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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 FRU197-33B3
FIELD Piceance Creek
REGION Rockies
COORDINATES 39.921374000
05108282504000
ELEVATION G.L.:6549.8'
RKB: 30.2'
COUNTY, STATE Rio Blanco, CO
API INDEX 051031143300
SPUD DATE 05/24/2010
CONTRACTOR HE
CO. REP. Chad Jarvis
RIG/TYPE HP321
LOGGING UNIT MLU#31
GEOLOGISTS Barbara Delaney
Chad Record
ADD. PERSONS Mike Franco
Mark Gross
CO. GEOLOGIST Chris Alba

LOG INTERVAL

CASING DATA

DEPTHS: 4550' TO 12720'
DATES: 05/25/2010 TO 06/03/2010
SCALE: 5" = 100'

16" AT 150'
10.75" AT 4537'
4.5" AT 12701'
AT

MUD TYPES

HOLE SIZE

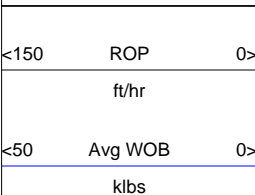
WATER-BASED TO 4550'
LSND TO 12720'
TO
TO

14.75" TO 4550'
9.5" TO 9855'
7.875" TO 12720'
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, KAOLINITIC, 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.



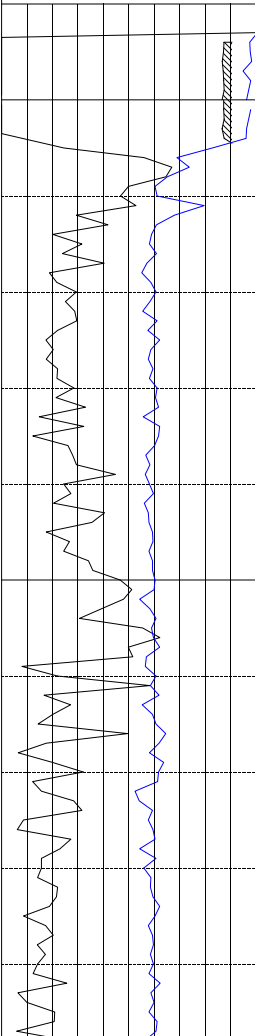
TVD Depth

Lithology

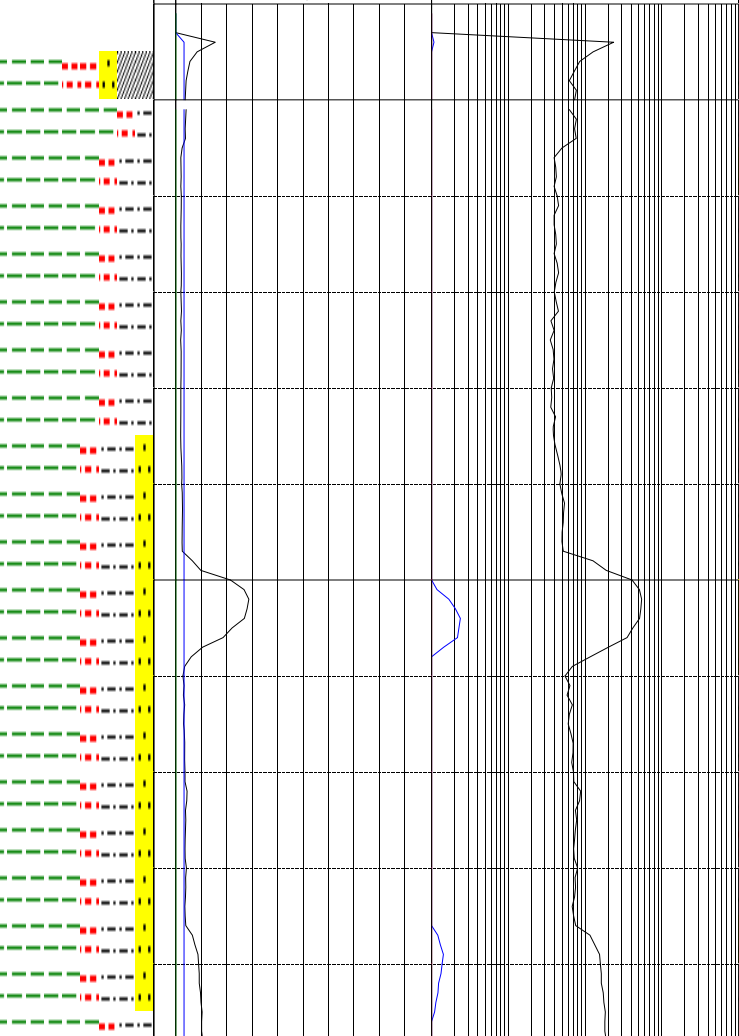
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<330	CO2 ppm	20K	<10	Ethn C-2	100K
<0	Flare Ht. ft	100	<10	Prop C-3	100K
			<10	Butn C-4	100K
			<10	Pent C-5	100K

Interp. Lith

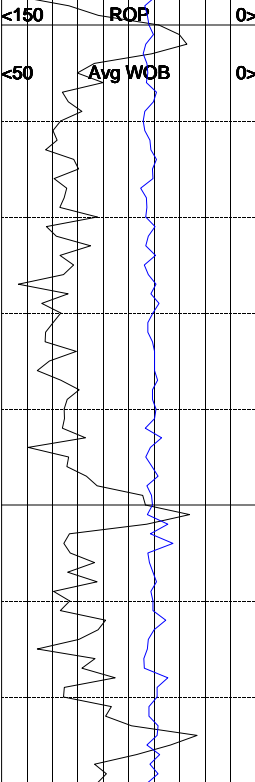
Remarks
Survey Data, Mud Reports, Other Info.



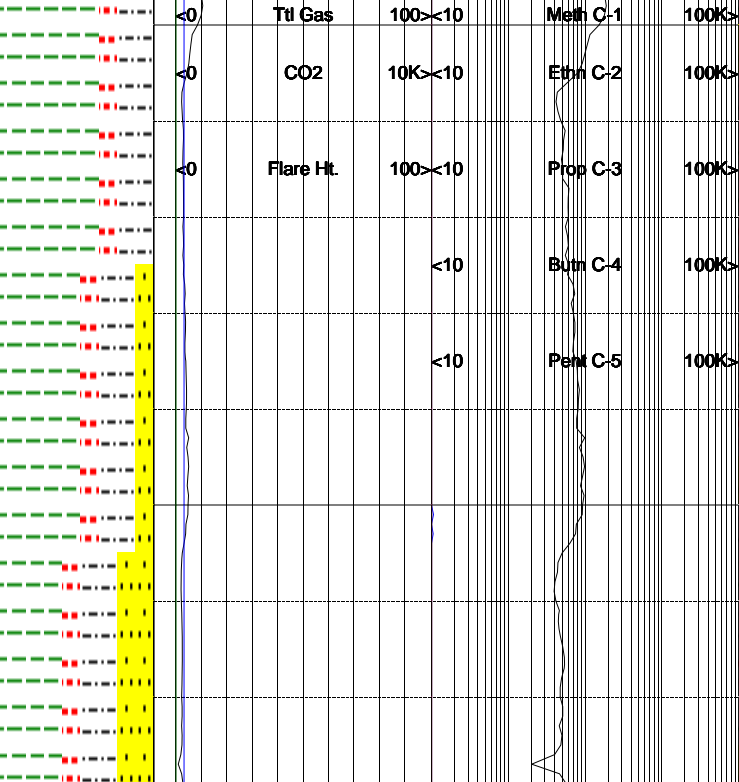
4400
4600 MD
4500



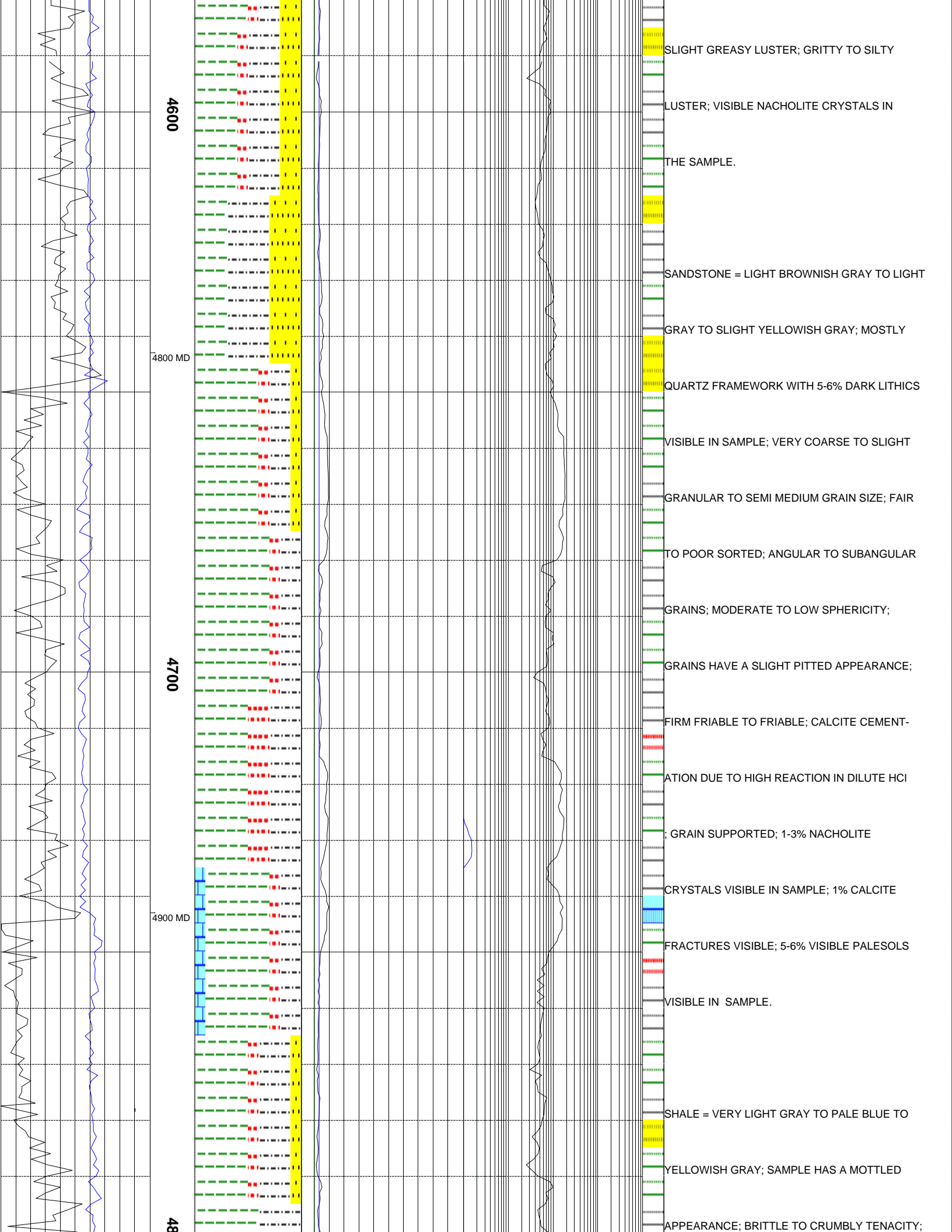
SHALE = MODERATE YELLOWISH BROWN TO
MEDIUM GRAY; PLATY TO SCALY TO TABULAR
CUTTINGS HABIT; CLAYEY TO MATTE TEXTURE;
EARTHY TO WAXY LUSTER; GRADES TO LIGHT
GRAY SILTSTONE; NO VISIBLE STRUCTURE.
SHALE = LIGHT YELLOWISH BROWN TO MOD
YELLOWISH BROWN WITH PALE BROWNISH
GRAY; IRREGULAR TO PLANAR TO HACKLY
FRACTURE; PLATY TO FLAKY TO WEDGELIKE
CUTTINGS HABIT; MATTE TO CLAYEY TEXTURE;
EARTHY LUSTER.



4700 MD



SILTSTONE = VERY LIGHT GRAY TO LIGHT
BLuish GRAY TO LIGHT GREENISH GRAY;
CRUMBLY TO BRITTLE TENACITY; PREDOMINATE
HACKLY TO IRREGULAR FRACTURING; PLATY
TO FLAKY TO OCCASIONALLY NODULAR CUTTING
HABIT; DULL EARTHY TO SEMI FROSTED TO



4600

4800 MD

4700

4900 MD

4800

SLIGHT GREASY LUSTER; GRITTY TO SILTY

LUSTER; VISIBLE NACHOLITE CRYSTALS IN

THE SAMPLE.

SANDSTONE = LIGHT BROWNISH GRAY TO LIGHT

GRAY TO SLIGHT YELLOWISH GRAY; MOSTLY

QUARTZ FRAMEWORK WITH 5-6% DARK LITHICS

VISIBLE IN SAMPLE; VERY COARSE TO SLIGHT

GRANULAR TO SEMI MEDIUM GRAIN SIZE; FAIR

TO POOR SORTED; ANGULAR TO SUBANGULAR

GRAINS; MODERATE TO LOW SPHERICITY;

GRAINS HAVE A SLIGHT PITTED APPEARANCE;

FIRM FRIABLE TO FRIABLE; CALCITE CEMENT-

ATION DUE TO HIGH REACTION IN DILUTE HCl

; GRAIN SUPPORTED; 1-3% NACHOLITE

CRYSTALS VISIBLE IN SAMPLE; 1% CALCITE

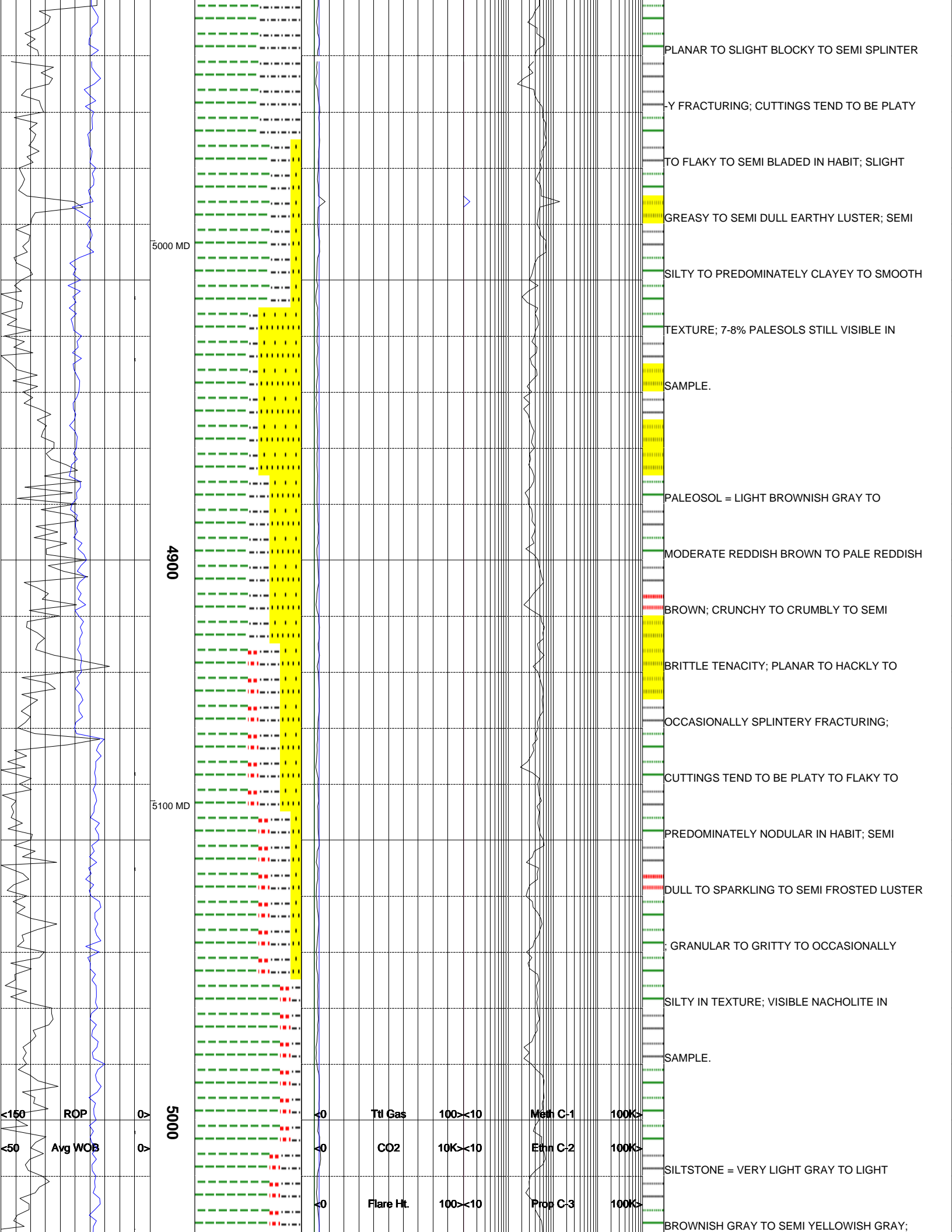
FRACTURES VISIBLE; 5-6% VISIBLE PALESOLS

