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MUDLOG TVD

COMPANY	EXXONMOBIL
WELL	FRU197-33A4
FIELD	FREEDOM RANCH UNIT
REGION	ROCKY MOUNTAINS
COORDINATES	N39,54,56.038 W108,17,6.105
ELEVATION	6415' 6388'
COUNTY, STATE	RIO BLANCO COUNTY, COLO
API INDEX	05-103-11100-00
SPUD DATE	05/19/2009
CONTRACTOR	HELMRICH AND PAYNE
CO. REP.	K.GARDNER/G.PERKINS
RIG/TYPE	239/FLEX 3
LOGGING UNIT	MLU 033
GEOLOGISTS	LAYNE GOOD NICK BAUER
ADD. PERSONS	JASON REISENBICHLER JASON REYNOLDS
CO. GEOLOGIST	MELISSA SAURBORN

LOG INTERVAL

DEPTHS: 3900' **TO** 12512'
DATES: 05/19/2008 **TO** 06/06/09
SCALE: 5"=100'

CASING DATA

16" **AT** 130'
10.75" **AT** 3877'
7" **AT** 8717'
4.5" **AT** 12500'

MUD TYPES

SPUD **TO** 3900'
LSND **TO** 12512'
TO
TO

HOLE SIZE

9.875" **TO** 8723"
6.125" **TO** 12512'
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	

[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 SEPERATOR) 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 FOR

HYDROCARBON FLUORESCENCE AND MINOR

FLUORESCENCE FROM POSSIBLE FRACTURE

FILL. ALL FLUORESCENCE IS NOTED ON THE

MUDLOG.

10.5" SURFACE CASING WAS SET AT 3876'.

CANRIG DRILLING TECHNOLOGY LTD.

COMMENCED FULL LOGGING SERVICES ON

05/19/2009 at 3900'.

