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## MUDLOG TVD

<b>COMPANY</b>	ExxonMobil Production
<b>WELL</b>	PCU-297-11B8
<b>FIELD</b>	PICEANCE CREEK
<b>REGION</b>	ROCKY MT
<b>COORDINATES</b>	LAT 39.885354000 LON 108.239363000
<b>ELEVATION</b>	GL = 7127' KB = 7154'
<b>COUNTY, STATE</b>	RIO BLANCO CO. CO
<b>API INDEX</b>	051031137100
<b>SPUD DATE</b>	4/21/2009
<b>CONTRACTOR</b>	HELMERICH_PAYNE
<b>CO. REP.</b>	RICKY T. OWENS
<b>RIG/TYPE</b>	FLEX 3
<b>LOGGING UNIT</b>	MLU051
<b>GEOLOGISTS</b>	GEORGE BAKER BRENDA MARSH
<b>ADD. PERSONS</b>	DEVIN CLAAR BILL JOHANNING
<b>CO. GEOLOGIST</b>	MICHAEL HOWELL

### LOG INTERVAL

<b>DEPTHS:</b>	3,717'	<b>TO</b>	12,715'
<b>DATES:</b>	11/23/2009	<b>TO</b>	12/04/2009
<b>SCALE:</b>	1" = 100'		

### CASING DATA

16.00"	<b>AT</b>	130'
10.75"	<b>AT</b>	3,717'
7.00"	<b>AT</b>	8,622'

