

Well-Site Geologists

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Software: HMG Strata Log
 Horizontal Mudlog & Geosteering, Inc
 PO Box 20658, Albuquerque, NM 87154
 505-320-3432 www.horizontalmudlog.com

Operator

SGS, Inc.

Well Name

Borehole #1-1

Operator Address

1 Geologist Lane
 Sharp Interp, CO 81301
 505.330.8307

Well Information

Field: Blanco MV / Basin DK
 Region: San Juan Basin
 Coordinates: 36.xxxxx° North, -107.xxxxx° West,
 SHL -xxxx' FNL, xxxx' FEL
 Location: Sec. 20 TxxN RxxW
 State: Rio Arriba Co., NM
 API Index: 30-039-xxxxx
 Rig Operator: Aztec Drilling Rig #xxx

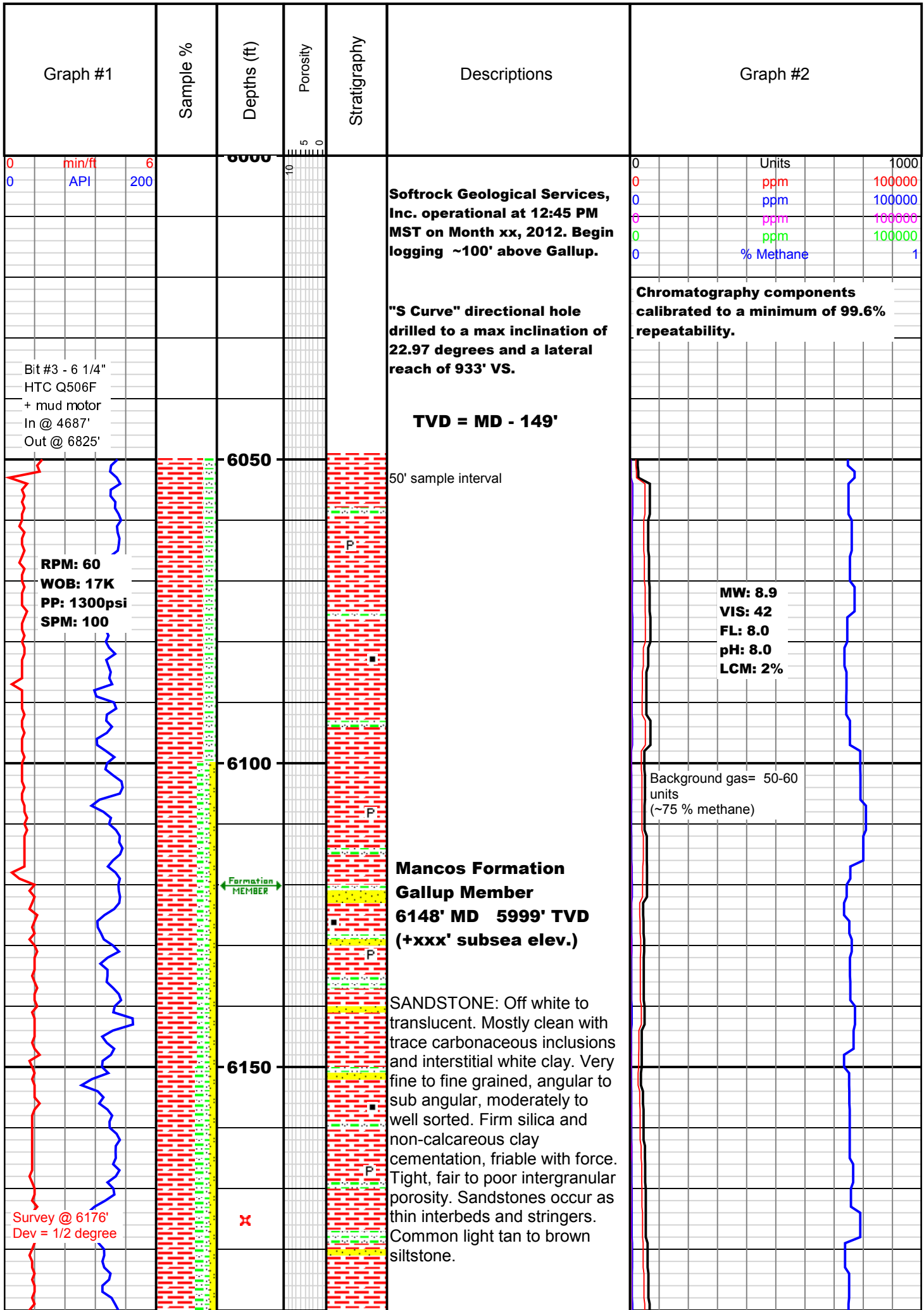
Ground Elevation(ft): 6000.0
 KB Elevation(ft): 6015.0
 Spud Date: xx.xx.2012
 Drilling Concluded: xx.xx.2012
 SGS, Inc. Geologist(s):
 Close Prognosis, III
 Rig Supervisor(s):
 Day Guy, Night Dude

