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

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MUDLOG TVD

COMPANY	ExxonMobil Production
WELL	PCU296-6A8
FIELD	PICEANCE
REGION	ROCKIES
COORDINATES	39.900102
	108.212136
ELEVATION	7363.9
COUNTY, STATE	RIO BLANCO, CO
API INDEX	05-103-11479-00
SPUD DATE	04/05/2010
CONTRACTOR	HP
CO. REP.	KEVIN GARDNER
RIG/TYPE	239 / FLEX 3
LOGGING UNIT	33
GEOLOGISTS	NICK BAUER
	JASON REISENBICHLER
ADD. PERSONS	LAYNE GOOD
	JASON REYNOLDS
CO. GEOLOGIST	MELISSA SAURBORN

LOG INTERVAL

DEPTHS:	148'	**TO**	9717'
DATES:	04/05/2010	**TO**	04/19/2010
SCALE:		1"=100'	

MUD TYPES

SPUD MUD	**TO**	4454'
LSND	**TO**	9717'
	TO	
	TO	

CASING DATA

16"	**AT**	147'
10.75"	**AT**	4438'
	AT	
	AT	

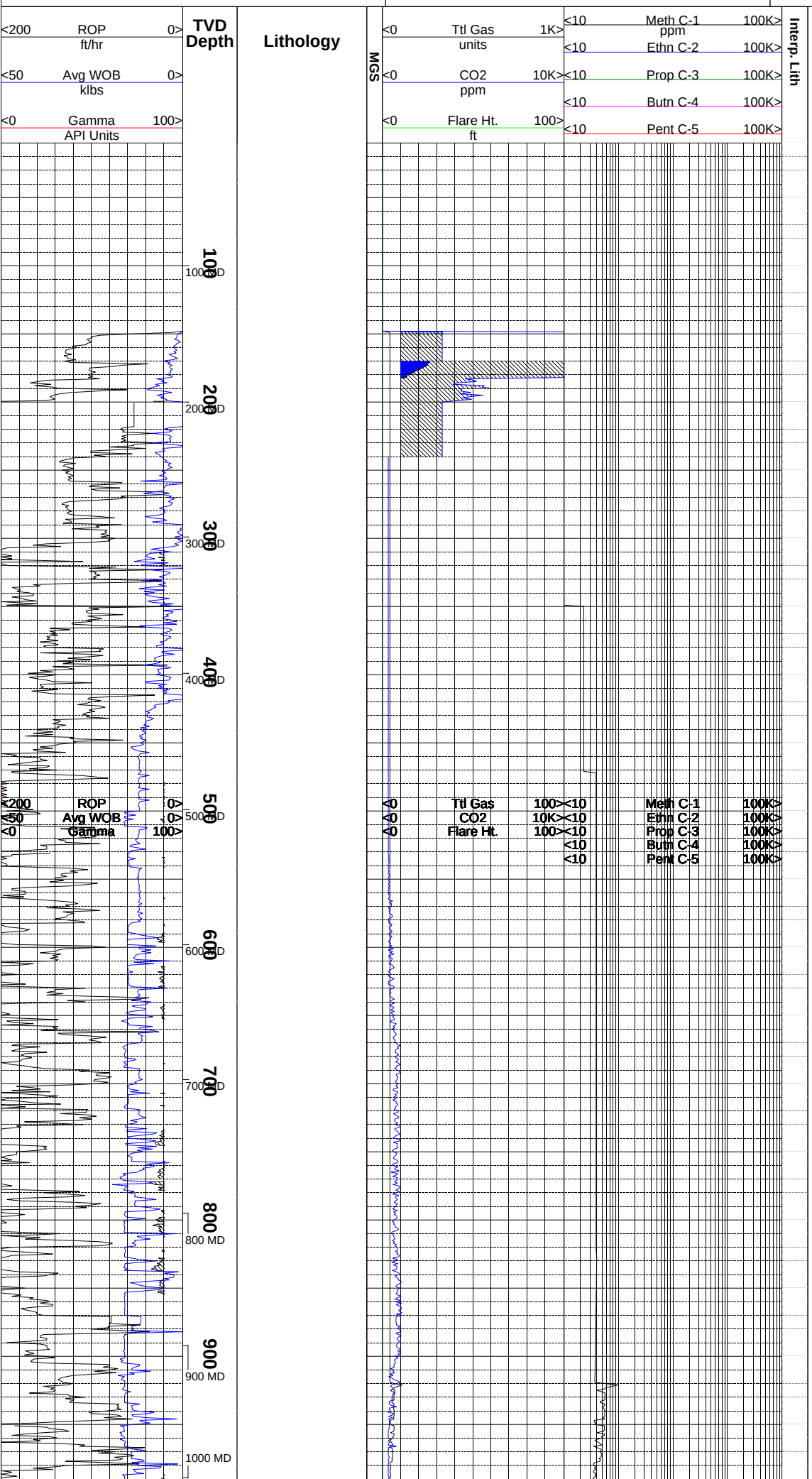
HOLE SIZE

14.75"	**TO**	4454'
9.875"	**TO**	9717'
	TO	
	TO	

ABBREVIATIONS

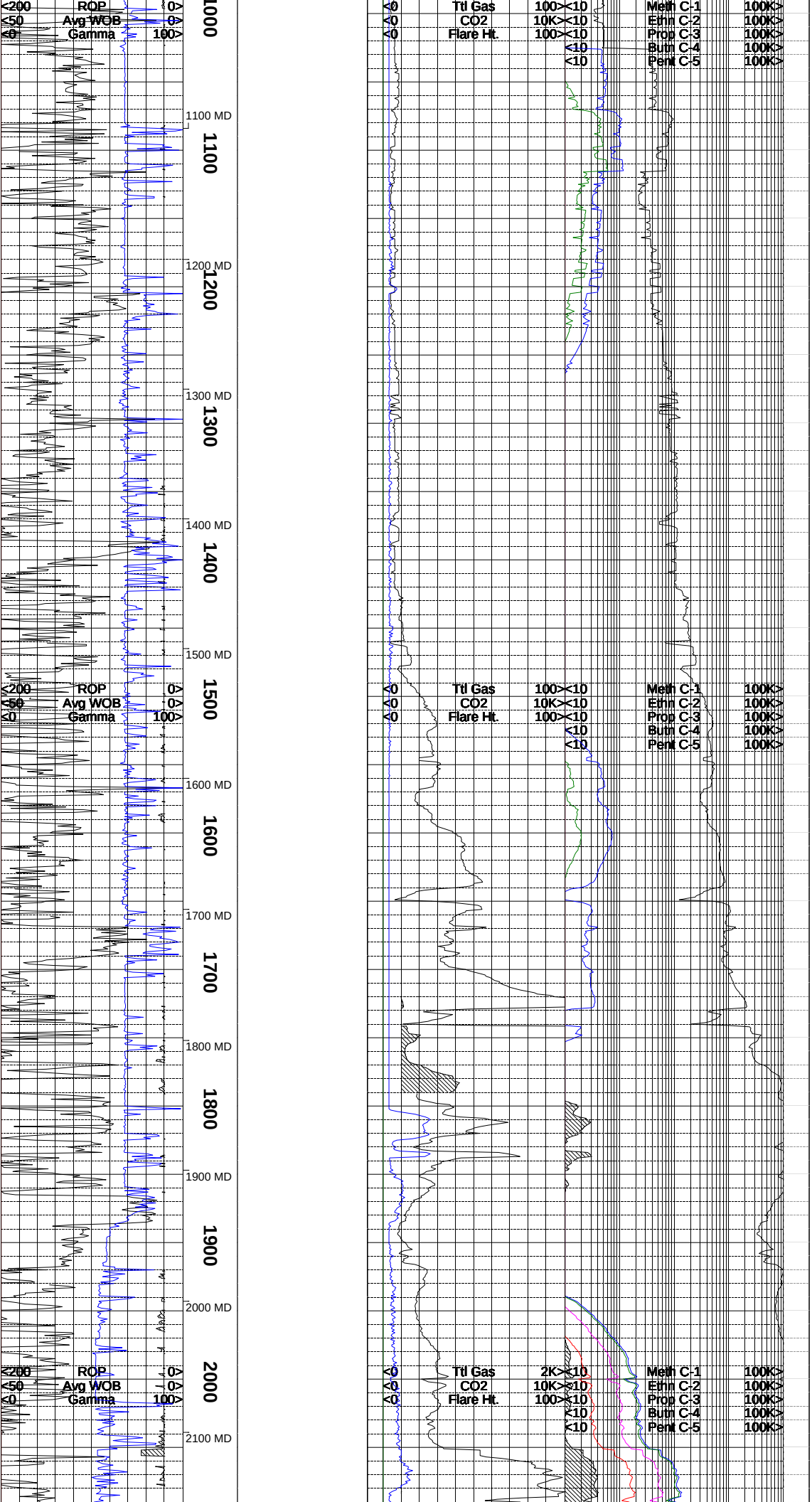
NB	NEWBIT	*PV*	PLASTIC VISCOSITY	*LC*	LOST CIRCULATION
