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Houston, TX (281) 784-5500
Bakersfield, CA (661) 328-1595
New Iberia, LA (337) 364-2322
Anchorage, AK (907) 561-2465

MUDLOG TVD

COMPANY ExxonMobil Production
WELL PCU - 297-12A6
FIELD Piceance Creek Unit
REGION Rocky Mountain
COORDINATES Lat: 39.889045
Long: 108.237271
ELEVATION GL: 7183.6'
KB: 7213.8'
COUNTY, STATE Rio Blanco, CO.
API INDEX 051031116400
SPUD DATE 08/18/08
CONTRACTOR HE Drilling
CO. REP. M.Sadler / J. Woods
RIG/TYPE 326 / FLEX FOUR
LOGGING UNIT Canrig Unit 36
GEOLOGISTS Jeremiah Kokes
Brandon Laiche
ADD. PERSONS Huel Strickland
Patty Strickland
CO. GEOLOGIST Chris Alba

LOG INTERVAL

CASING DATA

DEPTHS: 4133' TO 13444'
DATES: 06/01/09 TO 11/12/09
SCALE: 5" = 100'

16.000" AT 150'
10.750" AT 4105'
7.000" AT 9375'
4.500" AT 13444'

MUD TYPES

HOLE SIZE

WATER BASE TO 4133'
LSND TO 4134'
DSF TO 5811'
LSND TO 6185'

14.250" TO 4133'
9.875" TO 9390'
6.125" TO 13444'
TO

ABBREVIATIONS

NB NEWBIT PV PLASTIC VISCOSITY LC LOST CIRCULATION
RRB RERUN BIT YP YIELD POINT CO CIRCULATE OUT
CB CORE BIT FL FLUID LOSS NR NO RETURNS
WOB WEIGHT ON BIT CL PPM CLORIDE ION TG TRIP GAS
RPM ROTARY REV/MIN Rm MUD RESISTIVITY SG SURVEY GAS
PP PUMP PRESSURE Rmf FILTRATE RESISTIVITY WG WIPER GAS
SPM STROKES/MIN PR POOR RETURNS CG CONNECTION GAS
MW MUD WEIGHT LAT LOGGED AFTER TRIP
VIS FUNNEL VISCOSITY LAS LOGGED AFTER SURVEY

Legend of geological symbols and patterns including: ALTERED ZONE, ANDESITE, ANHYDRITE, BASALT, BENTONITE, BIOTITIZATION, BRECCIA, CALCARENITE, CALCAREOUS TUFF, CALCILUTITE, CARBONATES, CARBONACEOUS MAT, CARBONACEOUS SH, CEMENT CONTAM., CHALK, CRYSTALLINE TUFF, CHERT - ARGILL, CHERT - GLASSY, CHERT - PORCEL, CHERT - TIGER STRIPE, CHERT - UNDIFF, CLAY, CLAY-MUDSTONE, CLYST-TUFFACEOUS, CHLORITIZATION, COAL, CONGLOMERATE, CONGL. SAND, CONGL. SANDSTONE, COQUINA, DACITE, DIATOMITE, DIORITE, DOLOSTONE, FELSIC SILIC DIKE, FOSSIL, GABBRO, GLASSY TUFF, GRANITE, GRANITE WASH, GRANODIORITE, GYPSUM, HALITE, HORNBL-QTZ-DIO, IGNEOUS (ACIDIC), IGNEOUS (BASIC), INTRUSIVES, KAOLINIC, LIMESTONE, LITHIC TUFF, MARL - DOLO, MARL - CALC, METAMORPHICS, MUDSTONE, OBSIDIAN, PALEOSOL, PHOSPHATE, PORCELANITE, PORCELANEOUS CLYST, PYRITE, PYROCLASTICS, QUARTZ DIORITE, QUARTZ LATITE, QUARTZ MONZONITE, RECRYSTALLIZED CALCITE, RHYOLITE, SAND, SANDSTONE, SANDSTONE-TUFFACEOUS, SERICITIZATION, SERPENTINE, SHALE, SHALE TUFFACEOUS, SHELL FRAGMENTS, SIDERITE, SILICIFICATION, SILTSTONE, SILTST-TUFFACEOUS, TUFF, VOLCANICLASTICS SEDS, VOLCANICS.

3700

4000 MD

3800

4100 MD

39

THE GAS BUSTER, THE INTERVAL IS MARKED
IN THE MGS COLUMN AND SIZE OF FLARES
ARE NOTED.

EVIDENCE OF FRACTURE FILL IS NOTED ON
THE MUD LOG. KAOLIN PERCENTAGE IN SS
INTERVALS IS ALSO NOTED ON THE MUD LOG.

<0 Ttl Gas 500>

1 UNIT OF GAS = 200 PPM METHANE

SET 10 3/4" SURFACE CASING AT 4118'

EPOCH COMMENCED LOGGING ON 6/03/2009

AT 4133' MD.

SHALE = MODERATE YELLOWISH BROWN;

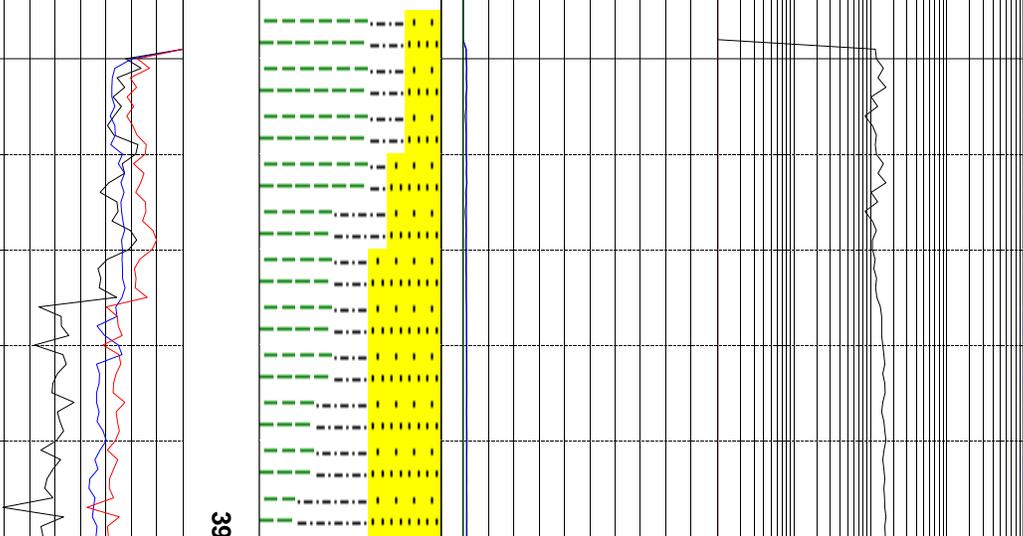
CRUMBLY, TENACITY; SUBBLOCKY FRACTURE;

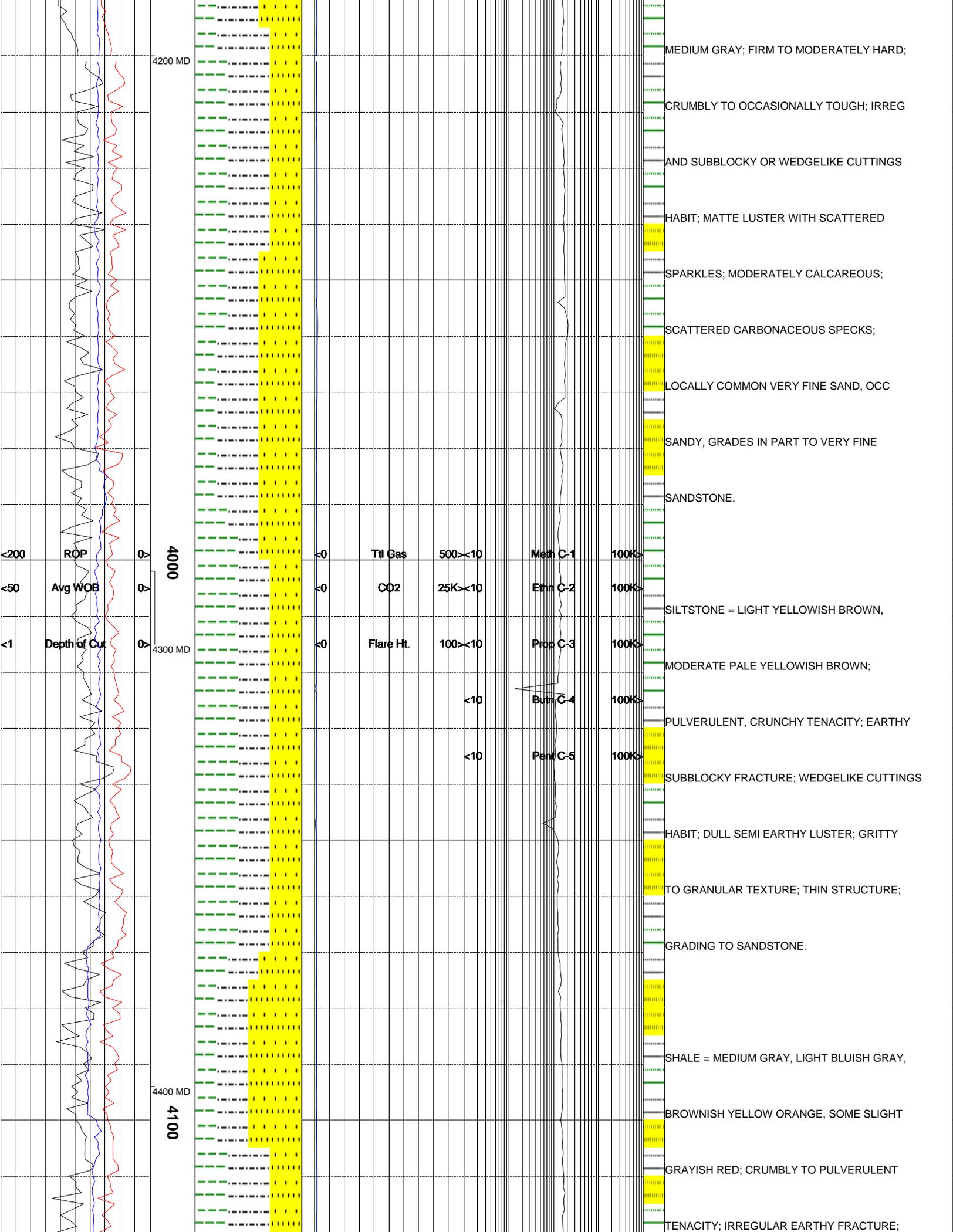
WEDGELIKE, TABULAR CUTTINGS HABIT; DULL

EARTHY LUSTER, SILTY, CLAYEY TEXTURE;

MASSIVE TO THICK STRUCTURE.

SILTSTONE = PURPLISH BROWN, LIGHT TO





4200 MD

4000

4300 MD

4400 MD

4100

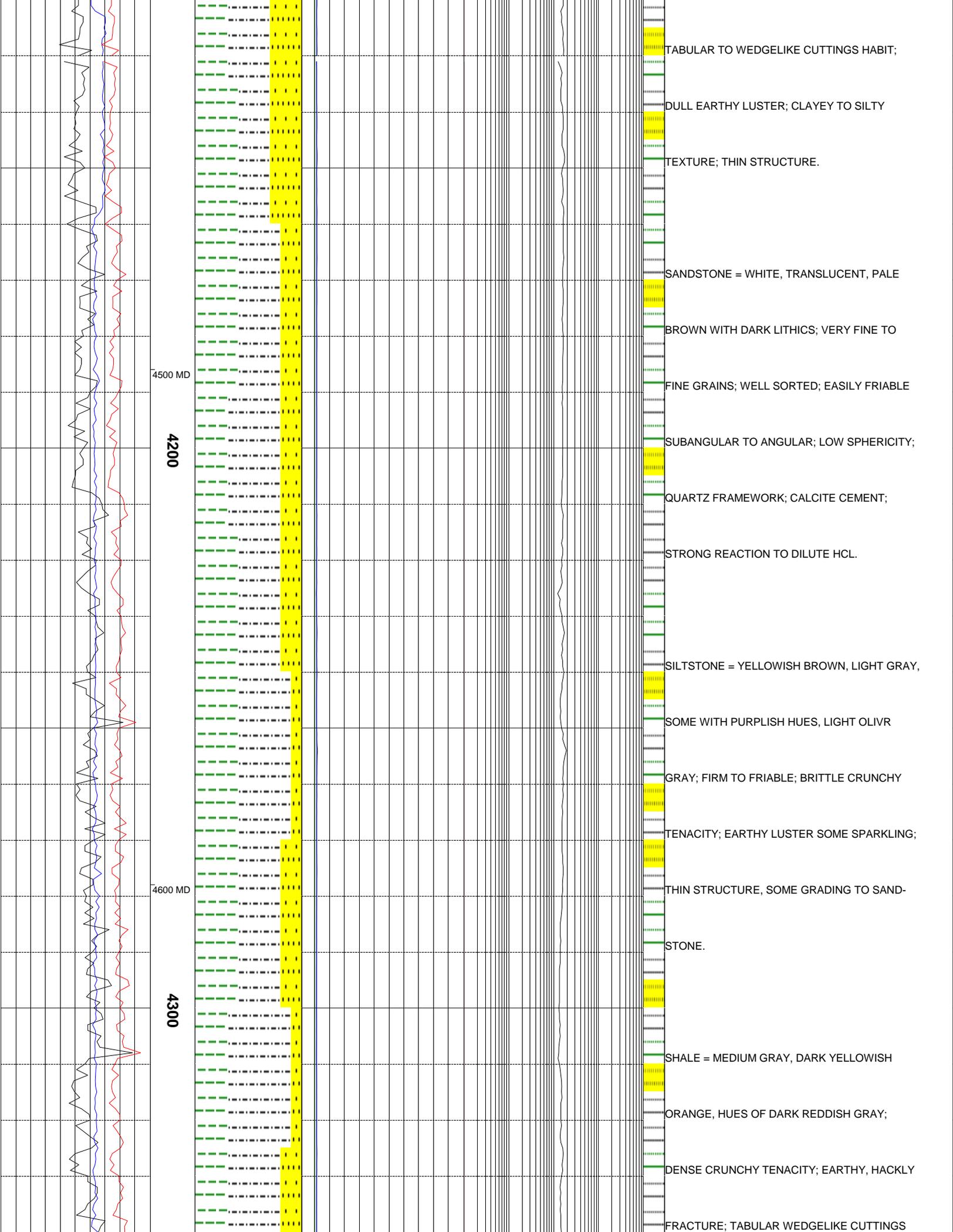
MEDIUM GRAY; FIRM TO MODERATELY HARD;
 CRUMBLY TO OCCASIONALLY TOUGH; IRREG
 AND SUBBLOCKY OR WEDGELIKE CUTTINGS
 HABIT; MATTE LUSTER WITH SCATTERED
 SPARKLES; MODERATELY CALCAREOUS;
 SCATTERED CARBONACEOUS SPECKS;
 LOCALLY COMMON VERY FINE SAND, OCC
 SANDY, GRADES IN PART TO VERY FINE
 SANDSTONE.

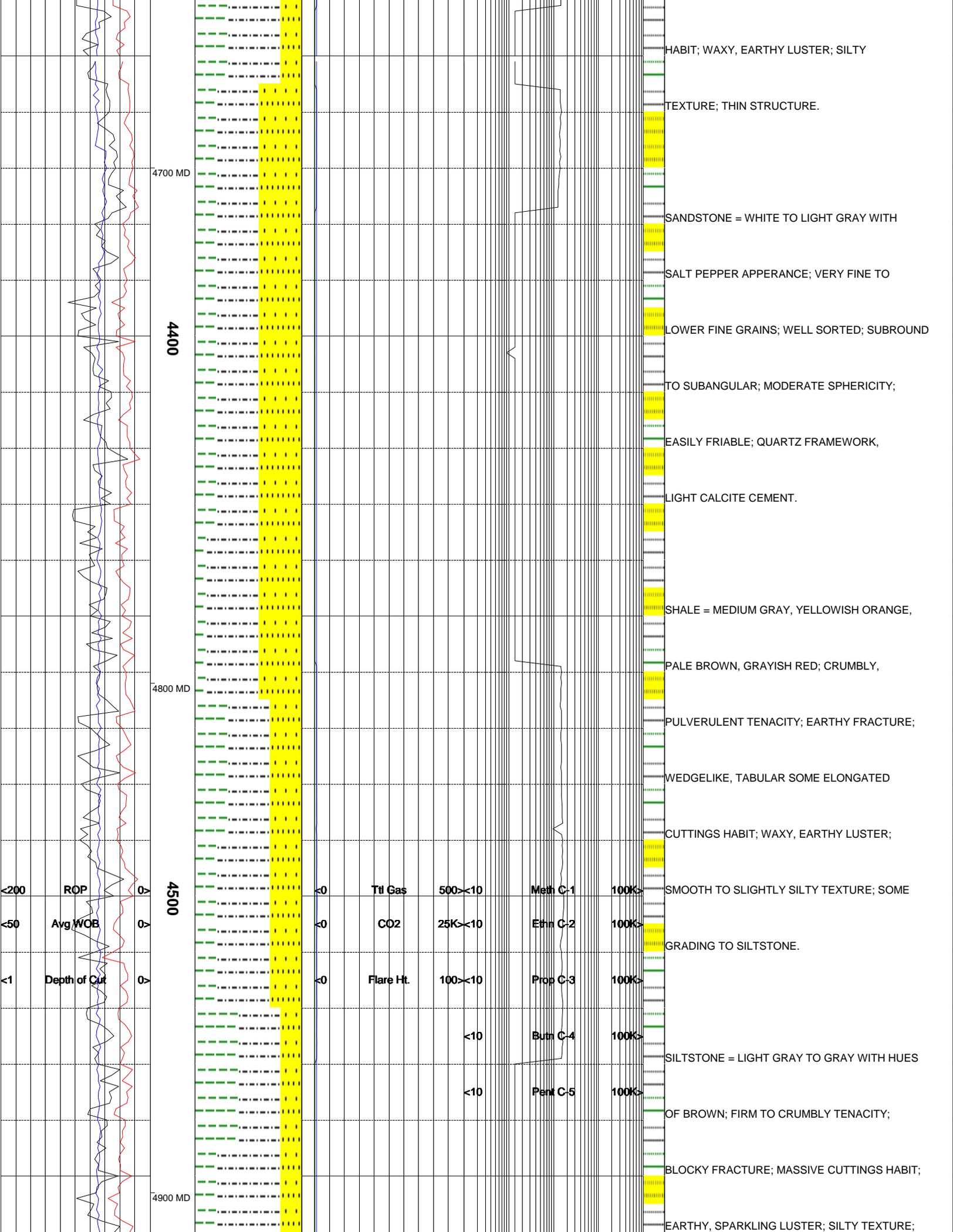
SILTSTONE = LIGHT YELLOWISH BROWN,
 MODERATE PALE YELLOWISH BROWN;
 PULVERULENT, CRUNCHY TENACITY; EARTHY
 SUBBLOCKY FRACTURE; WEDGELIKE CUTTINGS
 HABIT; DULL SEMI EARTHY LUSTER; GRITTY
 TO GRANULAR TEXTURE; THIN STRUCTURE;
 GRADING TO SANDSTONE.

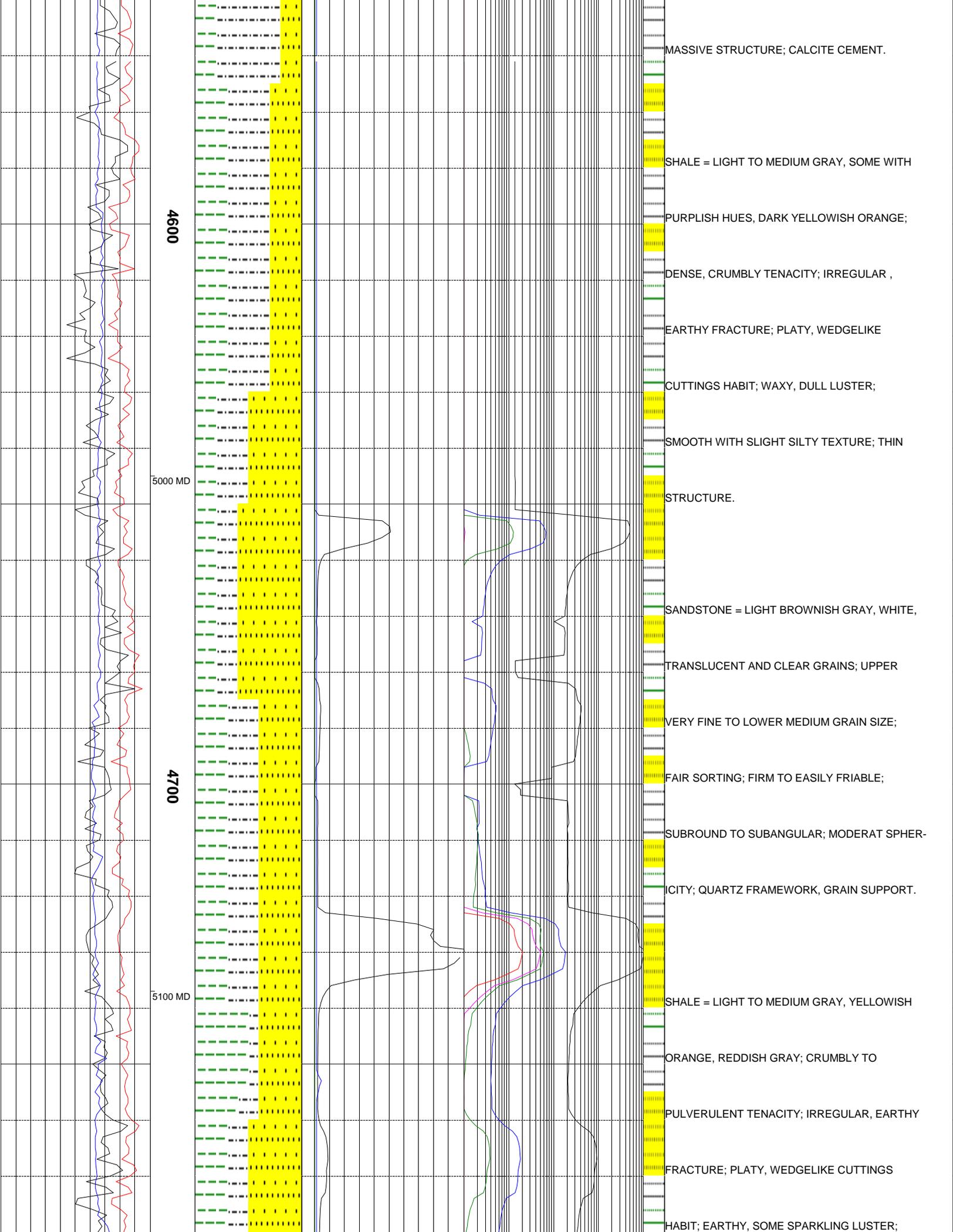
SHALE = MEDIUM GRAY, LIGHT BLUISH GRAY,
 BROWNISH YELLOW ORANGE, SOME SLIGHT
 GRAYISH RED; CRUMBLY TO PULVERULENT
 TENACITY; IRREGULAR EARTHY FRACTURE;

>200 ROP
 <50 Avg WOB
 <1 Depth of Cut

<0	Ttl Gas	500	<10	Meth C-1	100K
<0	CO2	25K	<10	Ethn C-2	100K
<0	Flare Ht.	100	<10	Prop C-3	100K
			<10	Burn C-4	100K
			<10	Perm C-5	100K







MASSIVE STRUCTURE; CALCITE CEMENT.

