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
WELL	PCU-297-11B1
FIELD	PICEANCE CREEK
REGION	ROCKY MT
COORDINATES	LAT.39.879628000
	LON.108.240365000
ELEVATION	GL = 7126'
	KB = 7143'
COUNTY, STATE	RIO BLANCO CO. CO
API INDEX	051031137800
SPUD DATE	04/10/2009
CONTRACTOR	HELMERICH PAYNE
CO. REP.	RICKY T. OWENS
RIG/TYPE	FLEX 3
LOGGING UNIT	MLU038
GEOLOGISTS	GEORGE BAKER
	BRENDA MARSH
ADD. PERSONS	BILL JOHANNING
	DEVIN CLAAR
CO. GEOLOGIST	MICHAEL HOWELL

LOG INTERVAL

DEPTHS:	3960'	**TO**	8976'
DATES:	09/21/2009	**TO**	09/26/2009
SCALE:	5" = 100'		

MUD TYPES

LSND	**TO**	8976'
	TO	
	TO	
	TO	

CASING DATA

16"	**AT**	130'
10.75"	**AT**	3953'
	AT	
	AT	

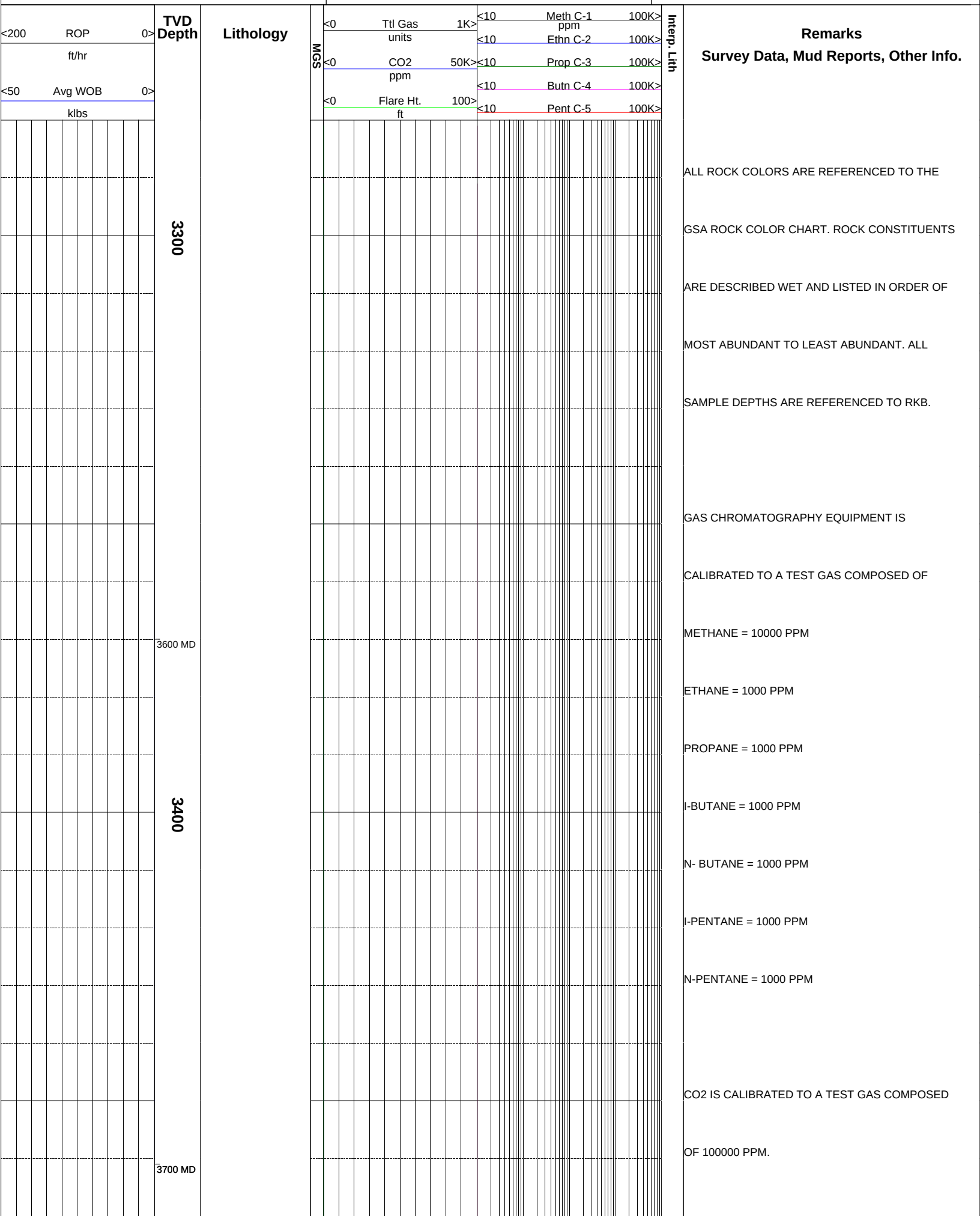
HOLE SIZE

9.875"	**TO**	8976'
	TO	
	TO	
	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		

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
SALT
SAND
SANDSTONE
SANDSTONE-TUFFACEOUS
SERICITIZATION
SERPENTINE
SHALE
SHALE TUFFACEOUS
SHELL FRAGMENTS
SIDERITE
SILICIFICATION
SILTSTONE
SILTST-TUFFACEOUS
TUFF
VOLCANICLASTICS SEDS
VOLCANICS



Remarks
Survey Data, Mud Reports, Other Info.

ALL ROCK COLORS ARE REFERENCED TO THE GSA ROCK COLOR CHART. ROCK CONSTITUENTS ARE DESCRIBED WET AND LISTED IN ORDER OF MOST ABUNDANT TO LEAST ABUNDANT. ALL SAMPLE DEPTHS ARE REFERENCED TO RKB.

GAS CHROMATOGRAPHY EQUIPMENT IS CALIBRATED TO A TEST GAS COMPOSED OF

METHANE = 10000 PPM

ETHANE = 1000 PPM

PROPANE = 1000 PPM

I-BUTANE = 1000 PPM

N- BUTANE = 1000 PPM

I-PENTANE = 1000 PPM

N-PENTANE = 1000 PPM

CO2 IS CALIBRATED TO A TEST GAS COMPOSED OF 100000 PPM.

<200 ROP 0>

<50 Avg WOB 0>

3500

<0 Ttl Gas 100>

<0 CO2 100>

<0 Flare Ht. 100>

<10 Meth C-1 100K>

<10 Ethn C-2 100K>

<10 Prop C-3 100K>

<10 Butn C-4 100K>

<10 Pent C-5 100K>

3800 MD

3600

3900 MD

1 UNIT OF GAS = 200 PPM C-1 ME

CONNECTION GAS, TRIP GAS AND WIPER GAS ARE NOTED ON THE MUD LOG. FLARE HEIGHTS AND DEPTHS OF GAS BUSTER USEAGE ARE ALSO NOTED.

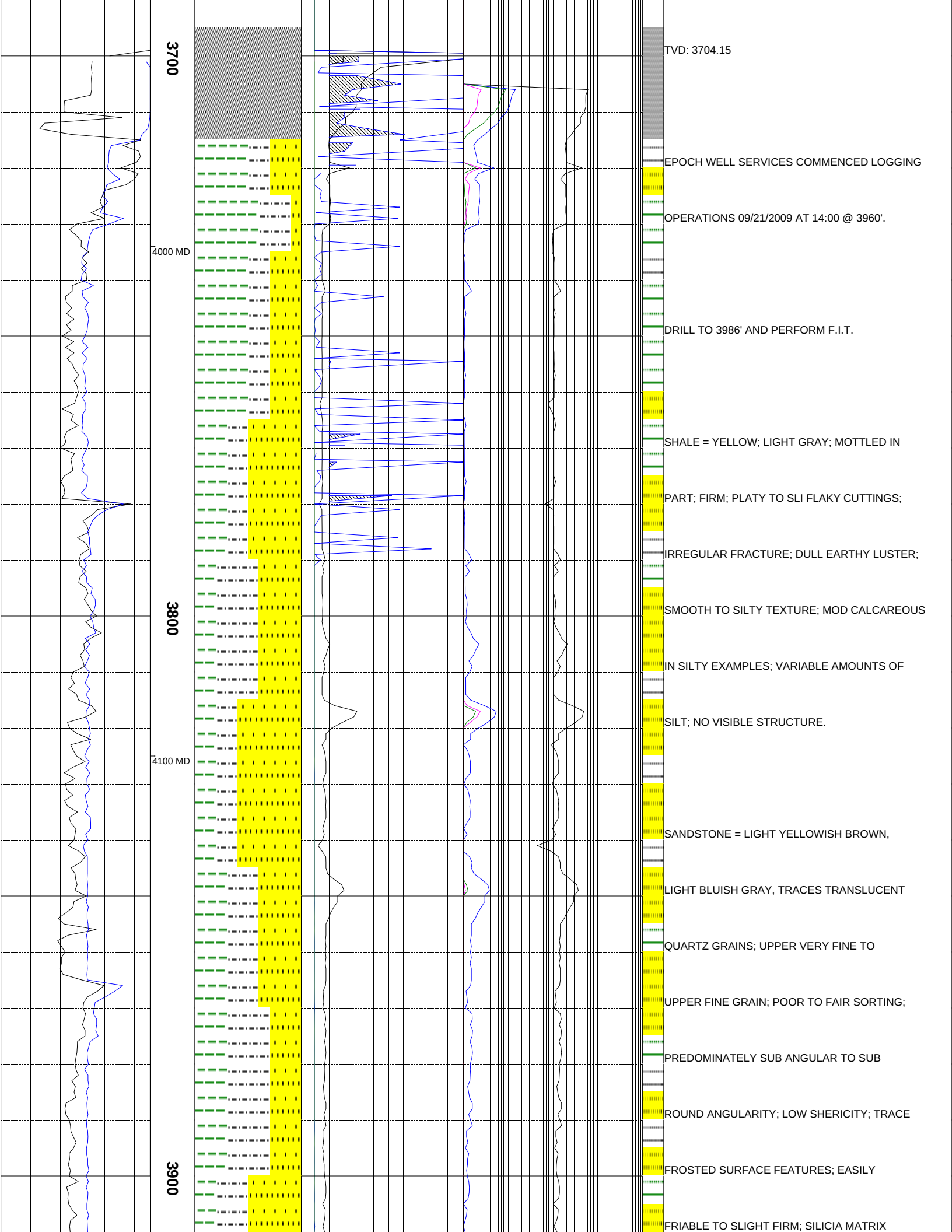
EARLY CONNECTION GASES REPRESENTING UP HOLE GAS INTERVALS BLEEDING INTO THE BOREHOLE ARE COMMON IN THE PRODUCTION INTERVAL.

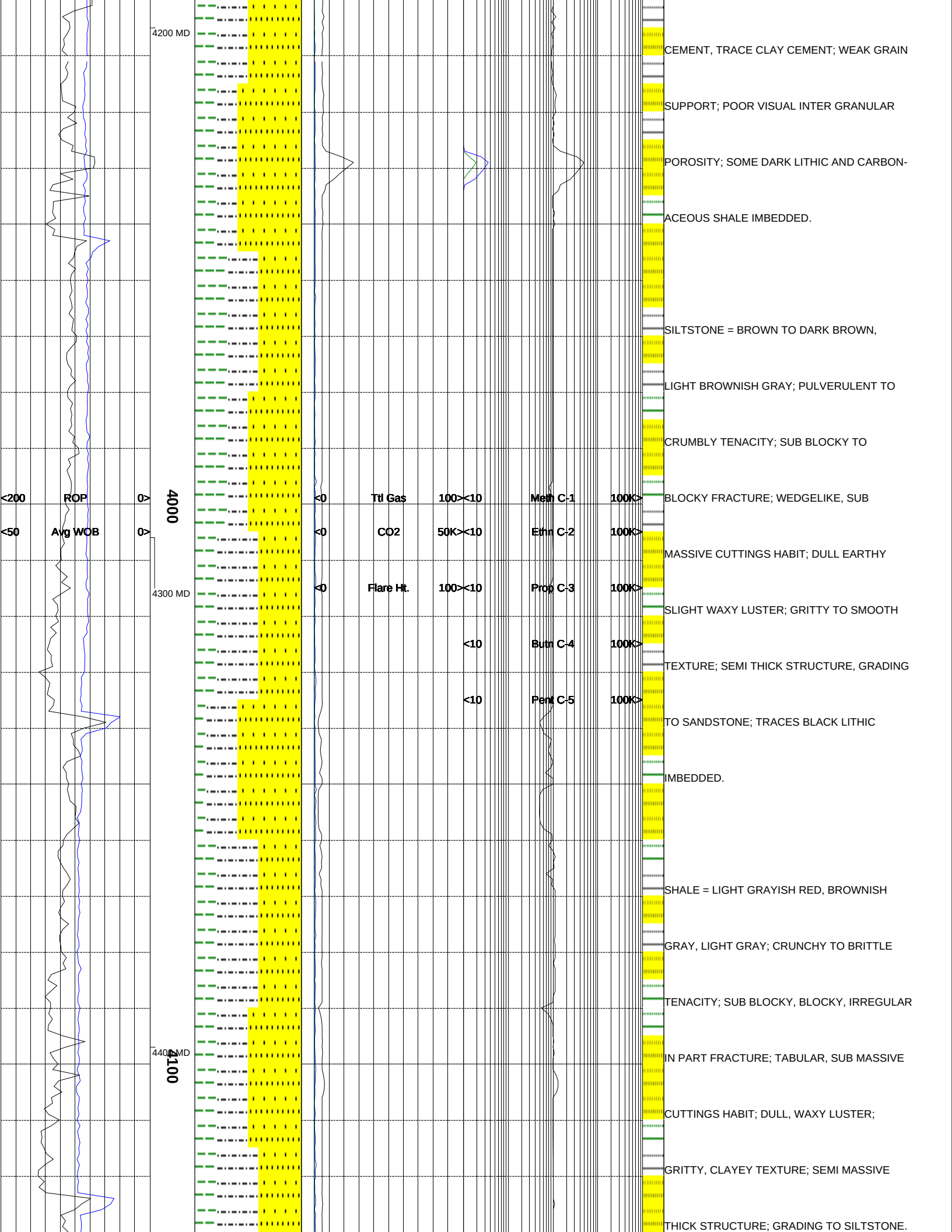
EVIDENCE OF FRACTURE FILL IS NOTED ON THE LOG USING THE LITHOLOGY SYMBOL FOR METAMORPHICS. THE 10% DOES NOT REPRESENT 10% FRACTURE FILL IN SAMPLE. IT ONLY INDICATES THAT FRACTURE FILL HAS BEEN OBSERVED OVER THE INTERVAL.