**AT**

### HOLE SIZE

9.875"	<b>TO</b>	8,641'
6.125"	<b>TO</b>	12,715'
	<b>TO</b>	
	<b>TO</b>	

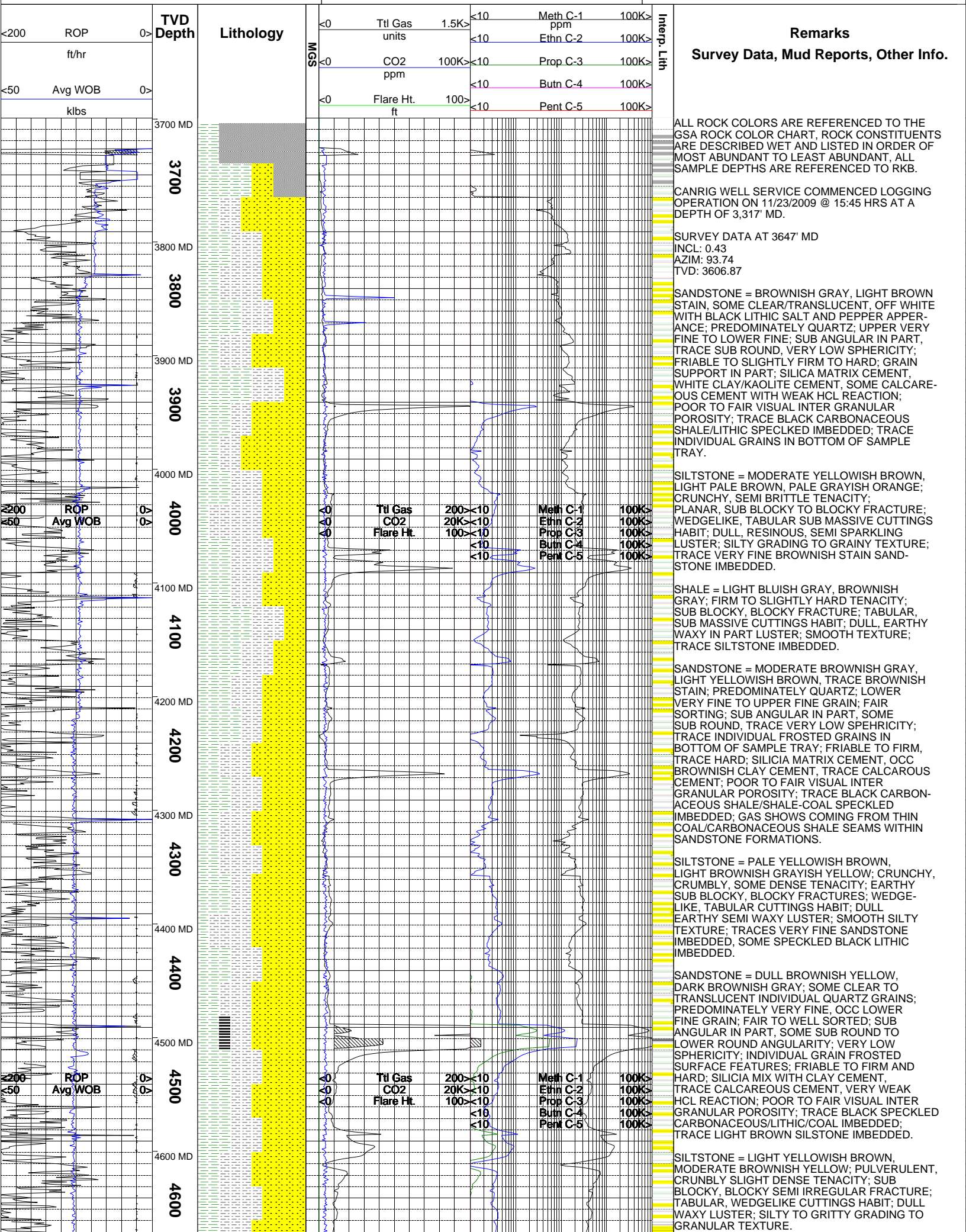
### MUD TYPES

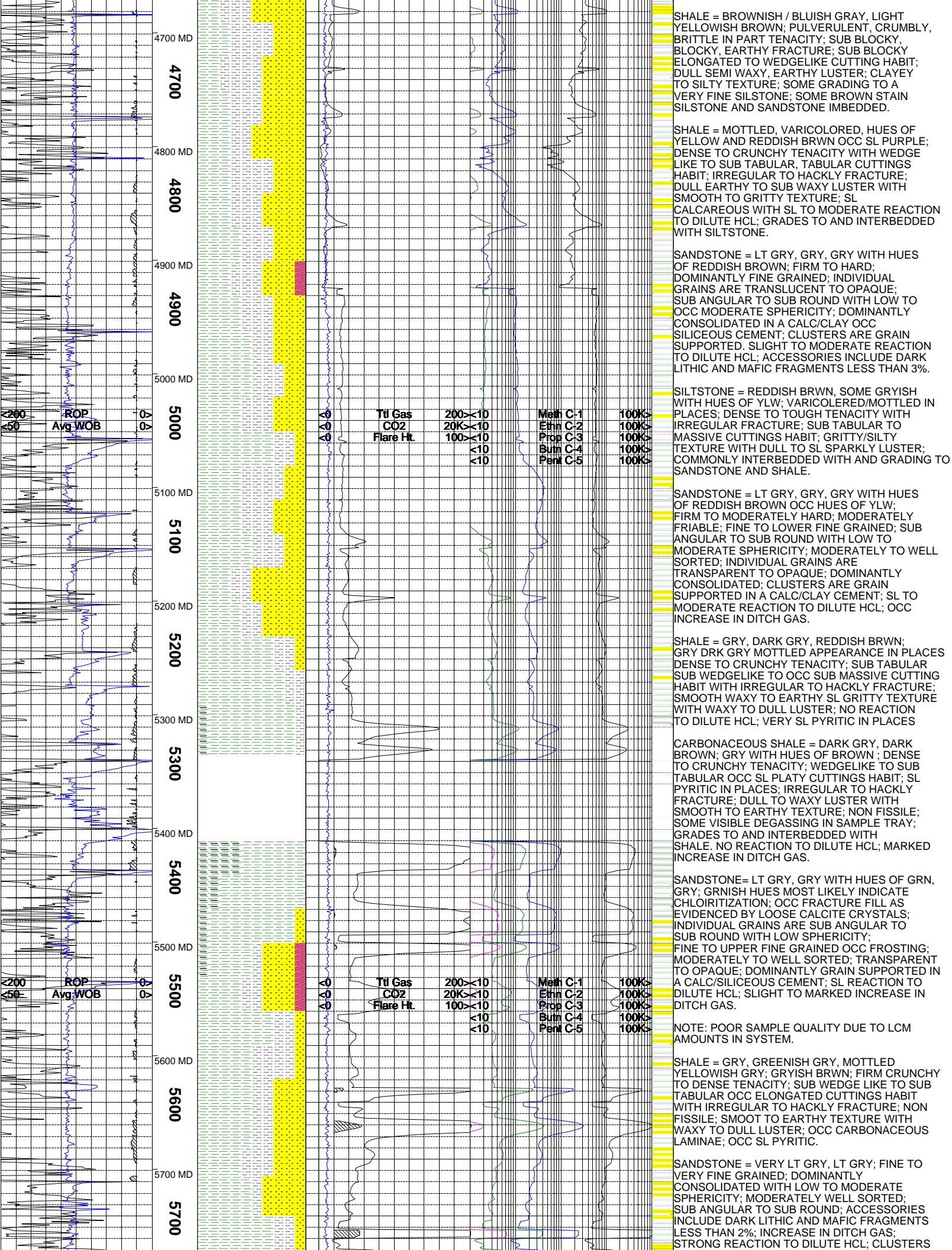
SPUD MUD	<b>TO</b>	3,717'
LSND	<b>TO</b>	12,175'
	<b>TO</b>	
	<b>TO</b>	