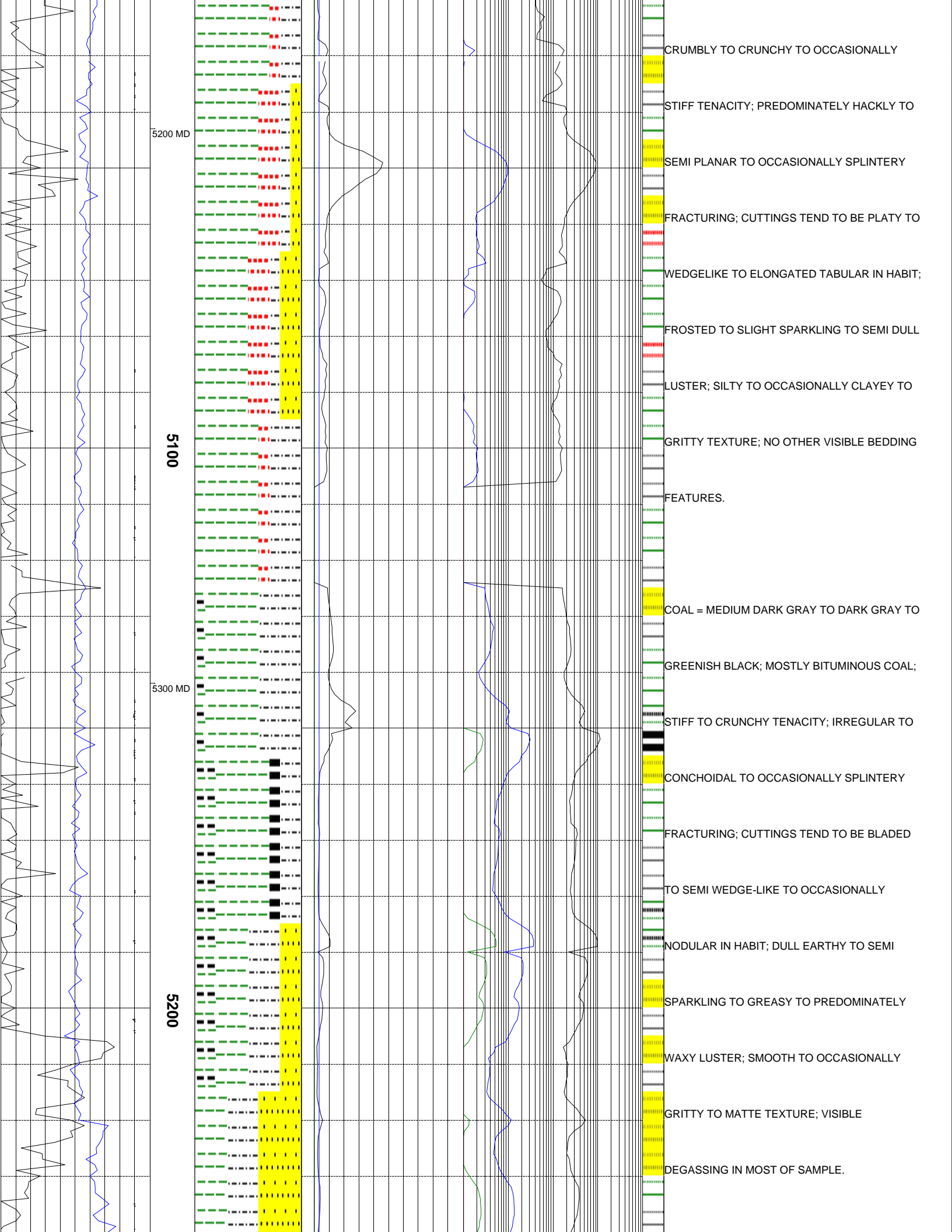
VISIBLE IN SAMPLE.

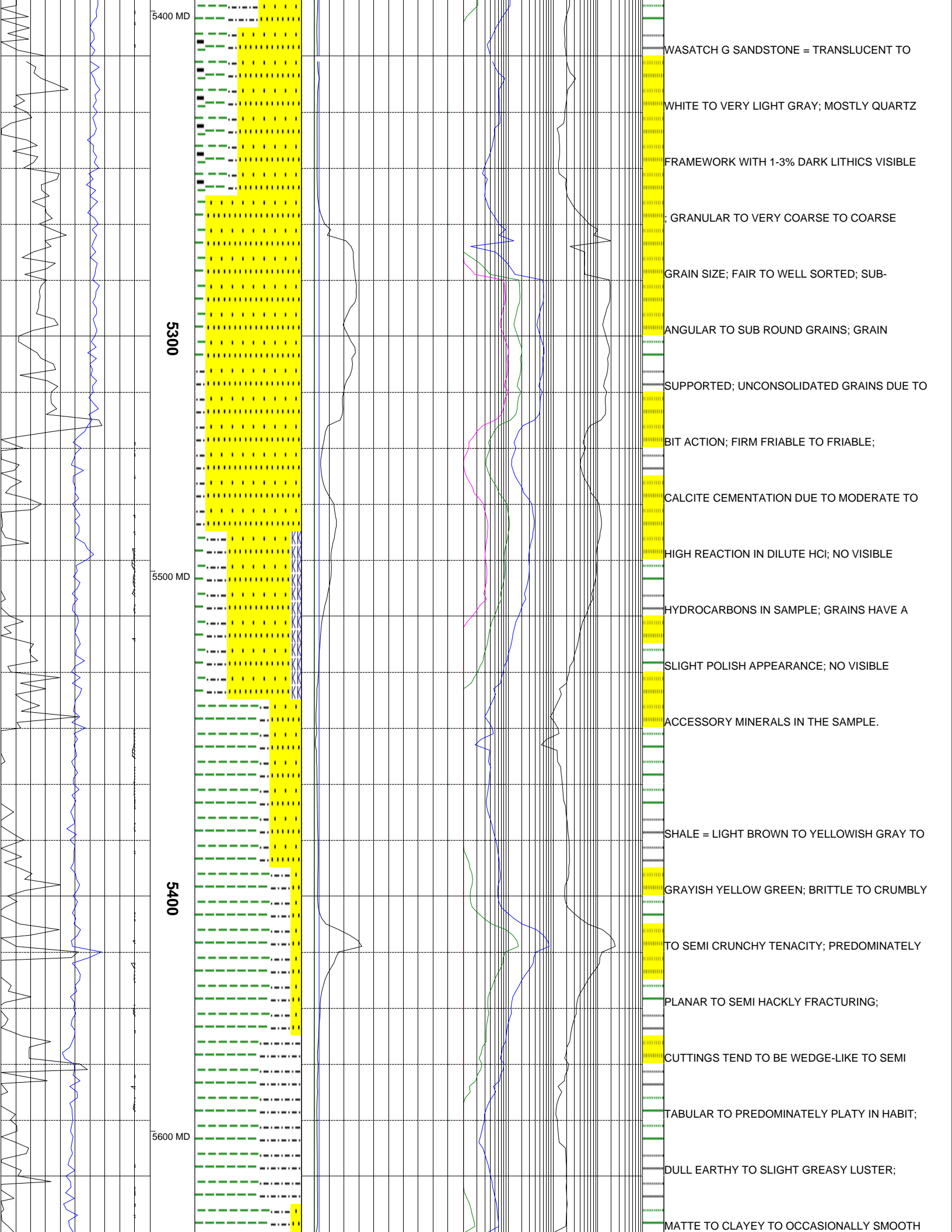
SHALE = VERY LIGHT GRAY TO PALE BLUE TO

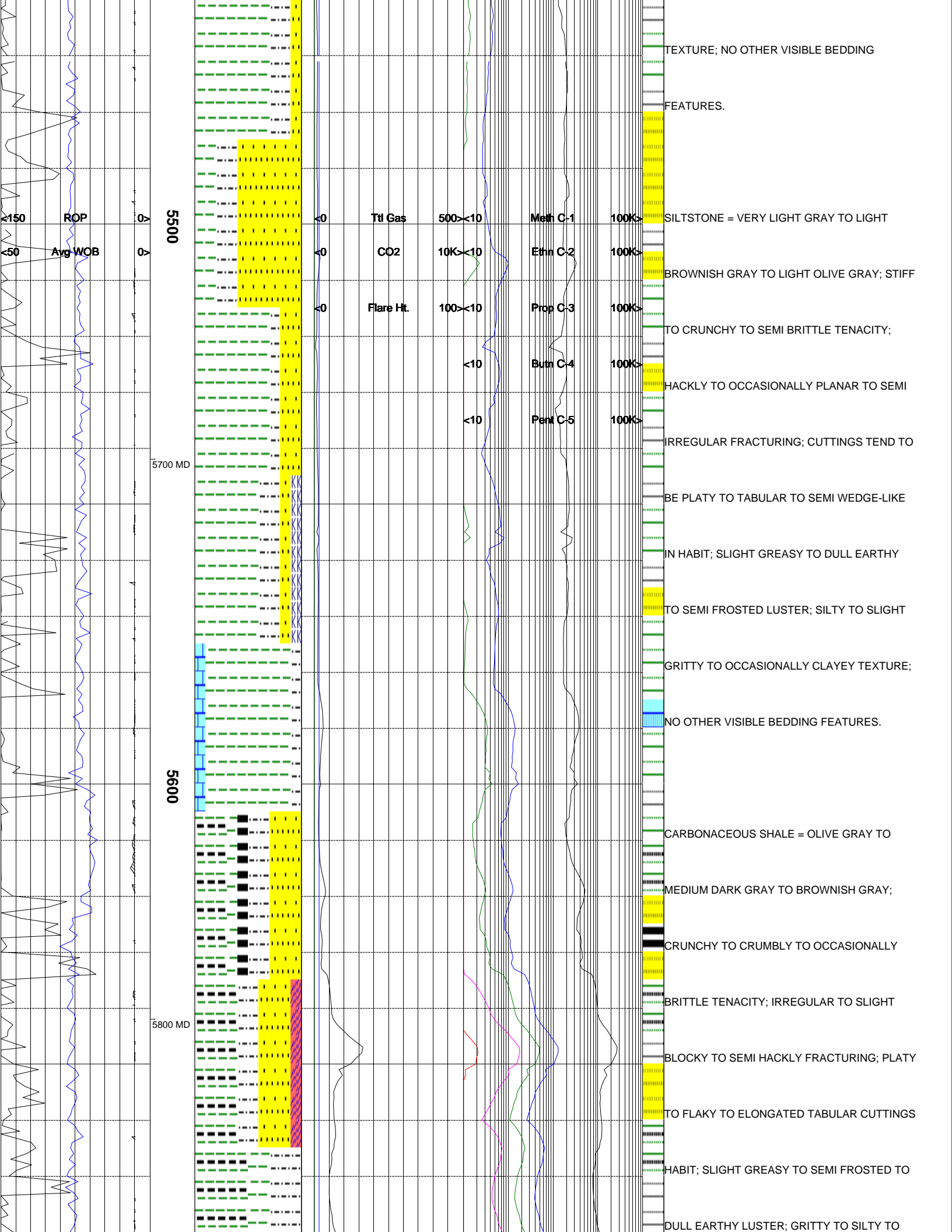
YELLOWISH GRAY; SAMPLE HAS A MOTTLED

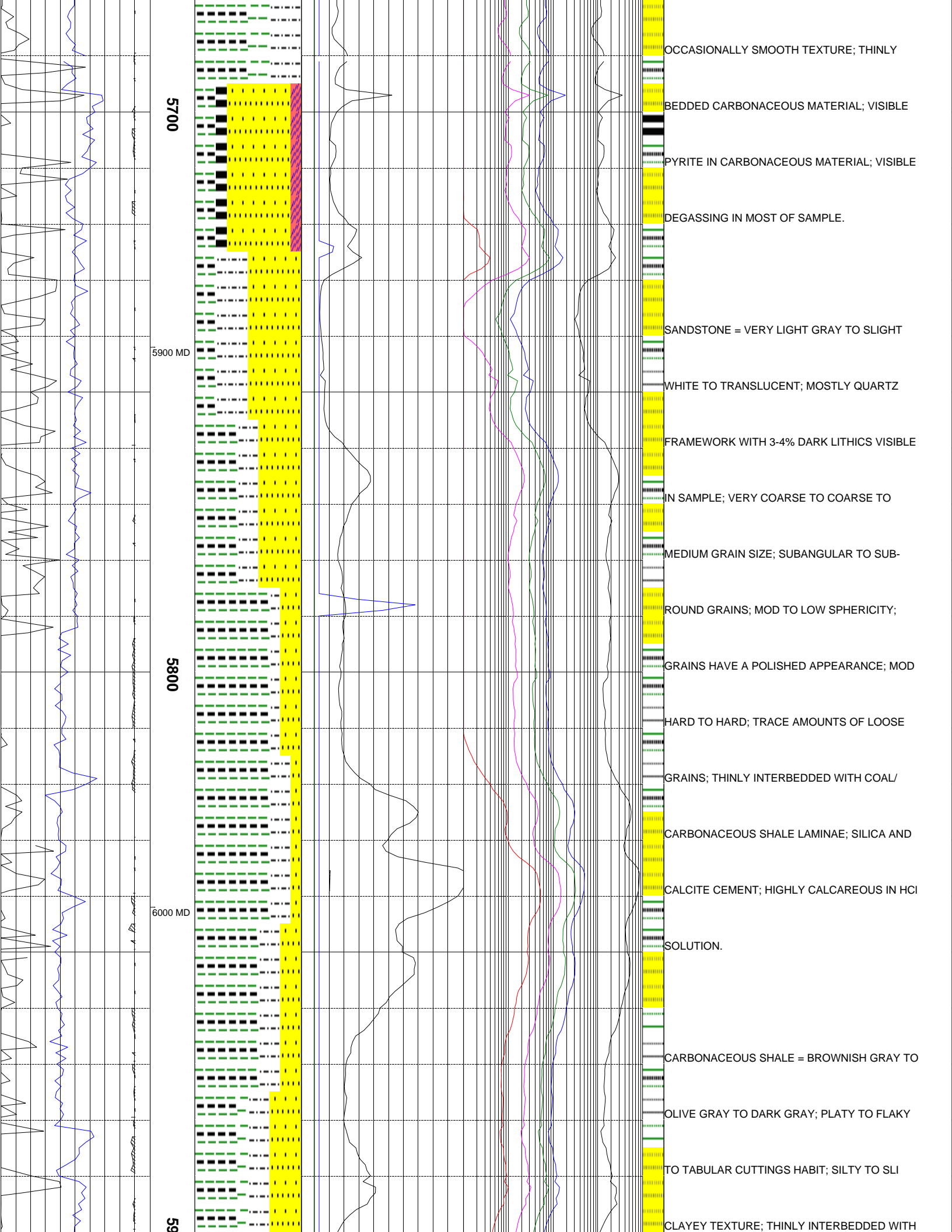
APPEARANCE; BRITTLE TO CRUMBLY TENACITY;