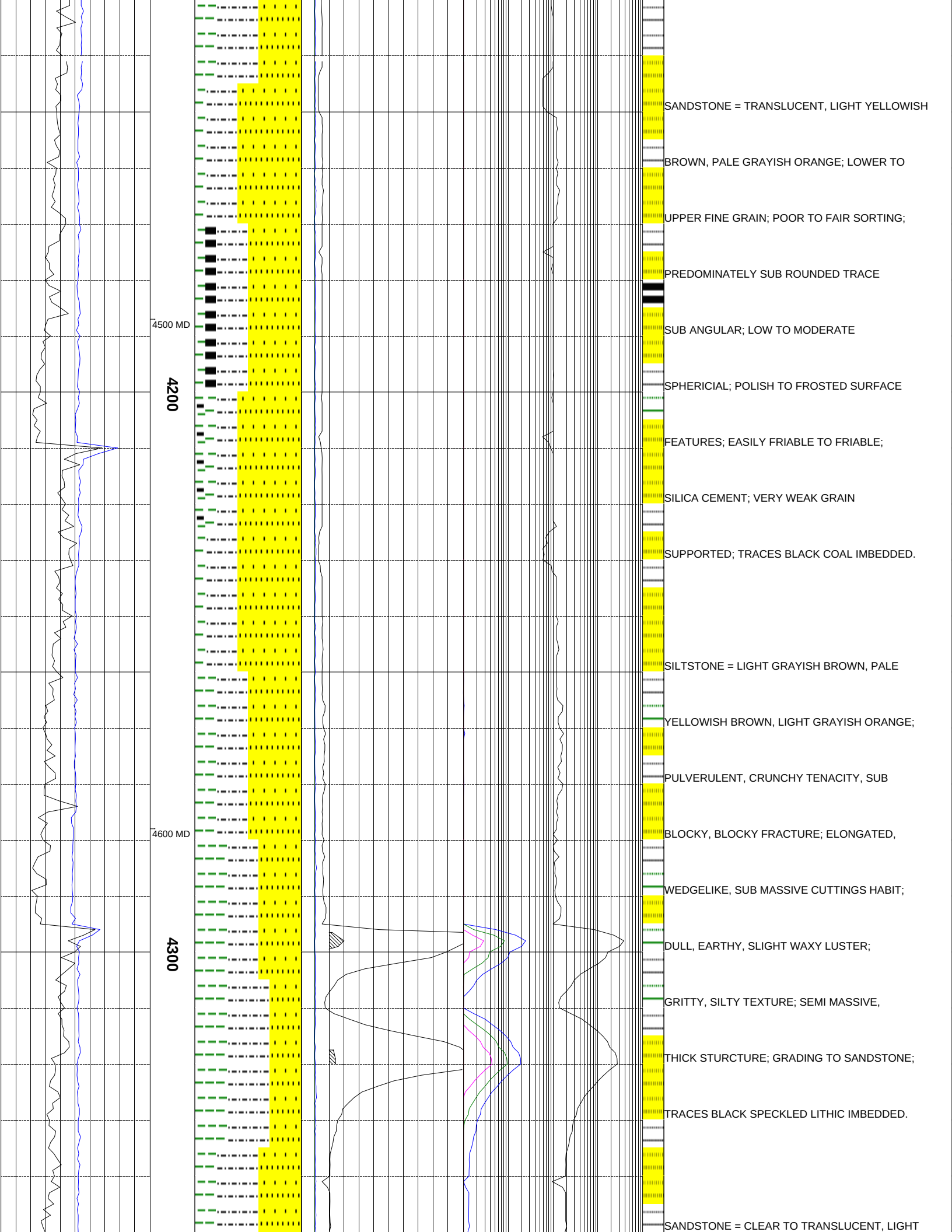
SURVEY DATA @ 3968'

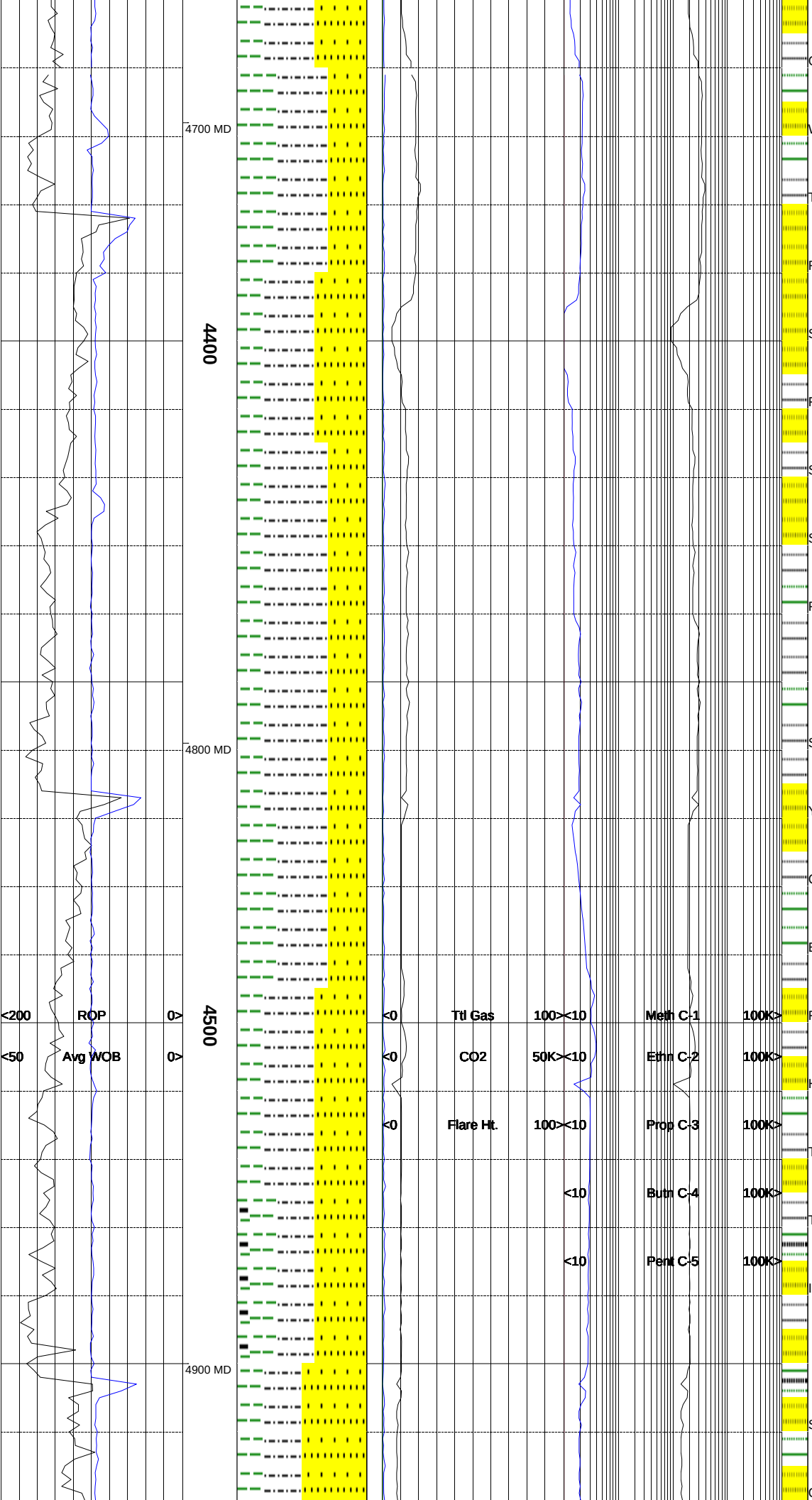
INC. 25.05

AZIMUTH: 187.66


3700
4000 MD
3800
4100 MD
3900
TVD: 3704.15
EPOCH WELL SERVICES COMMENCED LOGGING
OPERATIONS 09/21/2009 AT 14:00 @ 3960'.
DRILL TO 3986' AND PERFORM F.I.T.
SHALE = YELLOW; LIGHT GRAY; MOTTLED IN
PART; FIRM; PLATY TO SLI FLAKY CUTTINGS;
IRREGULAR FRACTURE; DULL EARTHY LUSTER;
SMOOTH TO SILTY TEXTURE; MOD CALCAREOUS
IN SILTY EXAMPLES; VARIABLE AMOUNTS OF
SILT; NO VISIBLE STRUCTURE.
SANDSTONE = LIGHT YELLOWISH BROWN,
LIGHT BLUISH GRAY, TRACES TRANSLUCENT
QUARTZ GRAINS; UPPER VERY FINE TO
UPPER FINE GRAIN; POOR TO FAIR SORTING;
PREDOMINATELY SUB ANGULAR TO SUB
ROUND ANGULARITY; LOW SHERICITY; TRACE
FROSTED SURFACE FEATURES; EASILY
FRIABLE TO SLIGHT FIRM; SILICIA MATRIX


4200 MD
4000
4300 MD
4100
4400 MD
<200
ROP
0>
<50
Avg WOB
0>
<0
Ttl Gas
100><10
Meth C-1
100K>
<0
CO2
50K><10
Ethn C-2
100K>
<0
Flare Ht.
100><10
Prop C-3
100K>
<10
Butn C-4
100K>
<10
Pent C-5
100K>
CEMENT, TRACE CLAY CEMENT; WEAK GRAIN
SUPPORT; POOR VISUAL INTER GRANULAR
POROSITY; SOME DARK LITHIC AND CARBON-
ACEOUS SHALE IMBEDDED.
SILTSTONE = BROWN TO DARK BROWN,
LIGHT BROWNISH GRAY; PULVERULENT TO
CRUMBLY TENACITY; SUB BLOCKY TO
BLOCKY FRACTURE; WEDGELIKE, SUB
MASSIVE CUTTINGS HABIT; DULL EARTHY
SLIGHT WAXY LUSTER; GRITTY TO SMOOTH
TEXTURE; SEMI THICK STRUCTURE, GRADING
TO SANDSTONE; TRACES BLACK LITHIC
IMBEDDED.
SHALE = LIGHT GRAYISH RED, BROWNISH
GRAY, LIGHT GRAY; CRUNCHY TO BRITTLE
TENACITY; SUB BLOCKY, BLOCKY, IRREGULAR
IN PART FRACTURE; TABULAR, SUB MASSIVE
CUTTINGS HABIT; DULL, WAXY LUSTER;
GRITTY, CLAYEY TEXTURE; SEMI MASSIVE
THICK STRUCTURE; GRADING TO SILTSTONE.


4500 MD
4200
4600 MD
4300
SANDSTONE = TRANSLUCENT, LIGHT YELLOWISH
BROWN, PALE GRAYISH ORANGE; LOWER TO
UPPER FINE GRAIN; POOR TO FAIR SORTING;
PREDOMINATELY SUB ROUNDED TRACE
SUB ANGULAR; LOW TO MODERATE
SPHERICIAL; POLISH TO FROSTED SURFACE
FEATURES; EASILY FRIABLE TO FRIABLE;
SILICA CEMENT; VERY WEAK GRAIN
SUPPORTED; TRACES BLACK COAL IMBEDDED.
SILTSTONE = LIGHT GRAYISH BROWN, PALE
YELLOWISH BROWN, LIGHT GRAYISH ORANGE;
PULVERULENT, CRUNCHY TENACITY, SUB
BLOCKY, BLOCKY FRACTURE; ELONGATED,
WEDGELIKE, SUB MASSIVE CUTTINGS HABIT;
DULL, EARTHY, SLIGHT WAXY LUSTER;
GRITTY, SILTY TEXTURE; SEMI MASSIVE,
THICK STURCTURE; GRADING TO SANDSTONE;
TRACES BLACK SPECKLED LITHIC IMBEDDED.
SANDSTONE = CLEAR TO TRANSLUCENT, LIGHT



GRAYISH BLUE, OFF WHITE; QUARTZ FRAME-

WORK; LOWER TO UPPER FINE GRAIN; FAIR

TO WELL SORTED; PREDOMINATELY SUB

ROUND TO ROUND ANGULARITY; MODERATE

SPHERICITY; FROSTED TO POLISH SURFACE

FEATURE; VERY FRIABLE TO FRIABLE; SOME

SILICA MATRIX CEMENT, VERY WEAK GRAIN

SUPPORT, GOOD VISUAL INTER GRANULAR

POROSITY; BLACK SPECKLED COAL IMBEDDED.

SILTSTONE = DUSKY YELLOWISH, PALE

YELLOWISH BROWN; PULVERULENT,

CRUMBLY, SLIGHT BRITTLE TENACITY;

