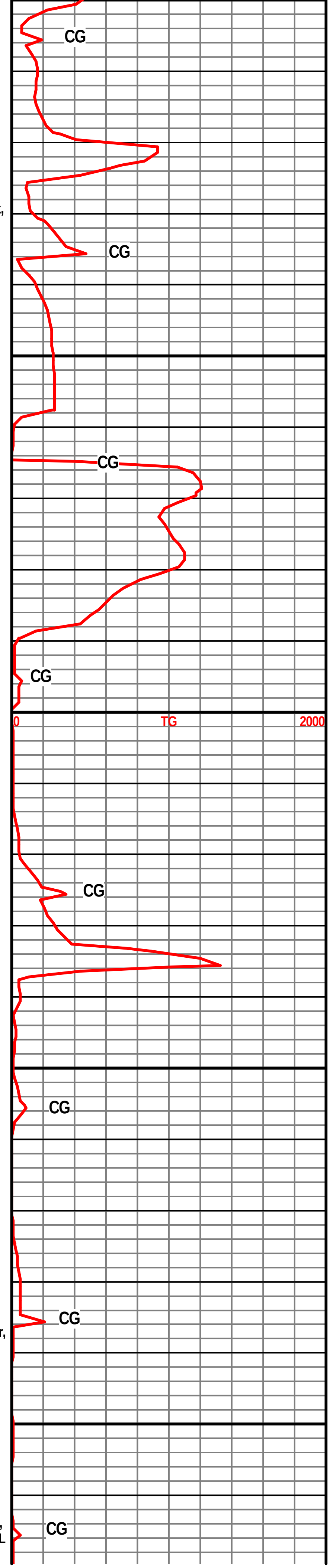
SANDSTONE clear white, vfg-fg, subrounded, mod sorted, poorly- unconsolidated, calcareous

INTRUSIVE brown, aphanitic, Quartz, Feldspar, calcareous, micaceous, Calcite, Intruded COAL black grey, mod bright, hard, rough, dendritic, cindery, flaky vesicular- waxy

SANDSTONE milky clear tan, vfg-fg, subrounded, mod sorted, poorly- unconsolidated, calcareous

INTRUSIVE brown grey, mafic, aphanitic, crxln-vfg, Feldspar, Quartz, strongly calcareous, Intruded COAL grey black, submetallic, mod bright, hard, brittle, flaky- blocky, rough, granular- vesicular, cindery, sooty, powdery

INTRUSIVE tan clear grey, rhyolitic, aphanitic, felsic, Quartz, Feldspar, calcareous, micaceous, tuffaceous, Intruded COAL



3122' Trinidad Sandstone

SANDSTONE clear milky tan, vfg-fg, subrounded-subangular, mod sorted, poorly- unconsolidated, calcareous, micaceous, SHALE interbedded

20:00 @ 3145'
60'/hr

CG

3150

INTRUSIVE white milky, aphanitic, pred trachytic Felspar lesser Quartz phenos, strongly calcareous, micaceous, Calcite

INTRUSIVE white green tan, aphanitic, pred trachytic Felspar lesser Quartz phenos, strongly calcareous, micaceous, Pyrite, Calcite

CG

SANDSTONE clear milky tan, vfg-fg, subrounded-subangular, mod sorted, poorly- unconsolidated, calcareous, micaceous

INTRUSIVE white milky, aphanitic, pred trachytic Felspar lesser Quartz phenos, strongly calcareous, micaceous, Calcite

3200

0 ROP (min/ft) 2

0 TG 2000

21:00 @ 3205'
60'/hr

CG

INTRUSIVE brown clear white, mafic, aphanitic, vfg-fg Quartz grains in brown matrix, trachytic Feldspar phenocrysts, strongly calcareous, micaceous

CG

SANDSTONE clear white milky, vfg-fg, subrounded-subangular, mod sorted, poorly- unconsolidated, calcareous, micaceous

3250

22:00 @ 3255'
50'/hr

INTRUSIVE brown clear white, mafic, aphanitic, vfg-fg Quartz grains in brown matrix, trachytic Feldspar phenocrysts, strongly calcareous, micaceous

CG

SANDSTONE clear white milky, vfg-fg, subrounded-subangular, mod sorted, poorly- unconsolidated, calcareous, micaceous

3300

23:53 @ 3295' TD
11/06/05

Webster 31-18