



Copyright © 2003 by Epoch Well Services, Inc.

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

MUDLOG MD

COMPANY	ExxonMobil Production
WELL	FRU 197-33A9
FIELD	FREEDOM RANCH UNIT
REGION	ROCKY MOUNTAINS
COORDINATES	N39.915656 W108.285725
ELEVATION	KB 6415' GL 6388'
COUNTY, STATE	RIO BLANCO COUNTY, CO
API INDEX	05-103-11400-00
SPUD DATE	10/02/2009
CONTRACTOR	HELMRICH AND PAYNE
CO. REP.	RICKY T OWENS
RIG/TYPE	215/FLEX 3
LOGGING UNIT	MLU 51
GEOLOGISTS	GEORGE BAKER BRENDA MARSH
ADD. PERSONS	DEVIN CLAAR BILL JOHANNING
CO. GEOLOGIST	MELISSA SAURBORN

LOG INTERVAL

DEPTHS: 3,800' **TO** 12,281'
DATES: 01/05/2010 **TO** 01/24/2010
SCALE: 5"=100'

CASING DATA

16" **AT** 131'
10.75" **AT** 3,833'
7.00" **AT** 8,533'

AT

HOLE SIZE

9.875' **TO** 8,533'
6.125' **TO** 12,281'
TO
TO

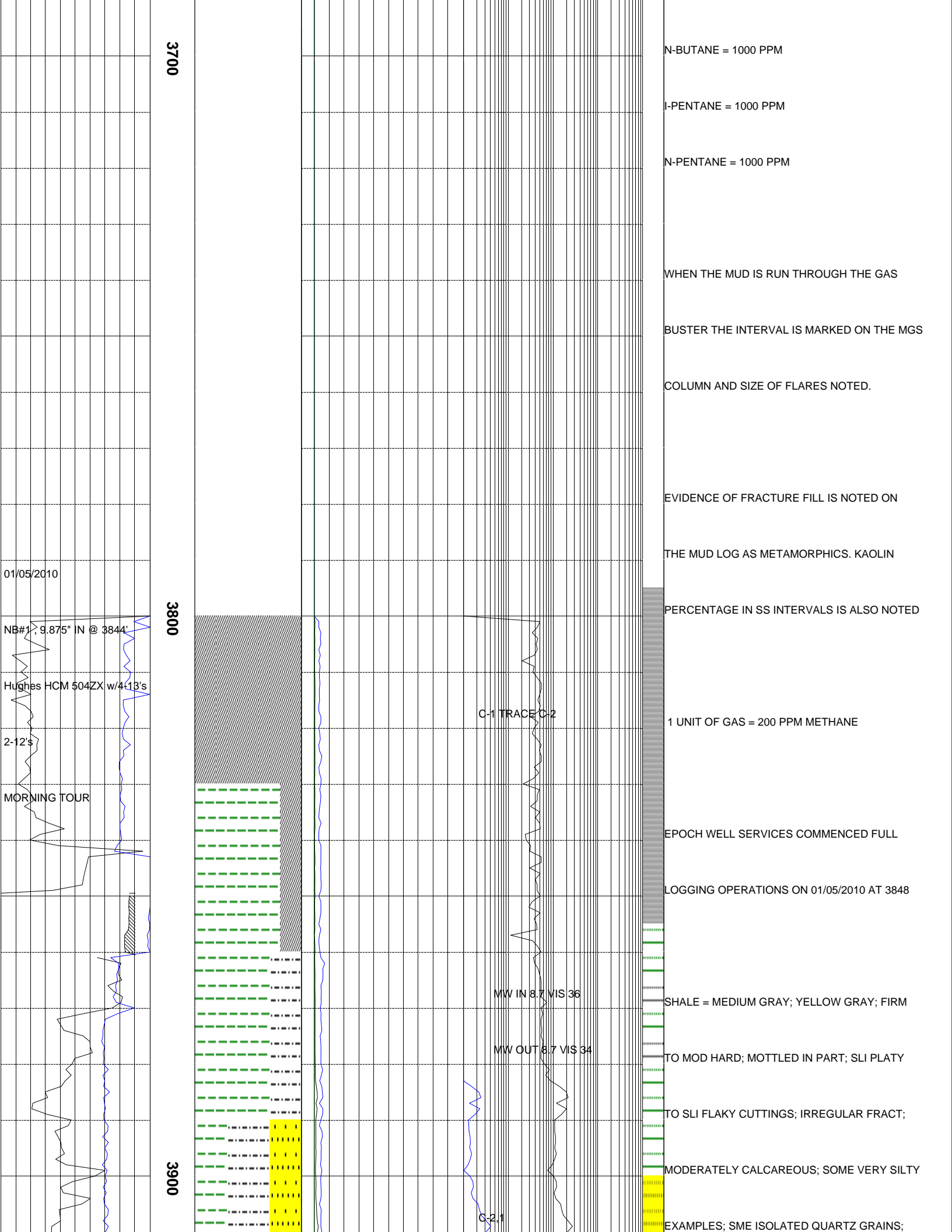
MUD TYPES

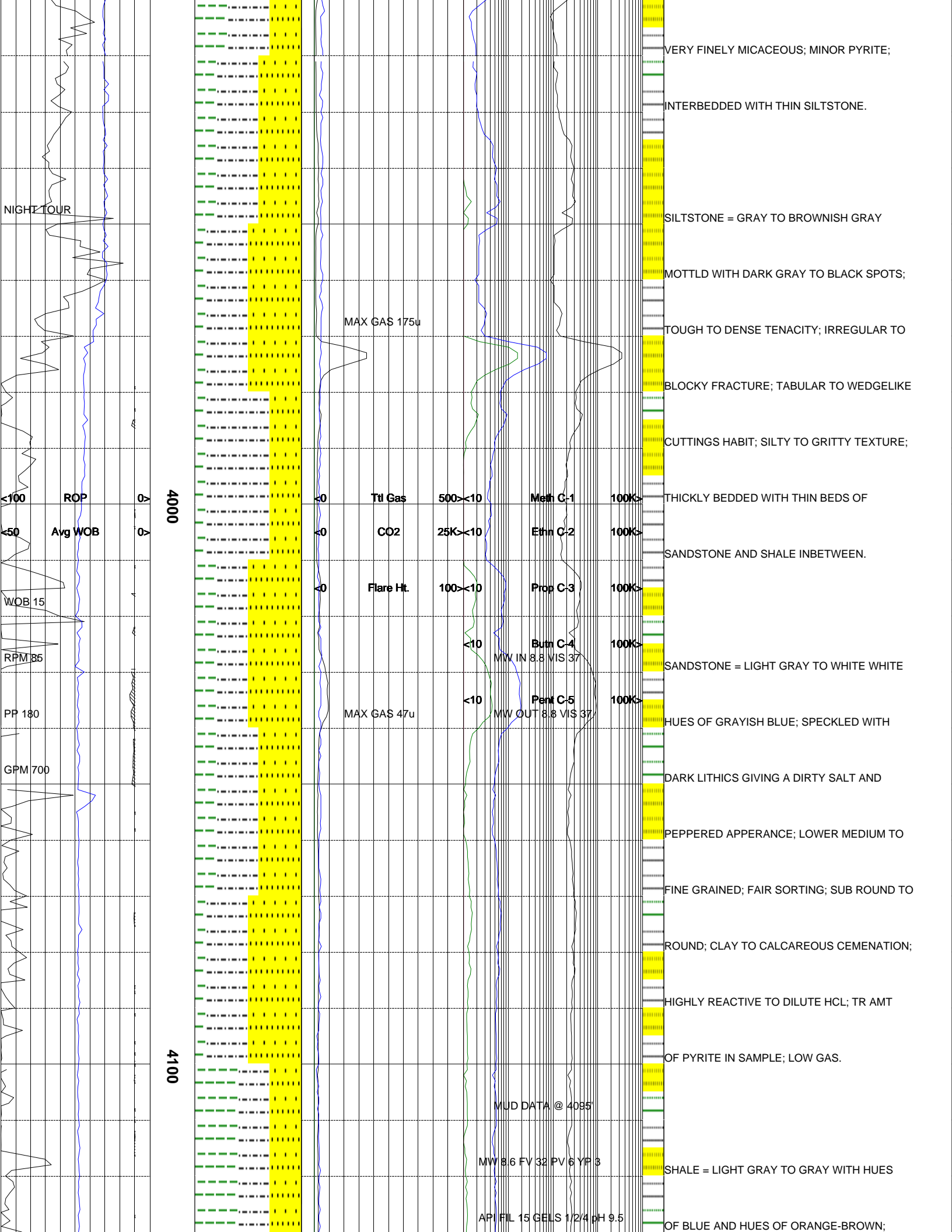
SPUD **TO** 3,833'
LSND **TO** 12,281'
TO
TO

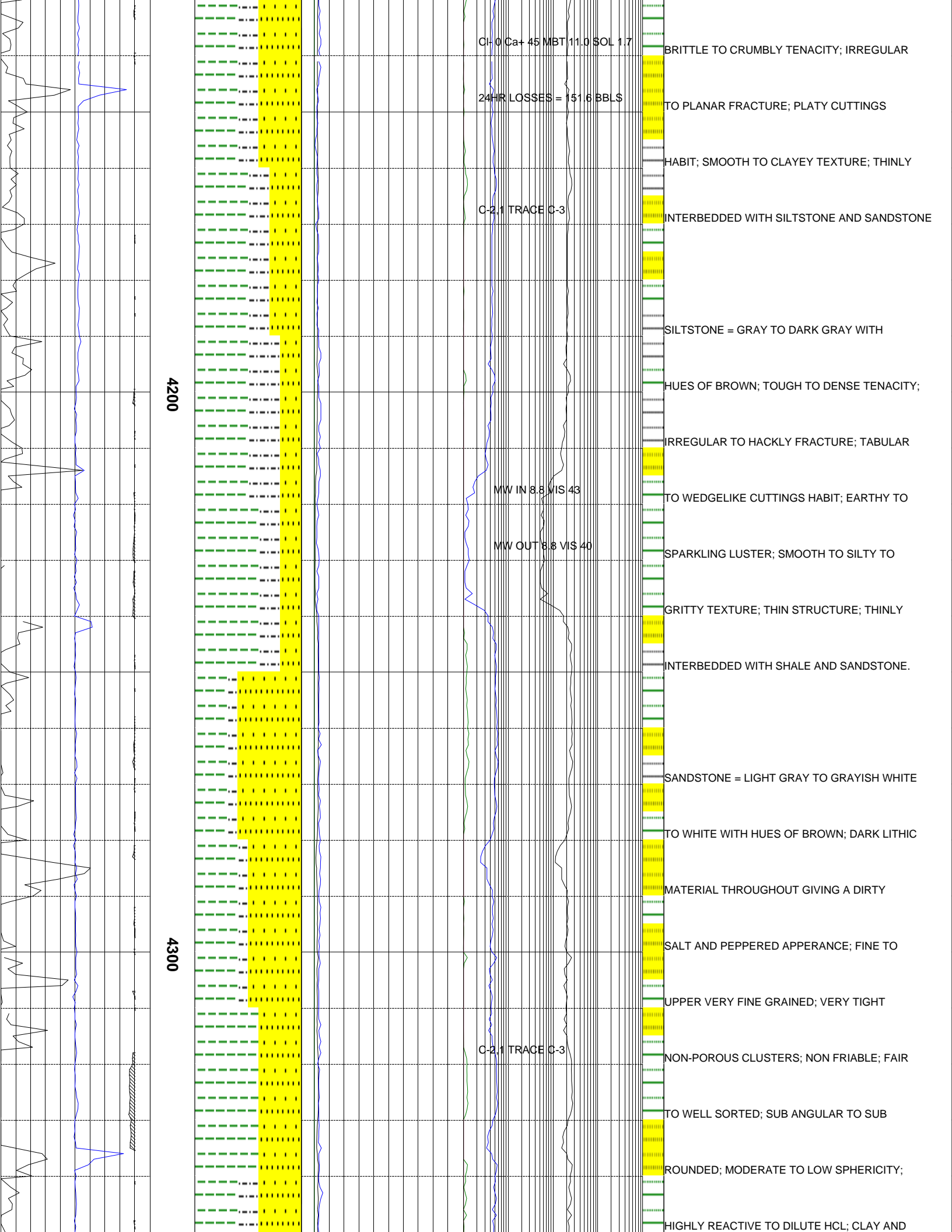
ABBREVIATIONS

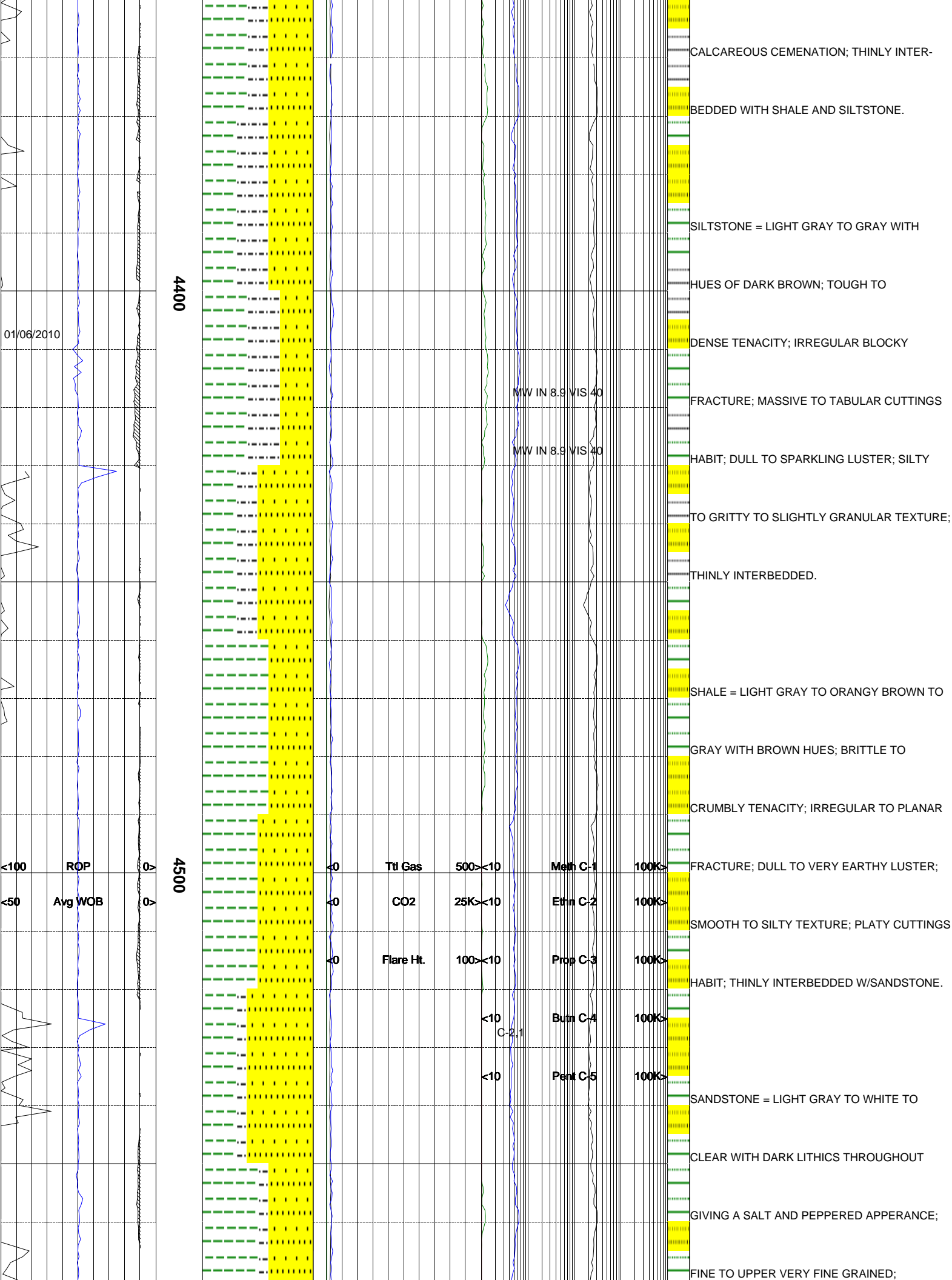
<i>NB</i> NEWBIT	<i>PV</i> PLASTIC VISCOSITY	<i>LC</i> LOST CIRCULATION
<i>RRB</i> RERUN BIT	<i>YP</i> YIELD POINT	<i>CO</i> CIRCULATE OUT
<i>CB</i> CORE BIT	<i>FL</i> FLUID LOSS	<i>NR</i> NO RETURNS
<i>WOB</i> WEIGHT ON BIT	<i>CL</i> PPM CLORIDE ION	<i>TG</i> TRIP GAS
<i>RPM</i> ROTARY REV/MIN	<i>Rm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