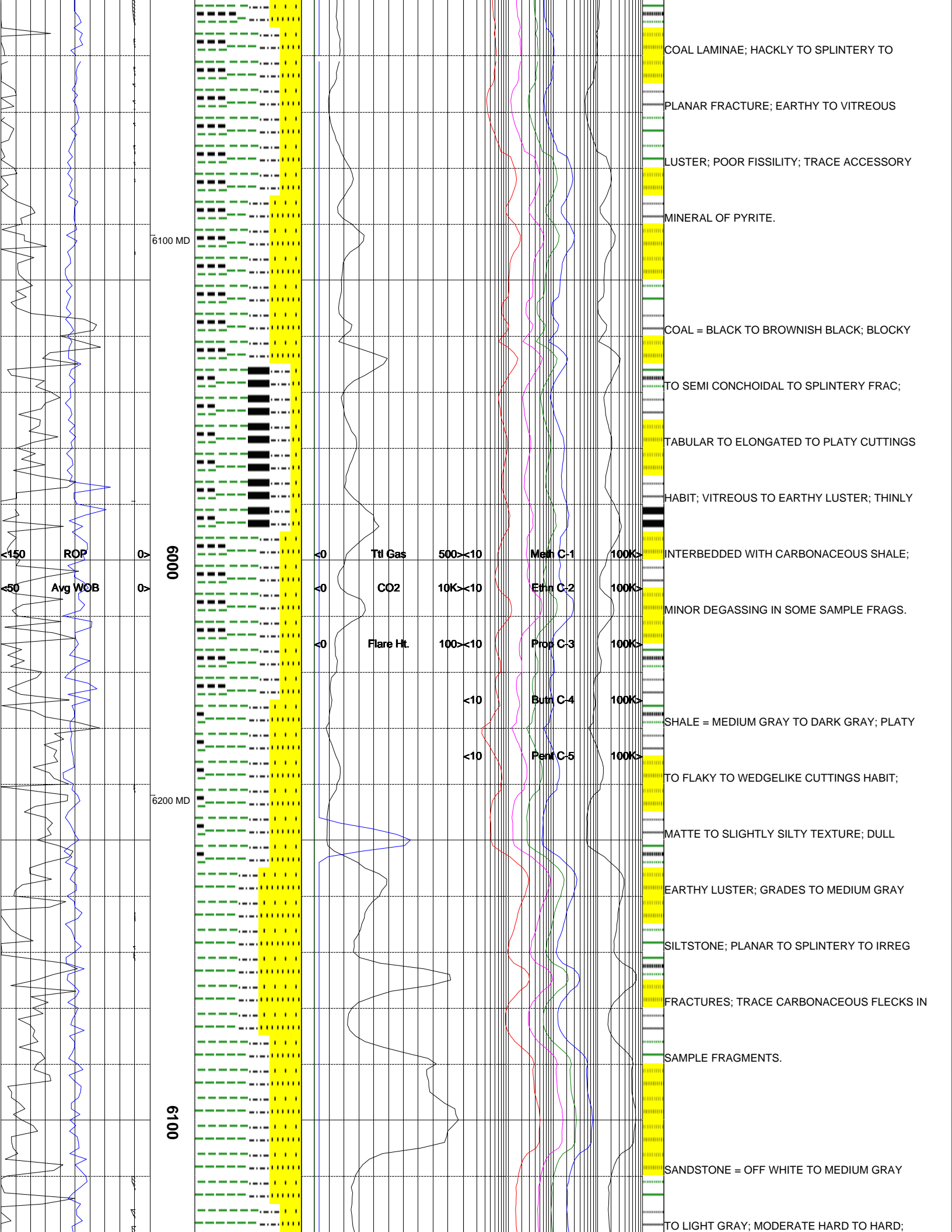


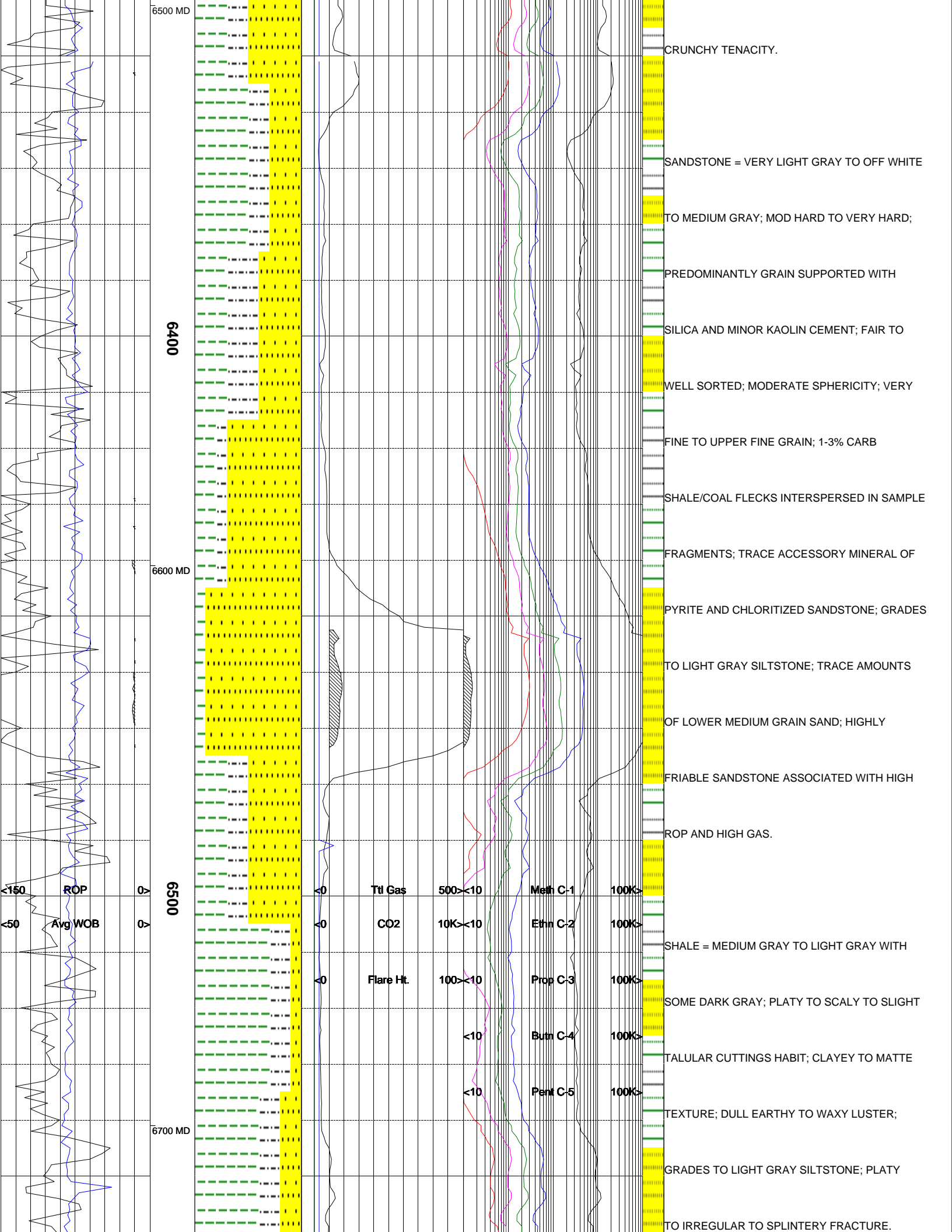


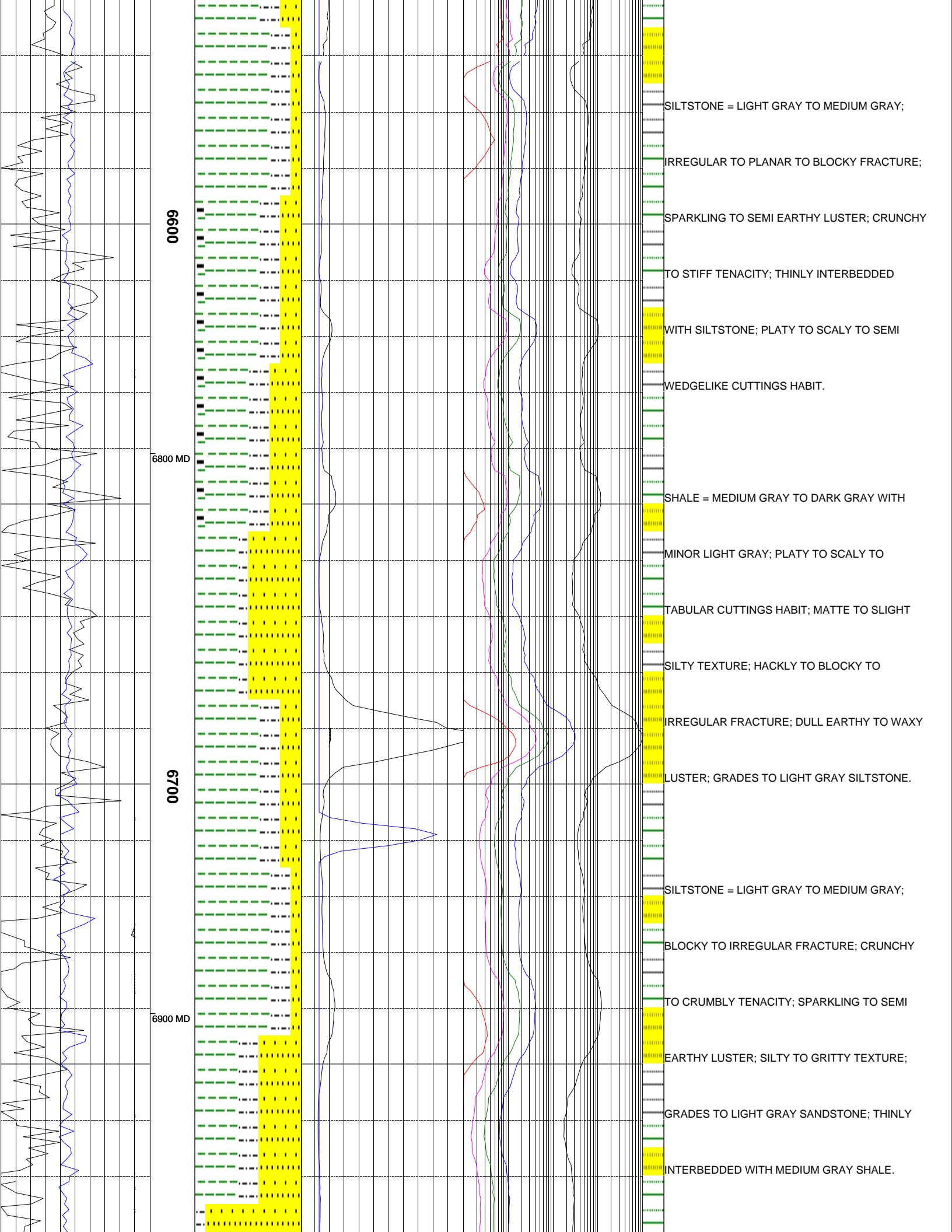












6600

6800 MD

6700

6900 MD

SILTSTONE = LIGHT GRAY TO MEDIUM GRAY;

IRREGULAR TO PLANAR TO BLOCKY FRACTURE;

SPARKLING TO SEMI EARTHY LUSTER; CRUNCHY

TO STIFF TENACITY; THINLY INTERBEDDED

WITH SILTSTONE; PLATY TO SCALY TO SEMI

WEDGELIKE CUTTINGS HABIT.

SHALE = MEDIUM GRAY TO DARK GRAY WITH

MINOR LIGHT GRAY; PLATY TO SCALY TO

TABULAR CUTTINGS HABIT; MATTE TO SLIGHT

SILTY TEXTURE; HACKLY TO BLOCKY TO

IRREGULAR FRACTURE; DULL EARTHY TO WAXY

LUSTER; GRADES TO LIGHT GRAY SILTSTONE.

SILTSTONE = LIGHT GRAY TO MEDIUM GRAY;

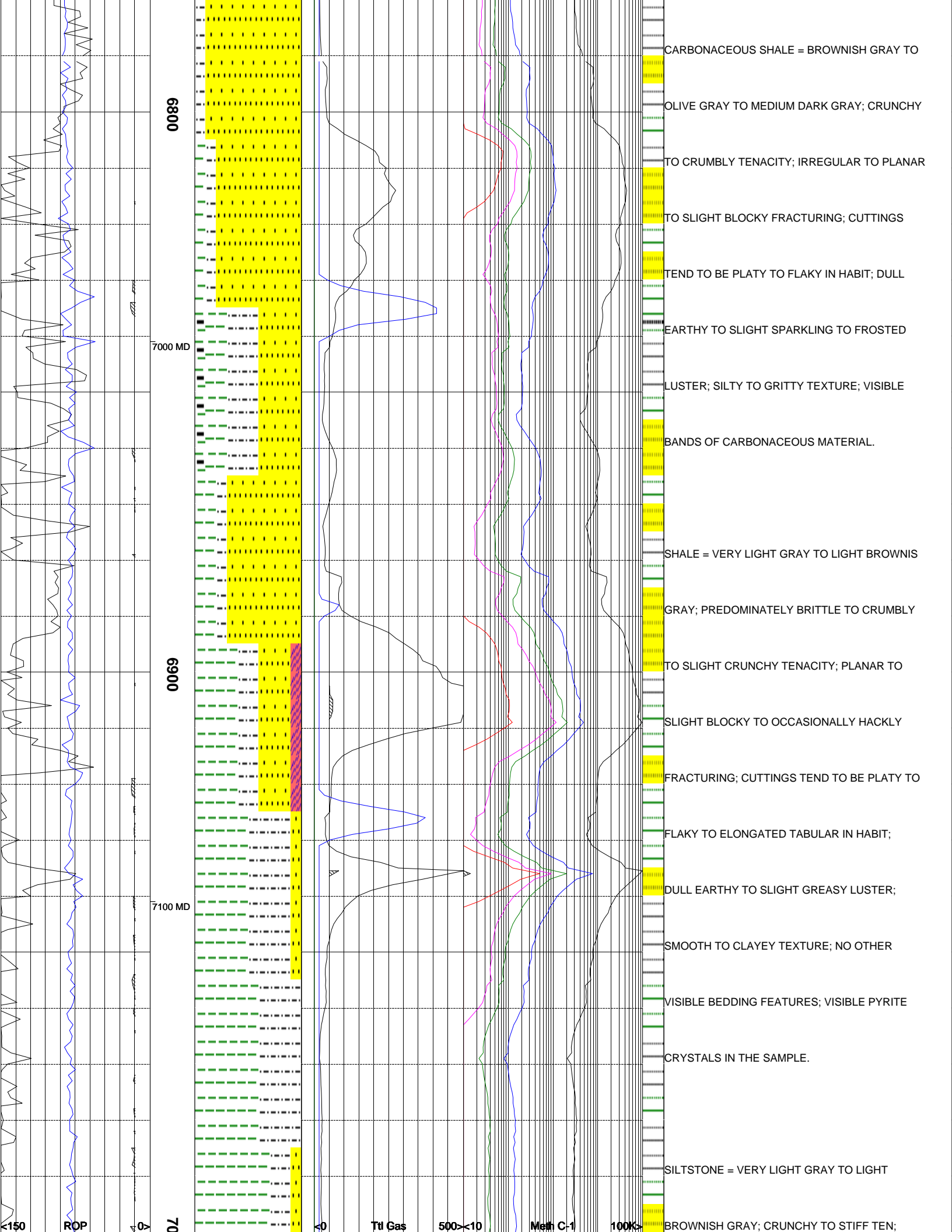
BLOCKY TO IRREGULAR FRACTURE; CRUNCHY

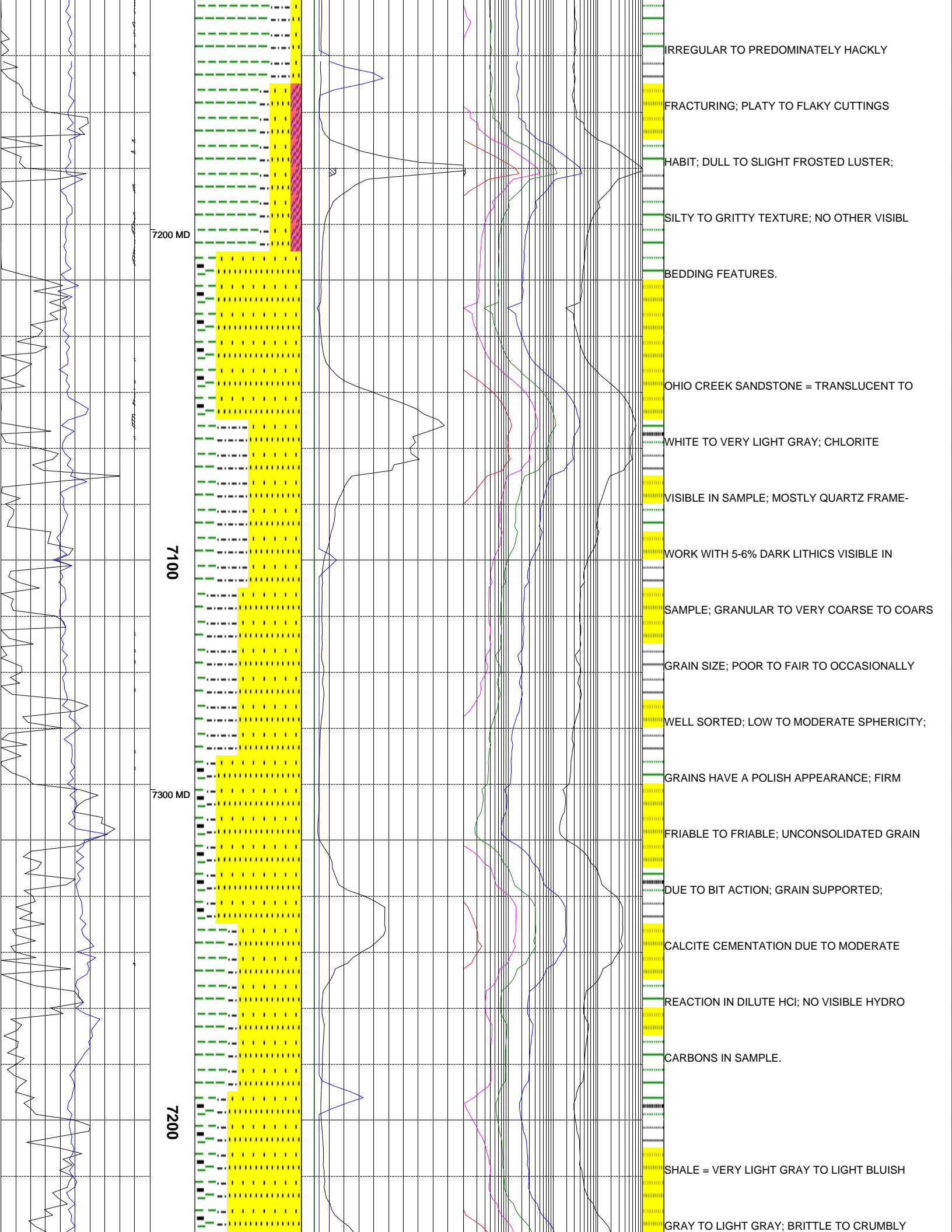
TO CRUMBLY TENACITY; SPARKLING TO SEMI

EARTHY LUSTER; SILTY TO GRITTY TEXTURE;

GRADES TO LIGHT GRAY SANDSTONE; THINLY

INTERBEDDED WITH MEDIUM GRAY SHALE.





IRREGULAR TO PREDOMINATELY HACKLY

FRACTURING; PLATY TO FLAKY CUTTINGS

HABIT; DULL TO SLIGHT FROSTED LUSTER;

SILTY TO GRITTY TEXTURE; NO OTHER VISIBL

BEDDING FEATURES.