3400

3700 MD

3500

3800 MD

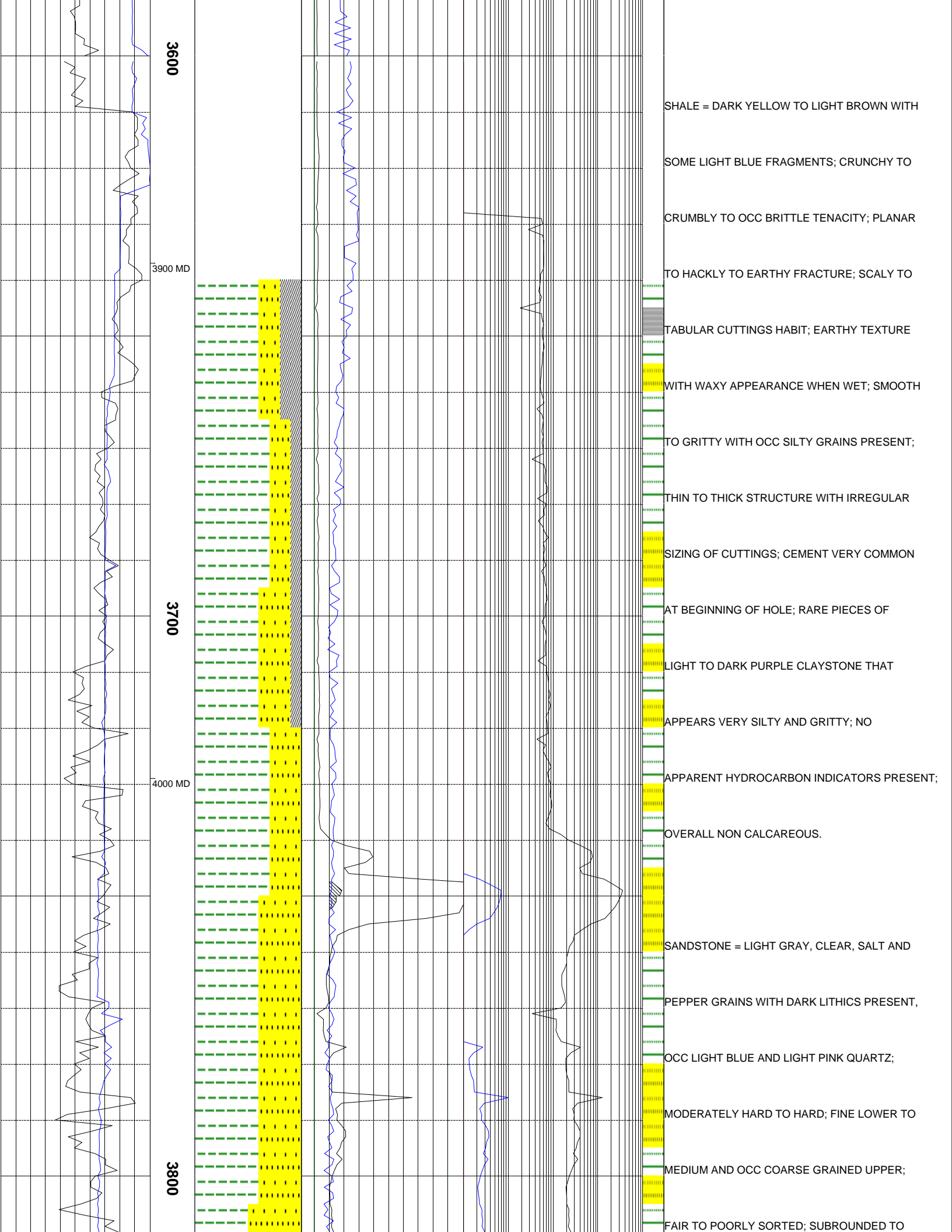
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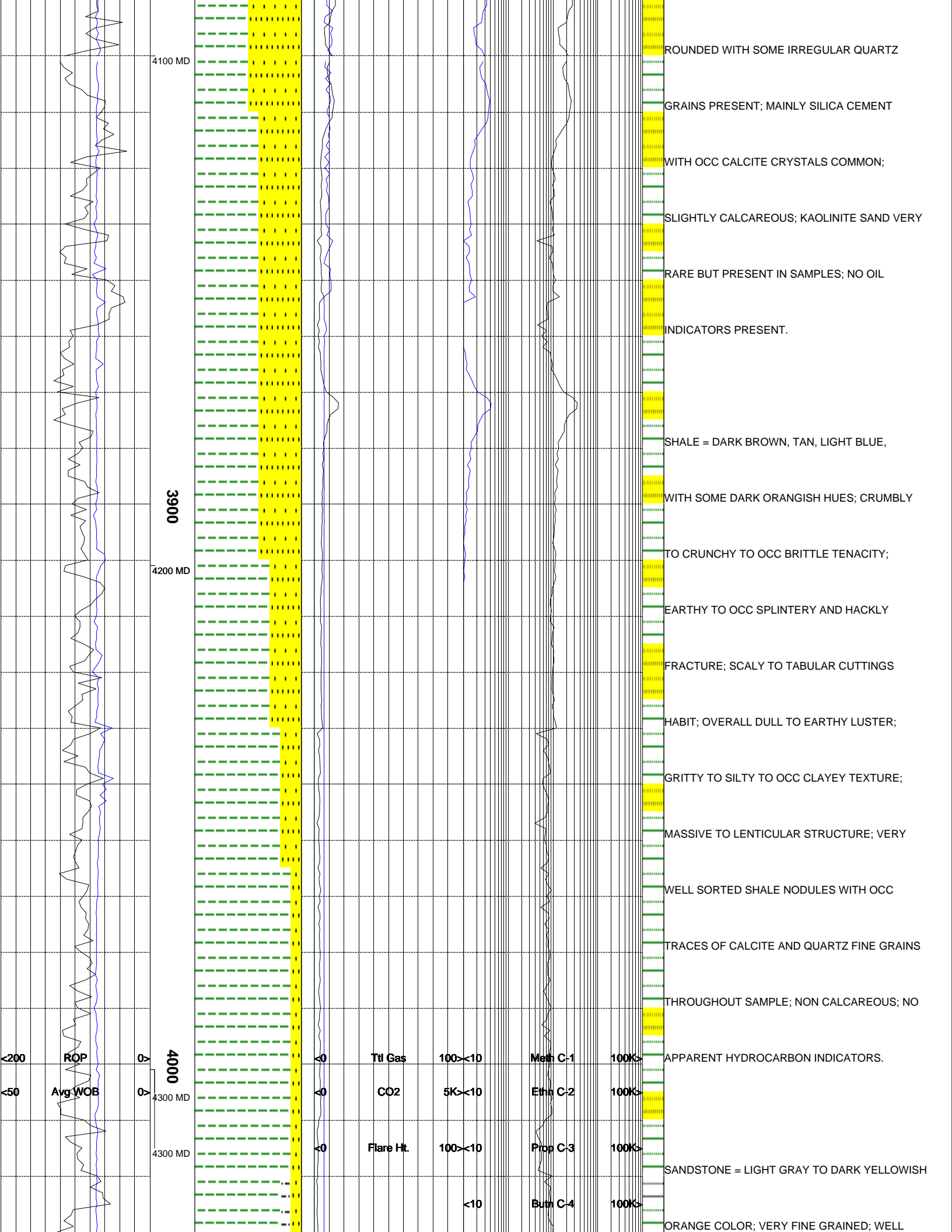
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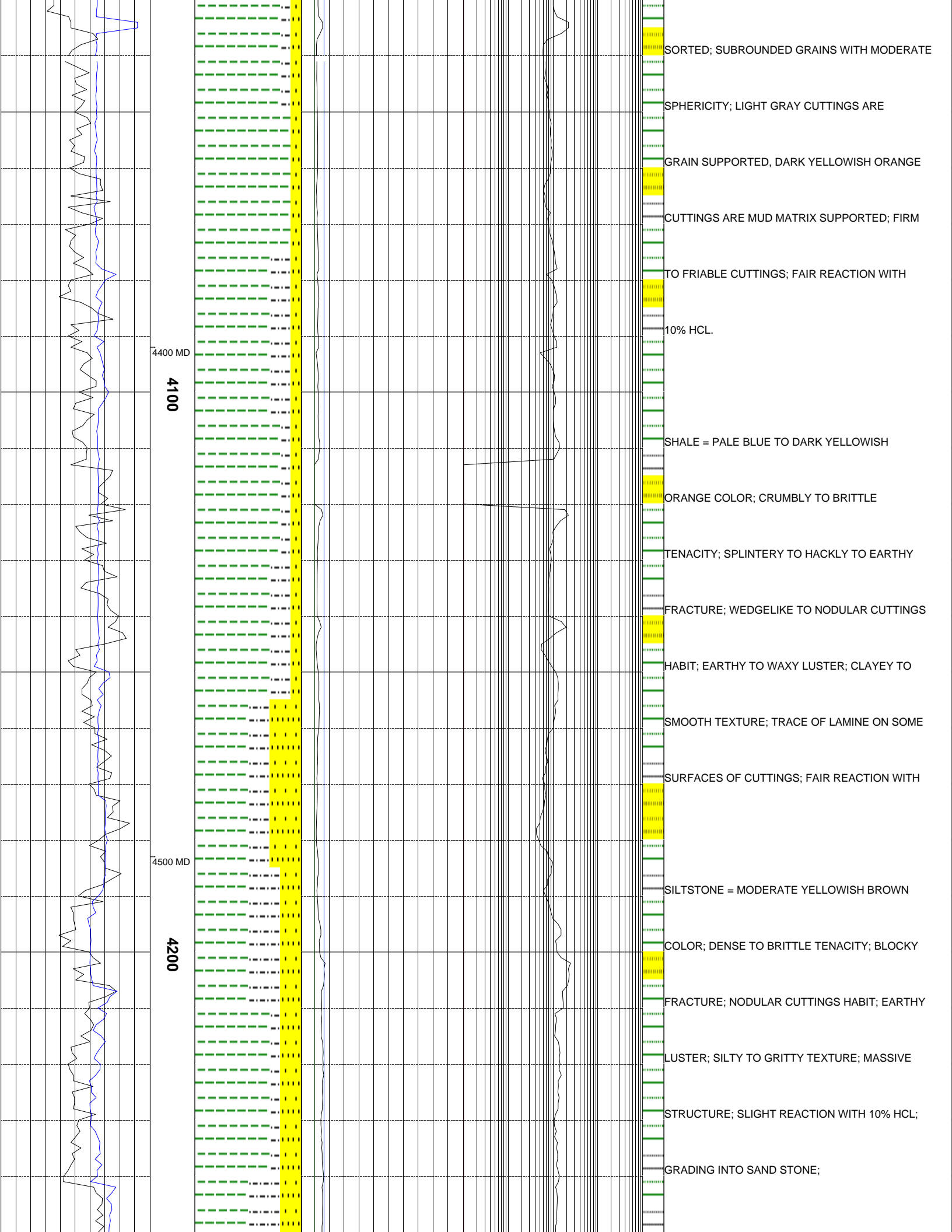