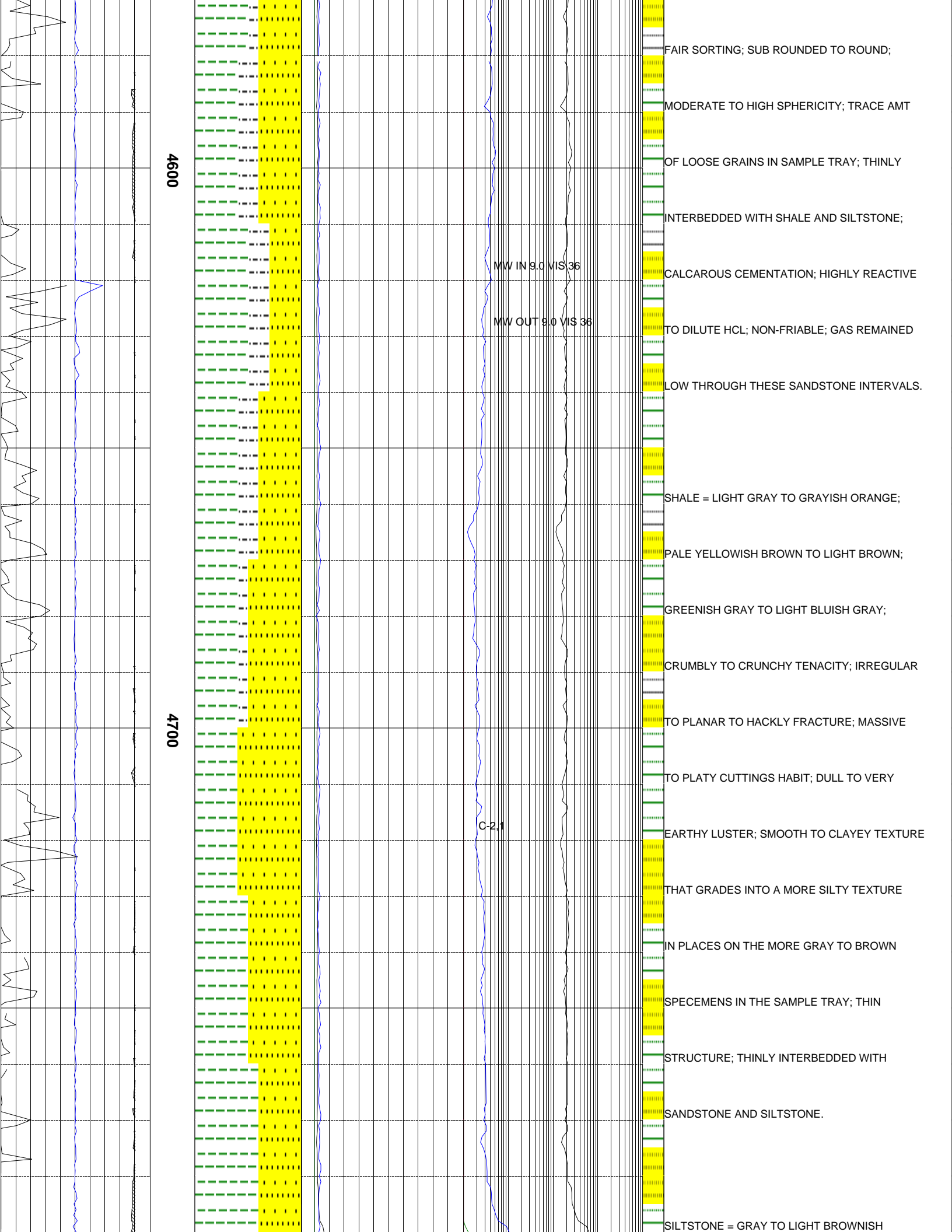
ALTERED ZONE	CHERT - GLASSY	FELSIC SILIC DIKE	MARL - CALC	SANDSTONE
ANDESITE	CHERT - PORCEL	FOSSIL	METAMORPHICS	SANDSTONE-TUFFACEOUS
ANHYDRITE	CHERT - TIGER STRIPE	GABBRO	MUDSTONE	SERICITIZATION
BASALT	CHERT - UNDIFF	GLASSY TUFF	OBSIDIAN	SERPENTINE
BENTONITE	CLAY	GRANITE	PALEOSOL	SHALE
BIOTITIZATION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