### ABBREVIATIONS

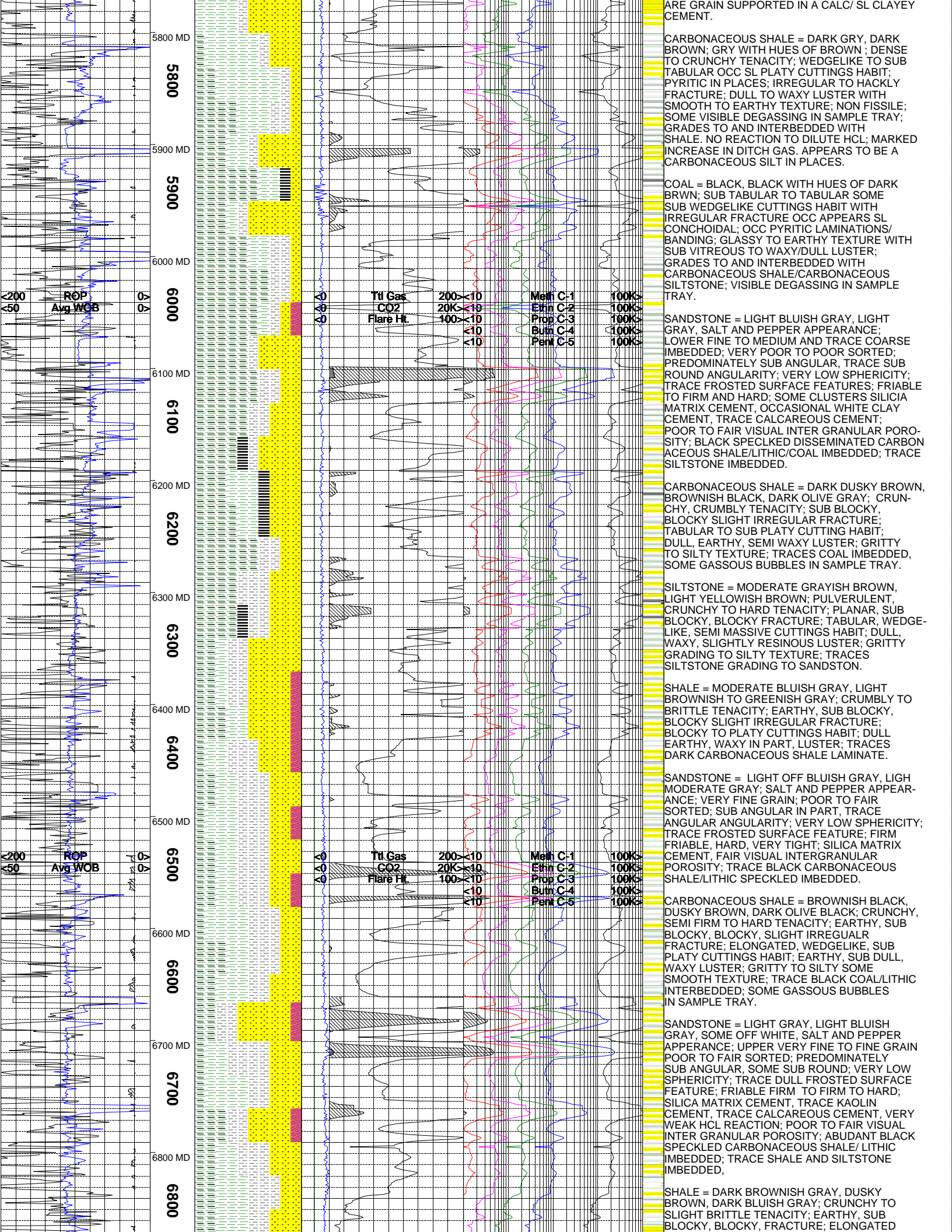
<i>NB</i> NEWBIT	<i>PV</i> PLASTIC VISCOSITY	<i>LC</i> LOST CIRCULATION
<i>RRB</i> RERUN BIT	<i>YP</i> YIELD POINT	<i>CO</i> CIRCULATE OUT
<i>CB</i> CORE BIT	<i>FL</i> FLUID LOSS	<i>NR</i> NO RETURNS
<i>WOB</i> WEIGHT ON BIT	<i>CL</i> PPM CLORIDE ION	<i>TG</i> TRIP GAS
<i>RPM</i> ROTARY REV/MIN	<i>Rm</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	

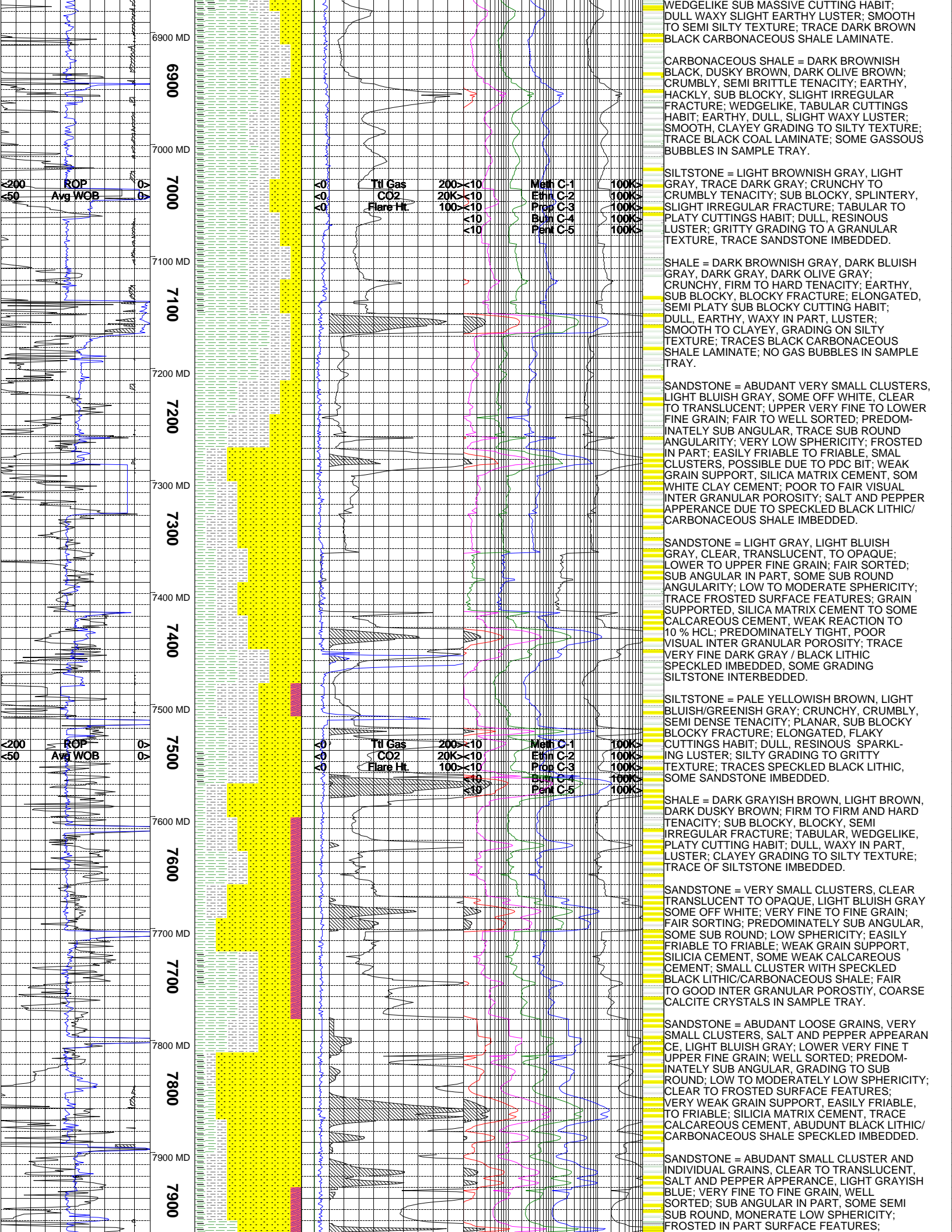
ALTERED ZONE	CHERT - GLASSY	FELSIC SILIC DIKE	MARL - CALC	SANDSTONE
ANDESITE	CHERT - PORCEL	FOSSIL	METAMORPHICS	SANDSTONE-TUFFACEOUS
ANHYDRITE	CHERT - TIGER STRIPE	GABBRO	MUDSTONE	SERICITIZATION
BASALT	CHERT - UNDIFF	GLASSY TUFF	OBSIDIAN	SERPENTINE
BENTONITE	CLAY	GRANITE	PALEOSOL	SHALE
BIOTITIZATION	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	