OHIO CREEK SANDSTONE = TRANSLUCENT TO

WHITE TO VERY LIGHT GRAY; CHLORITE

VISIBLE IN SAMPLE; MOSTLY QUARTZ FRAME-

WORK WITH 5-6% DARK LITHICS VISIBLE IN

SAMPLE; GRANULAR TO VERY COARSE TO COARS

GRAIN SIZE; POOR TO FAIR TO OCCASIONALLY

WELL SORTED; LOW TO MODERATE SPHERICITY;

GRAINS HAVE A POLISH APPEARANCE; FIRM

FRIABLE TO FRIABLE; UNCONSOLIDATED GRAIN

DUE TO BIT ACTION; GRAIN SUPPORTED;

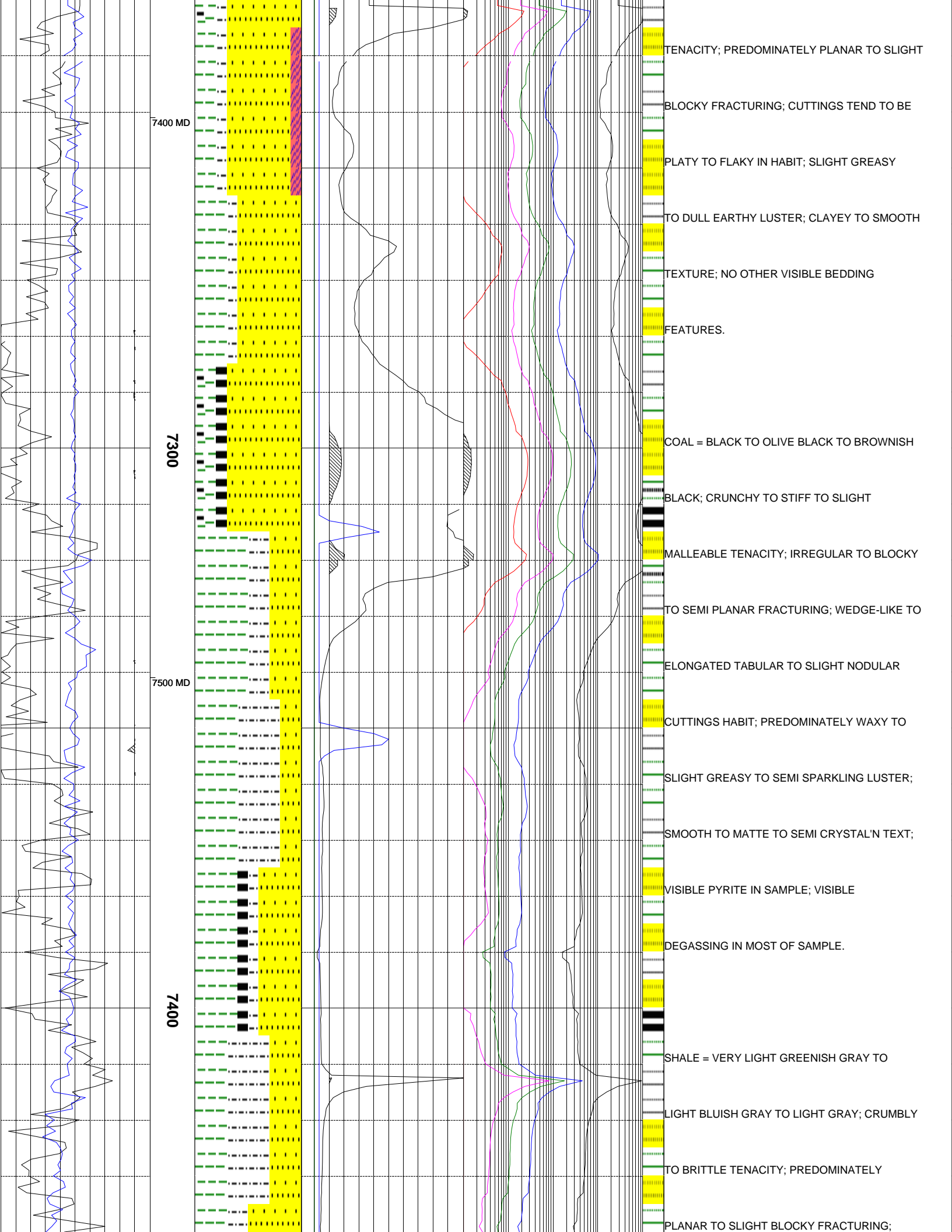
CALCITE CEMENTATION DUE TO MODERATE

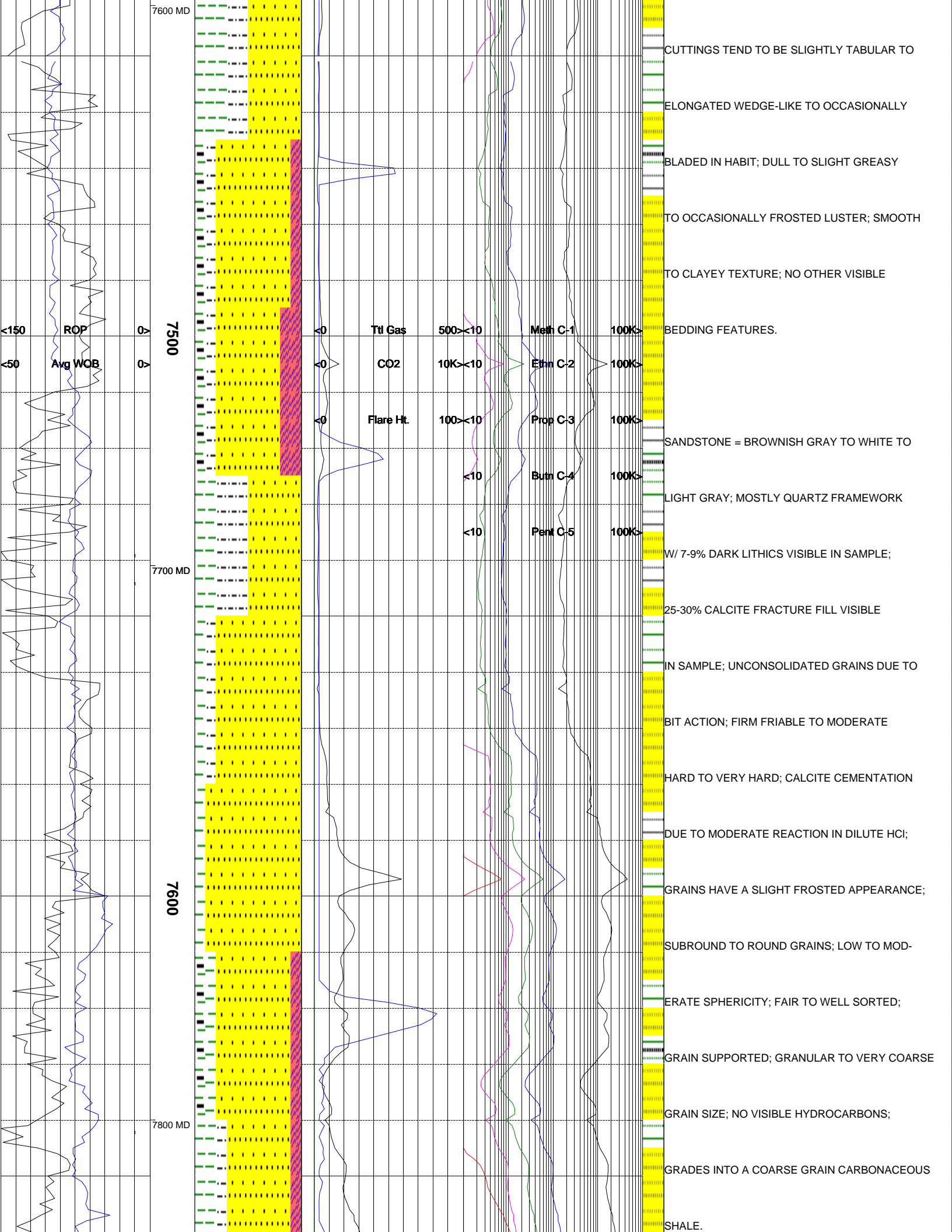
REACTION IN DILUTE HCl; NO VISIBLE HYDRO

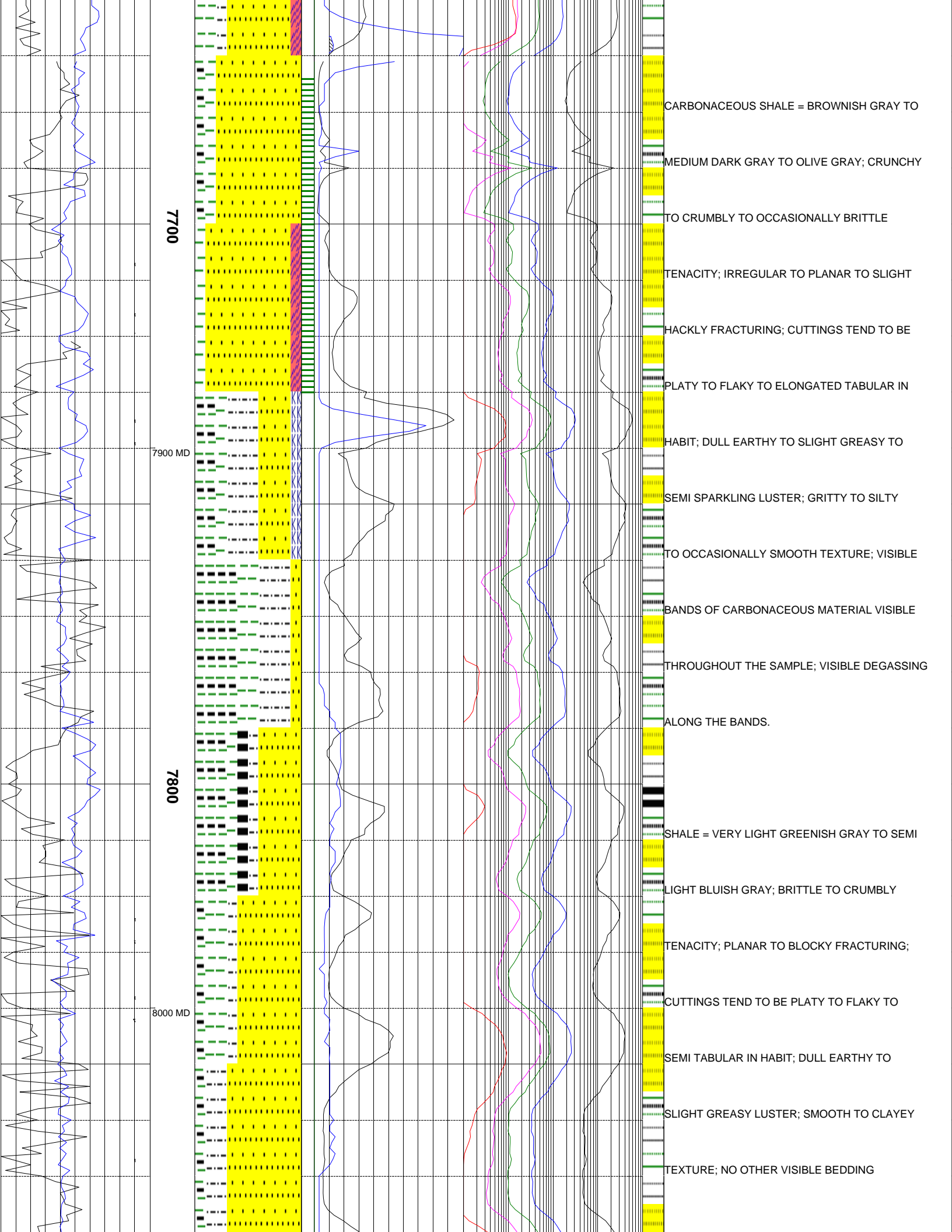
CARBONS IN SAMPLE.

SHALE = VERY LIGHT GRAY TO LIGHT BLUISH

GRAY TO LIGHT GRAY; BRITTLE TO CRUMBLY







7700

7900 MD

7800

8000 MD

CARBONACEOUS SHALE = BROWNISH GRAY TO

MEDIUM DARK GRAY TO OLIVE GRAY; CRUNCHY

TO CRUMBLY TO OCCASIONALLY BRITTLE

TENACITY; IRREGULAR TO PLANAR TO SLIGHT

HACKLY FRACTURING; CUTTINGS TEND TO BE

PLATY TO FLAKY TO ELONGATED TABULAR IN

HABIT; DULL EARTHY TO SLIGHT GREASY TO

SEMI SPARKLING LUSTER; GRITTY TO SILTY

TO OCCASIONALLY SMOOTH TEXTURE; VISIBLE

BANDS OF CARBONACEOUS MATERIAL VISIBLE

THROUGHOUT THE SAMPLE; VISIBLE DEGASSING

ALONG THE BANDS.

SHALE = VERY LIGHT GREENISH GRAY TO SEMI

LIGHT BLUISH GRAY; BRITTLE TO CRUMBLY

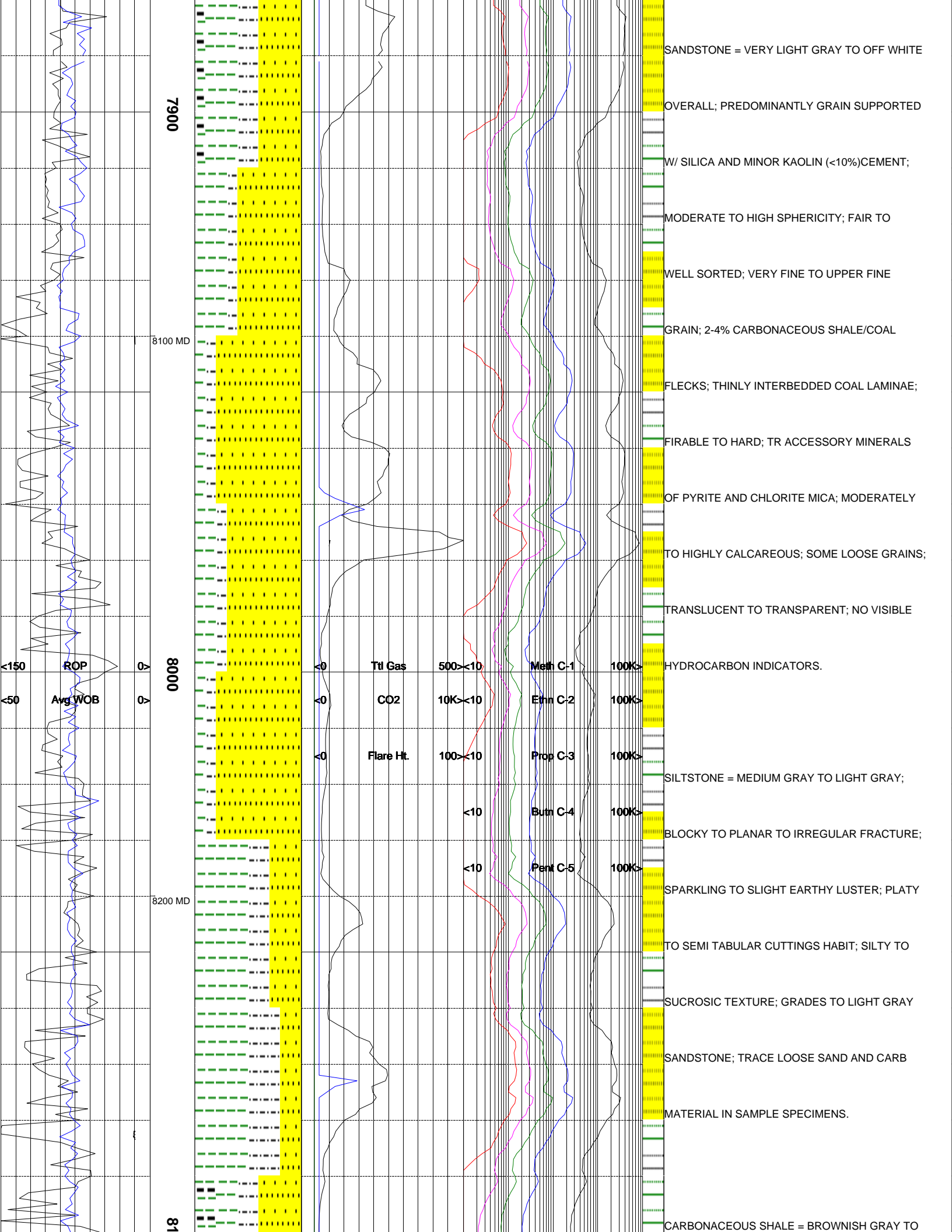
TENACITY; PLANAR TO BLOCKY FRACTURING;