SHALE = LIGHT TO MEDIUM GRAY, SOME WITH PURPLISH HUES, DARK YELLOWISH ORANGE;

DENSE, CRUMBLY TENACITY; IRREGULAR, EARTHY FRACTURE; PLATY, WEDGELIKE

CUTTINGS HABIT; WAXY, DULL LUSTER;

SMOOTH WITH SLIGHT SILTY TEXTURE; THIN

STRUCTURE.

SANDSTONE = LIGHT BROWNISH GRAY, WHITE,

TRANSLUCENT AND CLEAR GRAINS; UPPER

VERY FINE TO LOWER MEDIUM GRAIN SIZE;

FAIR SORTING; FIRM TO EASILY FRIABLE;

SUBROUND TO SUBANGULAR; MODERAT SPHER-

ICITY; QUARTZ FRAMEWORK, GRAIN SUPPORT.

SHALE = LIGHT TO MEDIUM GRAY, YELLOWISH

ORANGE, REDDISH GRAY; CRUMBLY TO

PULVERULENT TENACITY; IRREGULAR, EARTHY

FRACTURE; PLATY, WEDGELIKE CUTTINGS

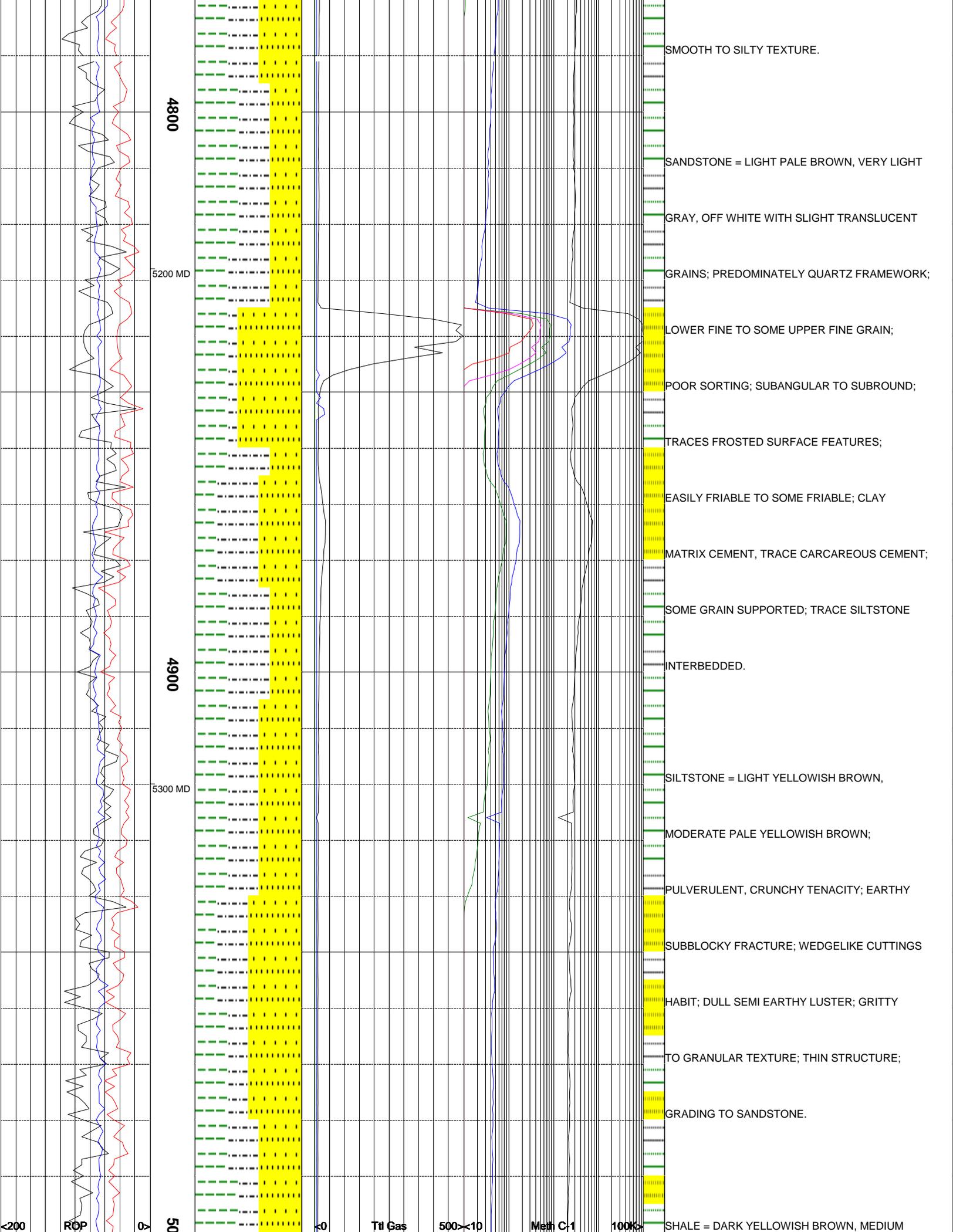
HABIT; EARTHY, SOME SPARKLING LUSTER;

4600

5000 MD

4700

5100 MD



4800

5200 MD

4900

5300 MD

SMOOTH TO SILTY TEXTURE.

SANDSTONE = LIGHT PALE BROWN, VERY LIGHT

GRAY, OFF WHITE WITH SLIGHT TRANSLUCENT

GRAINS; PREDOMINATELY QUARTZ FRAMEWORK;

LOWER FINE TO SOME UPPER FINE GRAIN;

POOR SORTING; SUBANGULAR TO SUBROUND;

TRACES FROSTED SURFACE FEATURES;

EASILY FRIABLE TO SOME FRIABLE; CLAY

MATRIX CEMENT, TRACE CARCAREOUS CEMENT;

SOME GRAIN SUPPORTED; TRACE SILTSTONE

INTERBEDDED.

SILTSTONE = LIGHT YELLOWISH BROWN,

MODERATE PALE YELLOWISH BROWN;

PULVERULENT, CRUNCHY TENACITY; EARTHY

SUBBLOCKY FRACTURE; WEDGELIKE CUTTINGS

HABIT; DULL SEMI EARTHY LUSTER; GRITTY

TO GRANULAR TEXTURE; THIN STRUCTURE;

GRADING TO SANDSTONE.

SHALE = DARK YELLOWISH BROWN, MEDIUM

200

ROP

A

50

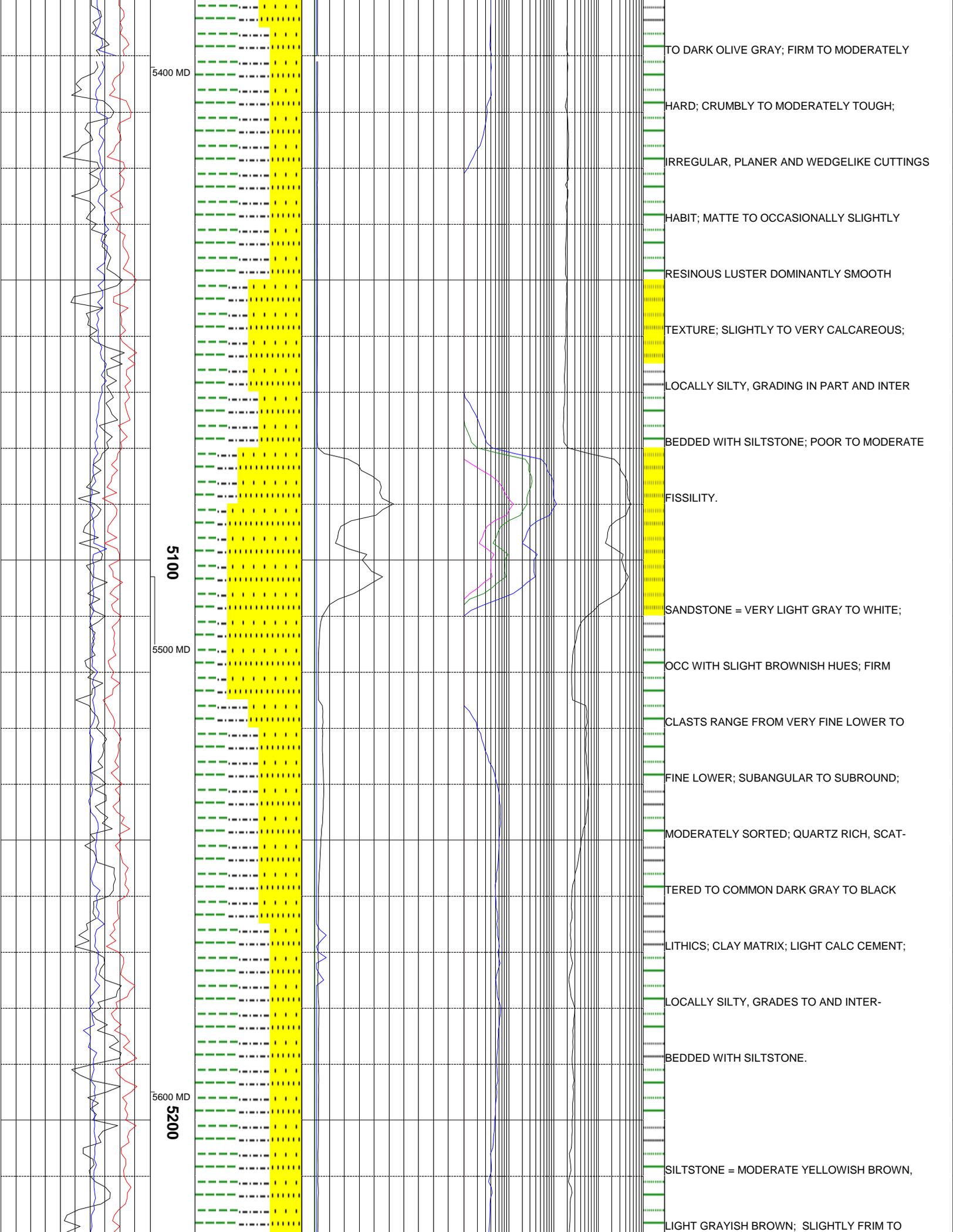
40

Ttl Gas

500x10

Meth C-1

100K>



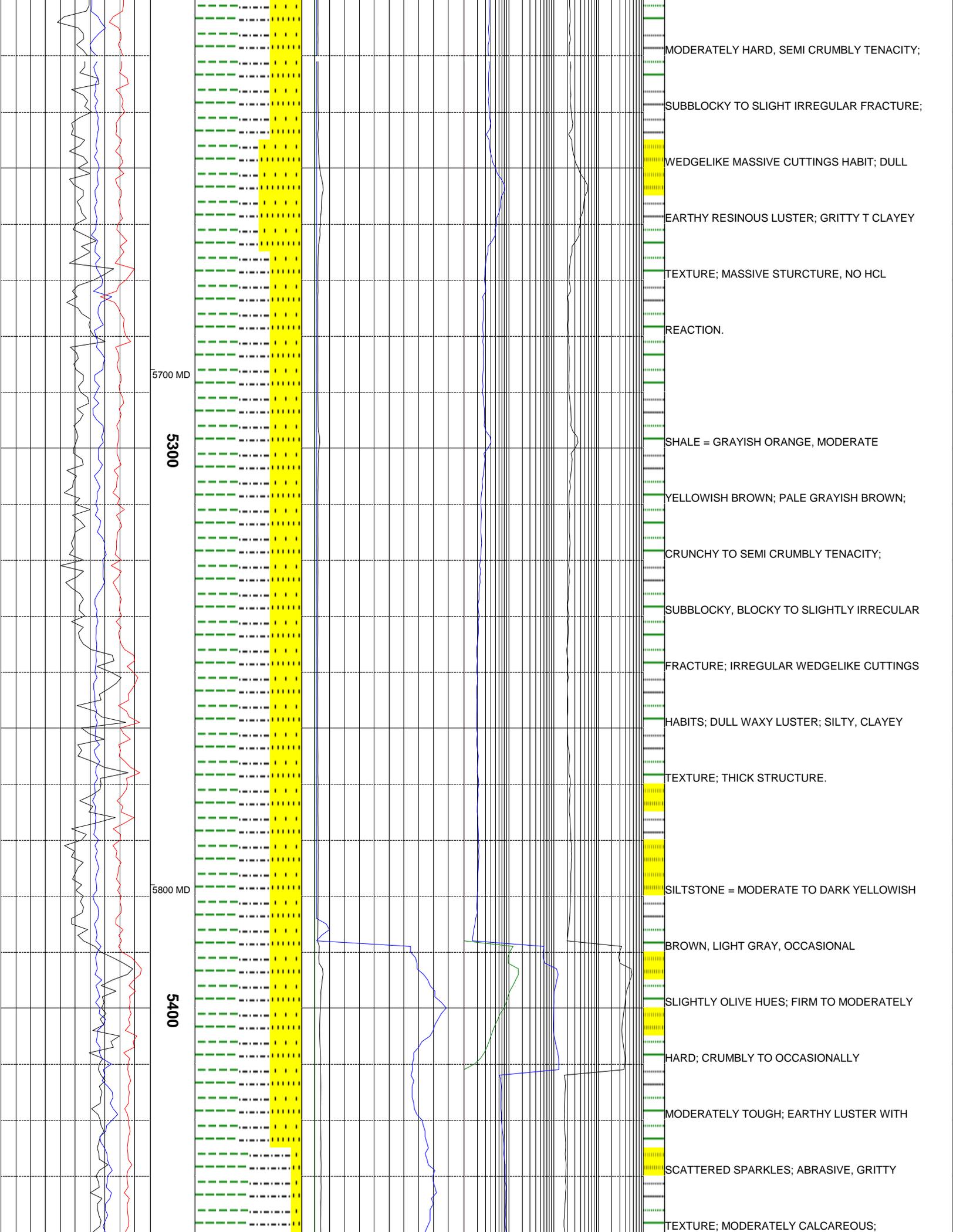
5400 MD

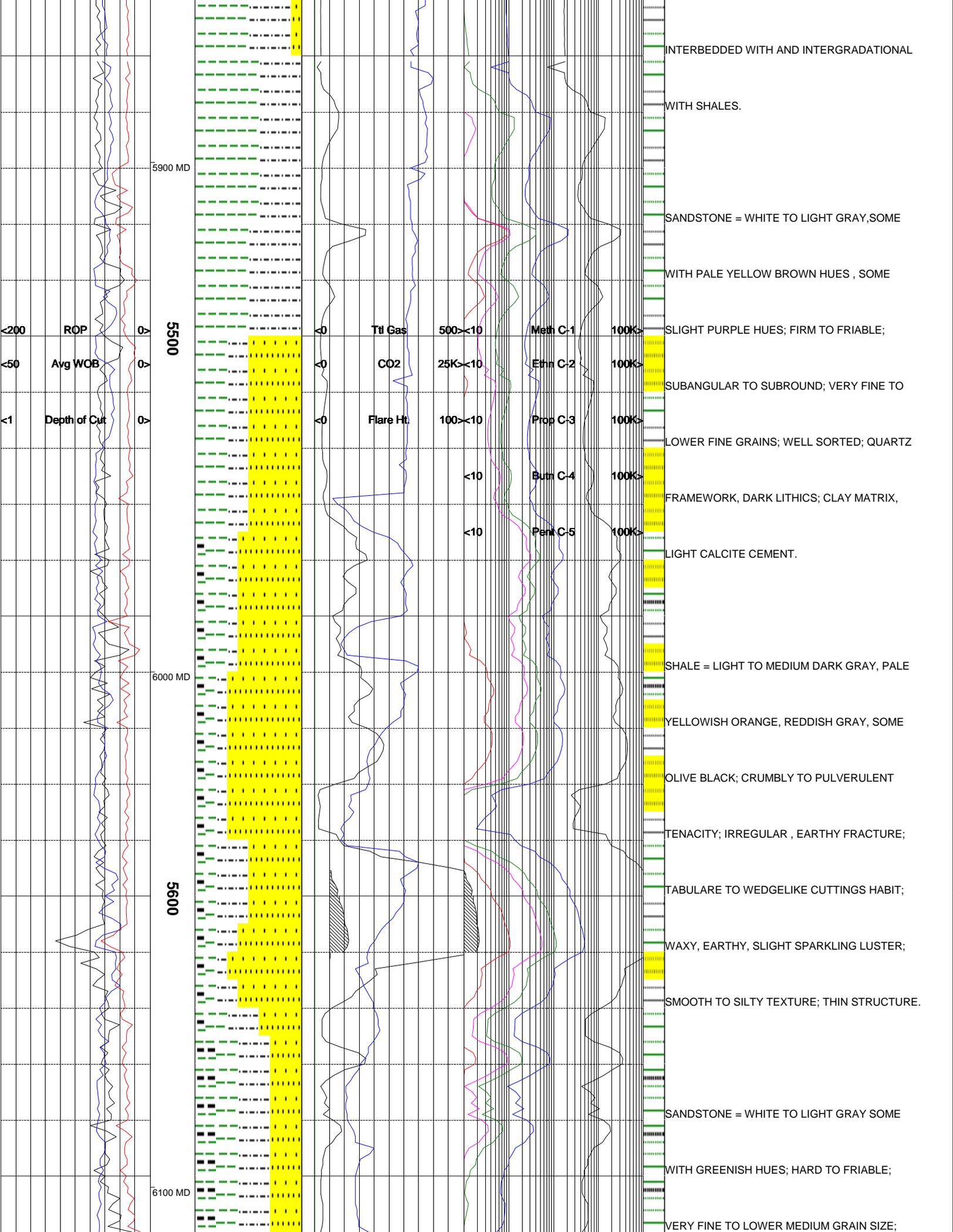
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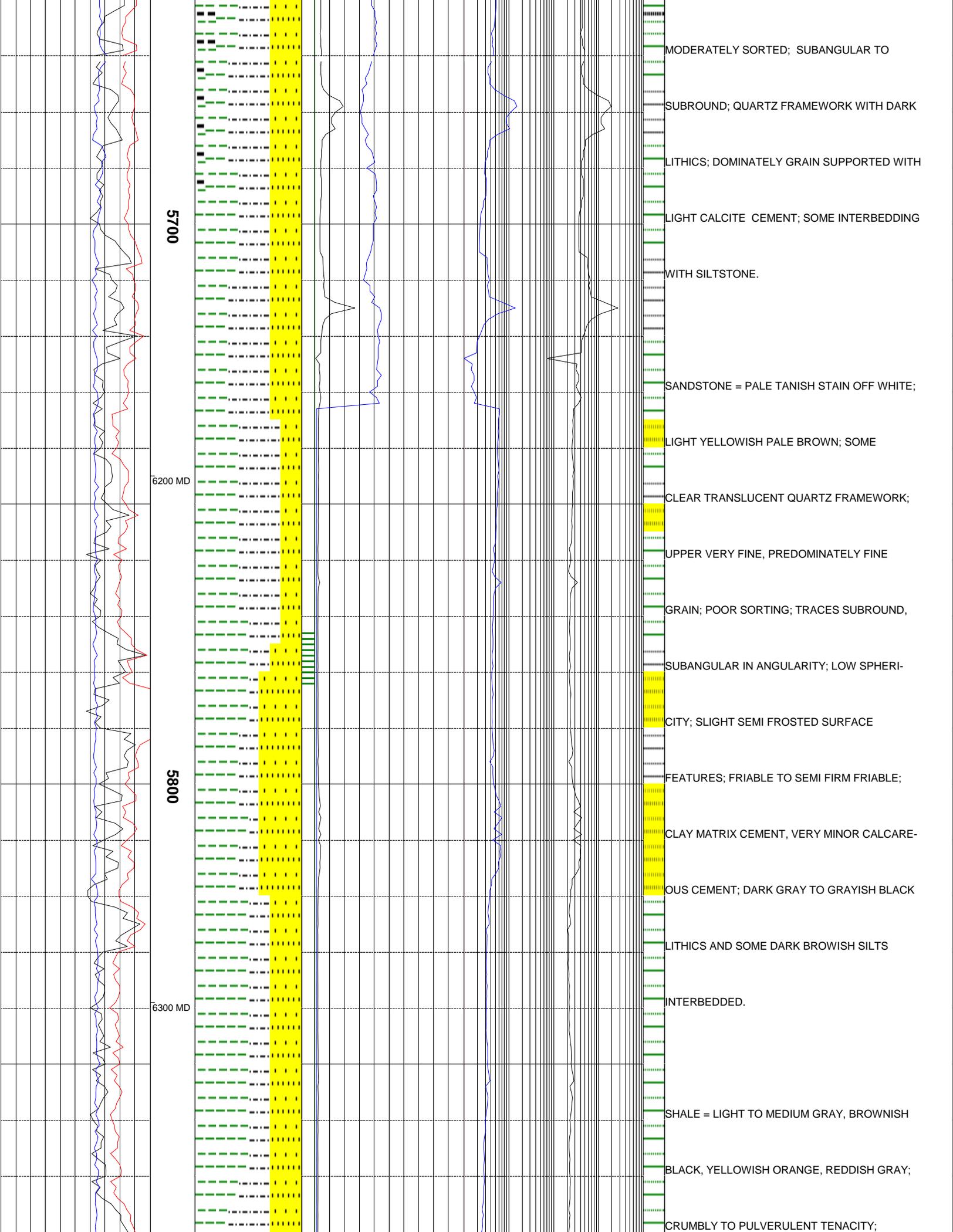
5500 MD