WEDGELIKE SUB MASSIVE CUTTING HABIT; DULL WAXY SLIGHT EARTHY LUSTER; SMOOTH TO SEMI SILTY TEXTURE; TRACE DARK BROWN BLACK CARBONACEOUS SHALE LAMINATE.

CARBONACEOUS SHALE = DARK BROWNISH BLACK, DUSKY BROWN, DARK OLIVE BROWN; CRUMBLY, SEMI BRITTLE TENACITY; EARTHY, HACKLY, SUB BLOCKY, SLIGHT IRREGULAR FRACTURE; WEDGELIKE, TABULAR CUTTINGS HABIT; EARTHY, DULL, SLIGHT WAXY LUSTER; SMOOTH TO CLAYEY GRADING TO SILTY TEXTURE; TRACE BLACK COAL LAMINATE; SOME GASSOUS BUBBLES IN SAMPLE TRAY.

SILTSTONE = LIGHT BROWNISH GRAY, LIGHT GRAY, TRACE DARK GRAY; CRUNCHY TO CRUMBLY TENACITY; SUB BLOCKY, SPLINTERY, SLIGHT IRREGULAR FRACTURE, TABULAR TO PLATY CUTTINGS HABIT; DULL, RESINOUS LUSTER; GRITTY GRADING TO A GRANULAR TEXTURE, TRACE SANDSTONE IMBEDDED.

SHALE = DARK BROWNISH GRAY, DARK BLUISH GRAY, TRACE DARK GRAY; CRUNCHY TO CRUMBLY, FIRM TO HARD TENACITY; EARTHY, SUB BLOCKY, BLOCKY FRACTURE; ELONGATED, SEMI PLATY SUB BLOCKY CUTTING HABIT; DULL, EARTHY, WAXY IN PART, LUSTER; SMOOTH TO CLAYEY, GRADING ON SILTY TEXTURE; TRACES BLACK CARBONACEOUS SHALE LAMINATE; NO GAS BUBBLES IN SAMPLE TRAY.

SANDSTONE = ABUNDANT VERY SMALL CLUSTERS, LIGHT BLUISH GRAY, SOME OFF WHITE, CLEAR TO TRANSLUCENT; UPPER VERY FINE TO LOWER FINE GRAIN; FAIR TO WELL SORTED; PREDOMINATELY SUB ANGULAR, TRACE SUB ROUND ANGULARITY; VERY LOW SPHERICITY; FROSTED IN PART; EASILY FRIABLE TO FRIABLE, SMALL CLUSTERS, POSSIBLE DUE TO PDC BIT; WEAK GRAIN SUPPORT, SILICA MATRIX CEMENT, SOM WHITE CLAY CEMENT; POOR TO FAIR VISUAL INTER GRANULAR POROSITY; SALT AND PEPPER APPERANCE DUE TO SPECKLED BLACK LITHIC/ CARBONACEOUS SHALE IMBEDDED.

SANDSTONE = LIGHT GRAY, LIGHT BLUISH GRAY, CLEAR, TRANSLUCENT, TO OPAQUE; LOWER TO UPPER FINE GRAIN; FAIR SORTED; SUB ANGULAR IN PART, SOME SUB ROUND ANGULARITY; LOW TO MODERATE SPHERICITY; TRACE FROSTED SURFACE FEATURES; GRAIN SUPPORTED, SILICA MATRIX CEMENT TO SOME CALCAREOUS CEMENT, WEAK REACTION TO 10 % HCL; PREDOMINATELY TIGHT, POOR VISUAL INTER GRANULAR POROSITY; TRACE VERY FINE DARK GRAY / BLACK LITHIC SPECKLED IMBEDDED, SOME GRADING SILTSTONE INTERBEDDED.