EARTHY, SUB BLOCKY, IRREGULAR IN PART

FRACTURE; WEDGELIKE, TABULAR CUTTINGS

HABIT; DULL, RESINOUS LUSTER; GRITTY

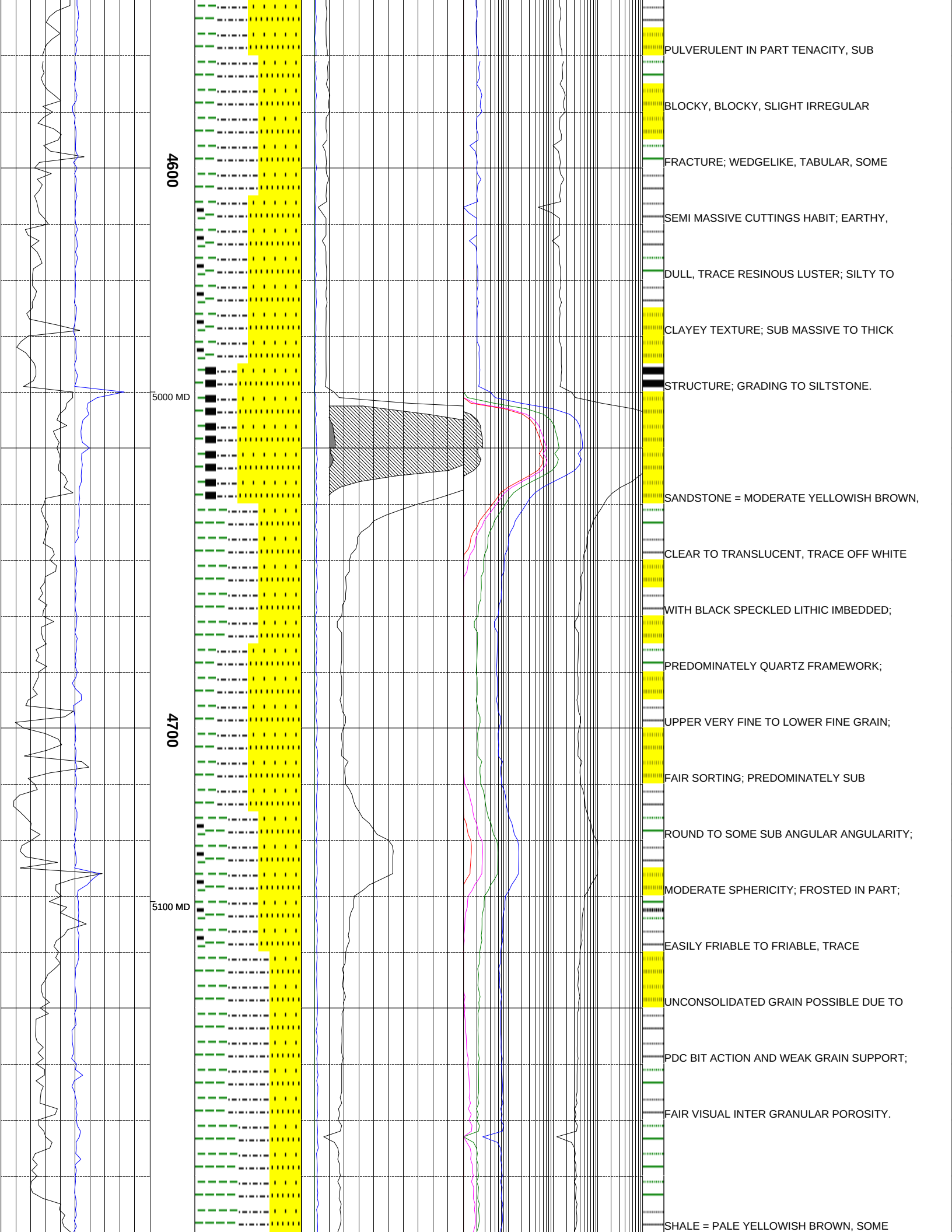
TO GRANULAR TEXTURE; SEMI MASSIVE

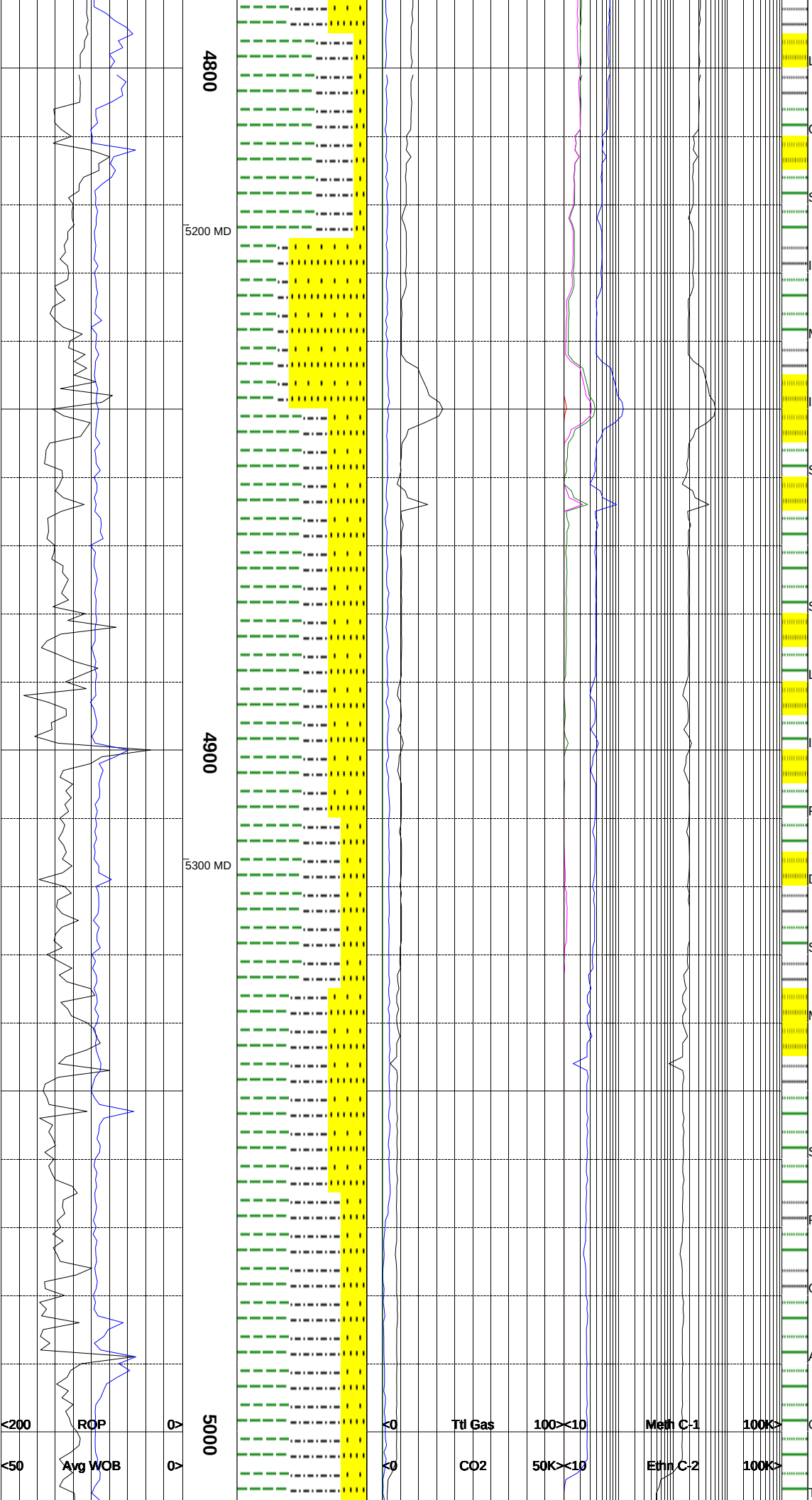
THICK STRUCTURE; TRACES BLACK LITHIC

IMBEDDED.

SHALE = MEDIUM LIGHT GRAY, LIGHT BLUISH

GRAY, SOME LIGHT BROWNISH GRAY; CRUNCHY,


4600
5000 MD
4700
5100 MD
PULVERULENT IN PART TENACITY, SUB
BLOCKY, BLOCKY, SLIGHT IRREGULAR
FRACTURE; WEDGELIKE, TABULAR, SOME
SEMI MASSIVE CUTTINGS HABIT; EARTHY,
DULL, TRACE RESINOUS LUSTER; SILTY TO
CLAYEY TEXTURE; SUB MASSIVE TO THICK
STRUCTURE; GRADING TO SILTSTONE.
SANDSTONE = MODERATE YELLOWISH BROWN,
CLEAR TO TRANSLUCENT, TRACE OFF WHITE
WITH BLACK SPECKLED LITHIC IMBEDDED;
PREDOMINATELY QUARTZ FRAMEWORK;
UPPER VERY FINE TO LOWER FINE GRAIN;
FAIR SORTING; PREDOMINATELY SUB
ROUND TO SOME SUB ANGULAR ANGULARITY;
MODERATE SPHERICITY; FROSTED IN PART;
EASILY FRIABLE TO FRIABLE, TRACE
UNCONSOLIDATED GRAIN POSSIBLE DUE TO
PDC BIT ACTION AND WEAK GRAIN SUPPORT;
FAIR VISUAL INTER GRANULAR POROSITY.
SHALE = PALE YELLOWISH BROWN, SOME



LIGHT BROWNISH GRAY; MODERATE LIGHT

GRAY; MALLEABLE TO CRUNCHY TENACITY;

SUB BLOCKY TO BLOCKY, SOME IRREGULAR

IN PART FRACTURE; WEDGELIKE, SEMI

MASSIVE CUTTINGS HABIT; DULL, WAXY IN

IN PART LUSTER; SILTY TO CLAYEY TEXTURE;

SUB MASSIVE TO SLIGHTLY THICK STRUCTURE.

SILTSTONE = YELLOWISH BROWN TO

LIGHT YELLOW GRAY; SME GRAY; MOTTLED

IN PART; MASSIVE TO WEDGELIKE TO SLI

PLATY; FIRM; BLOCKY TO IRREGULAR FRAC;

DULL EARTHY LUSTER; SILTY TEXTURE;

SLI TO MODERATELY CALCAREOUS; VF

MICA; THINLY BEDDED.

SANDSTONE = ABUNDANT LOOSE GRAINS;

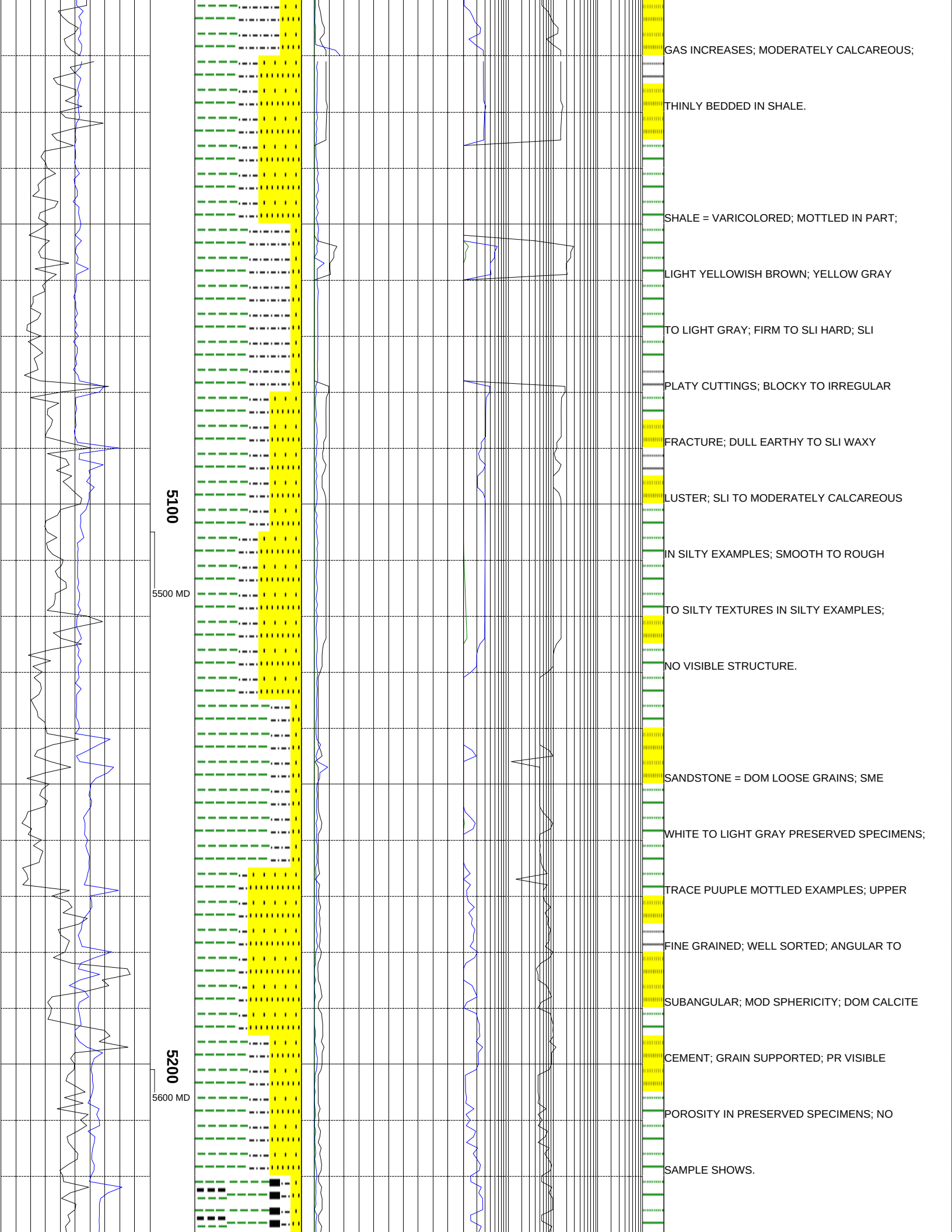
PRESERVED SPECIMENS WHITE TO LIGHT

GRAY; LOWER MEDIUM TO FINE GRAINED;

ANGULAR TO SUBANGULAR; DOM CALCITE

CEMENT; MODERATELY WELL SORTED;

TRACE GREEN GRAINS; ASSOCIATED W/



GAS INCREASES; MODERATELY CALCAREOUS;

THINLY BEDDED IN SHALE.

SHALE = VARICOLORED; MOTTLED IN PART;

LIGHT YELLOWISH BROWN; YELLOW GRAY

TO LIGHT GRAY; FIRM TO SLI HARD; SLI

PLATY CUTTINGS; BLOCKY TO IRREGULAR

FRACTURE; DULL EARTHY TO SLI WAXY

LUSTER; SLI TO MODERATELY CALCAREOUS

IN SILTY EXAMPLES; SMOOTH TO ROUGH

TO SILTY TEXTURES IN SILTY EXAMPLES;

NO VISIBLE STRUCTURE.