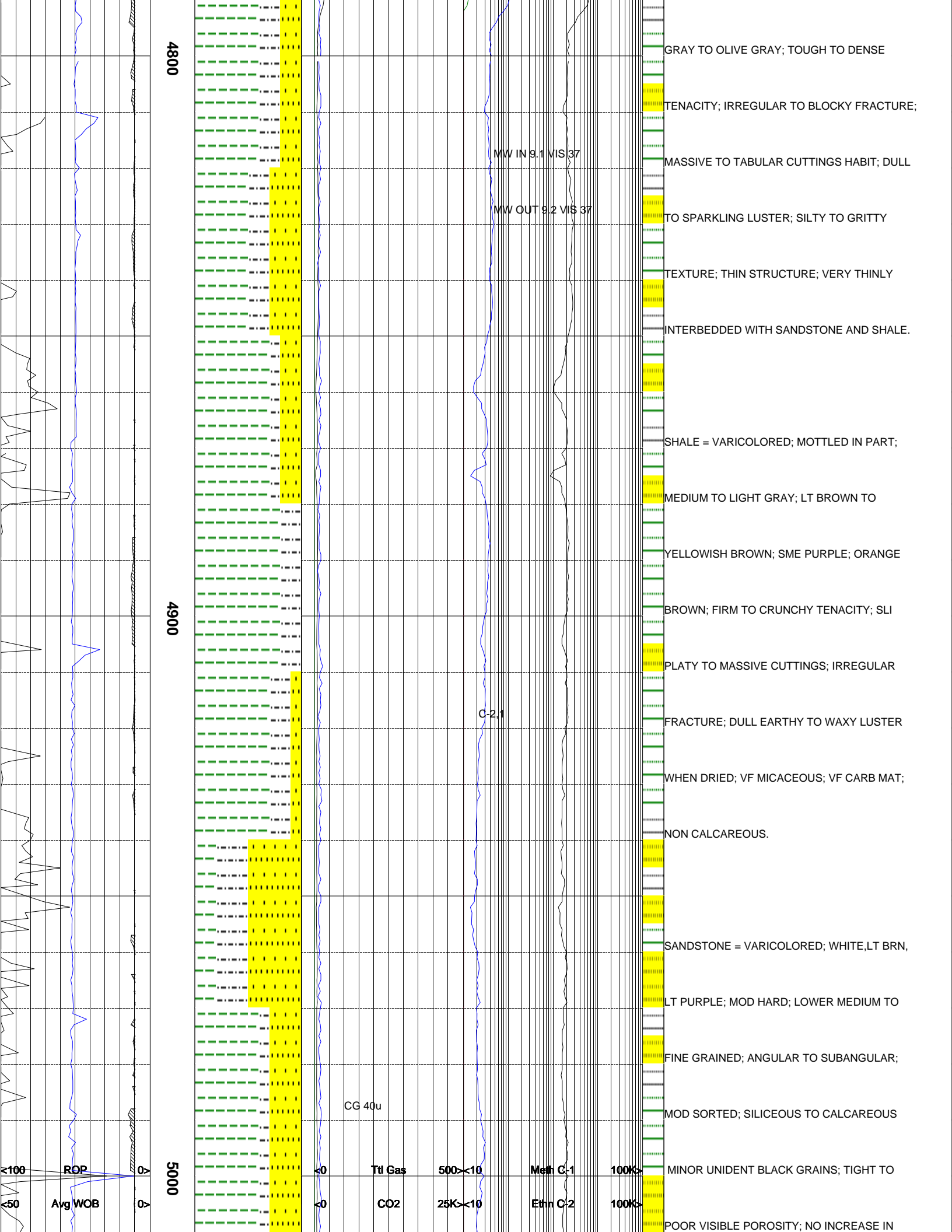


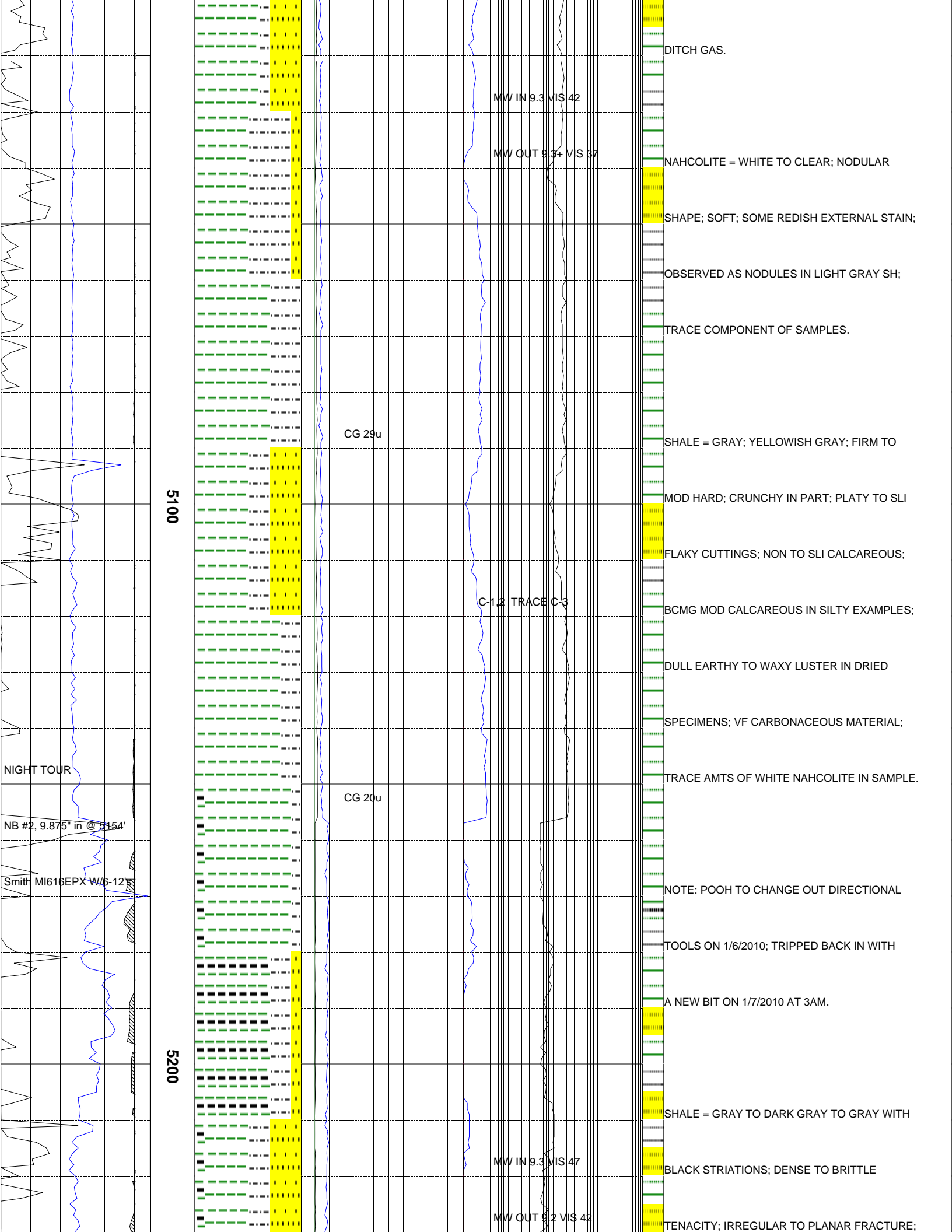


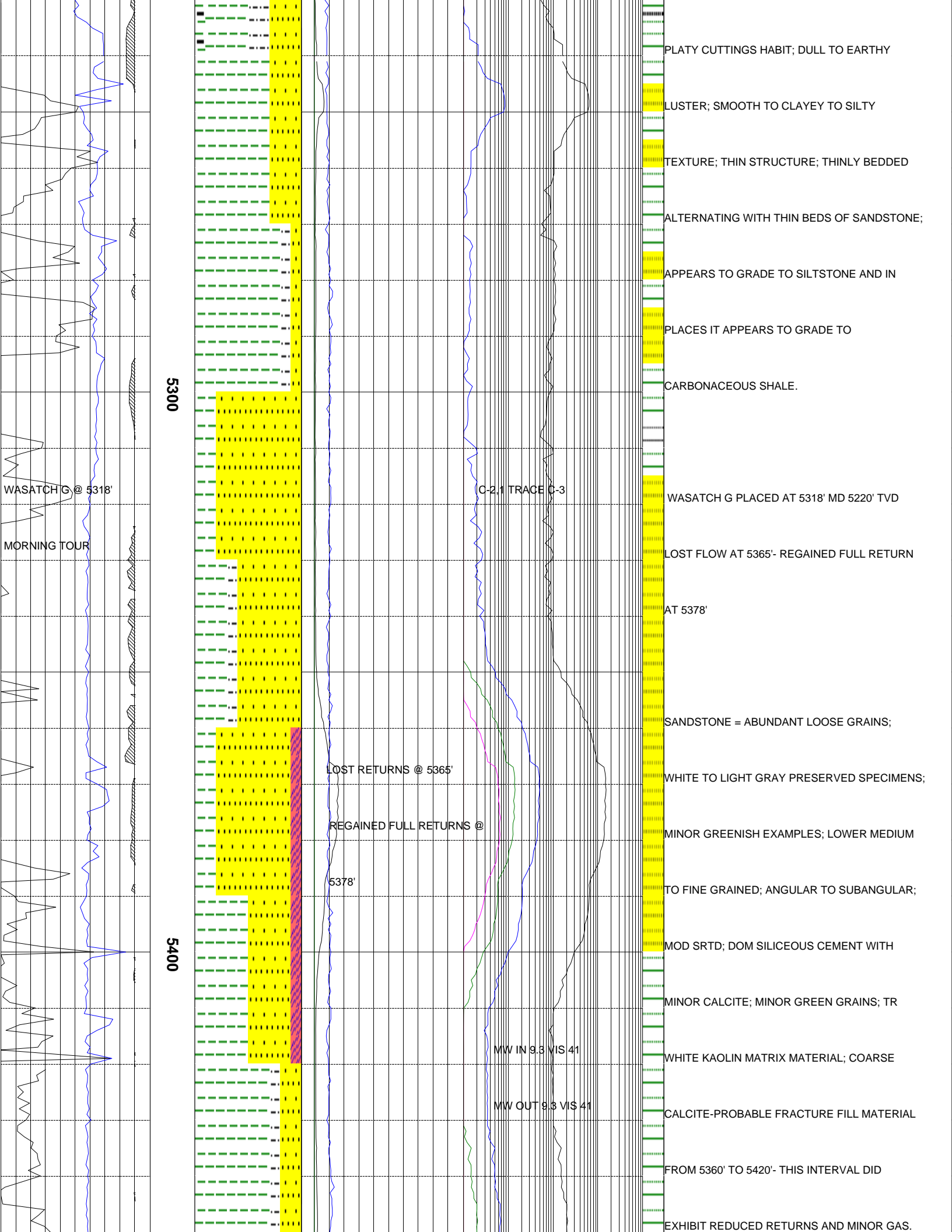


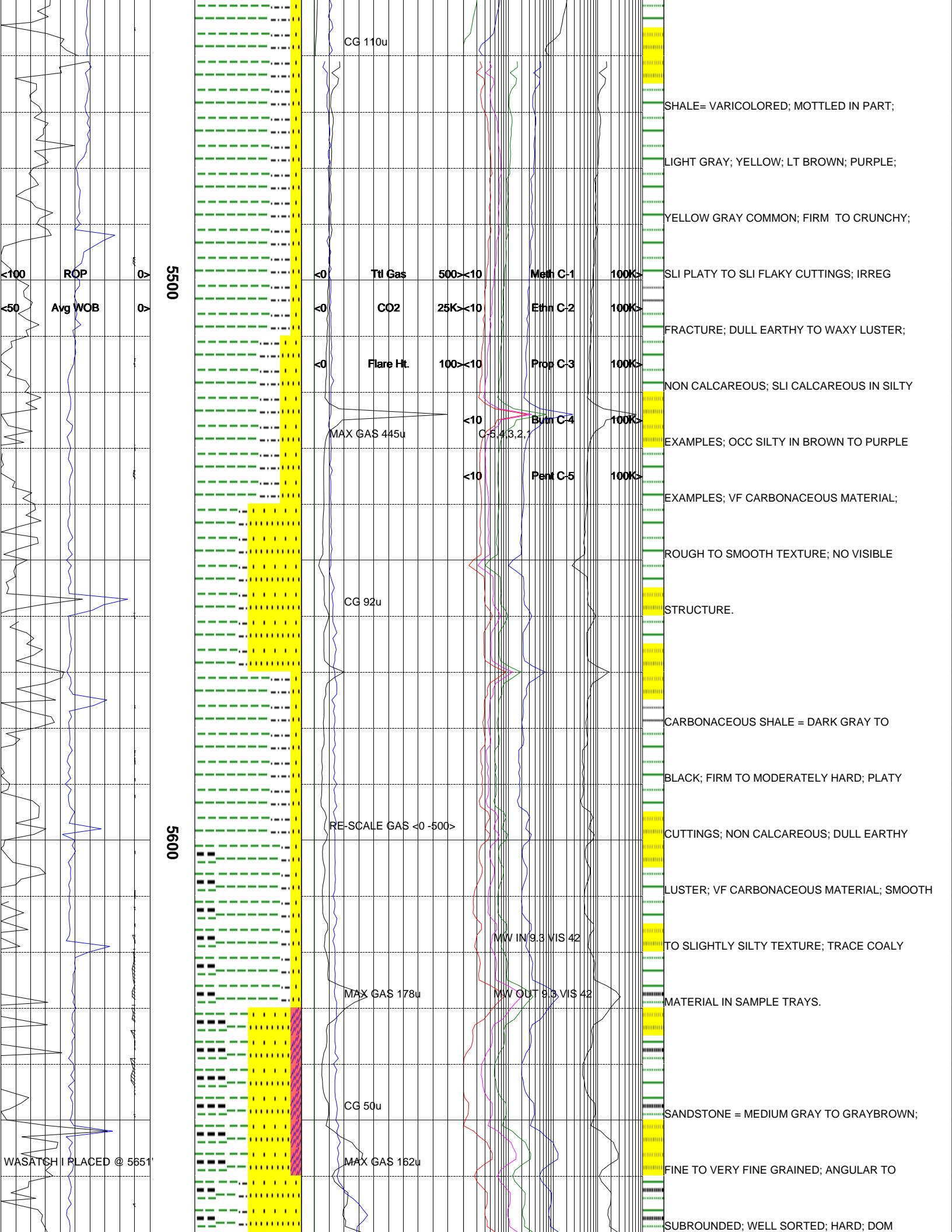


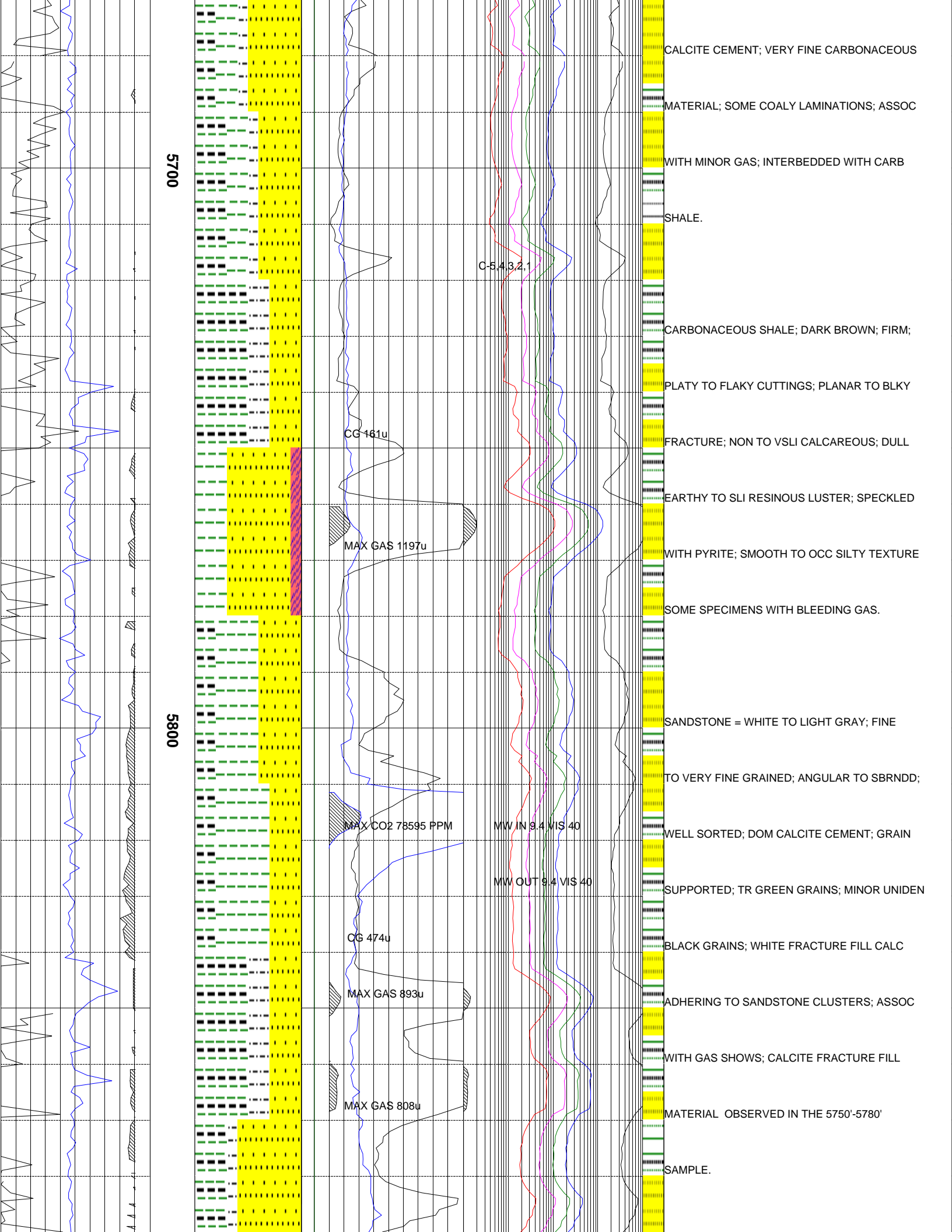


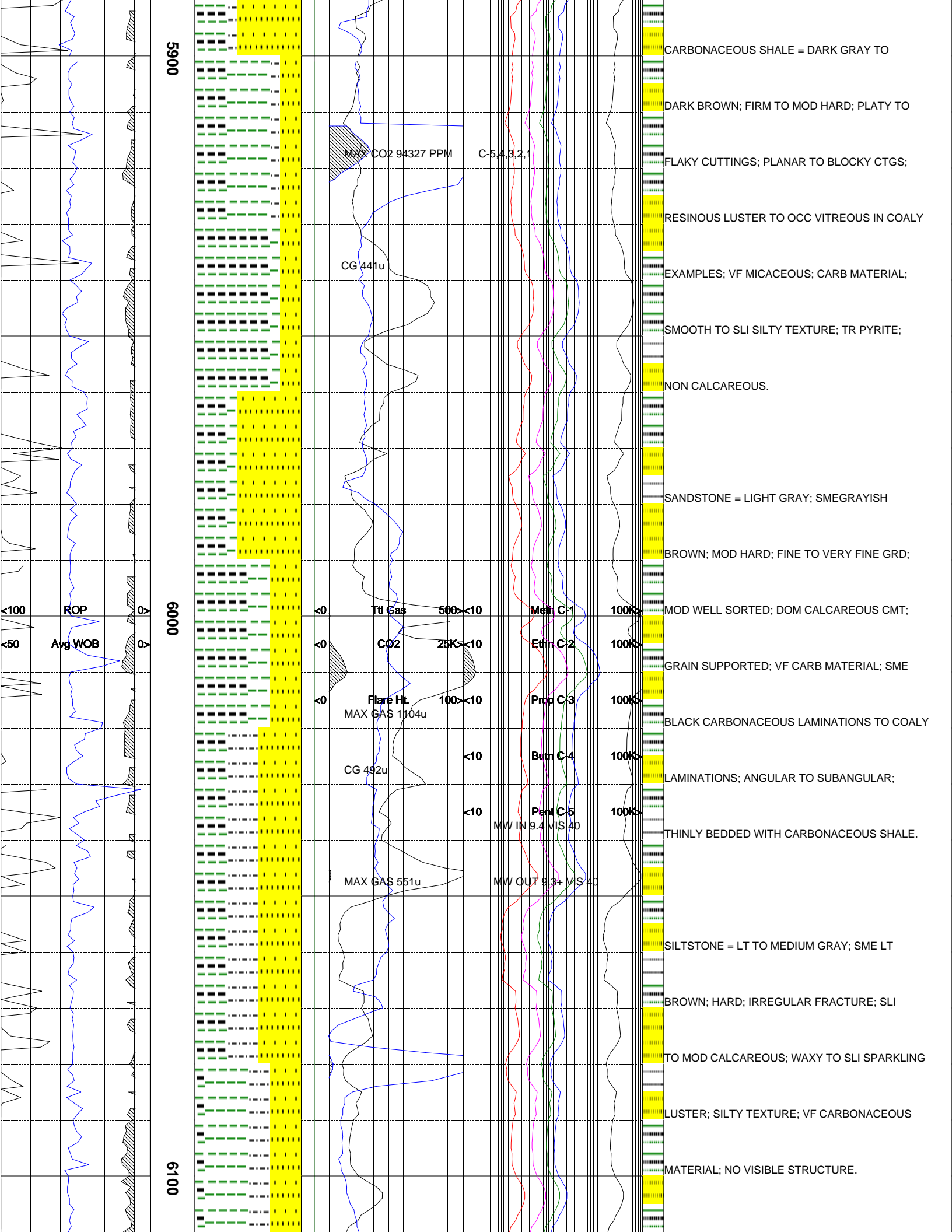


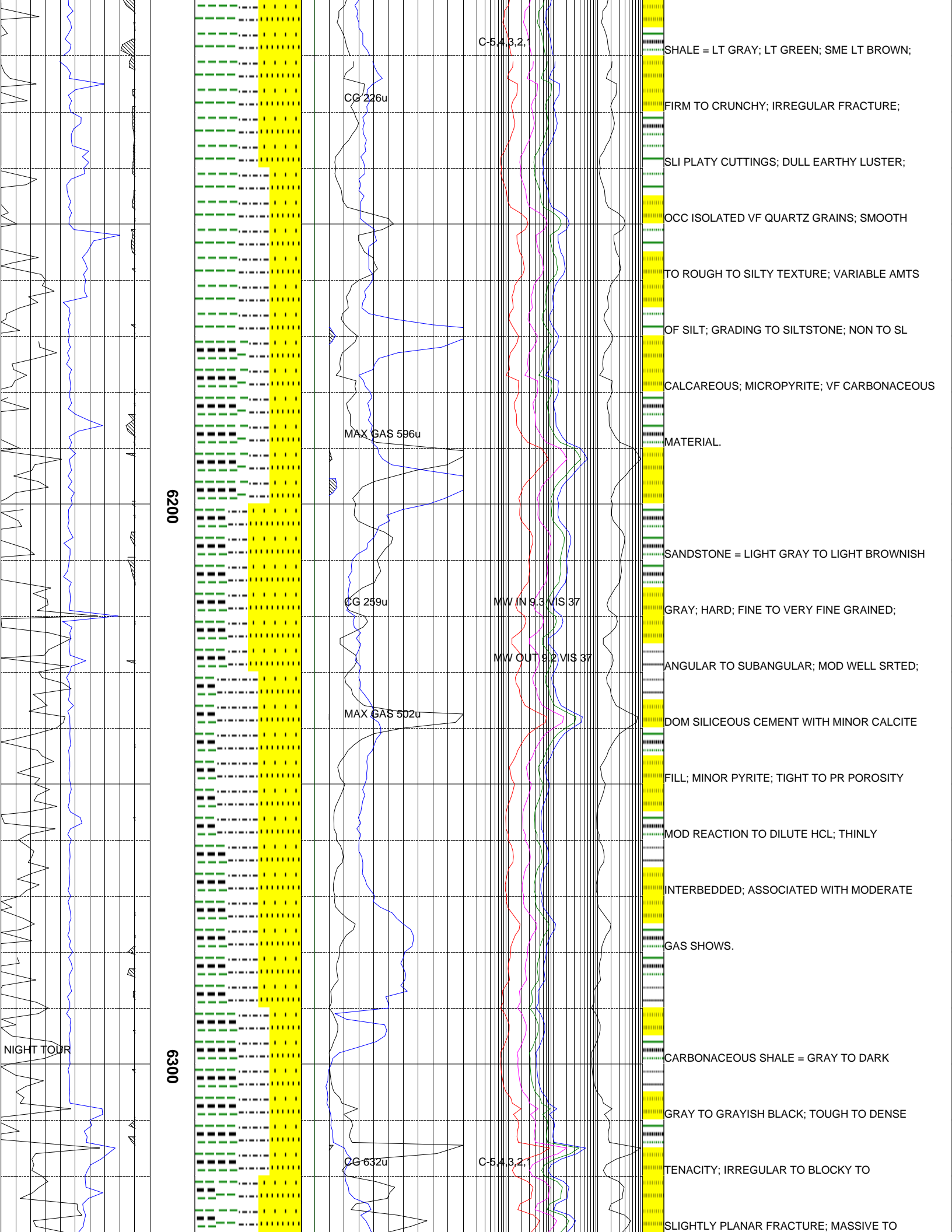


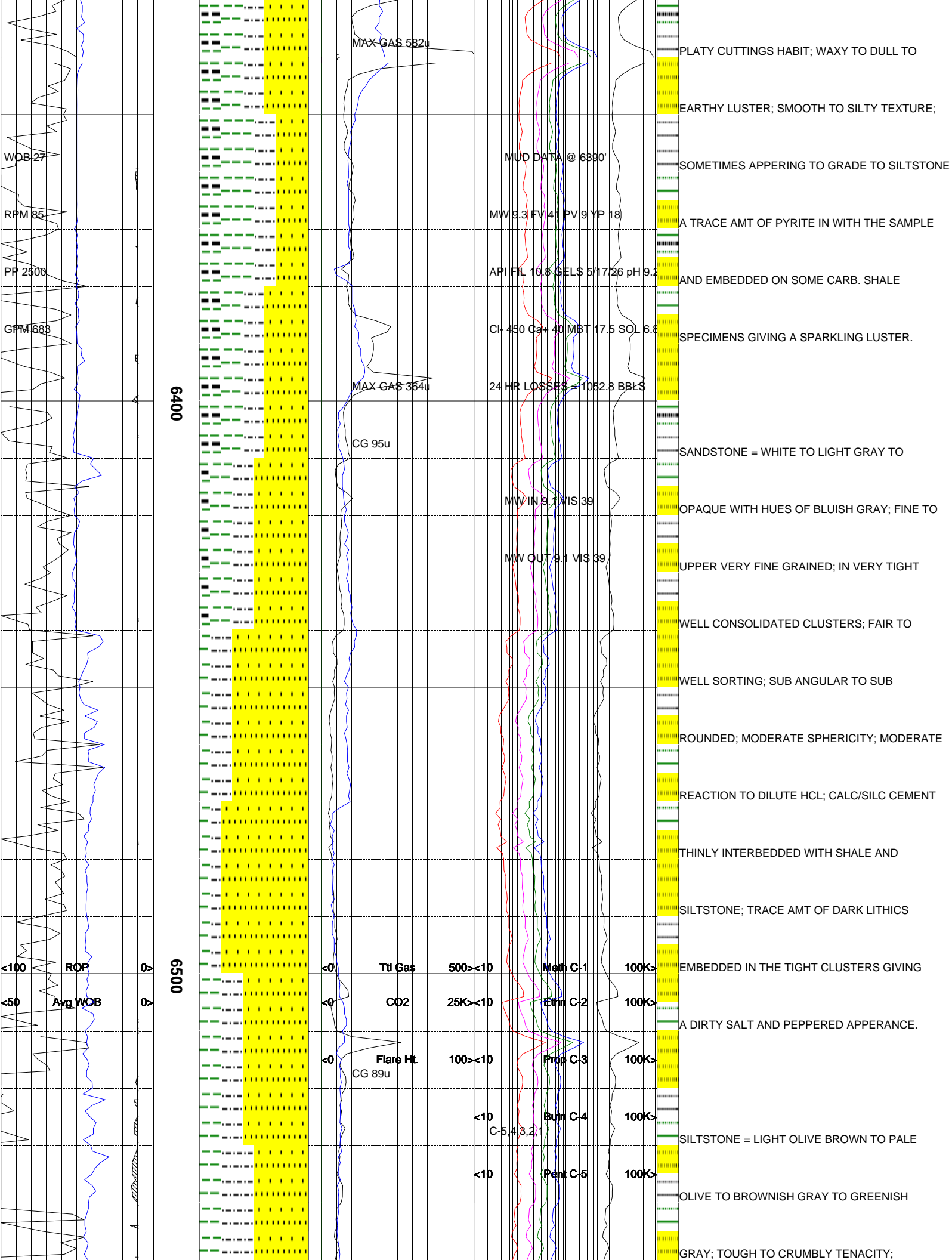


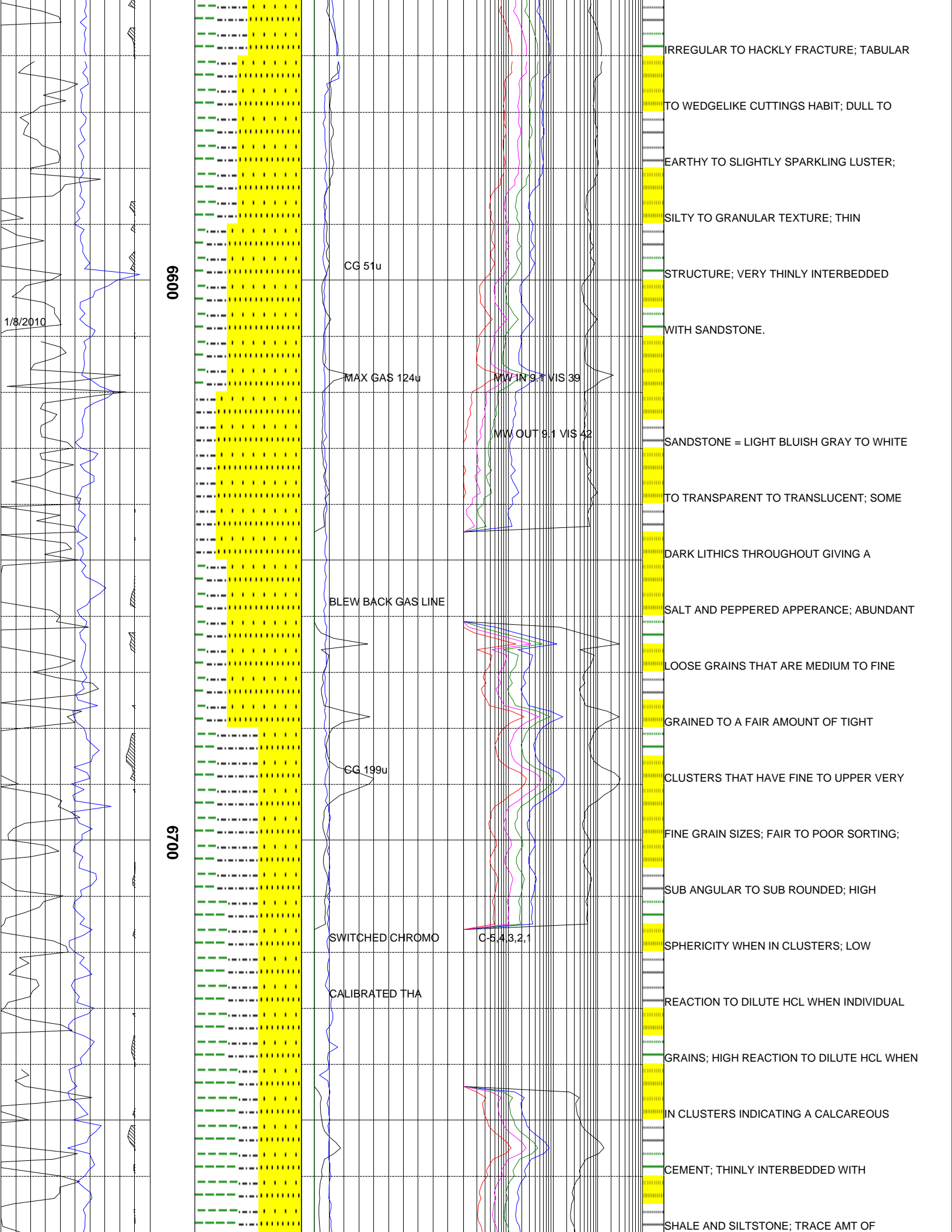


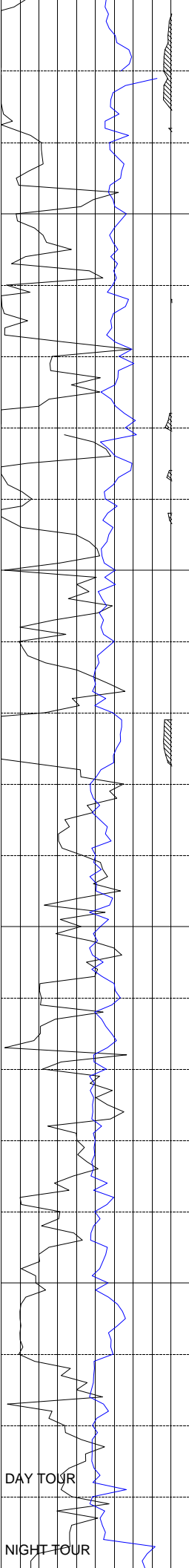












0089

0069

CG 940u
MAX GAS 836u

REPAIRED GAS EQUIPMENT
EQUIPMENT HAD ICE PLUG

MW IN 9.1 VIS 39

MW OUT 9.1 VIS 39

C-5.4.3.2

MW IN 9.1 VIS 39

MW OUT 9.2 VIS 38

PYRITE IN SAMPLE TRAY.

SHALE = LIGHT GRAY TO GRAY TO BLUISH

GRAY; TOUGH TO CRUMBLY TENACITY;

IRREGULAR TO PLANAR FRACTURE; MASSIVE

TO PLATY CUTTINGS HABIT; DULL TO EARTHY

LUSTER; SMOOTH TO SILTY TEXTURE;

VISIBLY GRADES TO SILTSTONE WHERE

SOME SPECIMENS SHOWED A DEFINITIVE

LINE WHERE IT WAS HALF SHALE AND HALF

SILTSTONE; THINLY INTERBEDDED.