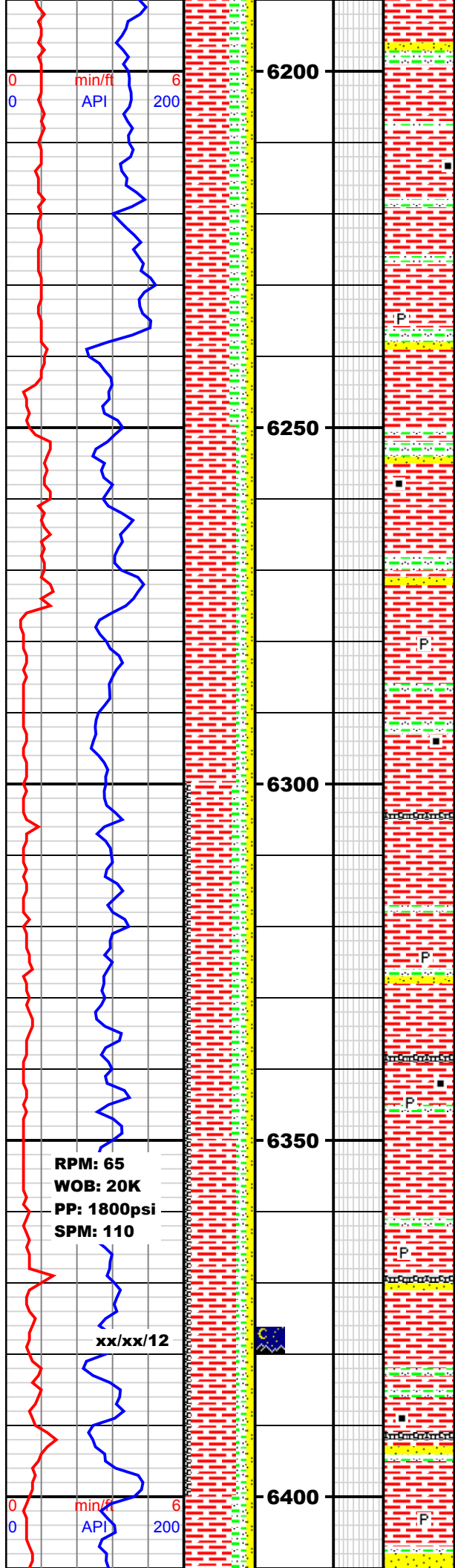
Hole Data

12 1/4" to 329'
 8 3/4" to 4687' MD
 6 1/4" to 7383' MD

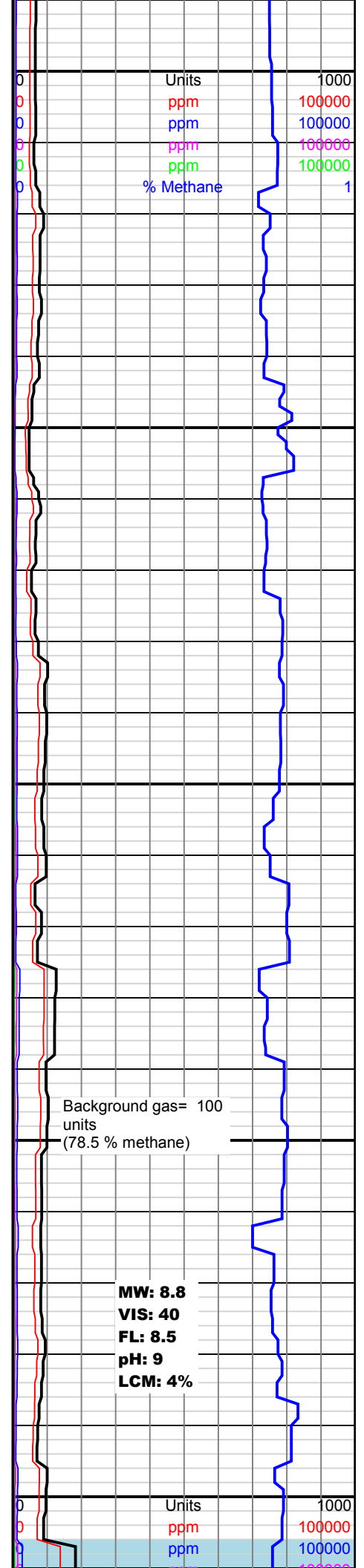