SANDSTONE = DOM LOOSE GRAINS; SME

WHITE TO LIGHT GRAY PRESERVED SPECIMENS;

TRACE PUUPLE MOTTLED EXAMPLES; UPPER

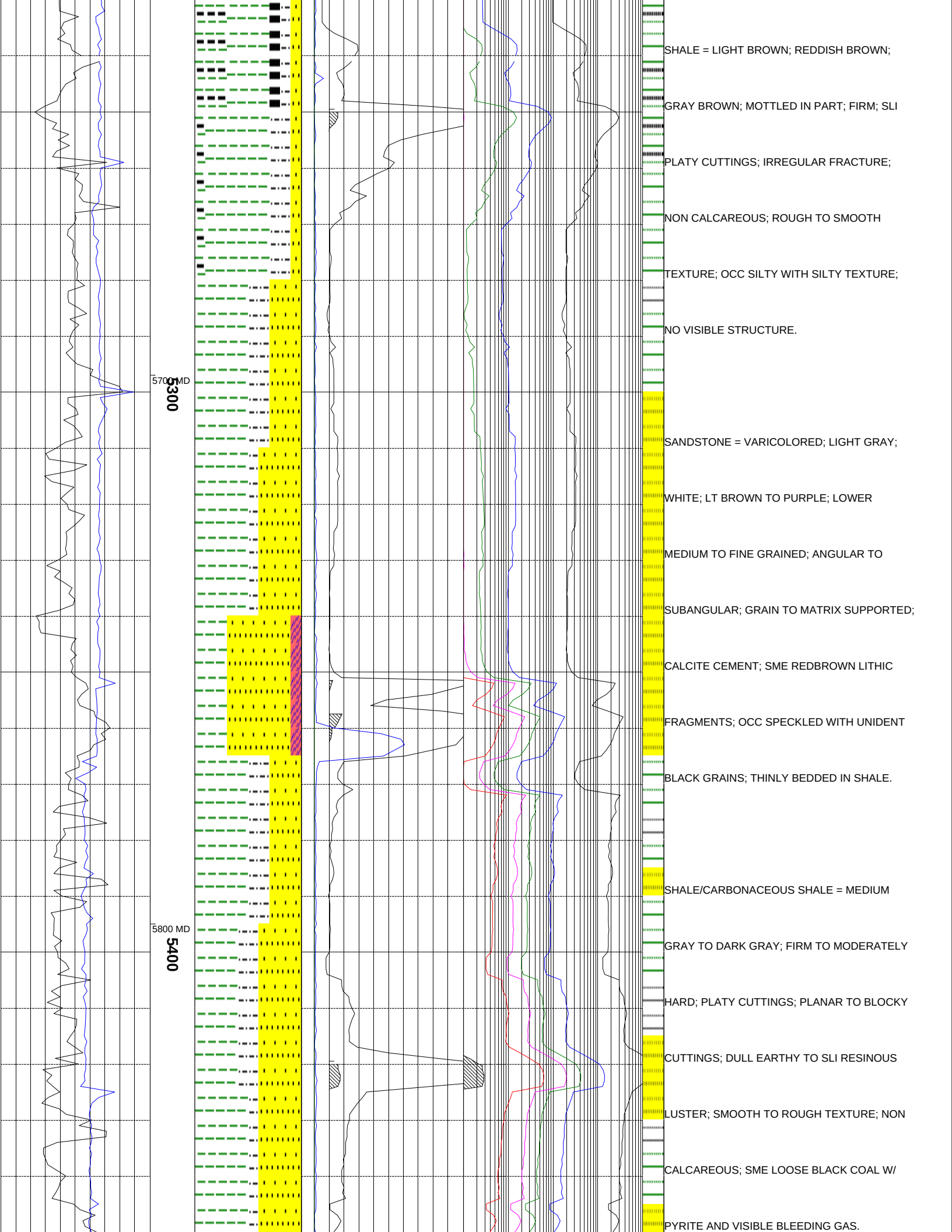
FINE GRAINED; WELL SORTED; ANGULAR TO

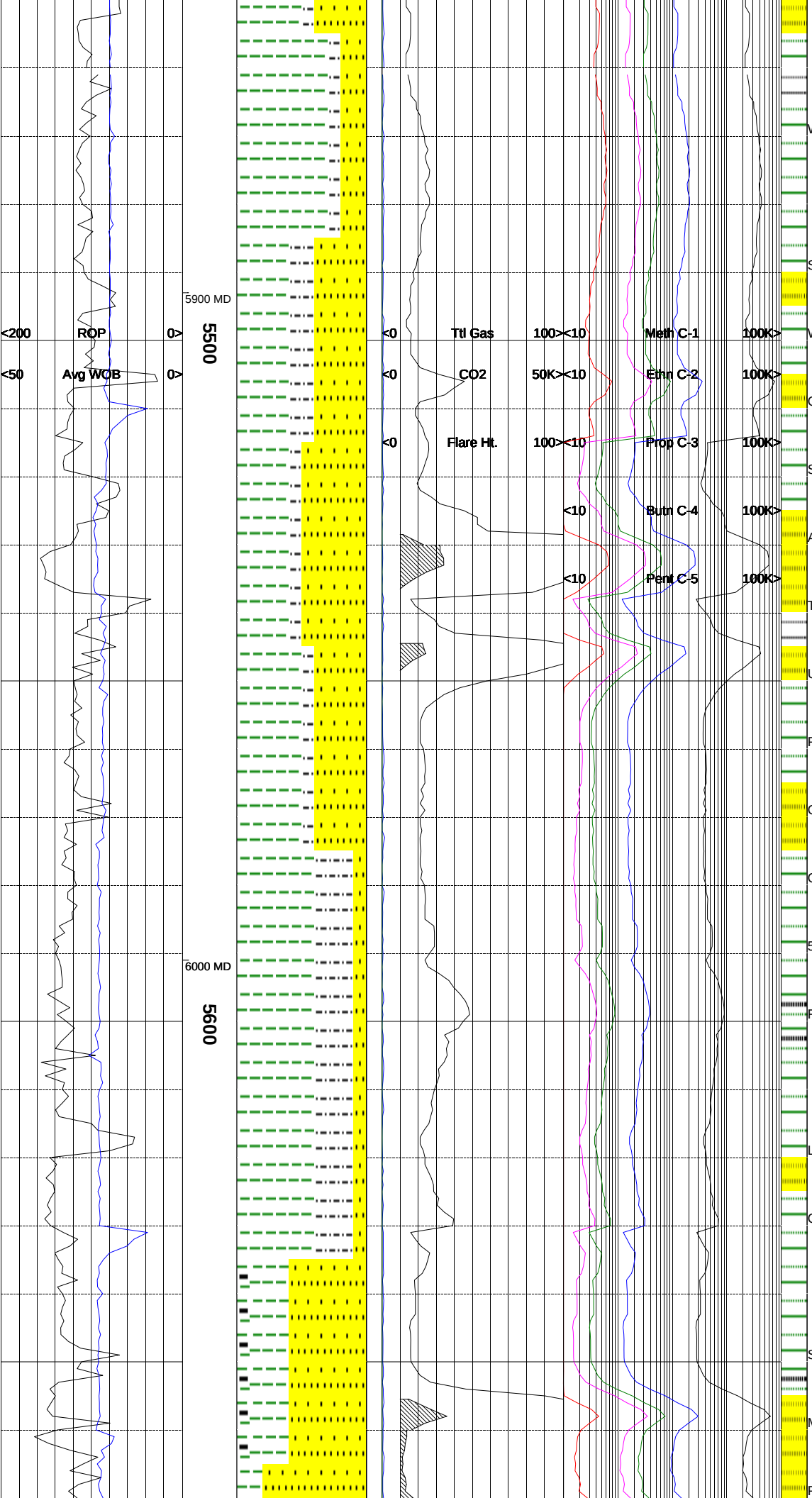
SUBANGULAR; MOD SPHERICITY; DOM CALCITE

CEMENT; GRAIN SUPPORTED; PR VISIBLE

POROSITY IN PRESERVED SPECIMENS; NO

SAMPLE SHOWS.


5700 MD
5300
5800 MD
5400
SHALE = LIGHT BROWN; REDDISH BROWN;
GRAY BROWN; MOTTLED IN PART; FIRM; SLI
PLATY CUTTINGS; IRREGULAR FRACTURE;
NON CALCAREOUS; ROUGH TO SMOOTH
TEXTURE; OCC SILTY WITH SILTY TEXTURE;
NO VISIBLE STRUCTURE.
SANDSTONE = VARICOLORED; LIGHT GRAY;
WHITE; LT BROWN TO PURPLE; LOWER
MEDIUM TO FINE GRAINED; ANGULAR TO
SUBANGULAR; GRAIN TO MATRIX SUPPORTED;
CALCITE CEMENT; SME REDBROWN LITHIC
FRAGMENTS; OCC SPECKLED WITH UNIDENT
BLACK GRAINS; THINLY BEDDED IN SHALE.
SHALE/CARBONACEOUS SHALE = MEDIUM
GRAY TO DARK GRAY; FIRM TO MODERATELY
HARD; PLATY CUTTINGS; PLANAR TO BLOCKY
CUTTINGS; DULL EARTHY TO SLI RESINOUS
LUSTER; SMOOTH TO ROUGH TEXTURE; NON
CALCAREOUS; SME LOOSE BLACK COAL W/
PYRITE AND VISIBLE BLEEDING GAS.



WASATCH G PLACED AT 5709' MD 5306' TVD

SANDSTONE = ABUNDANT LOOSE GRAINS;

WHITE; UPPER MEDIUM TO LOWER MEDIUM

GRAINED; ANGULAR TO SUBANGULAR; DOM

SILICEOUS CEMENT WITH MINOR CALCITE

AND WHITE KAOLIN CLAY; MOD WELL SRTED;

TRACE PYRITE AND CHERT; OCC SCATTERED

UNIDENTIFIED BLACK GRAINS; UPPER WASATCH

PRODUCED EXCELLENT ROP VALUES- SUGG

GOOD POROSITY/FRACTURING; TRACE AMT

OF COARSE CALCITE AND QUARTZ IN THE

5740' TO 5770' SAMPLE- PROBABLE FRACTURE

FILL.

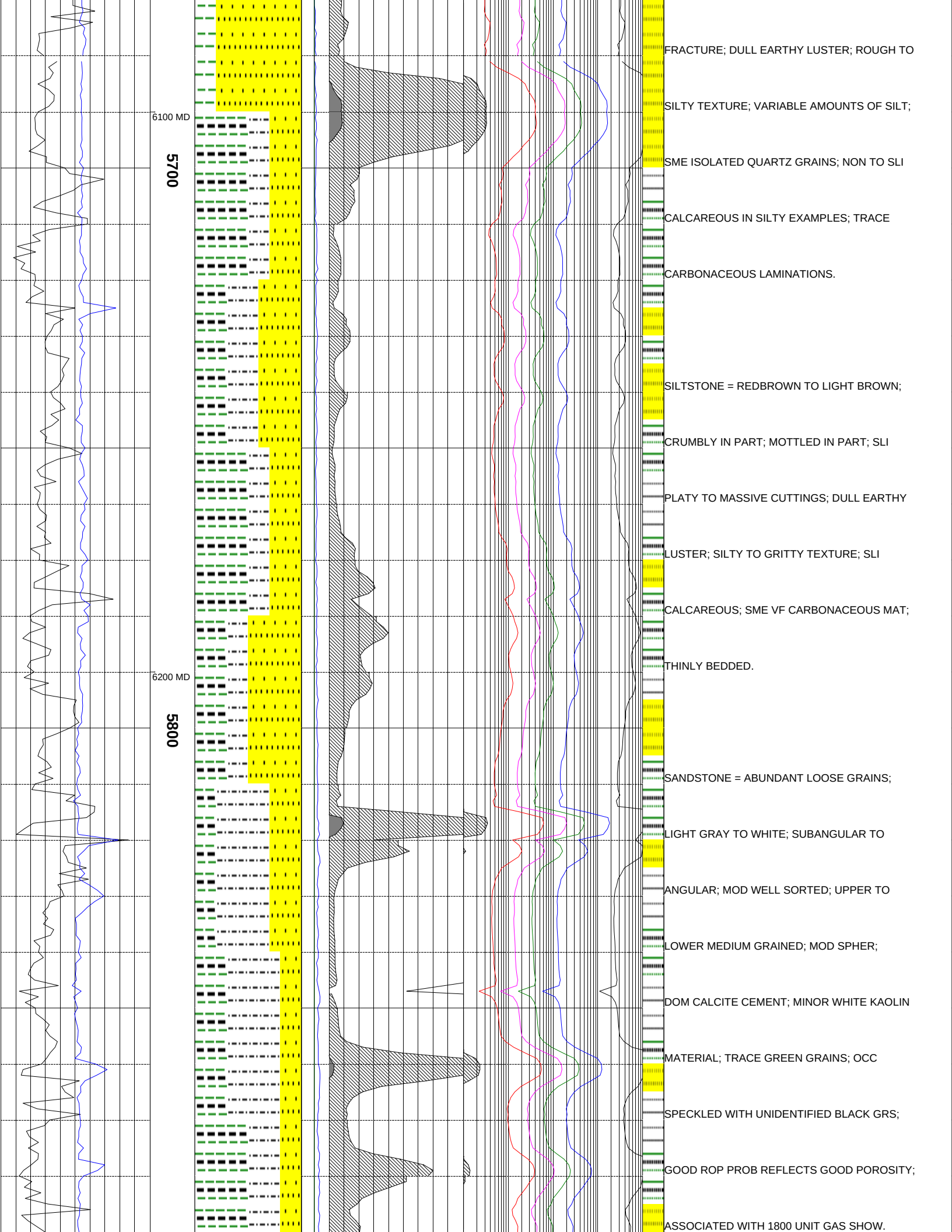
LOSING 100 BBLS/HR IN THE WASATCH G

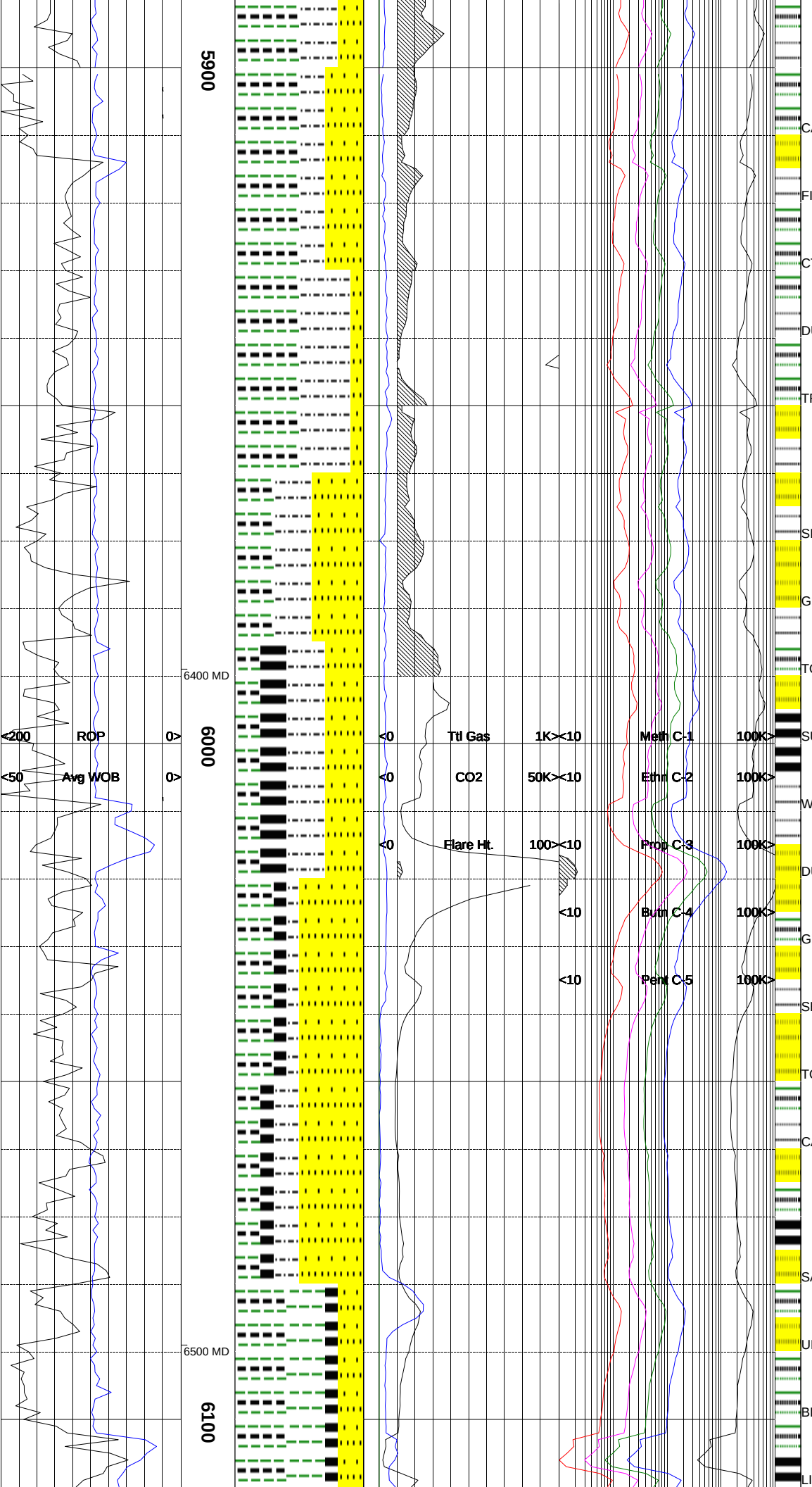
GAS AND SAMPLE LAG NOT RELIABLE.