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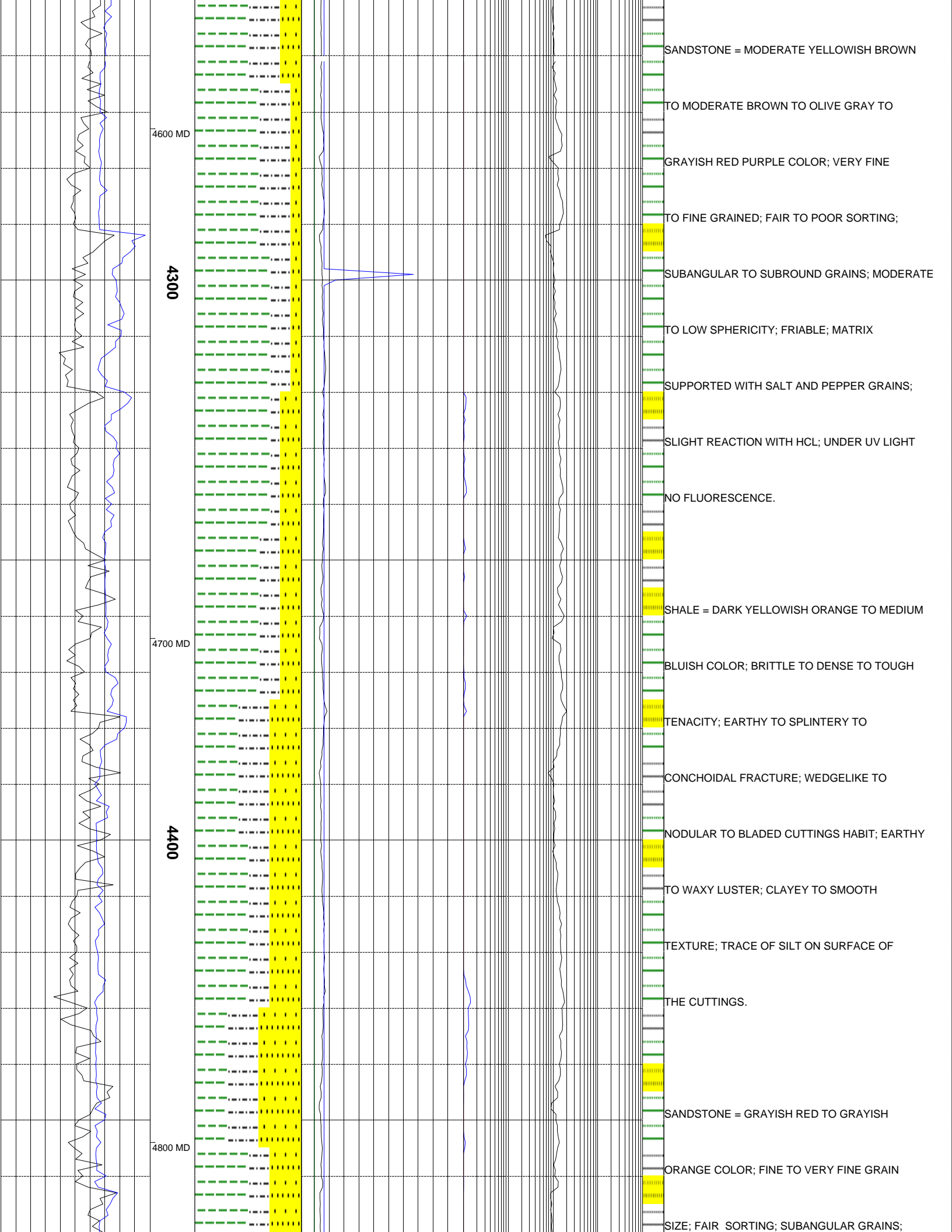
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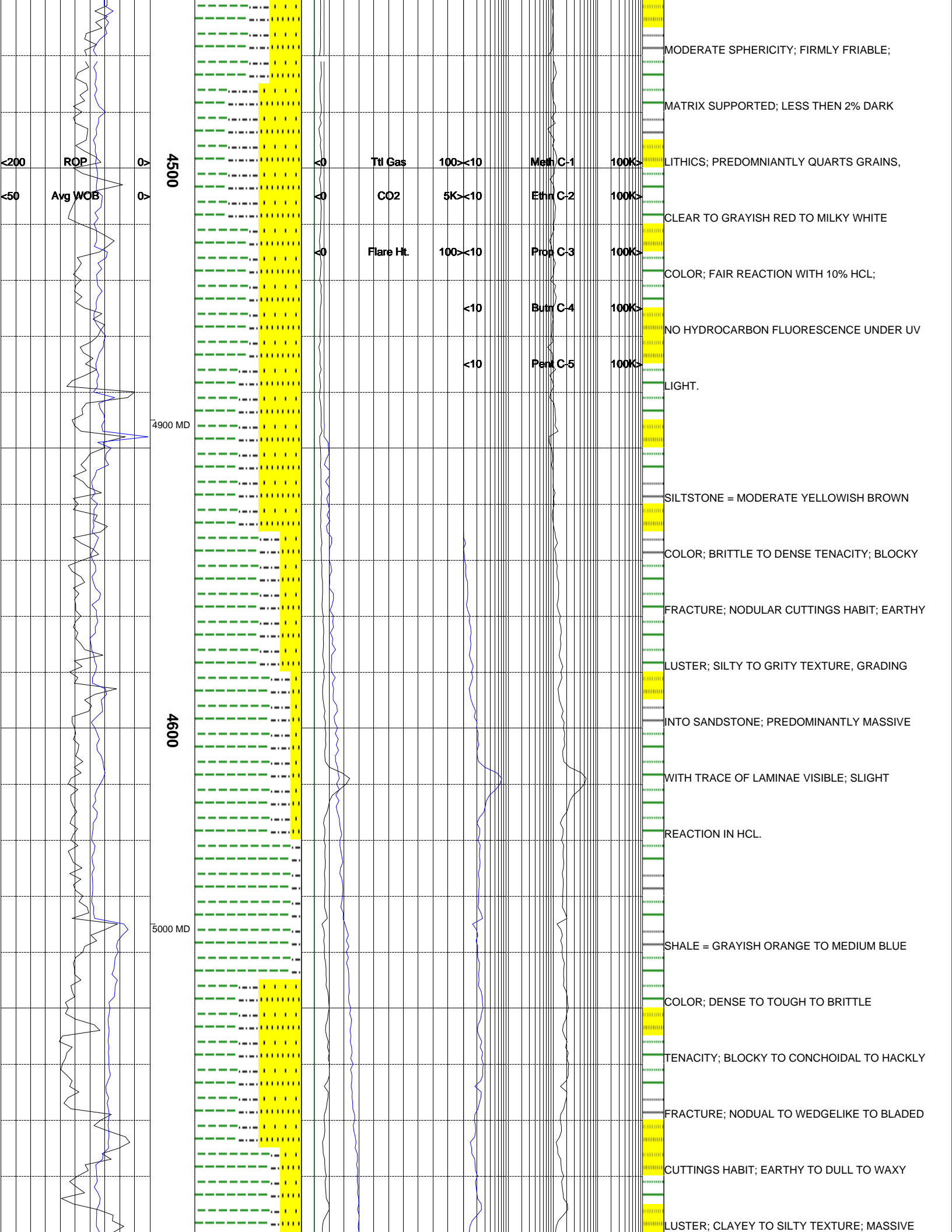
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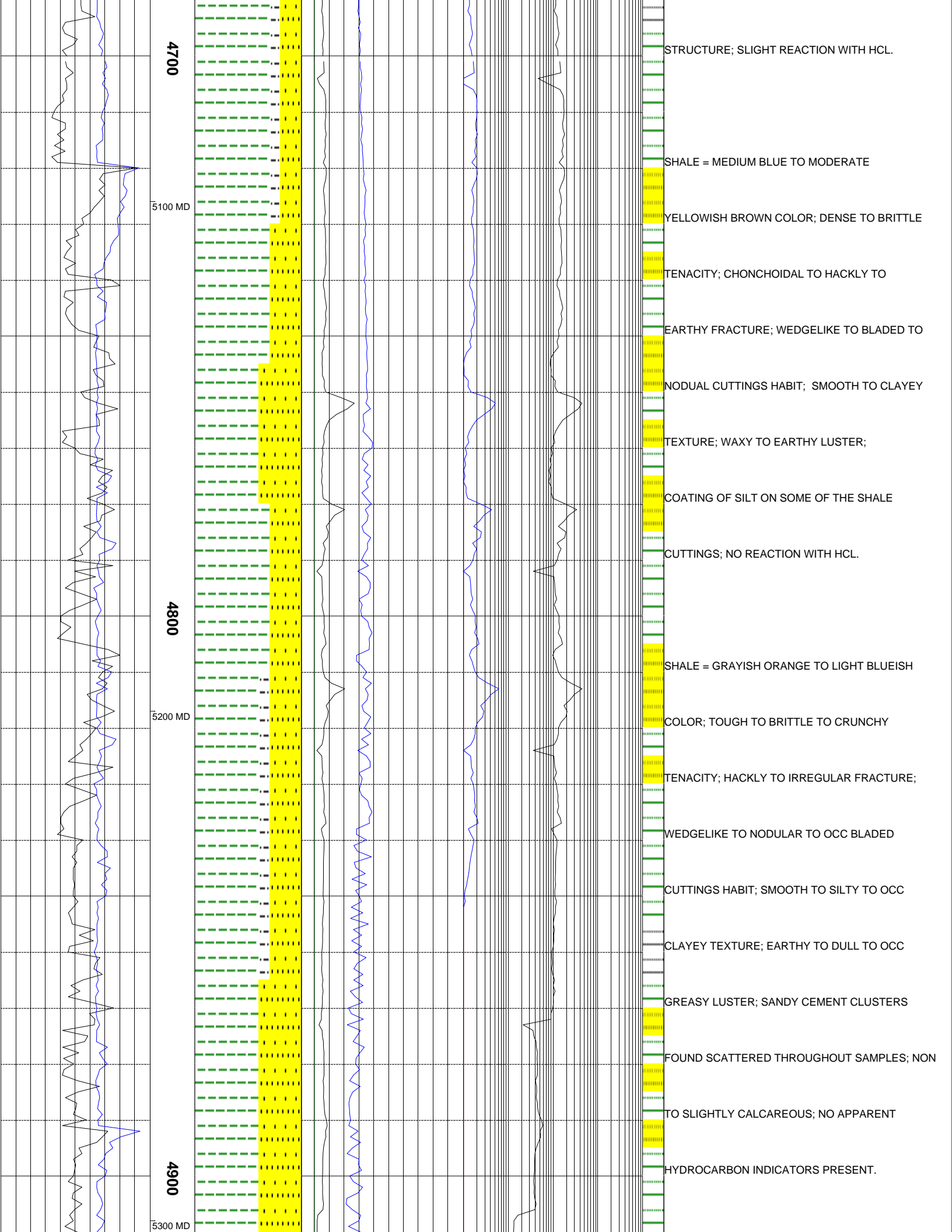