SILTSTONE = BROWN TO DARK BROWNISH

GRAY TO DARK GRAY; TOUGH TENACITY;

IRREGULAR TO BLOCKY FRACTURE; TABULAR

CUTTINGS HABIT; DULL TO SLIGHTLY

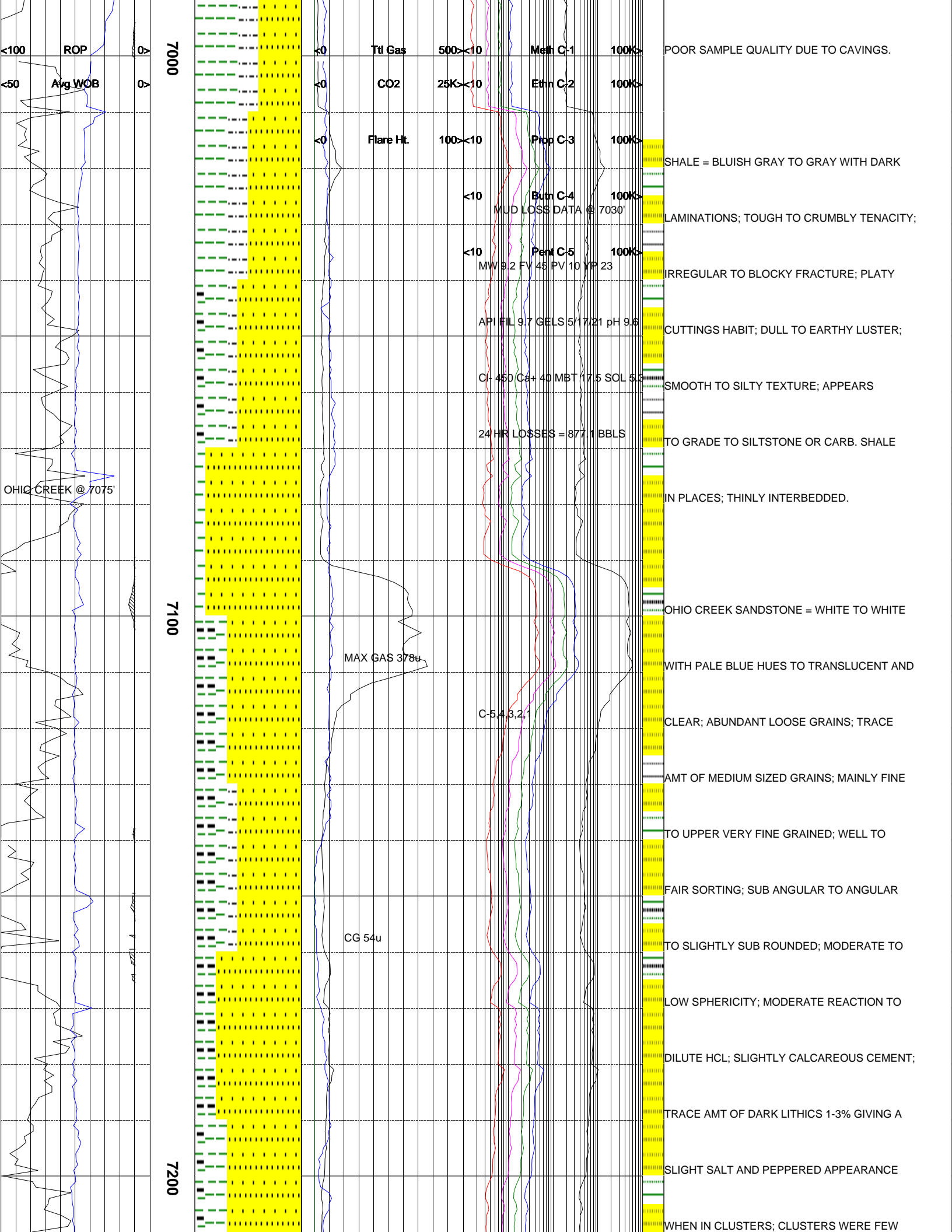
SPARKLING LUSTER; THIN STRUCTURE;

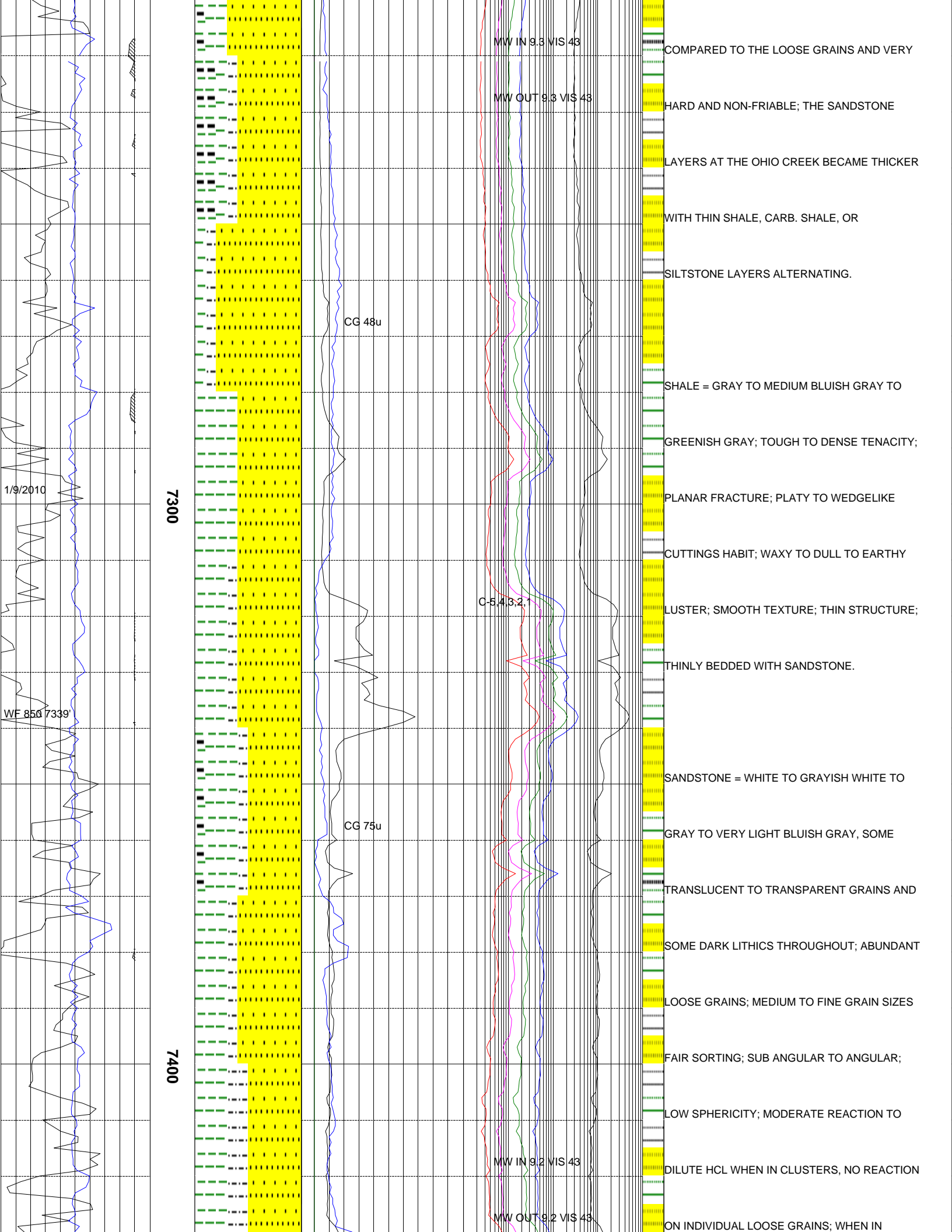
THINLY INTERBEDDED.

