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## MUDLOG MD

<b>COMPANY</b>	EXXONMOBIL
<b>WELL</b>	PCU_197-34A7
<b>FIELD</b>	PICEANCE CREEK
<b>REGION</b>	ROCKY MOUNTAIN
<b>COORDINATES</b>	LAT: 39.917998000 LONG: 108.277020000
<b>ELEVATION</b>	G.L.:6487.3' RKB: 30.2'
<b>COUNTY, STATE</b>	RIO BLANCO, CO
<b>API INDEX</b>	051031153800
<b>SPUD DATE</b>	01/04/2010
<b>CONTRACTOR</b>	HELMRICH_PAYNE
<b>CO. REP.</b>	JOSH LOVE
<b>RIG/TYPE</b>	325/FLEX 4S
<b>LOGGING UNIT</b>	MLU 48
<b>GEOLOGISTS</b>	MARK GROSS DONNA NEW
<b>ADD. PERSONS</b>	JENN SELL
<b>CO. GEOLOGIST</b>	MELISSA J. SAURBORN

### LOG INTERVAL

<b>DEPTHS:</b>	3815'	<b>TO</b>	12652'
<b>DATES:</b>	05/02/2010	<b>TO</b>	09/25/2010
<b>SCALE:</b>	5" = 100'		

### CASING DATA

10.75"	<b>AT</b>	3808'
7"	<b>AT</b>	8585'
4"	<b>AT</b>	
	<b>AT</b>	

### HOLE SIZE

14.75"	<b>TO</b>	3815'
9.875"	<b>TO</b>	8600'
6.125"	<b>TO</b>	12652'
	<b>TO</b>	

### MUD TYPES

SPUD MUD	<b>TO</b>	3815'
LSND	<b>TO</b>	12652'
	<b>TO</b>	
	<b>TO</b>	

### 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
	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
	OBSDIAN
	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

[illegible]

I-BUTANE = 1000 PPM

N-BUTANE = 1000 PPM

I-PENTANE = 1000 PPM

N-PENTANE = 1000 PPM

WHEN THE MUD IS RUN THROUGH THE MGS (MUD  
GAS SEPARATOR) THE INTERVAL IS MARKED ON  
THE LOG IN THE SLIDE COLUMN AND NOTED ON  
THE LOG.

ALL SANDSTONE INTERVALS ARE EXAMINED FOR  
SAMPLE FLUORESCENCE IN THE UV SCOPE AND  
FOR HYDROCARBON FLUORESCENCE AND MINOR  
FLUORESCENCE FROM POSSIBLE FRACTURE  
FILL. ALL FLUORESCENCE IS NOTED ON THE  
MUD LOG.

10.75" SURFACE CASING WAS SET AT 3809'.

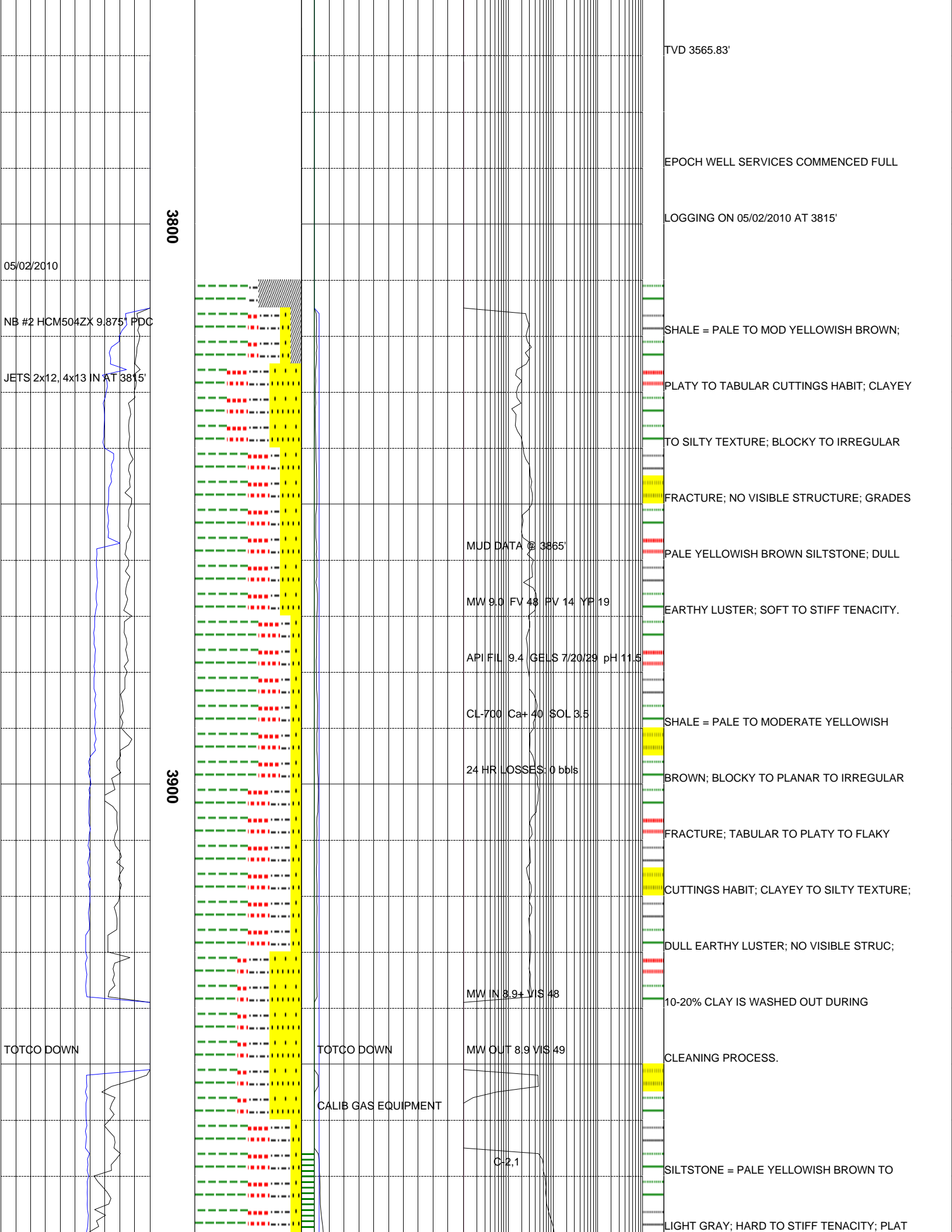
DRILLED 10' OF NEW FORMATION AND PERFORM

F.I.T. - GOOD. DRILL AHEAD.

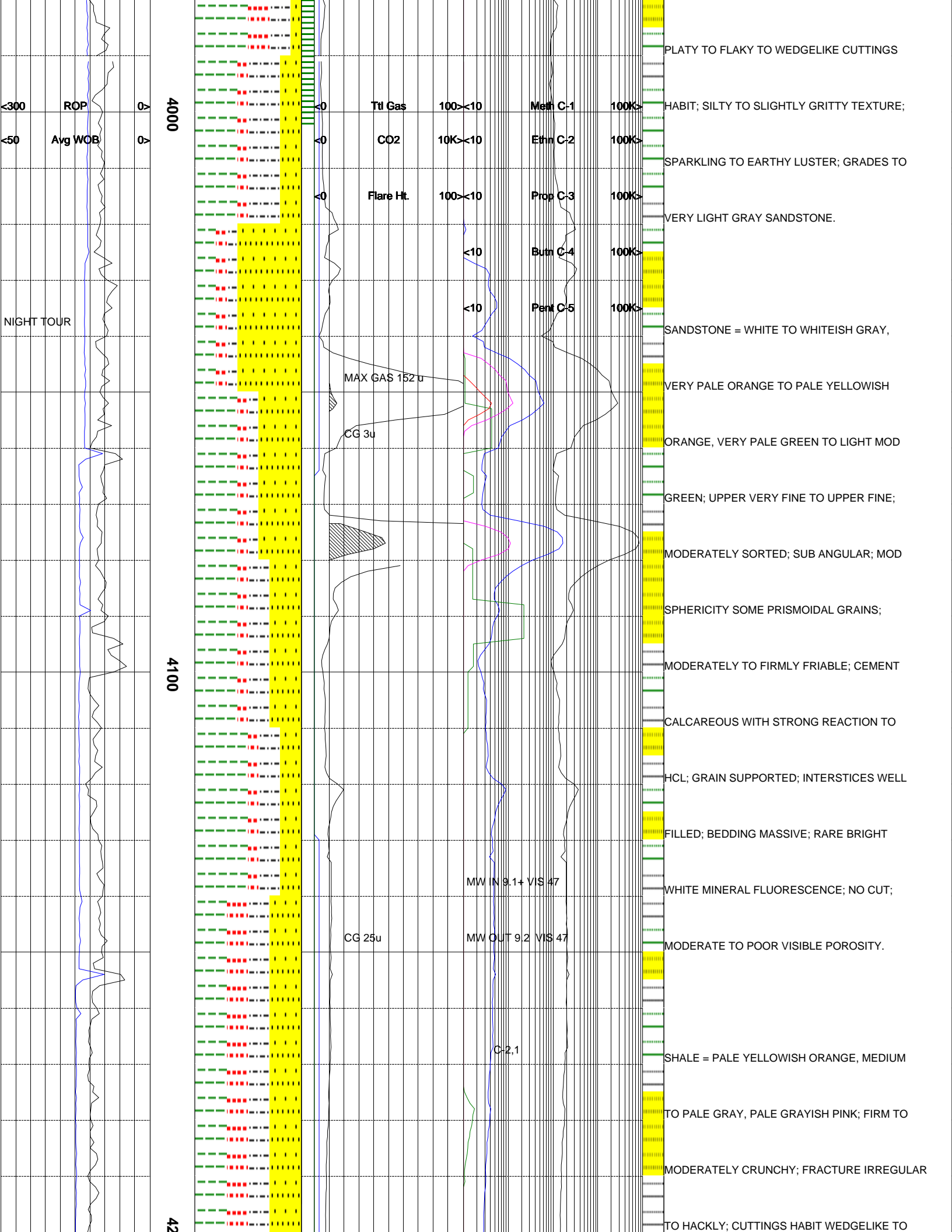
SURVEY @ 3764' MD: INC 19.01 AZI 135.95

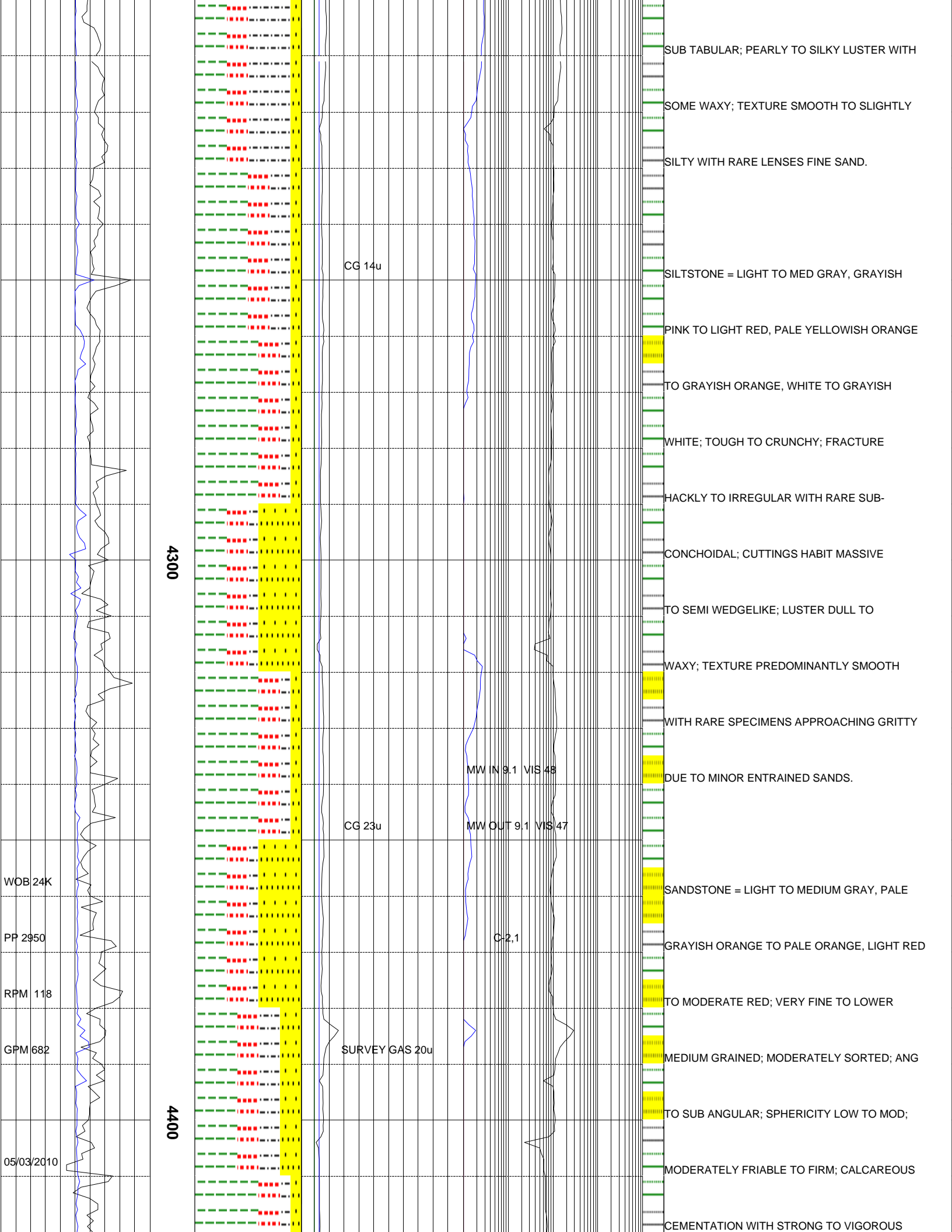
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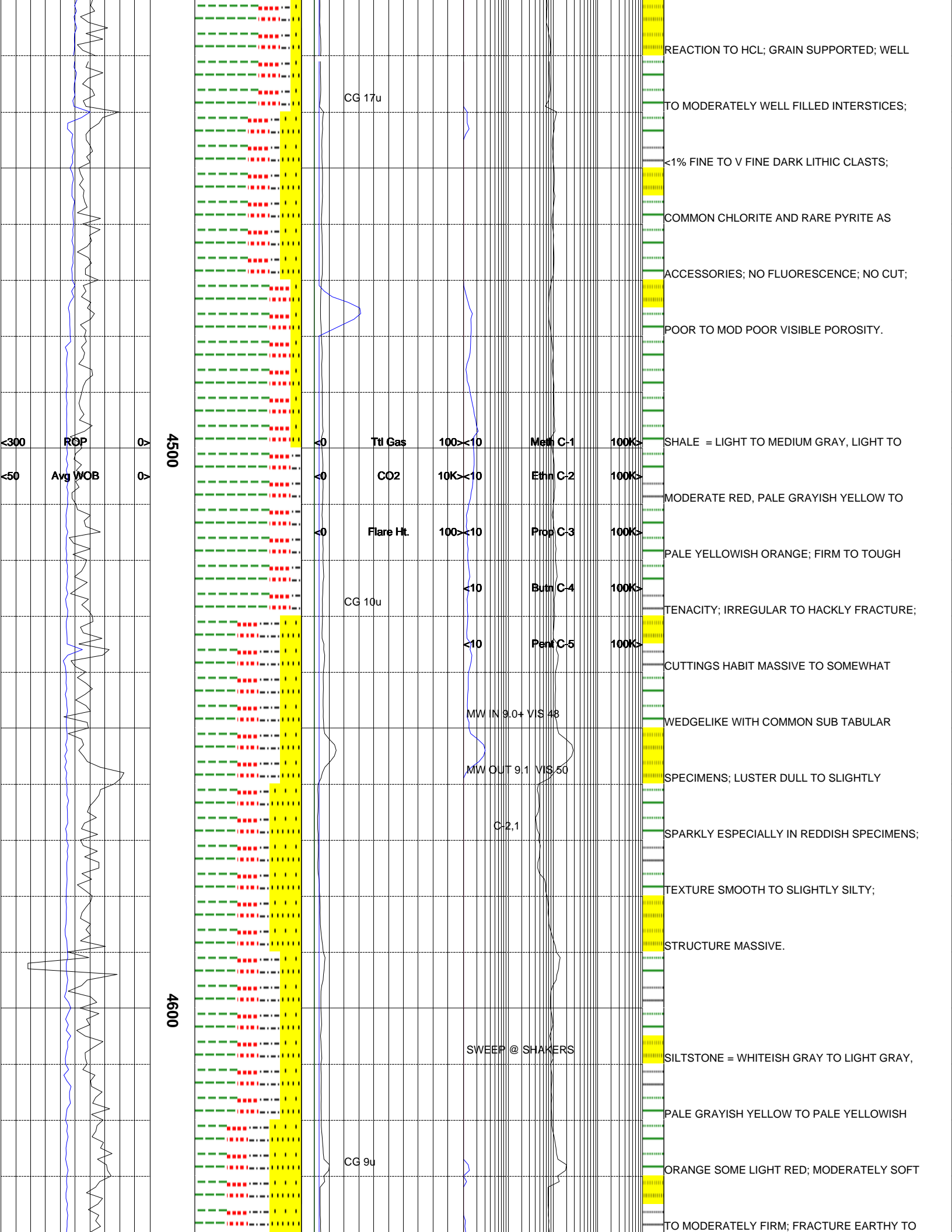
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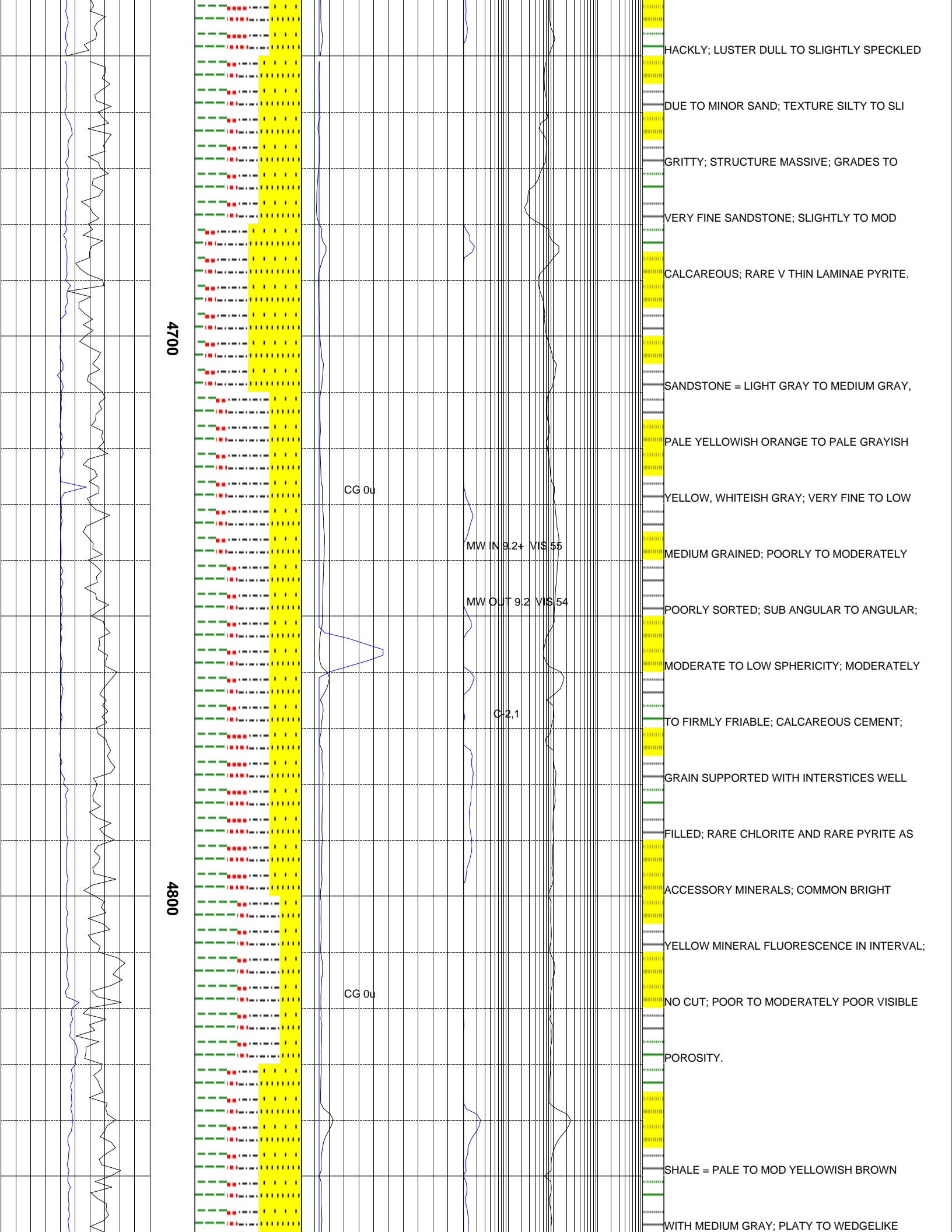