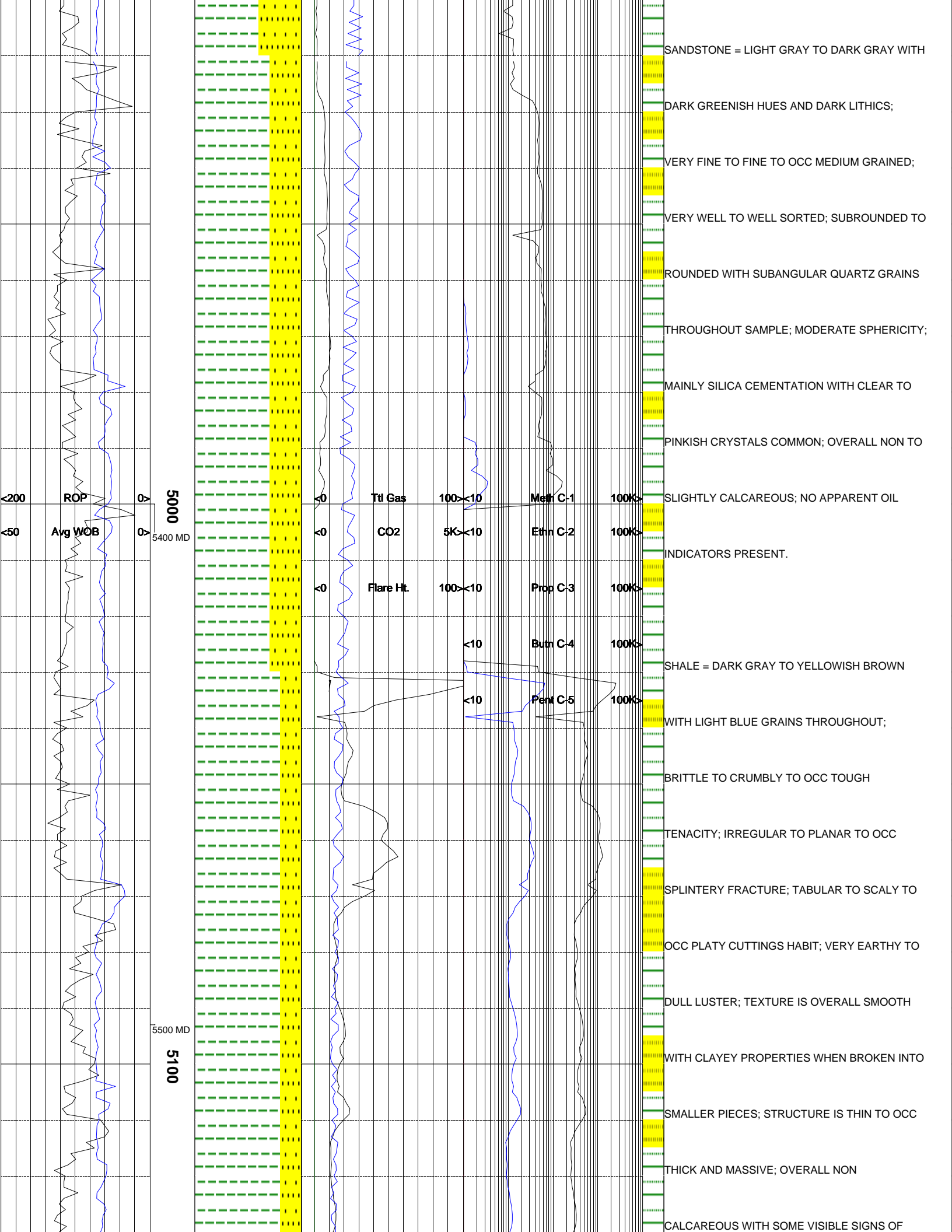


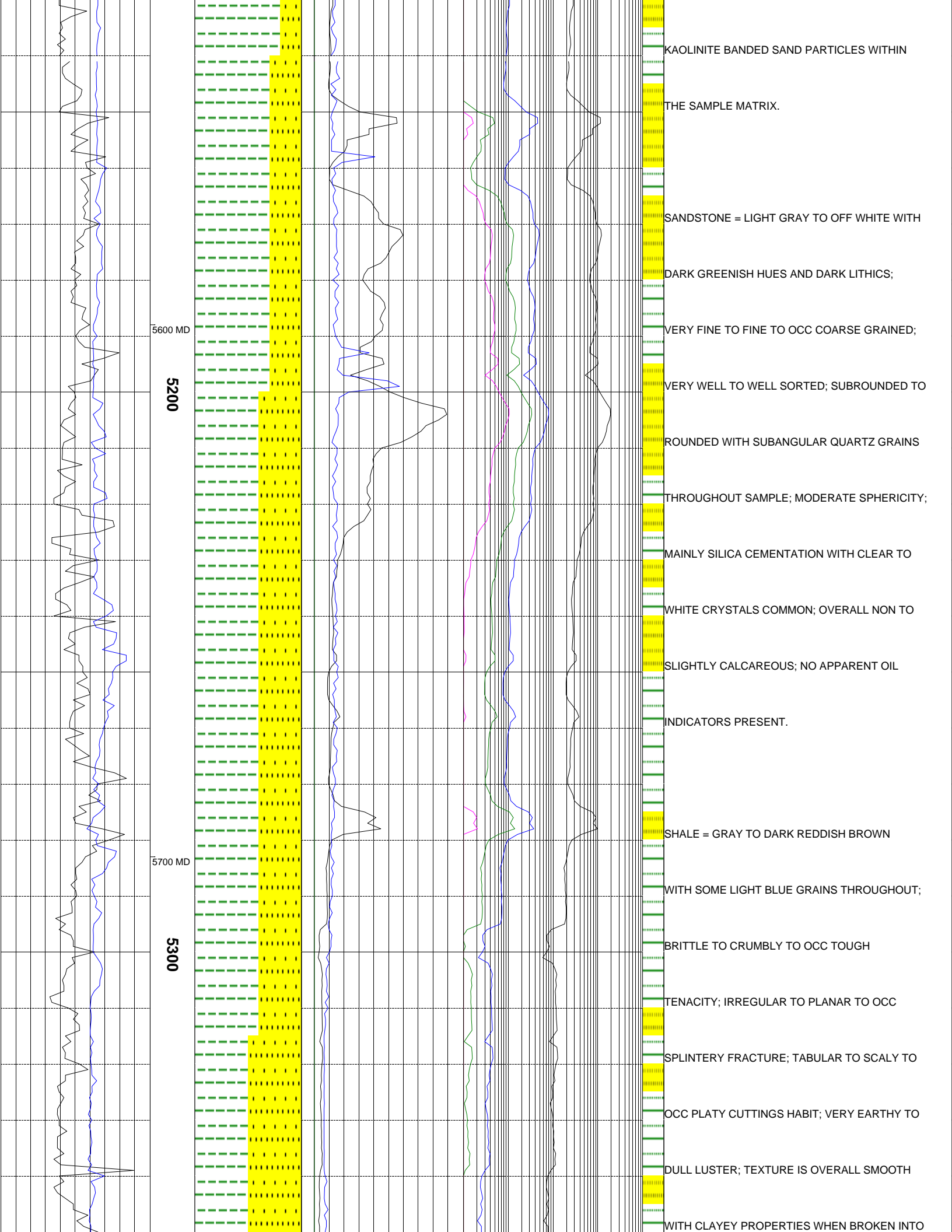


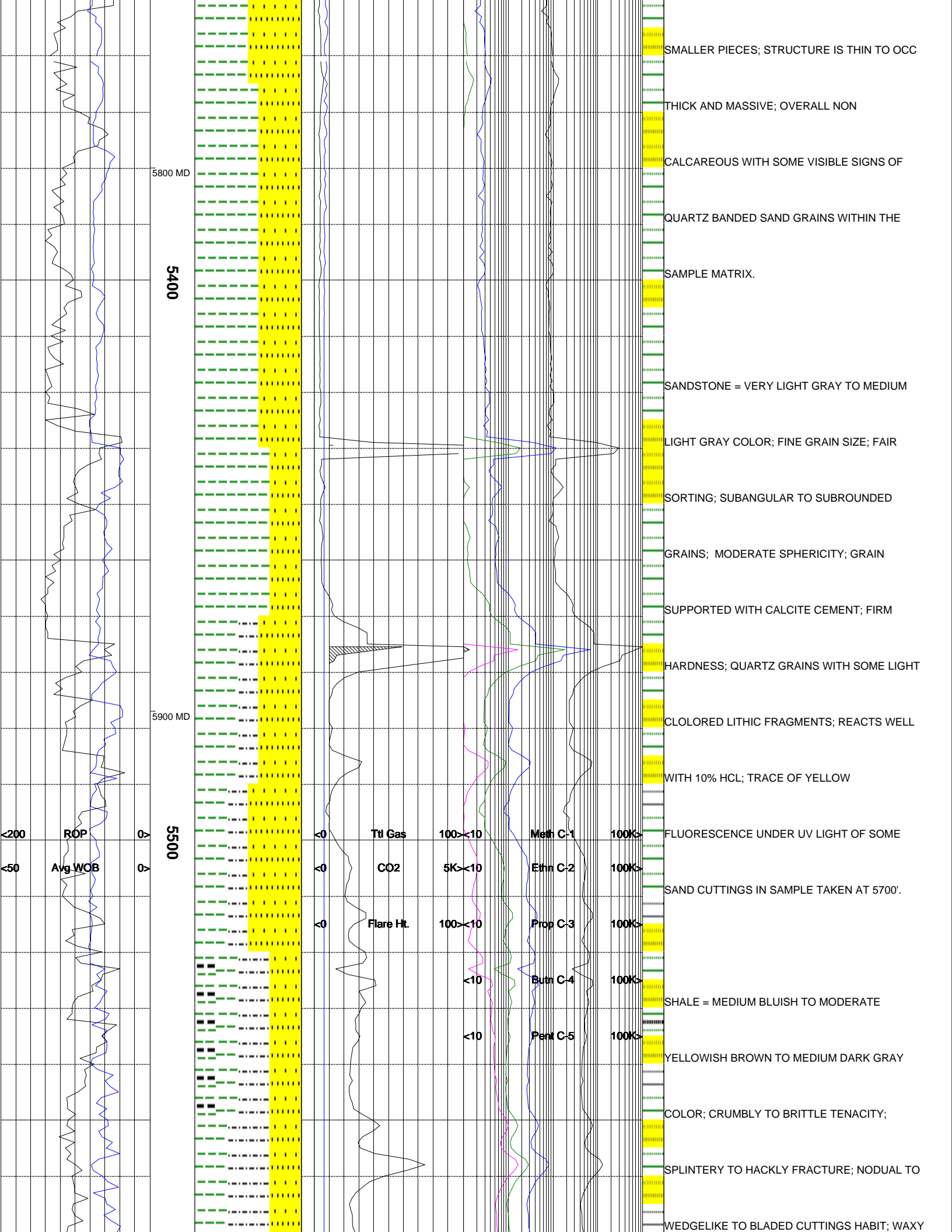


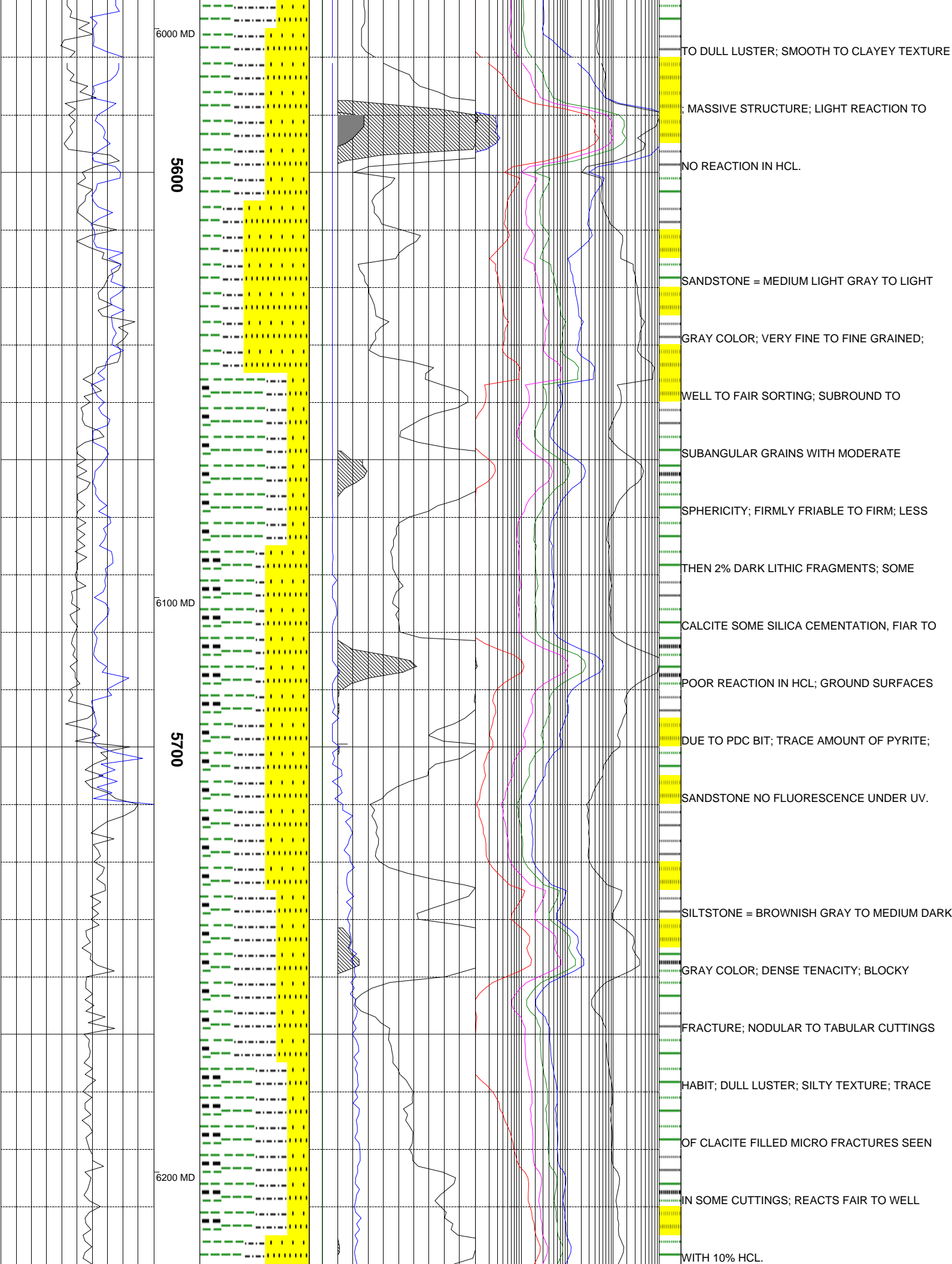


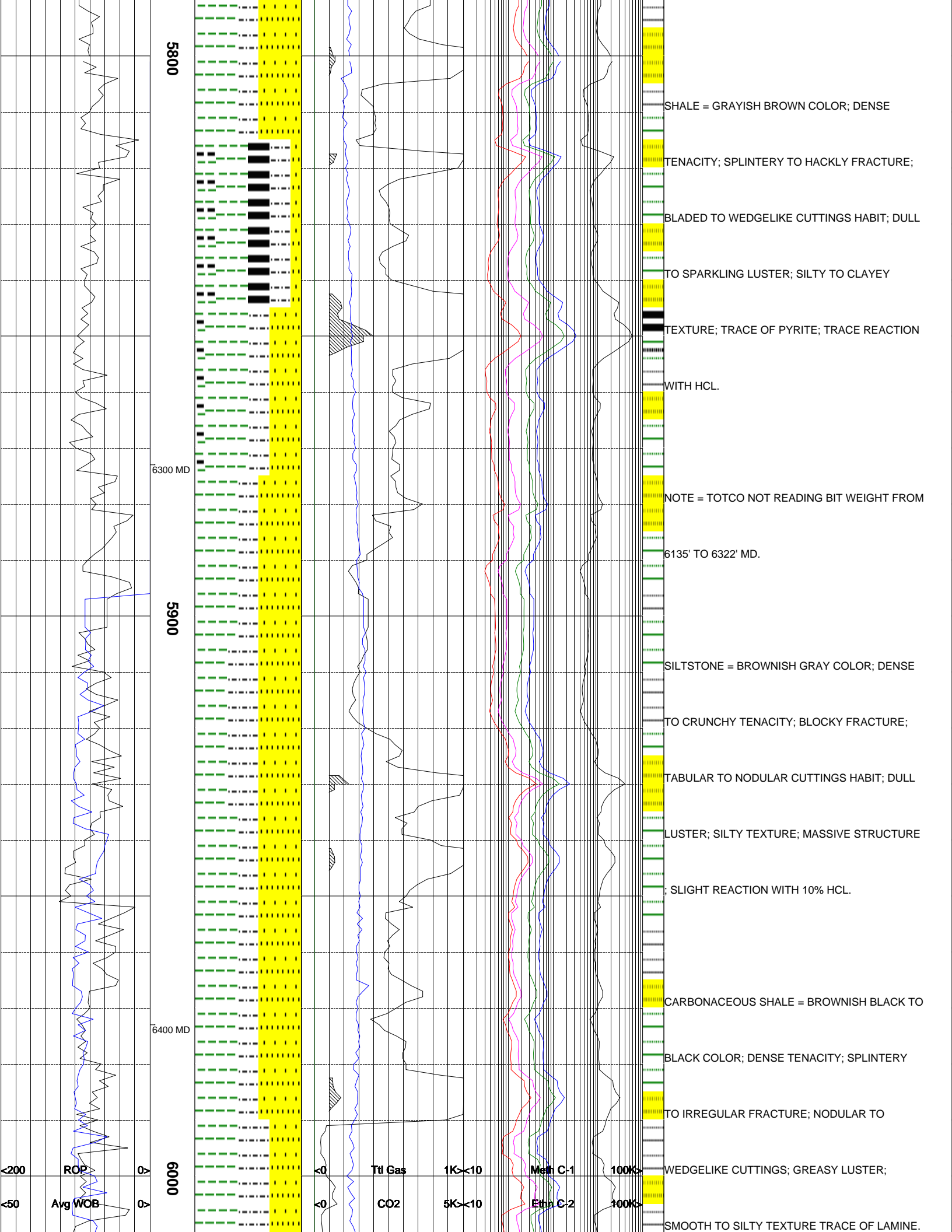


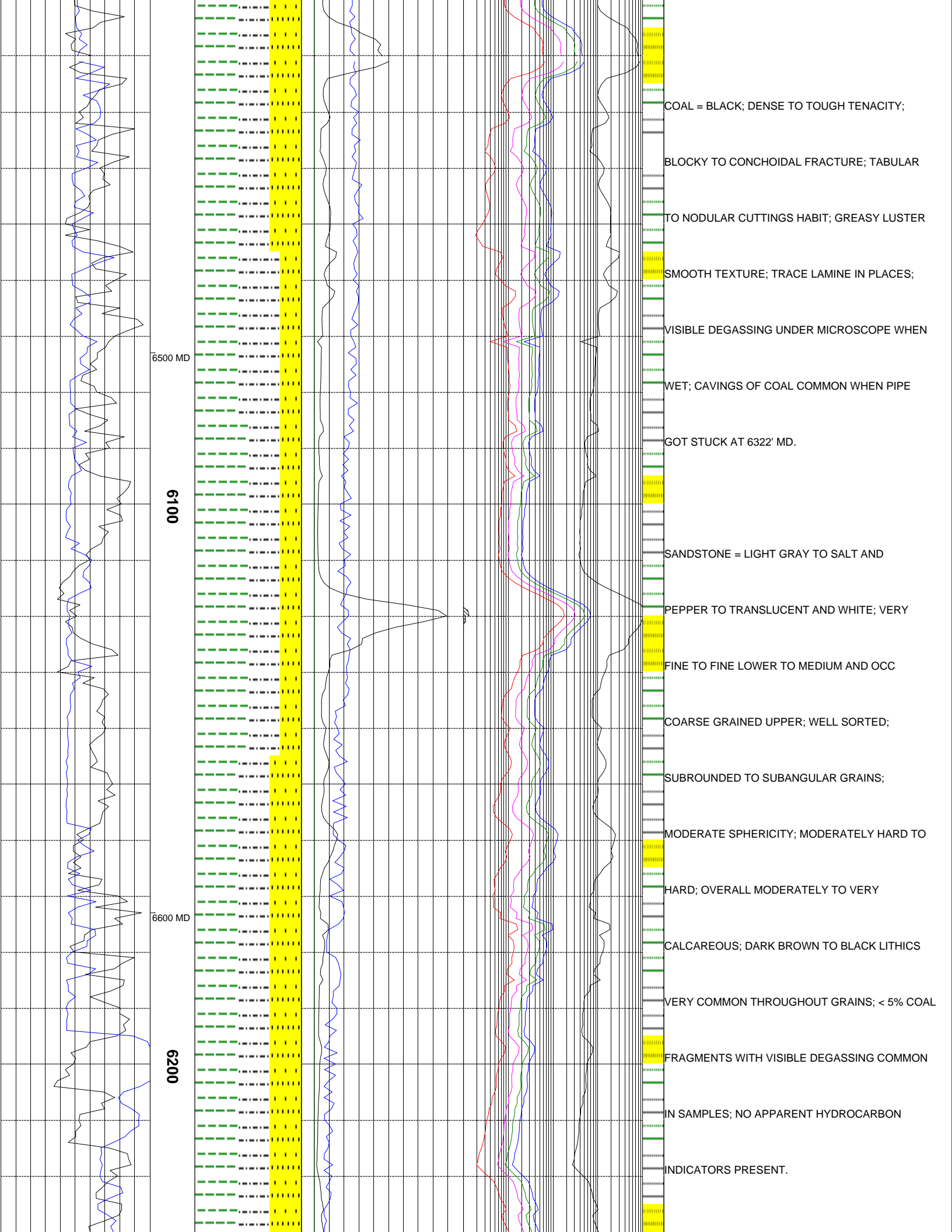