SHALE = DOM MEDIUM GRAY; REDBROWN;

MOTTLED GRAYBROWN; FIRM TO VERY HARD;

PLATY TO WEDGELIKE CUTTINGS; IRREGULAR


6100 MD
5700
6200 MD
5800
FRACTURE; DULL EARTHY LUSTER; ROUGH TO
SILTY TEXTURE; VARIABLE AMOUNTS OF SILT;
SME ISOLATED QUARTZ GRAINS; NON TO SLI
CALCAREOUS IN SILTY EXAMPLES; TRACE
CARBONACEOUS LAMINATIONS.
SILTSTONE = REDBROWN TO LIGHT BROWN;
CRUMBLY IN PART; MOTTLED IN PART; SLI
PLATY TO MASSIVE CUTTINGS; DULL EARTHY
LUSTER; SILTY TO GRITTY TEXTURE; SLI
CALCAREOUS; SME VF CARBONACEOUS MAT;
THINLY BEDDED.
SANDSTONE = ABUNDANT LOOSE GRAINS;
LIGHT GRAY TO WHITE; SUBANGULAR TO
ANGULAR; MOD WELL SORTED; UPPER TO
LOWER MEDIUM GRAINED; MOD SPHER;
DOM CALCITE CEMENT; MINOR WHITE KAOLIN
MATERIAL; TRACE GREEN GRAINS; OCC
SPECKLED WITH UNIDENTIFIED BLACK GRS;
GOOD ROP PROB REFLECTS GOOD POROSITY;
ASSOCIATED WITH 1800 UNIT GAS SHOW.



CARBONACEOUS SHALE = DARK BROWN;

FIRM TO CRUMBLY; PLATY TO OCC FLAKY

CTGS; IRREGULAR TO PLANAR FRACTURE;

DULL EARTHY LUSTER; ROUGH TEXTURE;

TRACE AMT OF COAL; THINLY BEDDED.

SILTSTONE = MEDIUM LIGHT BROWNISH

GRAY, MEDIUM LIGHT GRAY; PULVERULENT

TO CRUMBLY TENACITY; PREDOMINATELY

SUB BLOCKY TO BLOCKY FRACTURE;

WEDGELIKE, TABULAR CUTTINGS HABIT;

DULL, EARTHY, SEMI WAXY LUSTER;

GRANULAR TO GRITTY TEXTURE; MASSIVE

SEMI THICK STRUCTURE; SOME GRADING

TO SANDSTONE; TRACES OF DUSKY BROWN

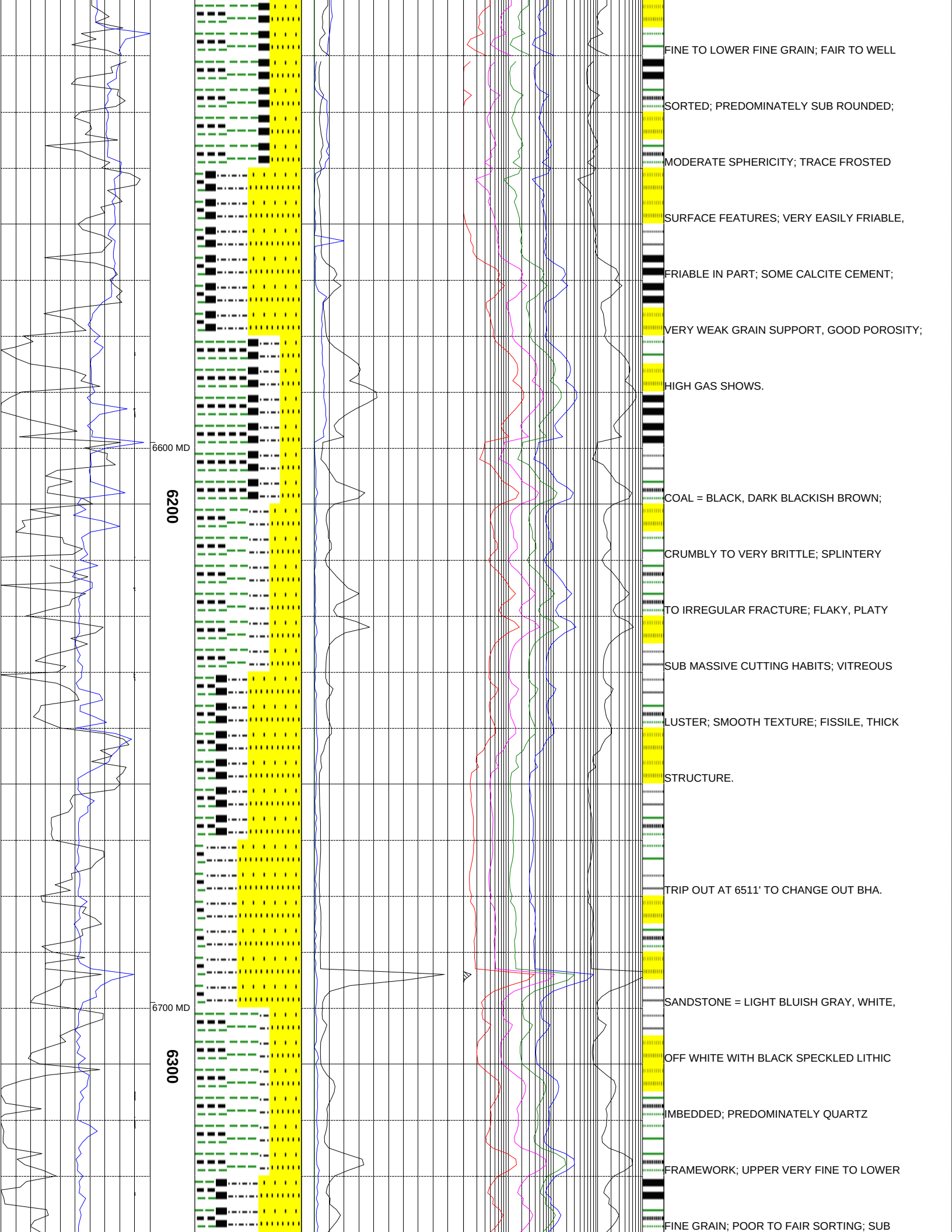
CARBONACEOUS SHALE.

SANDSTONE = CLEAR TO TRANSLUCENT

UNCONSOLIDATED GRAINS, OFF WHITE, LIGHT

BLUISH GRAY WITH TRACES BLACK SPECKLED

LITHIC; QUARTIZ FRAMEWORK; UPPER VERY



FINE TO LOWER FINE GRAIN; FAIR TO WELL

SORTED; PREDOMINATELY SUB ROUNDED;

MODERATE SPHERICITY; TRACE FROSTED

SURFACE FEATURES; VERY EASILY FRIABLE,

FRIABLE IN PART; SOME CALCITE CEMENT;

VERY WEAK GRAIN SUPPORT, GOOD POROSITY;

HIGH GAS SHOWS.

COAL = BLACK, DARK BLACKISH BROWN;

CRUMBLY TO VERY BRITTLE; SPLINTERY

TO IRREGULAR FRACTURE; FLAKY, PLATY

SUB MASSIVE CUTTING HABITS; VITREOUS

LUSTER; SMOOTH TEXTURE; FISSILE, THICK

STRUCTURE.

TRIP OUT AT 6511' TO CHANGE OUT BHA.

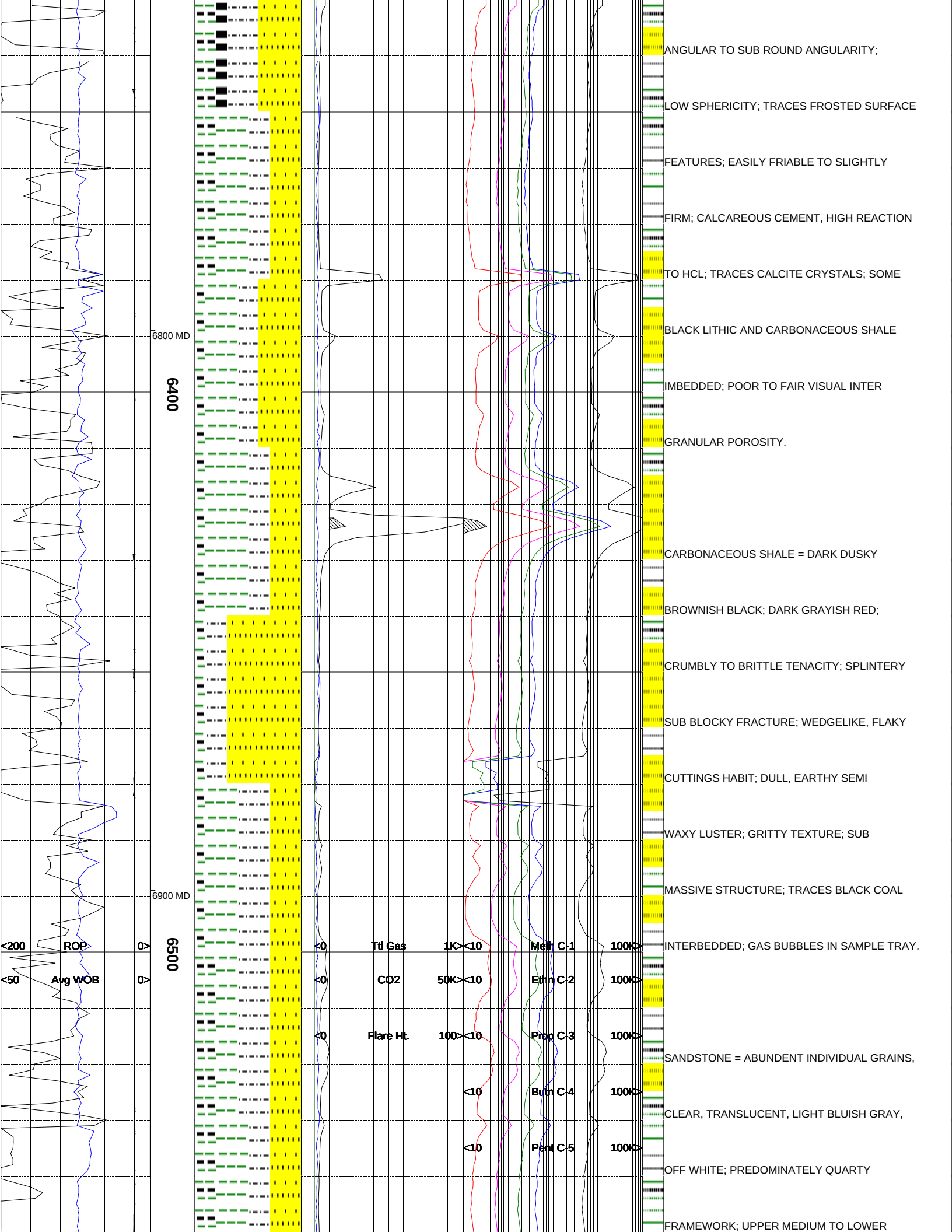
SANDSTONE = LIGHT BLUISH GRAY, WHITE,

OFF WHITE WITH BLACK SPECKLED LITHIC

IMBEDDED; PREDOMINATELY QUARTZ

FRAMEWORK; UPPER VERY FINE TO LOWER

FINE GRAIN; POOR TO FAIR SORTING; SUB



ANGULAR TO SUB ROUND ANGULARITY;

LOW SPHERICITY; TRACES FROSTED SURFACE

FEATURES; EASILY FRIABLE TO SLIGHTLY

FIRM; CALCAREOUS CEMENT, HIGH REACTION

TO HCL; TRACES CALCITE CRYSTALS; SOME

BLACK LITHIC AND CARBONACEOUS SHALE

IMBEDDED; POOR TO FAIR VISUAL INTER

GRANULAR POROSITY.