SILTSTONE = PALE YELLOWISH BROWN, LIGHT BLUISH/GREENISH GRAY; CRUNCHY, CRUMBLY, SEMI DENSE TENACITY; PLANAR, SUB BLOCKY BLOCKY FRACTURE; ELONGATED, FLAKY CUTTINGS HABIT; DULL, RESINOUS SPARKLING LUSTER; SILTY GRADING TO GRITTY TEXTURE; TRACES SPECKLED BLACK LITHIC, SOME SANDSTONE IMBEDDED.

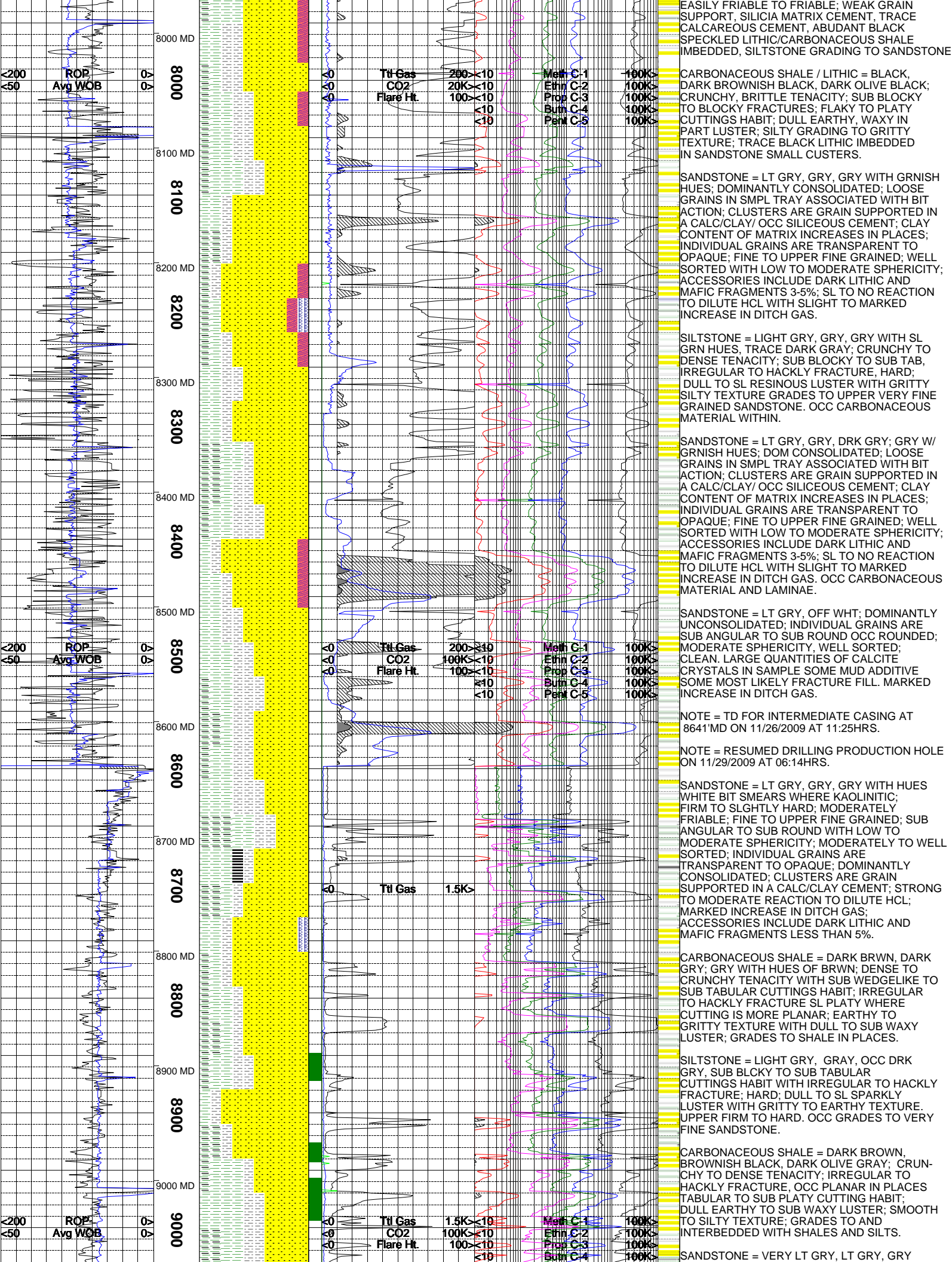
SHALE = DARK GRAYISH BROWN, LIGHT BROWN, DARK DUSKY BROWN; FIRM TO FIRM AND HARD TENACITY; SUB BLOCKY, BLOCKY, SEMI IRREGULAR FRACTURE; TABULAR, WEDGELIKE, PLATY CUTTING HABIT; DULL, WAXY IN PART, LUSTER; CLAYEY GRADING TO SILTY TEXTURE; TRACE OF SILTSTONE IMBEDDED.