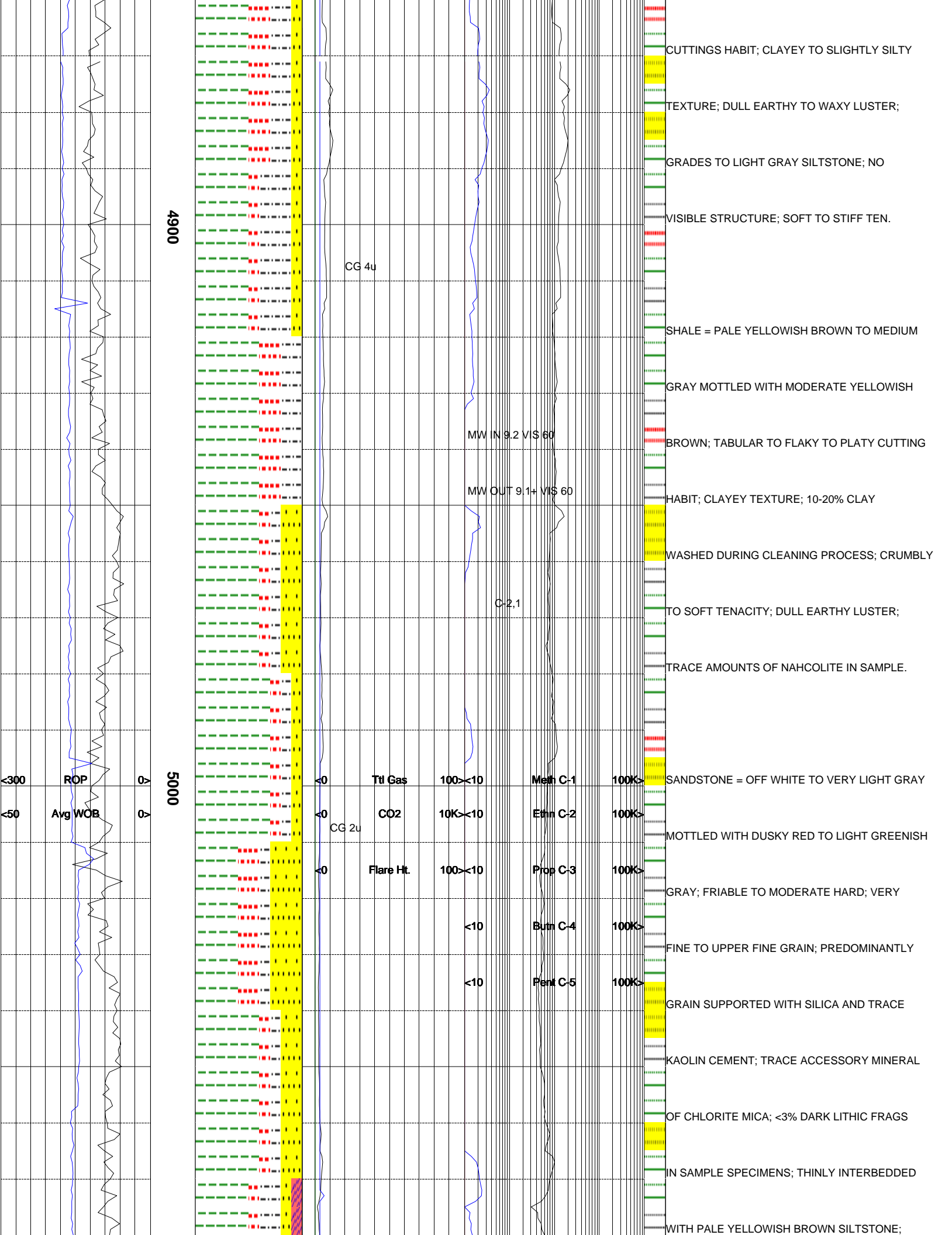


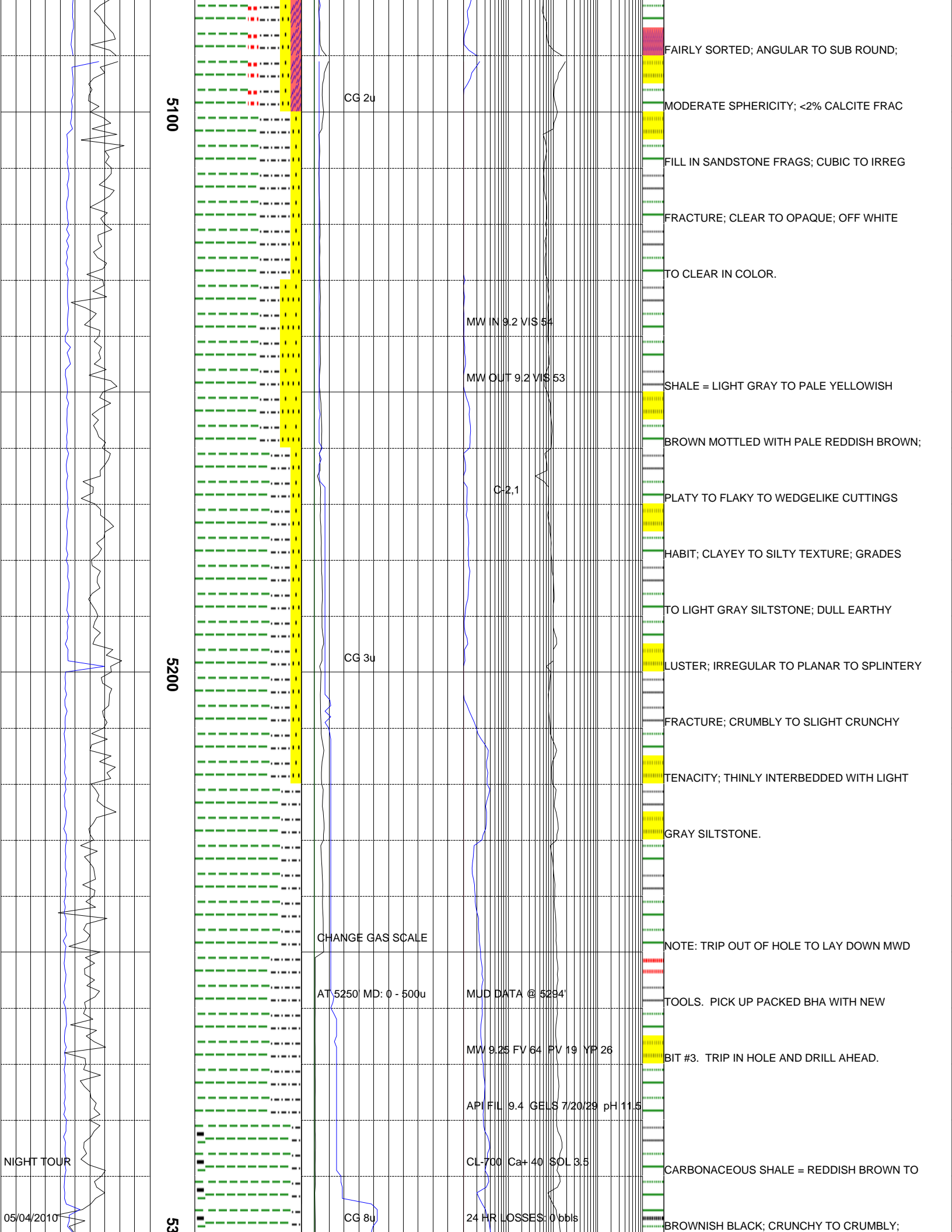


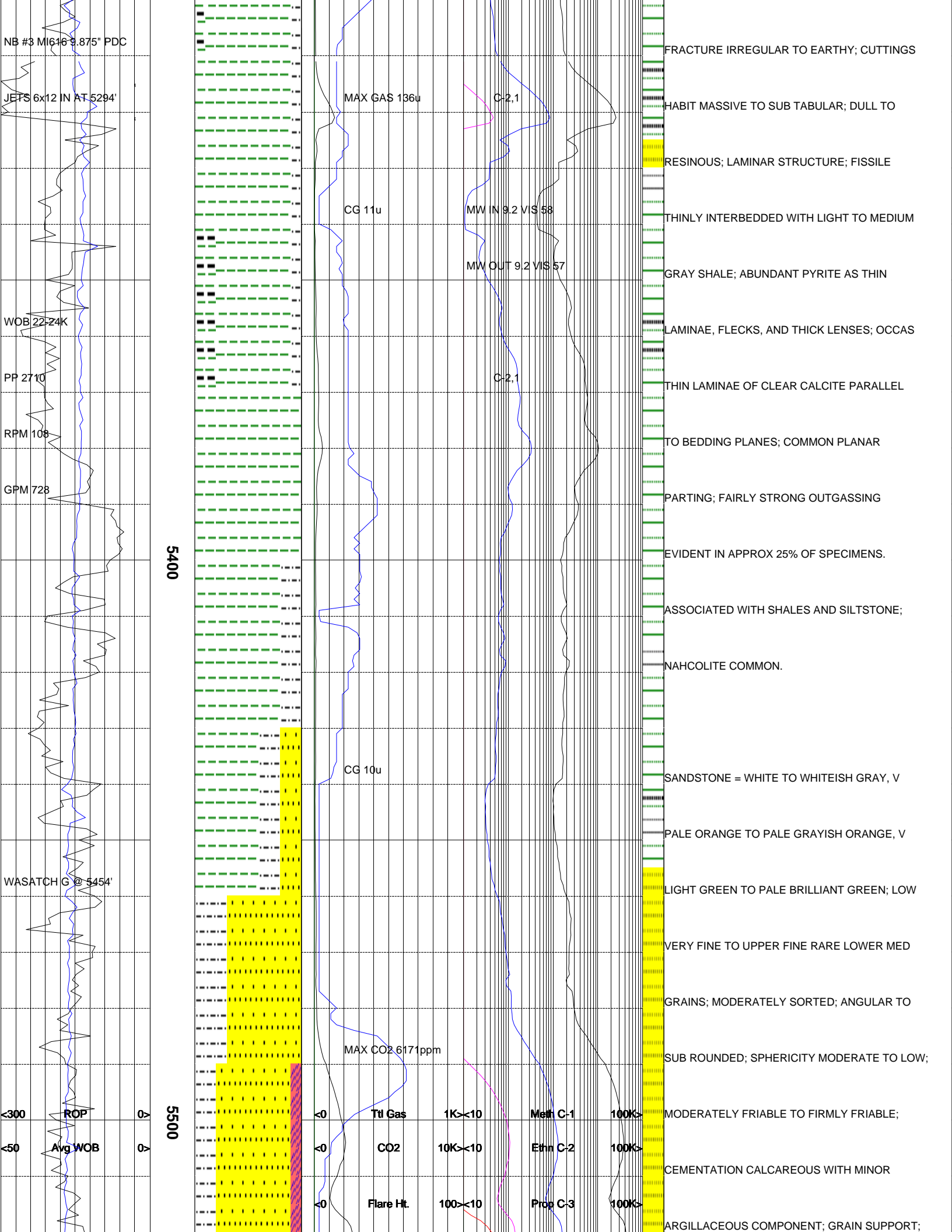


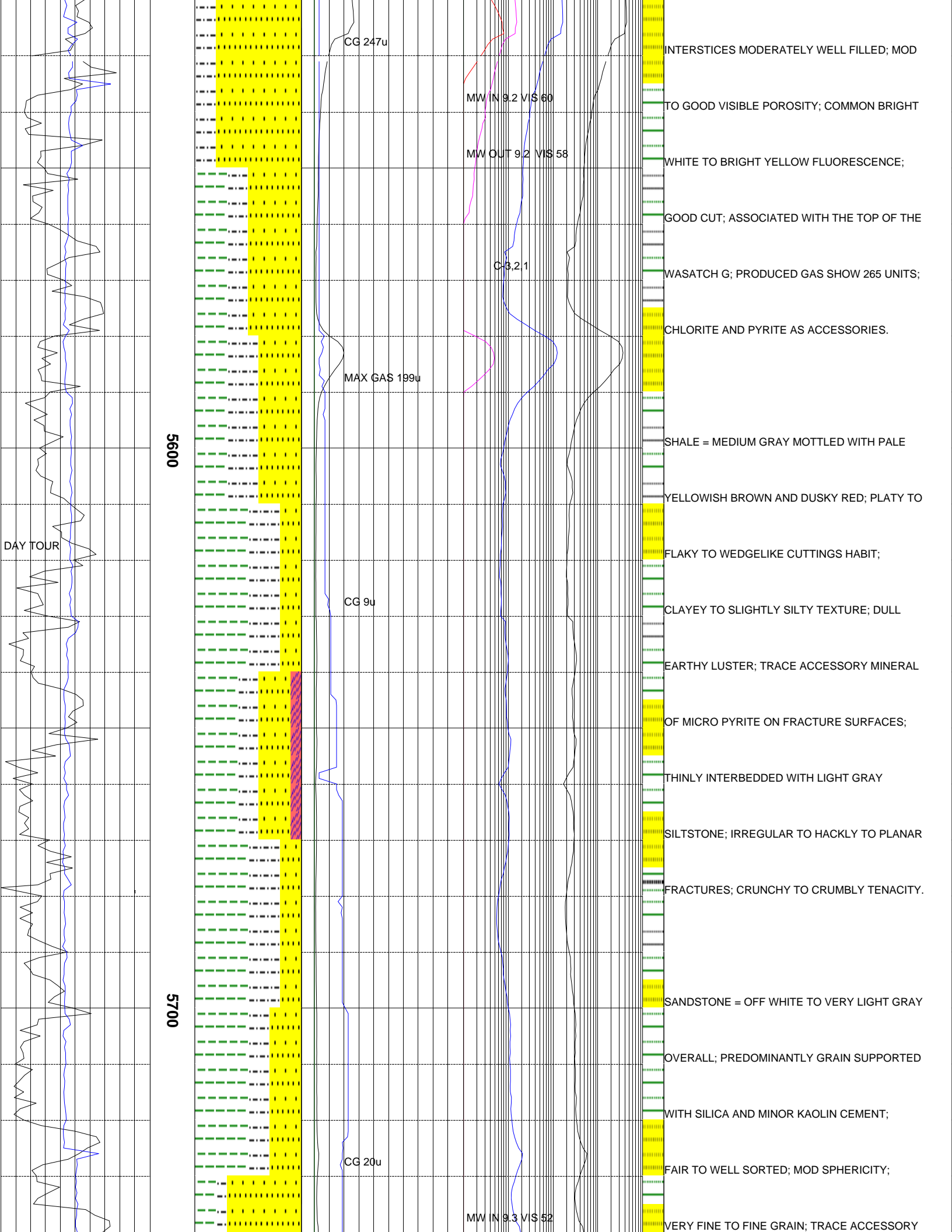




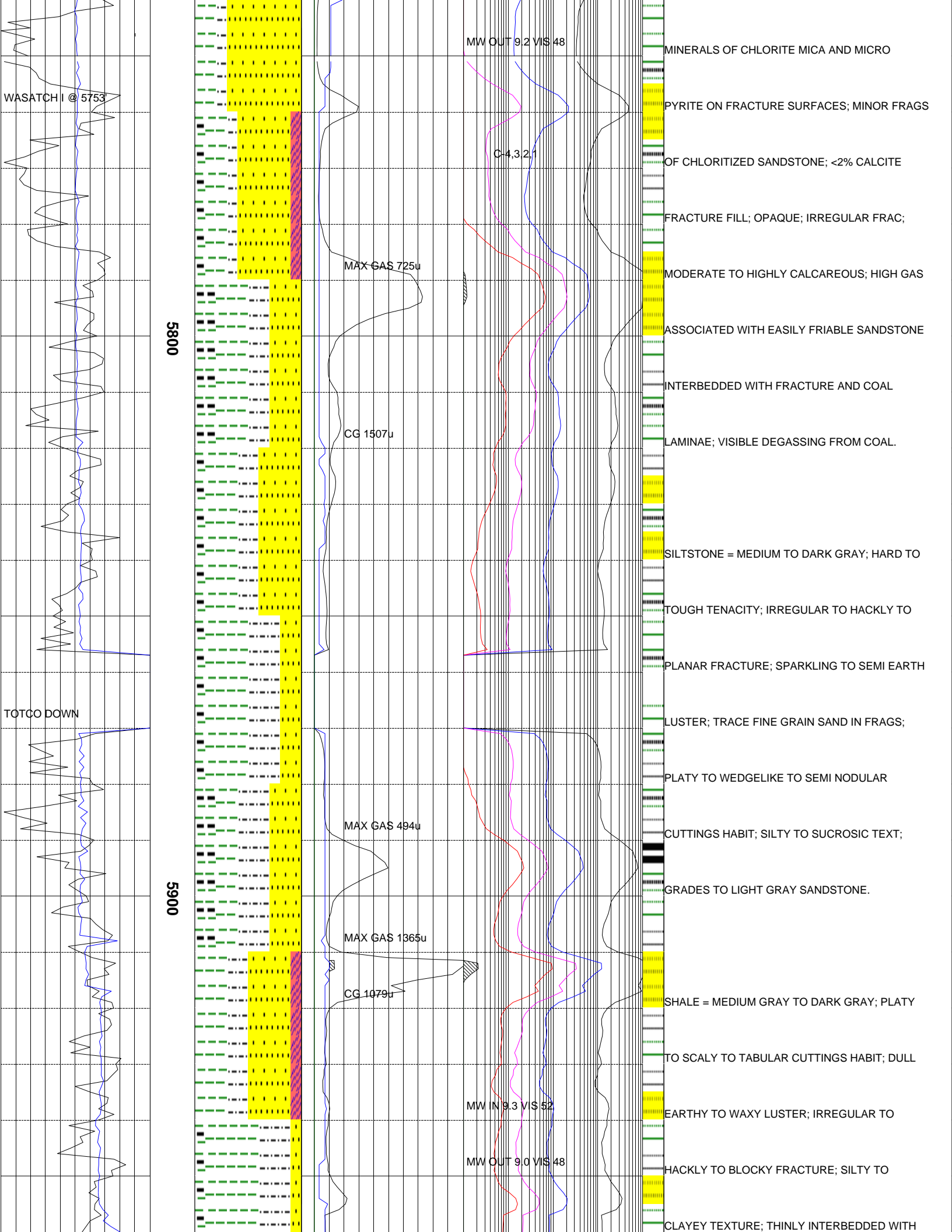












WASATCH I @ 5753

TOTCO DOWN

5800

5900

MW OUT 9.2 VIS 48

C-4.3.2.1

MAX GAS 725u

CG 1507u

MAX GAS 494u

MAX GAS 1365u

CG 1079u

MW IN 9.3 VIS 52

MW OUT 9.0 VIS 48

MINERALS OF CHLORITE MICA AND MICRO

PYRITE ON FRACTURE SURFACES; MINOR FRAGS

OF CHLORITIZED SANDSTONE; <2% CALCITE

FRACTURE FILL; OPAQUE; IRREGULAR FRAC;