Casing Data

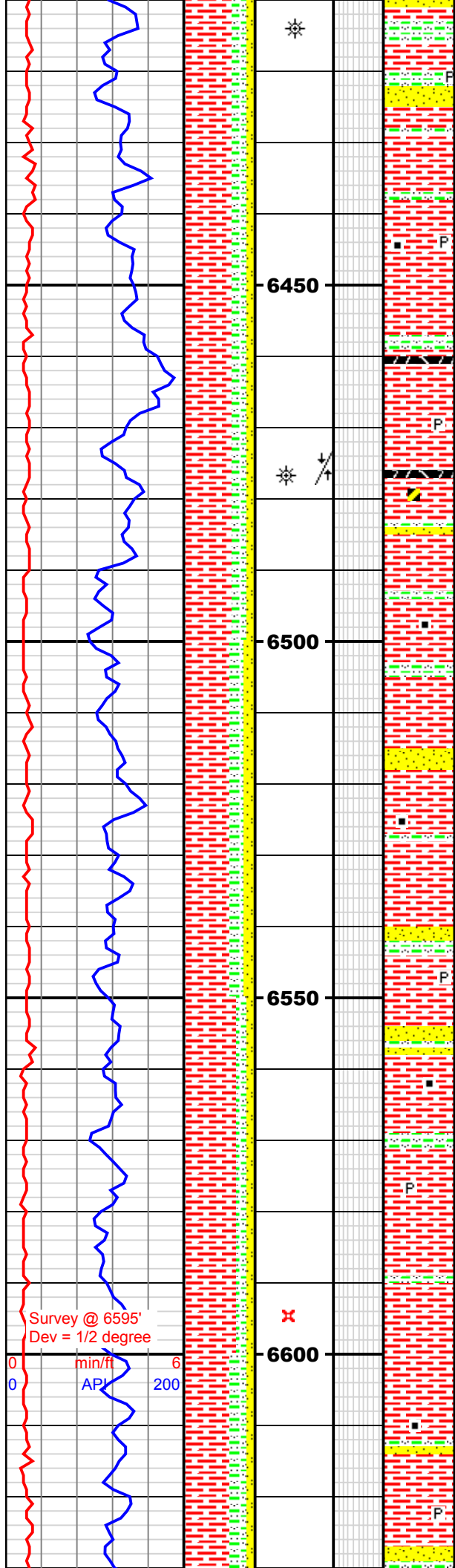
9 5/8" 32.3# H-40 STC to 309'
 7" 23# J-55 LTC to 4673.5' MD
 4 1/2" 11.6# L-80 LTC to TD