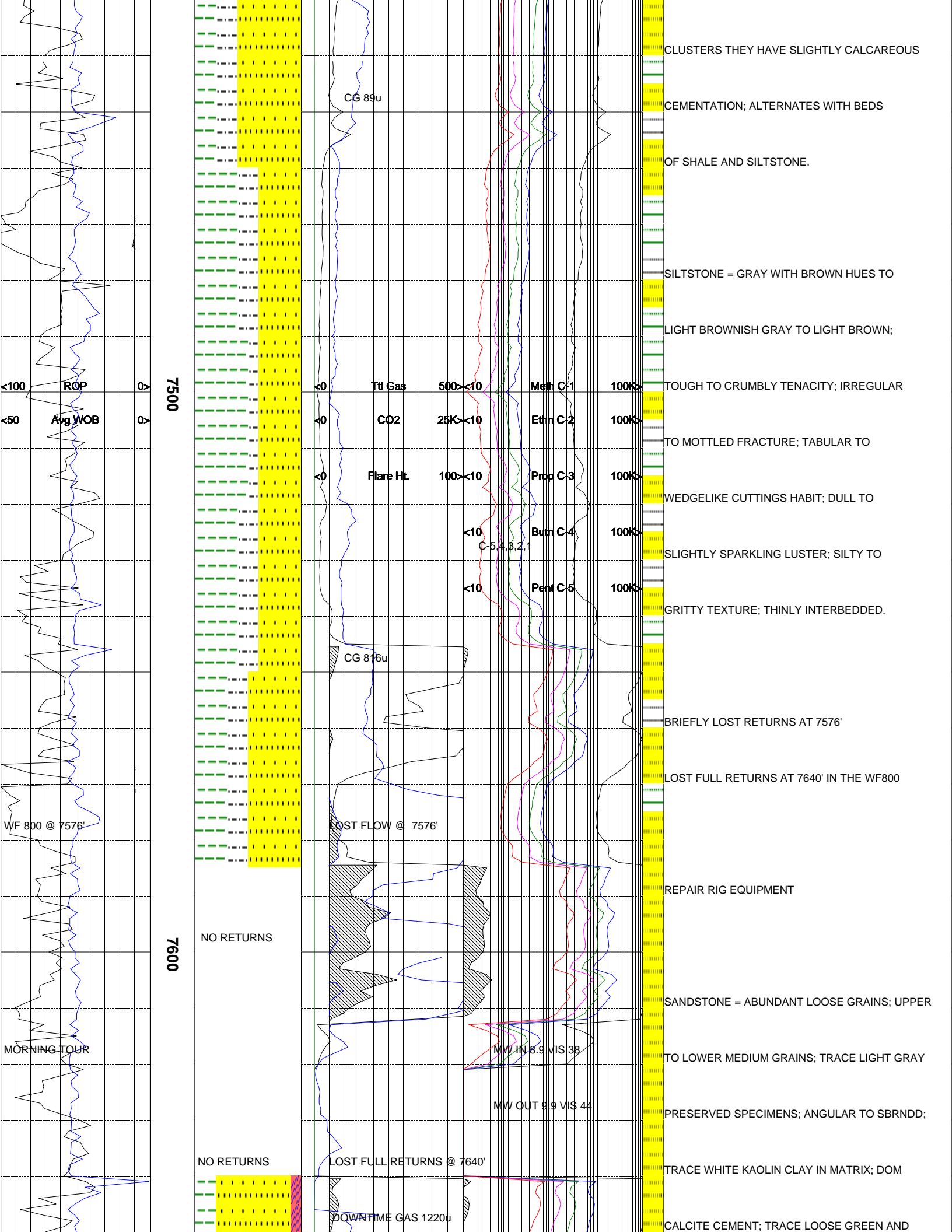
NOTE: SHORT WIPER TRIP AT 6983' MD

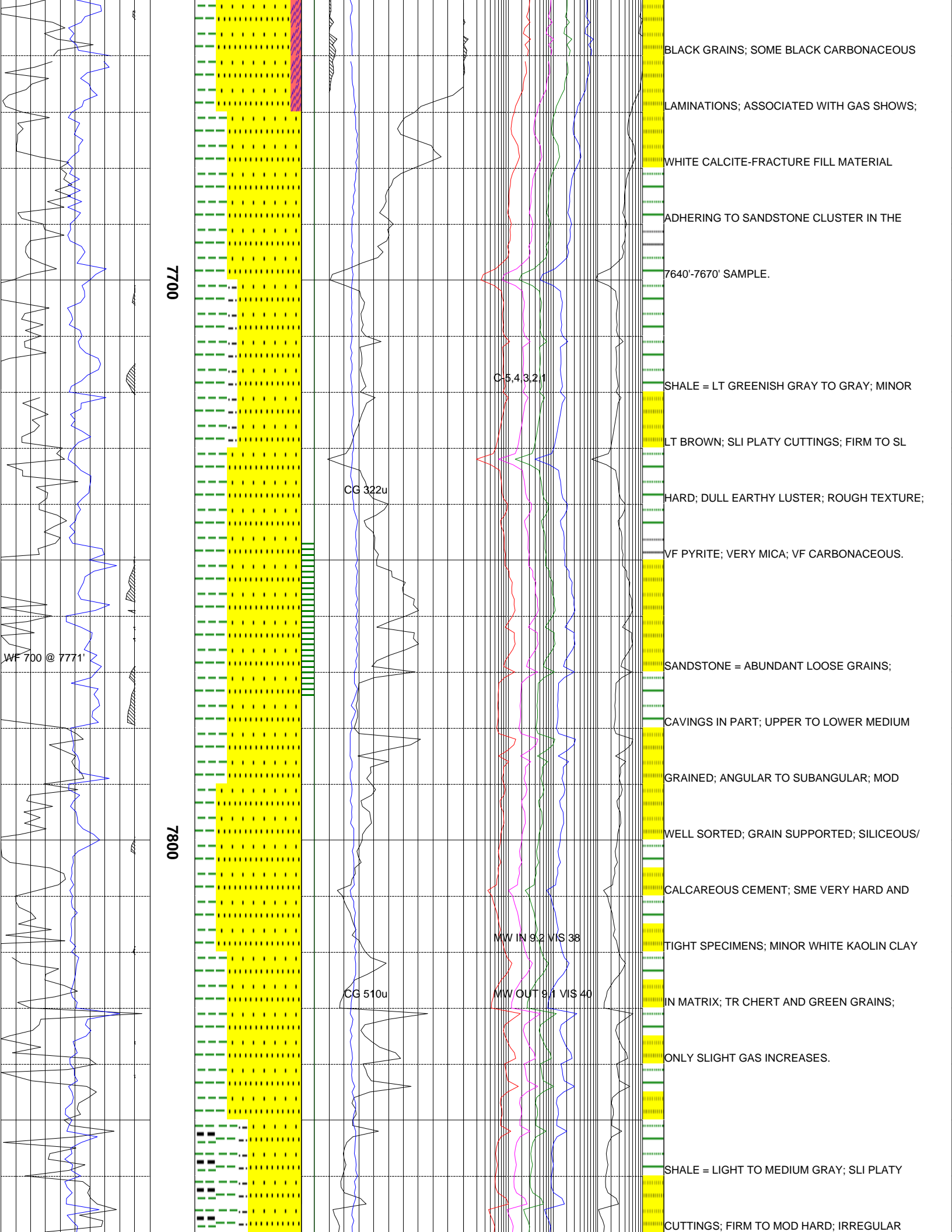
ON 1/8/2010 6AM; RESUMED DRILLING ON

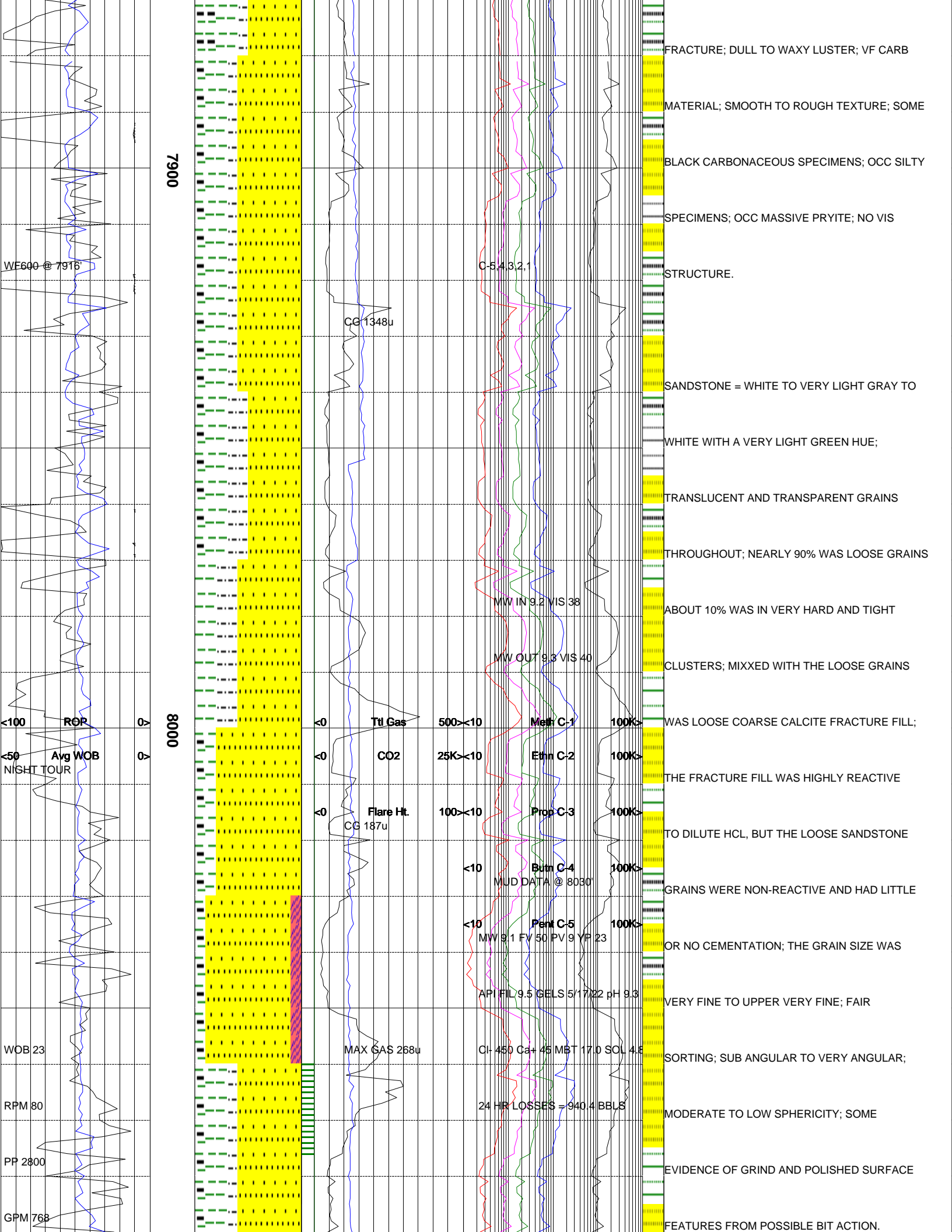
1/8/2010 AT 6:30PM. FIRST SAMPLE HAD

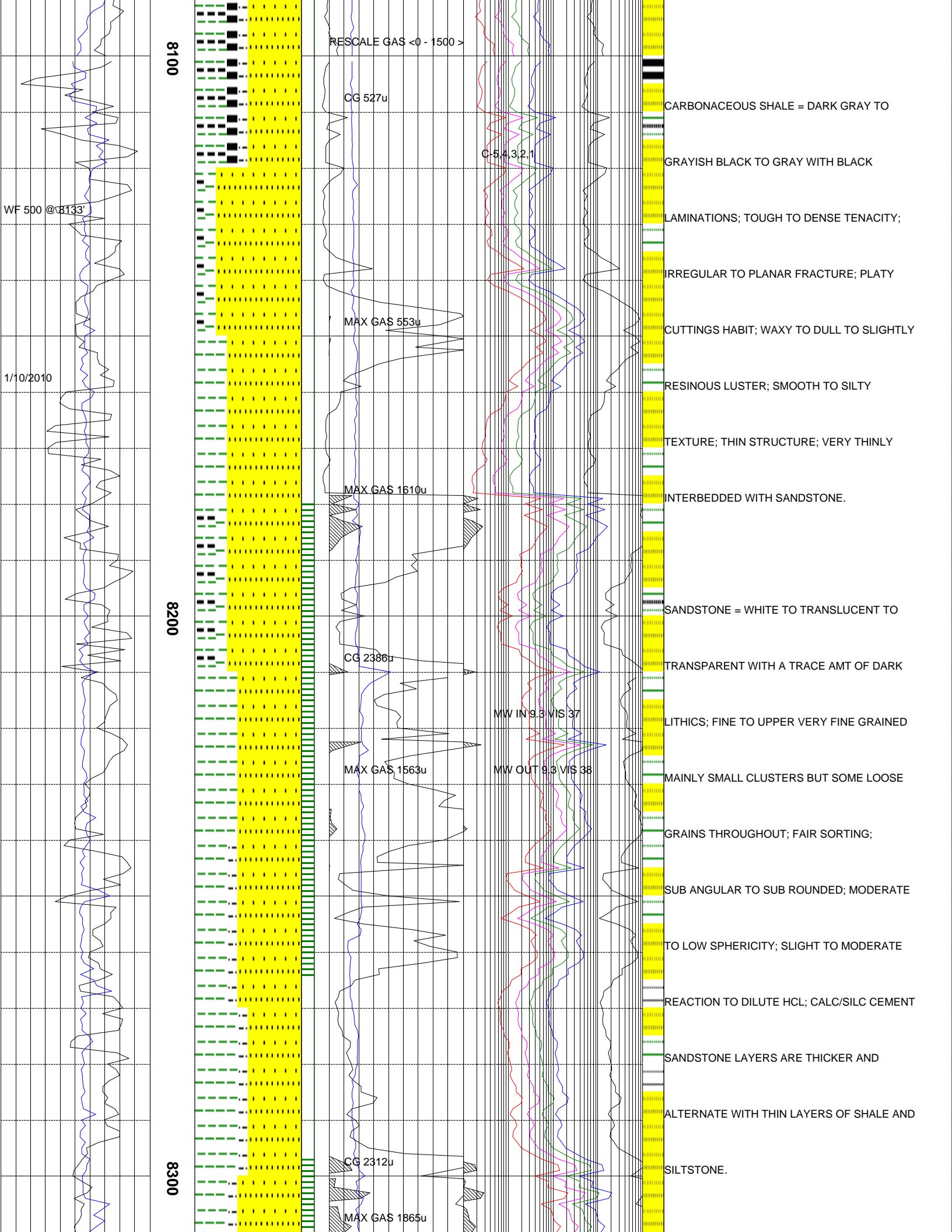


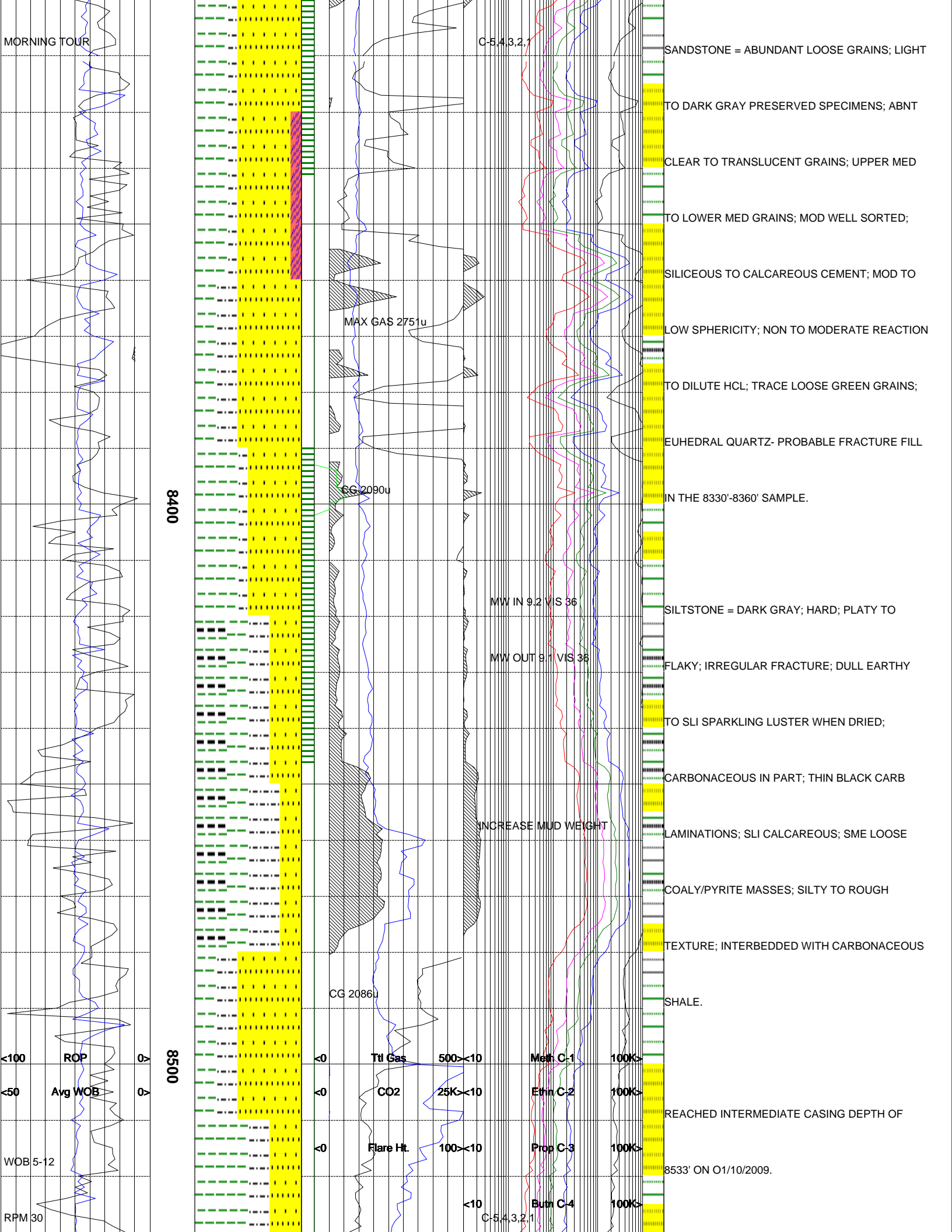


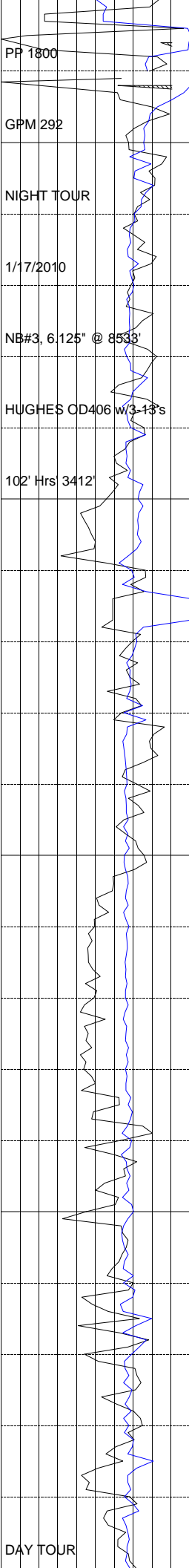






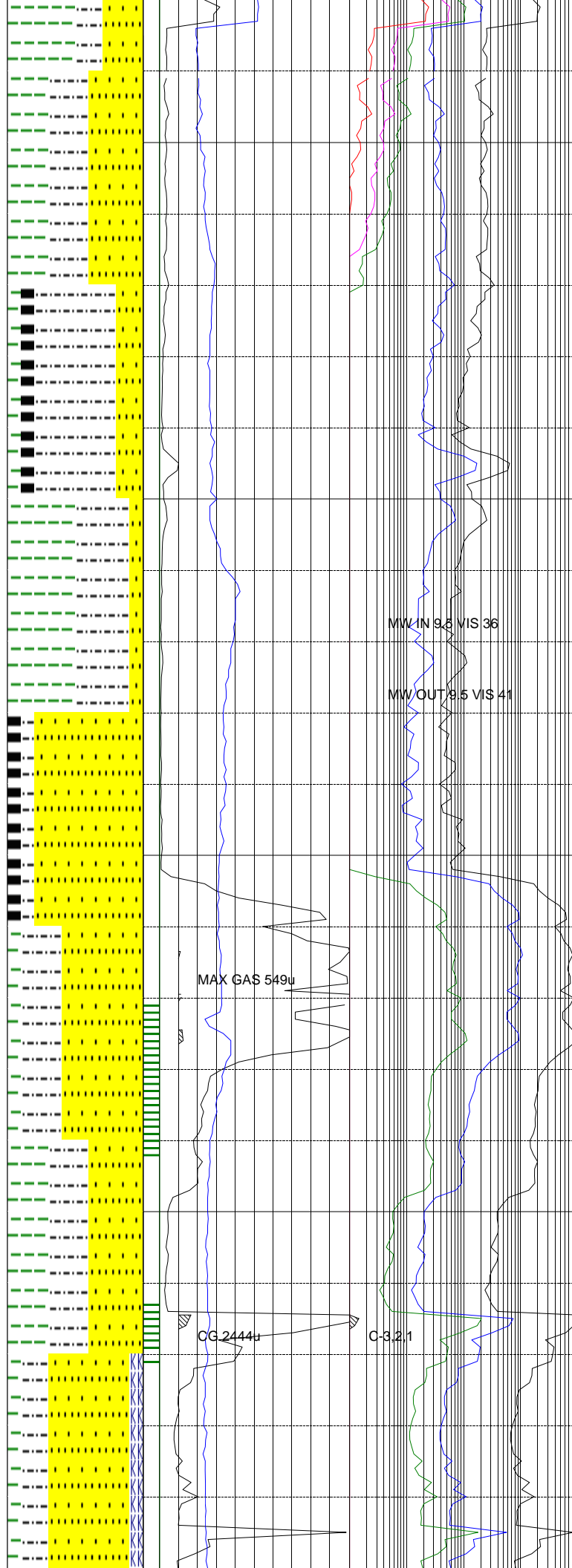






8060

8700



MW IN 9.5 VIS 36

MW OUT 9.5 VIS 41

MAX GAS 549u

CG-2444u

C-3.2.1

SILTSTONE = LIGHT GRAY, MODERATE LIGHT

GRAY SOME DARK GRAY; CRUMBLY TENACITY;

PLANAR TO SUB BLOCKY FRACTURE; TABULAR

TO SEMI PLATY CUTTINGS HABIT; DULL

LUSTER; SMOOTH/SILTY TO GRITTY TEXTURE;

SOME GRADING TO A VERY FINE SANDSTONE.

SANDSTONE = ABUNDANT LOOSE GRAINS; CLEAR

TO TRANSLUCENT, OFF WHITE, WHITE; LOWER

TO UPPER FINE GRAIN; PREDOMINATELY WELL

SORTED; SUB ANGULAR IN PART; LOW TO

MODERATE SPHERICITY; TRACE FROSTED

SURFACE FEATURE; LOOSE GRAINS, VERY

EASILY FRIABLE; SOME KAOLITE CEMENT,

SILICA CEMENTATION; VERY WEAK GRAIN

SUPPORT, VERY GOOD POROSITY, HIGH

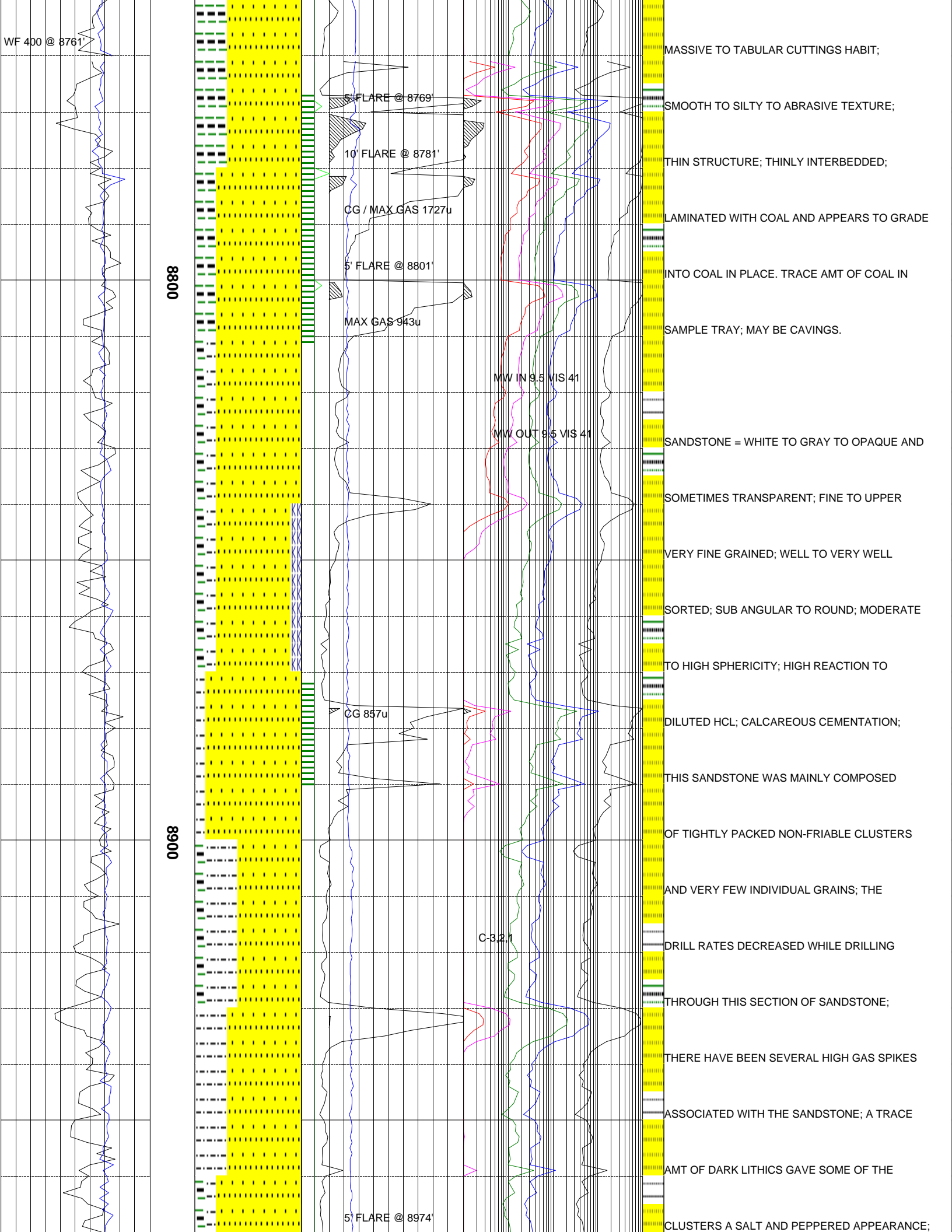
CONNECTION GAS AND SHOW AT 2444u @ 8717'

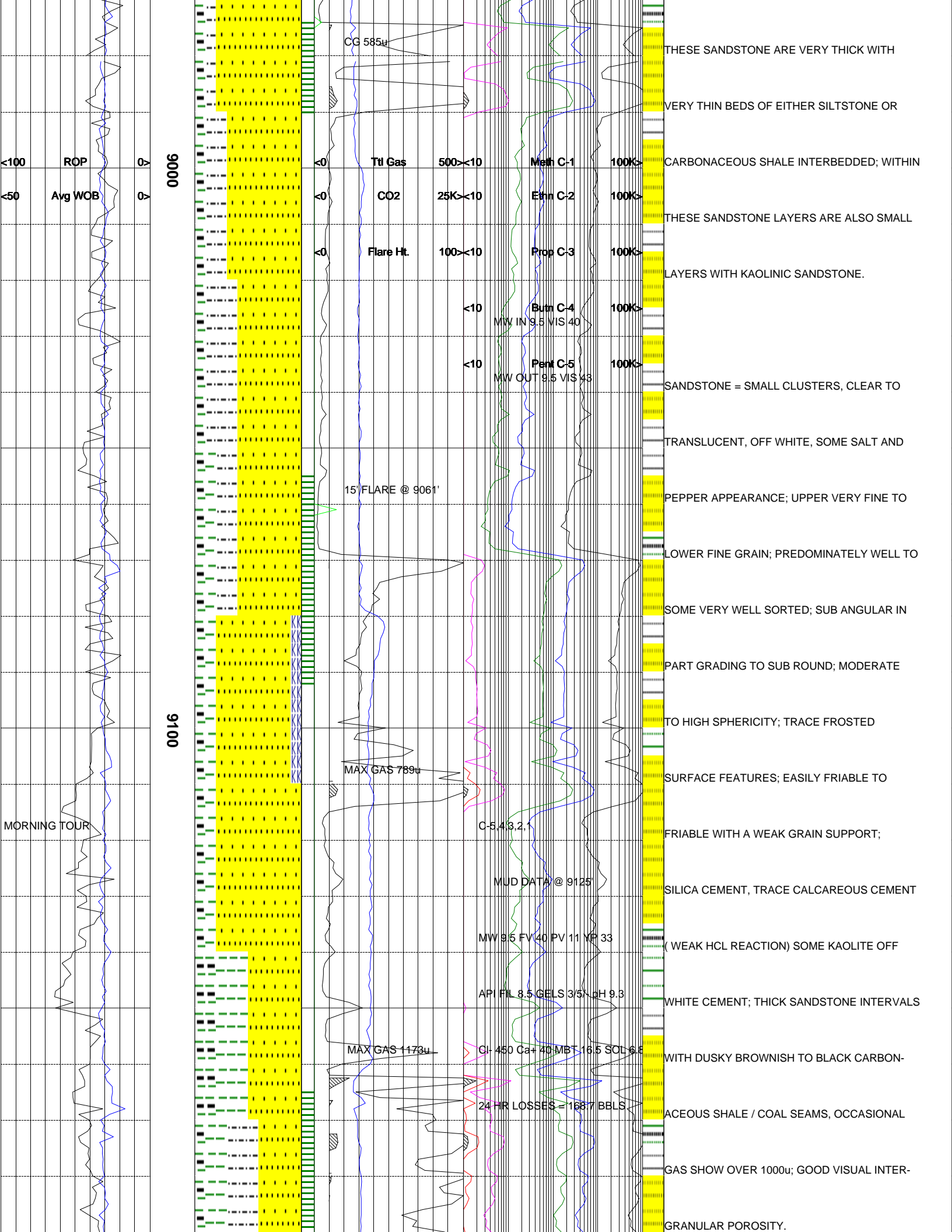
TRACE BLACK SPECKLED COAL IN SAMPLE TRAY