MODERATE TO HIGHLY CALCAREOUS; HIGH GAS

ASSOCIATED WITH EASILY FRIABLE SANDSTONE

INTERBEDDED WITH FRACTURE AND COAL

LAMINAE; VISIBLE DEGASSING FROM COAL.

SILTSTONE = MEDIUM TO DARK GRAY; HARD TO

TOUGH TENACITY; IRREGULAR TO HACKLY TO

PLANAR FRACTURE; SPARKLING TO SEMI EARTH

LUSTER; TRACE FINE GRAIN SAND IN FRAGS;

PLATY TO WEDGELIKE TO SEMI NODULAR

CUTTINGS HABIT; SILTY TO SUCROSIC TEXT;

GRADES TO LIGHT GRAY SANDSTONE.

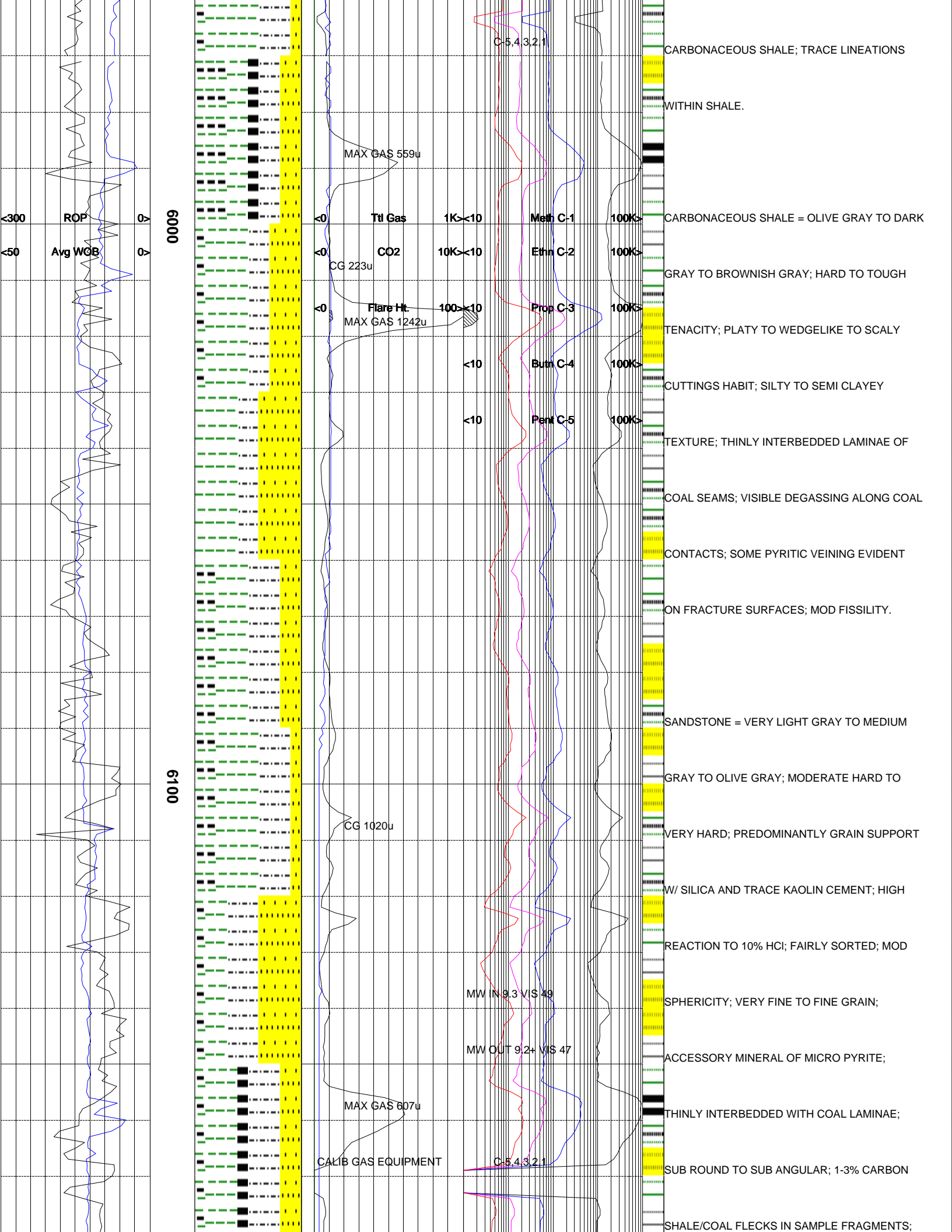
SHALE = MEDIUM GRAY TO DARK GRAY; PLATY

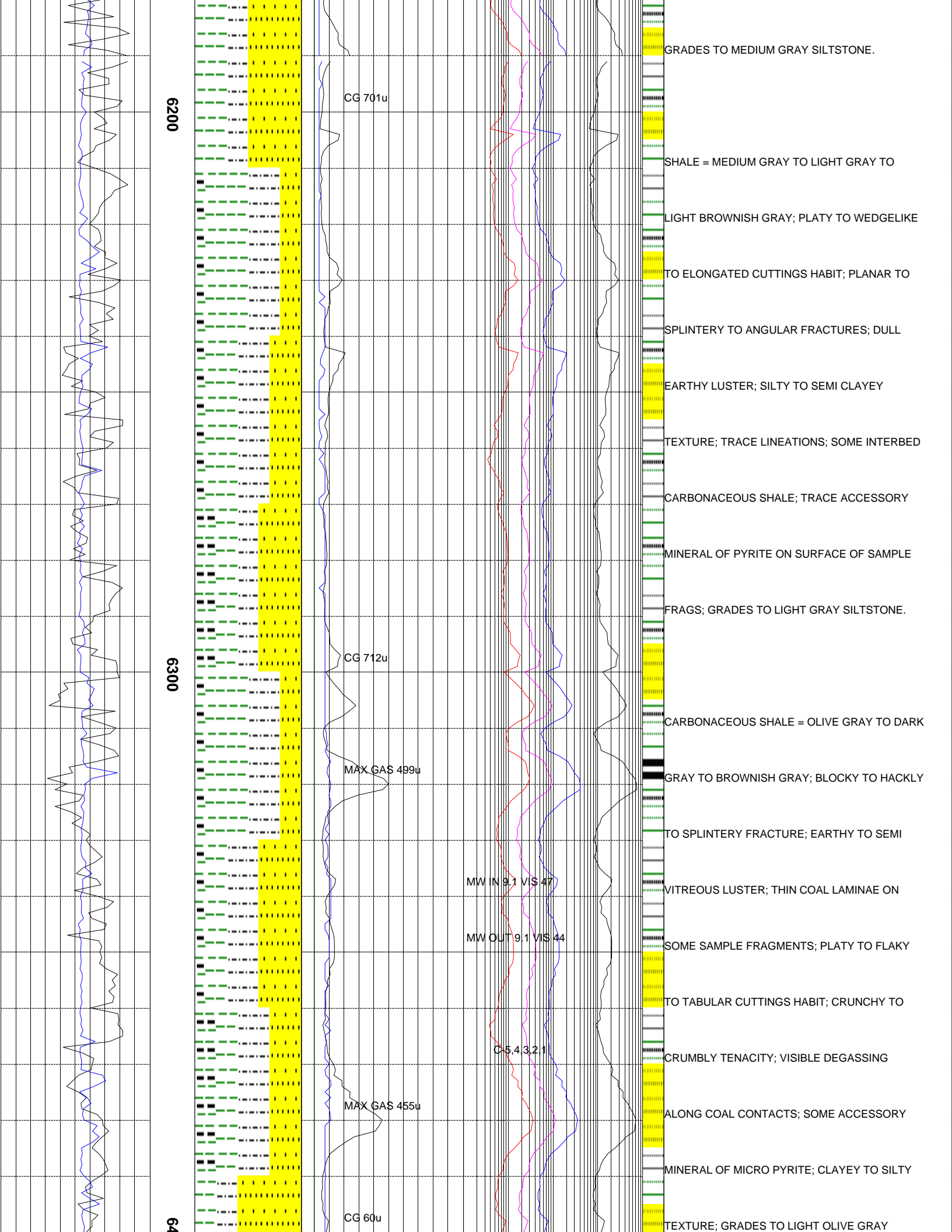
TO SCALY TO TABULAR CUTTINGS HABIT; DULL