CARBONACEOUS SHALE = DARK DUSKY

BROWNISH BLACK; DARK GRAYISH RED;

CRUMBLY TO BRITTLE TENACITY; SPLINTERY

SUB BLOCKY FRACTURE; WEDGELIKE, FLAKY

CUTTINGS HABIT; DULL, EARTHY SEMI

WAXY LUSTER; GRITTY TEXTURE; SUB

MASSIVE STRUCTURE; TRACES BLACK COAL

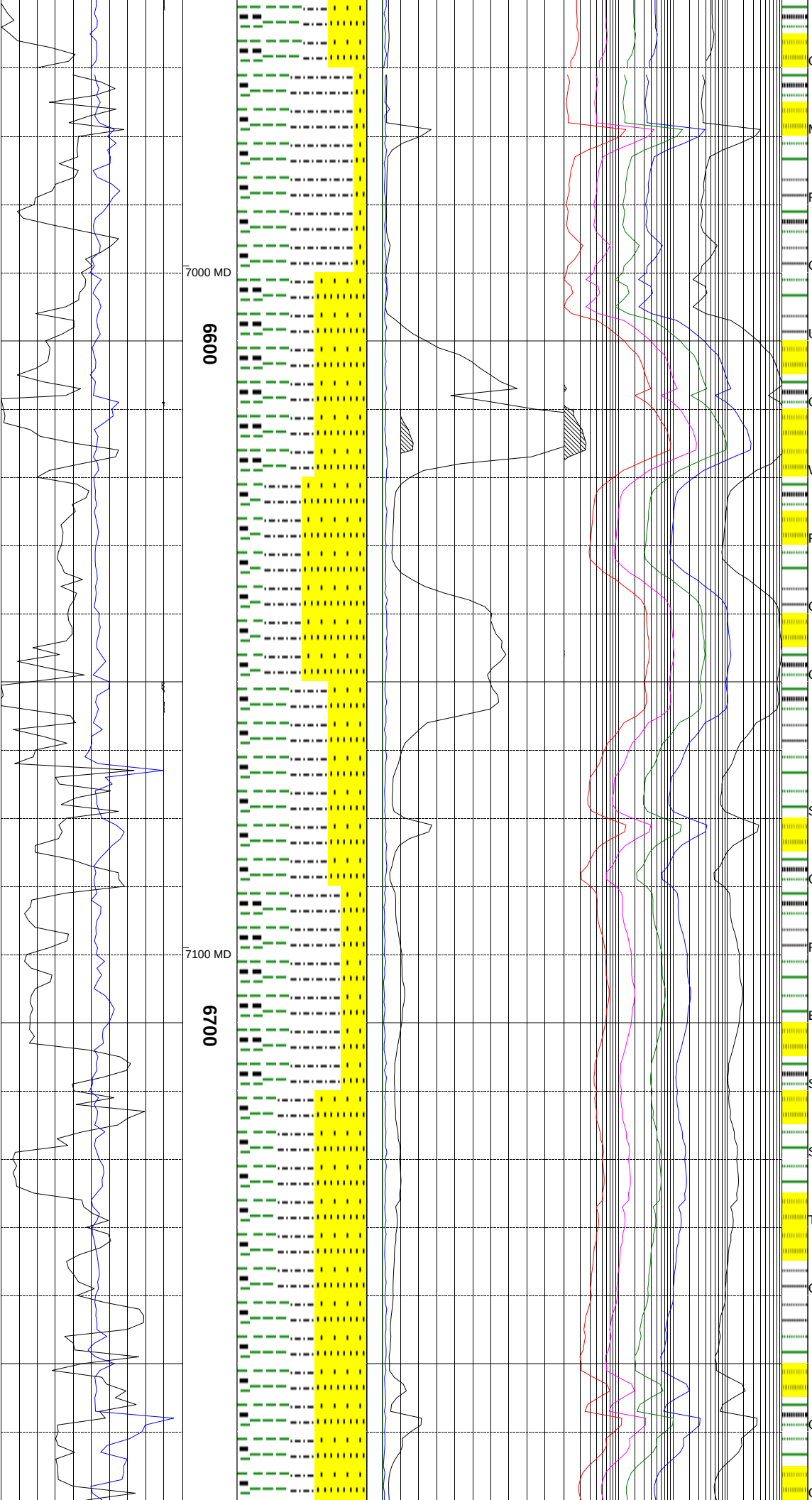
INTERBEDDED; GAS BUBBLES IN SAMPLE TRAY.

SANDSTONE = ABUNDENT INDIVIDUAL GRAINS,

CLEAR, TRANSLUCENT, LIGHT BLUISH GRAY,

OFF WHITE; PREDOMINATELY QUARTY

FRAMEWORK; UPPER MEDIUM TO LOWER



COARSE GRAINS; FAIR TO WELL SORTED;

MODERATE SPHERICITY; FROSTED SURFACE

FEATURES; EASILY FRIABLE, VERY WEAK

GRAIN SUPPORTED, PREDOMINATELY

UNCONSOLIDATED; SOME SILICA MATRIX

CEMENT, TRACE CALCAREOUS CEMENT, VERY

WEAK HCL REACTION; FAIR INTER GRANULAR

POROSITY; TRACES BLACK LITHIC AND

CARBONACEOUS SHALE IMBEDDED; LOSS

CIRCULATION FROM 6876' - 6880'.

SHALE = LIGHT BLUISH GRAY, LIGHT

GREENISH GRAY, LIGHT BROWNISH GRAY;

PULVERULENT, CRUMBLY TENACITY; SUB

BLOCKY, BLOCKY FRACTURES; WEDGELIKE

SUB PLATY CUTTINGS HABIT; DULL, EARTHY,

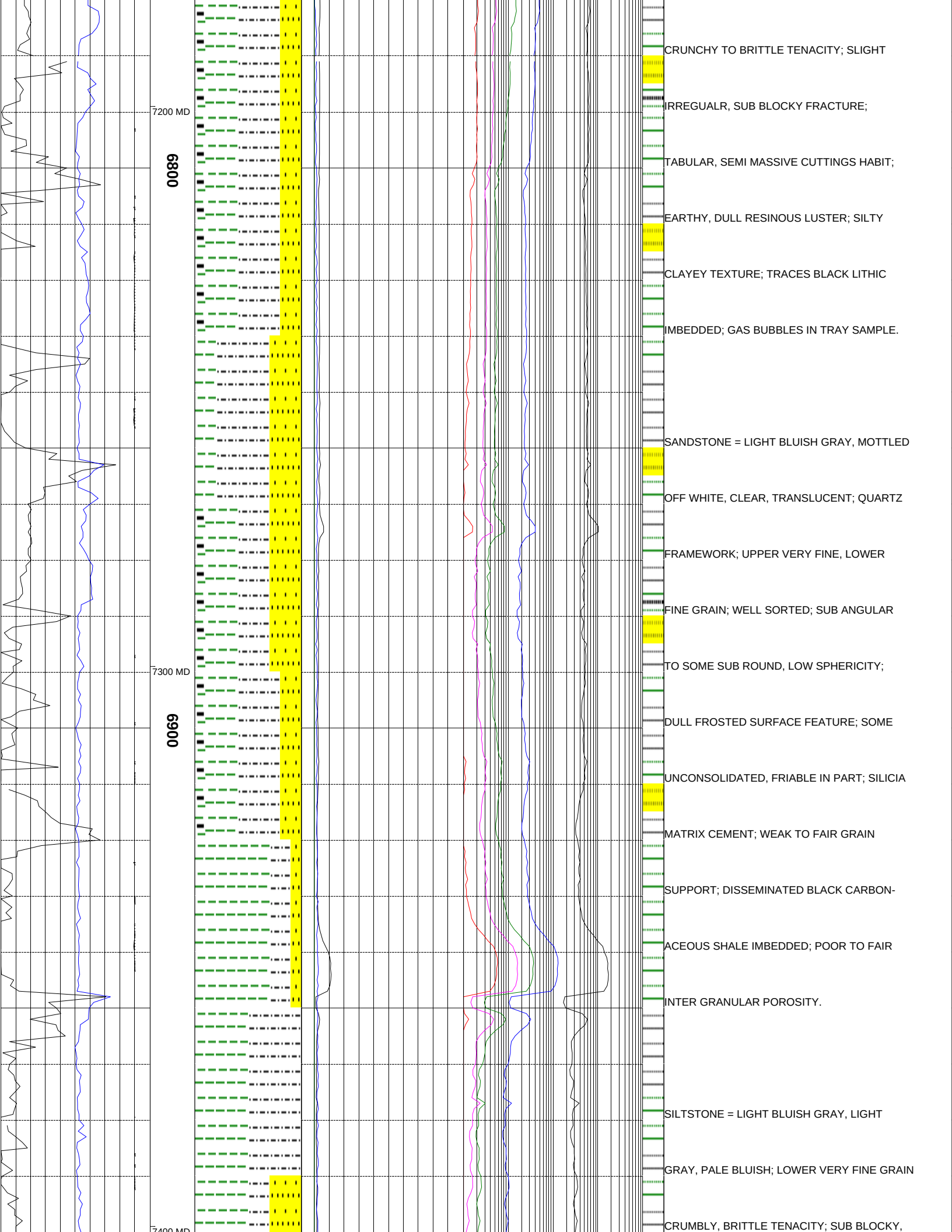
SLIGHT WAXY LUSTER; SMOOTH TO CLAYEY

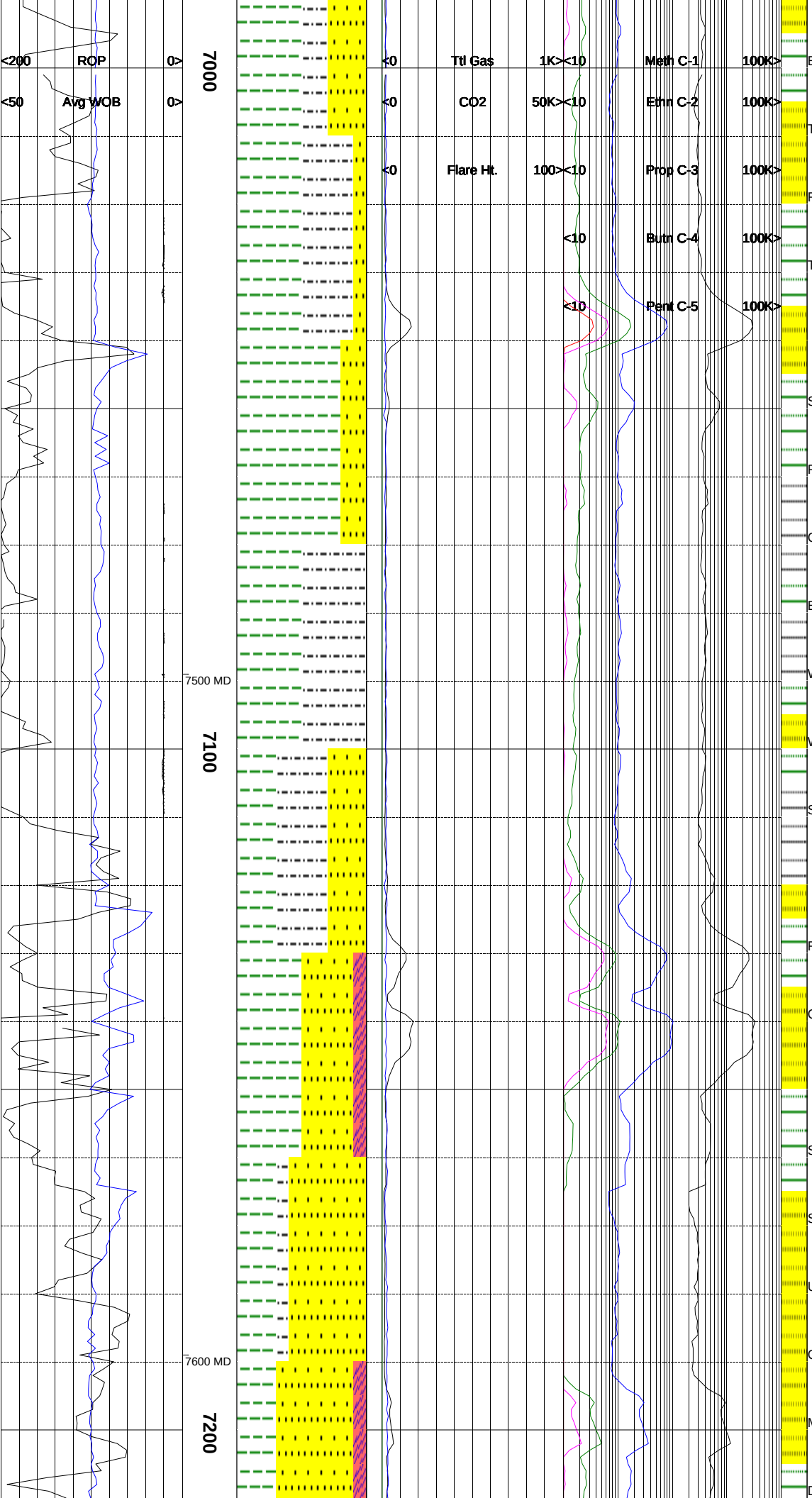
TEXTURE; SEMI MASSIVE TO THICK STRUCTURE

GRADING TO SILTSTONE.

CARBONACEOUS SHALE = DUSKY DARK

GRAYISH BROWN, GREENISH BLACK;


7200 MD
6800
7300 MD
6900
7400 MD
CRUNCHY TO BRITTLE TENACITY; SLIGHT
IRREGUALR, SUB BLOCKY FRACTURE;
TABULAR, SEMI MASSIVE CUTTINGS HABIT;
EARTHY, DULL RESINOUS LUSTER; SILTY
CLAYEY TEXTURE; TRACES BLACK LITHIC
IMBEDDED; GAS BUBBLES IN TRAY SAMPLE.
SANDSTONE = LIGHT BLUISH GRAY, MOTTLED
OFF WHITE, CLEAR, TRANSLUCENT; QUARTZ
FRAMEWORK; UPPER VERY FINE, LOWER
FINE GRAIN; WELL SORTED; SUB ANGULAR
TO SOME SUB ROUND, LOW SPHERICITY;
DULL FROSTED SURFACE FEATURE; SOME
UNCONSOLIDATED, FRIABLE IN PART; SILICIA
MATRIX CEMENT; WEAK TO FAIR GRAIN
SUPPORT; DISSEMINATED BLACK CARBON-
ACEOUS SHALE IMBEDDED; POOR TO FAIR
INTER GRANULAR POROSITY.
SILTSTONE = LIGHT BLUISH GRAY, LIGHT
GRAY, PALE BLUISH; LOWER VERY FINE GRAIN
CRUMBLY, BRITTLE TENACITY; SUB BLOCKY,



BLOCKY, SLIGHT IRREGUALR FRACTRUE;

TABULAR, WEDGELIKE CUTTINGS HABIT;

RESINOUS, DULL LUSTER; SILTY, SMOOTH

TEXTURE, THIN, SUB MASSIBE STRUCTURE.

SHALE = MODERATELY YELLOWISH BROWN,

PALE YELLOWISH BROWN; PULVERULENT,

CRUNCHY, SOME BRITTLE TENACITY, SUB

BLOCKY, BLOCKY FRACTURE; TABULAR,

WEDGELIKE CUTTINGS HABIT; DULL, SUB

WAXY LUSTER; SMOOTH, CLAYEY TEXTURE;

SUB MASSIVE STRUCTURE.