5600 MD

5200





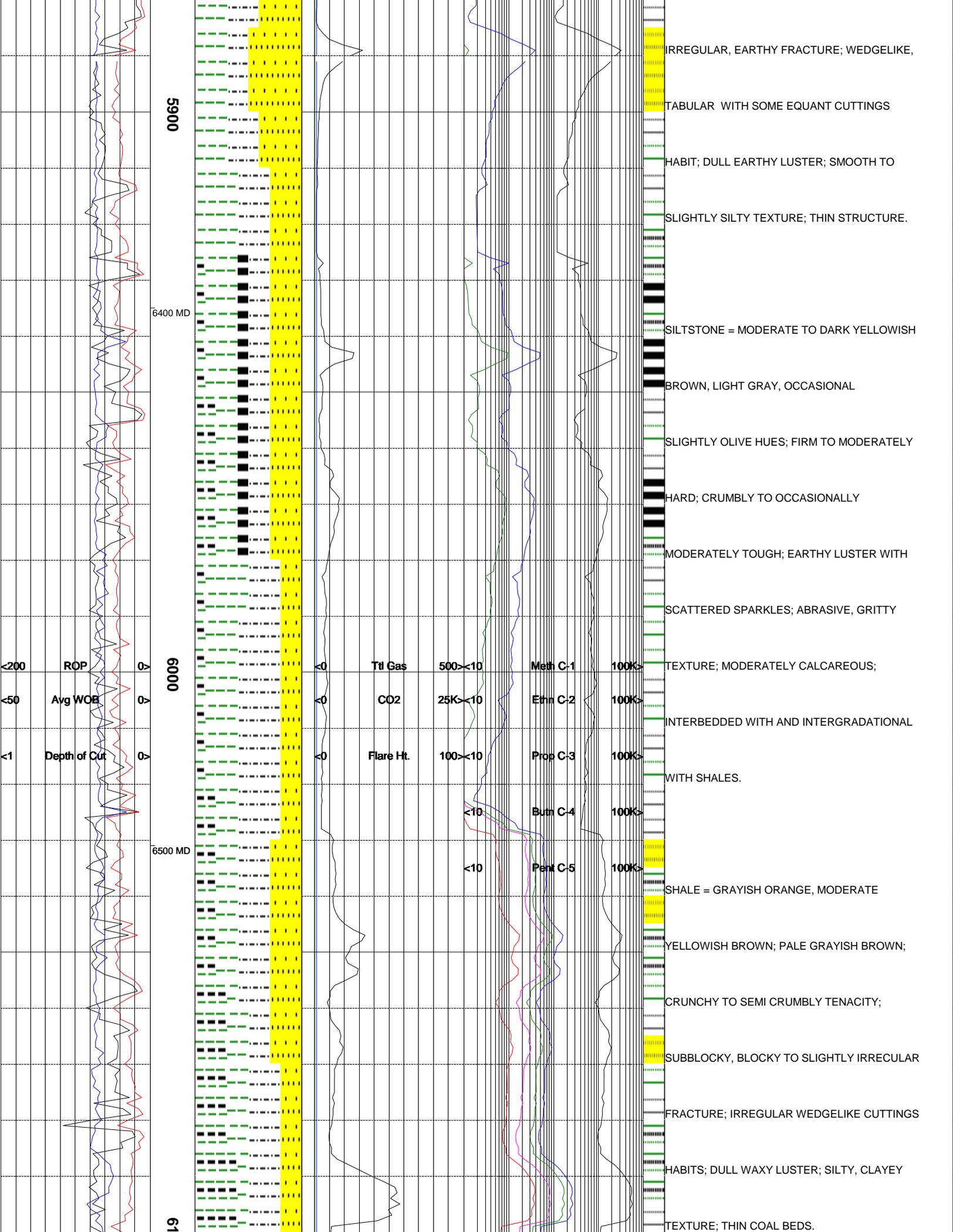


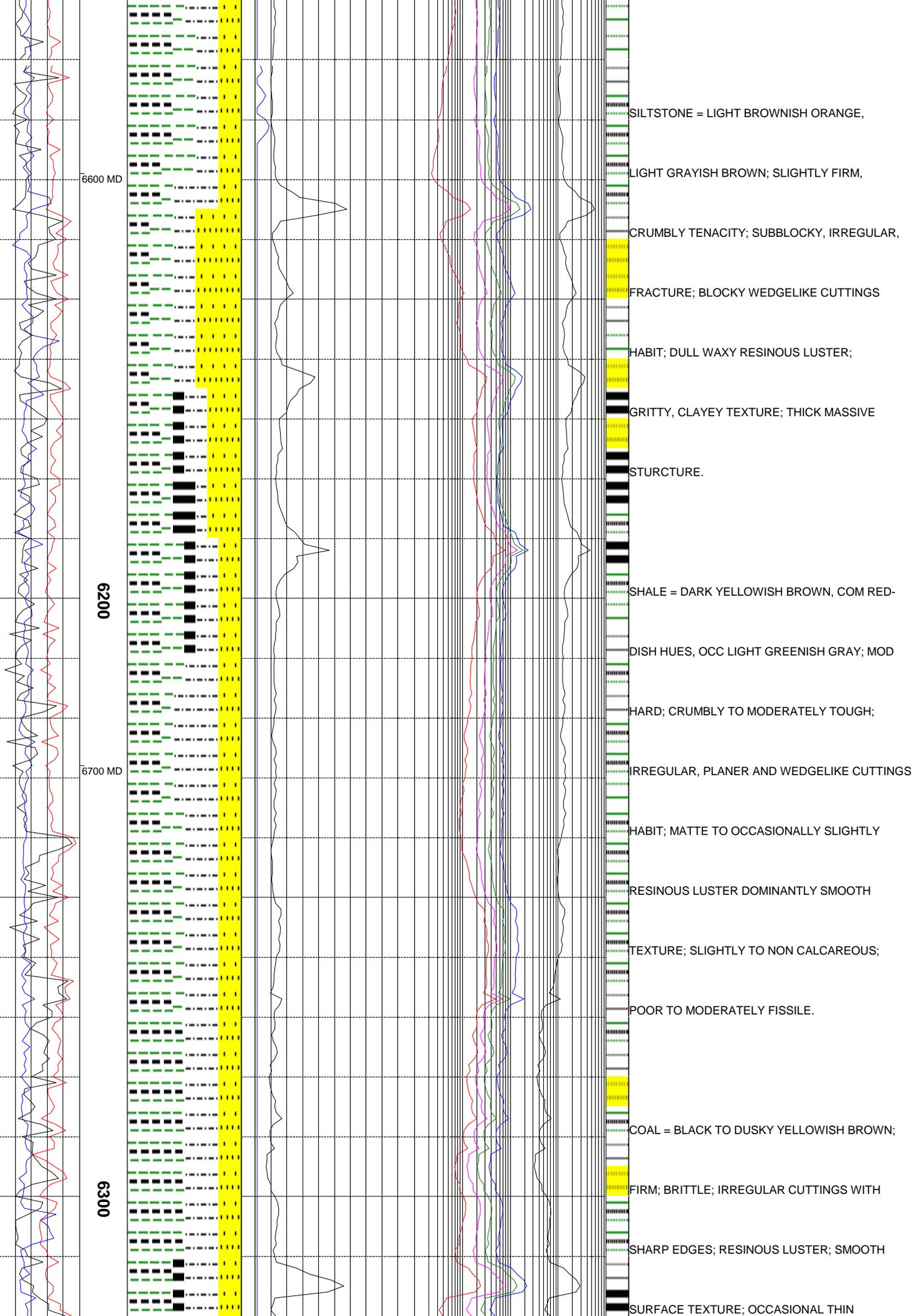
5700

6200 MD

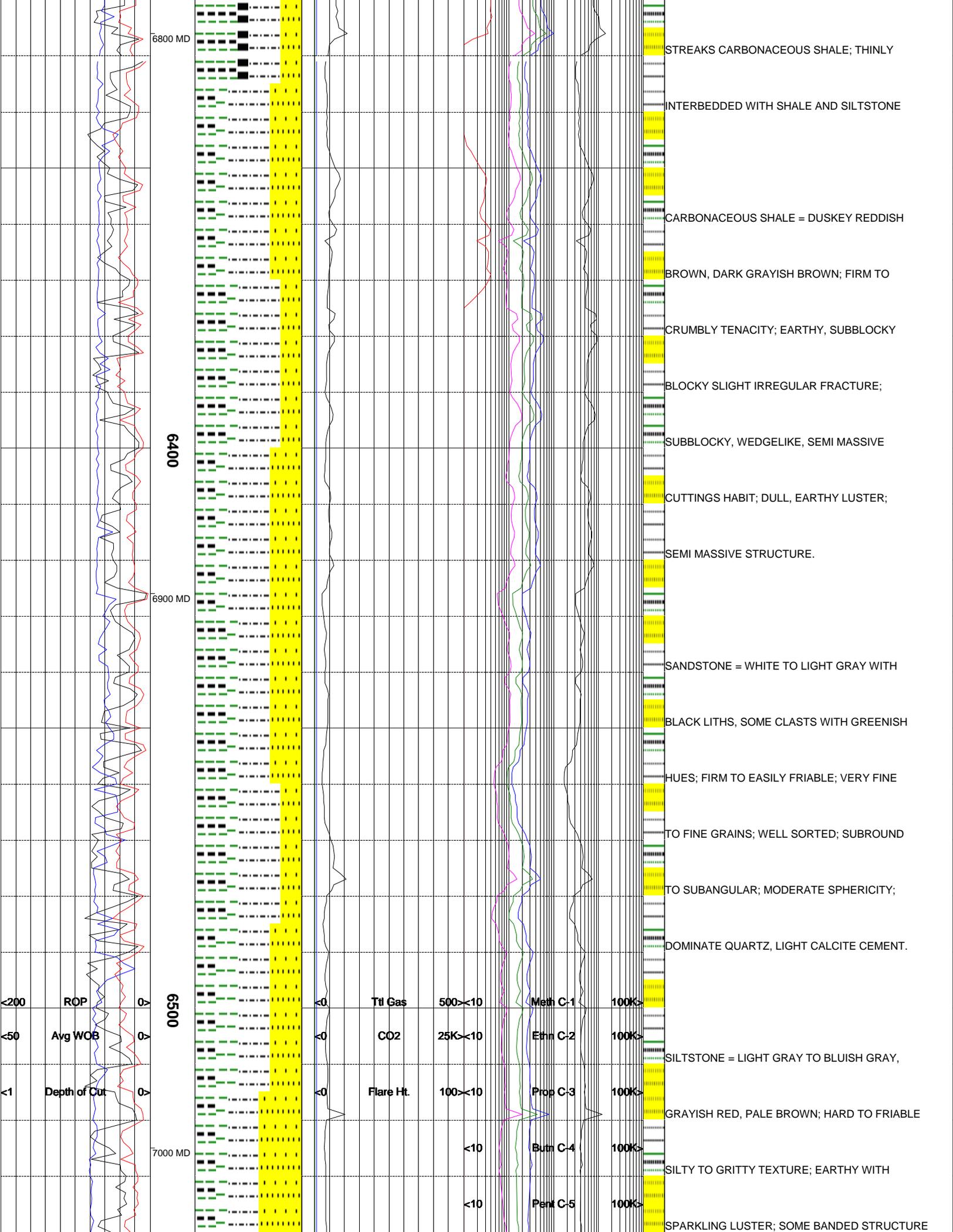
5800

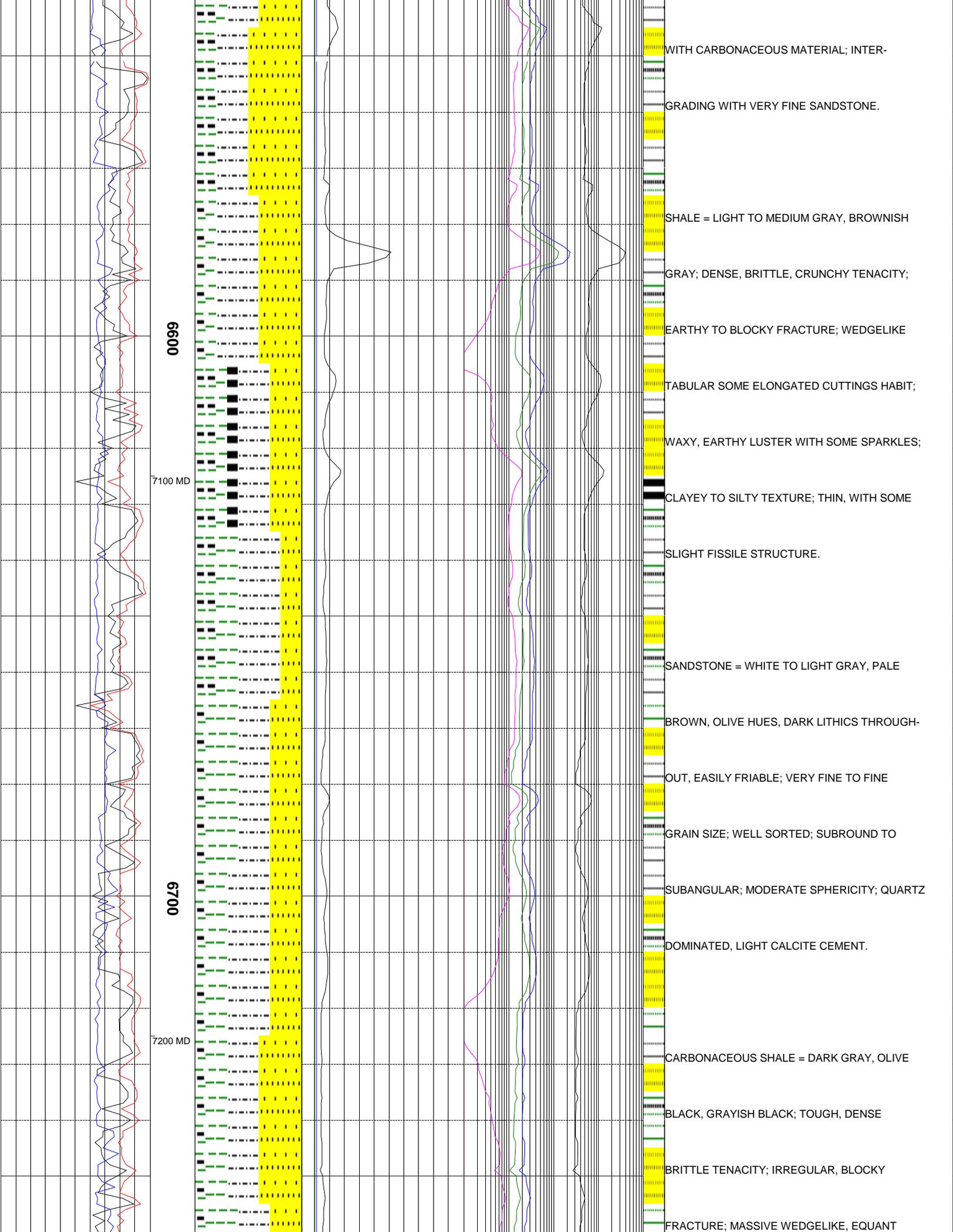
6300 MD





SILTSTONE = LIGHT BROWNISH ORANGE,
 LIGHT GRAYISH BROWN; SLIGHTLY FIRM,
 CRUMBLY TENACITY; SUBBLOCKY, IRREGULAR,
 FRACTURE; BLOCKY WEDGELIKE CUTTINGS
 HABIT; DULL WAXY RESINOUS LUSTER;
 GRITTY, CLAYEY TEXTURE; THICK MASSIVE
 STURCTURE.
 SHALE = DARK YELLOWISH BROWN, COM RED-
 DISH HUES, OCC LIGHT GREENISH GRAY; MOD
 HARD; CRUMBLY TO MODERATELY TOUGH;
 IRREGULAR, PLANER AND WEDGELIKE CUTTINGS
 HABIT; MATTE TO OCCASIONALLY SLIGHTLY
 RESINOUS LUSTER DOMINANTLY SMOOTH
 TEXTURE; SLIGHTLY TO NON CALCAREOUS;
 POOR TO MODERATELY FISSILE.
 COAL = BLACK TO DUSKY YELLOWISH BROWN;
 FIRM; BRITTLE; IRREGULAR CUTTINGS WITH
 SHARP EDGES; RESINOUS LUSTER; SMOOTH
 SURFACE TEXTURE; OCCASIONAL THIN



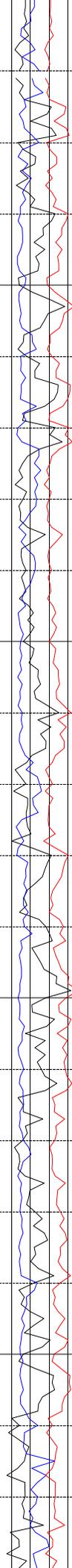


6600

7100 MD

6700

7200 MD



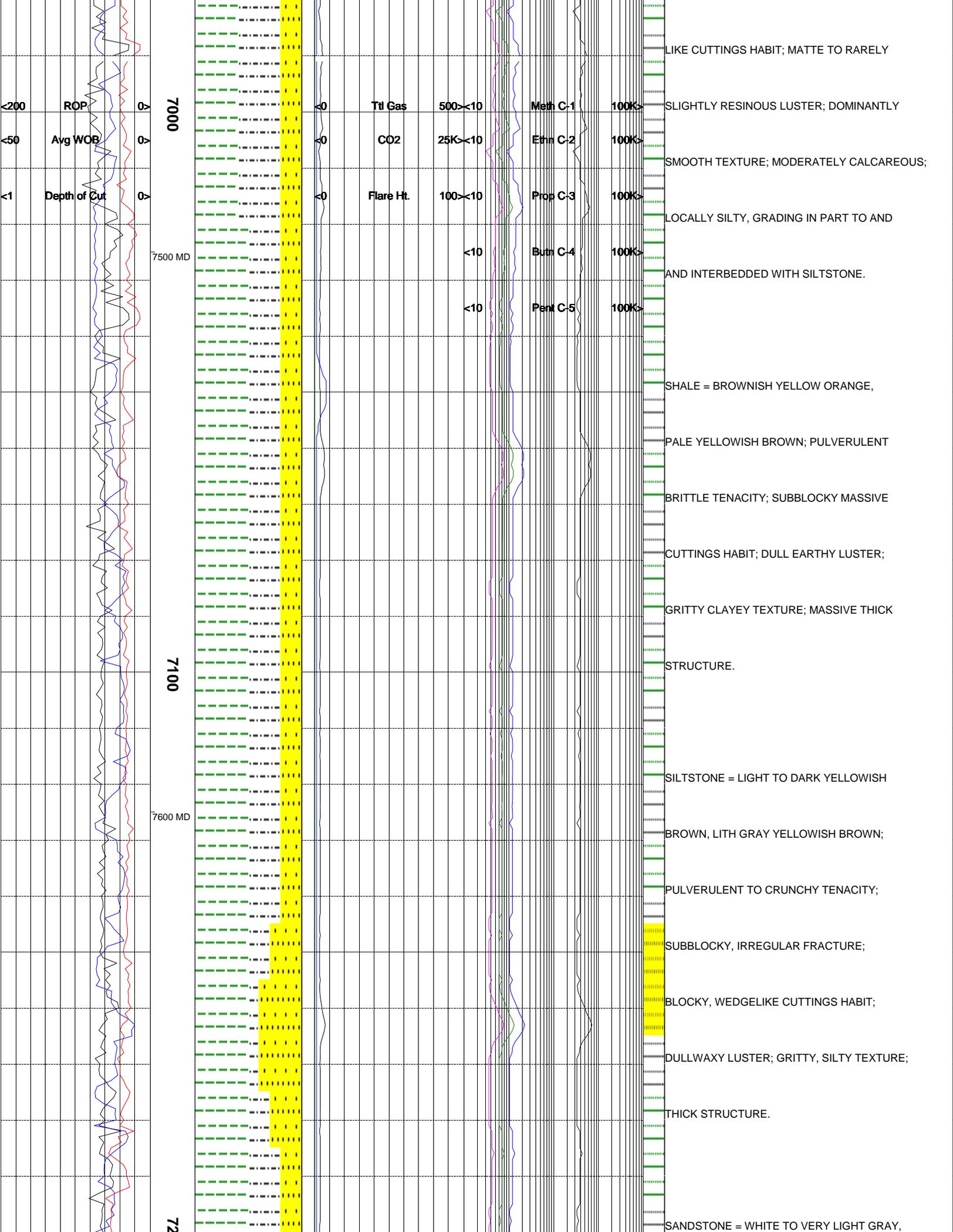
CUTTINGS HABIT; WAXY, EARTHY LUSTER;
 SMOOTH TO SILTY TEXTURE; MASSIVE
 STRUCTURE. TRACE COAL IN SAMPLE.
 NOTE: NB # 4 IN AT 7123' - GEO DIAMOND
 M1616 - JETS 4 X 13 / 2 X 12 SN JY9468
 NB # 3 OUT AT 7123' - MADE 2990' IN
 52.25 HRS.
 SANDSTONE WHITE TO LIGHT GRAY WITH
 DARK LITHICS; QUARTZ FRAMEWORK; VERY
 FINE TO FINE GRAIN SIZE; WELL SORTED; SU
 ANGULAR TO SUB ROUND; MODERATE
 SPHERICITY; CARBONACEOUS MATERIAL
 THROUGHOUT; LIGHT CALCITE CEMENT.
 SHALE = MODERATE TO DARK YELLOWISH
 BROWN, BROWNISH YELLOW ORANGE,
 OCCASIONALLY MEDIUM GRAY WITH SLIGHT
 GREENISH HUES; FIRM; CRUMBLY TO
 OCCASIONALLY MODERATELY TOUGH;
 IRREGULAR, SUBBLOCKY, RARELY WEDGE-