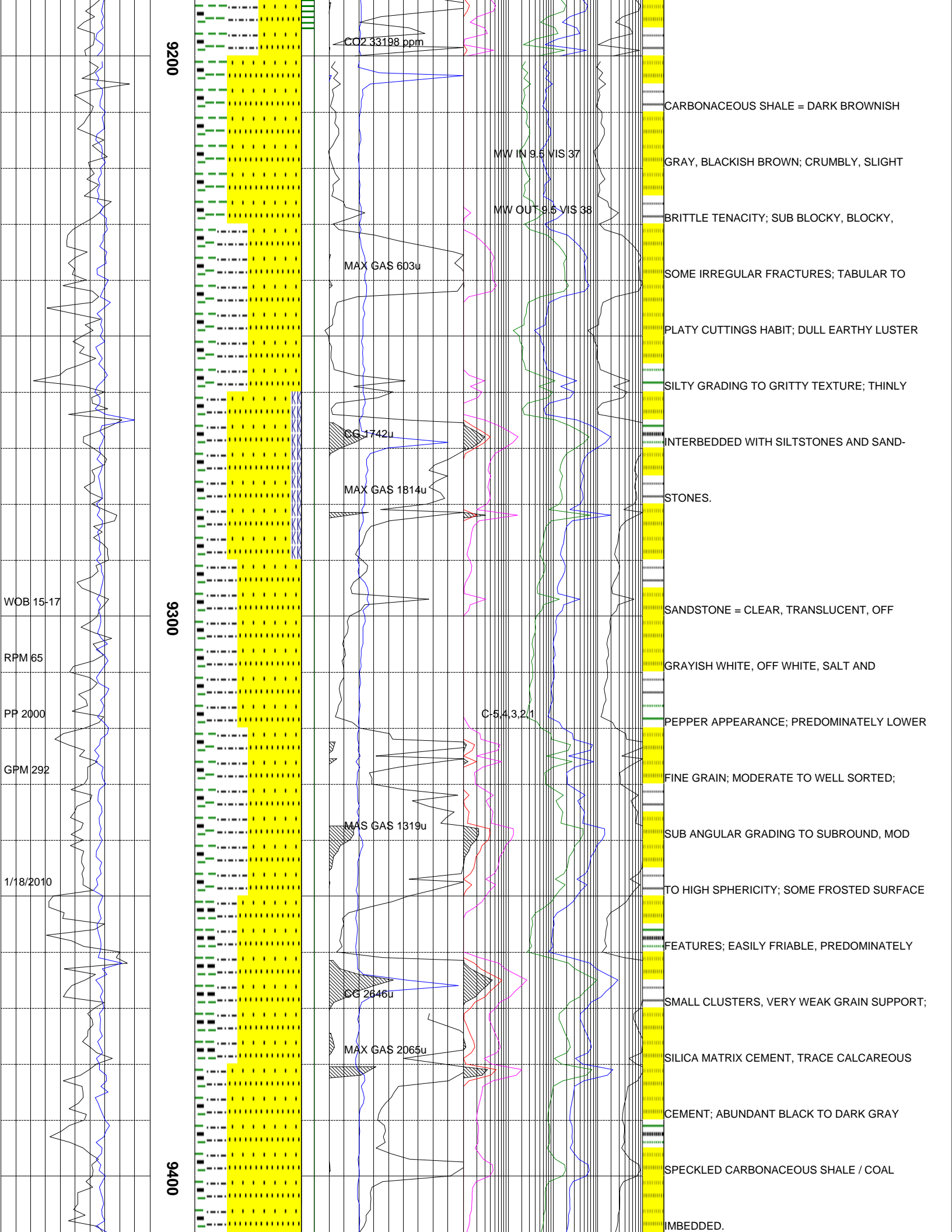
CARBONACEOUS SHALE = DARK GRAY TO

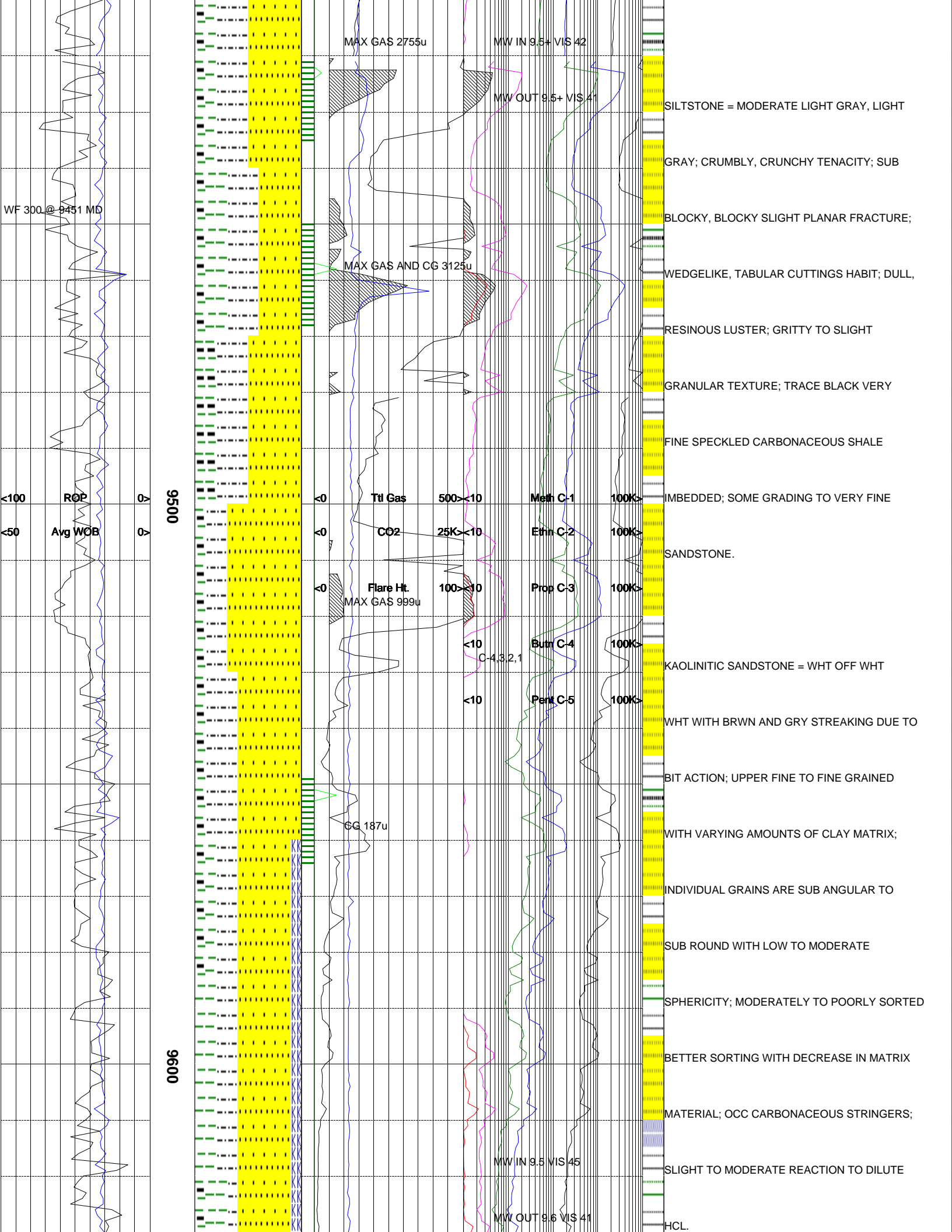
GRAYISH BLACK TO BLACK; TOUGH TO DENSE

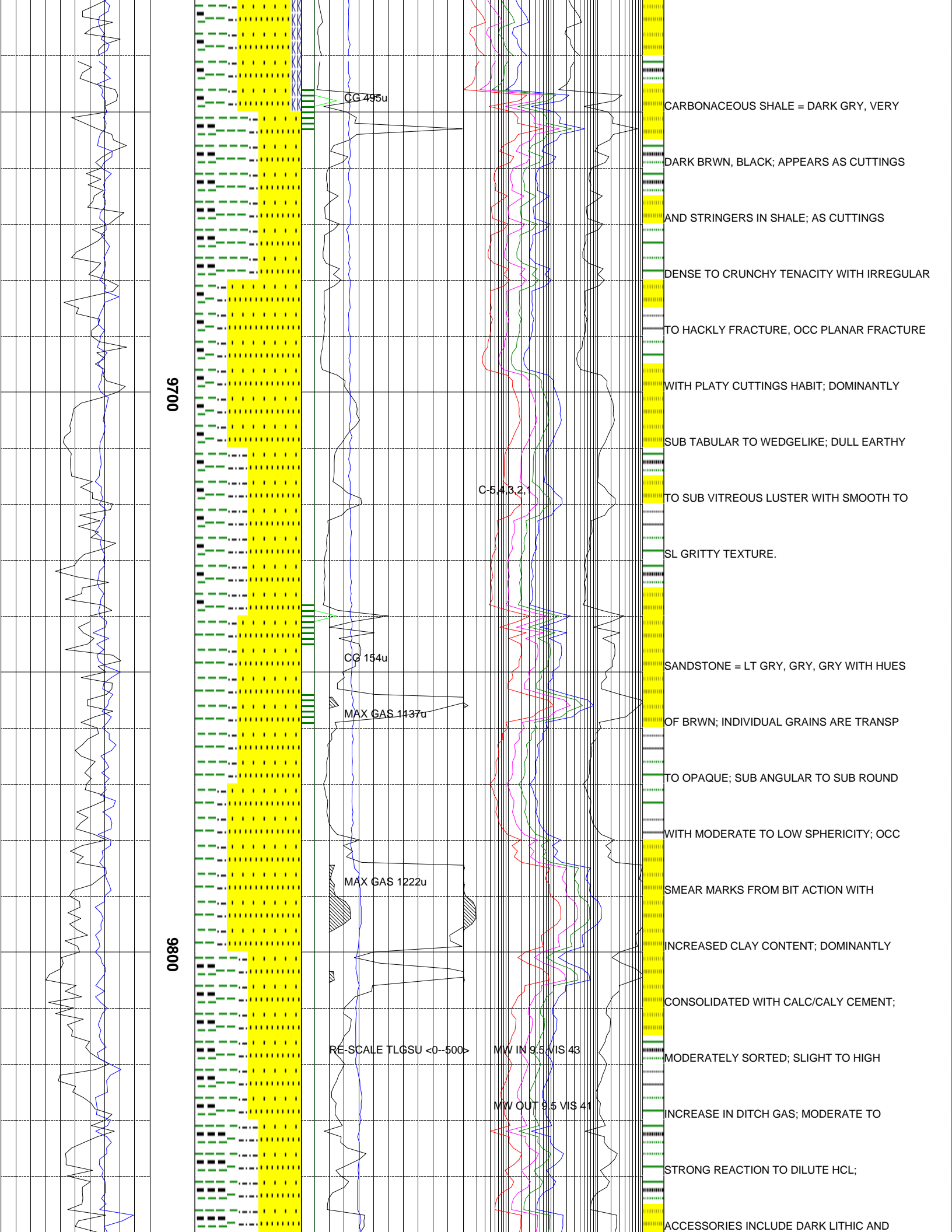
TENACITY; IRREGULAR TO BLOCKY FRACTURE;