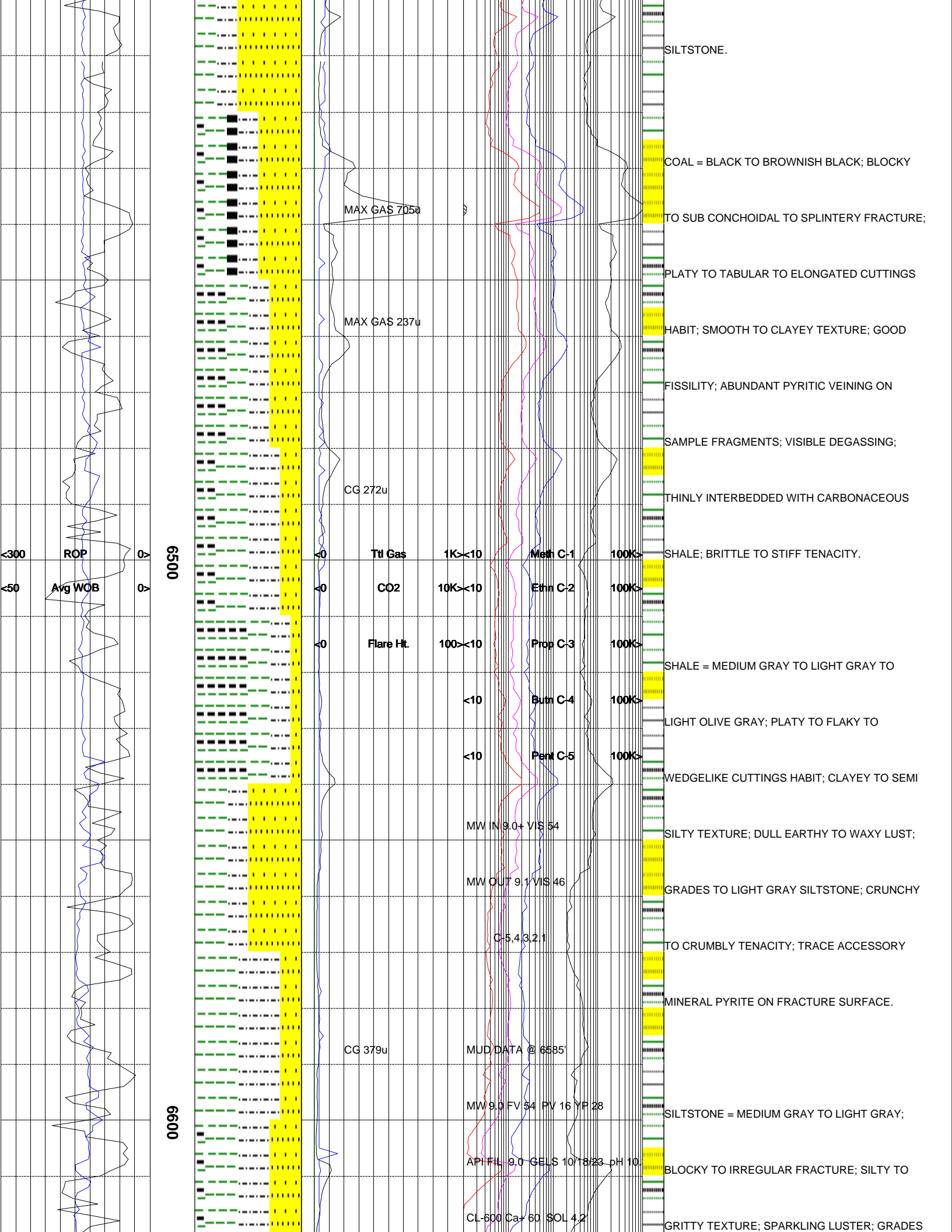
EARTHY TO WAXY LUSTER; IRREGULAR TO

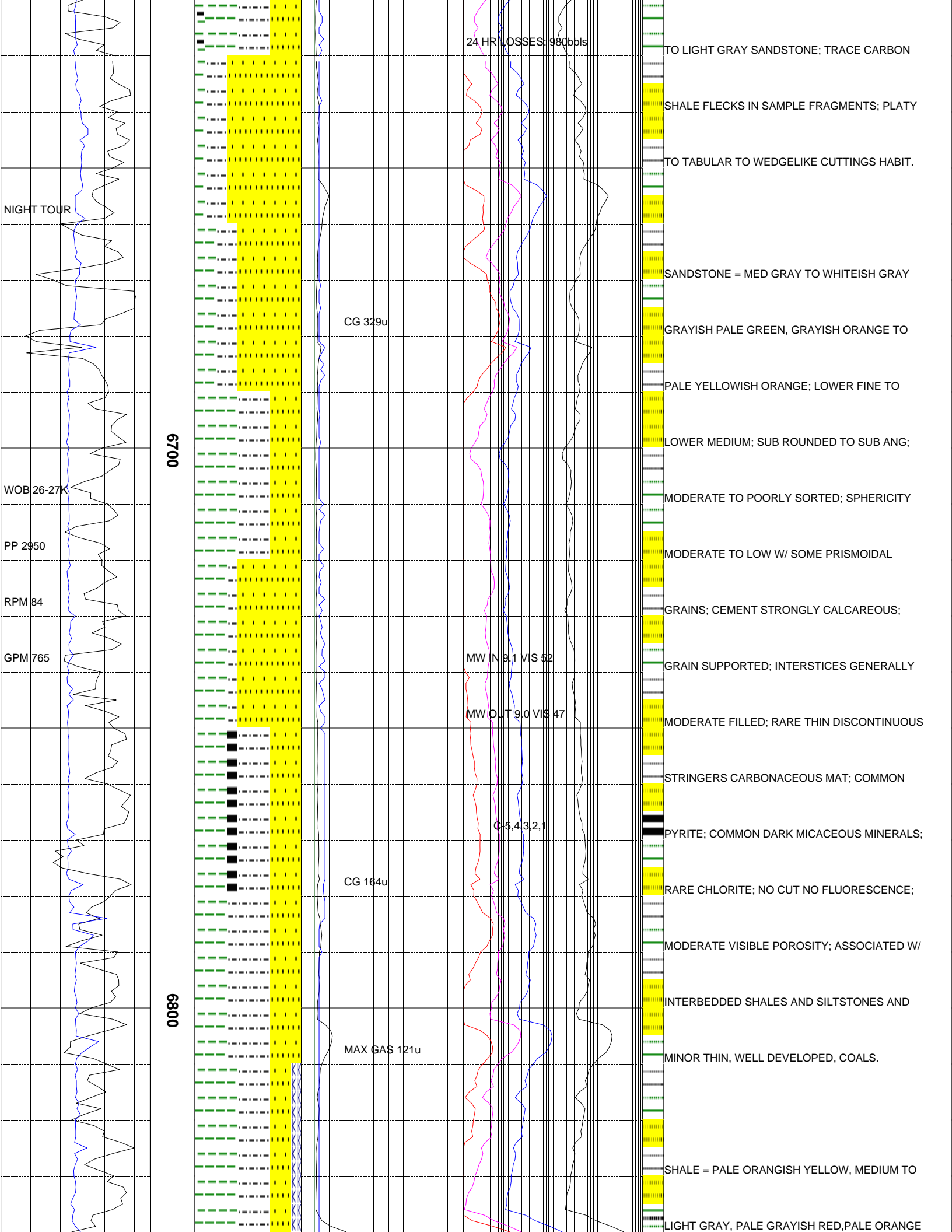
HACKLY TO BLOCKY FRACTURE; SILTY TO

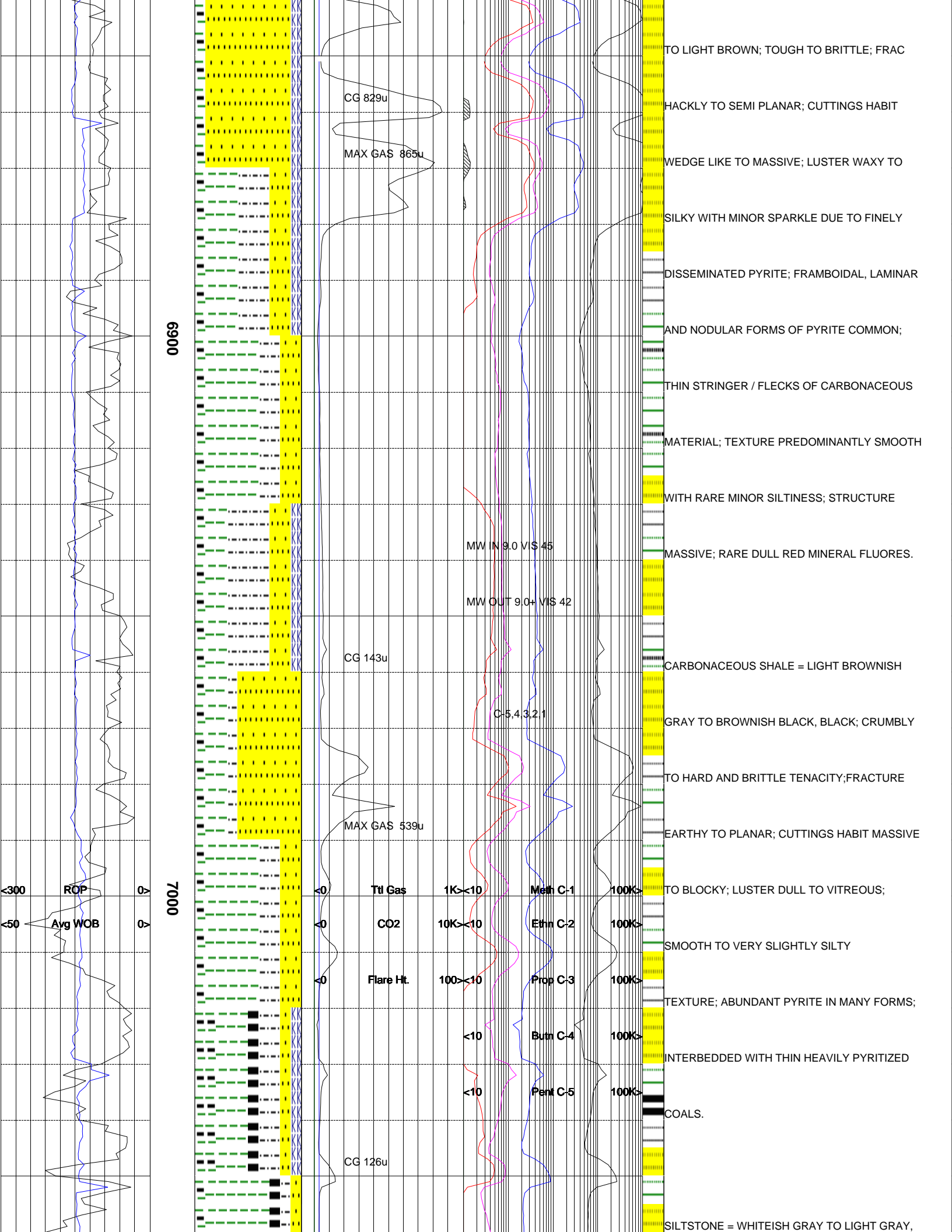
CLAYEY TEXTURE; THINLY INTERBEDDED WITH

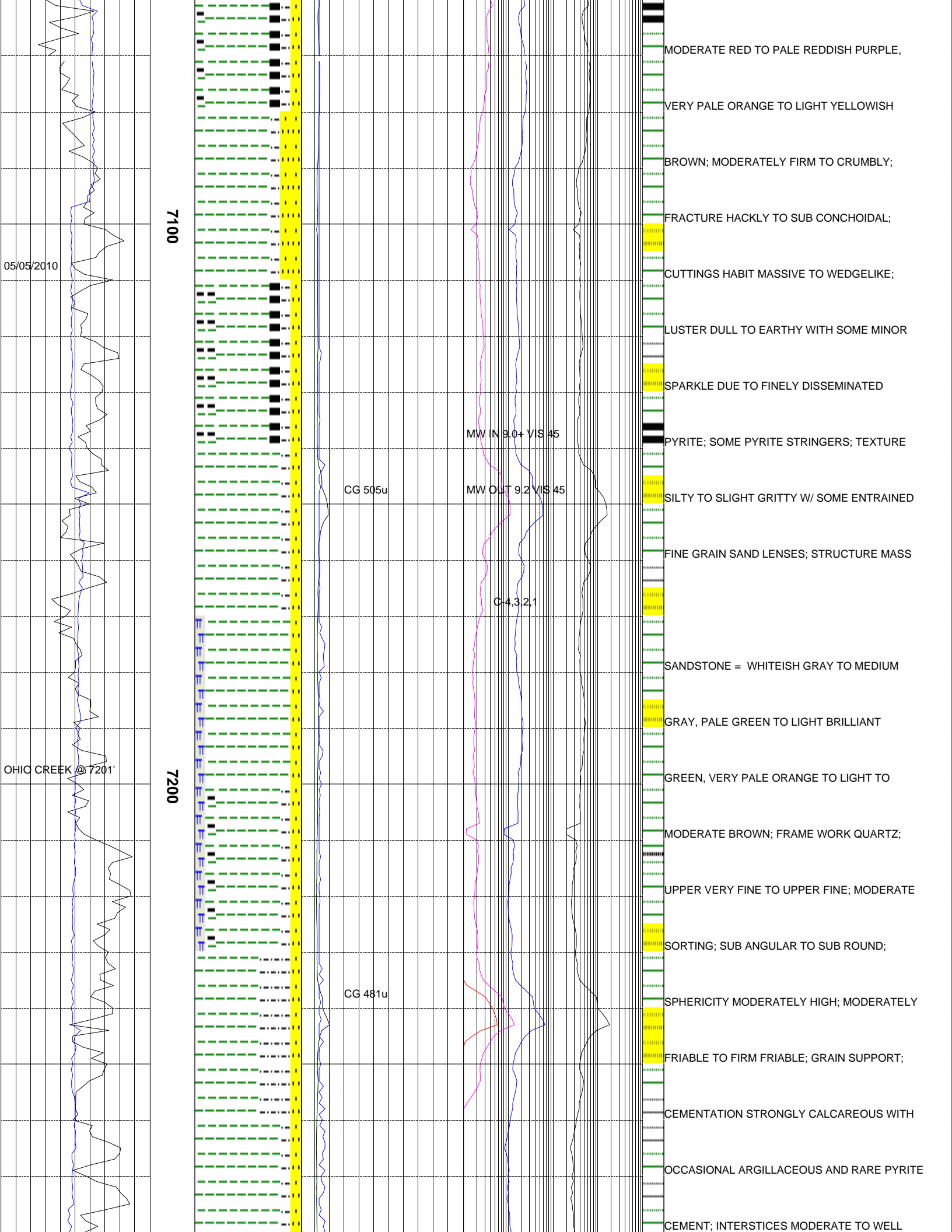


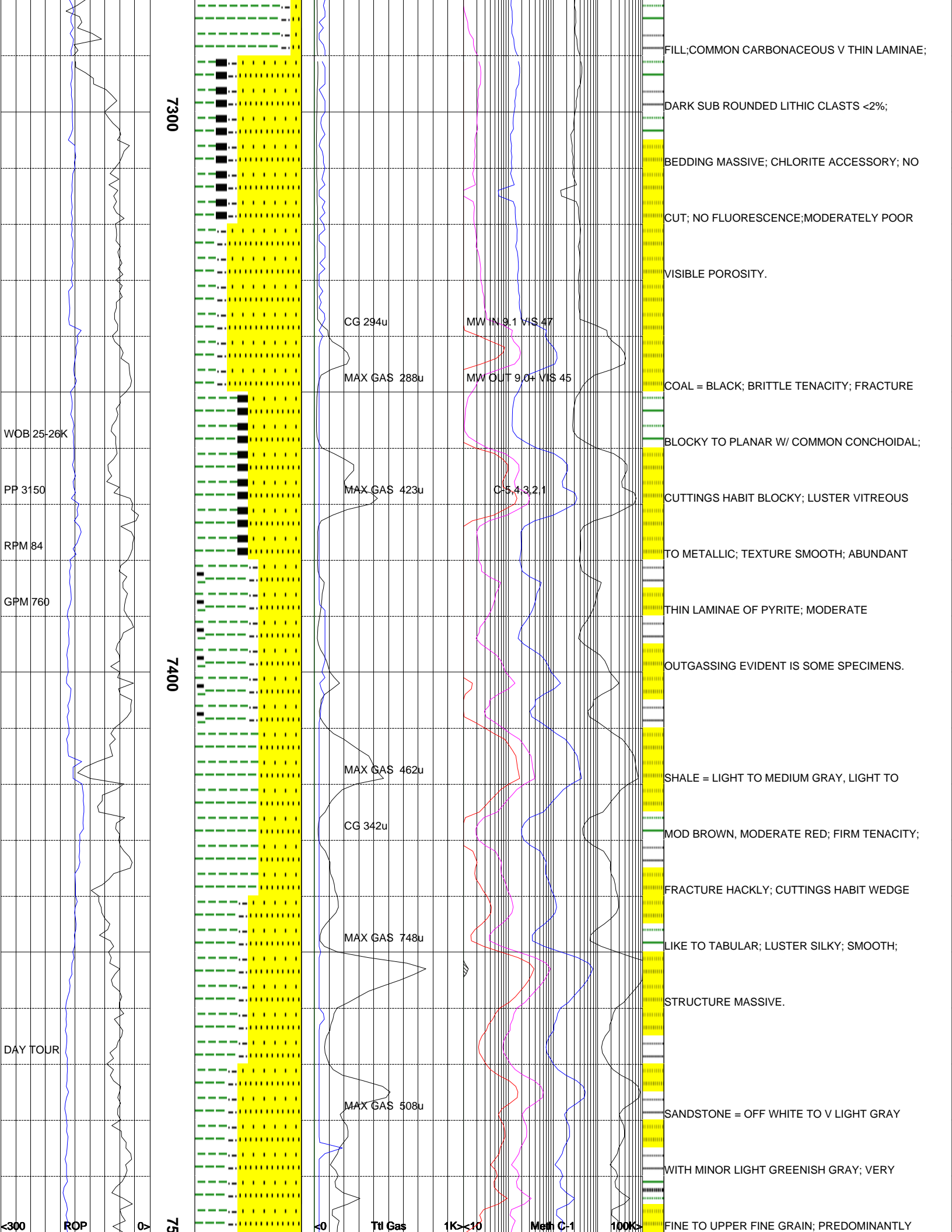




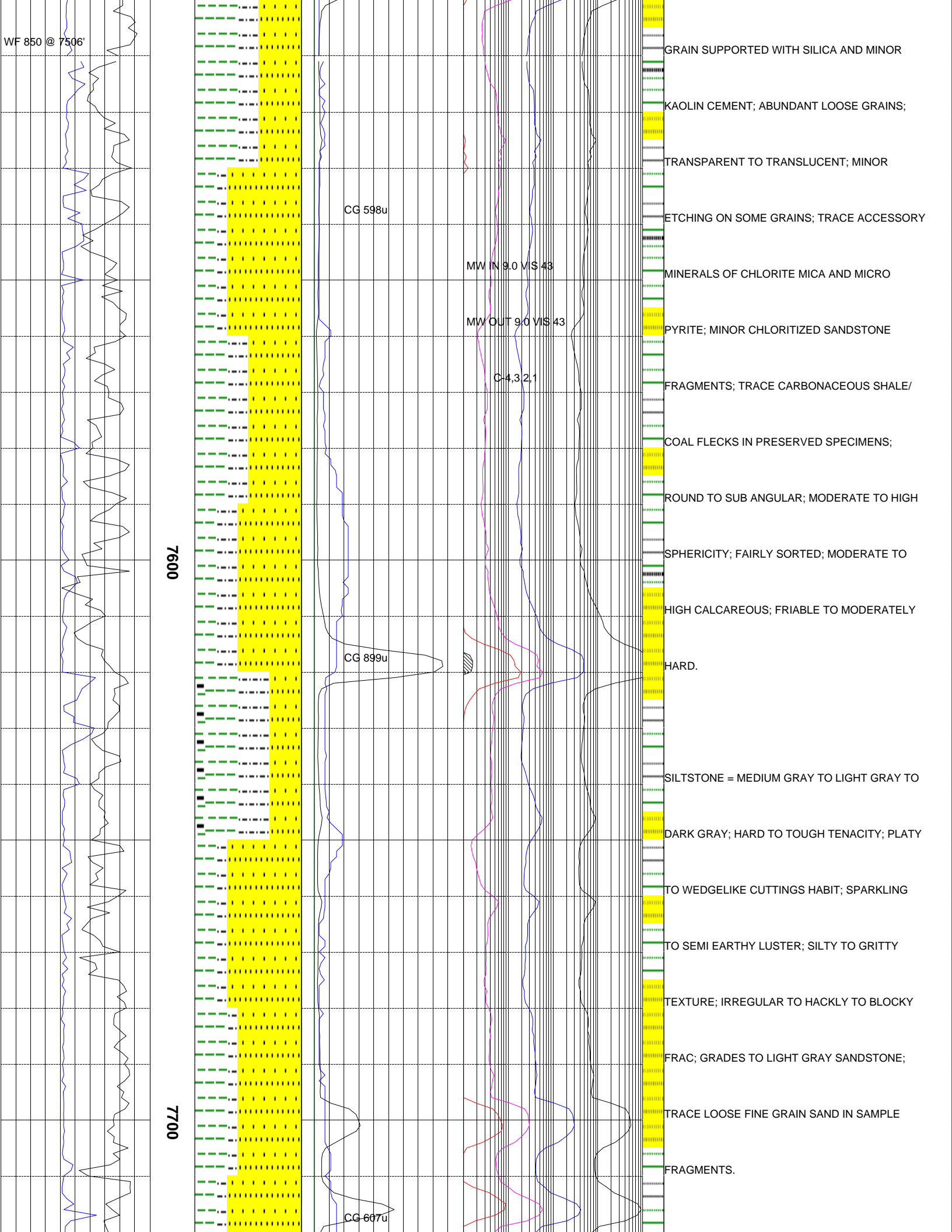


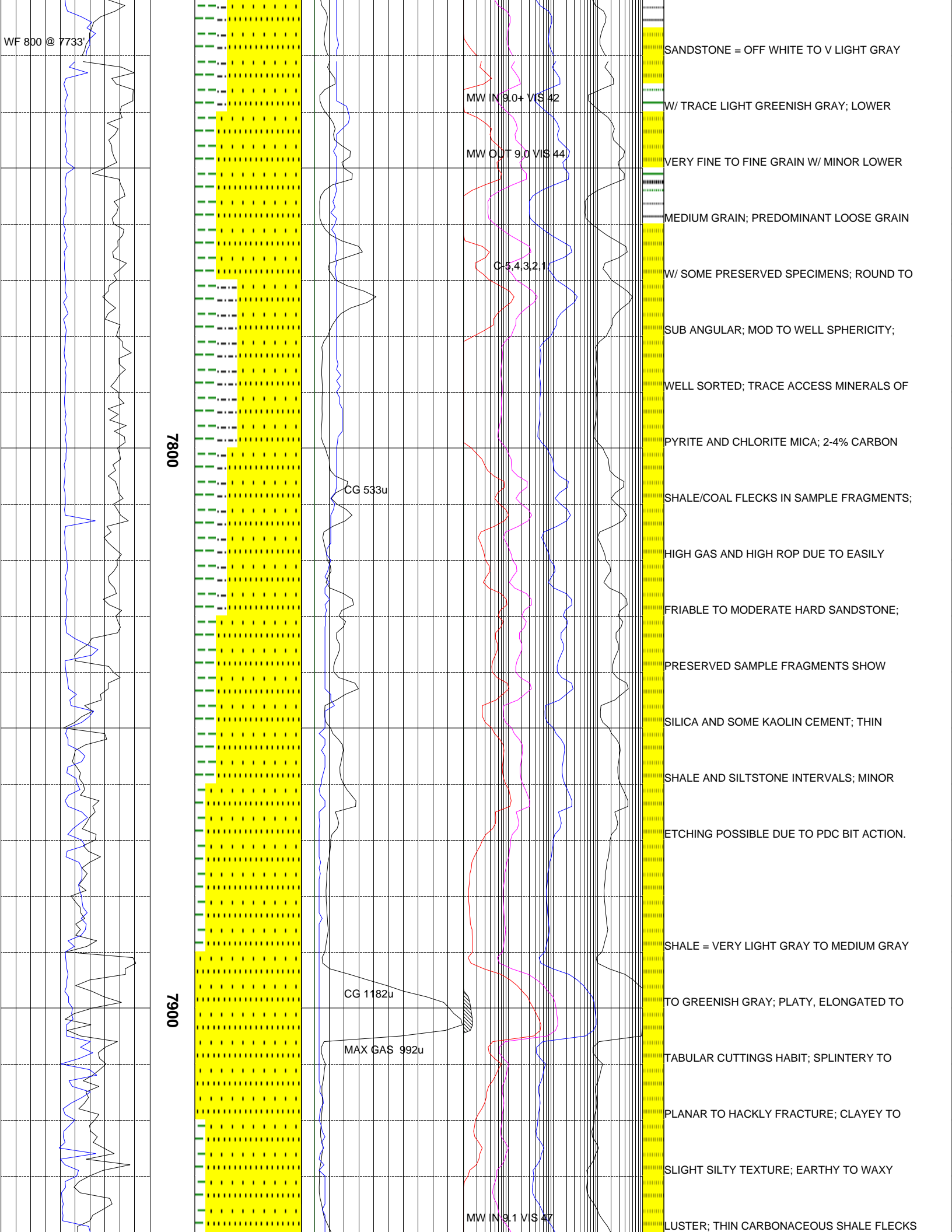