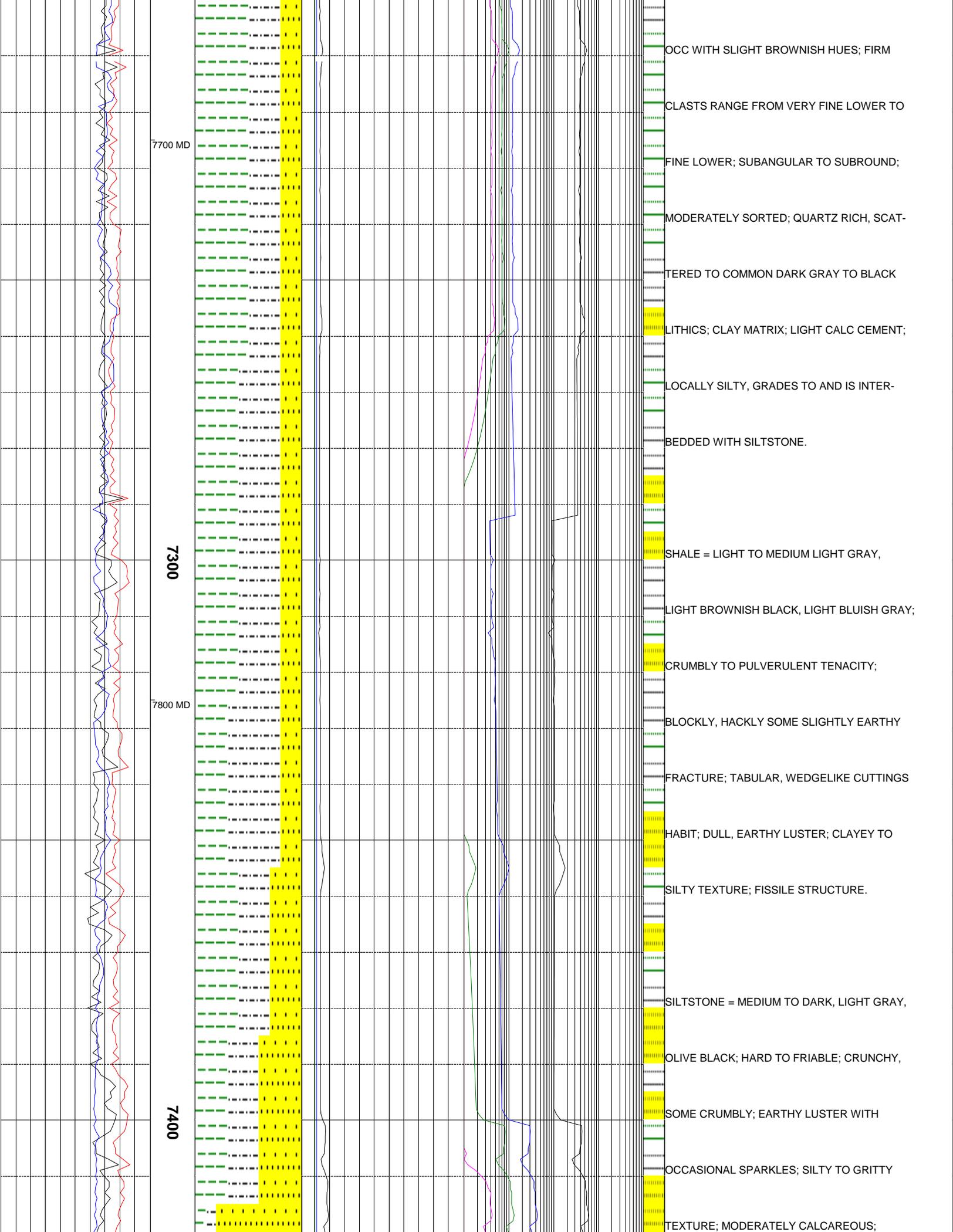
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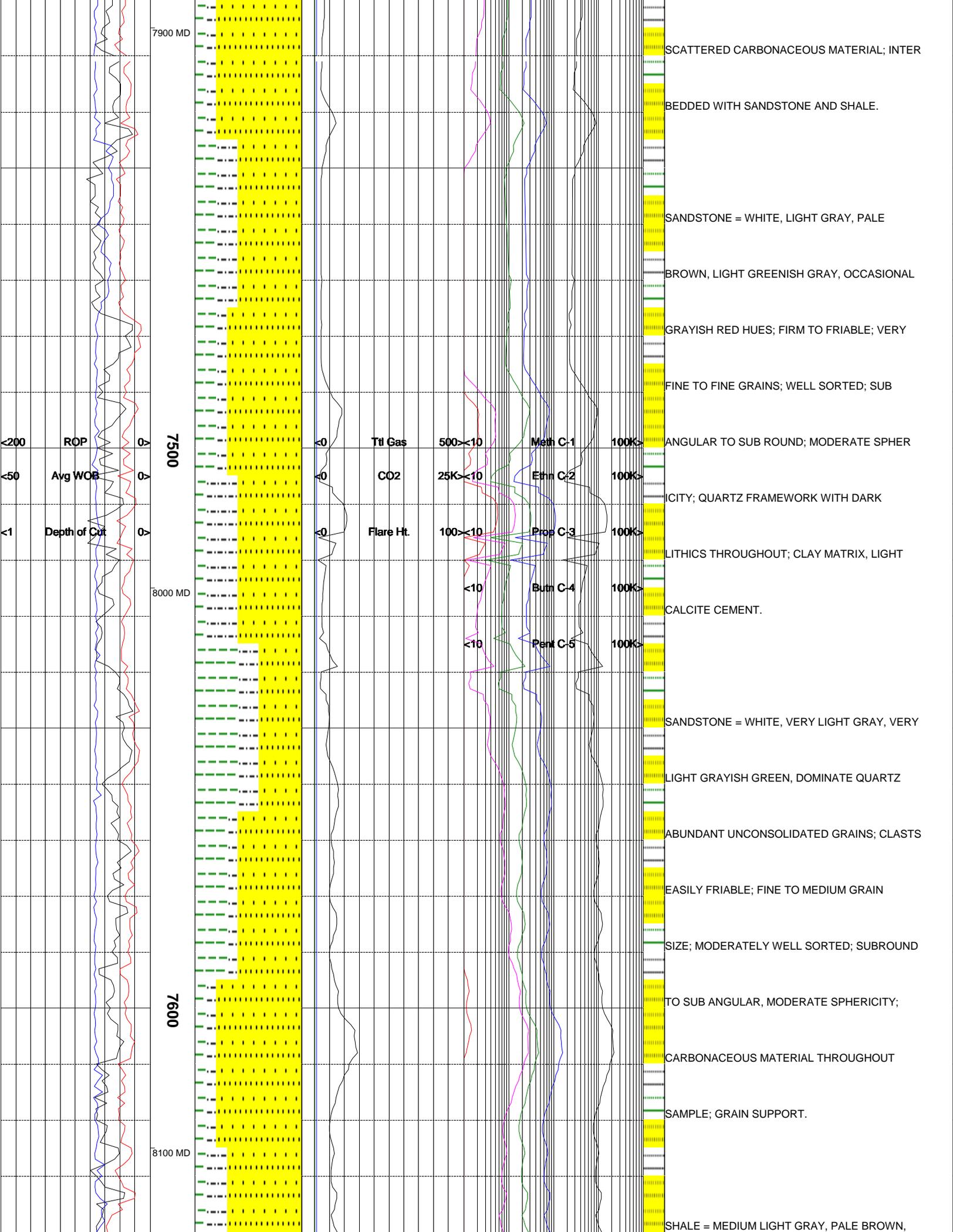
7300 MD

0069

7400 MD





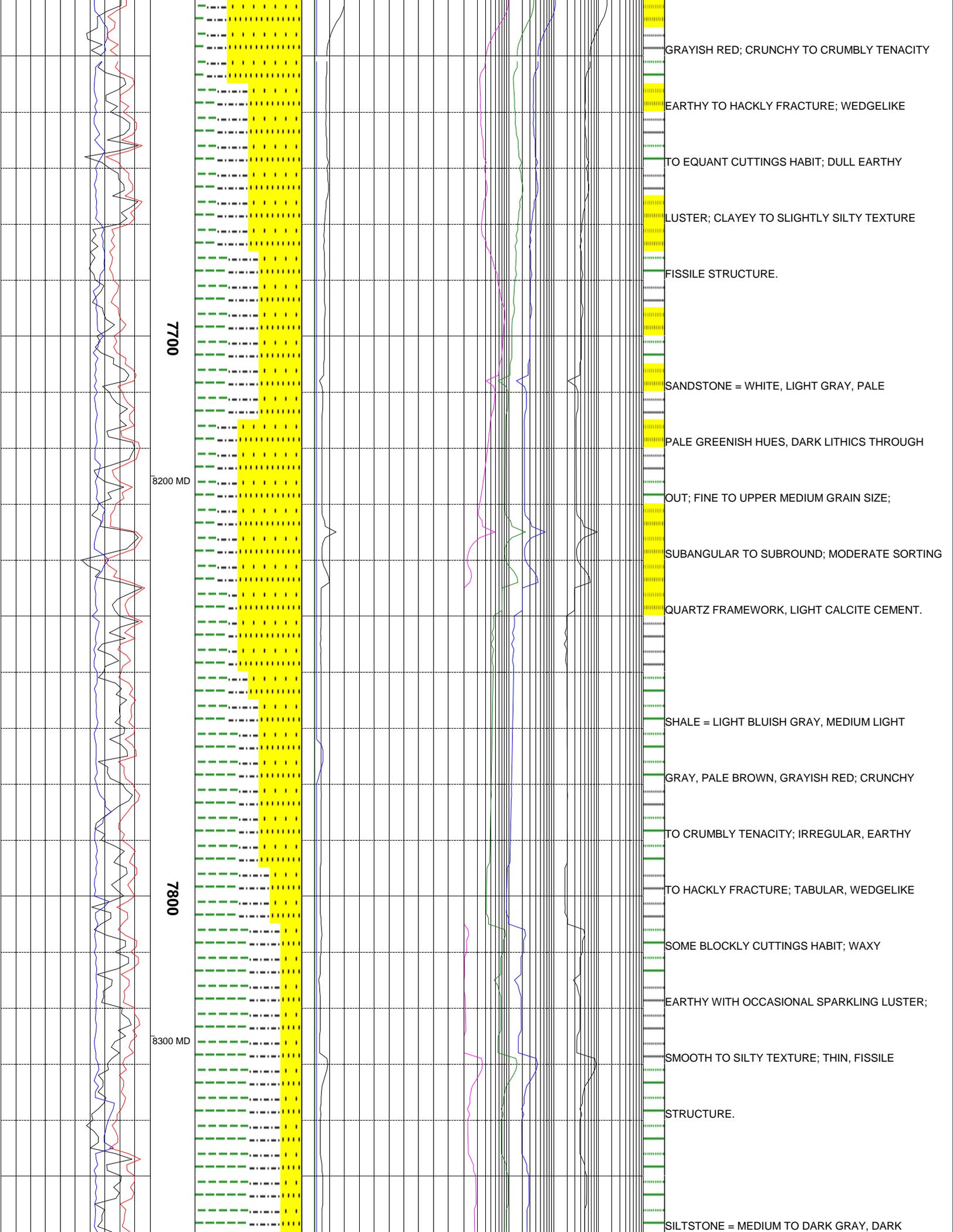


7900 MD
7500
8000 MD
7600
8100 MD

<200 ROP
<50 Avg WOB
<1 Depth of Cut

Ttl Gas 500 <10
CO2 25K <10
Flare Ht. 100 <10
Meth C-1 100K
Ethn C-2 100K
Prop C-3 100K
Butn C-4 100K
Pent C-5 100K

SCATTERED CARBONACEOUS MATERIAL; INTER
BEDDED WITH SANDSTONE AND SHALE.
SANDSTONE = WHITE, LIGHT GRAY, PALE
BROWN, LIGHT GREENISH GRAY, OCCASIONAL
GRAYISH RED HUES; FIRM TO FRIABLE; VERY
FINE TO FINE GRAINS; WELL SORTED; SUB
ANGULAR TO SUB ROUND; MODERATE SPHER
ICITY; QUARTZ FRAMEWORK WITH DARK
LITHICS THROUGHOUT; CLAY MATRIX, LIGHT
CALCITE CEMENT.
SANDSTONE = WHITE, VERY LIGHT GRAY, VERY
LIGHT GRAYISH GREEN, DOMINATE QUARTZ
ABUNDANT UNCONSOLIDATED GRAINS; CLASTS
EASILY FRIABLE; FINE TO MEDIUM GRAIN
SIZE; MODERATELY WELL SORTED; SUBROUND
TO SUB ANGULAR, MODERATE SPHERICITY;
CARBONACEOUS MATERIAL THROUGHOUT
SAMPLE; GRAIN SUPPORT.
SHALE = MEDIUM LIGHT GRAY, PALE BROWN,



GRAYISH RED; CRUNCHY TO CRUMBLY TENACITY

EARTHY TO HACKLY FRACTURE; WEDGELIKE

TO EQUANT CUTTINGS HABIT; DULL EARTHY

LUSTER; CLAYEY TO SLIGHTLY SILTY TEXTURE

FISSILE STRUCTURE.

7700

SANDSTONE = WHITE, LIGHT GRAY, PALE

PALE GREENISH HUES, DARK LITHICS THROUGH

8200 MD

OUT; FINE TO UPPER MEDIUM GRAIN SIZE;

SUBANGULAR TO SUBROUND; MODERATE SORTING

QUARTZ FRAMEWORK, LIGHT CALCITE CEMENT.

SHALE = LIGHT BLUISH GRAY, MEDIUM LIGHT

GRAY, PALE BROWN, GRAYISH RED; CRUNCHY

TO CRUMBLY TENACITY; IRREGULAR, EARTHY

7800

TO HACKLY FRACTURE; TABULAR, WEDGELIKE

SOME BLOCKLY CUTTINGS HABIT; WAXY

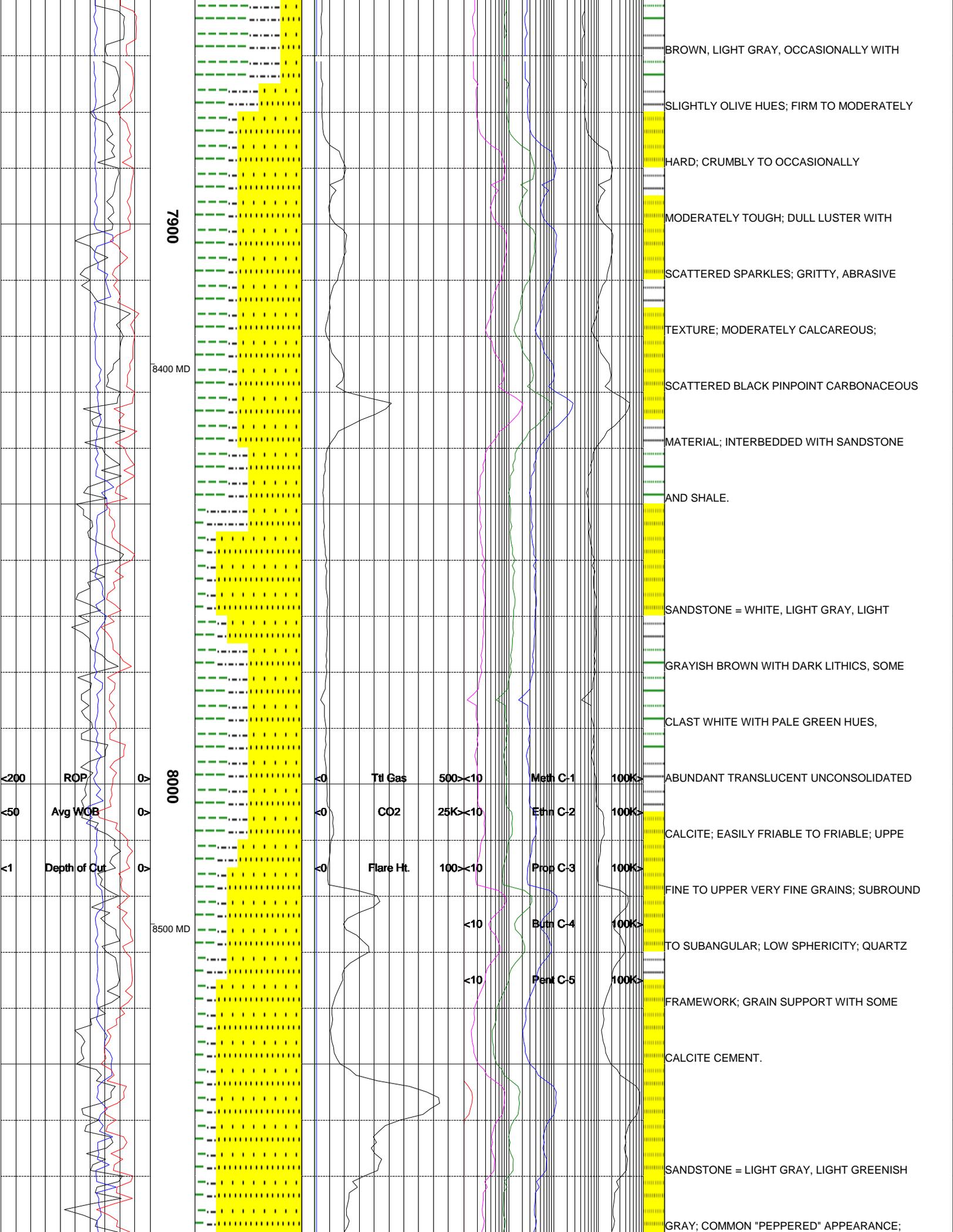
EARTHY WITH OCCASIONAL SPARKLING LUSTER;

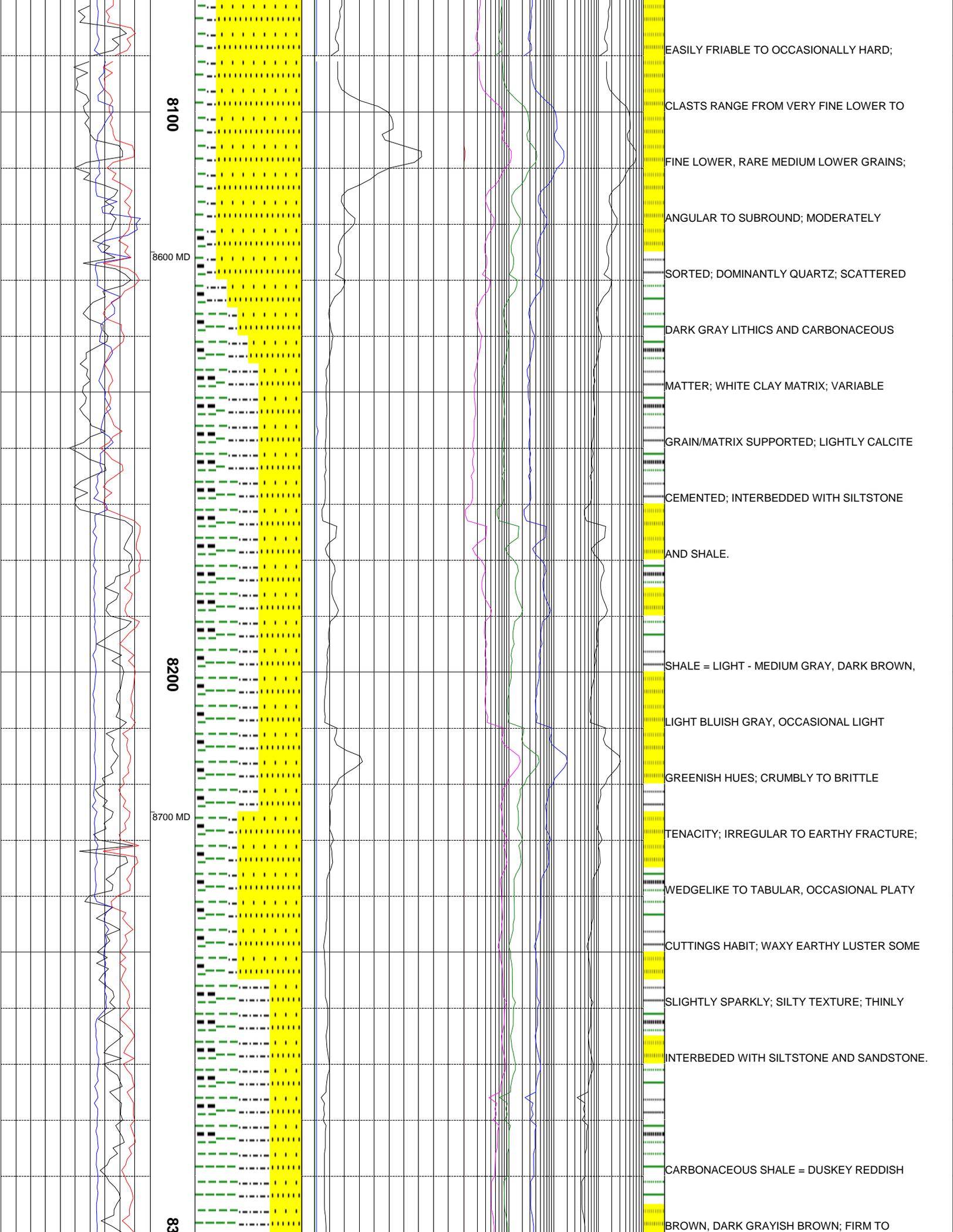
8300 MD

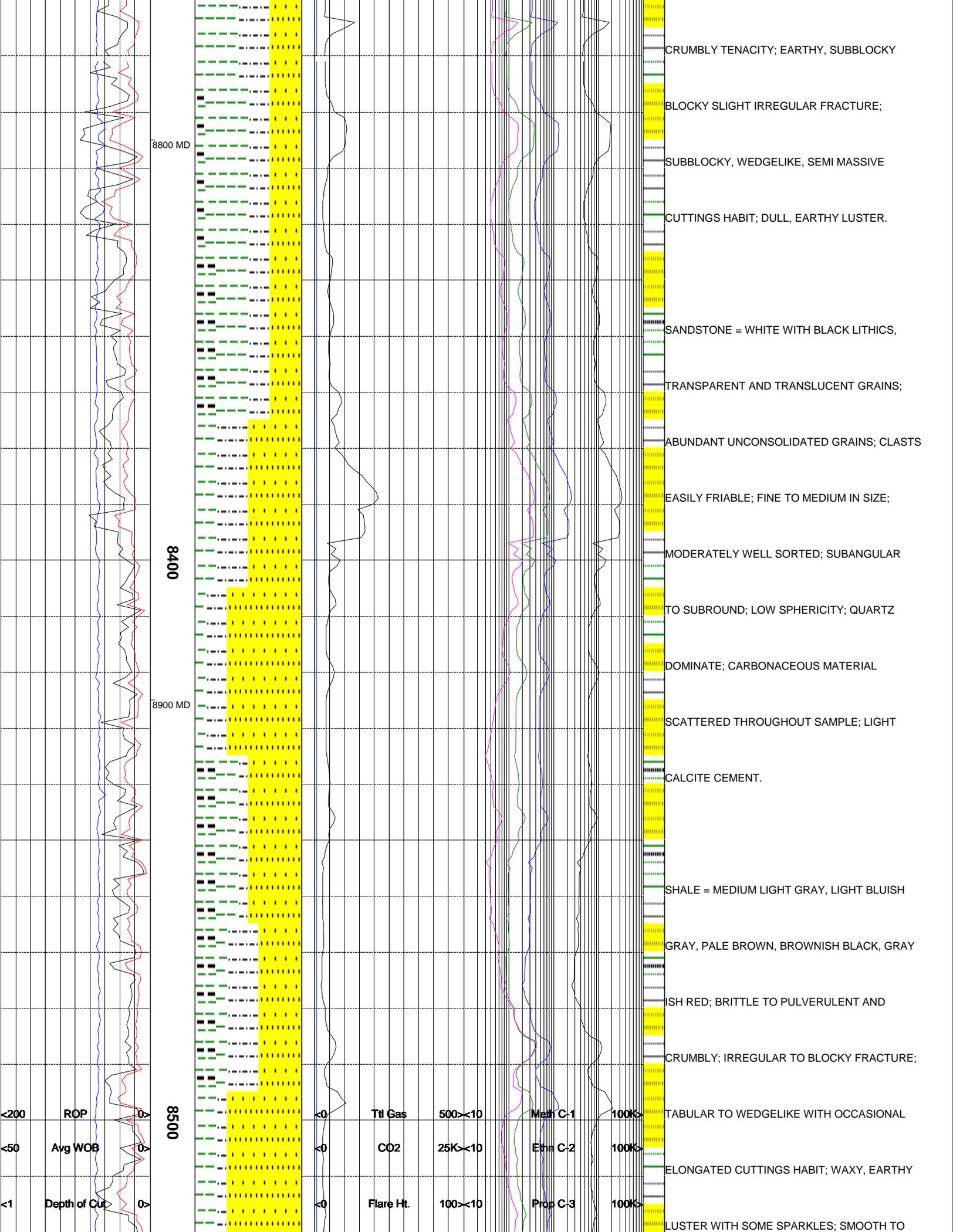
SMOOTH TO SILTY TEXTURE; THIN, FISSILE

STRUCTURE.