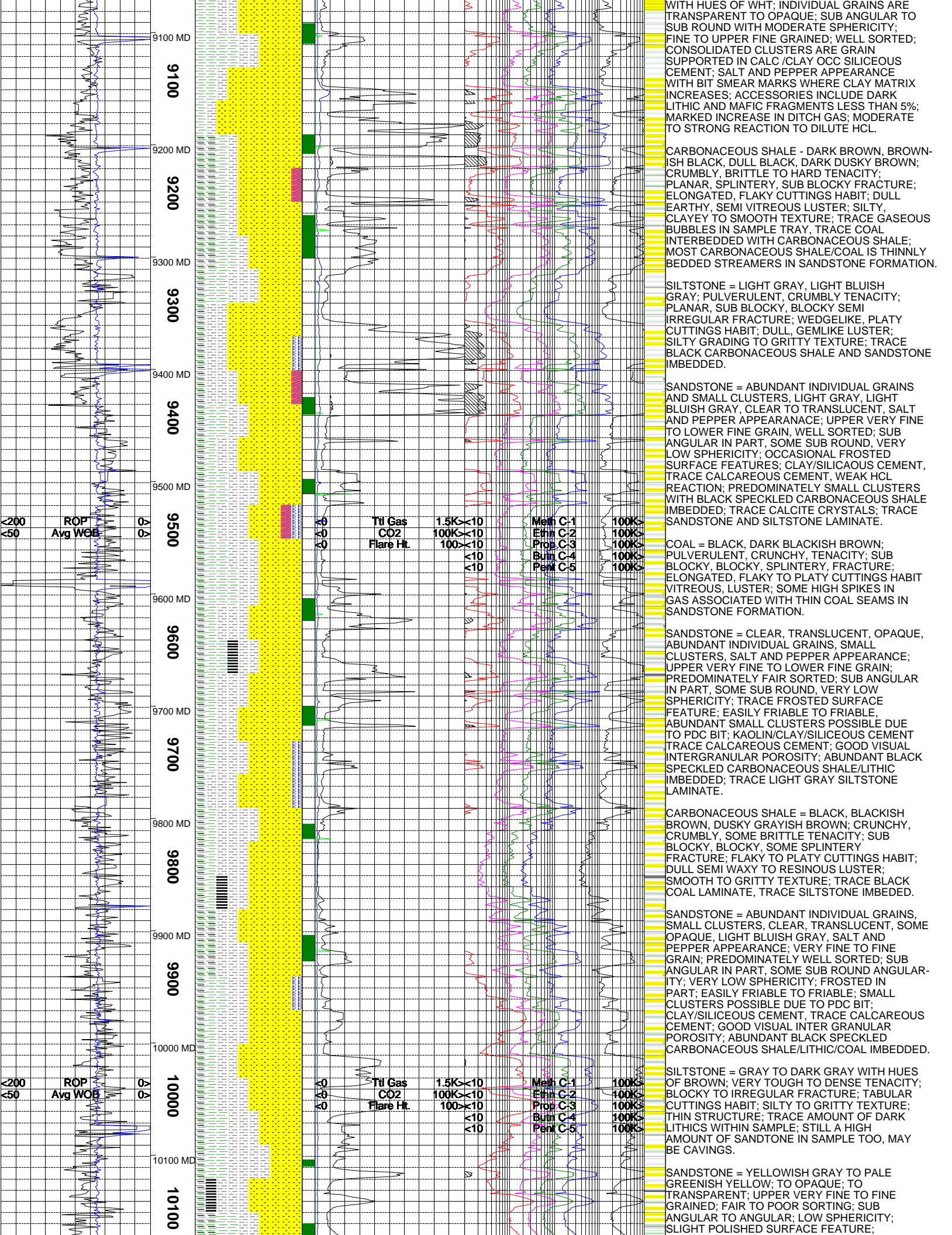
SANDSTONE = VERY SMALL CLUSTERS, CLEAR TRANSLUCENT TO OPAQUE, LIGHT BLUISH GRAY SOME OFF WHITE; VERY FINE TO FINE GRAIN; FAIR SORTING; PREDOMINATELY SUB ANGULAR, SOME SUB ROUND; LOW SPHERICITY; EASILY FRIABLE TO FRIABLE; WEAK GRAIN SUPPORT, SILICA CEMENT, SOME WEAK CALCAREOUS CEMENT; SMALL CLUSTER WITH SPECKLED BLACK LITHIC/CARBONACEOUS SHALE; FAIR TO GOOD INTER GRANULAR POROSTIY, COARSE CALCITE CRYSTALS IN SAMPLE TRAY.

SANDSTONE = ABUNDANT LOOSE GRAINS, VERY SMALL CLUSTERS, SALT AND PEPPER APPERANCE, LIGHT BLUISH GRAY; LOWER VERY FINE T UPPER FINE GRAIN; WELL SORTED; PREDOMINATELY SUB ANGULAR, GRADING TO SUB ROUND; LOW TO MODERATELY LOW SPHERICITY; CLEAR TO FROSTED SURFACE FEATURES; VERY WEAK GRAIN SUPPORT, EASILY FRIABLE, TO FRIABLE; SILICA MATRIX CEMENT, TRACE CALCAREOUS CEMENT, ABUDUNT BLACK LITHIC/ CARBONACEOUS SHALE SPECKLED IMBEDDED.