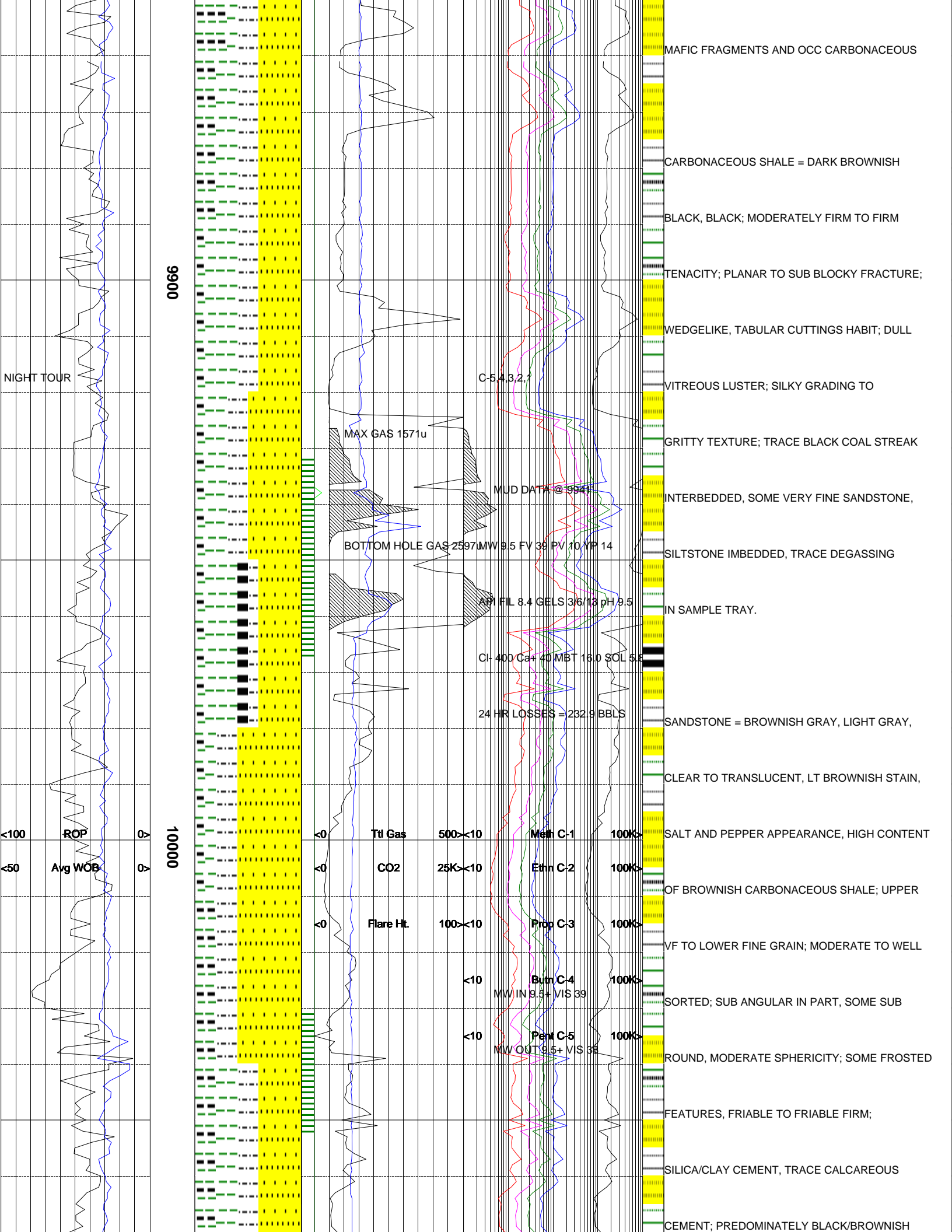


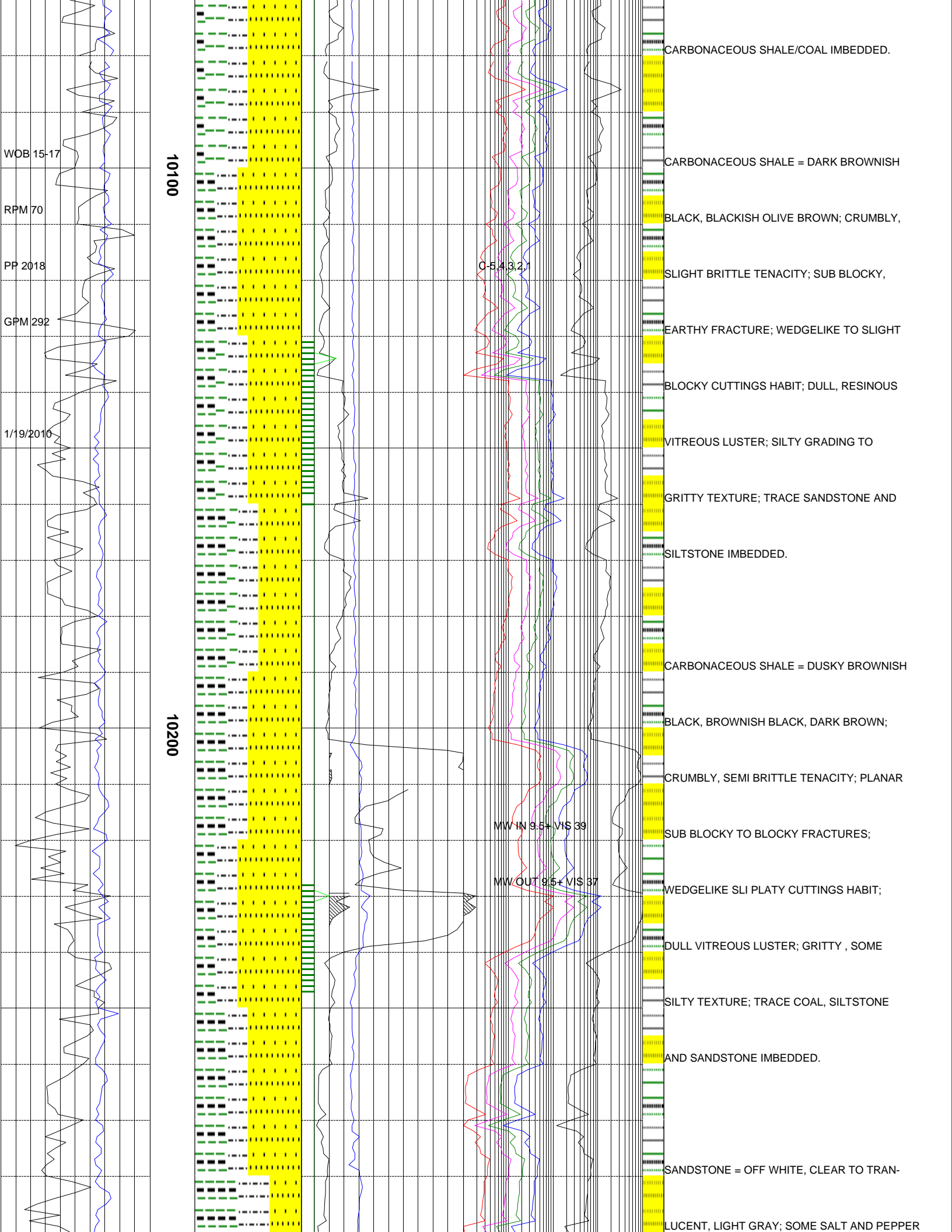


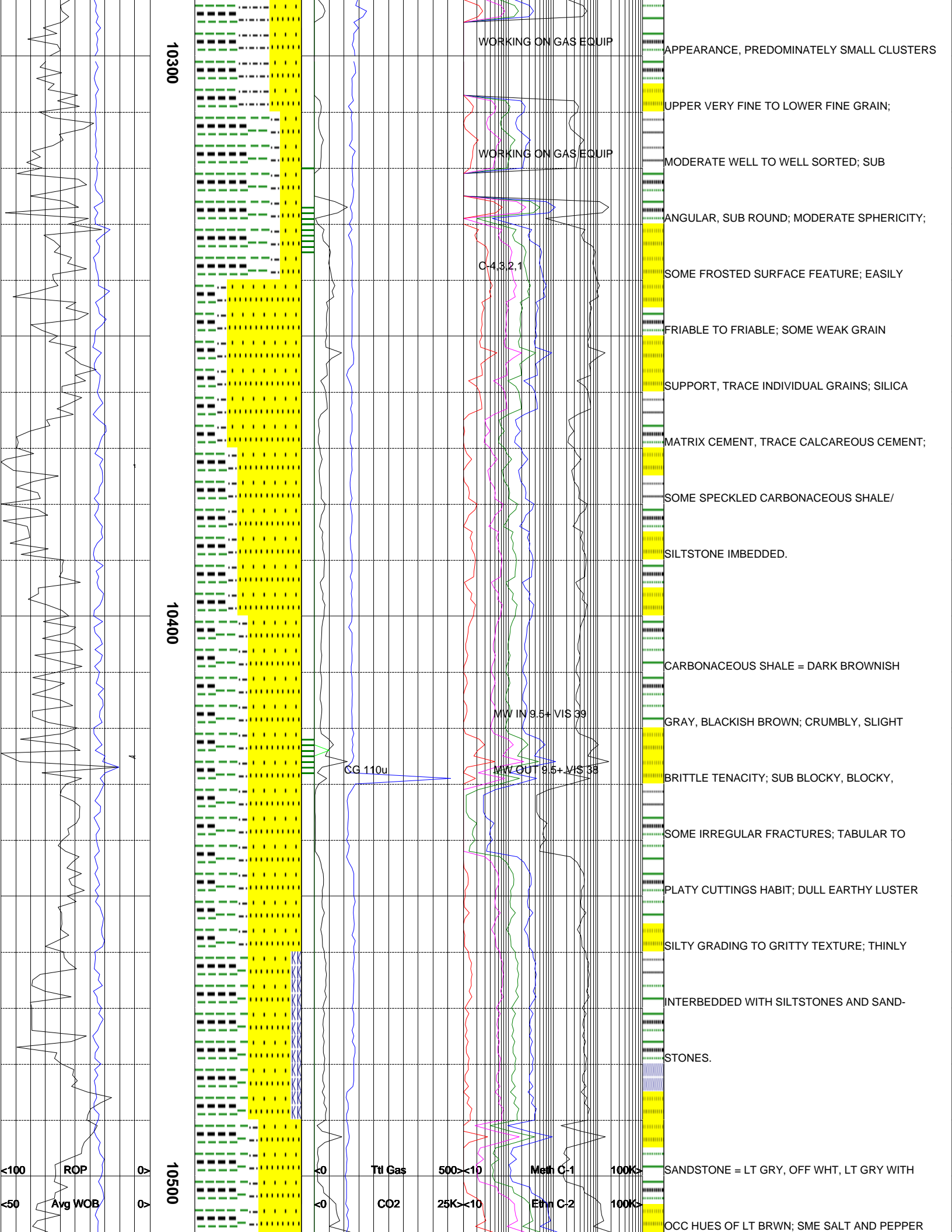


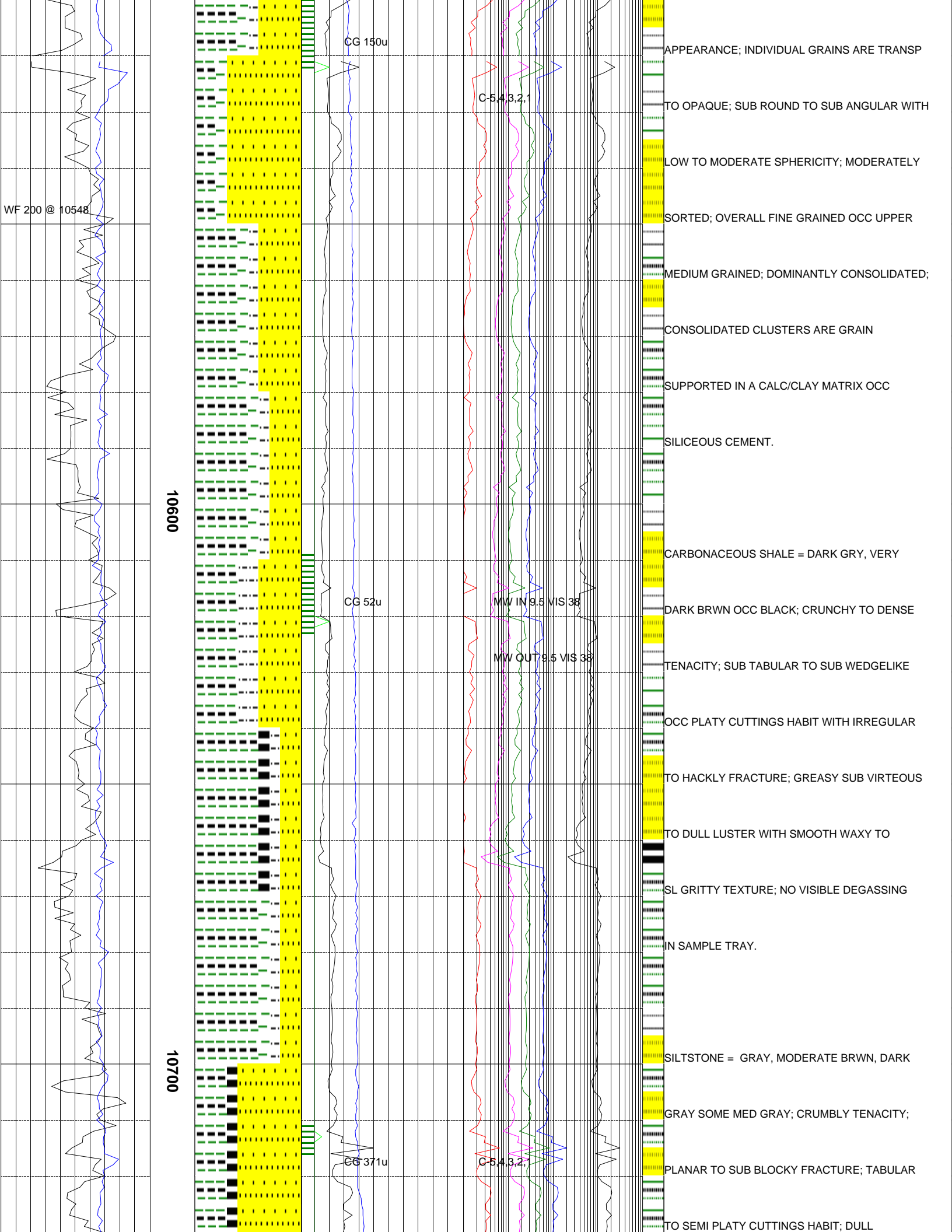












WF 200 @ 10548

CG 150u

C-5.43.2.1

10600

CG 52u

MW IN 9.5 VIS 38

MW OUT 9.5 VIS 38

10700

CG 371u

C-5.43.2.1

APPEARANCE; INDIVIDUAL GRAINS ARE TRANSP

TO OPAQUE; SUB ROUND TO SUB ANGULAR WITH

LOW TO MODERATE SPHERICITY; MODERATELY

SORTED; OVERALL FINE GRAINED OCC UPPER

MEDIUM GRAINED; DOMINANTLY CONSOLIDATED;

CONSOLIDATED CLUSTERS ARE GRAIN

SUPPORTED IN A CALC/CLAY MATRIX OCC

SILICEOUS CEMENT.

CARBONACEOUS SHALE = DARK GRAY, VERY

DARK BRWN OCC BLACK; CRUNCHY TO DENSE

TENACITY; SUB TABULAR TO SUB WEDGELIKE

OCC PLATY CUTTINGS HABIT WITH IRREGULAR

TO HACKLY FRACTURE; GREASY SUB VIRTEOUS

TO DULL LUSTER WITH SMOOTH WAXY TO

SL GRITTY TEXTURE; NO VISIBLE DEGASSING

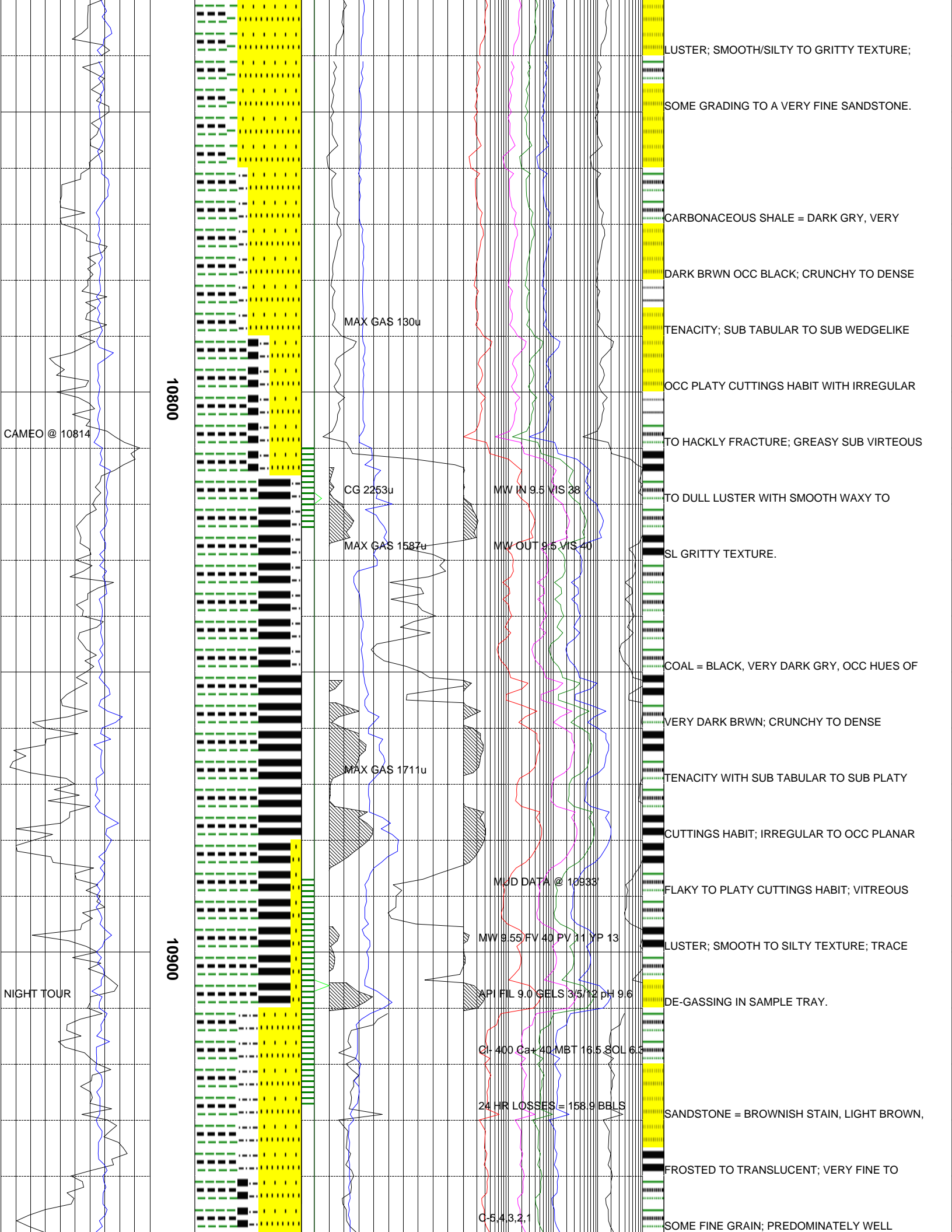
IN SAMPLE TRAY.

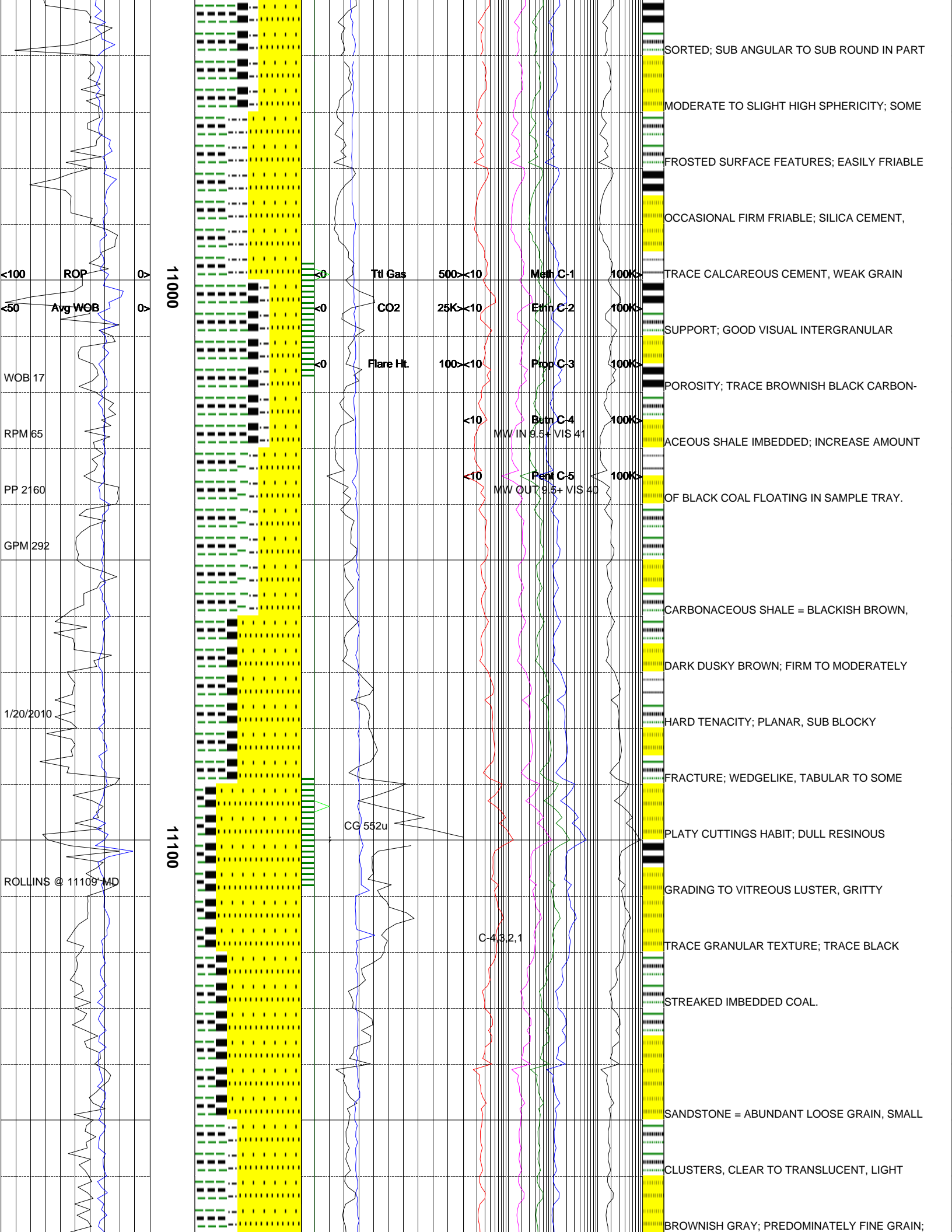
SILTSTONE = GRAY, MODERATE BRWN, DARK

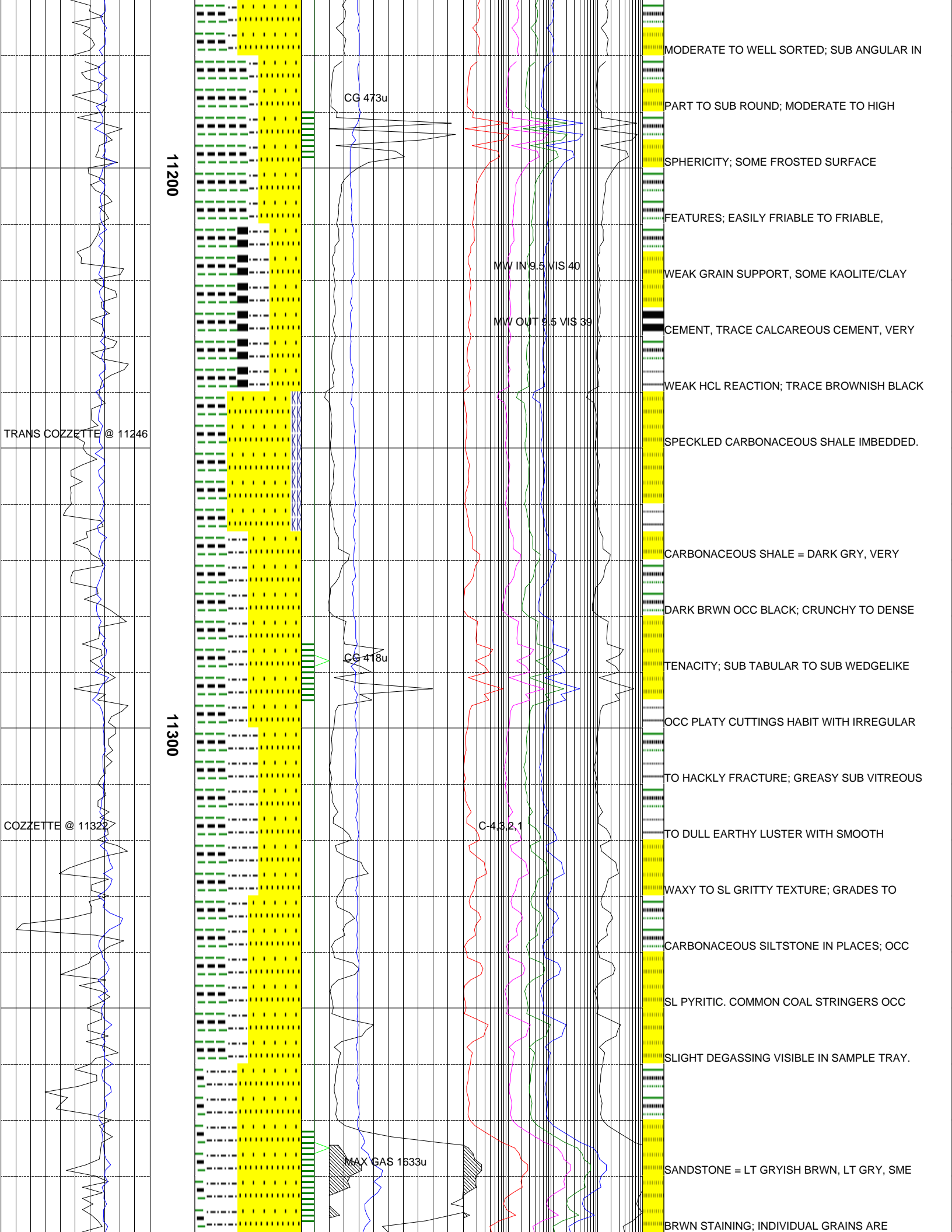
GRAY SOME MED GRAY; CRUMBLY TENACITY;