SILTSTONE = MEDIUM TO DARK GRAY, DARK







8800 MD

8400

8900 MD

8500

CRUMBLY TENACITY; EARTHY, SUBBLOCKY

BLOCKY SLIGHT IRREGULAR FRACTURE;

SUBBLOCKY, WEDGELIKE, SEMI MASSIVE

CUTTINGS HABIT; DULL, EARTHY LUSTER.

SANDSTONE = WHITE WITH BLACK LITHICS,

TRANSPARENT AND TRANSLUCENT GRAINS;

ABUNDANT UNCONSOLIDATED GRAINS; CLASTS

EASILY FRIABLE; FINE TO MEDIUM IN SIZE;

MODERATELY WELL SORTED; SUBANGULAR

TO SUBROUND; LOW SPHERICITY; QUARTZ

DOMINATE; CARBONACEOUS MATERIAL

SCATTERED THROUGHOUT SAMPLE; LIGHT

CALCITE CEMENT.

SHALE = MEDIUM LIGHT GRAY, LIGHT BLUISH

GRAY, PALE BROWN, BROWNISH BLACK, GRAY

ISH RED; BRITTLE TO PULVERULENT AND

CRUMBLY; IRREGULAR TO BLOCKY FRACTURE;

TABULAR TO WEDGELIKE WITH OCCASIONAL

ELONGATED CUTTINGS HABIT; WAXY, EARTHY

LUSTER WITH SOME SPARKLES; SMOOTH TO

<200 ROP

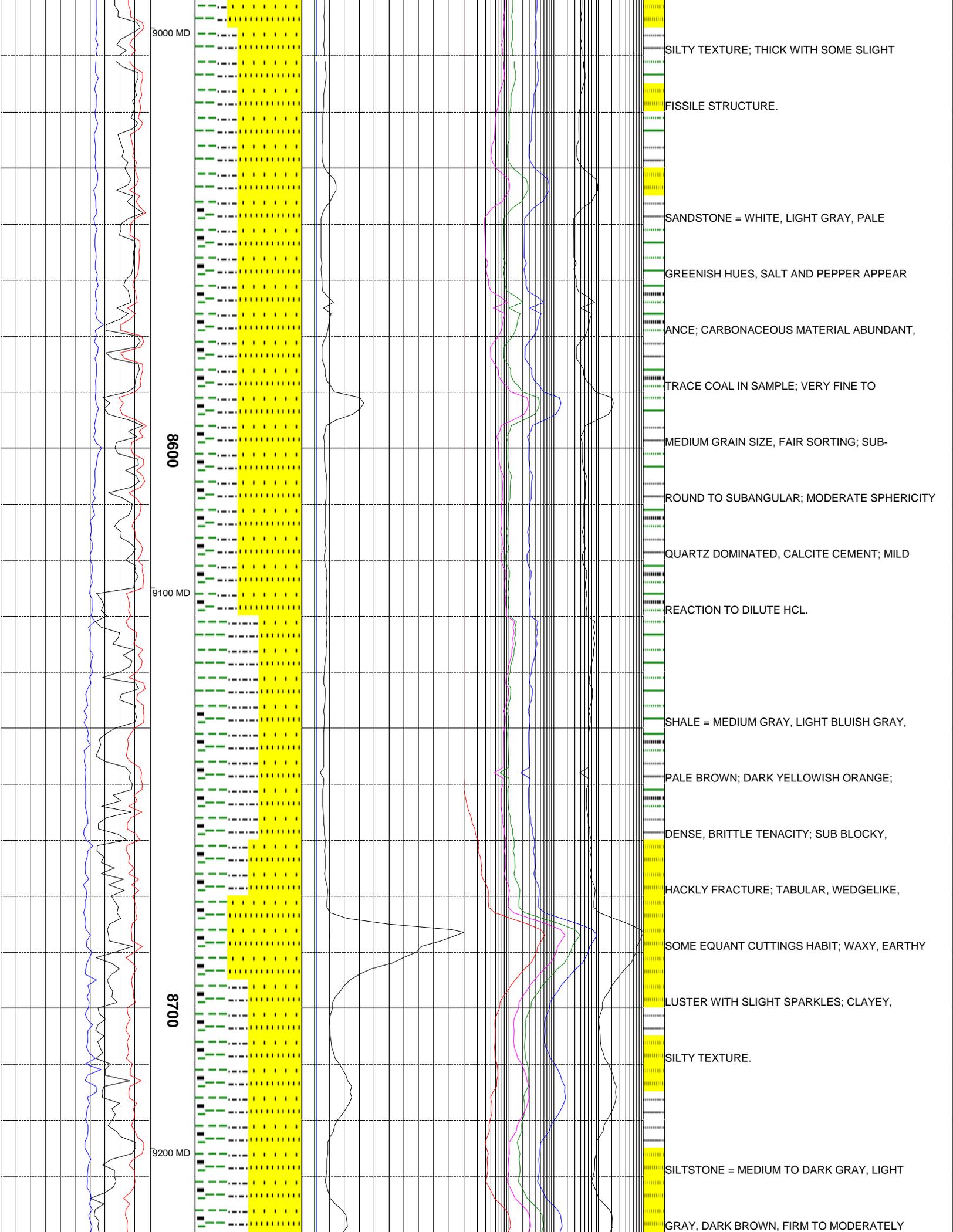
<50 Avg WOB

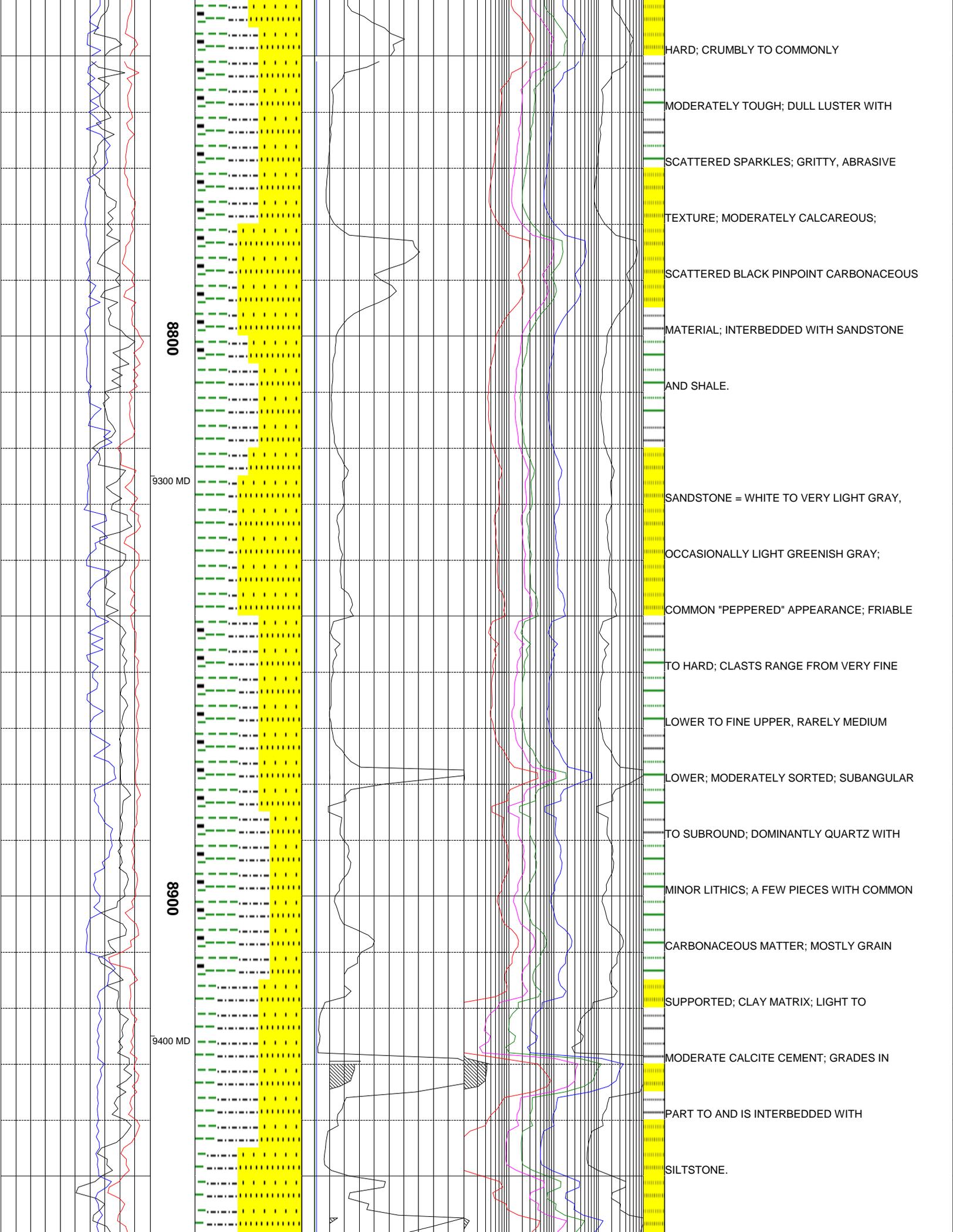
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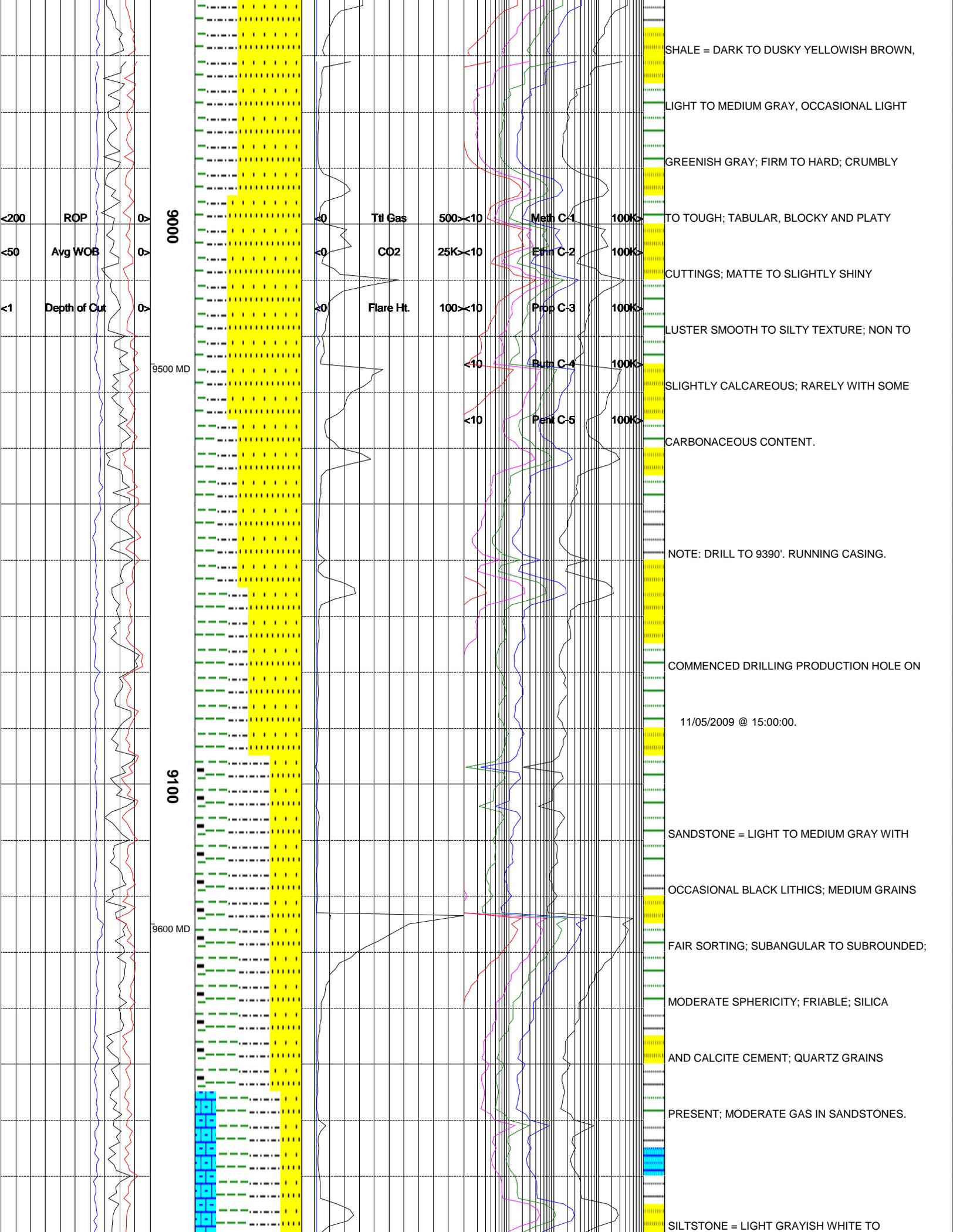
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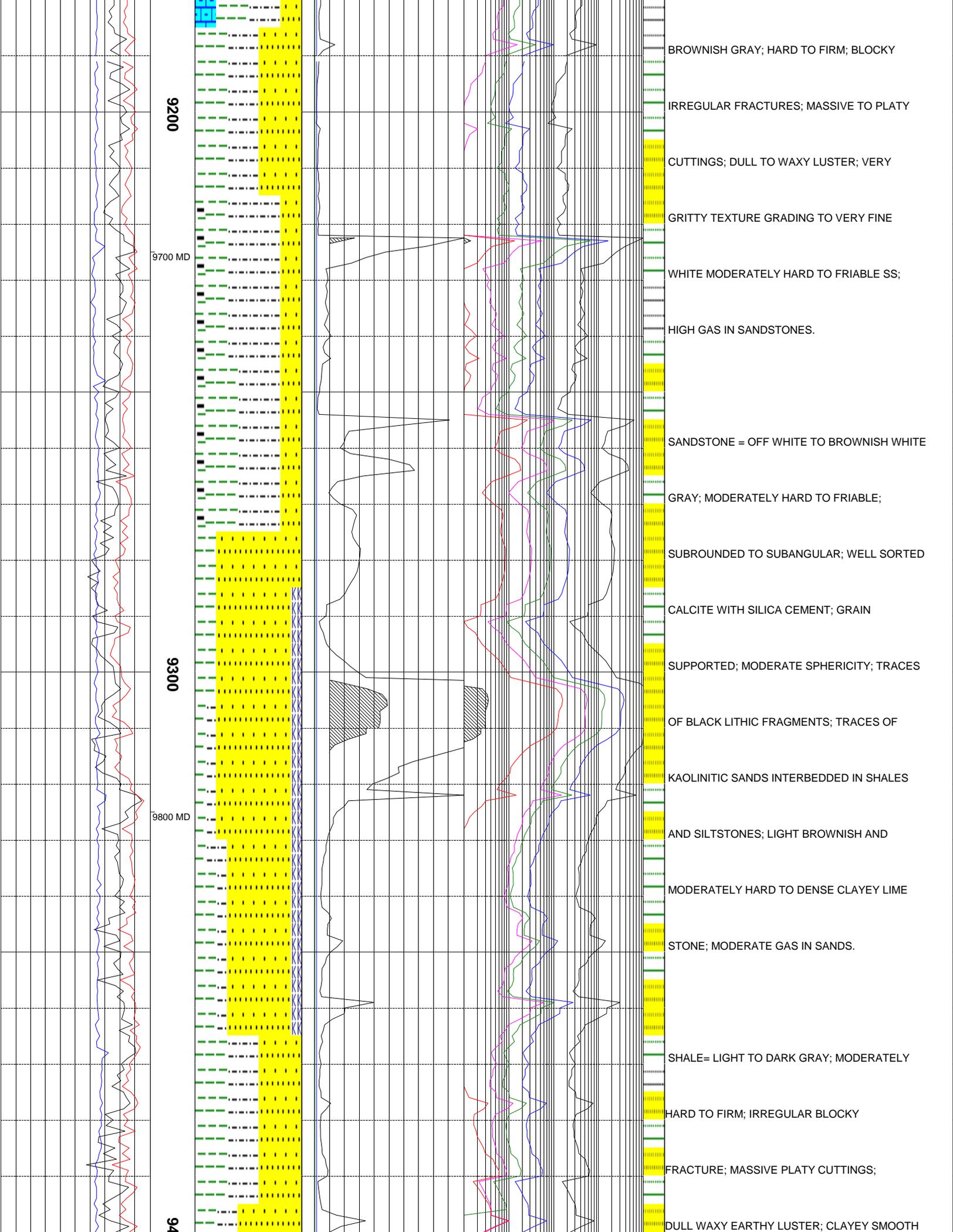
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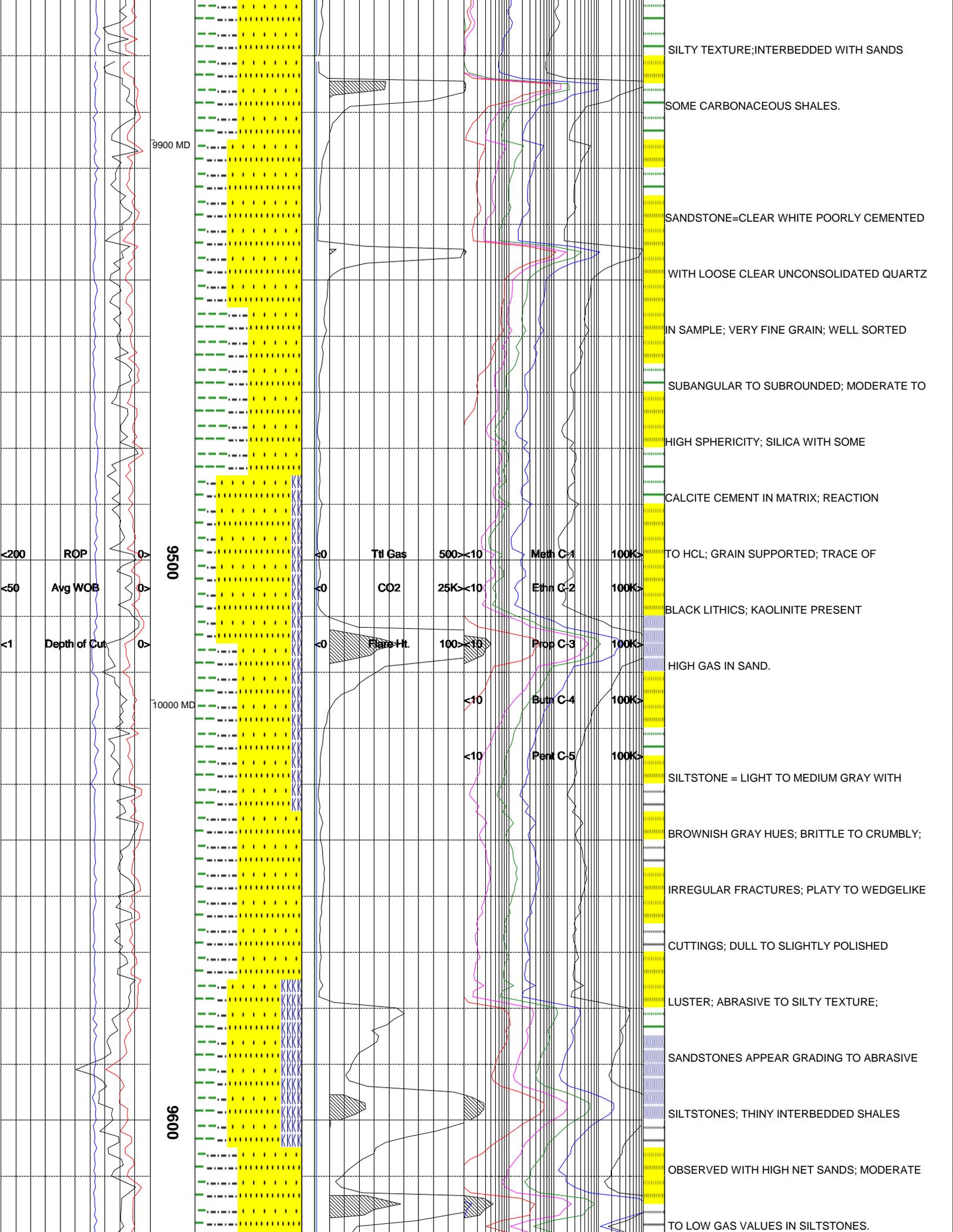
<0 Flare Ht. 100<10 Prop C-3 100K>