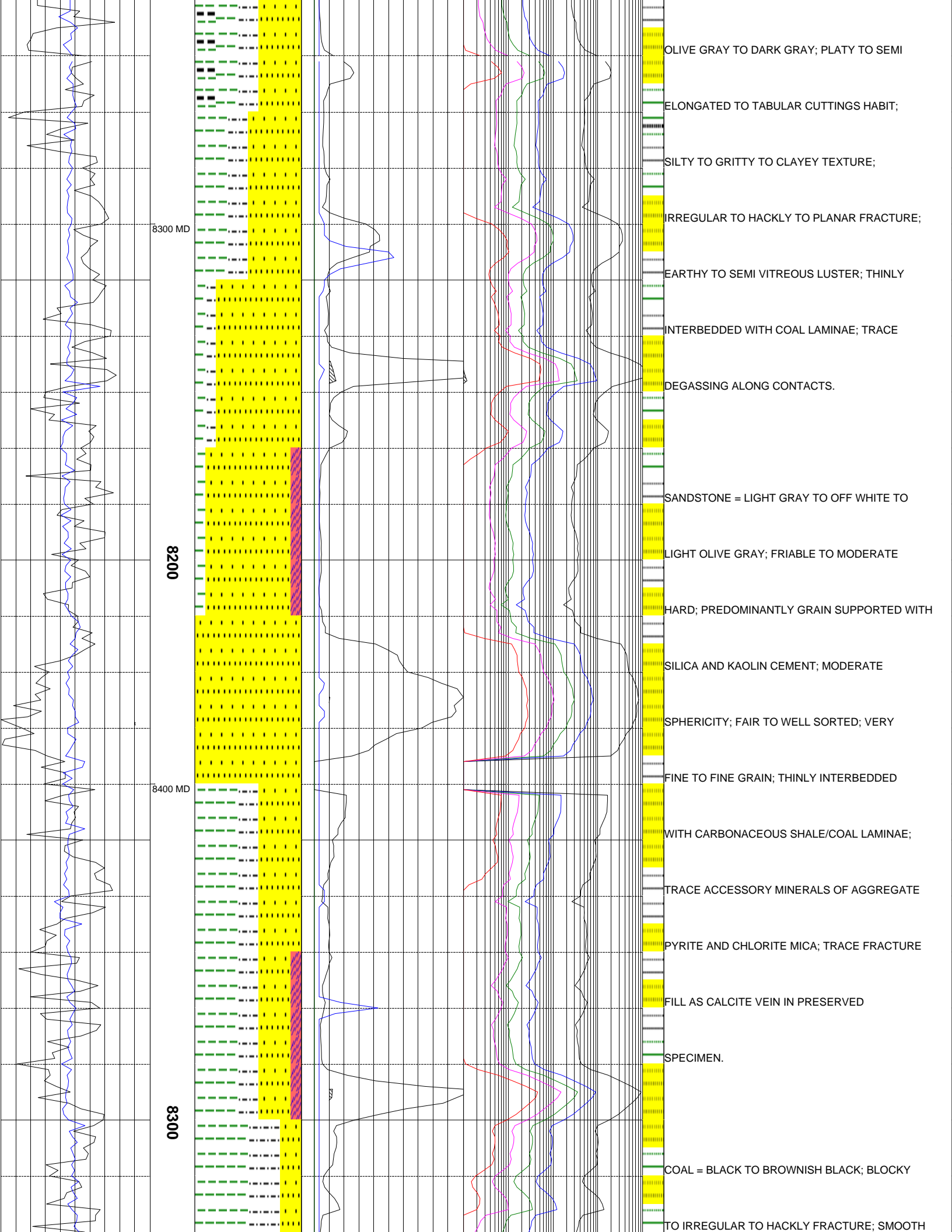
CUTTINGS TEND TO BE PLATY TO FLAKY TO

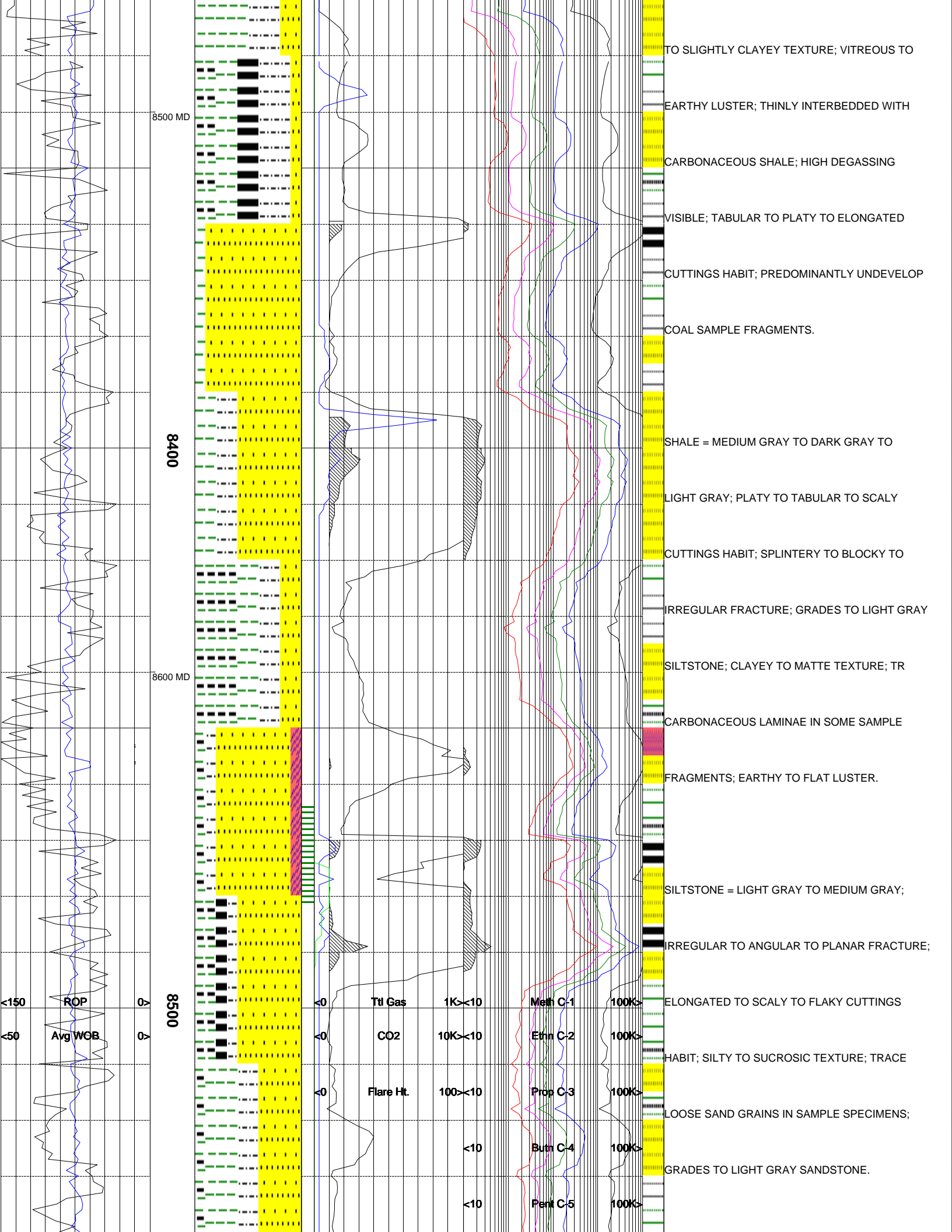
SEMI TABULAR IN HABIT; DULL EARTHY TO

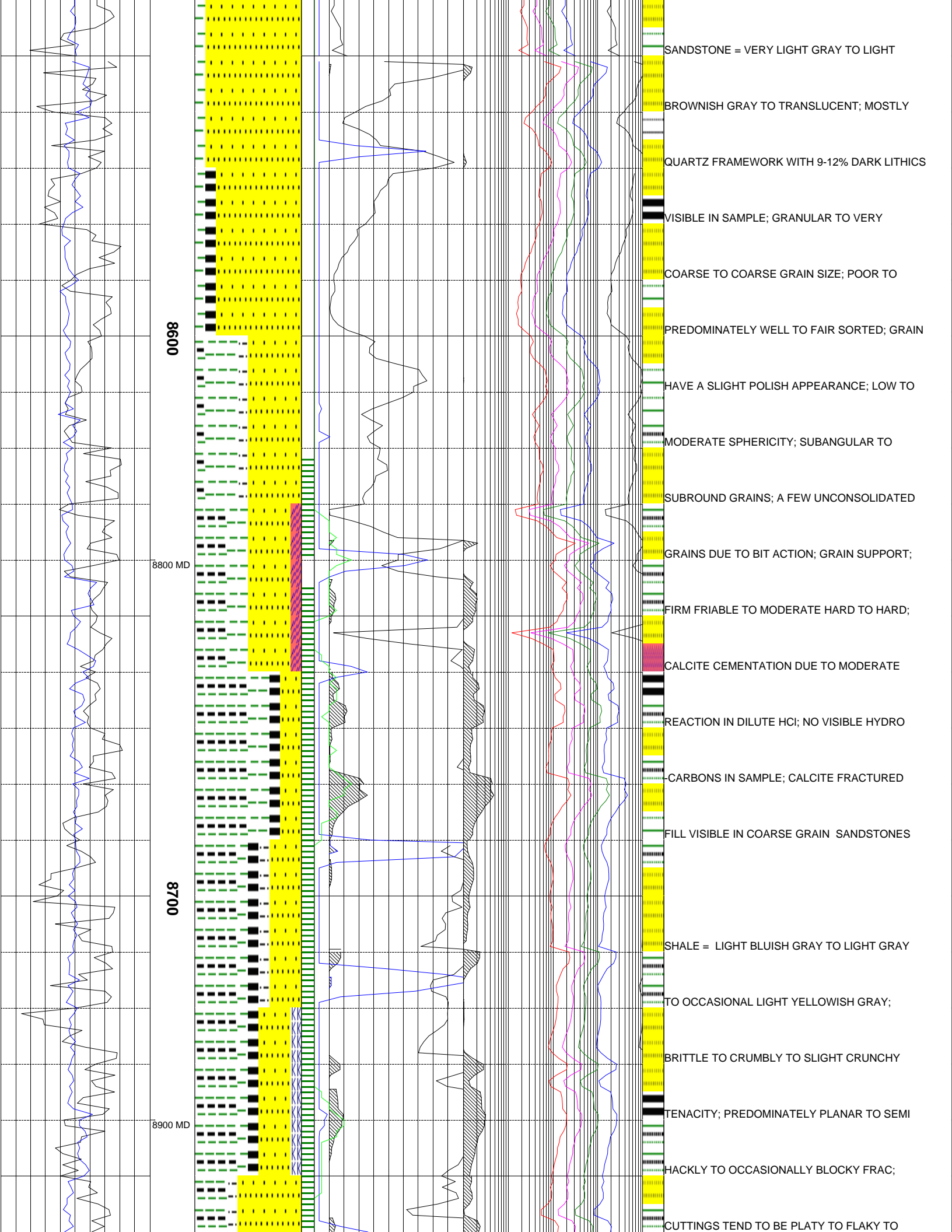
SLIGHT GREASY LUSTER; SMOOTH TO CLAYEY

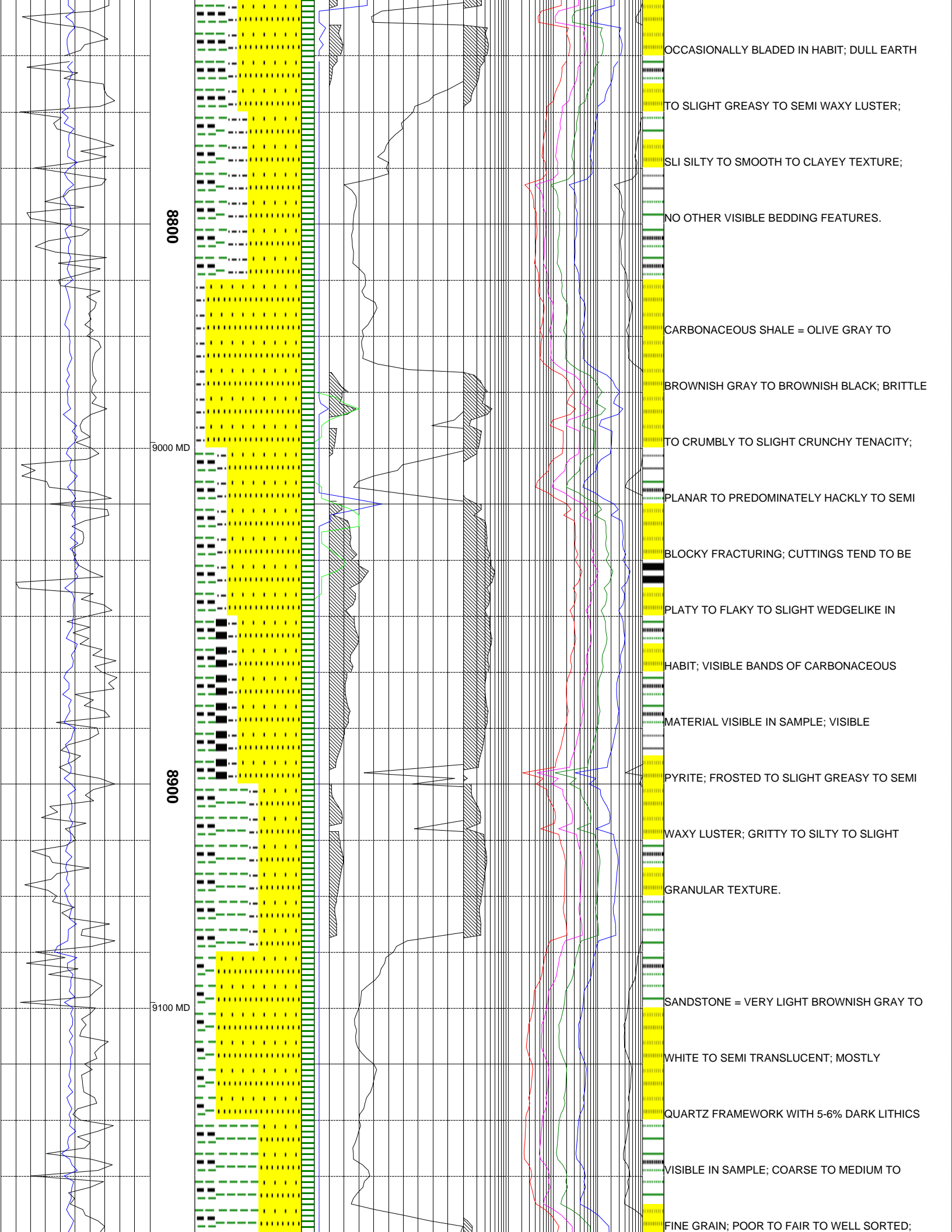
TEXTURE; NO OTHER VISIBLE BEDDING











0088

9000 MD

0068

9100 MD

OCCASIONALLY BLADED IN HABIT; DULL EARTH

TO SLIGHT GREASY TO SEMI WAXY LUSTER;

SLI SILTY TO SMOOTH TO CLAYEY TEXTURE;

NO OTHER VISIBLE BEDDING FEATURES.

CARBONACEOUS SHALE = OLIVE GRAY TO

BROWNISH GRAY TO BROWNISH BLACK; BRITTLE

TO CRUMBLY TO SLIGHT CRUNCHY TENACITY;

PLANAR TO PREDOMINATELY HACKLY TO SEMI

BLOCKY FRACTURING; CUTTINGS TEND TO BE

PLATY TO FLAKY TO SLIGHT WEDGELIKE IN

HABIT; VISIBLE BANDS OF CARBONACEOUS

MATERIAL VISIBLE IN SAMPLE; VISIBLE

PYRITE; FROSTED TO SLIGHT GREASY TO SEMI

WAXY LUSTER; GRITTY TO SILTY TO SLIGHT

GRANULAR TEXTURE.

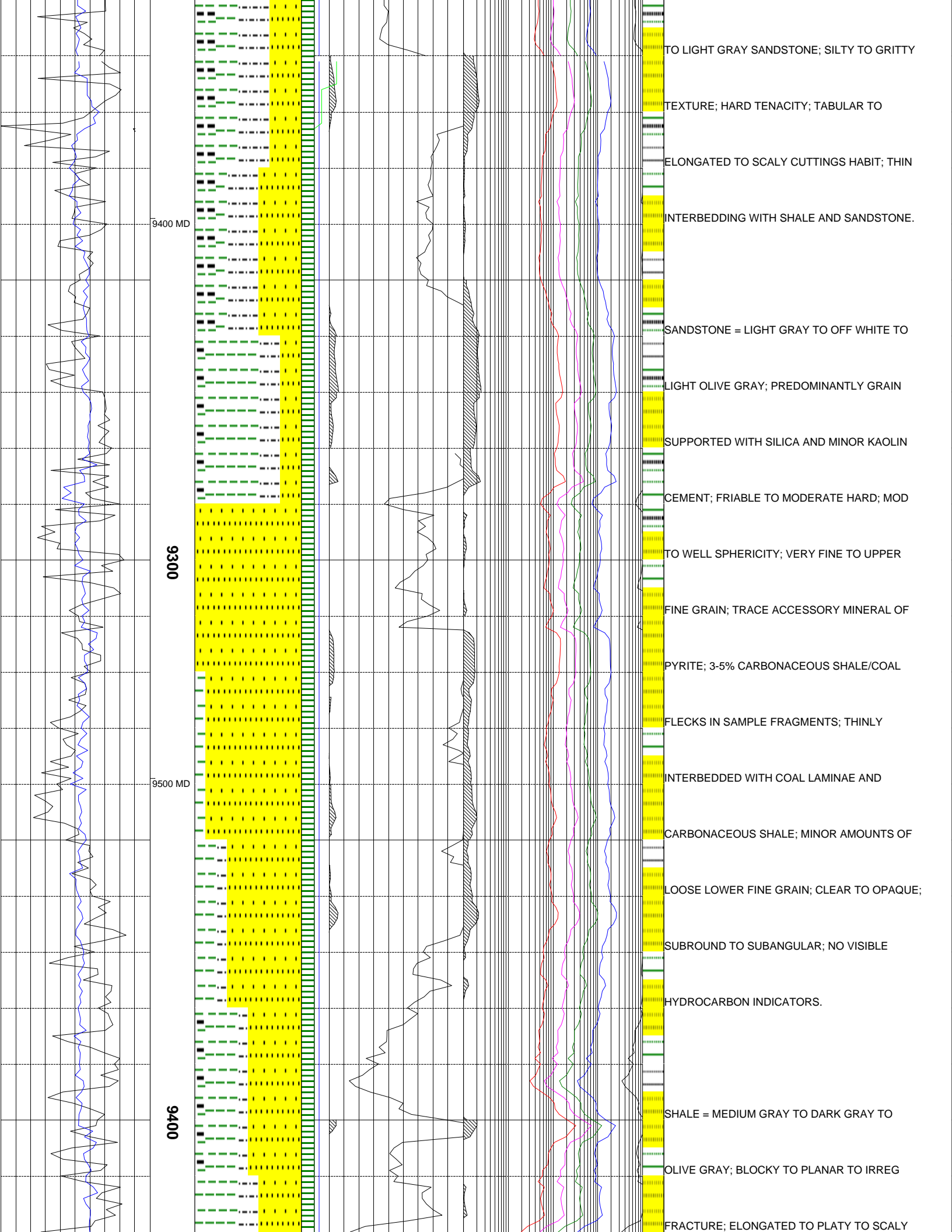
SANDSTONE = VERY LIGHT BROWNISH GRAY TO

WHITE TO SEMI TRANSLUCENT; MOSTLY

QUARTZ FRAMEWORK WITH 5-6% DARK LITHICS

VISIBLE IN SAMPLE; COARSE TO MEDIUM TO

FINE GRAIN; POOR TO FAIR TO WELL SORTED;