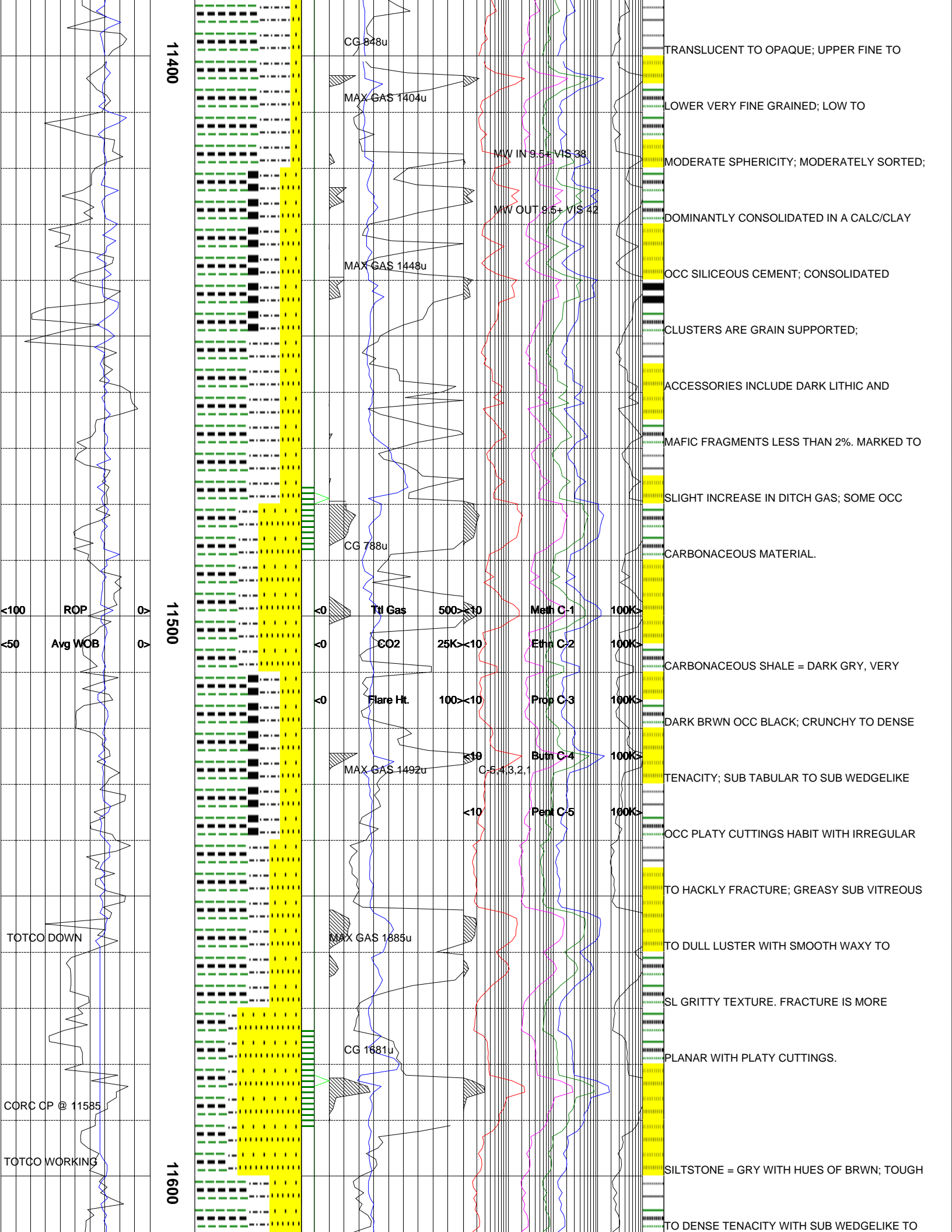
PLANAR TO SUB BLOCKY FRACTURE; TABULAR

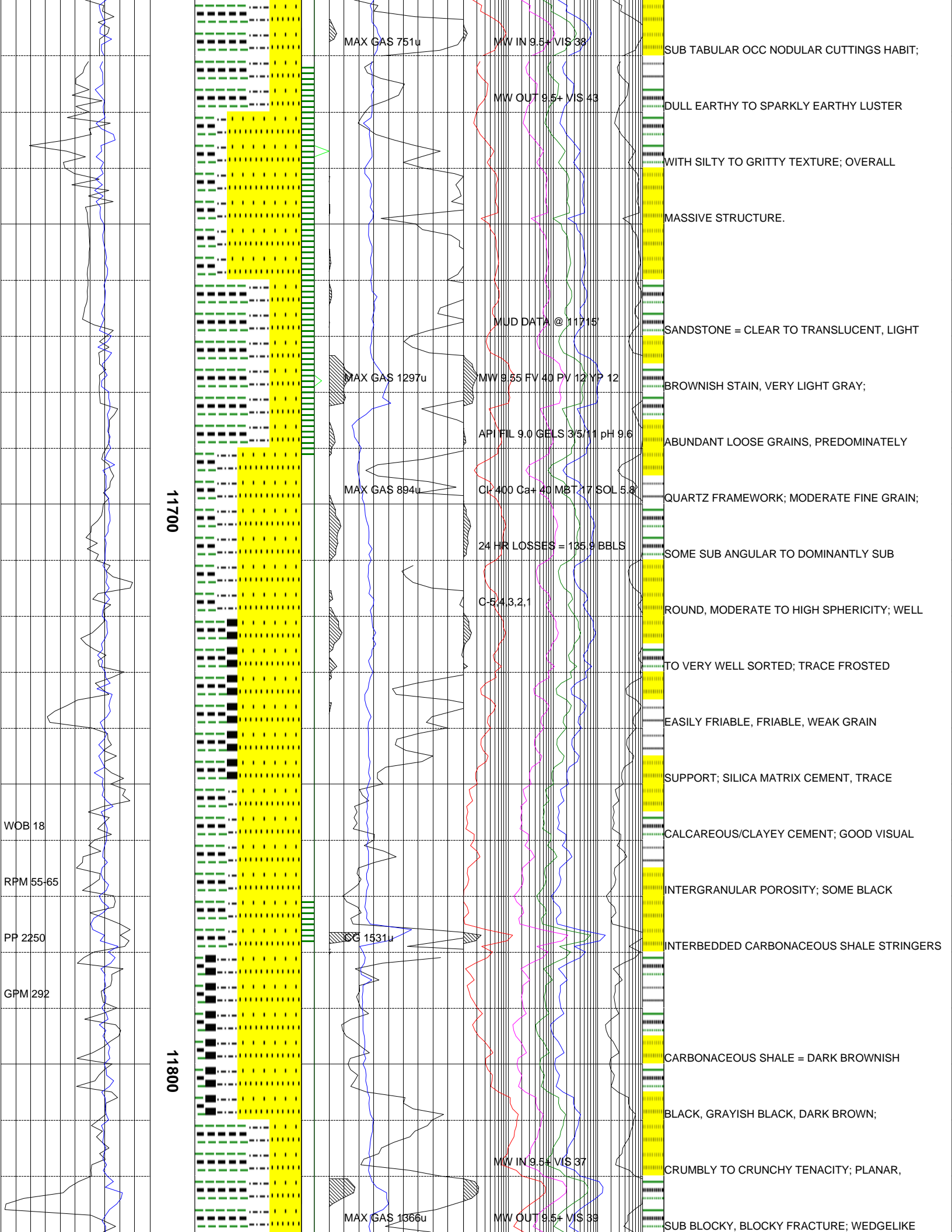
TO SEMI PLATY CUTTINGS HABIT; DULL

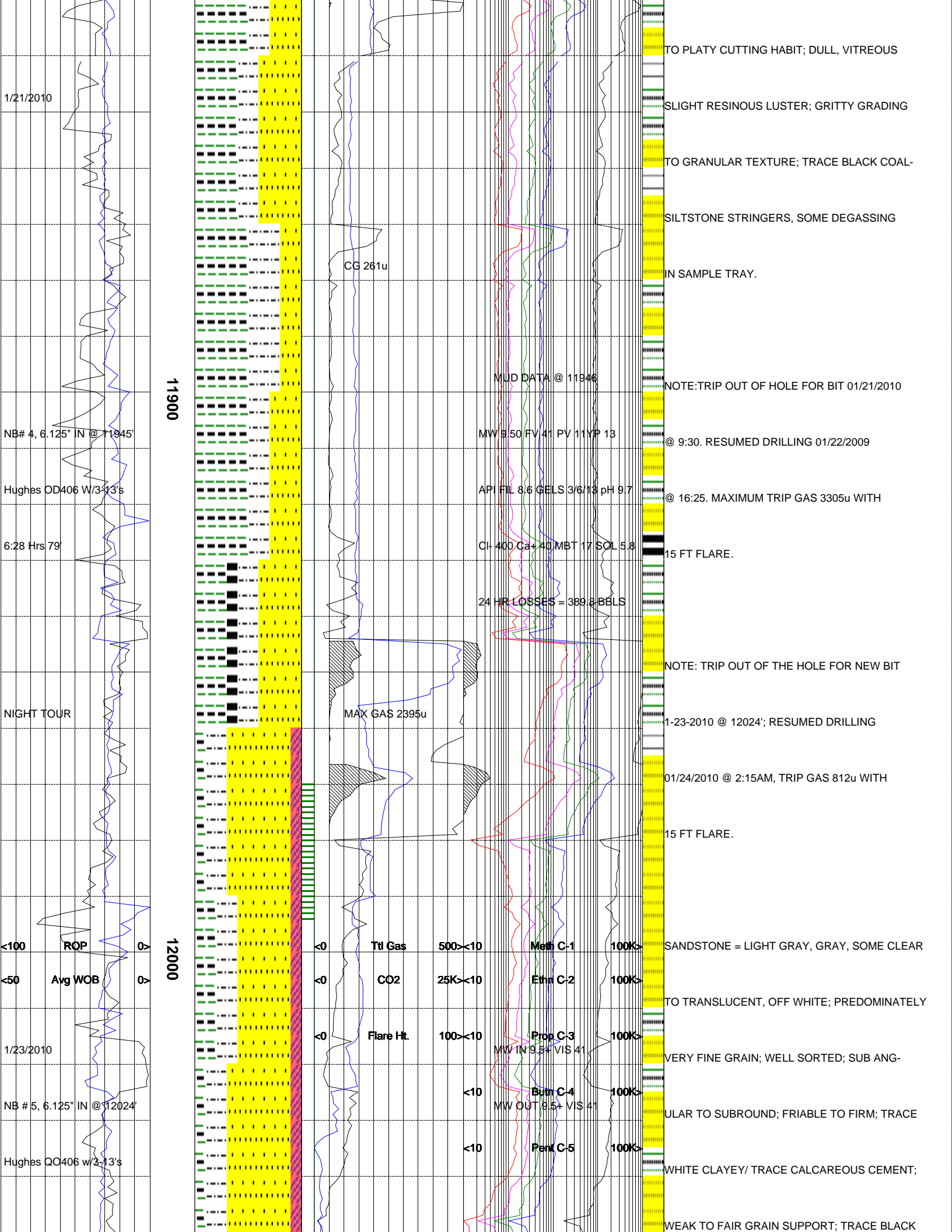


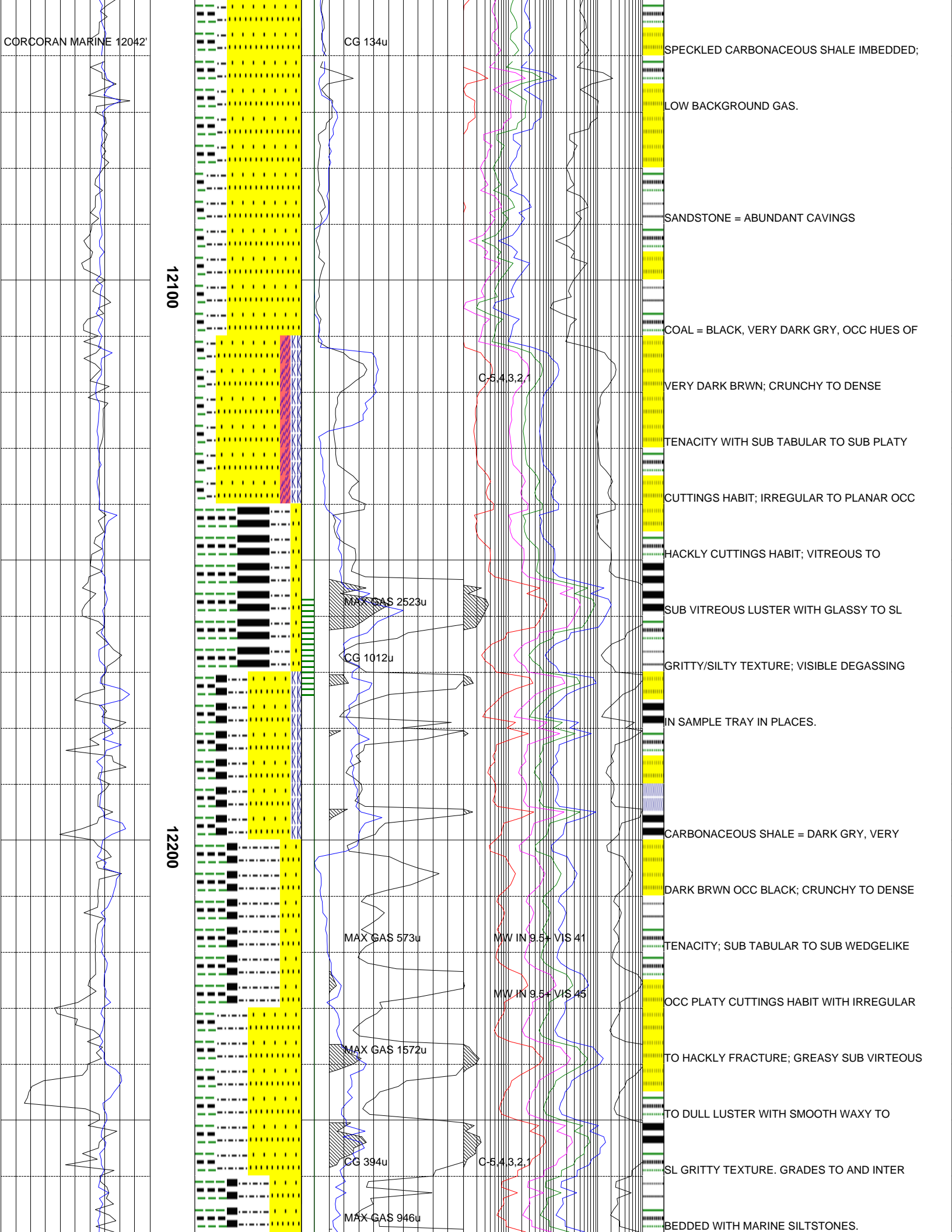


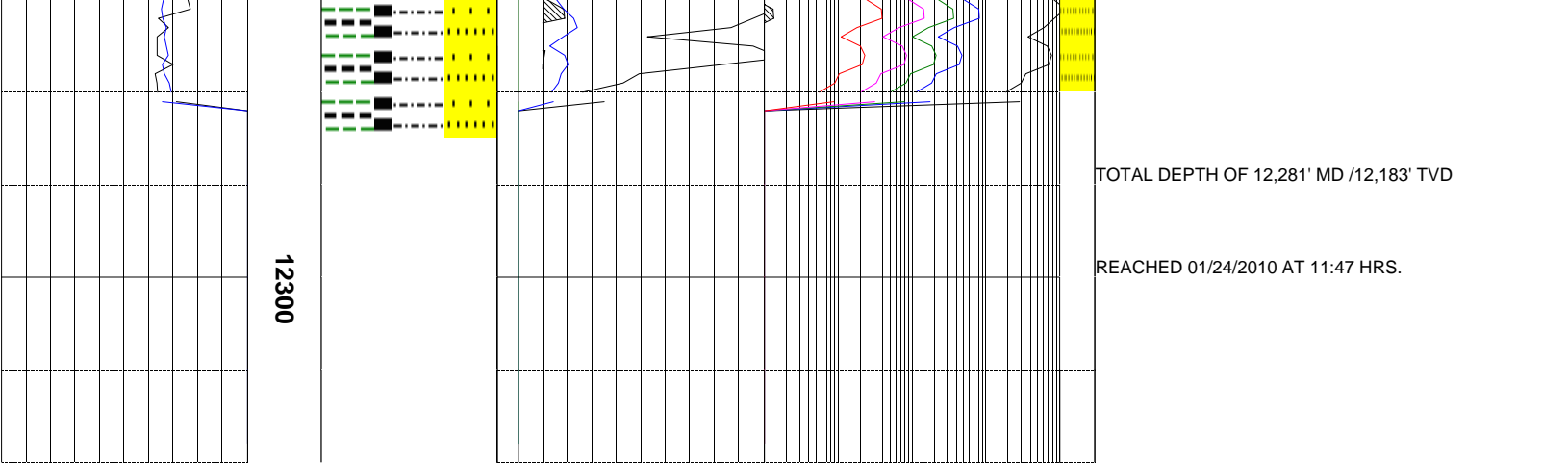












The log data, interpretations and recommendation provided by Epoch are inferences and assumptions based on measurements of drilling fluids. Such inferences and assumptions are not infallible and reasonable professionals may differ. Epoch does not represent or warrant the accuracy, correctness or completeness of any log data, interpretations, recommendations or information provided by Epoch, its officers, agents or employees. Epoch does not and cannot guarantee the accuracy of any such interpretation of the log data, interpretations or recommendations and Company is fully responsible for all decisions and actions it takes based on such log data, interpretations and recommendations.