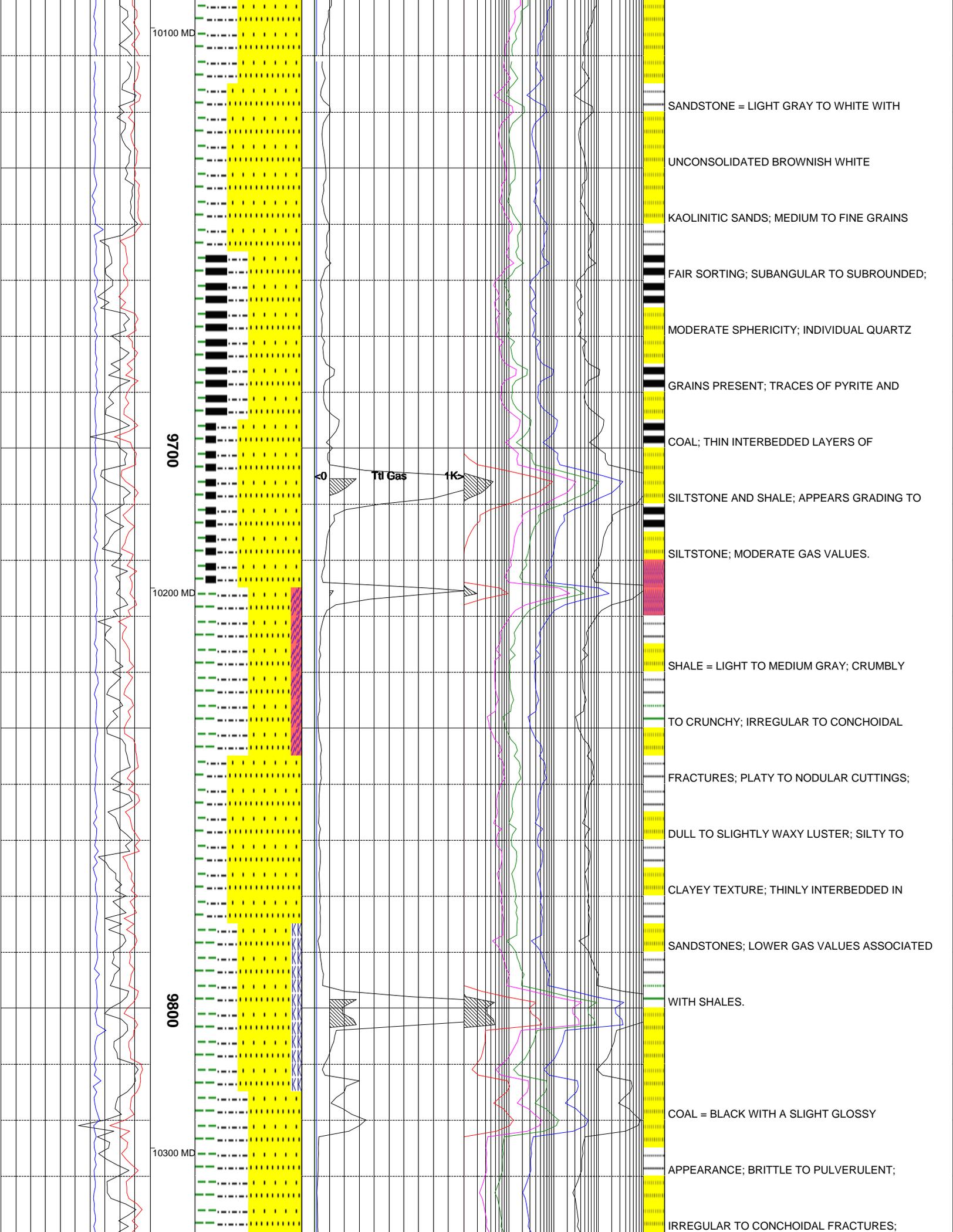


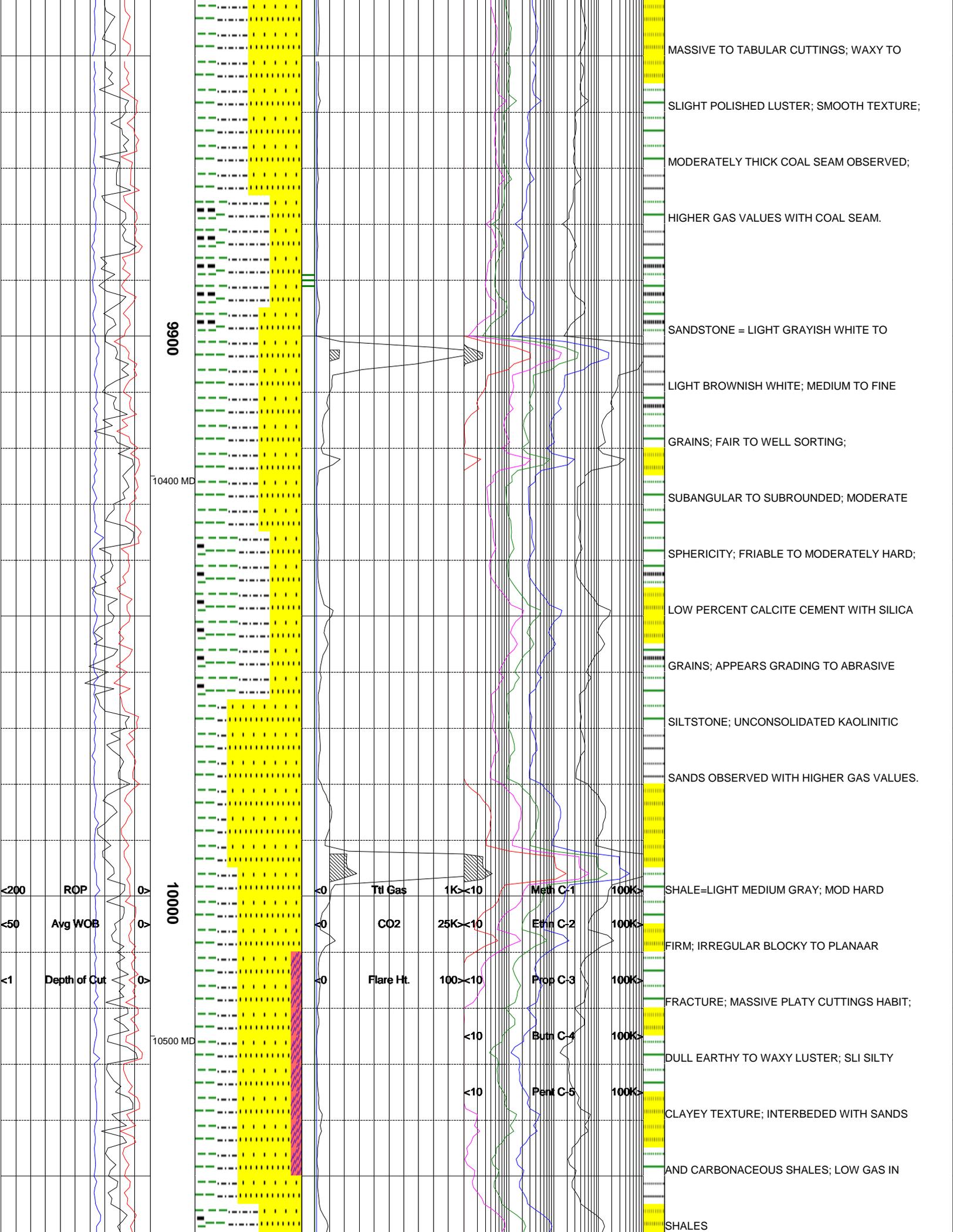












9900

10400 MD

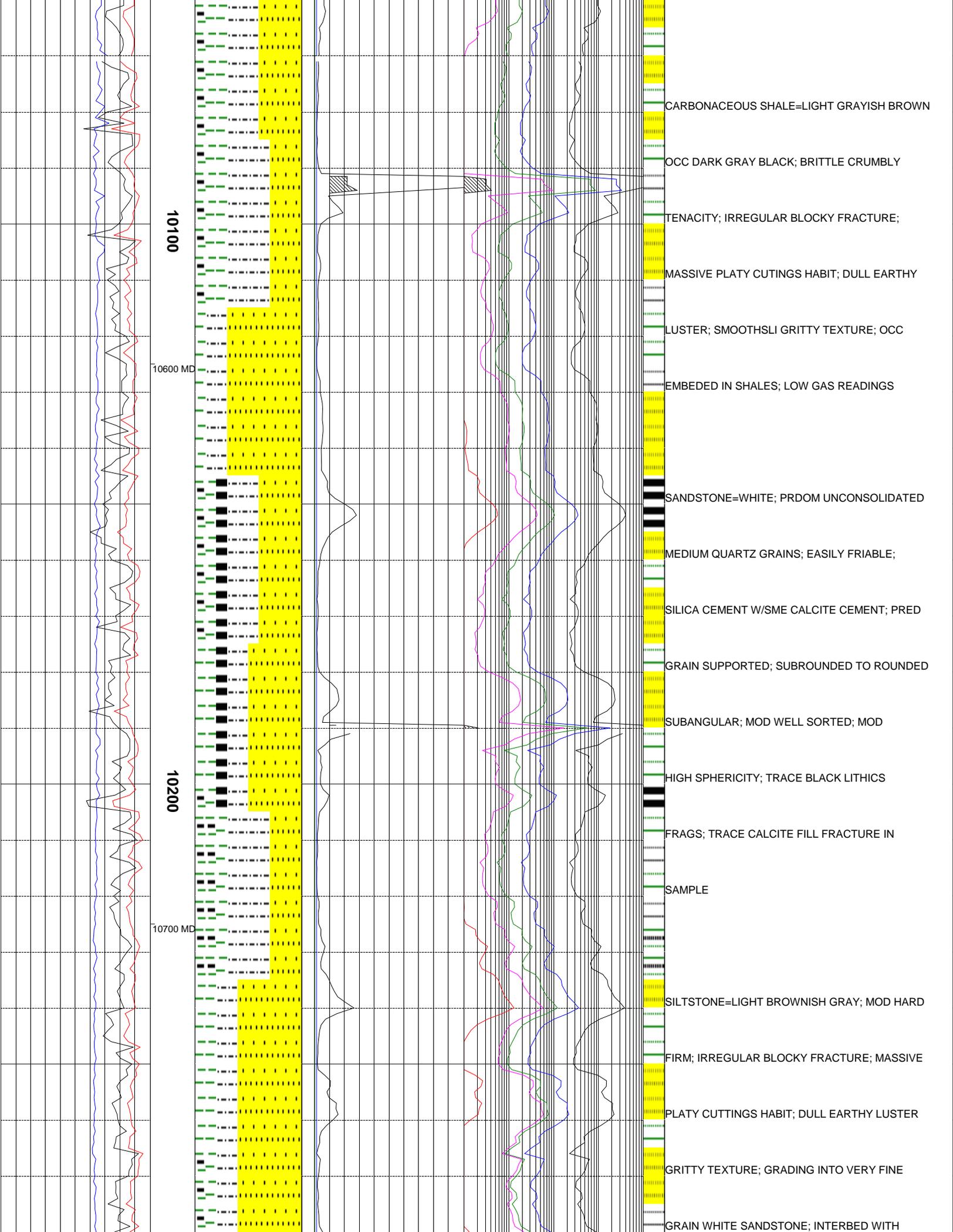
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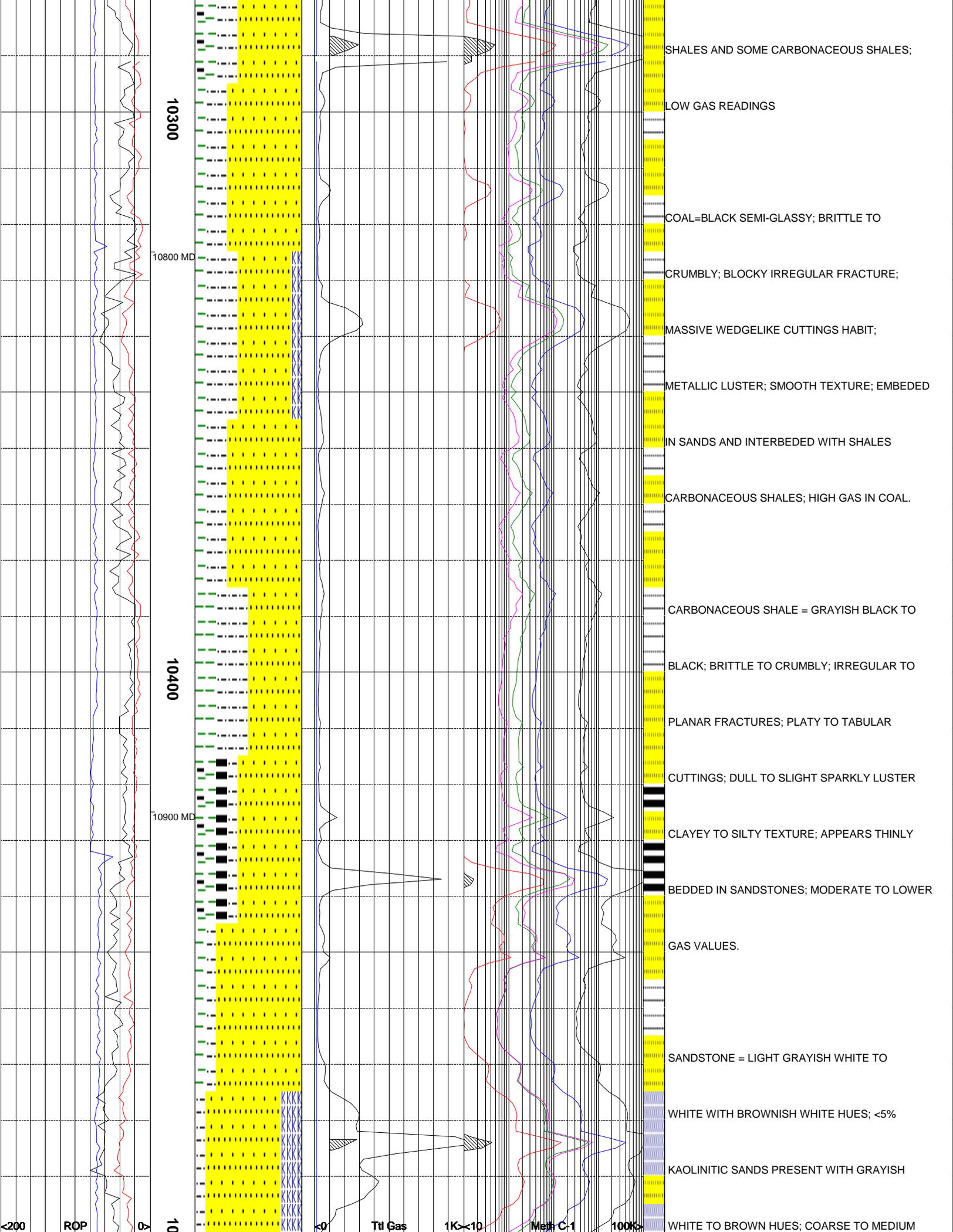
10500 MD

MASSIVE TO TABULAR CUTTINGS; WAXY TO
 SLIGHT POLISHED LUSTER; SMOOTH TEXTURE;
 MODERATELY THICK COAL SEAM OBSERVED;
 HIGHER GAS VALUES WITH COAL SEAM.
 SANDSTONE = LIGHT GRAYISH WHITE TO
 LIGHT BROWNISH WHITE; MEDIUM TO FINE
 GRAINS; FAIR TO WELL SORTING;
 SUBANGULAR TO SUBROUNDED; MODERATE
 SPHERICITY; FRIABLE TO MODERATELY HARD;
 LOW PERCENT CALCITE CEMENT WITH SILICA
 GRAINS; APPEARS GRADING TO ABRASIVE
 SILTSTONE; UNCONSOLIDATED KAOLINITIC
 SANDS OBSERVED WITH HIGHER GAS VALUES.
 SHALE=LIGHT MEDIUM GRAY; MOD HARD
 FIRM; IRREGULAR BLOCKY TO PLANAAR
 FRACTURE; MASSIVE PLATY CUTTINGS HABIT;
 DULL EARTHY TO WAXY LUSTER; SLI SILTY
 CLAYEY TEXTURE; INTERBEDDED WITH SANDS
 AND CARBONACEOUS SHALES; LOW GAS IN
 SHALES

<200 ROP
 <50 Avg WOB
 <1 Depth of Cut

Ttl Gas 1K<10 Meth C-1 100K<
 CO2 25K<10 Ethn C-2 100K<
 Flare Ht. 100>10 Prop C-3 100K<
 <10 Butn C-4 100K<
 <10 Pent C-5 100K<





SHALES AND SOME CARBONACEOUS SHALES;

LOW GAS READINGS

COAL=BLACK SEMI-GLASSY; BRITTLE TO

CRUMBLY; BLOCKY IRREGULAR FRACTURE;

MASSIVE WEDGELIKE CUTTINGS HABIT;

METALLIC LUSTER; SMOOTH TEXTURE; EMBEDDED

IN SANDS AND INTERBEDDED WITH SHALES

CARBONACEOUS SHALES; HIGH GAS IN COAL.

CARBONACEOUS SHALE = GRAYISH BLACK TO

BLACK; BRITTLE TO CRUMBLY; IRREGULAR TO

PLANAR FRACTURES; PLATY TO TABULAR

CUTTINGS; DULL TO SLIGHT SPARKLY LUSTER

CLAYEY TO SILTY TEXTURE; APPEARS THINLY

BEDDED IN SANDSTONES; MODERATE TO LOWER

GAS VALUES.