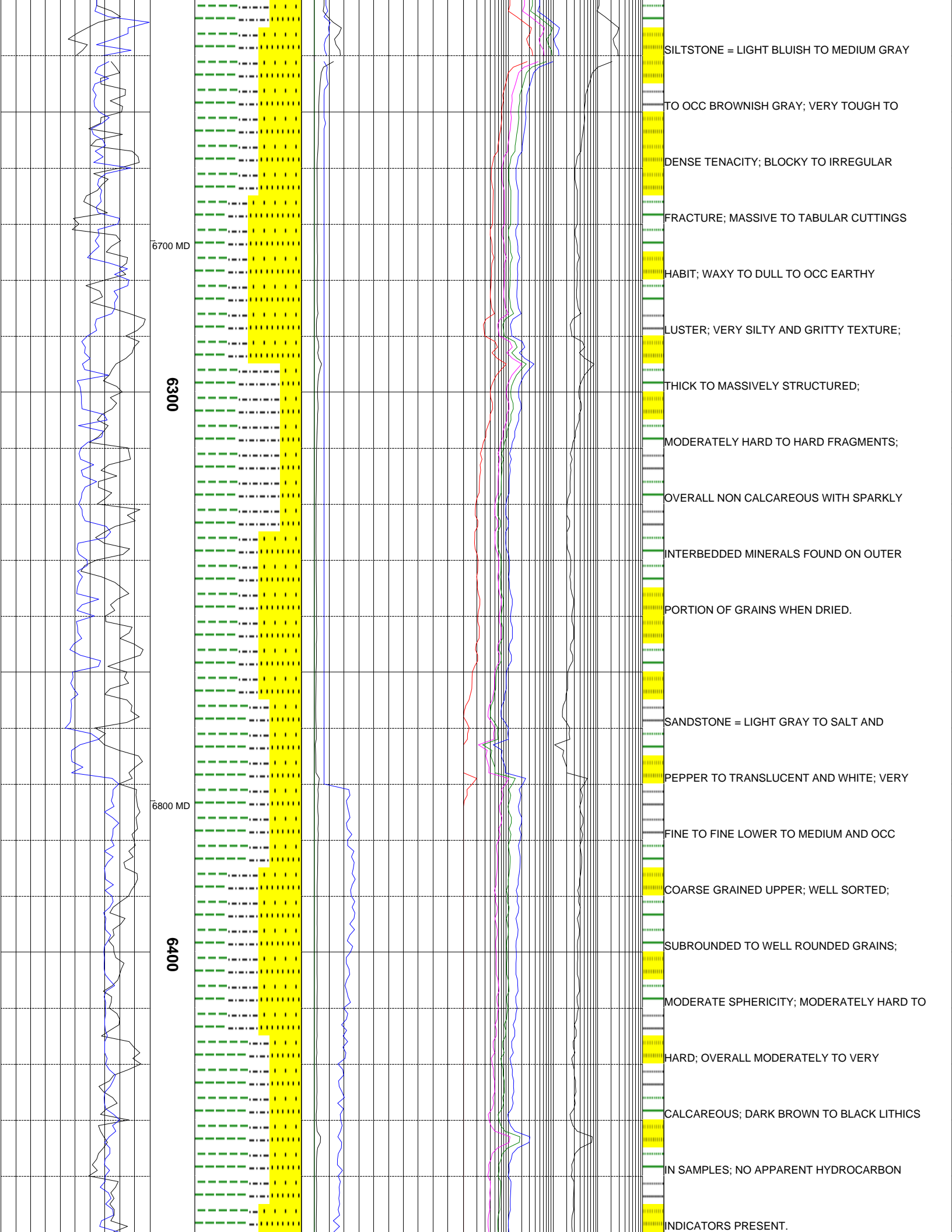


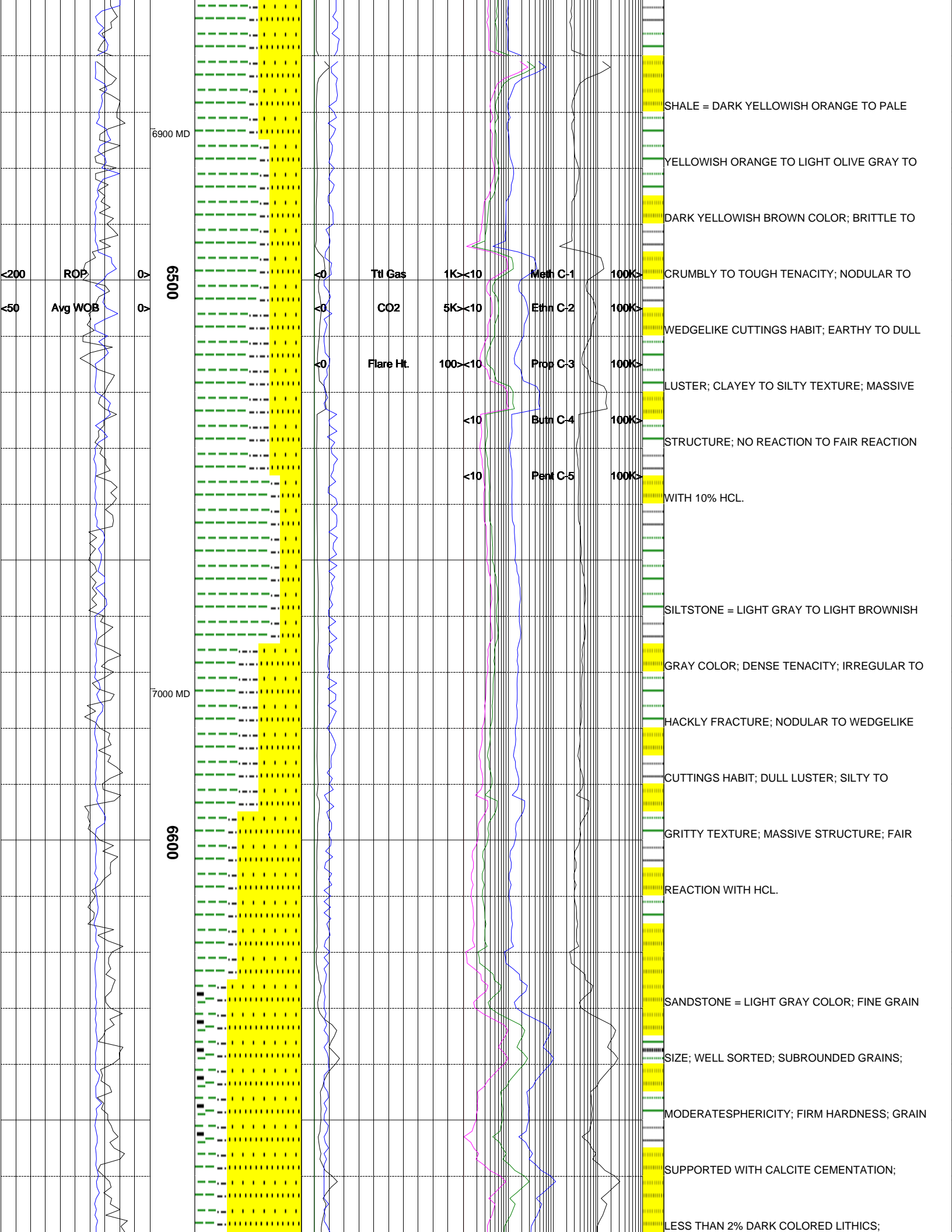


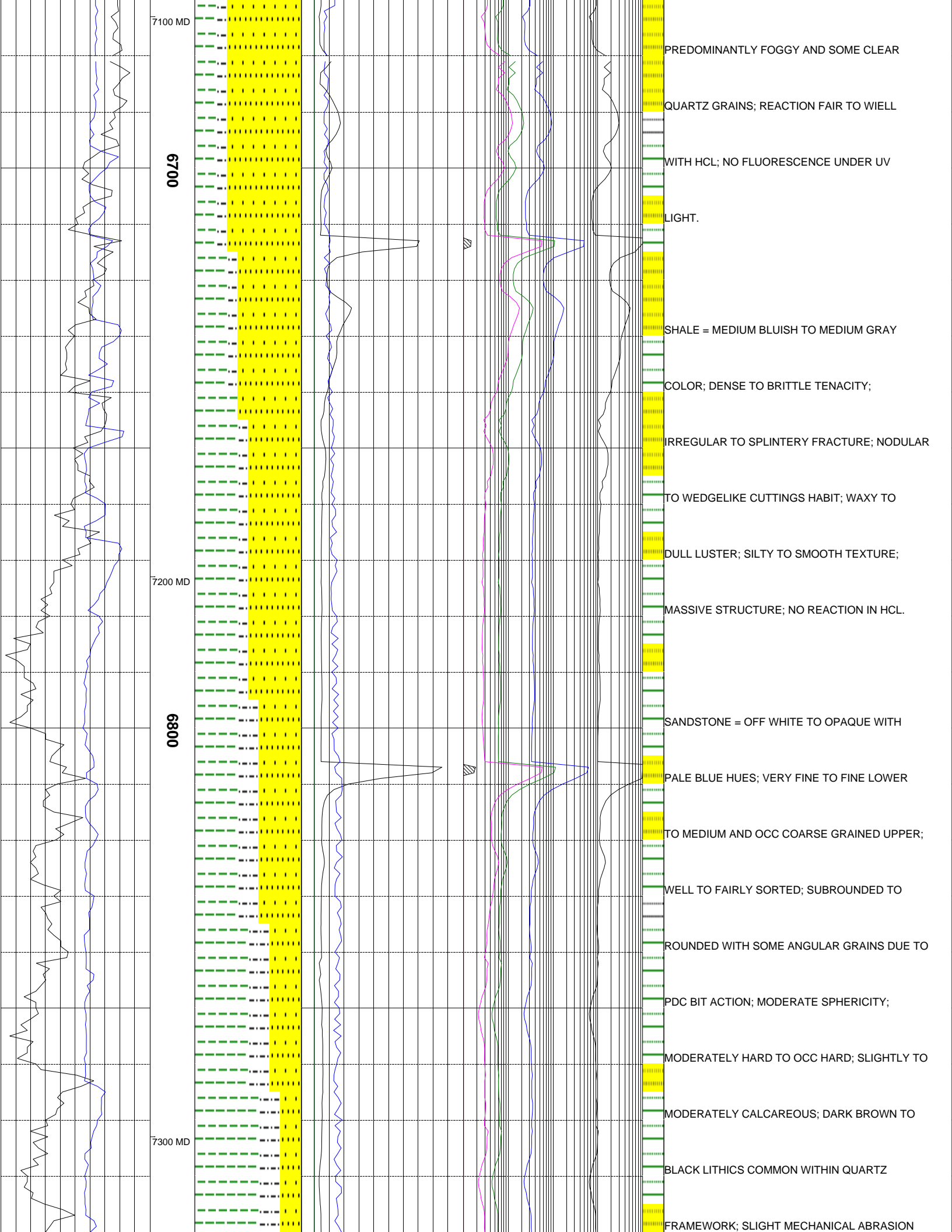


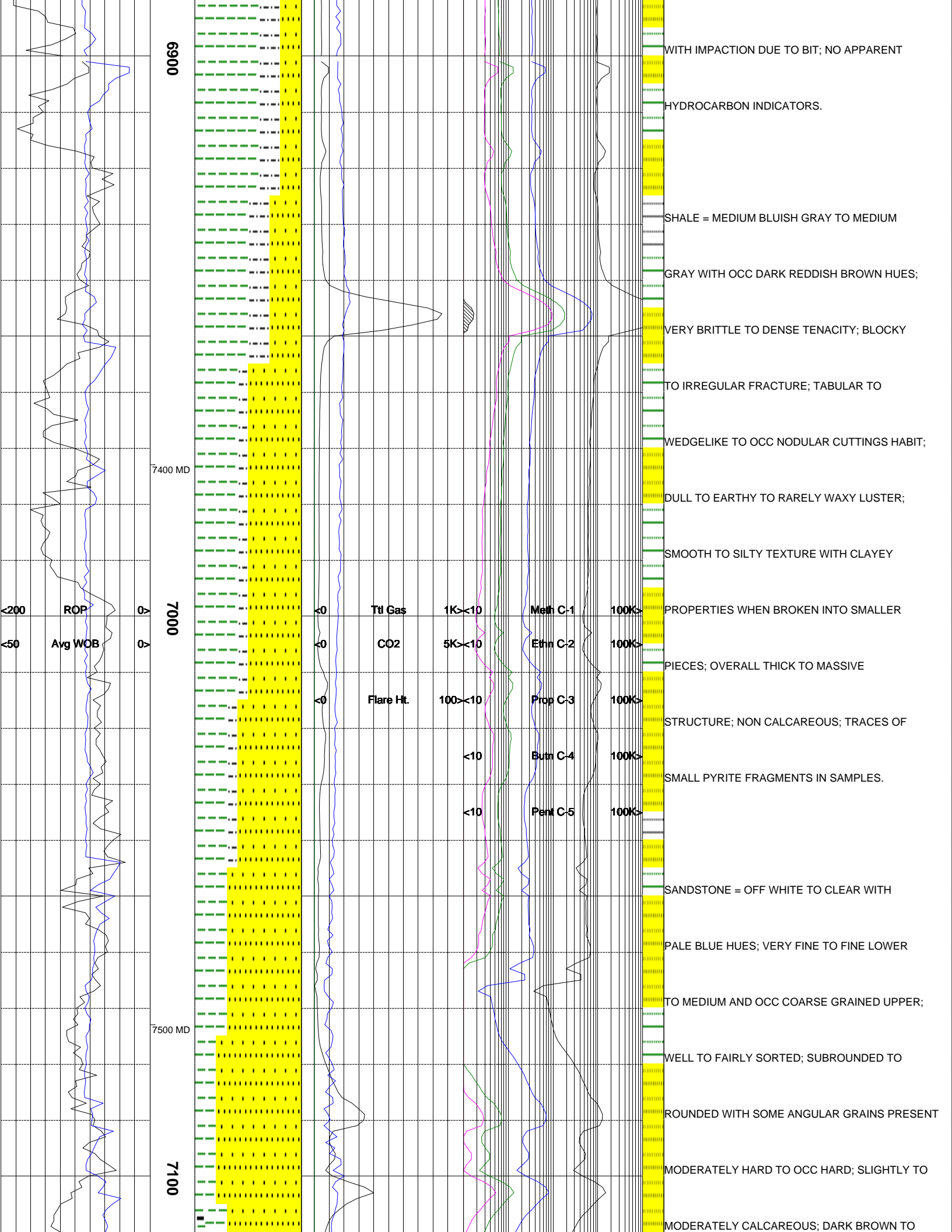


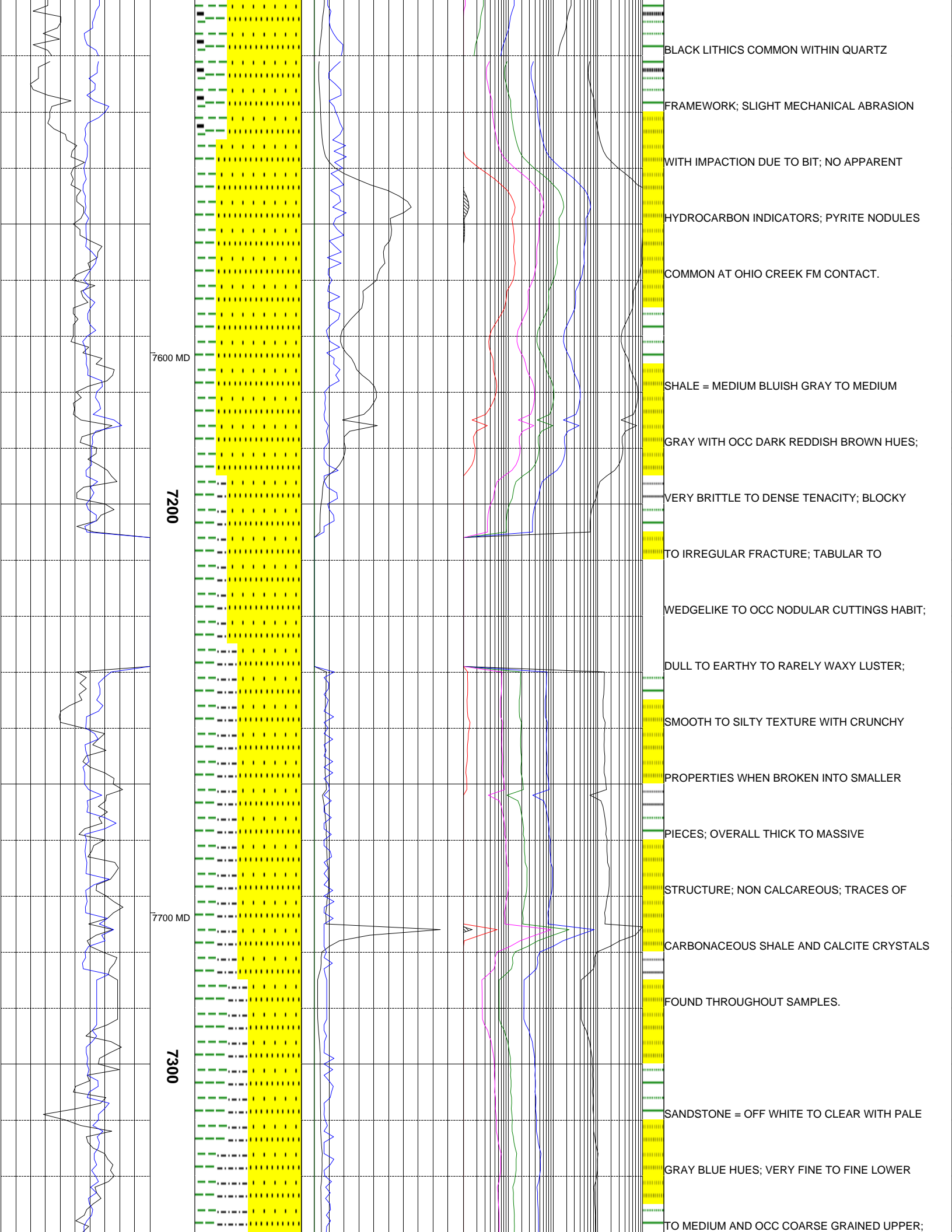


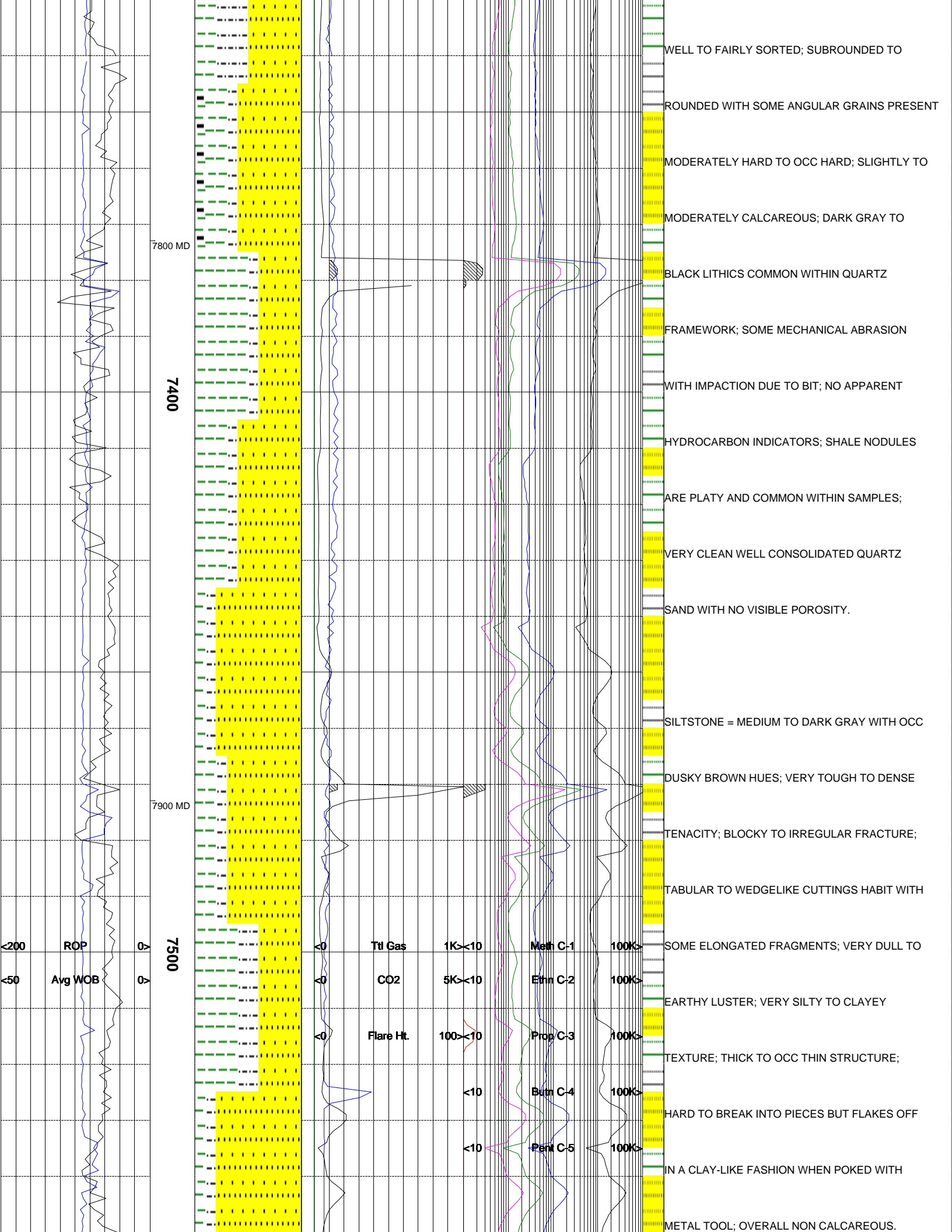