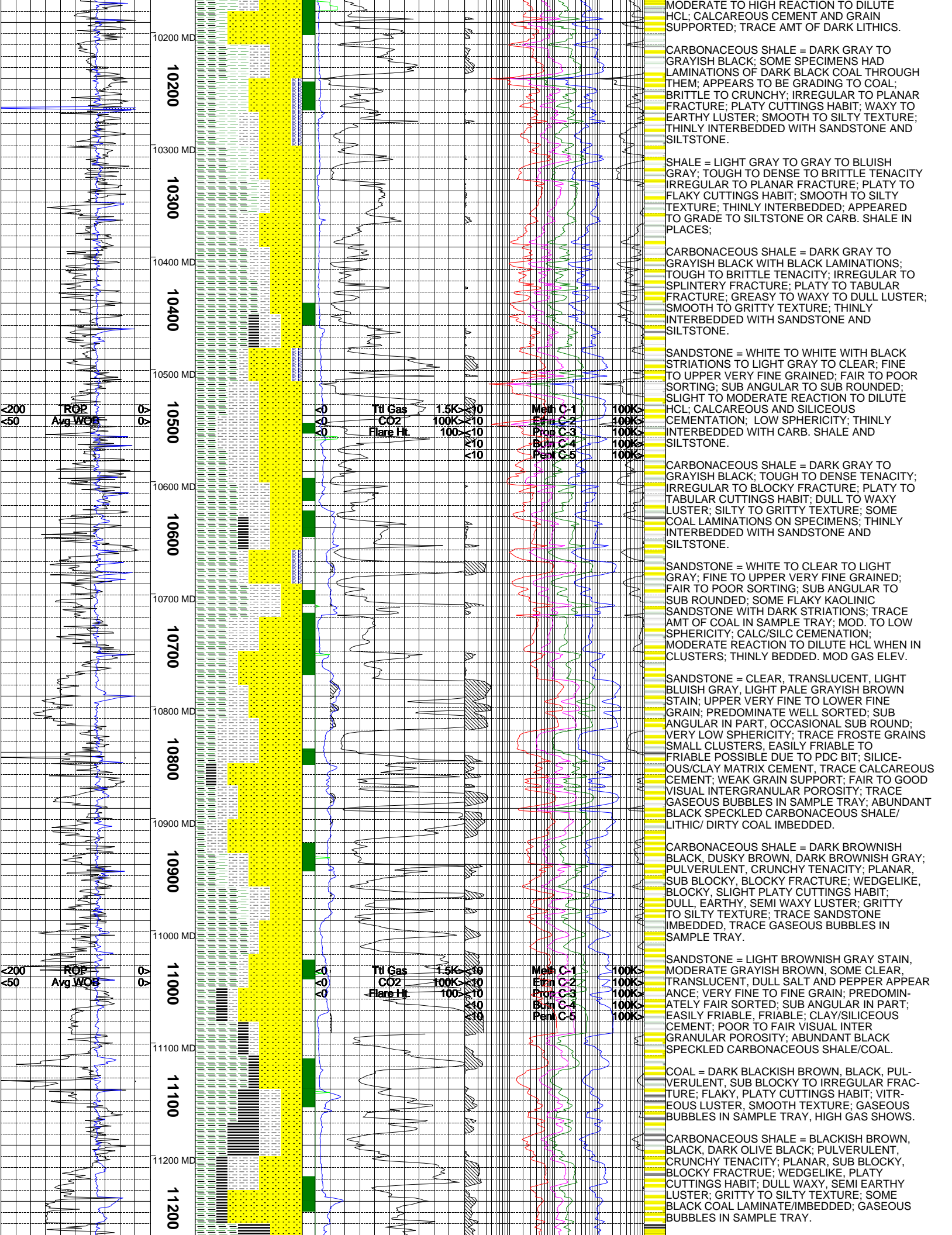
SANDSTONE = ABUNDANT SMALL CLUSTER AND INDIVIDUAL GRAINS, CLEAR TO TRANSLUCENT, SALT AND PEPPER APPERANCE, LIGHT GRAYISH BLUE; VERY FINE TO FINE GRAIN, WELL SORTED; SUB ANGULAR IN PART, SOME SEMI SUB ROUND, MONERATE LOW SPHERICITY; FROSTED IN PART SURFACE FEATURES;