SANDSTONE = LIGHT GRAYISH WHITE TO

WHITE WITH BROWNISH WHITE HUES; <math><5\%</math>

KAOLINITIC SANDS PRESENT WITH GRAYISH

WHITE TO BROWN HUES; COARSE TO MEDIUM

10300

10800 MD

10400

10900 MD

10

<math><200</math>

ROP

Δ

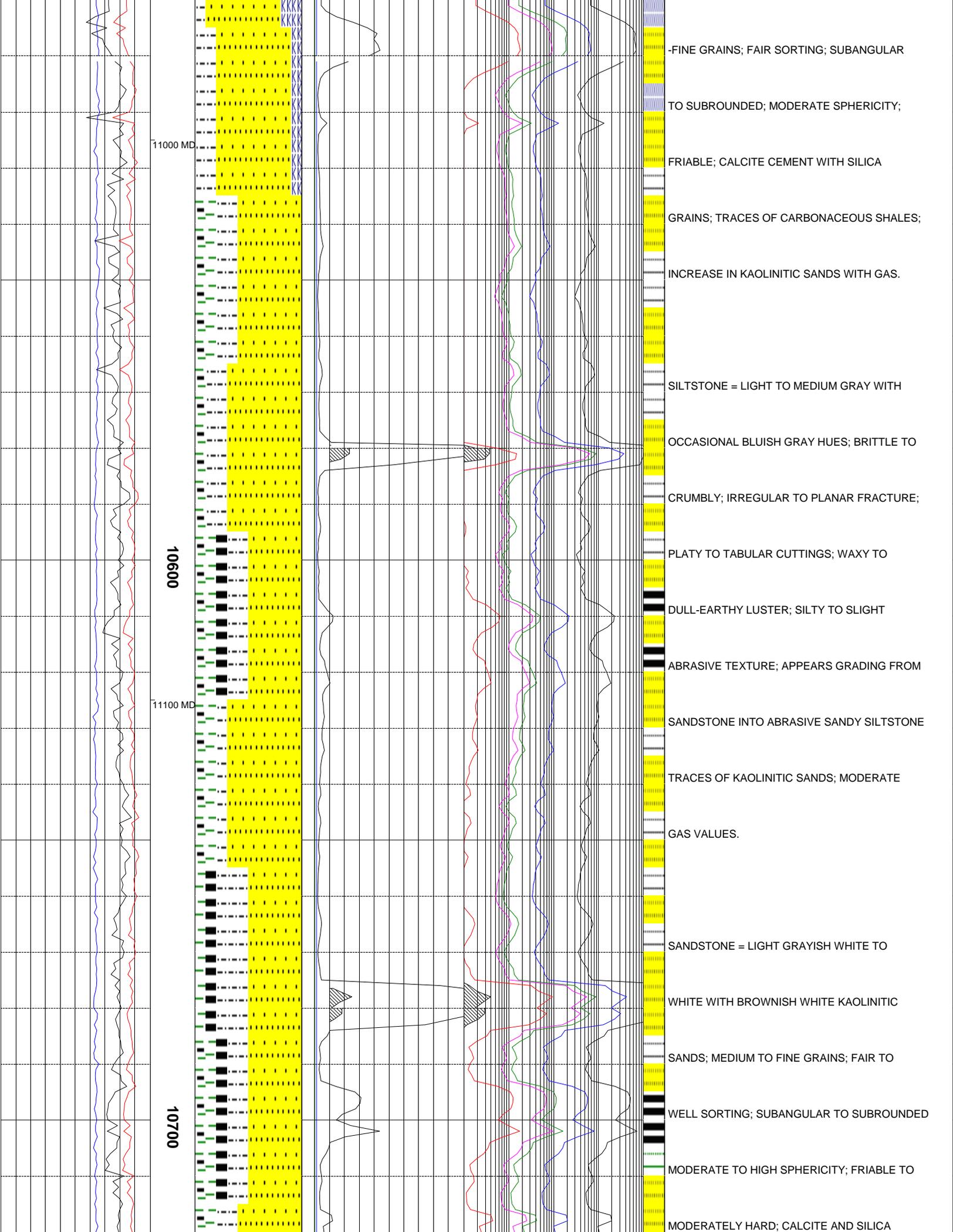
∇

Ttl Gas

$1K<10$

Meth C-1

$100K>$

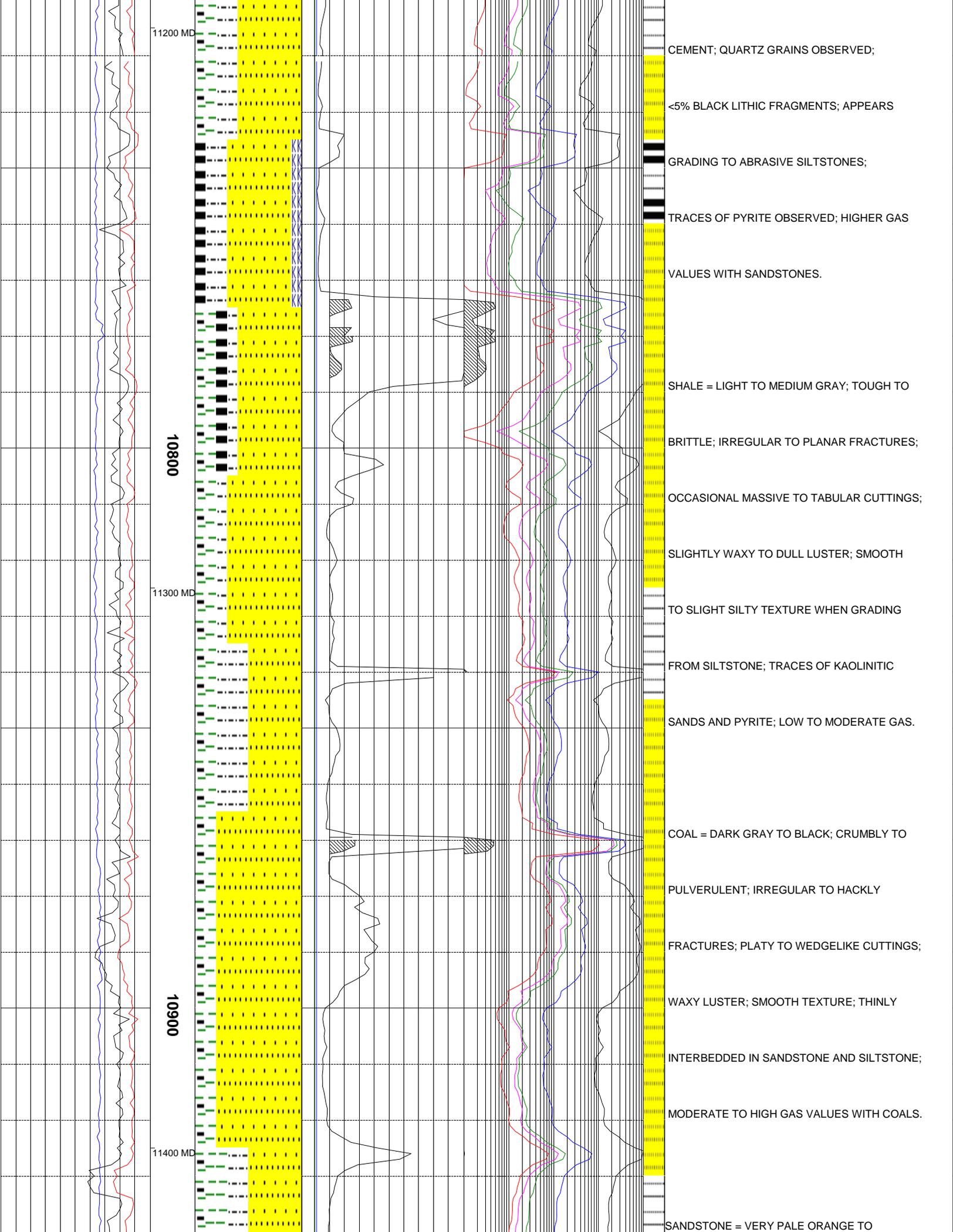


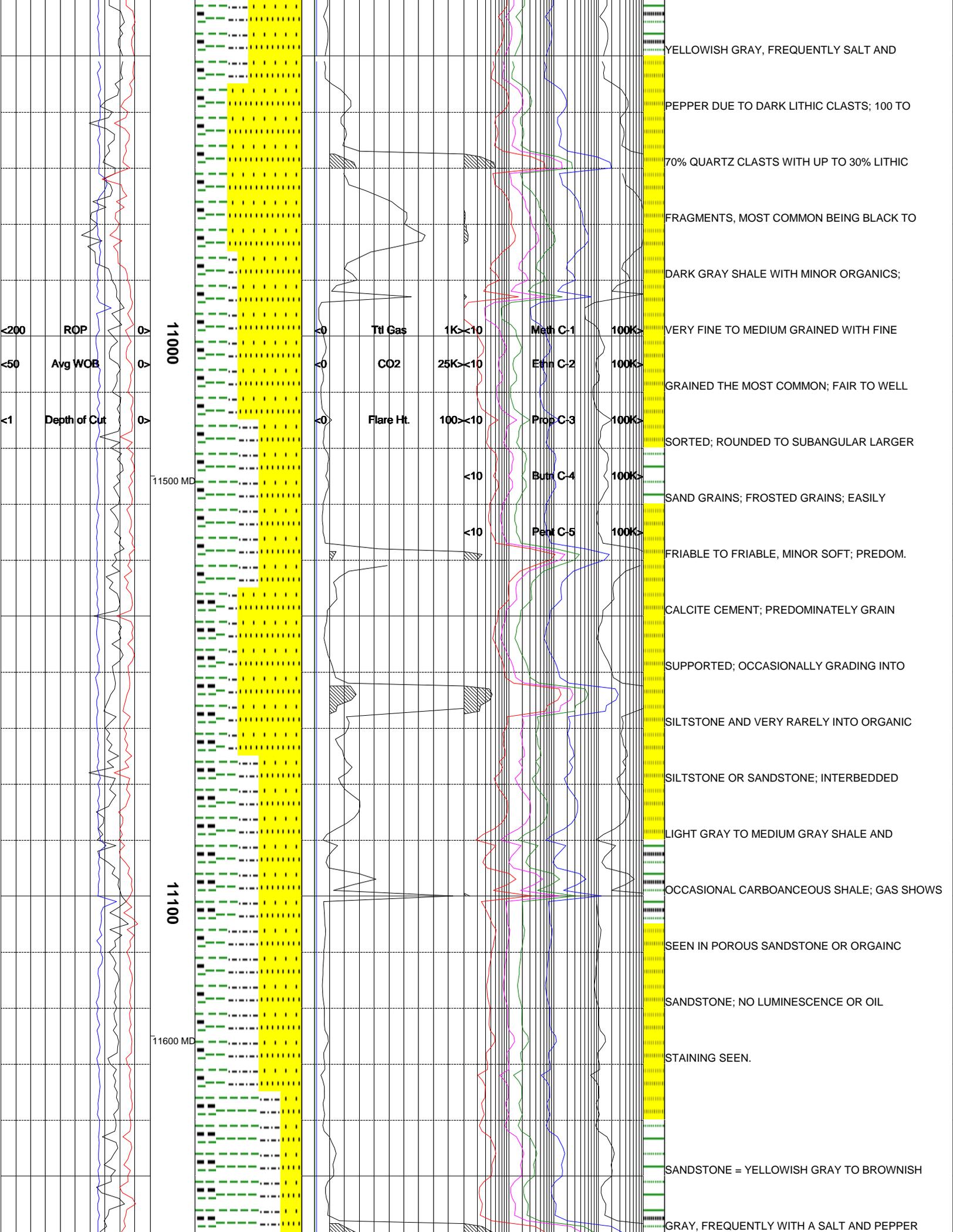
11000 MD

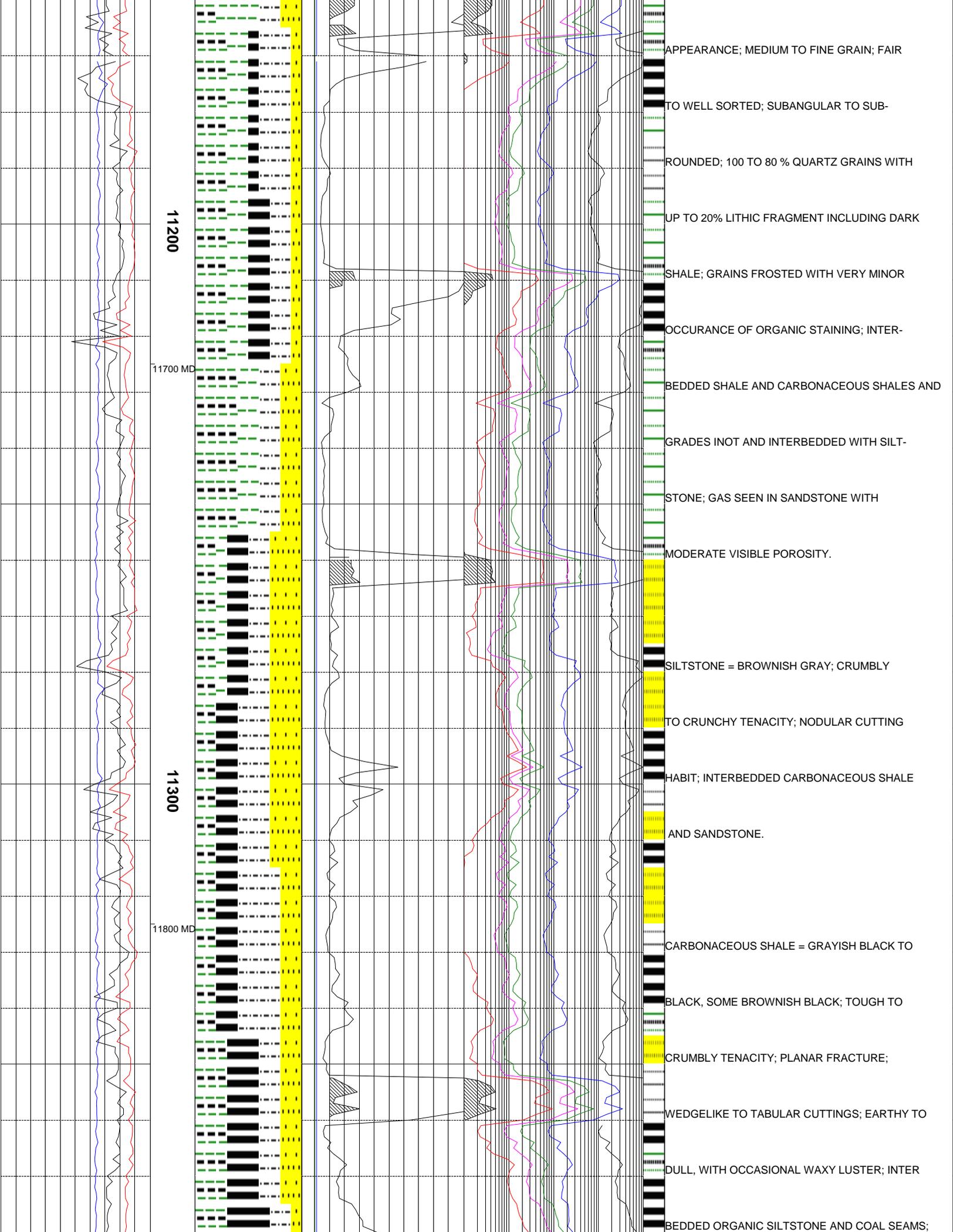
10600

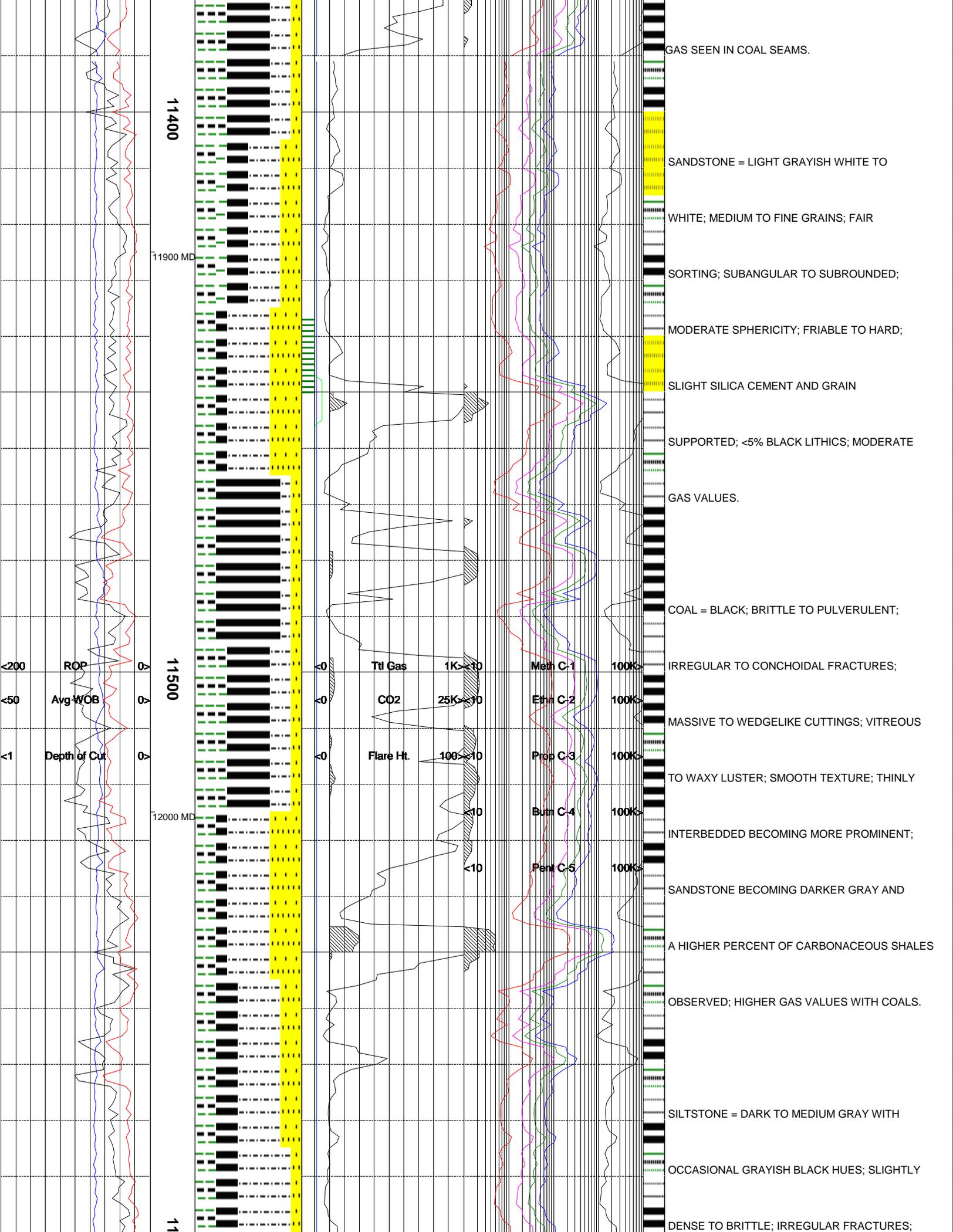
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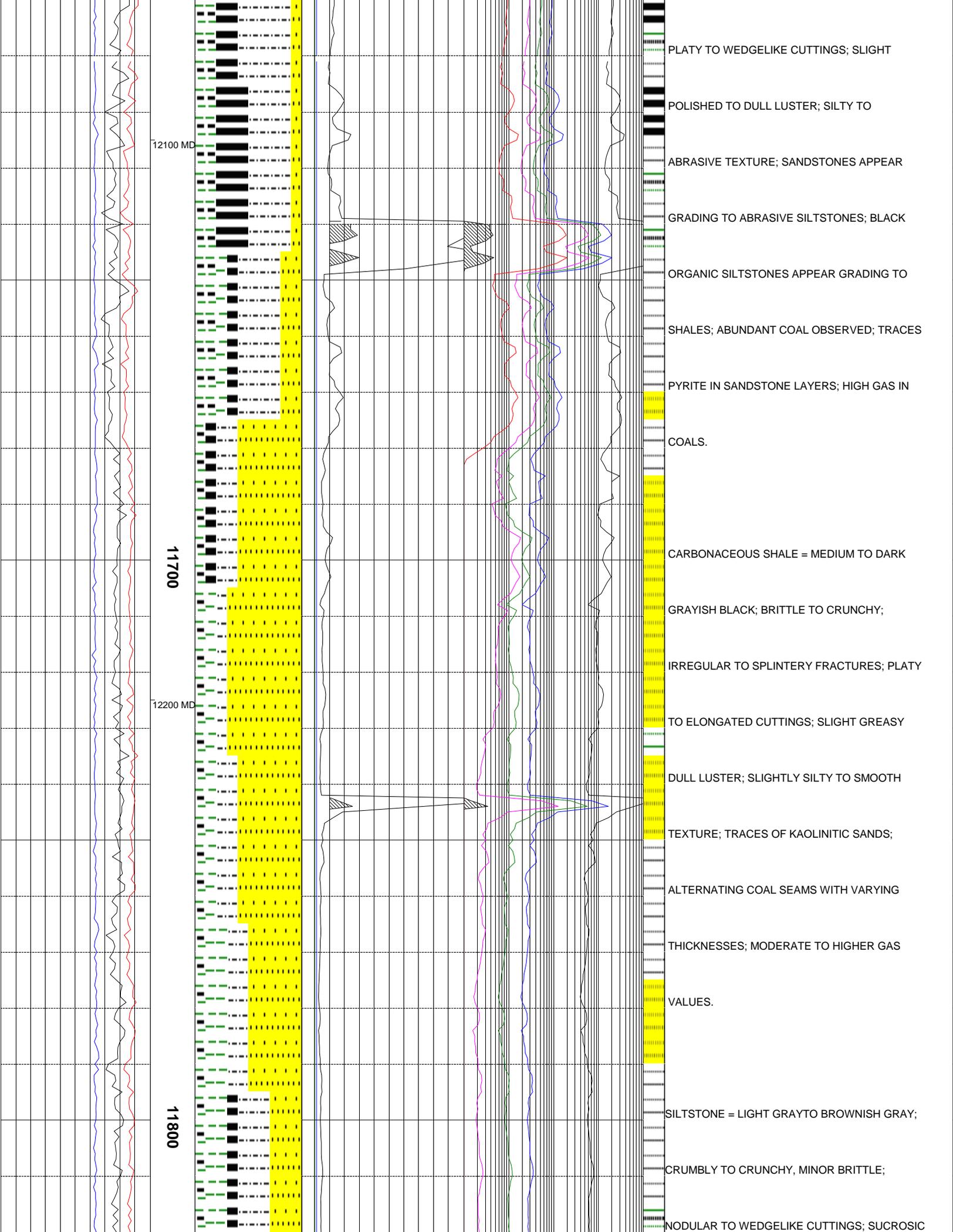
10700











12100 MD

11700

12200 MD

11800

PLATY TO WEDGELIKE CUTTINGS; SLIGHT

POLISHED TO DULL LUSTER; SILTY TO

ABRASIVE TEXTURE; SANDSTONES APPEAR

GRADING TO ABRASIVE SILTSTONES; BLACK

ORGANIC SILTSTONES APPEAR GRADING TO

SHALES; ABUNDANT COAL OBSERVED; TRACES

PYRITE IN SANDSTONE LAYERS; HIGH GAS IN

COALS.

CARBONACEOUS SHALE = MEDIUM TO DARK

GRAYISH BLACK; BRITTLE TO CRUNCHY;

IRREGULAR TO SPLINTERY FRACTURES; PLATY

TO ELONGATED CUTTINGS; SLIGHT GREASY

DULL LUSTER; SLIGHTLY SILTY TO SMOOTH

TEXTURE; TRACES OF KAOLINITIC SANDS;