REPAIR #2 PUMP

OHIO CREEK @ 7547'MD 7137' TVD

SANDSTONE = LIGHT GRAY TO WHITE; COM

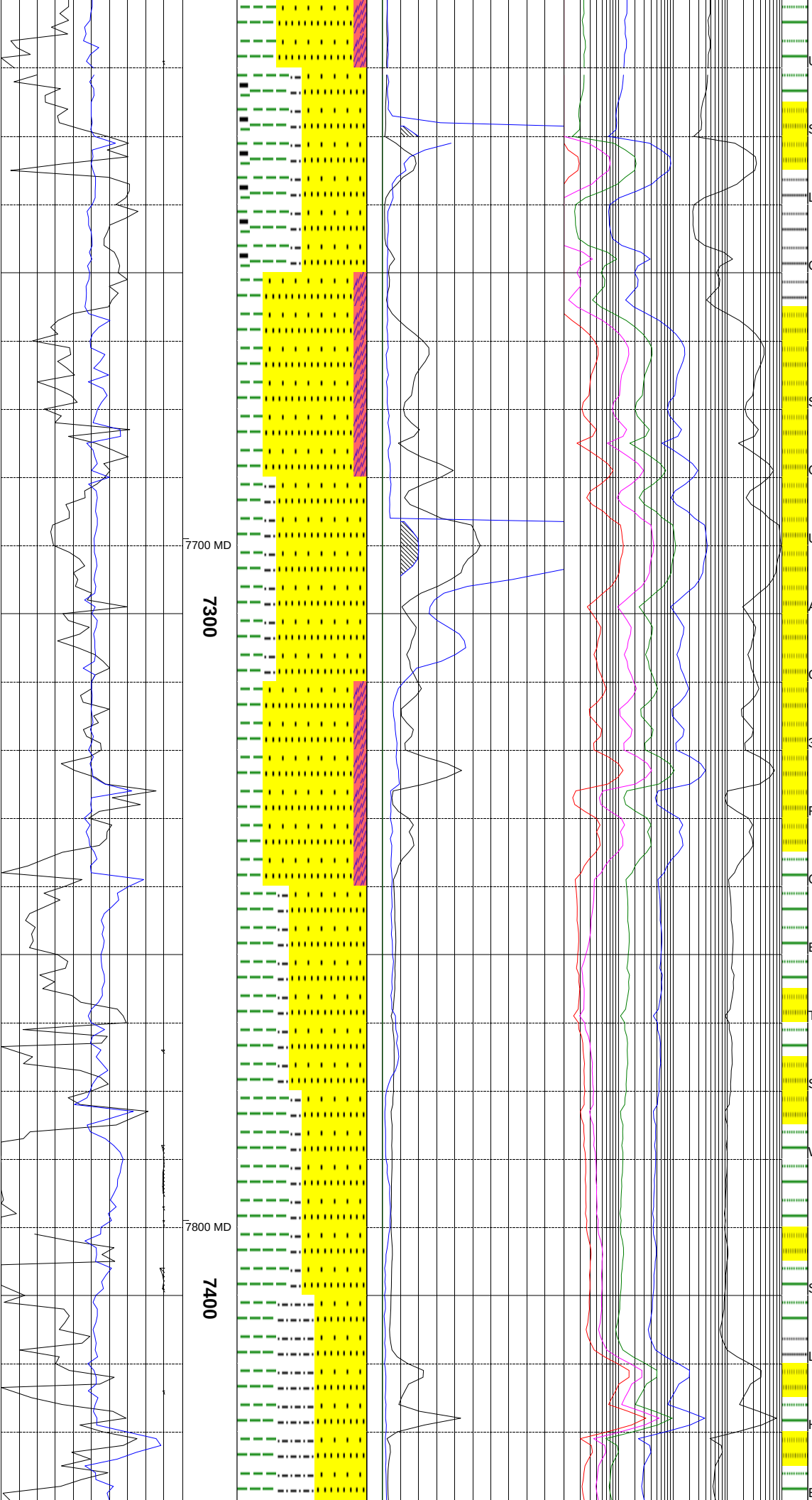
SPECKLED WITH BLACK CARB MAT AND

UNIDENT GRAINS; LOWER MEDIUM TO FINE

GRAINED; ANGULAR TO SUBANGULAR GRAINS;

MOD WELL SORTED; GRAIN SUPPORTED;

DOM CALCITE CEMENT; SME MICA; SME



UNIDENT GREEN GRAINS; LITTLE LOOSE

SAND GRAINS; SOME BLACK CARBONACEOUS

LAMINATIONS; ASSOCIATED WITH ONLY MINOR

GAS.

SANDSTONE = INCREASE IN GRAIN SIZE; LT

GRAY TO WHITE; ABUNDANT LOOSE GRAINS;

UPPER MEDIUM TO LOWER MEDIUM GRAINED;

ANGULAR TO SUBANGULAR; MOD WELL SRTD;

GRAIN SUPPORTED; TRACE GREEN GRAINS;

3% UNIDENTIFIED BLACK GRAINS; SOME

REDBROWN LITHIC FRAGMENTS; SME REDDISH

GRAINS; SOME COARSE CHERT; LOOSE COARSE

EUHEDRAL QUARTZ AND COARSE CALCITE IN

THE 7660' TO 7690' SAMPLE AND THE 7720'

SAMPLE- PROBABLE FRACTURE FILL; ASSOC

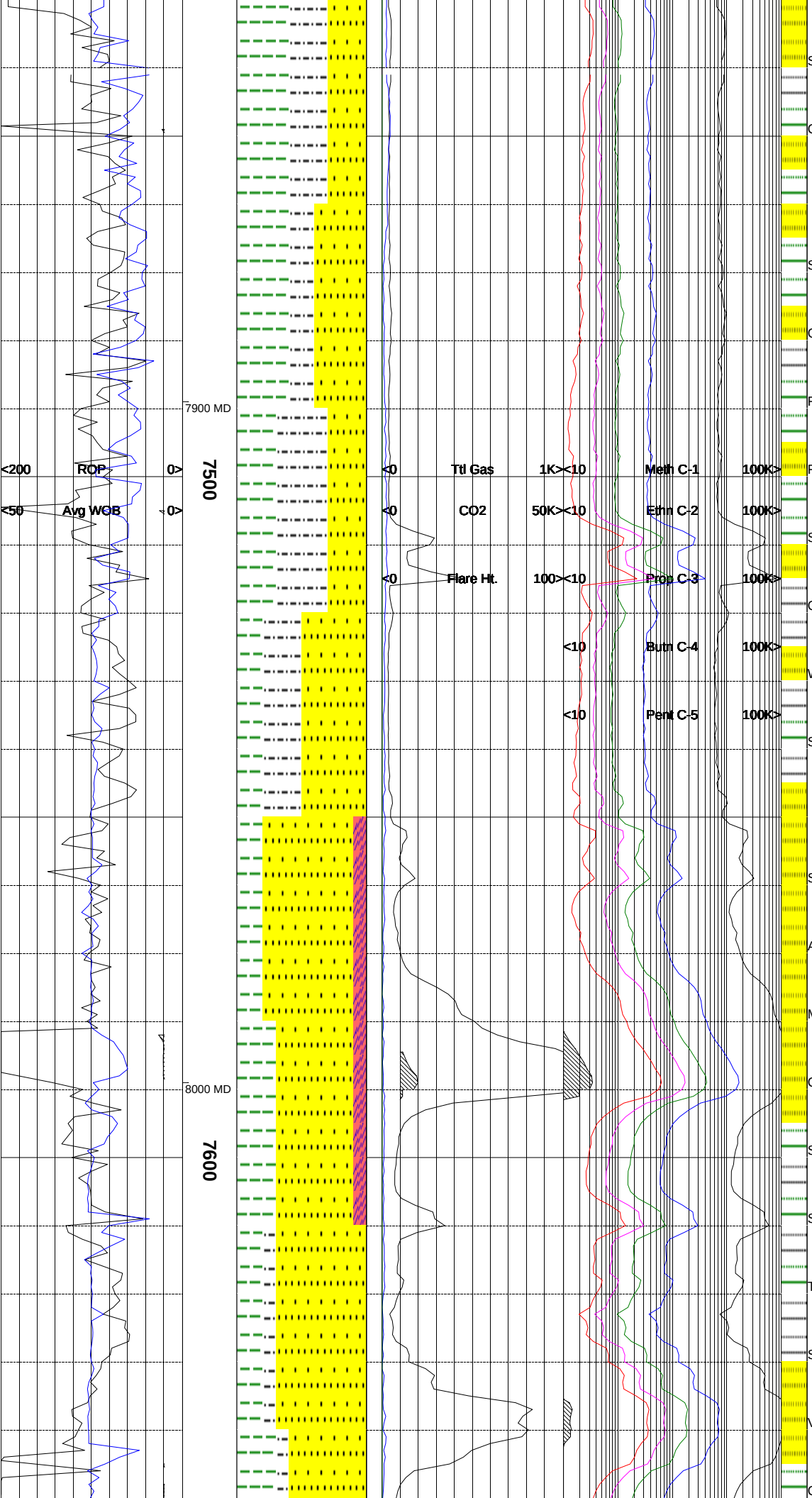
WITH MINOR GAS INCREASES.

SHALE = LIGHT TO MEDIUM GRAY; LT BROWN;

LIGHT GREENISH GRAY; FIRM TO MODERATELY

HARD; PLATY TO FLAKY CUTTINGS; DULL

EARTHY TO WAXY LUSTER; VF CARB MAT;



SMOOTH TO ROUGH TEXTURE; NON TO VSLI

CALCAREOUS; NO VISIBLE STRUCTURE.

SILTSTONE = LIGHT GREEN; LIGHT GREENISH

GRAY; SME MEDIUM GRAY TO LIGHT BROWN;

FIRM; PLATY TO FLAKY CUTTINGS; IRREGULAR

FRACTURE; DULL WAXY LUSTER; NON CALC;

SILTY TEXTURE; SME ISOLATED FINE TO MED

QUARTZ GRAINS IN MATRIX; OCC SPECKLED

WITH CARBONACEOUS MATERIAL; NO VISIBLE

STRUCTURE.

SANDSTONE = LIGHT GRAY TO OFF WHITE;

ABNT LOOSE GRAINS; UPPER MEDIUM TO LOWER

MEDIUM; MOD WELL SORTED; DOM CALCITE

CEMENT; ANGULAR TO SUB ROUNDED; GRAIN

SUPPORTED; SME CHORITIZED GRAINS; SOME

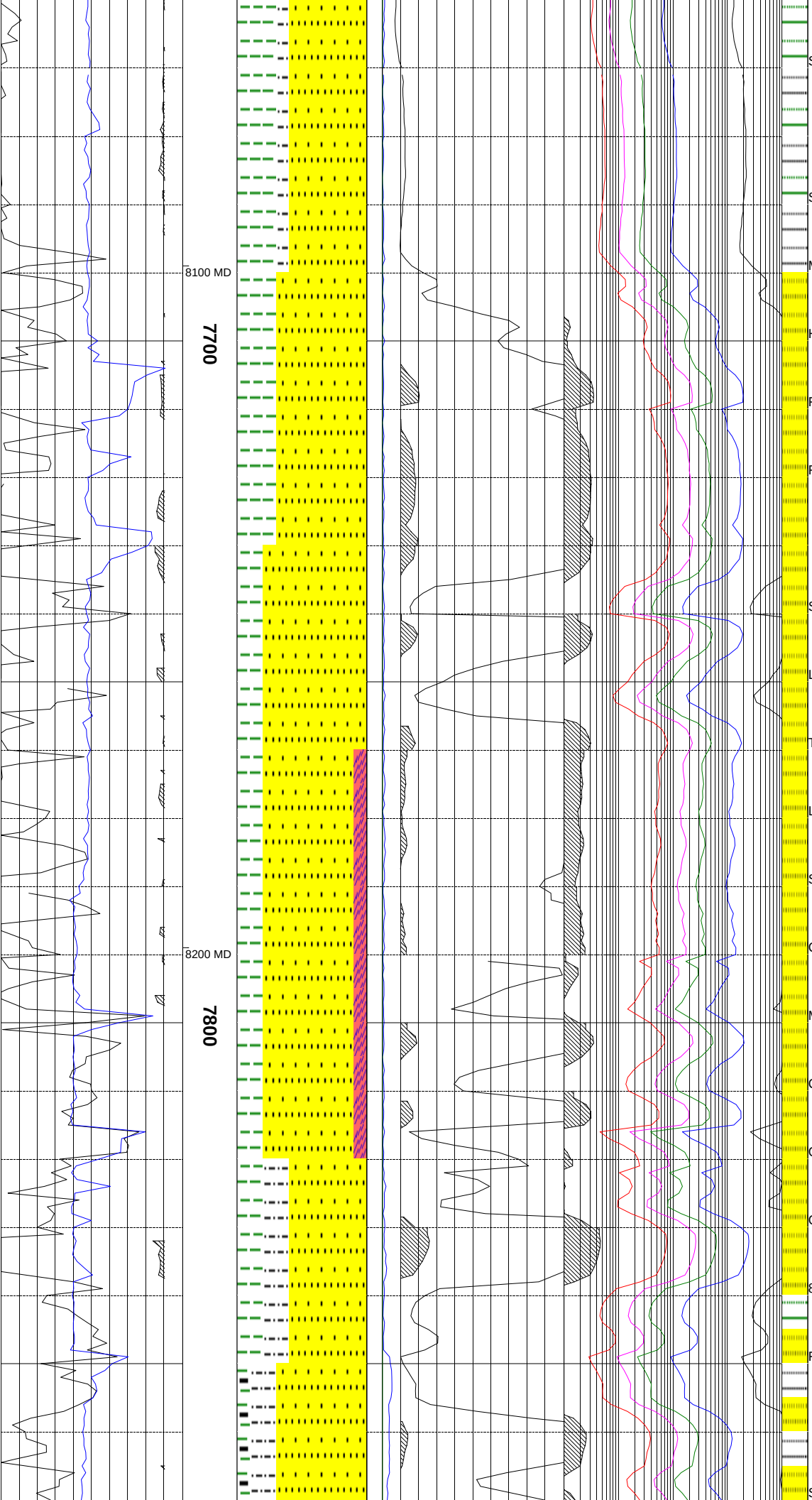
SCATTERED BLACK UNIDENTIFIED GRAINS;

TRACE AMOUNTS OF WHITE KAOLIN FILL;

SAND INTERVAL FROM 7990' TO 8000' SHOWED

VERY HIGH ROP VALUES W/ MAX GAS AT 1987u

COARSE CALCITE IN THE 7960' TO 8010'



SAMPLES- PROBABLY FRACTURE FILL.

SHALE = LT GREEN TO LIGHT GRAY; SME

MEDIUM GRAY TO BLACK; FIRM; SME VERY

HARD SILICEOUS SPECIMENS; IRREGULAR

FRACTURE; WAXY TO DULL EARTHY LUSTER;

ROUGH TO OCC SLI SILTY TEXTURE.