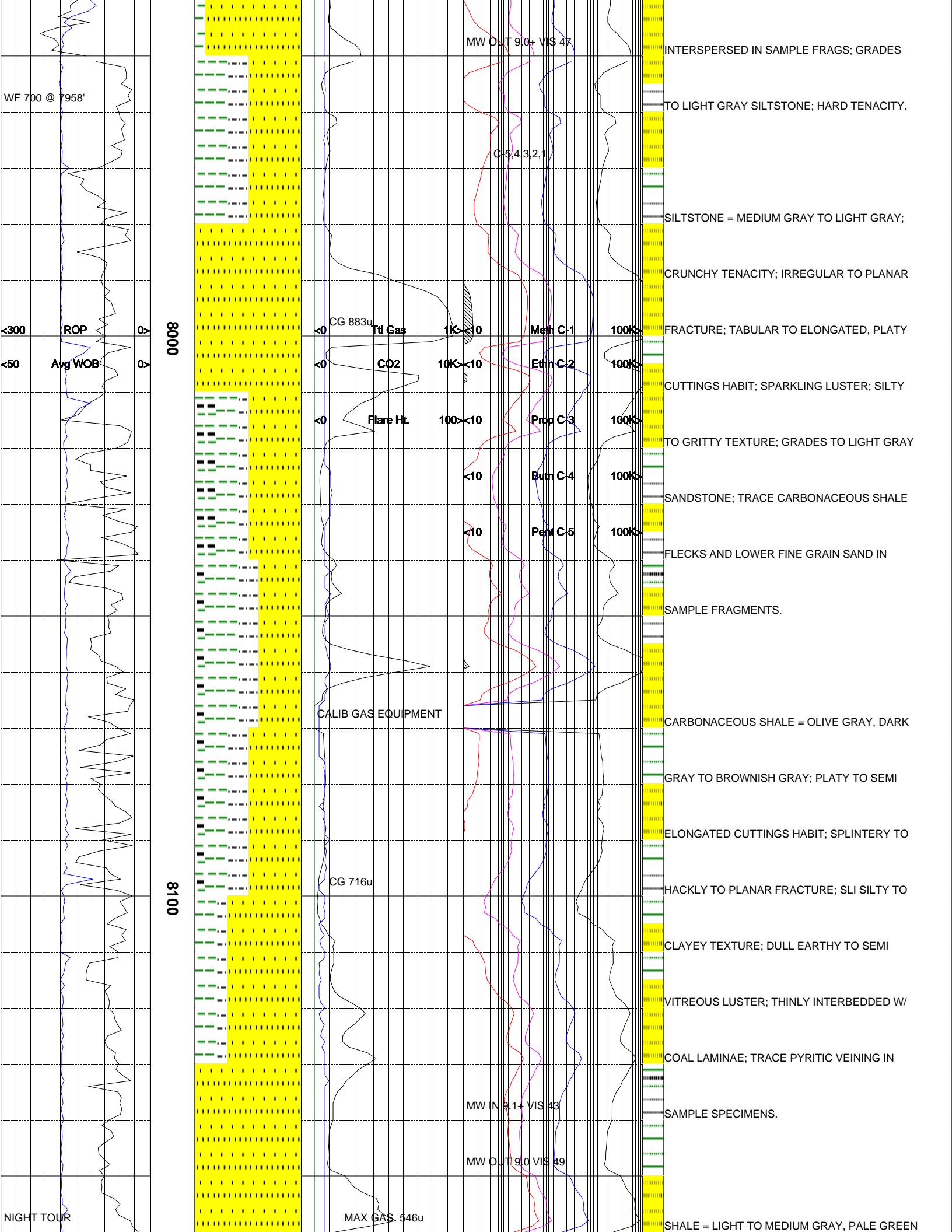


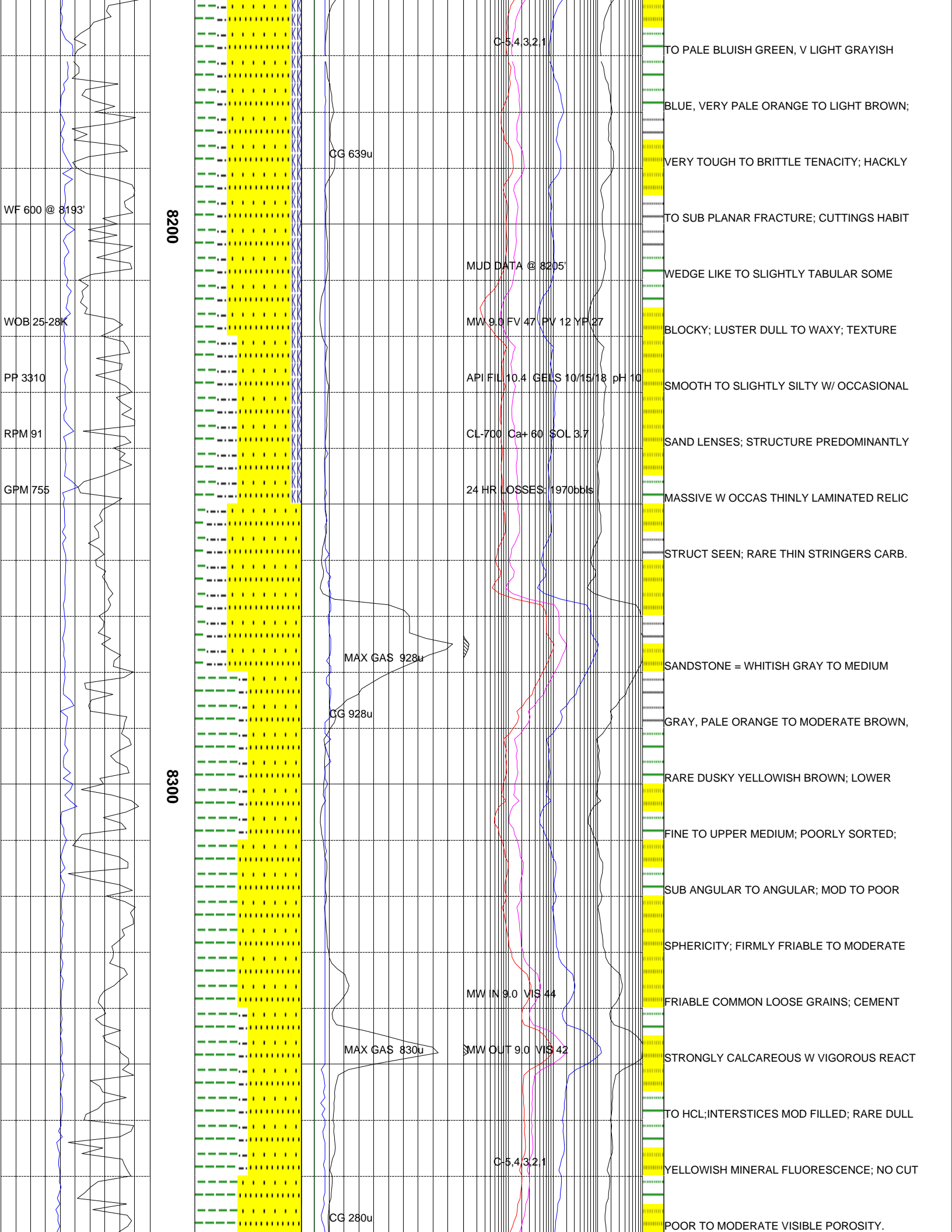


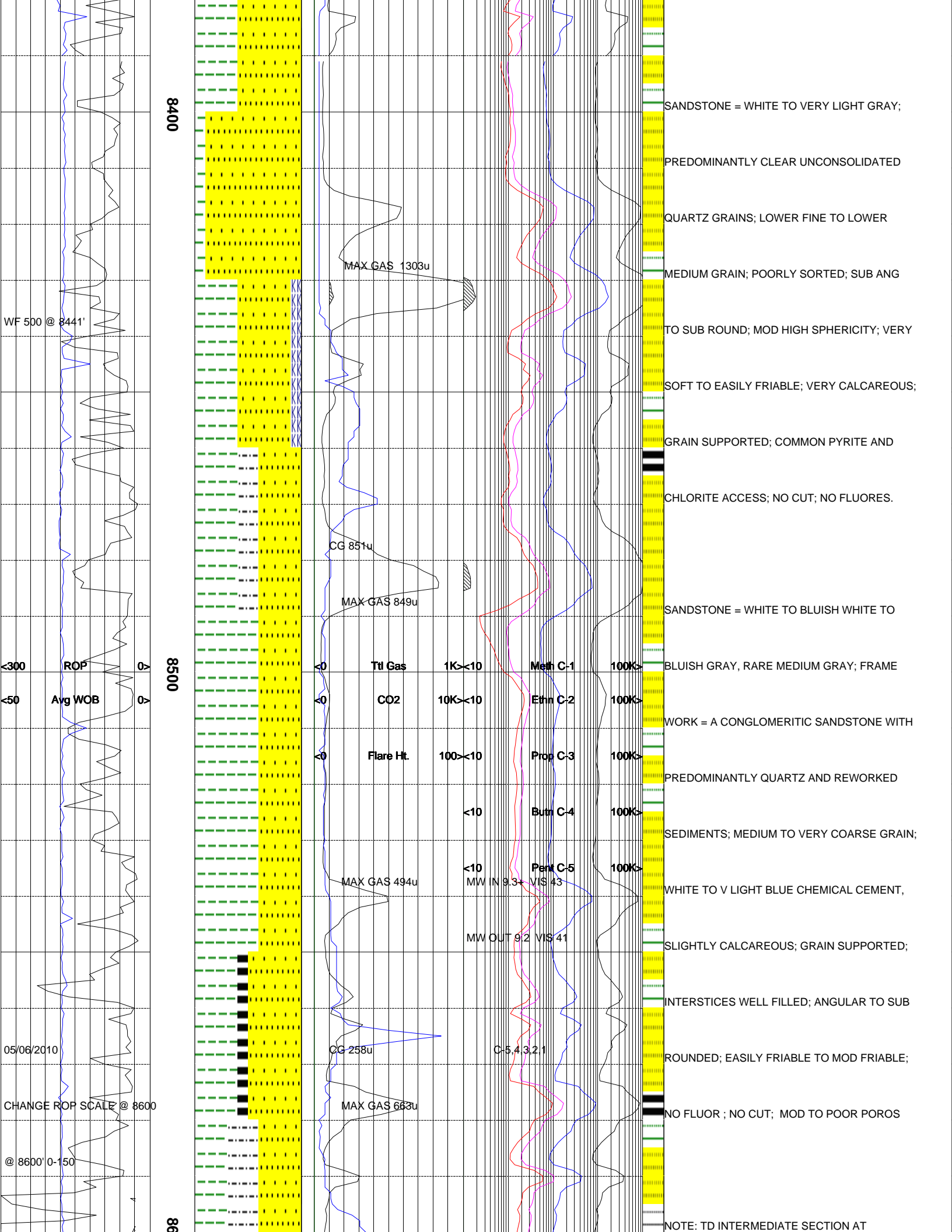


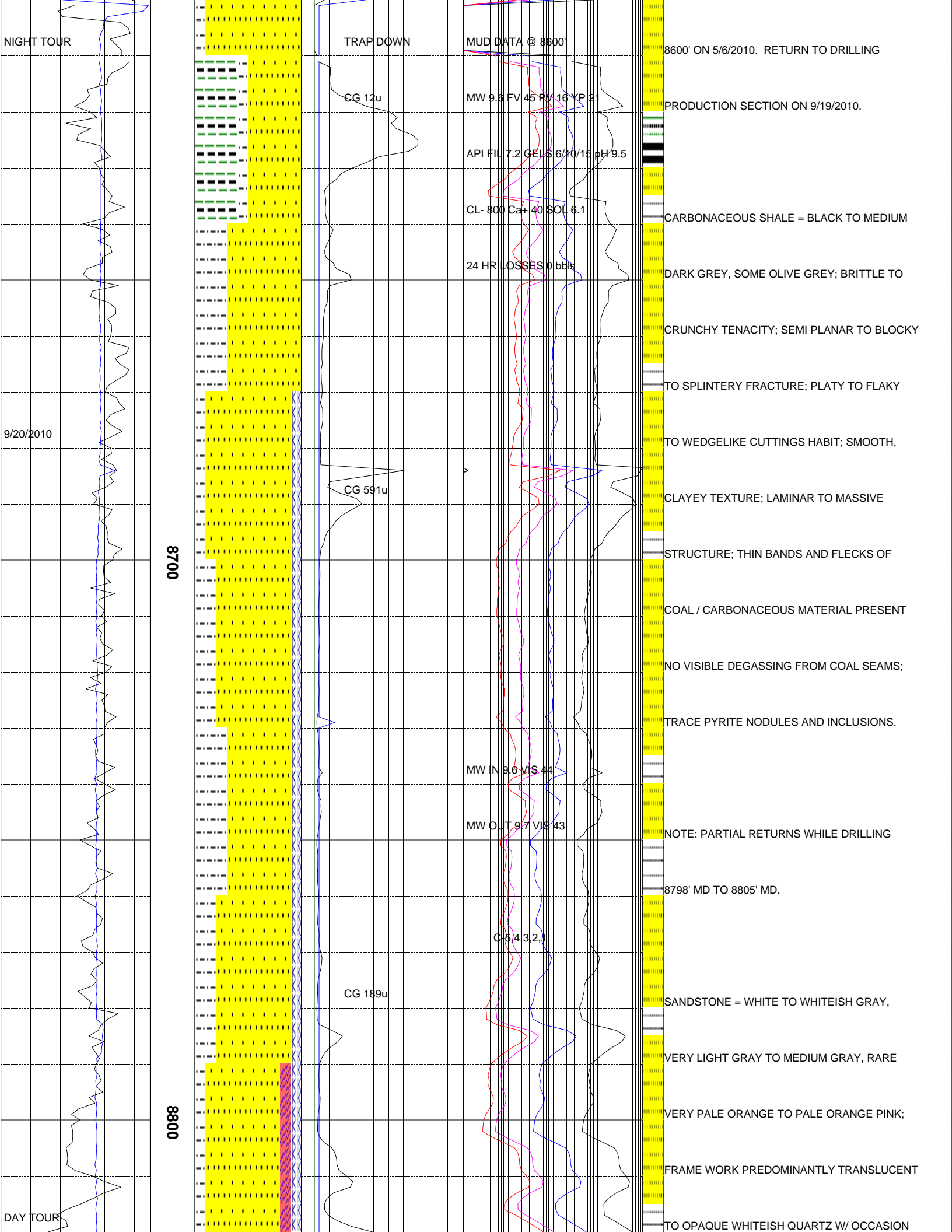


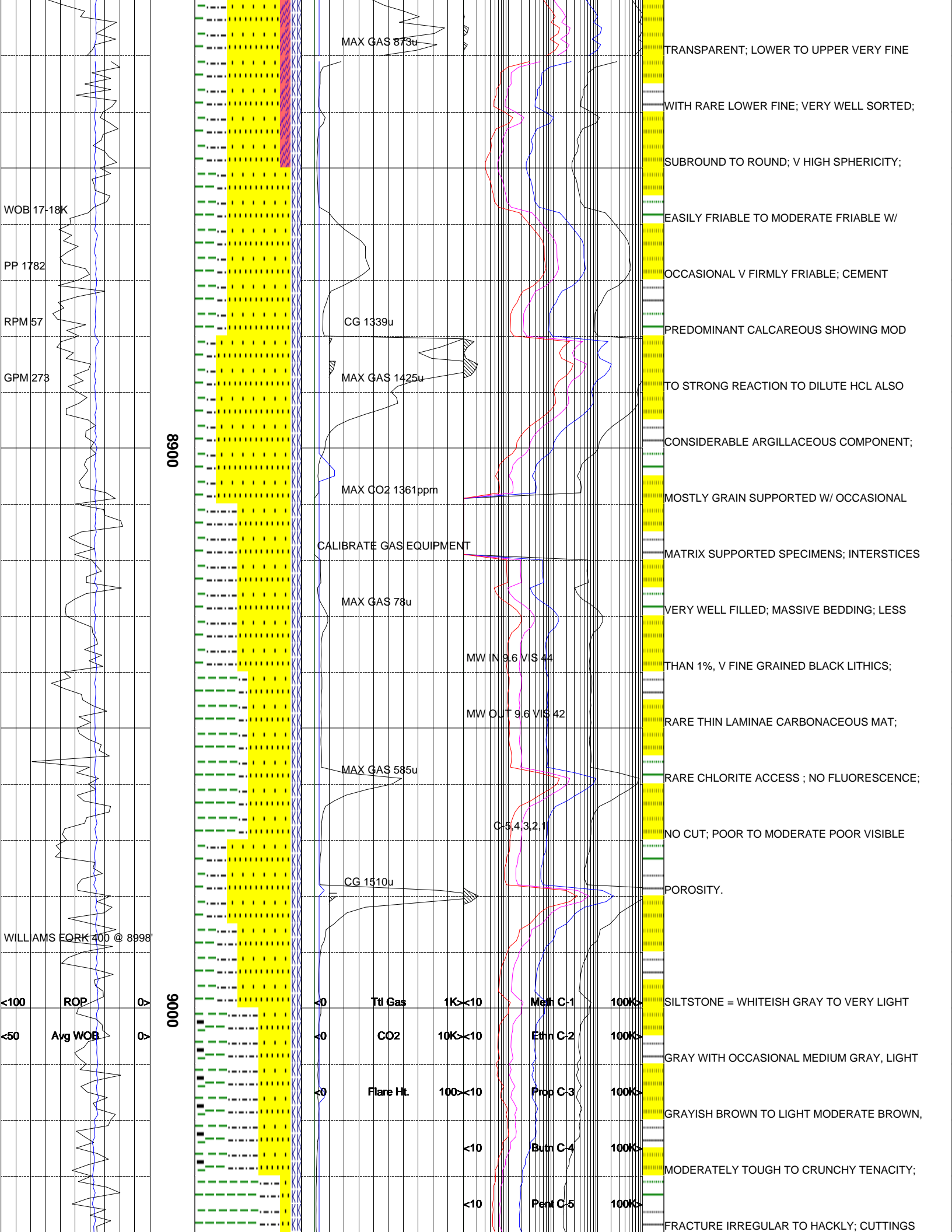


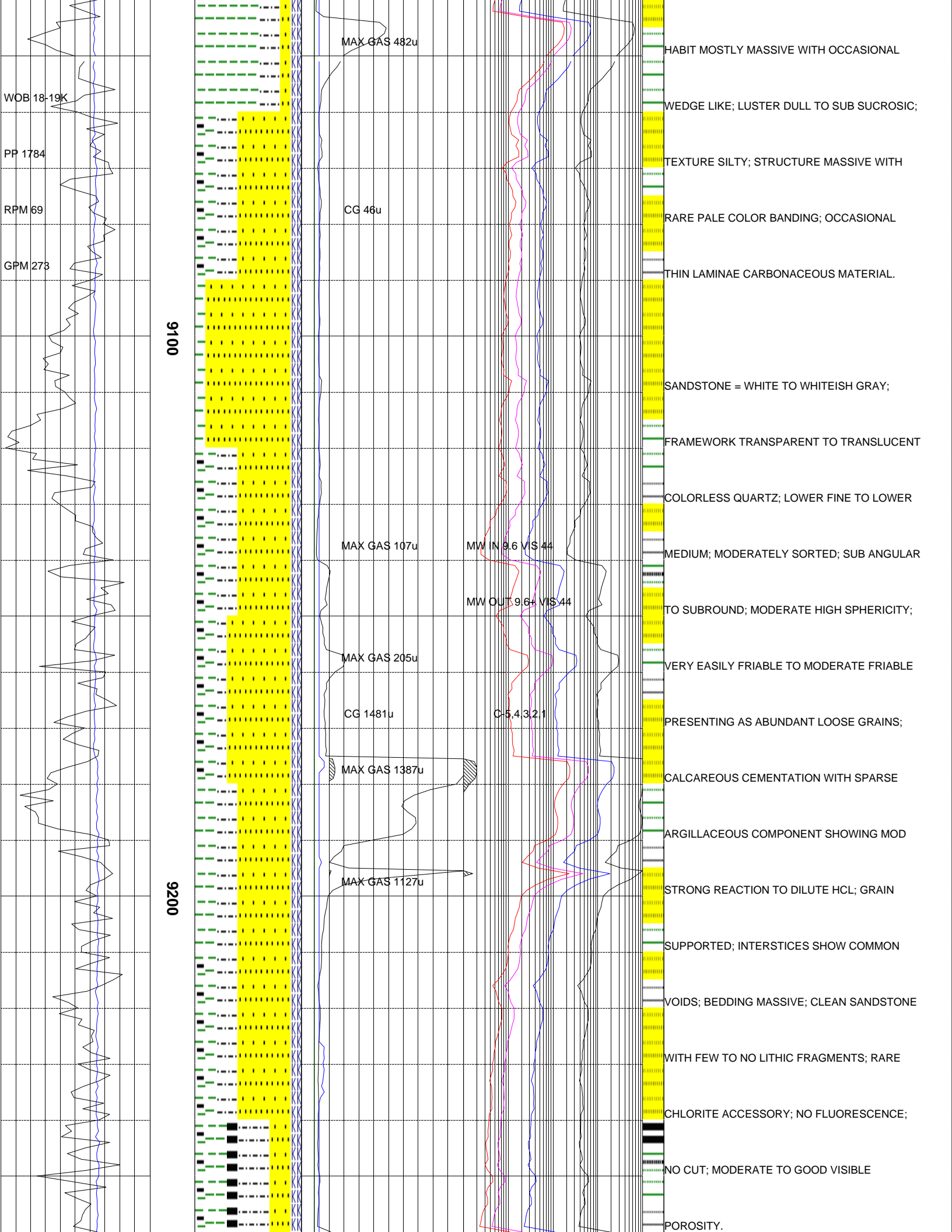




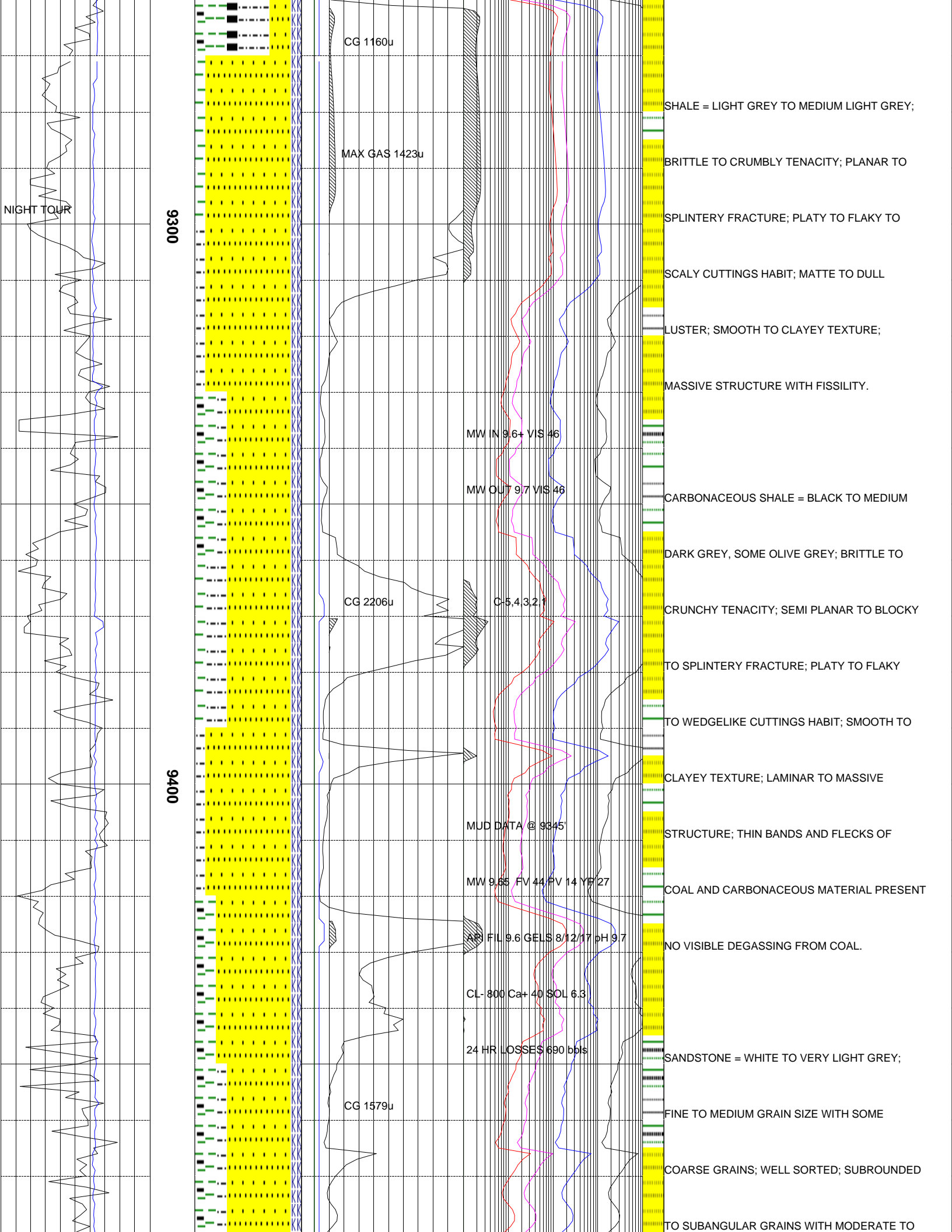


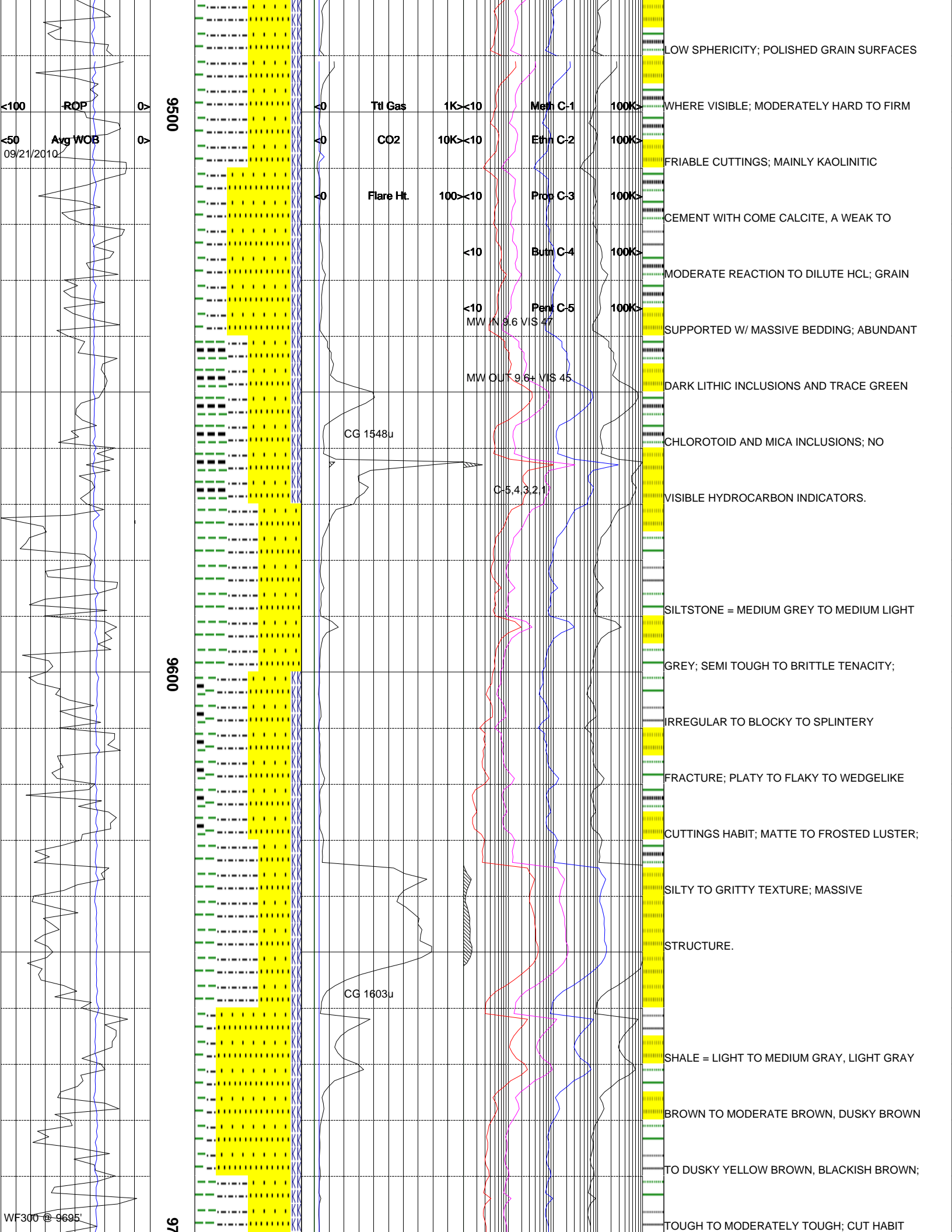


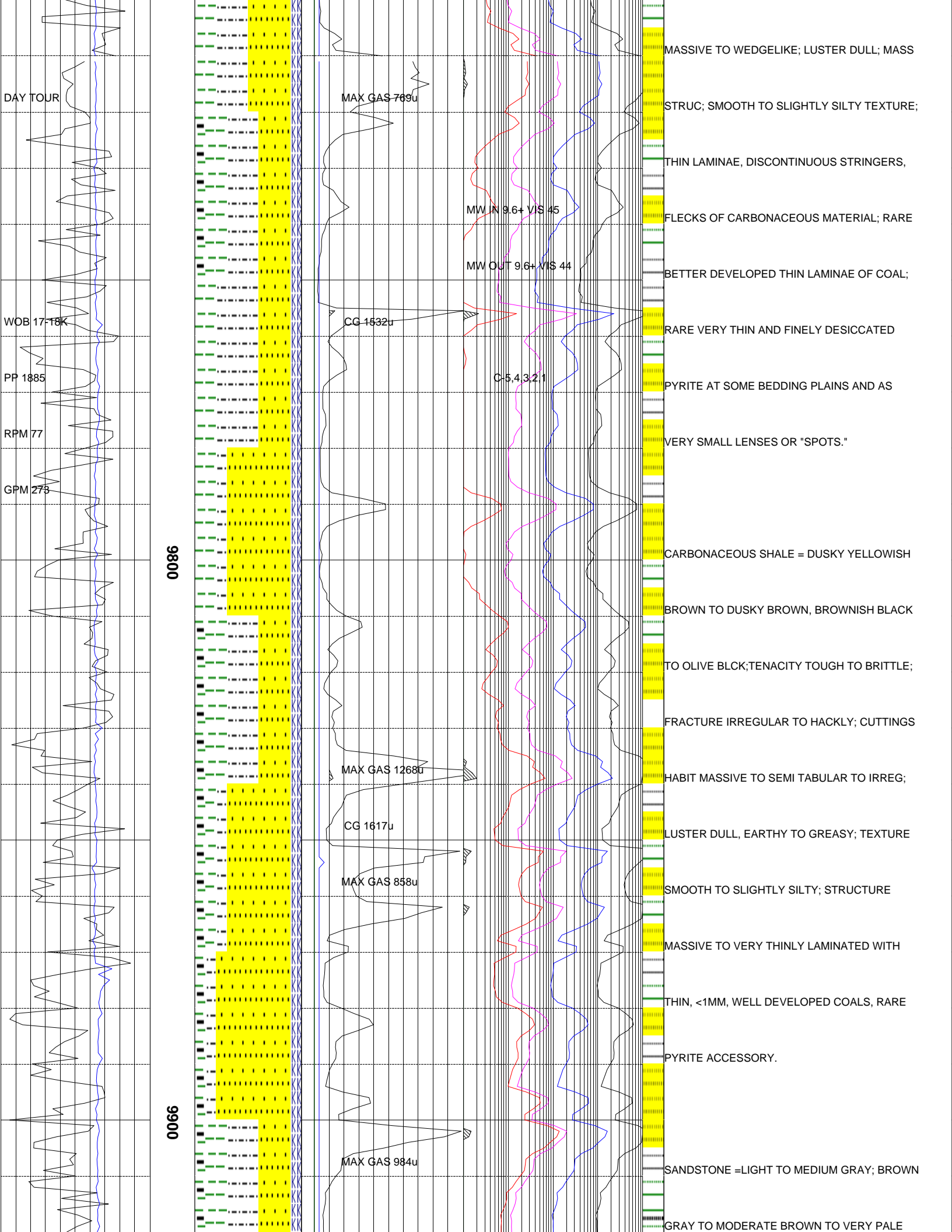


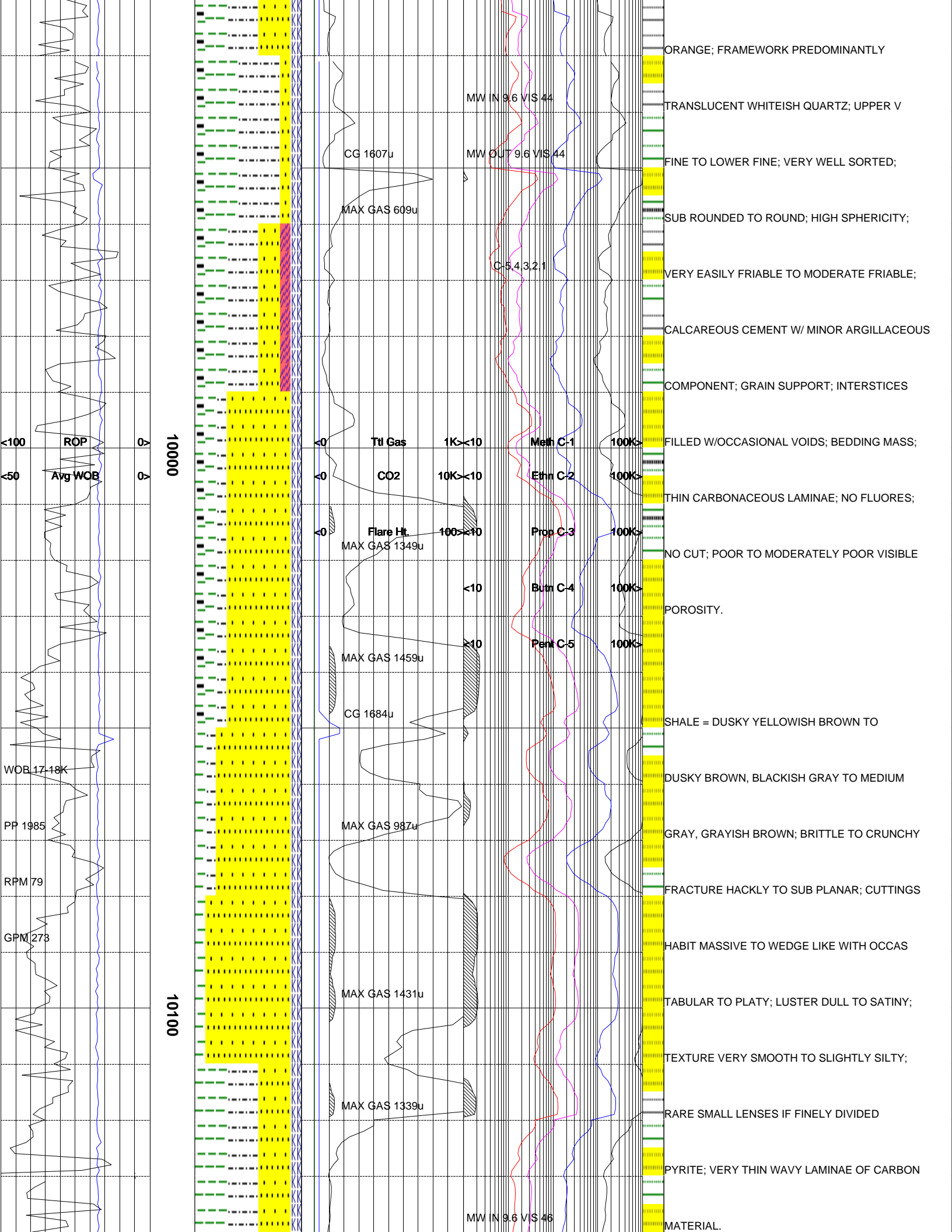