ALTERNATING COAL SEAMS WITH VARYING

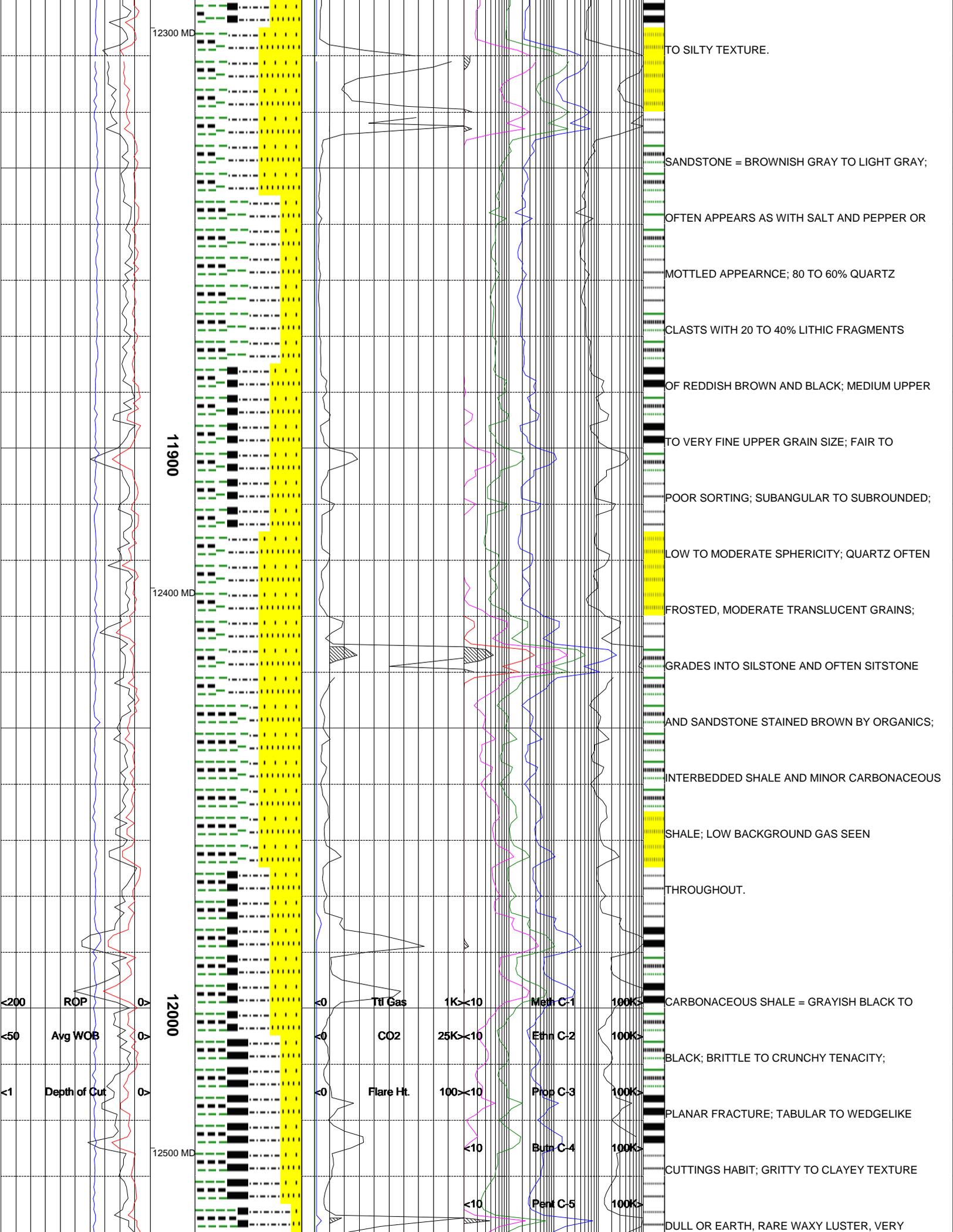
THICKNESSES; MODERATE TO HIGHER GAS

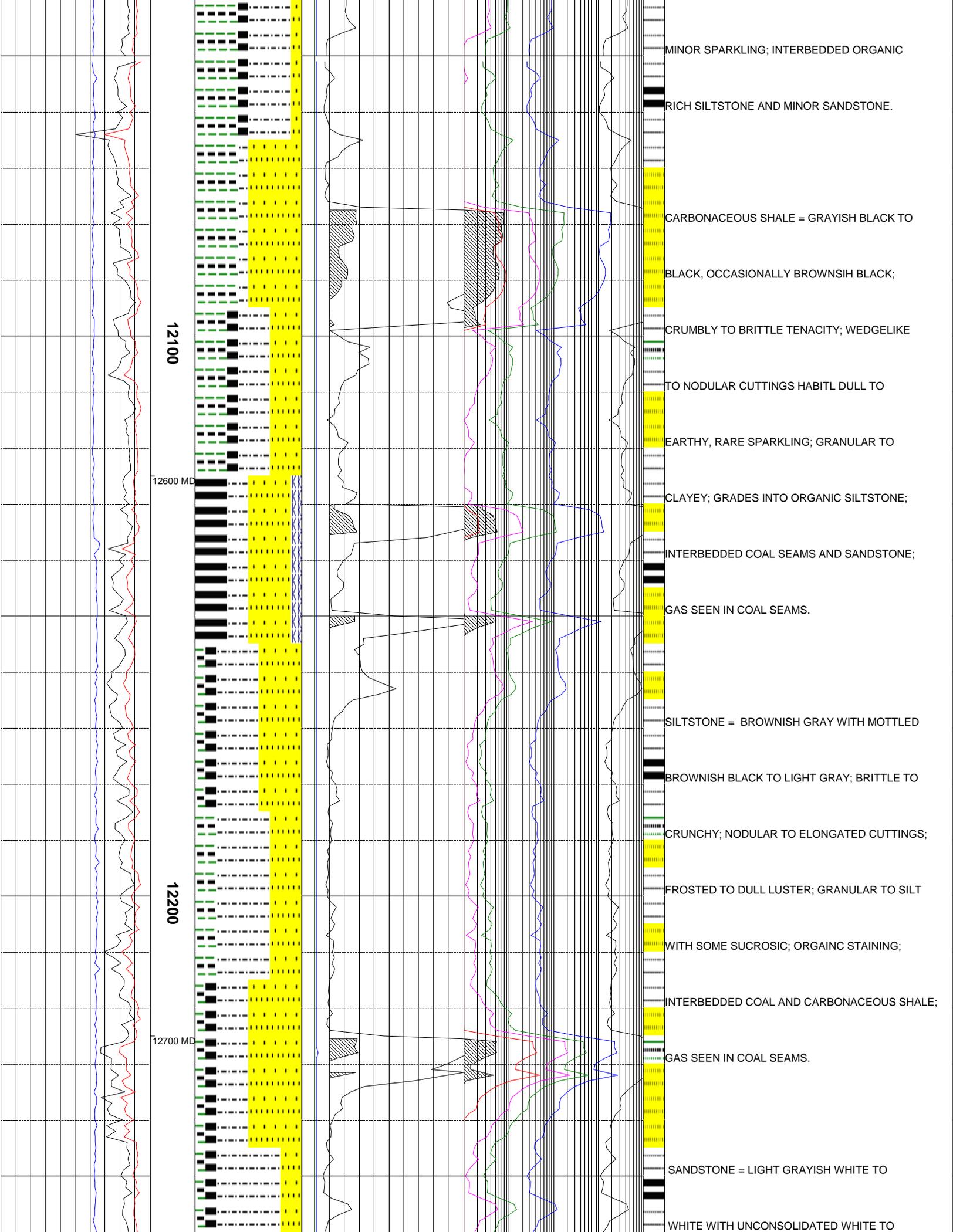
VALUES.

SILTSTONE = LIGHT GRAY TO BROWNISH GRAY;

CRUMBLY TO CRUNCHY, MINOR BRITTLE;

NODULAR TO WEDGELIKE CUTTINGS; SUCROSIC





12100

12600 MD

12200

12700 MD

MINOR SPARKLING; INTERBEDDED ORGANIC

RICH SILTSTONE AND MINOR SANDSTONE.

CARBONACEOUS SHALE = GRAYISH BLACK TO

BLACK, OCCASIONALLY BROWNSIH BLACK;

CRUMBLY TO BRITTLE TENACITY; WEDGELIKE

TO NODULAR CUTTINGS HABITL DULL TO

EARTHY, RARE SPARKLING; GRANULAR TO

CLAYEY; GRADES INTO ORGANIC SILTSTONE;

INTERBEDDED COAL SEAMS AND SANDSTONE;

GAS SEEN IN COAL SEAMS.

SILTSTONE = BROWNISH GRAY WITH MOTTLED

BROWNISH BLACK TO LIGHT GRAY; BRITTLE TO

CRUNCHY; NODULAR TO ELONGATED CUTTINGS;

FROSTED TO DULL LUSTER; GRANULAR TO SILT

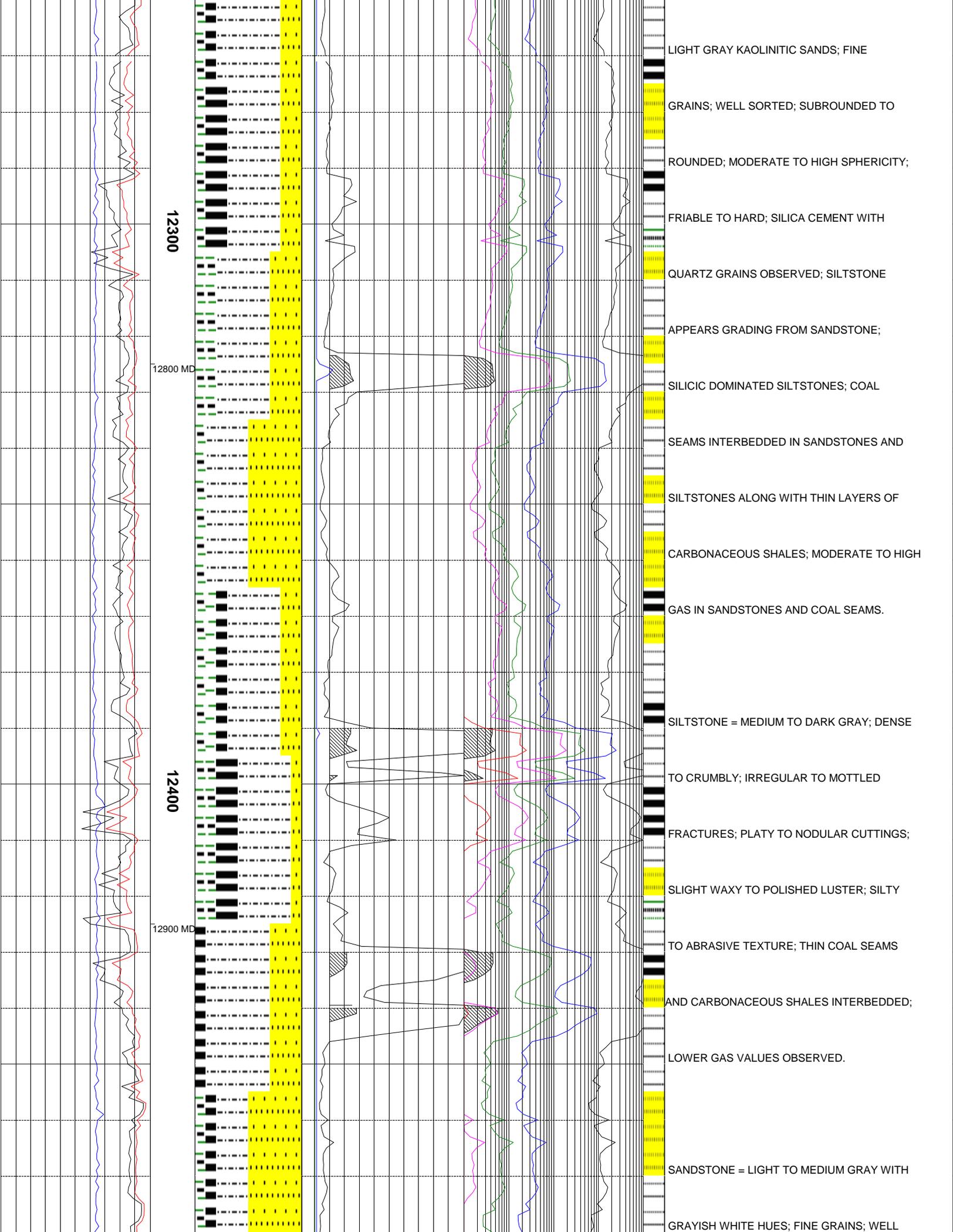
WITH SOME SUCROSIC; ORGANIC STAINING;

INTERBEDDED COAL AND CARBONACEOUS SHALE;

GAS SEEN IN COAL SEAMS.

SANDSTONE = LIGHT GRAYISH WHITE TO

WHITE WITH UNCONSOLIDATED WHITE TO



12300

12800 MD

12400

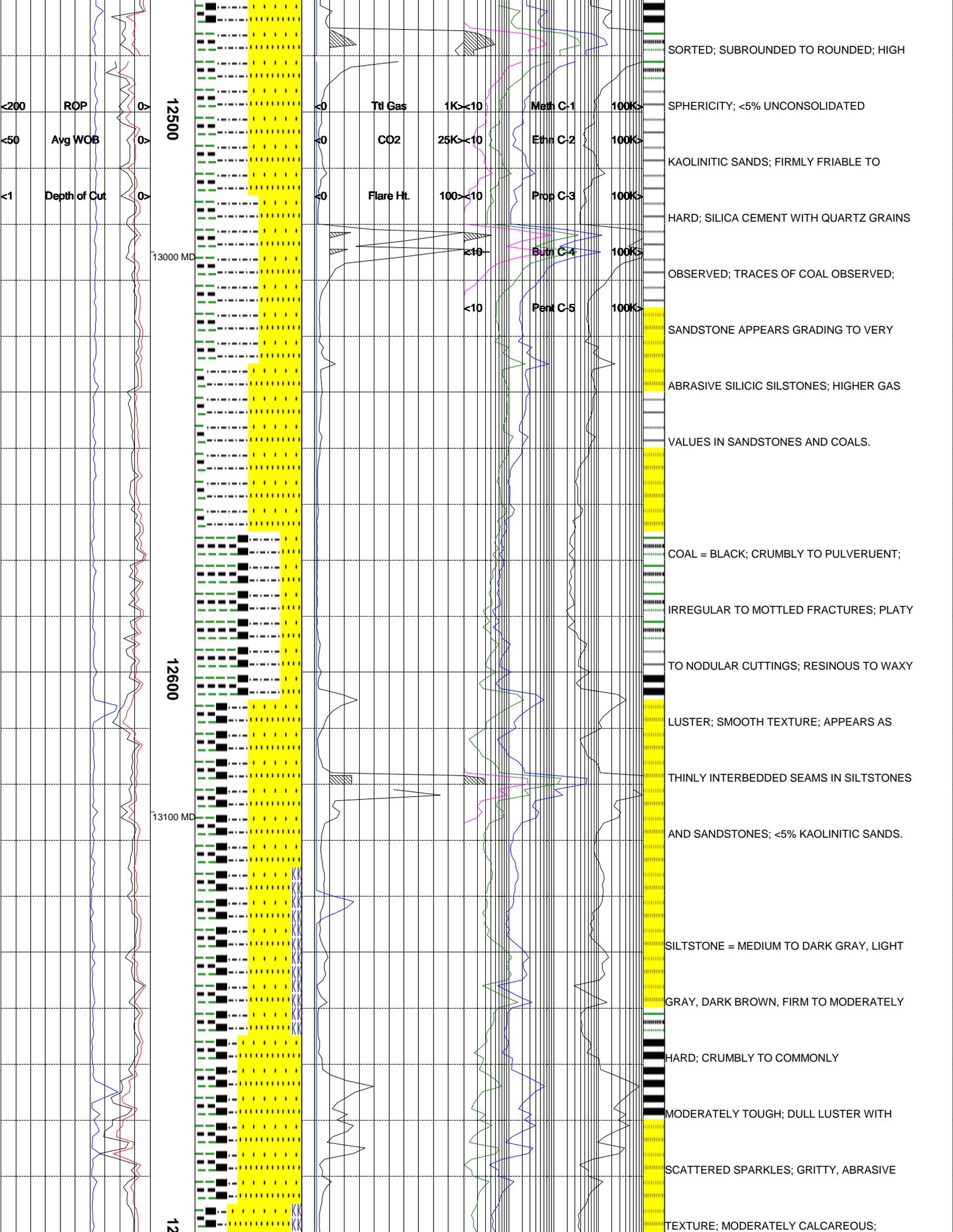
12900 MD

LIGHT GRAY KAOLINITIC SANDS; FINE GRAINS; WELL SORTED; SUBROUNDED TO ROUNDED; MODERATE TO HIGH SPHERICITY; FRIABLE TO HARD; SILICA CEMENT WITH QUARTZ GRAINS OBSERVED; SILTSTONE APPEARS GRADING FROM SANDSTONE;

SILICIC DOMINATED SILTSTONES; COAL SEAMS INTERBEDDED IN SANDSTONES AND SILTSTONES ALONG WITH THIN LAYERS OF CARBONACEOUS SHALES; MODERATE TO HIGH GAS IN SANDSTONES AND COAL SEAMS.

SILTSTONE = MEDIUM TO DARK GRAY; DENSE TO CRUMBLY; IRREGULAR TO MOTTLED FRACTURES; PLATY TO NODULAR CUTTINGS; SLIGHT WAXY TO POLISHED LUSTER; SILTY TO ABRASIVE TEXTURE; THIN COAL SEAMS AND CARBONACEOUS SHALES INTERBEDDED; LOWER GAS VALUES OBSERVED.

SANDSTONE = LIGHT TO MEDIUM GRAY WITH GRAYISH WHITE HUES; FINE GRAINS; WELL



12500

13000 MD

12600

13100 MD

12

ROP
Avg WOB
Depth of Cut

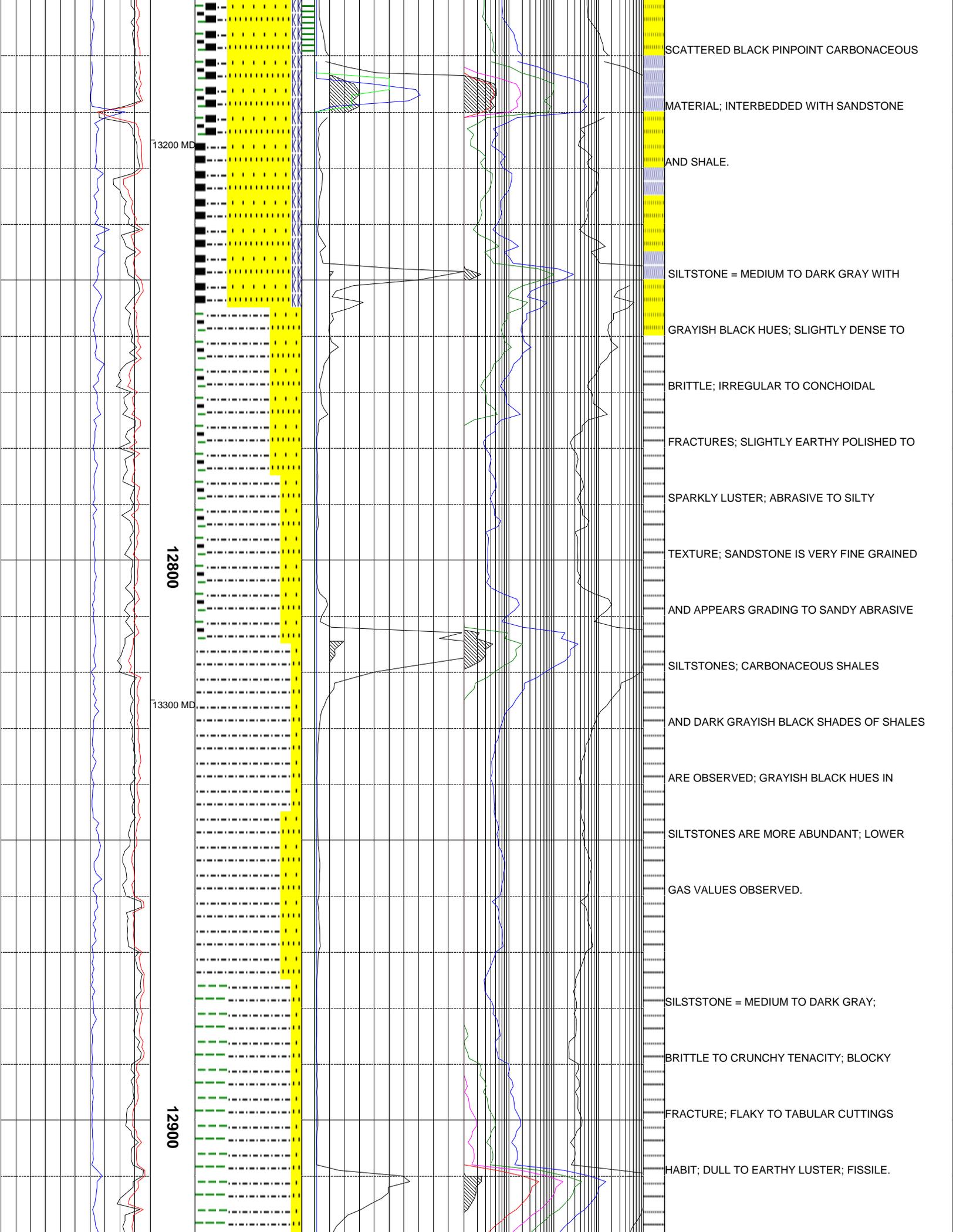
Ttl Gas
CO2
Flare Ht.

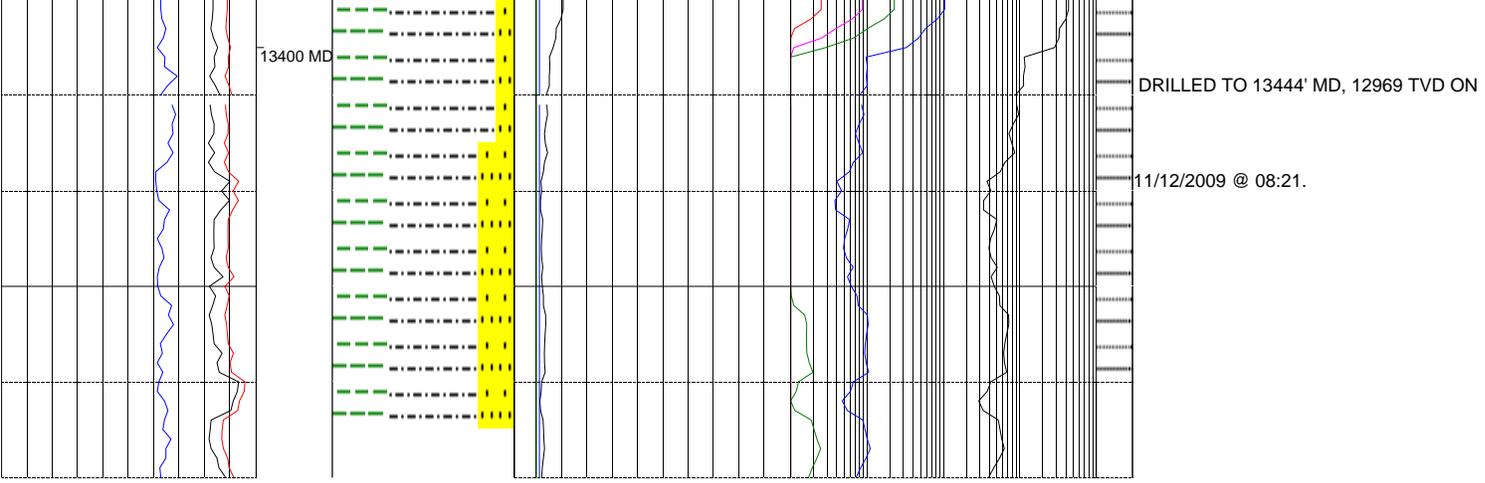
Meth C-1
Ethn C-2
Prop C-3
Butn C-4
Pent C-5

SORTED; SUBROUNDED TO ROUNDED; HIGH
 SPHERICITY; <5% UNCONSOLIDATED
 KAOLINITIC SANDS; FIRMLY FRIABLE TO
 HARD; SILICA CEMENT WITH QUARTZ GRAINS
 OBSERVED; TRACES OF COAL OBSERVED;
 SANDSTONE APPEARS GRADING TO VERY
 ABRASIVE SILICIC SILTSTONES; HIGHER GAS
 VALUES IN SANDSTONES AND COALS.
 COAL = BLACK; CRUMBLY TO PULVERUENT;
 IRREGULAR TO MOTTLED FRACTURES; PLATY
 TO NODULAR CUTTINGS; RESINOUS TO WAXY
 LUSTER; SMOOTH TEXTURE; APPEARS AS
 THINLY INTERBEDDED SEAMS IN SILTSTONES
 AND SANDSTONES; <5% KAOLINITIC SANDS.
 SILTSTONE = MEDIUM TO DARK GRAY, LIGHT
 GRAY, DARK BROWN, FIRM TO MODERATELY
 HARD; CRUMBLY TO COMMONLY
 MODERATELY TOUGH; DULL LUSTER WITH
 SCATTERED SPARKLES; GRITTY, ABRASIVE
 TEXTURE; MODERATELY CALCAREOUS;

100K
100K
100K
100K
100K

1K<10
25K<10
100<10
x10
<10





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