WELL TO FAIRLY SORTED; SUBROUNDED TO

ROUNDED WITH SOME ANGULAR GRAINS PRESENT

MODERATELY HARD TO OCC HARD; SLIGHTLY TO

MODERATELY CALCAREOUS; DARK GRAY TO

BLACK LITHICS COMMON WITHIN QUARTZ

FRAMEWORK; SOME MECHANICAL ABRASION

WITH IMPACTION DUE TO BIT; NO APPARENT

HYDROCARBON INDICATORS; SHALE NODULES

ARE PLATY AND COMMON WITHIN SAMPLES;

VERY CLEAN WELL CONSOLIDATED QUARTZ

SAND WITH NO VISIBLE POROSITY.

SILTSTONE = MEDIUM TO DARK GRAY WITH OCC

DUSKY BROWN HUES; VERY TOUGH TO DENSE

TENACITY; BLOCKY TO IRREGULAR FRACTURE;

TABULAR TO WEDGELIKE CUTTINGS HABIT WITH

SOME ELONGATED FRAGMENTS; VERY DULL TO

EARTHY LUSTER; VERY SILTY TO CLAYEY

TEXTURE; THICK TO OCC THIN STRUCTURE;

HARD TO BREAK INTO PIECES BUT FLAKES OFF

IN A CLAY-LIKE FASHION WHEN POKED WITH

METAL TOOL; OVERALL NON CALCAREOUS.