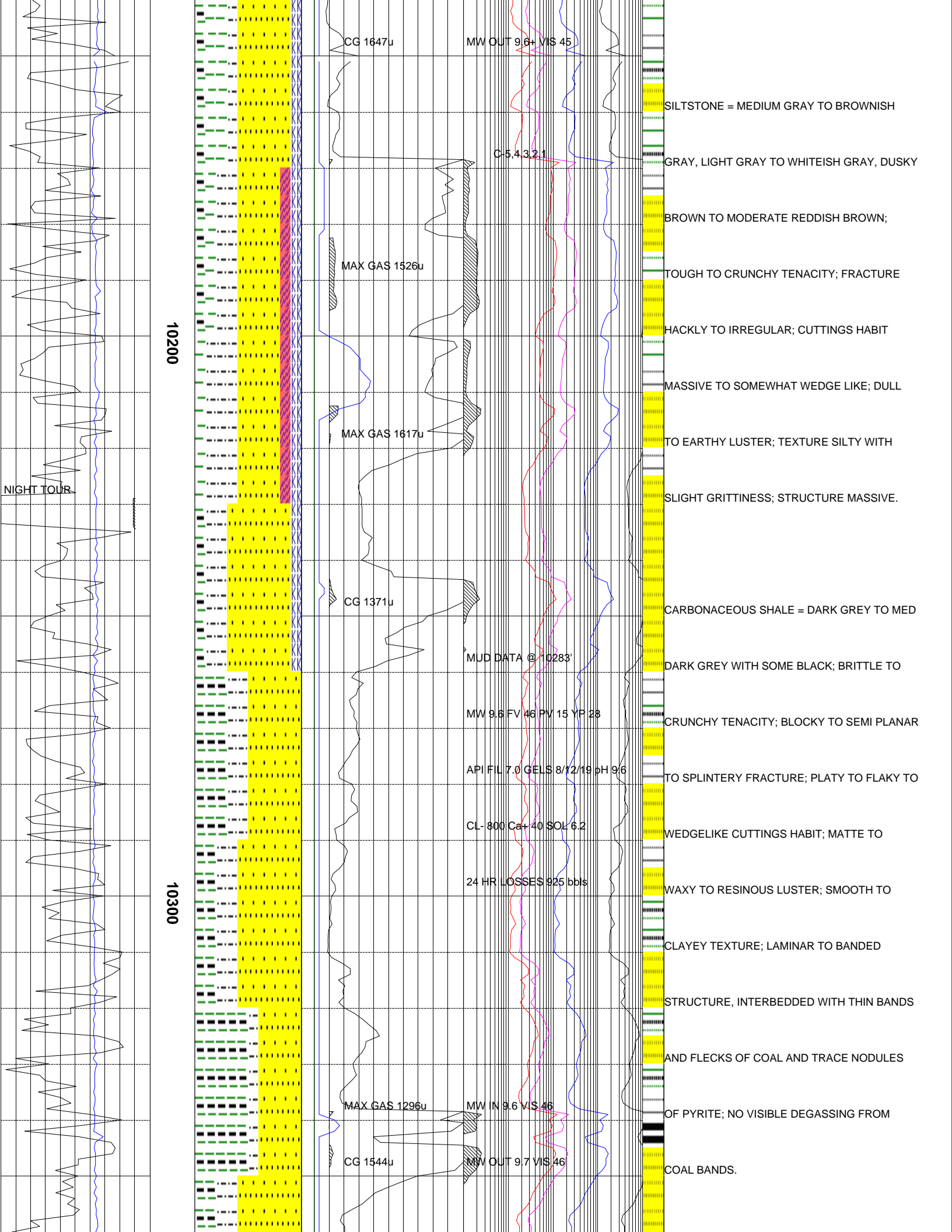


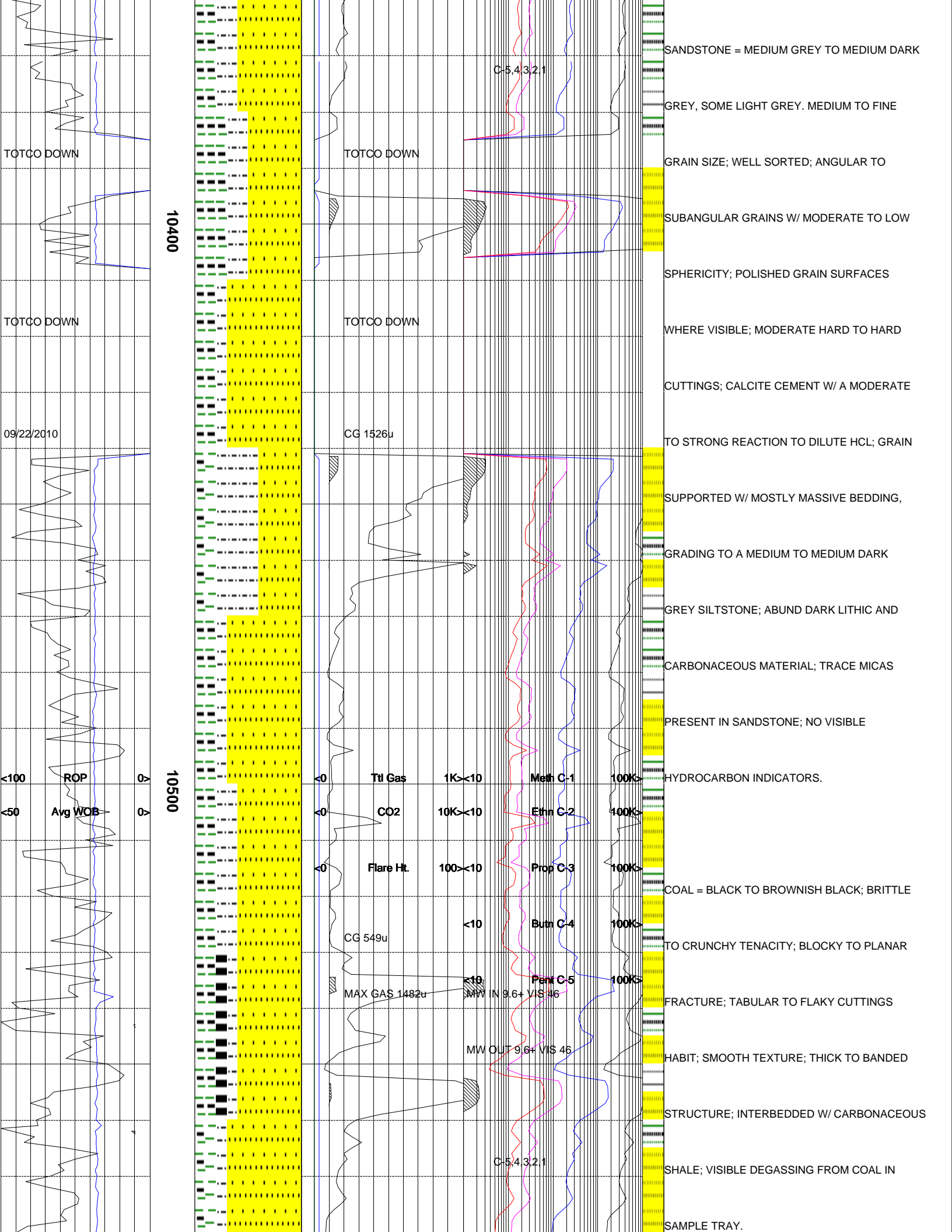


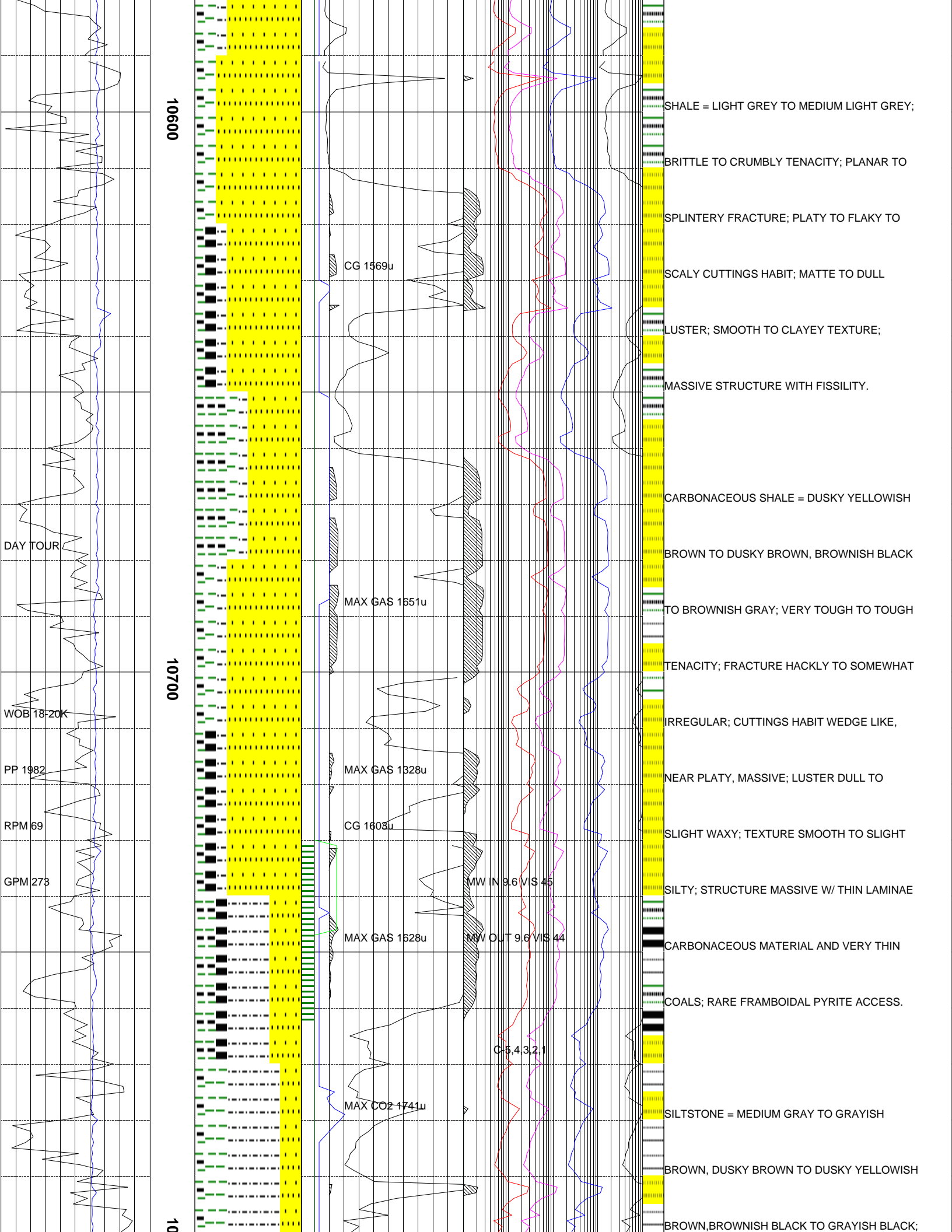




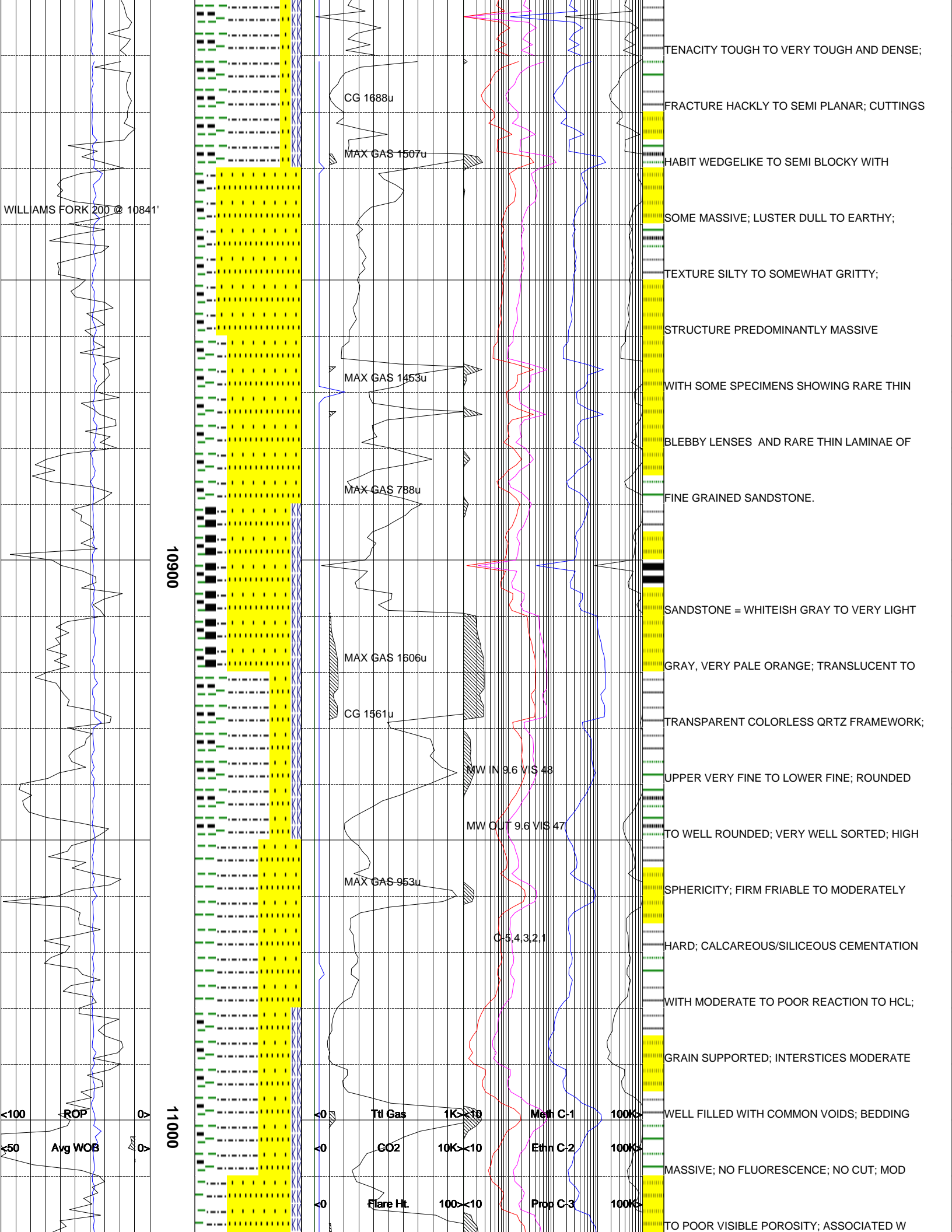




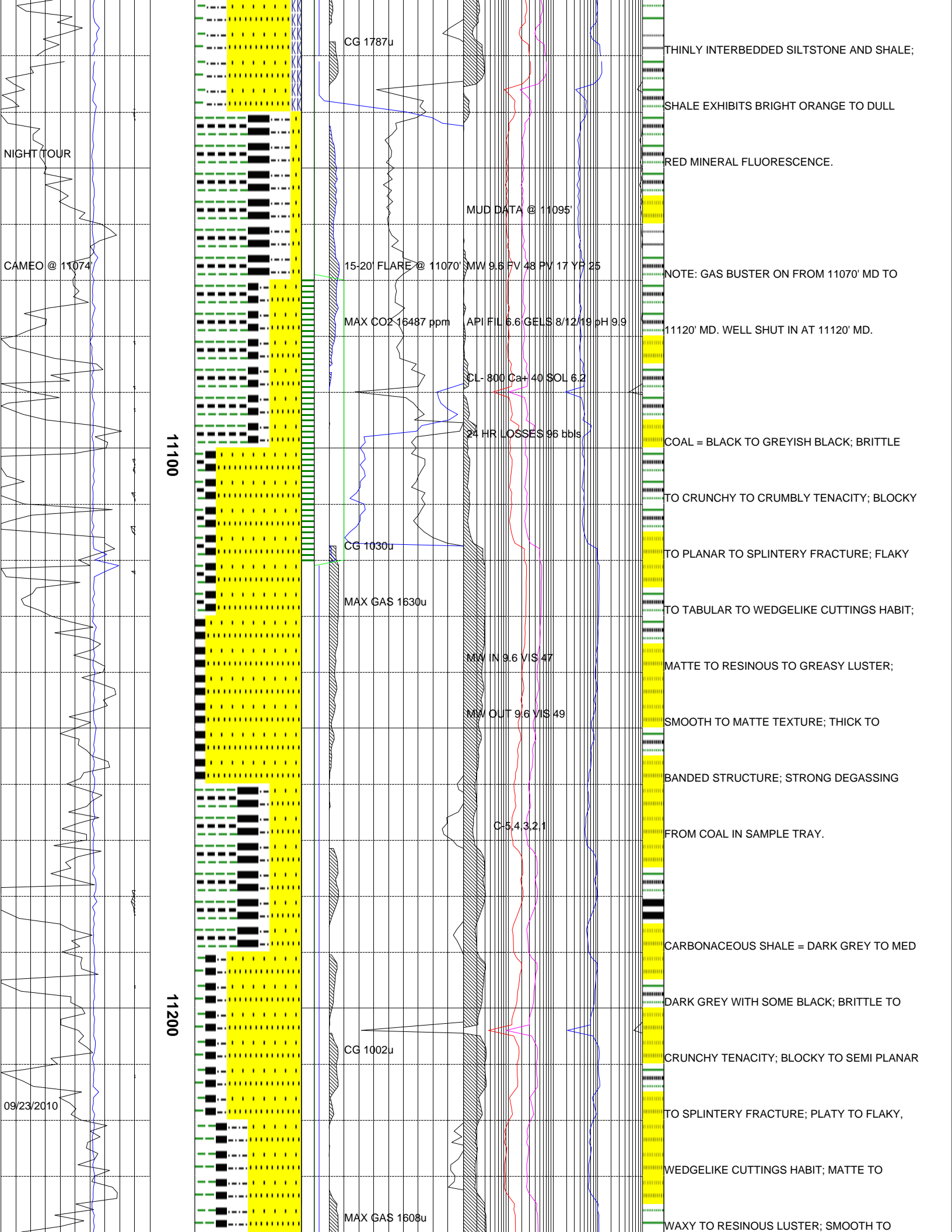












CG 1787u

THINLY INTERBEDDED SILTSTONE AND SHALE;

SHALE EXHIBITS BRIGHT ORANGE TO DULL

RED MINERAL FLUORESCENCE.

MUD DATA @ 11095'

NIGHT TOUR

CAMEO @ 11074'

15-20 FLARE @ 11070' MW 9.6 FV 48 PV 17 YP 25