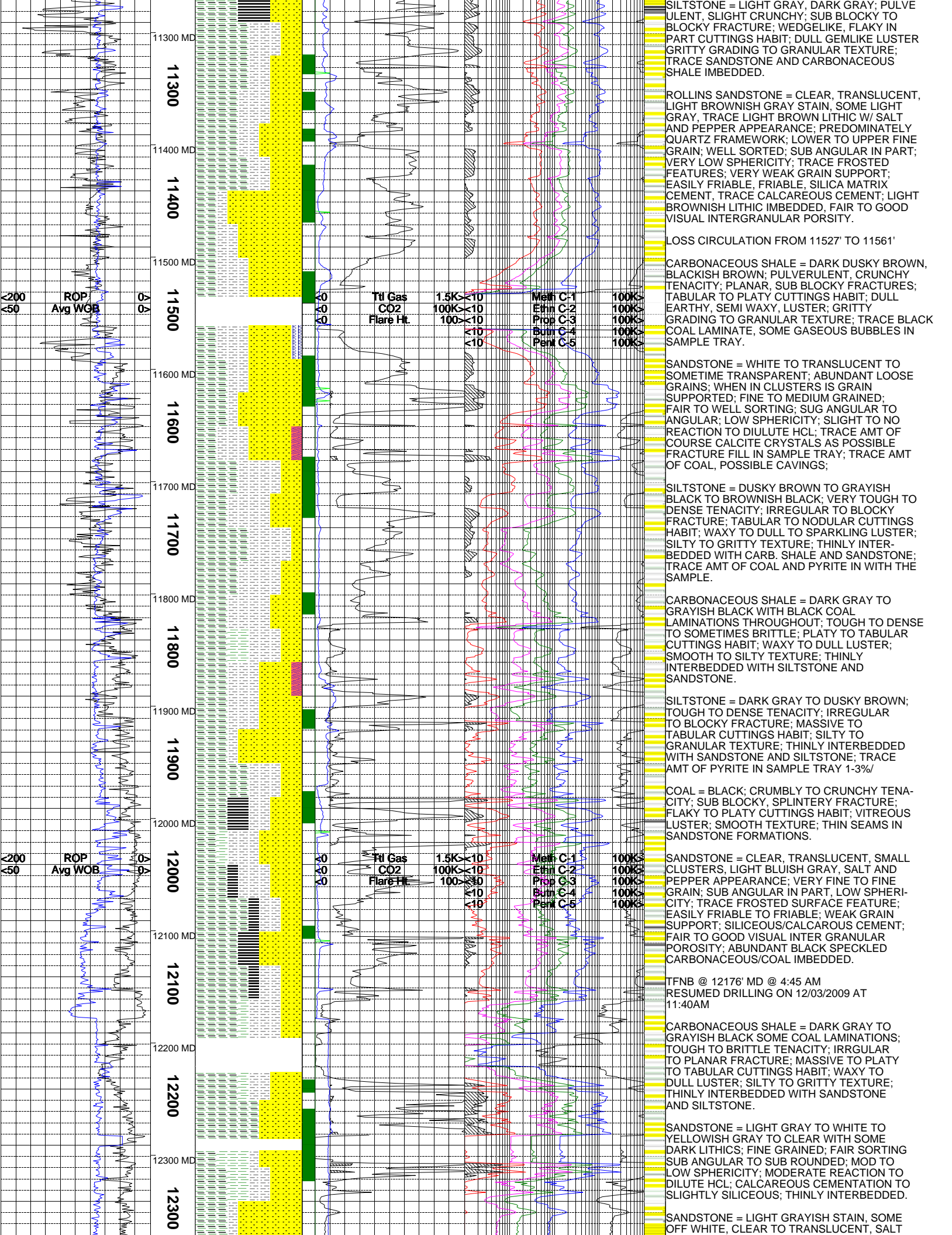


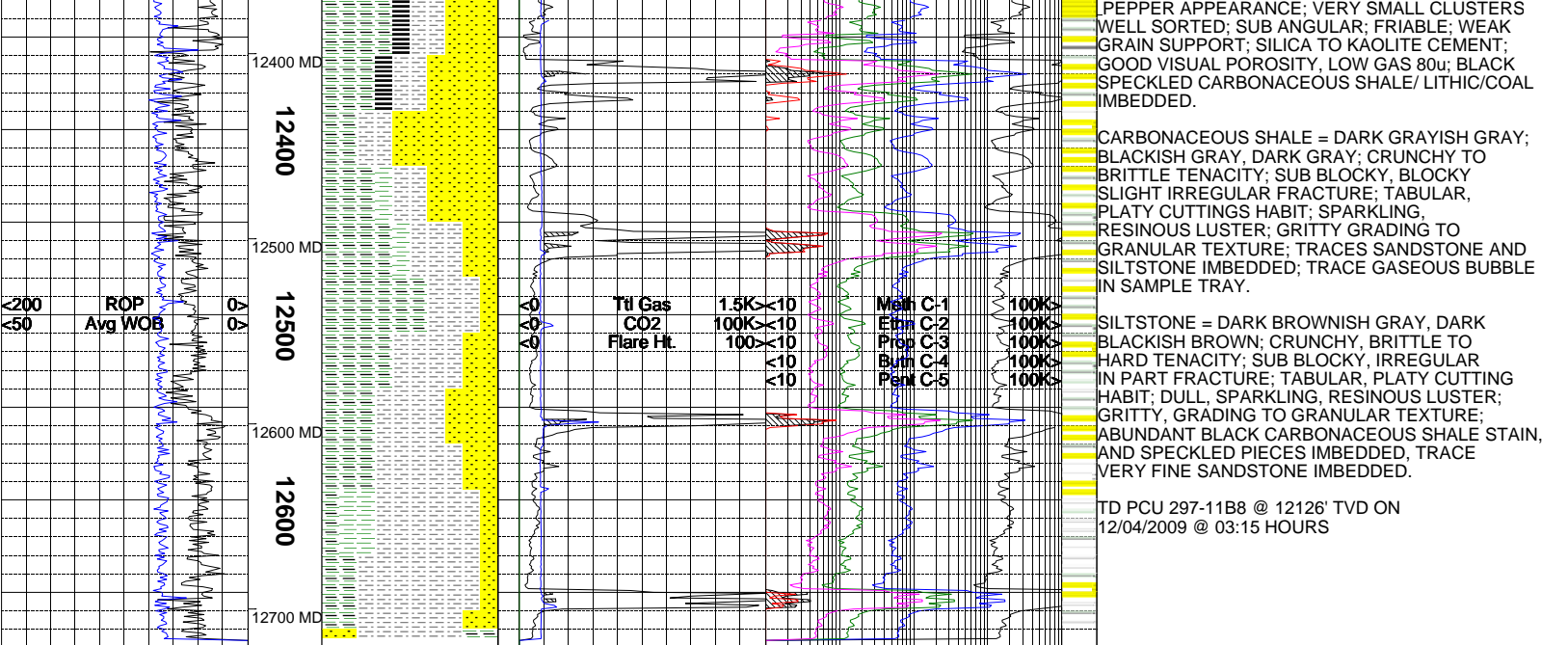












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