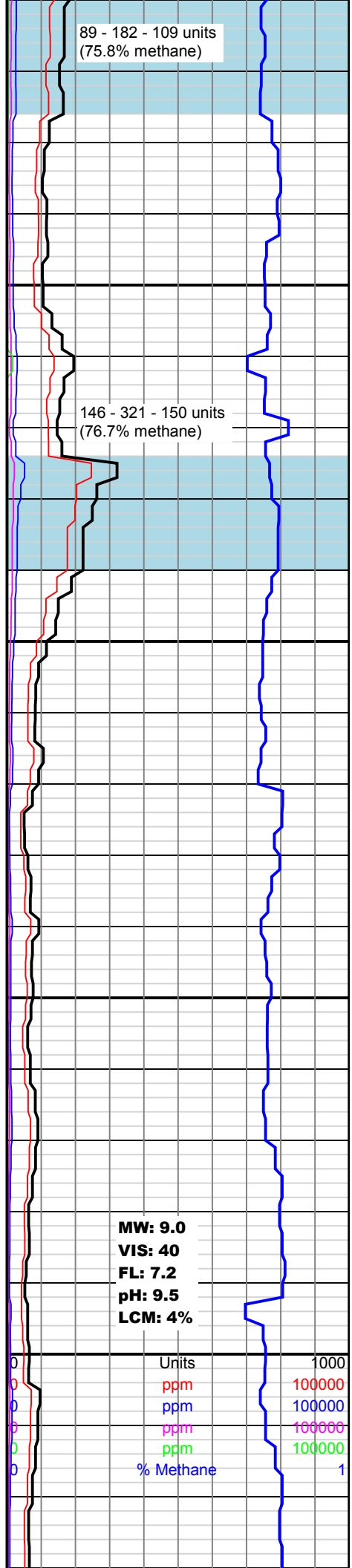
SHALE: Light to medium gray with a speckled appearance, trace microcrystalline pyrite and black carbonaceous peppering. Sub platy to platy to irregular cuttings. Mostly hard to firm, with occasional soft to brittle. Calcareous clay matrix, dull to earthy luster, gritty to silty texture. Mostly uniform shale lithology with occasional siltstone and sandstone stringers and lenses. Trace off white bentonite.





SHALE: medium to dark gray to dark gray-brown. Slight peppering with microcrystalline pyrite, trace black carbonaceous laminations and flakes. Sub block to sub platy to irregular. Very hard to firm, moderately calcareous matrix. Dull-earthy luster, smooth to gritty texture. Possible fracture zone: 6460 - 6490'. Increase in secondary mineralization, loose pyrite and calcite fracture fill.

SHALE: medium to dark gray to gray- brown. Occasionally peppered with black carby laminations and common micropyrte. Grades to light to medium brown to tan siltstone, trace translucent to off white sandstone stringers and interbeds. Sub platy to platy, fissile. Moderately hard to firm, highly calcareous matrix.



89 - 182 - 109 units
(75.8% methane)

146 - 321 - 150 units
(76.7% methane)