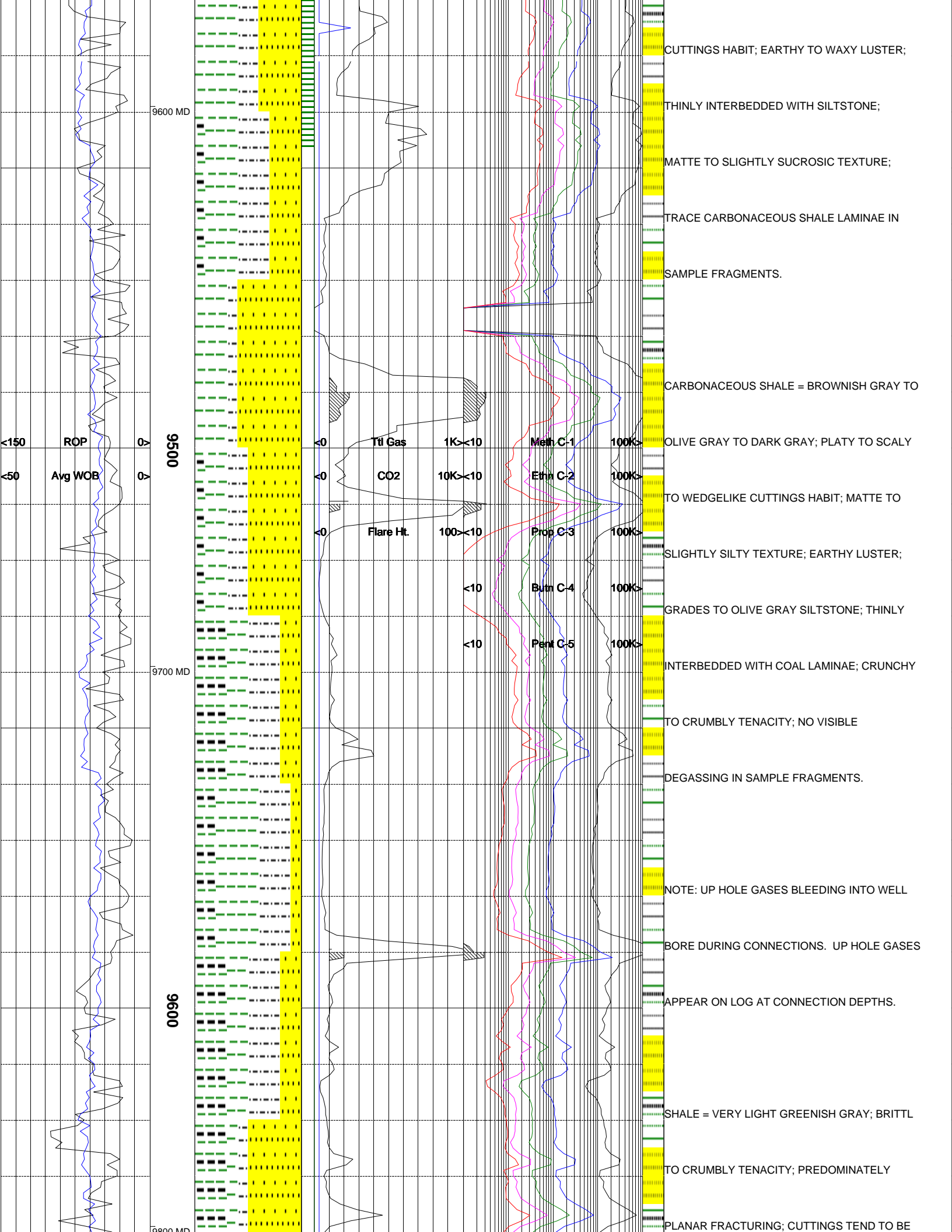


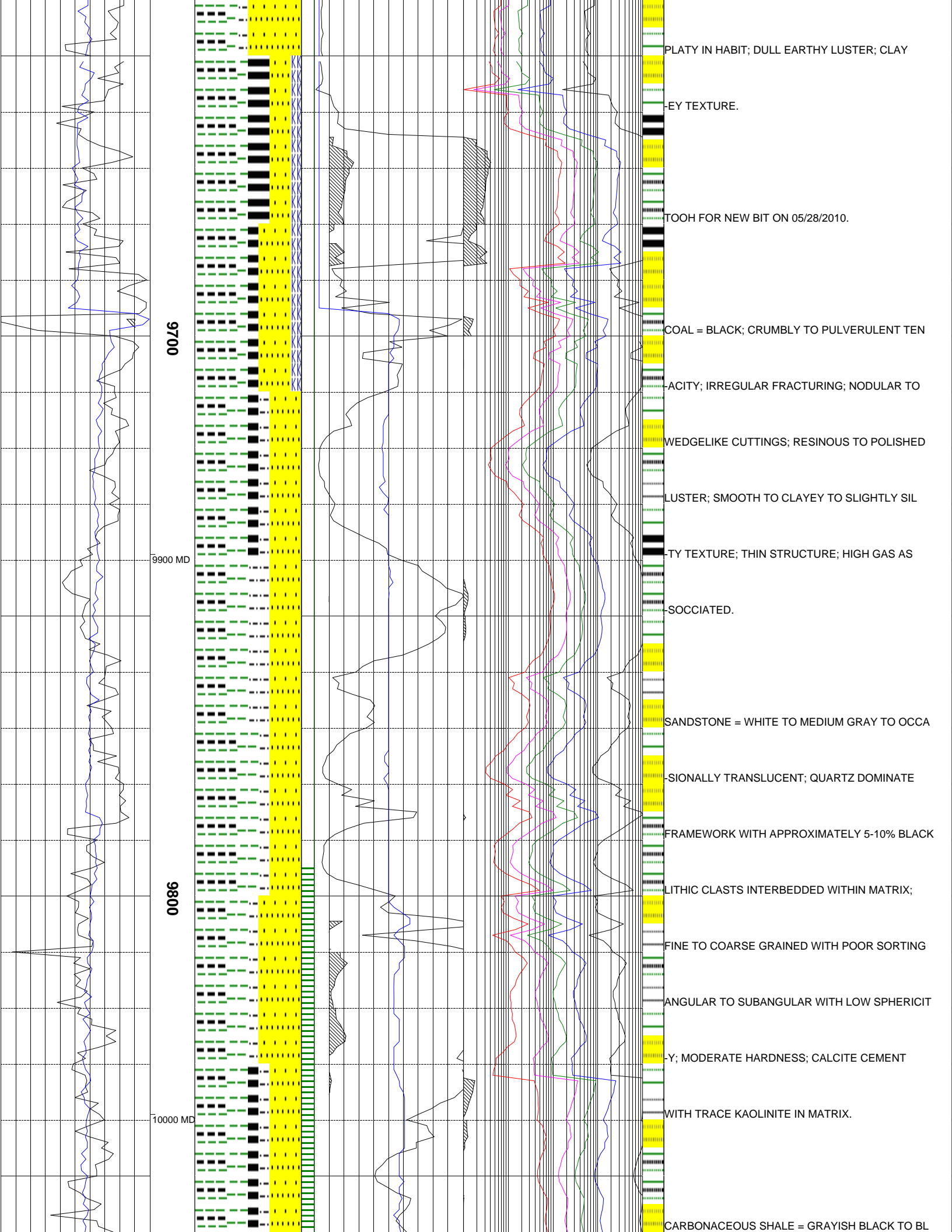
9400 MD

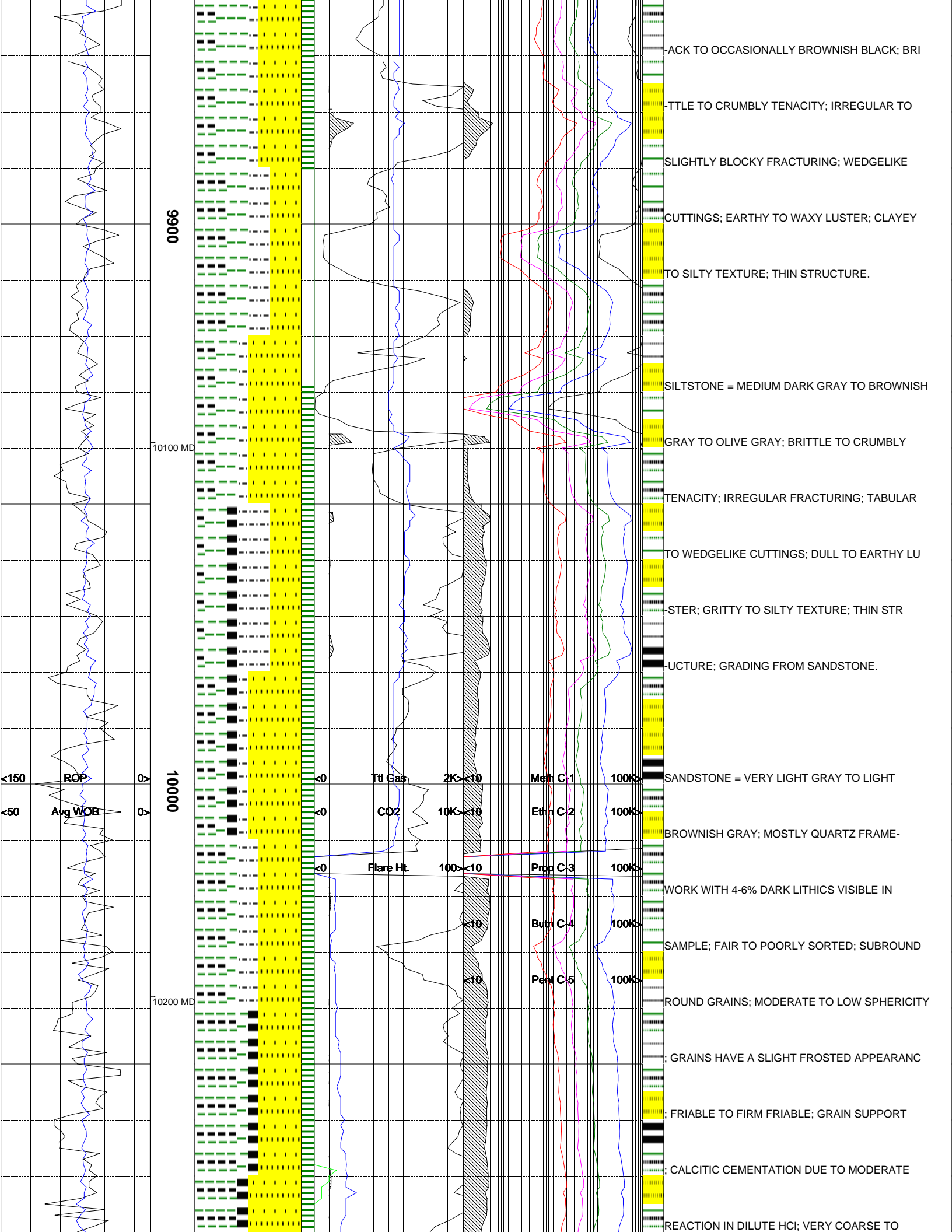
9300

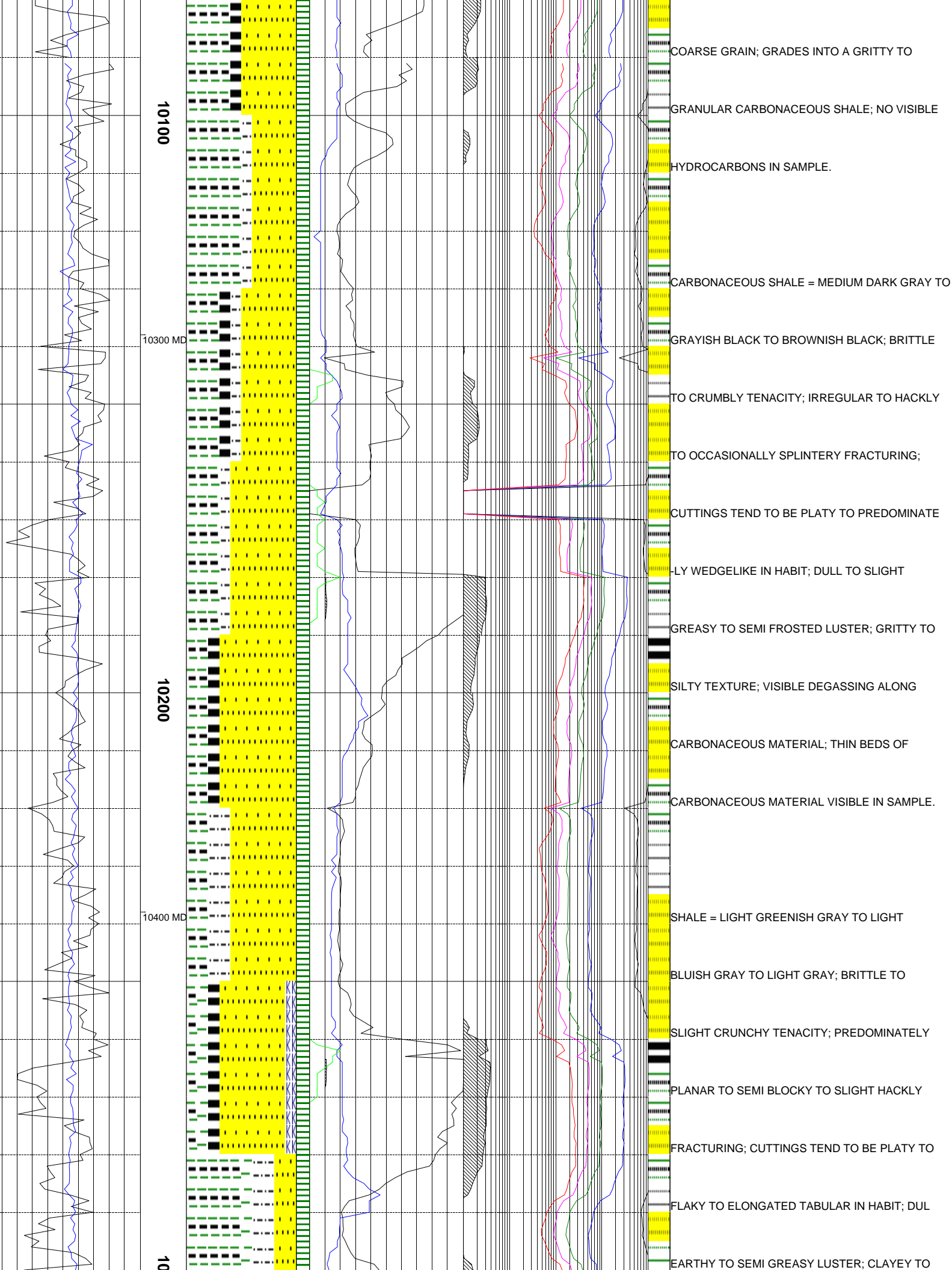
9500 MD

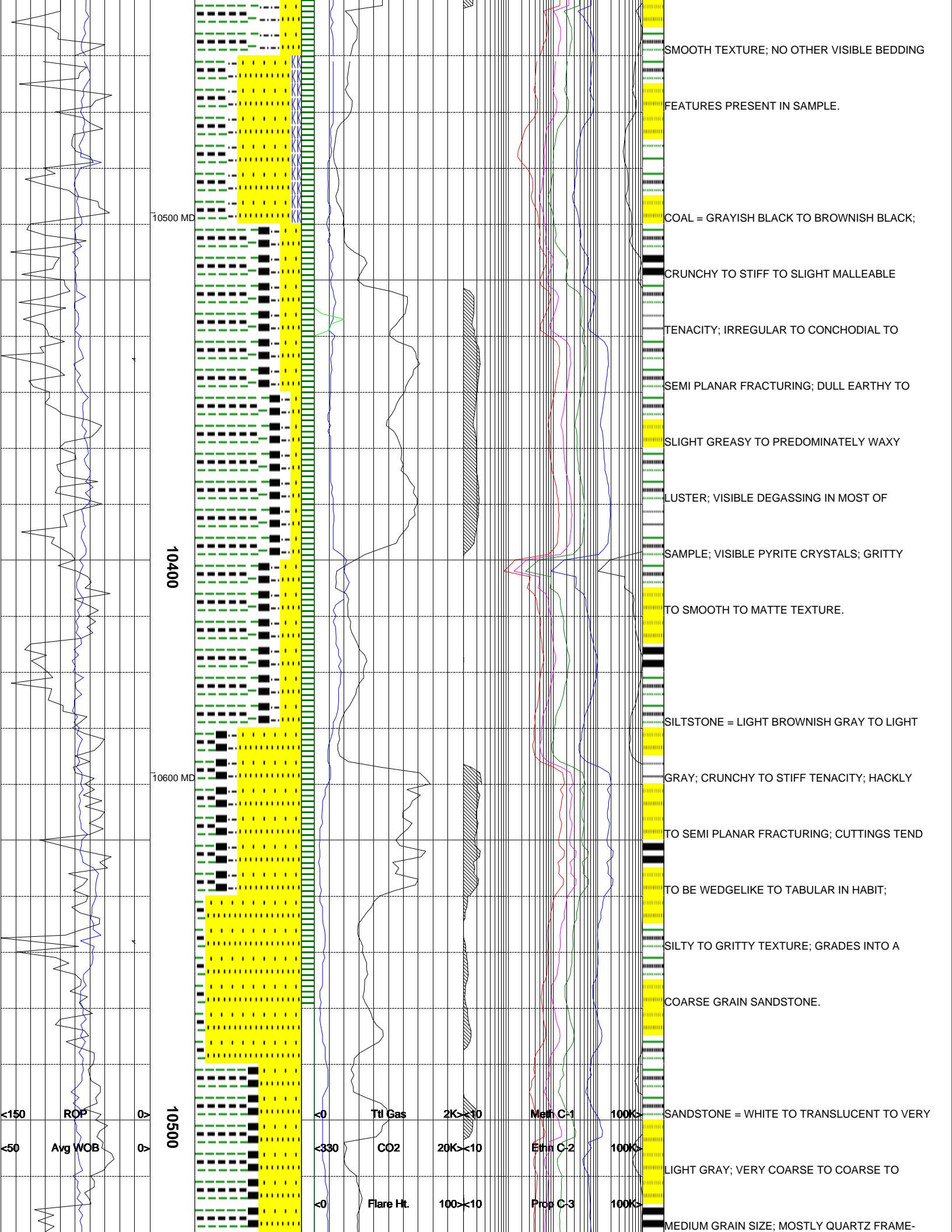
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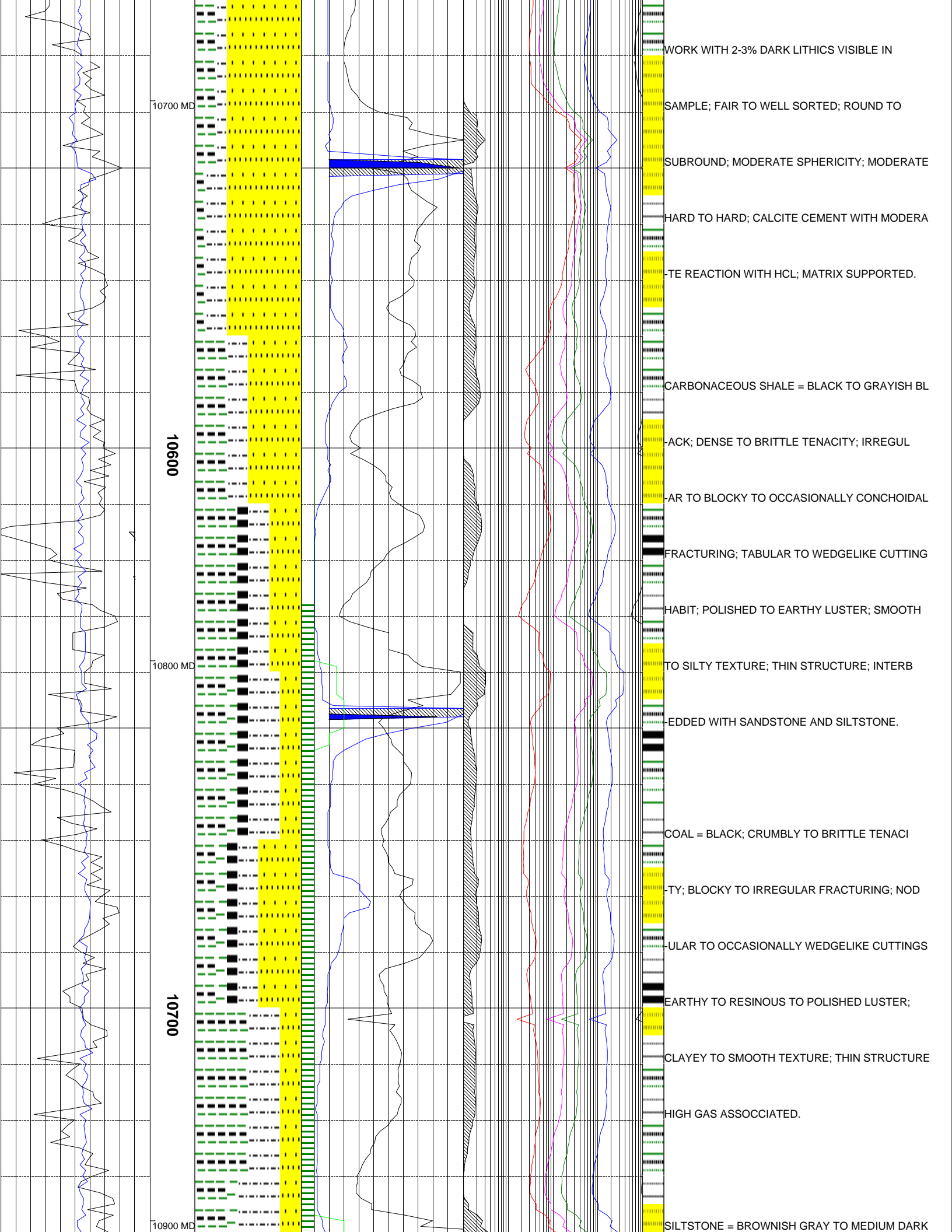


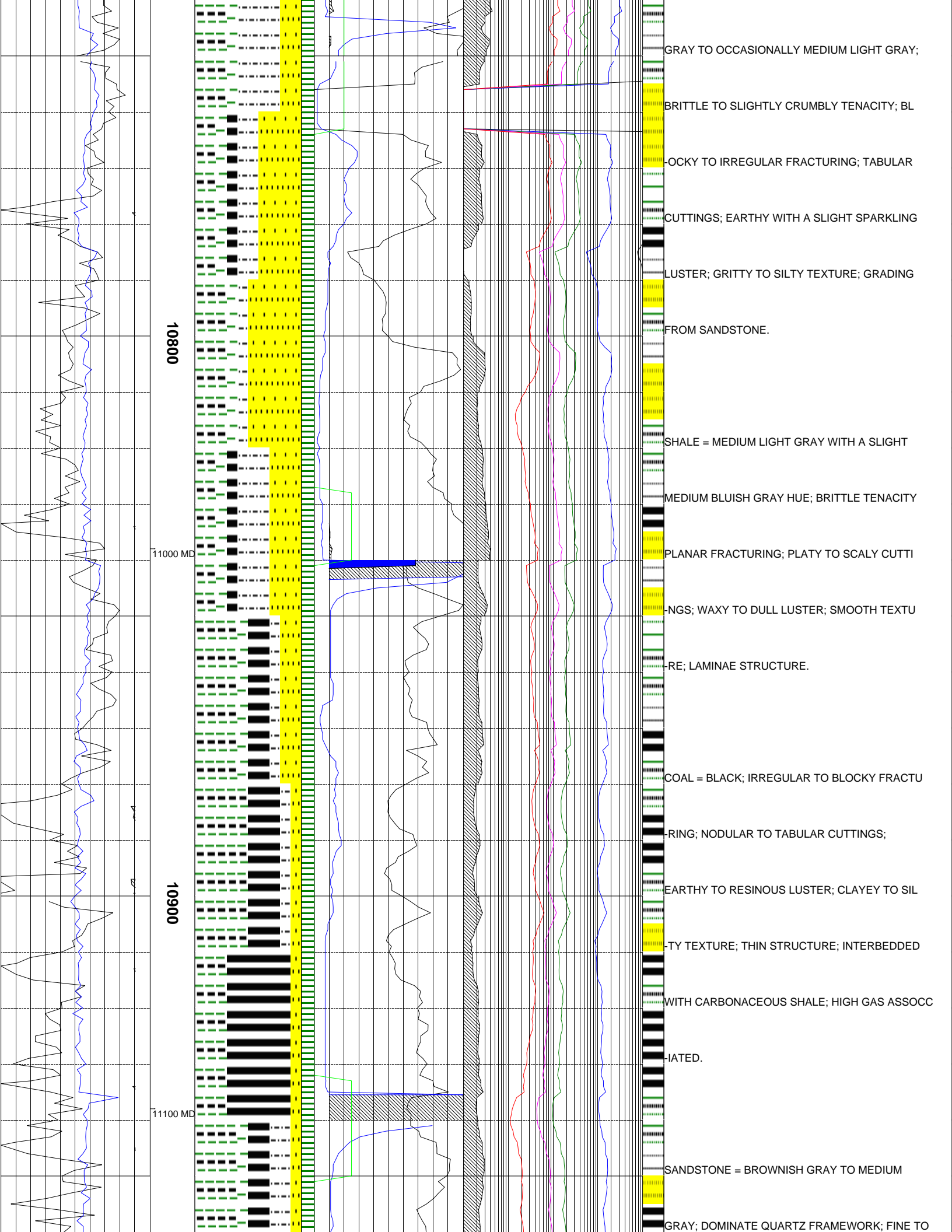












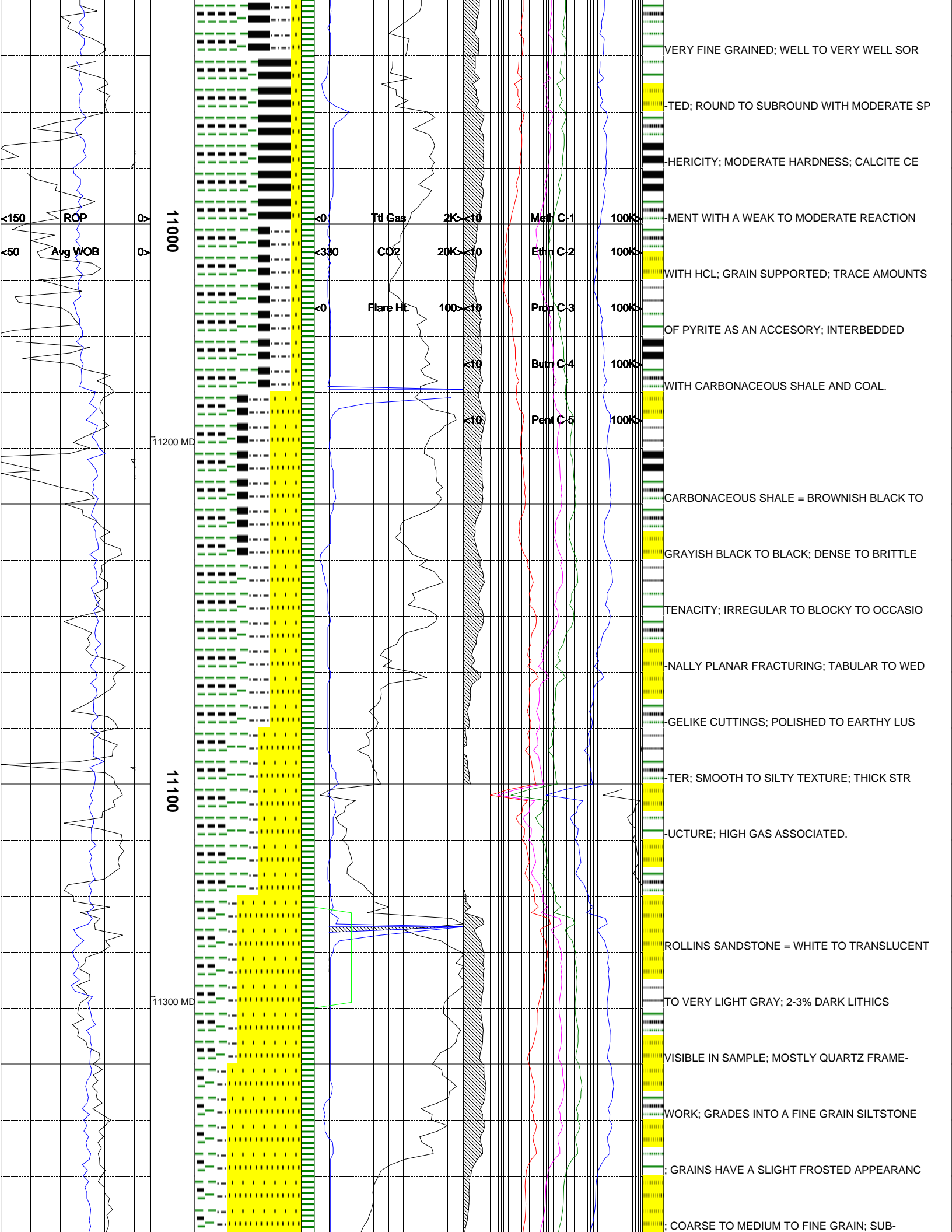
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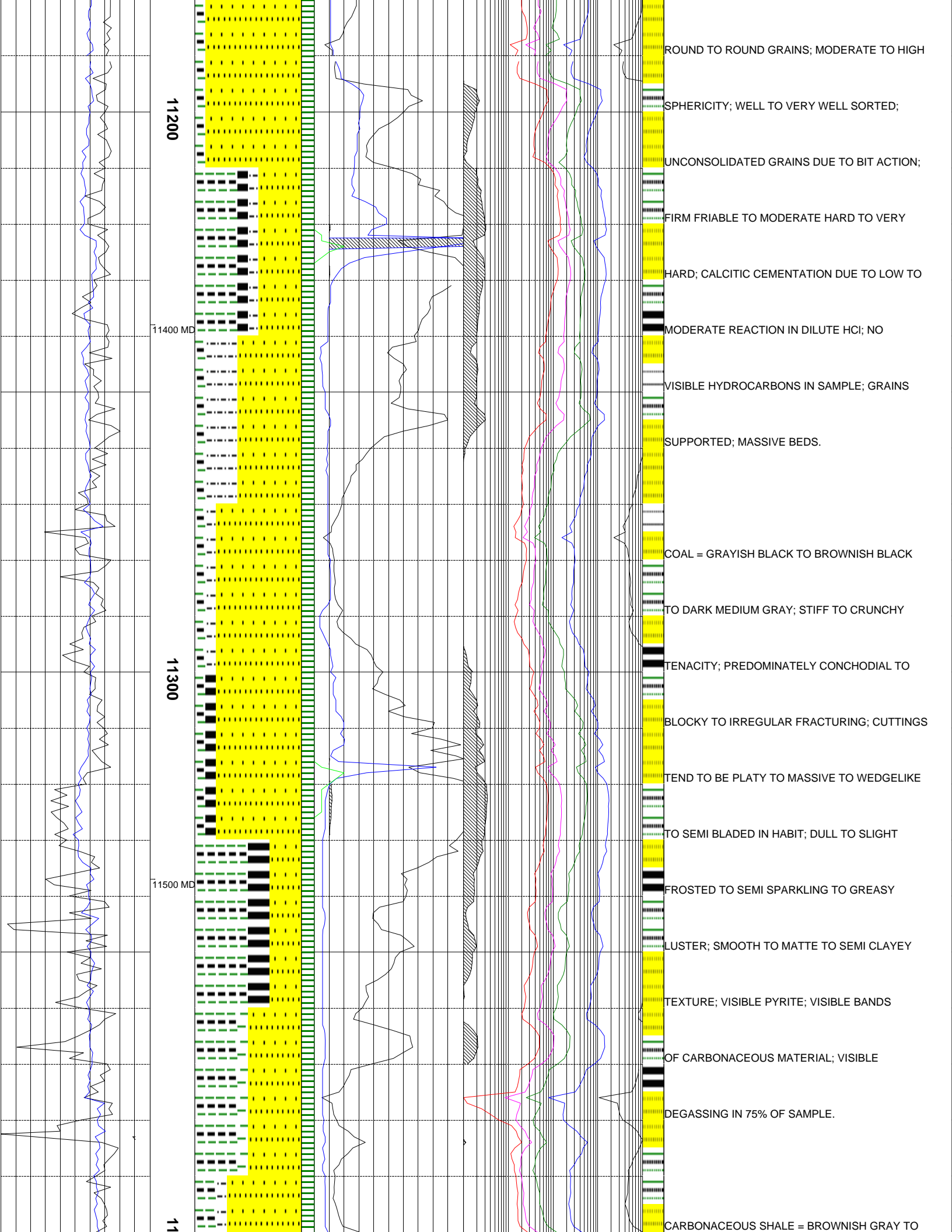
11000 MD

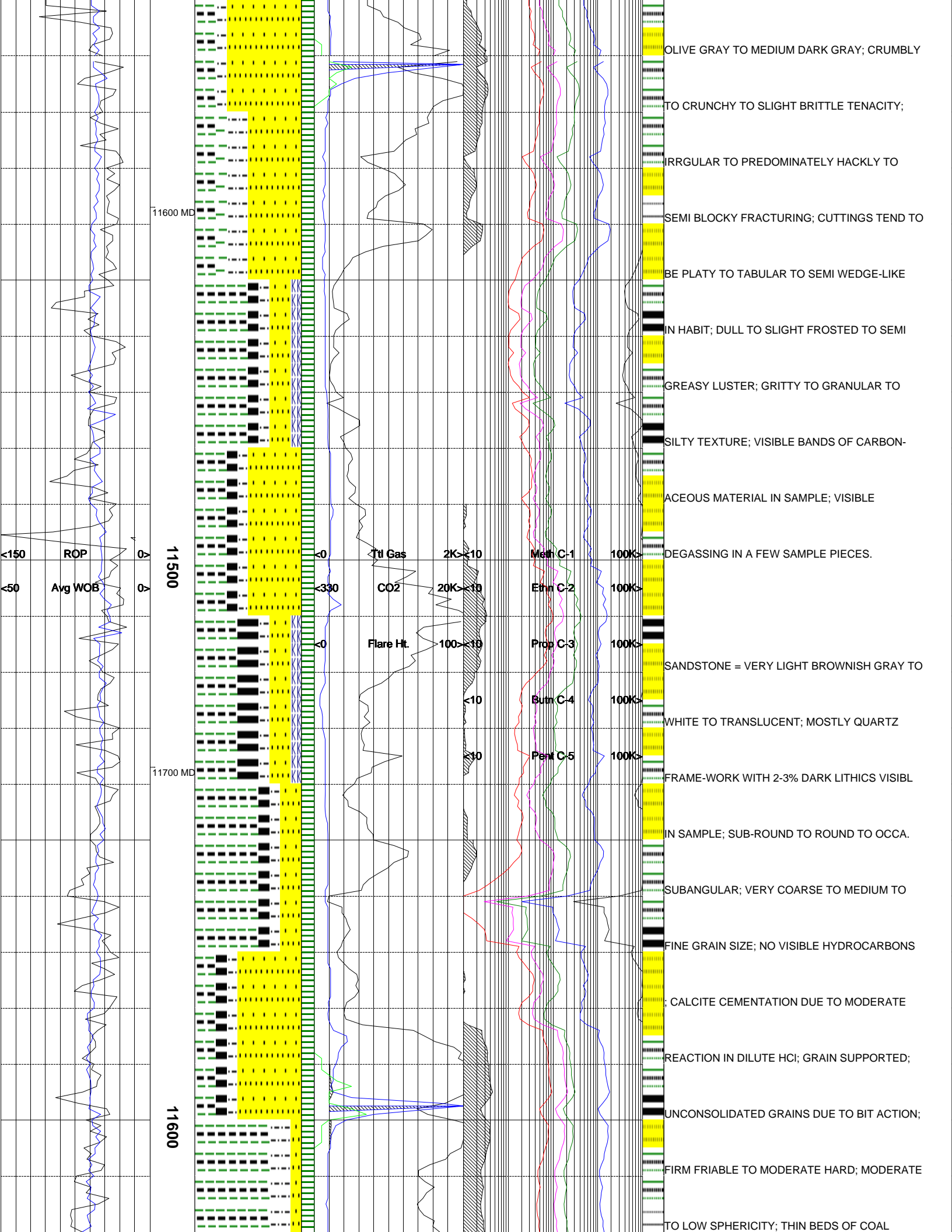
10900

11100 MD

GRAY TO OCCASIONALLY MEDIUM LIGHT GRAY;
 BRITTLE TO SLIGHTLY CRUMBLY TENACITY; BL
 BLOCKY TO IRREGULAR FRACTURING; TABULAR
 CUTTINGS; EARTHY WITH A SLIGHT SPARKLING
 LUSTER; GRITTY TO SILTY TEXTURE; GRADING
 FROM SANDSTONE.
 SHALE = MEDIUM LIGHT GRAY WITH A SLIGHT
 MEDIUM BLUISH GRAY HUE; BRITTLE TENACITY
 PLANAR FRACTURING; PLATY TO SCALY CUTTI
 NGS; WAXY TO DULL LUSTER; SMOOTH TEXTU
 RE; LAMINAE STRUCTURE.
 COAL = BLACK; IRREGULAR TO BLOCKY FRACTU
 RING; NODULAR TO TABULAR CUTTINGS;
 EARTHY TO RESINOUS LUSTER; CLAYEY TO SIL
 TY TEXTURE; THIN STRUCTURE; INTERBEDDED
 WITH CARBONACEOUS SHALE; HIGH GAS ASSOCC
 IATED.
 SANDSTONE = BROWNISH GRAY TO MEDIUM
 GRAY; DOMINATE QUARTZ FRAMEWORK; FINE TO