SANDSTONE = ABUNDANT LOOSE GRAINS;

LIGHT GRAY TO GRAYISH WHITE; UPPER

TO LOWER MEDIUM GRAINED; SME LOOSE

LOWER COARSE GRAINS; ANGULAR TO

SUBROUNDED; MOD WELL SORTED; DOM

CALCITE CEMENT; SOME LOOSE WHITE KAOLIN

MATRIX MATERIAL; TRACE GREEN GRAINS; TR

CHERT; WF800 EXHIBITS GOOD ROP SUGGESTS

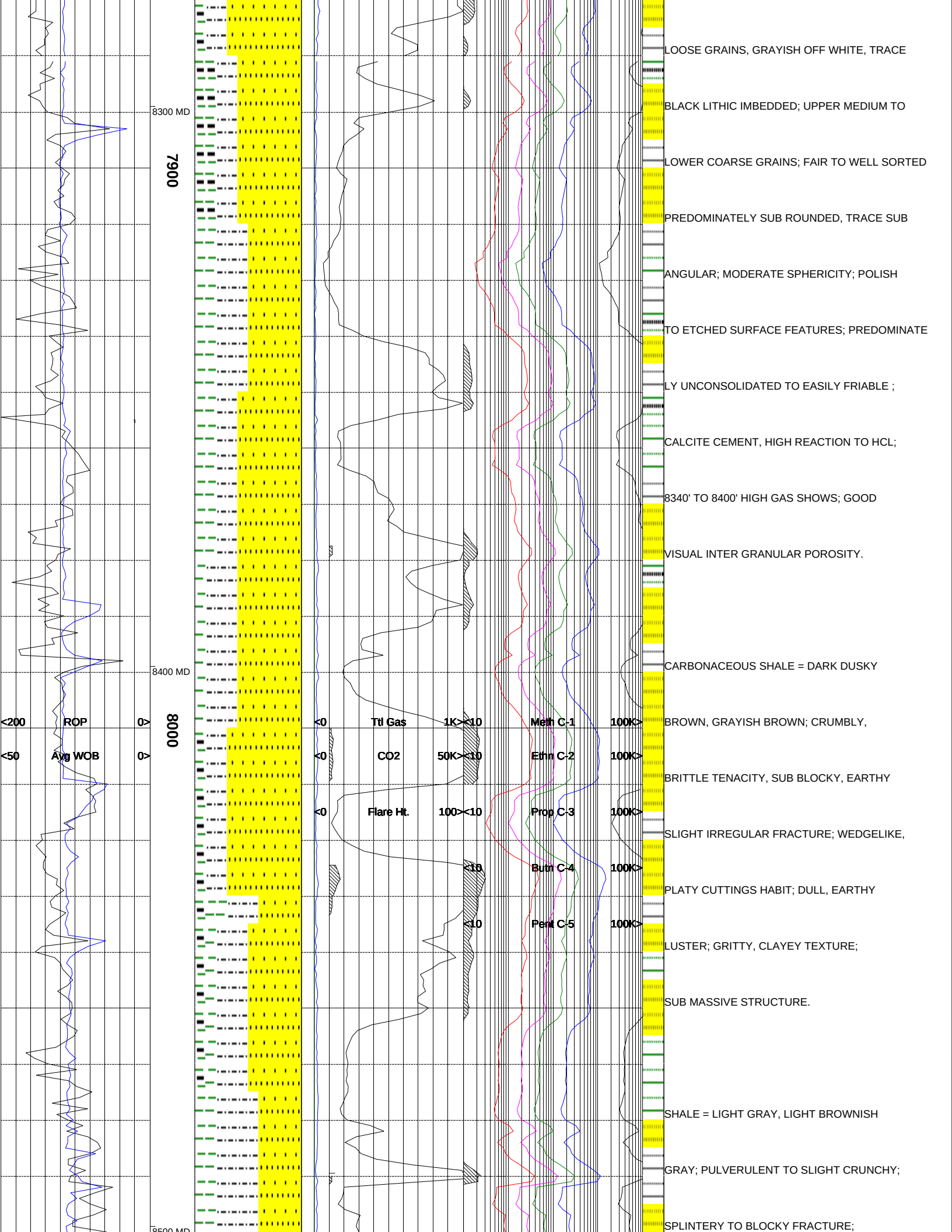
GOOD POROSITY; ASSOCIATED WITH GOOD

GAS INCREASES; COARSE CALCITE IN THE

8170' TO 8230' SAMPLES- PROBABLE

FRACTURE FILL.

SANDSTONE = ABNT CLEAR TRANSLUCENT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7900
8400 MD
8000
8500 MD
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Ethn C-2 100K>
Prop C-3 100K>
Butn C-4 100K>
Pent C-5 100K>
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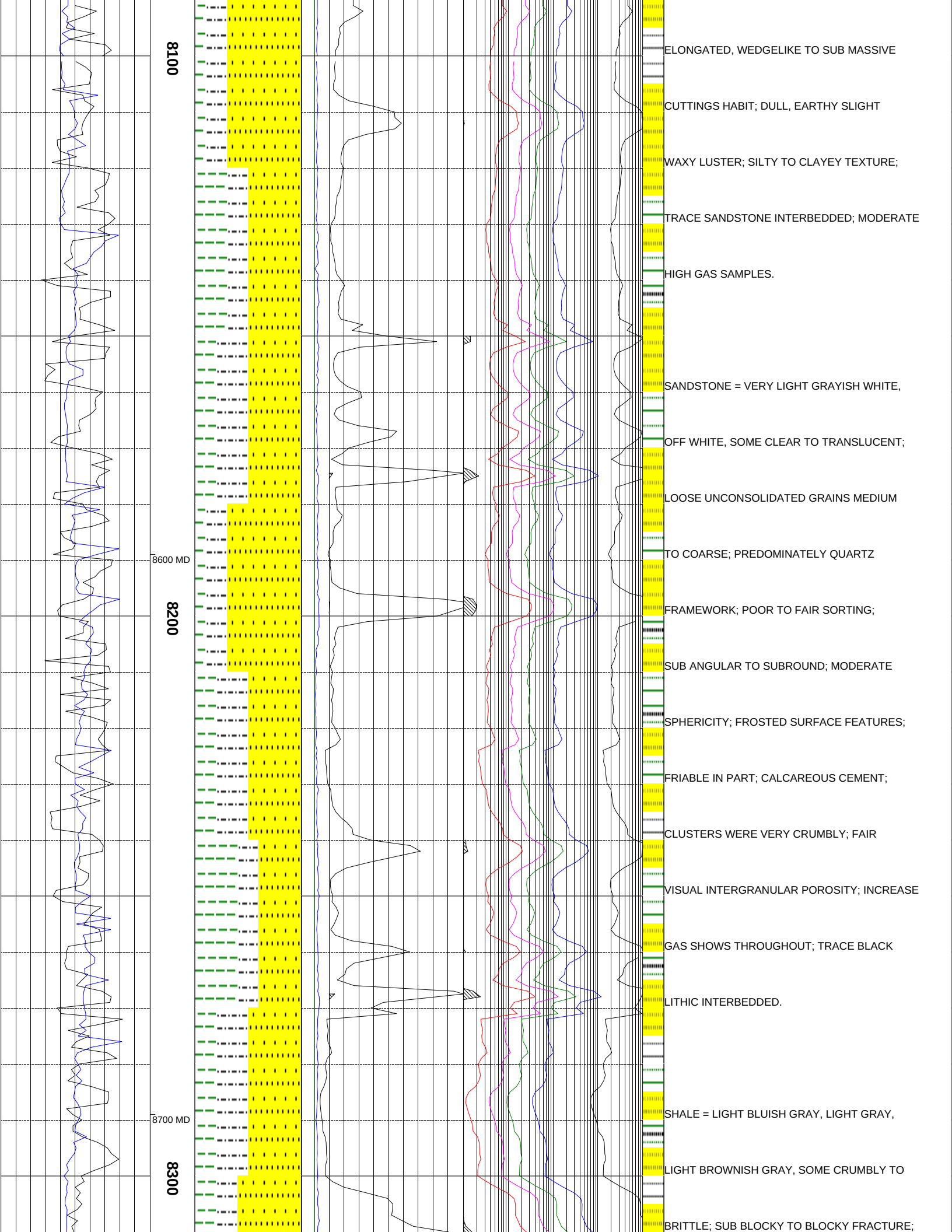
LOOSE GRAINS, GRAYISH OFF WHITE, TRACE
BLACK LITHIC IMBEDDED; UPPER MEDIUM TO
LOWER COARSE GRAINS; FAIR TO WELL SORTED
PREDOMINATELY SUB ROUNDED, TRACE SUB
ANGULAR; MODERATE SPHERICITY; POLISH
TO ETCHED SURFACE FEATURES; PREDOMINATE
LY UNCONSOLIDATED TO EASILY FRIABLE ;
CALCITE CEMENT, HIGH REACTION TO HCL;
8340' TO 8400' HIGH GAS SHOWS; GOOD
VISUAL INTER GRANULAR POROSITY.
CARBONACEOUS SHALE = DARK DUSKY
BROWN, GRAYISH BROWN; CRUMBLY,
BRITTLE TENACITY, SUB BLOCKY, EARTHY
SLIGHT IRREGULAR FRACTURE; WEDGELIKE,
PLATY CUTTINGS HABIT; DULL, EARTHY
LUSTER; GRITTY, CLAYEY TEXTURE;
SUB MASSIVE STRUCTURE.
SHALE = LIGHT GRAY, LIGHT BROWNISH
GRAY; PULVERULENT TO SLIGHT CRUNCHY;
SPLINTERY TO BLOCKY FRACTURE;



ELONGATED, WEDGELIKE TO SUB MASSIVE

CUTTINGS HABIT; DULL, EARTHY SLIGHT

WAXY LUSTER; SILTY TO CLAYEY TEXTURE;

TRACE SANDSTONE INTERBEDDED; MODERATE

HIGH GAS SAMPLES.

SANDSTONE = VERY LIGHT GRAYISH WHITE,

OFF WHITE, SOME CLEAR TO TRANSLUCENT;

LOOSE UNCONSOLIDATED GRAINS MEDIUM

TO COARSE; PREDOMINATELY QUARTZ

FRAMEWORK; POOR TO FAIR SORTING;

SUB ANGULAR TO SUBROUND; MODERATE

SPHERICITY; FROSTED SURFACE FEATURES;

FRIABLE IN PART; CALCAREOUS CEMENT;

CLUSTERS WERE VERY CRUMBLY; FAIR

VISUAL INTERGRANULAR POROSITY; INCREASE

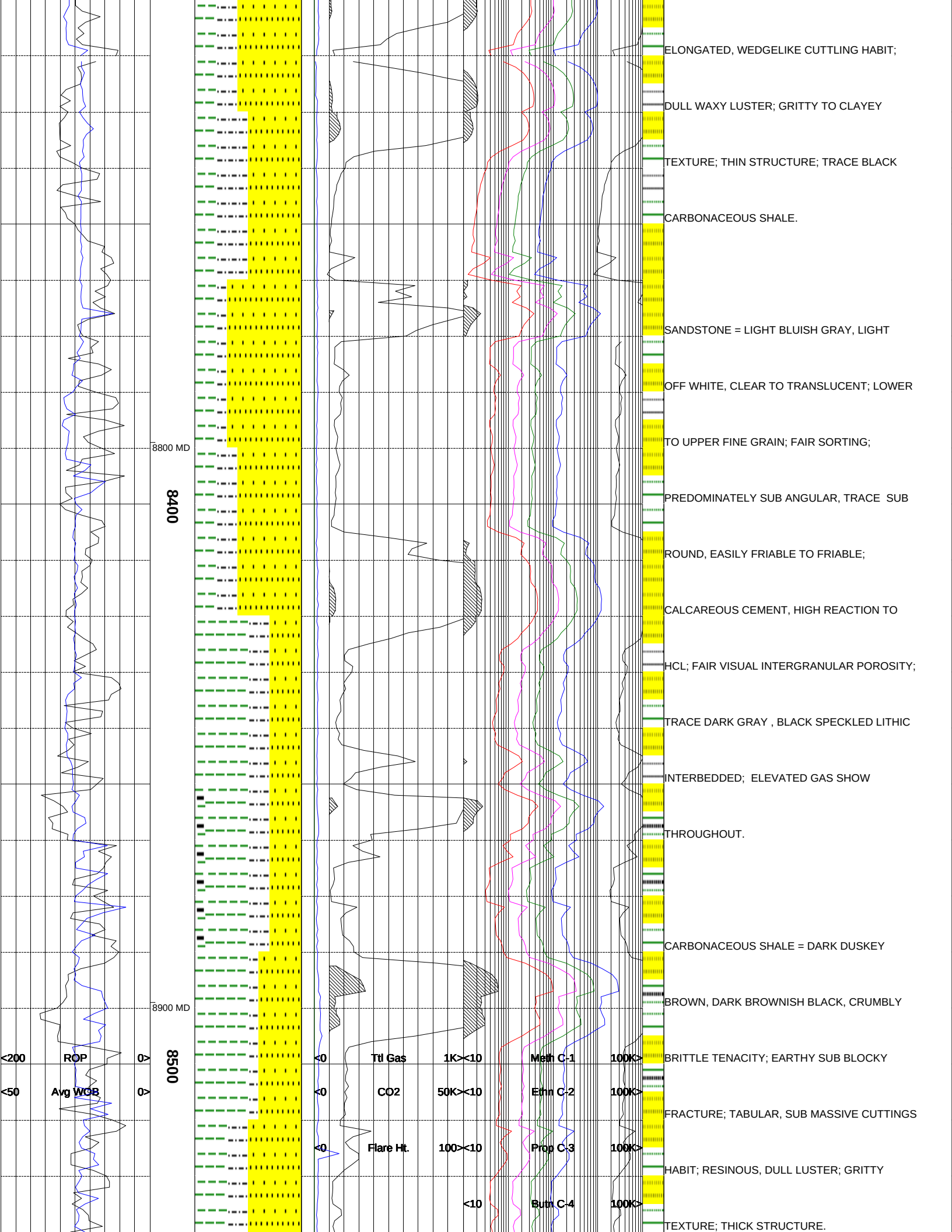
GAS SHOWS THROUGHOUT; TRACE BLACK

LITHIC INTERBEDDED.

SHALE = LIGHT BLUISH GRAY, LIGHT GRAY,

LIGHT BROWNISH GRAY, SOME CRUMBLY TO

BRITTLE; SUB BLOCKY TO BLOCKY FRACTURE;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8400
8900 MD
8500
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<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Buta C-4 100K>
ELONGATED, WEDGELIKE CUTTLING HABIT;
DULL WAXY LUSTER; GRITTY TO CLAYEY
TEXTURE; THIN STRUCTURE; TRACE BLACK
CARBONACEOUS SHALE.
SANDSTONE = LIGHT BLUISH GRAY, LIGHT
OFF WHITE, CLEAR TO TRANSLUCENT; LOWER
TO UPPER FINE GRAIN; FAIR SORTING;
PREDOMINATELY SUB ANGULAR, TRACE SUB
ROUND, EASILY FRIABLE TO FRIABLE;
CALCAREOUS CEMENT, HIGH REACTION TO
HCL; FAIR VISUAL INTERGRANULAR POROSITY;
TRACE DARK GRAY , BLACK SPECKLED LITHIC
INTERBEDDED; ELEVATED GAS SHOW
THROUGHOUT.
CARBONACEOUS SHALE = DARK DUSKEY
BROWN, DARK BROWNISH BLACK, CRUMBLY
BRITTLE TENACITY; EARTHY SUB BLOCKY
FRACTURE; TABULAR, SUB MASSIVE CUTTINGS
HABIT; RESINOUS, DULL LUSTER; GRITTY
TEXTURE; THICK STRUCTURE.