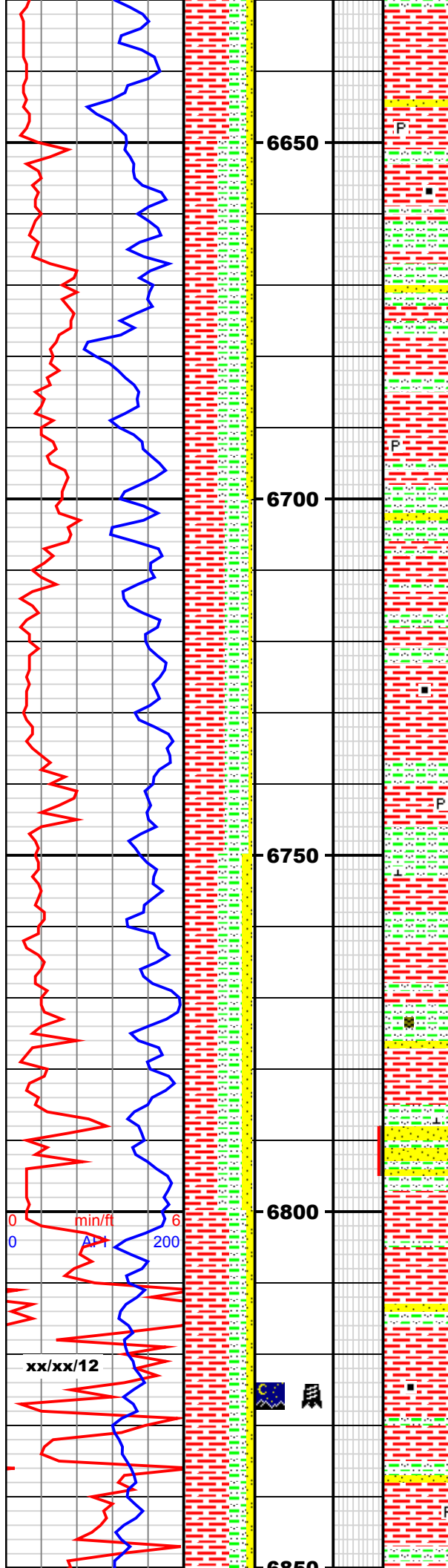
MW: 9.0
VIS: 40
FL: 7.2
pH: 9.5
LCM: 4%

Units	1000
ppm	100000
ppm	100000
ppm	100000
ppm	100000
% Methane	1

Survey @ 6595'
Dev = 1/2 degree

min/ft
API 200

Dull to earthy luster, gritty texture.



6650

6700

6750

6800

6850

P

P

P

P

SILTSTONE: light gray-brown to medium gray-brown. Sub-blocky to sub-platy, moderately soft and brittle, calcareous. Dull earthy luster, gritty to sub-silty texture. An abundance of micro mica flakes, lightly peppered with carbonaceous material, Grades to and interbedded with shale. Trace thin sandstone stringers.

Bit #4 - 6 1/4"
 HTC Q506F + mud motor
 In @ 6825'
 Out @ TD
 except for cores

SHALE: light to dark gray,

Background gas= 60-65 units
 (~76 % methane)

MW: 9.1
 VIS: 41
 FL: 10.6
 pH: 9.5
 LCM: 3%

Units	1000
ppm	100000
ppm	100000
ppm	100000
ppm	100000
% Methane	1

Background gas= 20-25 units
 (~71 % methane)

peppered slightly with carbonaceous streaks and flakes, pyrite, and mica. Firm, sub platy to platy, some blocky, brittle. Complete dropoff of calcite in clay matrix; good indicator above Greenhorn. Section is very homogenous and almost all shale unlike silty shale from above samples. Interbeds have dropped out with the exception of rare siltstone, trace translucent sandstone and off white bentonite.

MW: 8.9
VIS: 40
FL: 12
pH: 9.5
LCM: 4%

RPM: 65
WOB: 18K
PP: 1415psi
SPM: 95

6900

10' sample interval at 6900'

6950

Gas show @ 6944' - 6960' likely from open fracture. Heavy ended gas show. Trace calcite fracture fill in sample. No noted torque increase or stall in drilling.

112 - 407 - 208 units (61.0% methane)

Greenhorn Formation
6986' MD 6837' TVD
(-xxx' subsea elevation)

Formation TOP

MARLSTONE/ CHALKY SHALE: mostly light gray to tan with off white laths. Brittle to chalky, sub blocky to sub platy. Highly calcareous matrix with thin calcite sheets. Sub waxy to dull luster, predominantly smooth texture. Trace pyrite, off white to light gray bentonite.

7000

min/ft
 API
RPM: 60
WOB: 20K
PP: 1450psi
SPM: 95

Units	1000
ppm	100000
ppm	100000
ppm	100000
ppm	100000
% Methane	1

Graneros Formation
7043' MD 6894' TVD
(-xxx' subsea elevation)

Formation TOP

SHALE: medium gray to medium brown. Speckled with black carby laminations and quartz silt grains. Trace pyrite nodules. Platy to sub platy, fissile. Firm, highly calcareous. Grades to and interbedded with light to medium brown-tan siltstone. Beige bentonite denotes top of formation

7050

MW: 8.8
VIS: 39
FL: 10.4
pH: 9.5
LCM: 8%

Various bentonite stringers throughout. Smooth to silty texture, dull-earthy luster.

Dakota Formation
Twowells Member
7099' MD 6950' TVD
(-xxx' subsea elevation)

SANDSTONE: Overall a very dirty sandstone, offwhite to gray with even amounts of light brown and clear quartz grains, slightly peppered with carbonaceous material, trace micropyrrite. Very fine to fine grained, moderately well sorted, sub angular to rounded. Weak silica cement, easily friable, with individual grains breaking more easily. Fair intergranular porosity. Downward fining.