11600 MD

11500

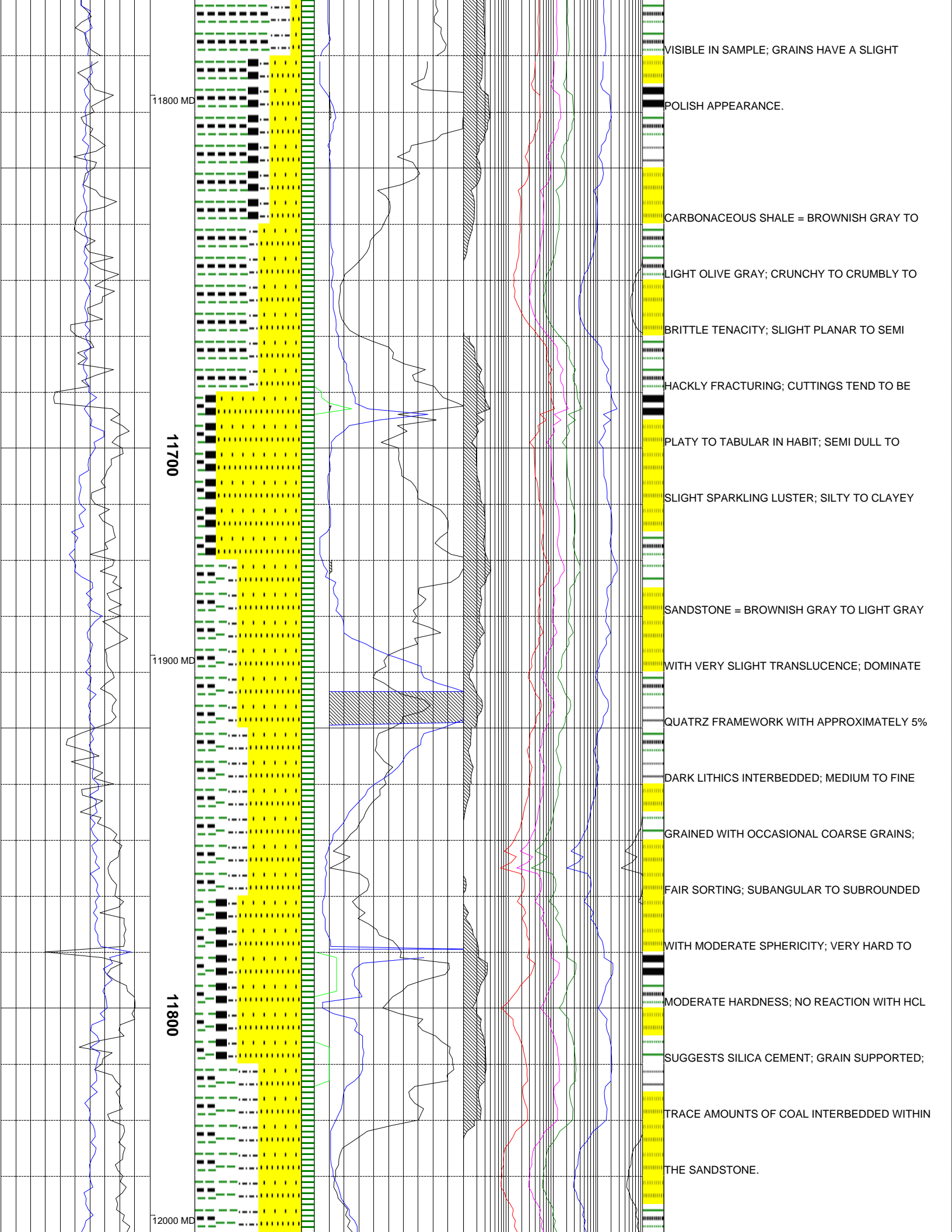
11700 MD

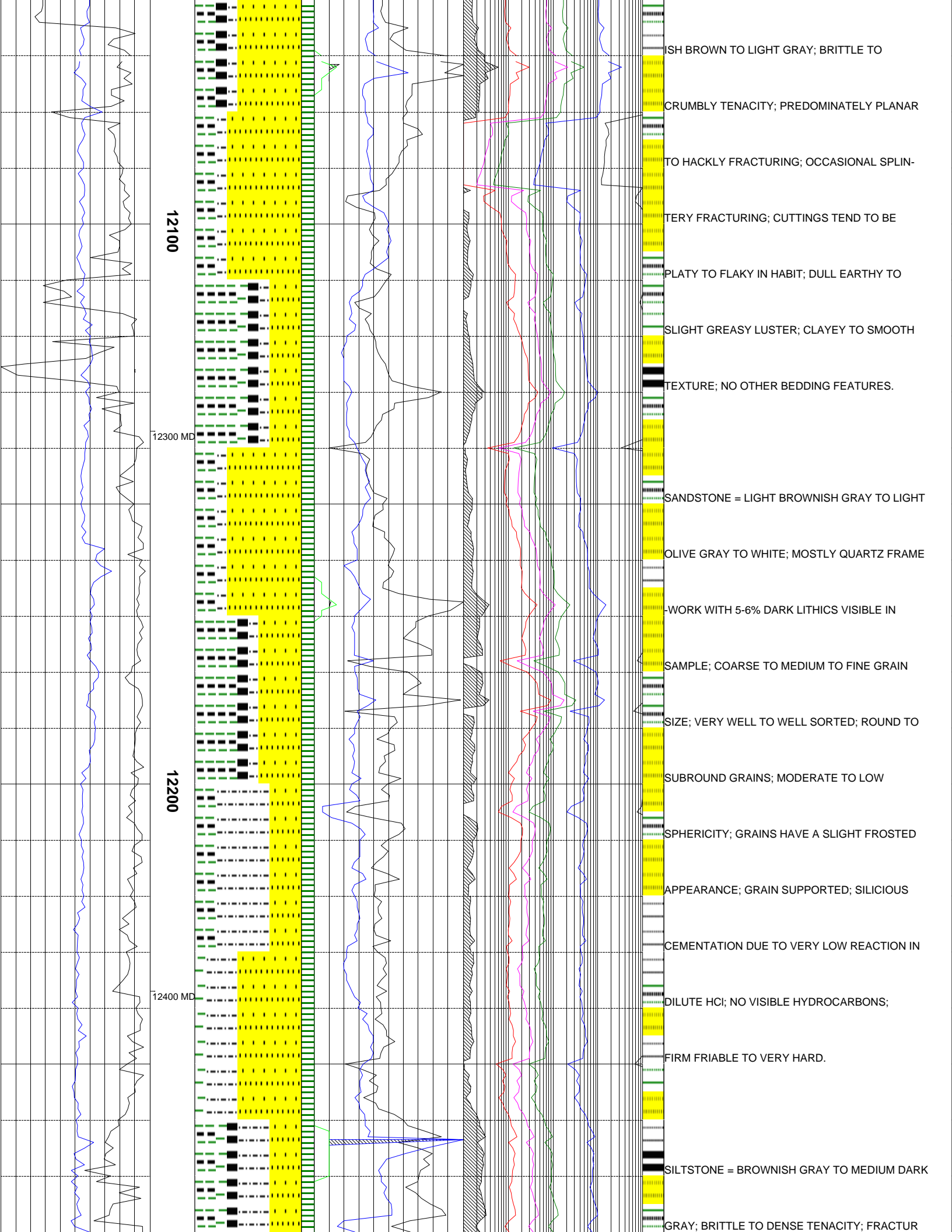
11600

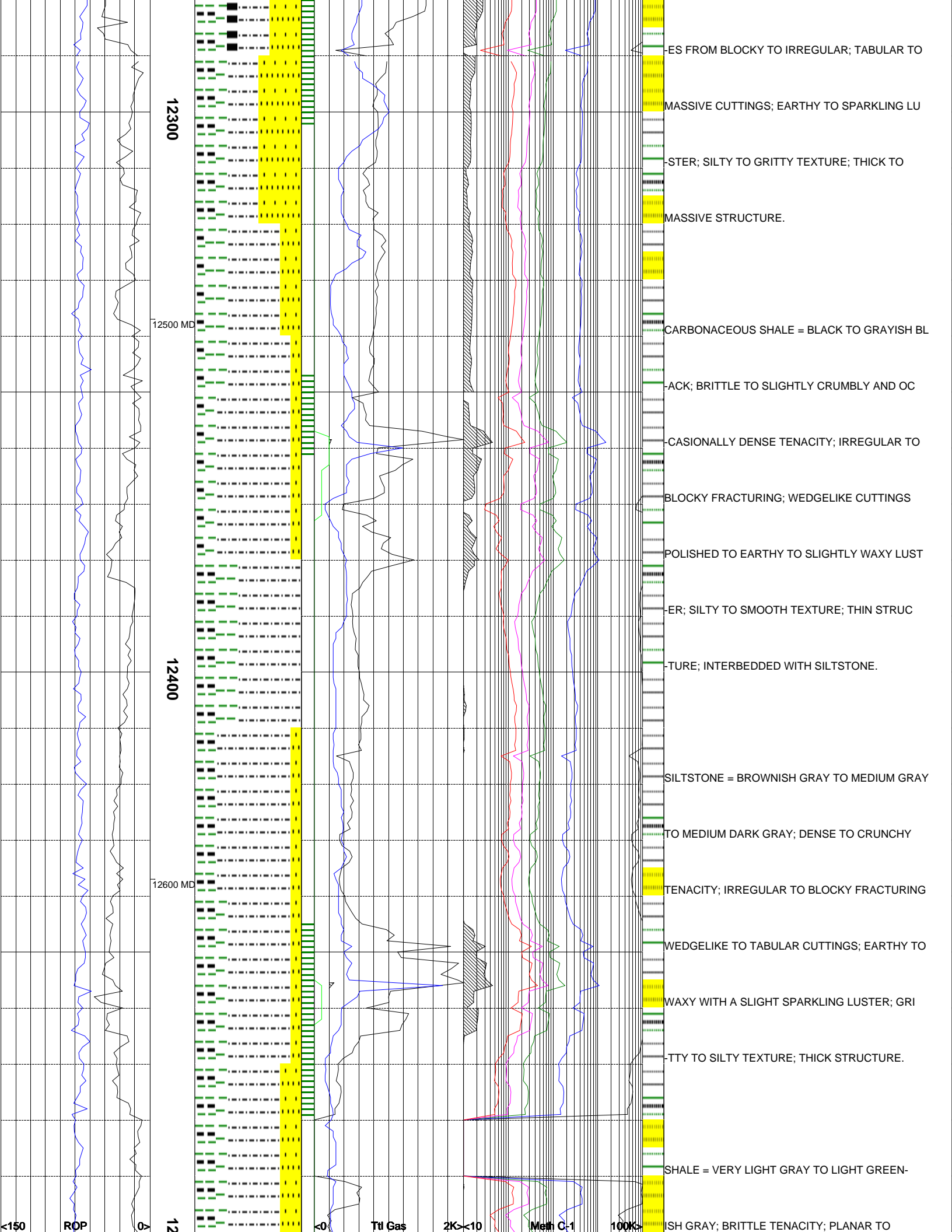
<150 ROP
<50 Avg WOB

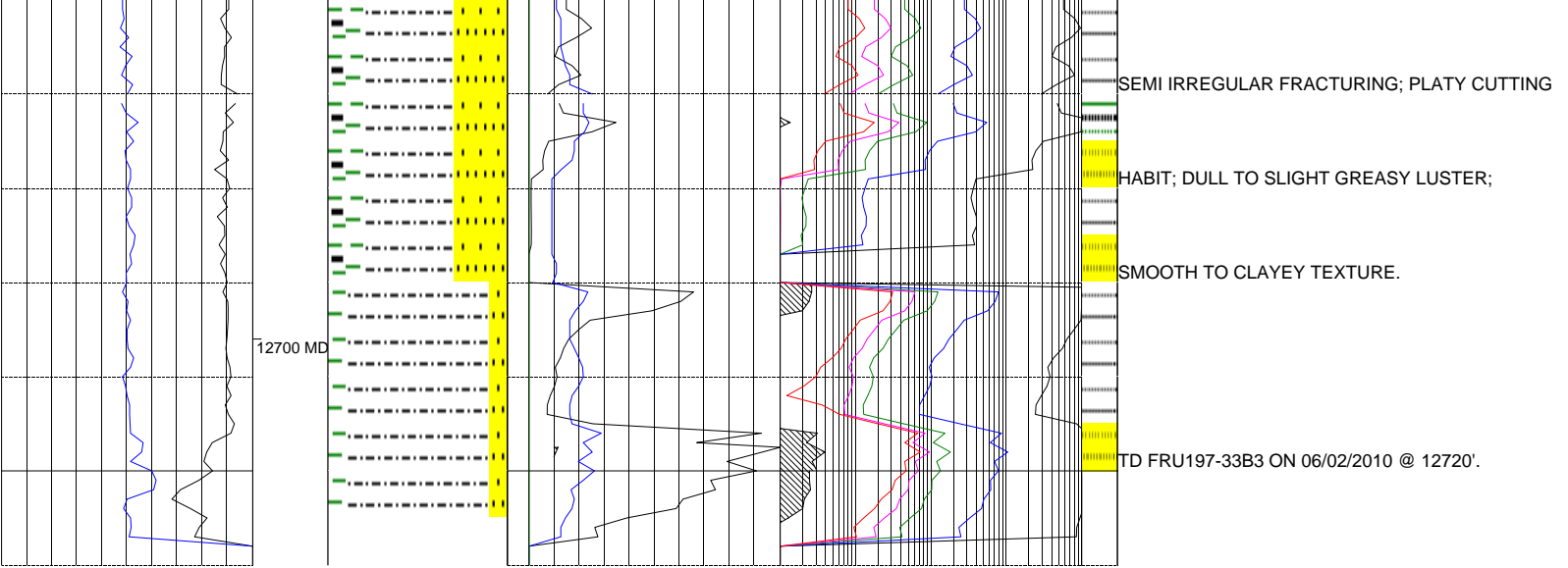
Total Gas 2K < 10
CO2 20K > 10
Flare Ht. 100 > 10
Meth C-1 100K >
Ethn C-2 100K >
Prop C-3 100K >
Butn C-4 100K >
Pent C-5 100K >

OLIVE GRAY TO MEDIUM DARK GRAY; CRUMBLY
TO CRUNCHY TO SLIGHT BRITTLE TENACITY;
IRREGULAR TO PREDOMINATELY HACKLY TO
SEMI BLOCKY FRACTURING; CUTTINGS TEND TO
BE PLATY TO TABULAR TO SEMI WEDGE-LIKE
IN HABIT; DULL TO SLIGHT FROSTED TO SEMI
GREASY LUSTER; GRITTY TO GRANULAR TO
SILTY TEXTURE; VISIBLE BANDS OF CARBON-
ACEOUS MATERIAL IN SAMPLE; VISIBLE
DEGASSING IN A FEW SAMPLE PIECES.
SANDSTONE = VERY LIGHT BROWNISH GRAY TO
WHITE TO TRANSLUCENT; MOSTLY QUARTZ
FRAME-WORK WITH 2-3% DARK LITHICS VISIBL
IN SAMPLE; SUB-ROUND TO ROUND TO OCCA.
SUBANGULAR; VERY COARSE TO MEDIUM TO
FINE GRAIN SIZE; NO VISIBLE HYDROCARBONS
; CALCITE CEMENTATION DUE TO MODERATE
REACTION IN DILUTE HCl; GRAIN SUPPORTED;
UNCONSOLIDATED GRAINS DUE TO BIT ACTION;
FIRM FRIABLE TO MODERATE HARD; MODERATE
TO LOW SPHERICITY; THIN BEDS OF COAL









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