NOTE: GAS BUSTER ON FROM 11070' MD TO

MAX CO2 16487 ppm API FIL 6.6 GELS 8/12/19 pH 9.9

11120' MD. WELL SHUT IN AT 11120' MD.

CL- 800 Ca+ 40 SOL 6.2

24 HR LOSSES 96 bbls

COAL = BLACK TO GREYISH BLACK; BRITTLE

TO CRUNCHY TO CRUMBLY TENACITY; BLOCKY

TO PLANAR TO SPLINTERY FRACTURE; FLAKY

CG 1030u

TO TABULAR TO WEDGELIKE CUTTINGS HABIT;

MAX GAS 1630u

MATTE TO RESINOUS TO GREASY LUSTER;

MW IN 9.6 VIS 47

MW OUT 9.6 VIS 49

SMOOTH TO MATTE TEXTURE; THICK TO

BANDED STRUCTURE; STRONG DEGASSING

C-5.4.3.2.1

FROM COAL IN SAMPLE TRAY.

CARBONACEOUS SHALE = DARK GREY TO MED

DARK GREY WITH SOME BLACK; BRITTLE TO

CG 1002u

CRUNCHY TENACITY; BLOCKY TO SEMI PLANAR

TO SPLINTERY FRACTURE; PLATY TO FLAKY,

WEDGELIKE CUTTINGS HABIT; MATTE TO

MAX GAS 1608u

WAXY TO RESINOUS LUSTER; SMOOTH TO

11100

11200

09/23/2010