Paguate SS
7151' MD 7002' TVD
(-xxx' subsea elevation)

SILTSTONE: Poorly developed Paguate Ss. member. Lithology is predominantly siltstone with thin sandstone interbeds and lenses. Light to medium gray with medium to dark gray laminations. Firm to hard, blocky to sub blocky, brittle to friable when sand content is higher. Gritty to sandy texture, dull luster. Grain dominated matrix is weakly calcareous. Trace off white bentonite stringers.

Upper Cubero SS
7191' MD 7042' TVD
(-xxx' subsea elevation)

SANDSTONE: translucent grading to light gray. Peppered lightly with green/blue clay blems. Very fine, sub rounded to sub angular, well sorted. Firm calcite cement, non to slightly friable. Pinpoint to poor intergranular porosity, tight. Sand is very clean with carby streaks and laminations near base.

Lower Cubero SS
7222' MD 7073' TVD
(-xxx' subsea elevation)

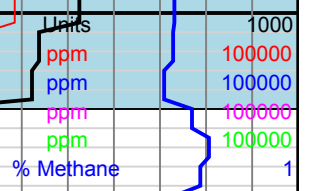
SANDSTONE: light gray to brown with white laminations. Peppered with carby material with minor pyrite replacement. Very fine, sub angular, well sorted. Friable cement is mostly silica, but there is a weakly calcareous component. Fair intergranular porosity with traces of brown clay fill.

Encinal Canyon SS
7290' MD 7141' TVD
(-xxx' subsea elevation)

19 - 883 - 35 units
 (54.4% methane)

MW: 9.1
VIS: 40
FL: 7.4
pH: 9.0
LCM: 8%

12 - 767 - 110 units
 (67.3% methane)



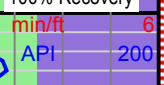
110 - 380 - 86 units
 (82.3% methane)

MW: 9.2
VIS: 40
FL: 8.4
pH: 9.0
LCM: 5%

CORE #1
 7090-7120'
 90% Recovery
 7090-7117'

CORE #2
 7190-7220'
 100% Recovery

CORE #3
 7220-7250'
 100% Recovery



7100

7150

7200

7250

Formation

Formation MEMBER

Formation MEMBER

Formation

SANDSTONE: clear to translucent, frosted, individual quartz grains have a very light gray matrix color as grains clusters, white chert peppering. Mostly very fine to fine grained, trace lower medium, sub angular to sub rounded grains, fair sorting. Well cemented with silica including some quartz overgrowths, occasionally friable to brittle. Tight, fair intergranular porosity.

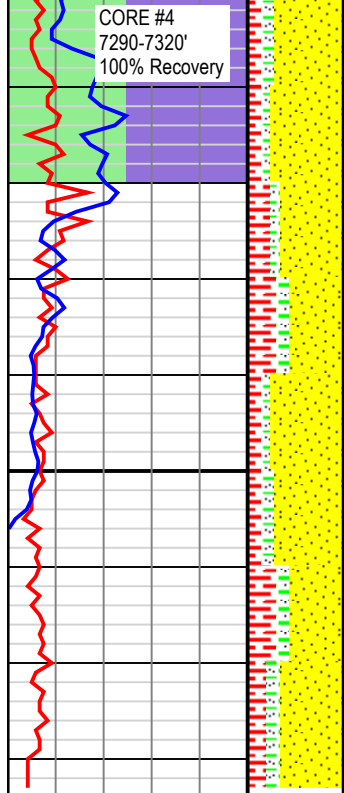
SANDSTONE: clear to translucent, frosted, predominantly unconsolidated to weakly cemented with silica in grain clusters. Very clean, no accessory minerals. Very fine to upper medium grained, sub angular to mostly angular grains, moderately sorted. Fair intergranular porosity.

Total Depth of 7383' MD from KB reached at 9:30 PM MST on Month xx, 2012.

35 - 140 - 63 units (61.1% methane)

26 - 224 - 83 units (90.8% methane)

Background Gas at TD = 45 units (~90% methane)



TD = 7383' MD
7234' TVD (-xxx' ss)

6
200

0	Units	1000
0	ppm	100000
0	ppm	100000
0	ppm	100000
0	ppm	100000
0	% Methane	1