RRB	RERUN BIT	*YP*	YIELD POINT	*CO*	CIRCULATE OUT
CB	CORE BIT	*FL*	FLUID LOSS	*NR*	NO RETURNS
WOB	WEIGHT ON BIT	*CL*	PPM CLORIDE ION	*TG*	TRIP GAS
RPM	ROTARY REV/MIN	*Rm*	MUD RESISTIVITY	*SG*	SURVEY GAS
PP	PUMP PRESSURE	*Rmf*	FILTRATE RESISTIVITY	*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.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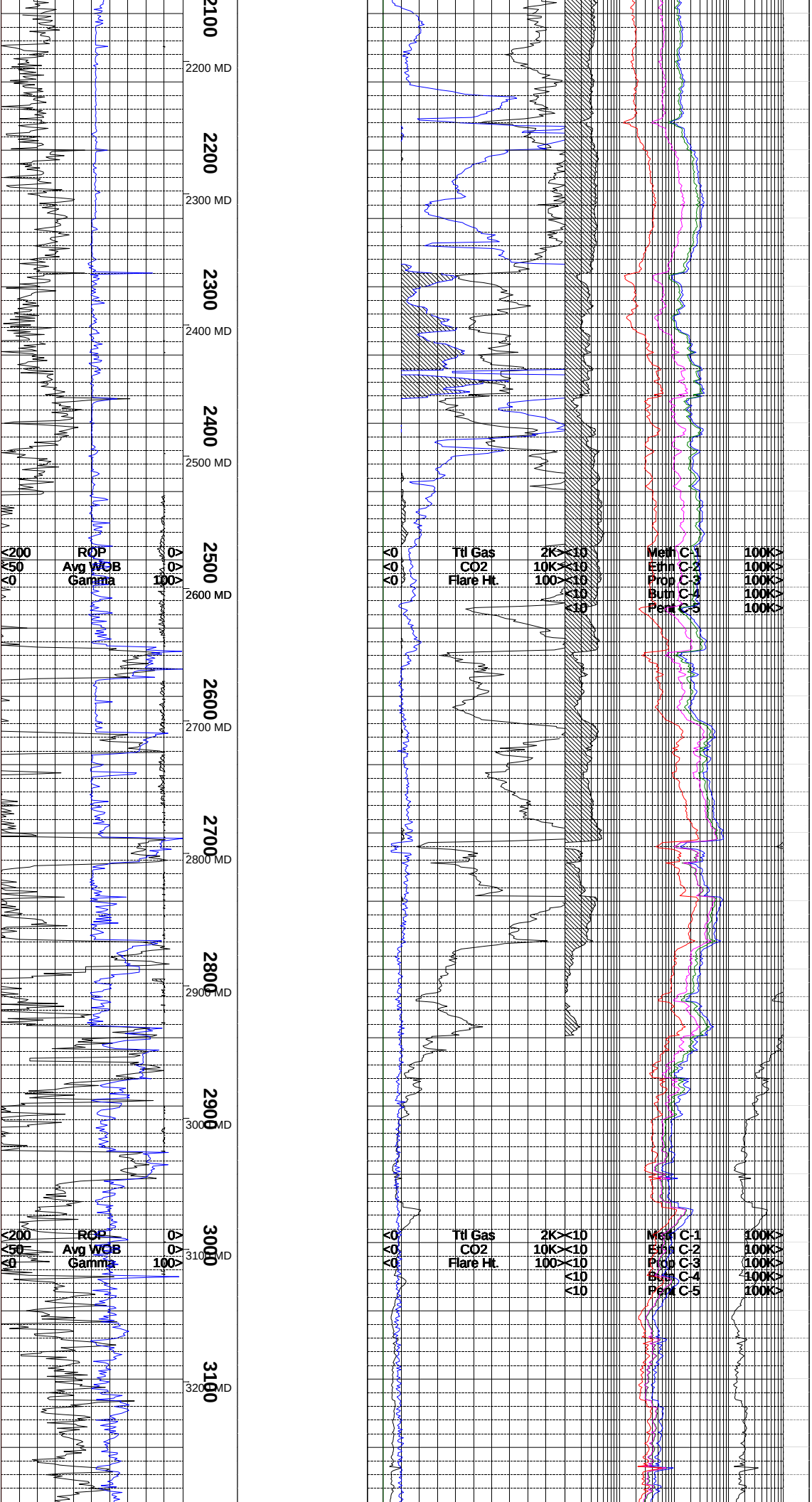
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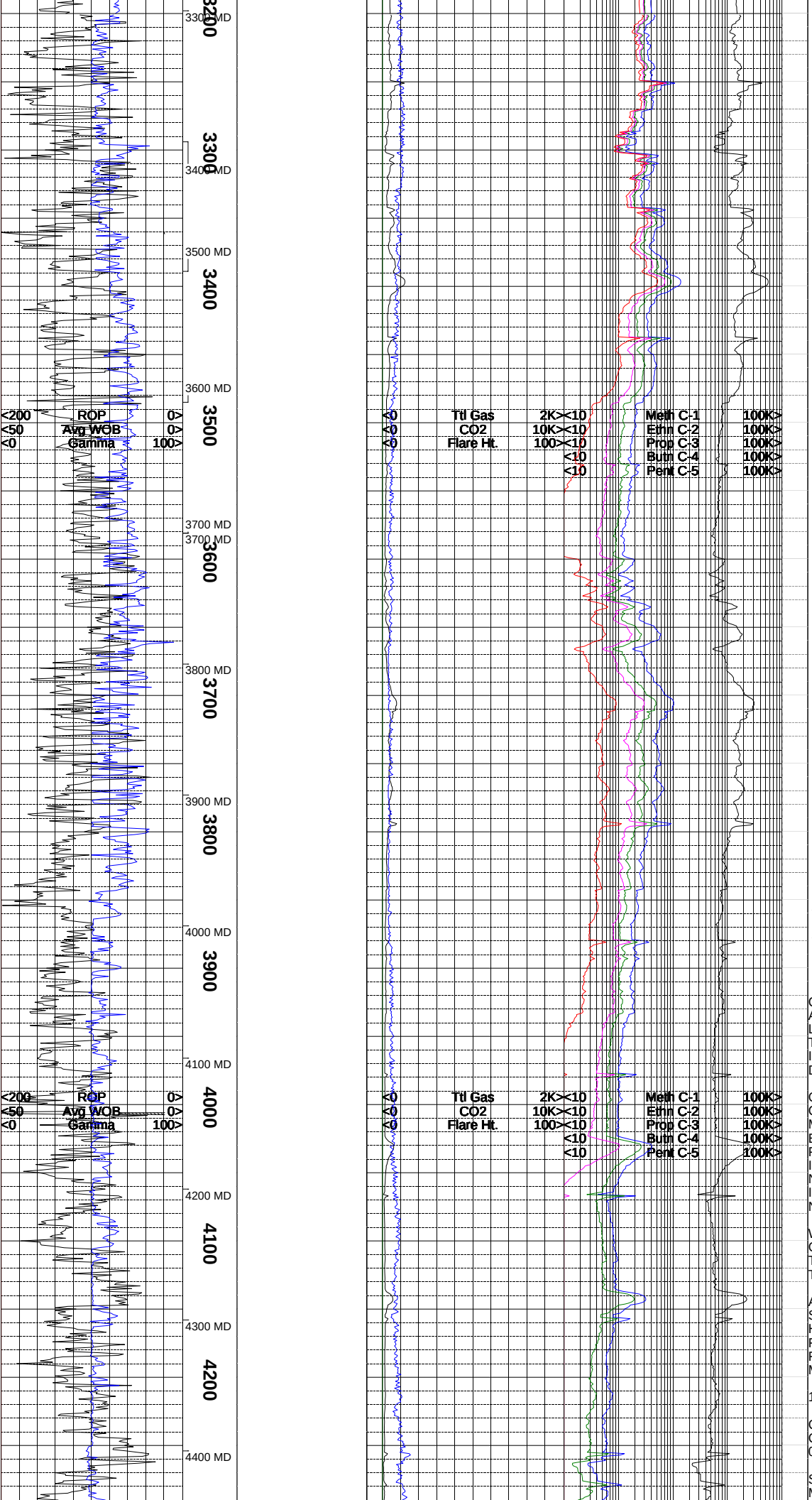


ALL ROCK COLORS ARE REFERENCED TO THE GSA ROCK COLOR CHART. ROCK CONSTITUENTS ARE DESCRIBED WET AND LISTED IN ORDER OF MOST ABUNDANT TO LEAST ABUNDANT WITH RESPECT TO PERCENTAGE IN SAMPLE. DEPTH IS REFERENCED TO RKB.

CONNECTION GASES AS WELL AS TRIP GASES AND DOWNTIME GASES ARE NOTED ON THE LOG LARGE CONNECTION GASES WHICH APPEAR ON THE MUDLOG USUALLY REFLECT UPHOLE GAS INTERVALS BLEEDING INTO THE BORE HOLE DURING CONNECTIONS.

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

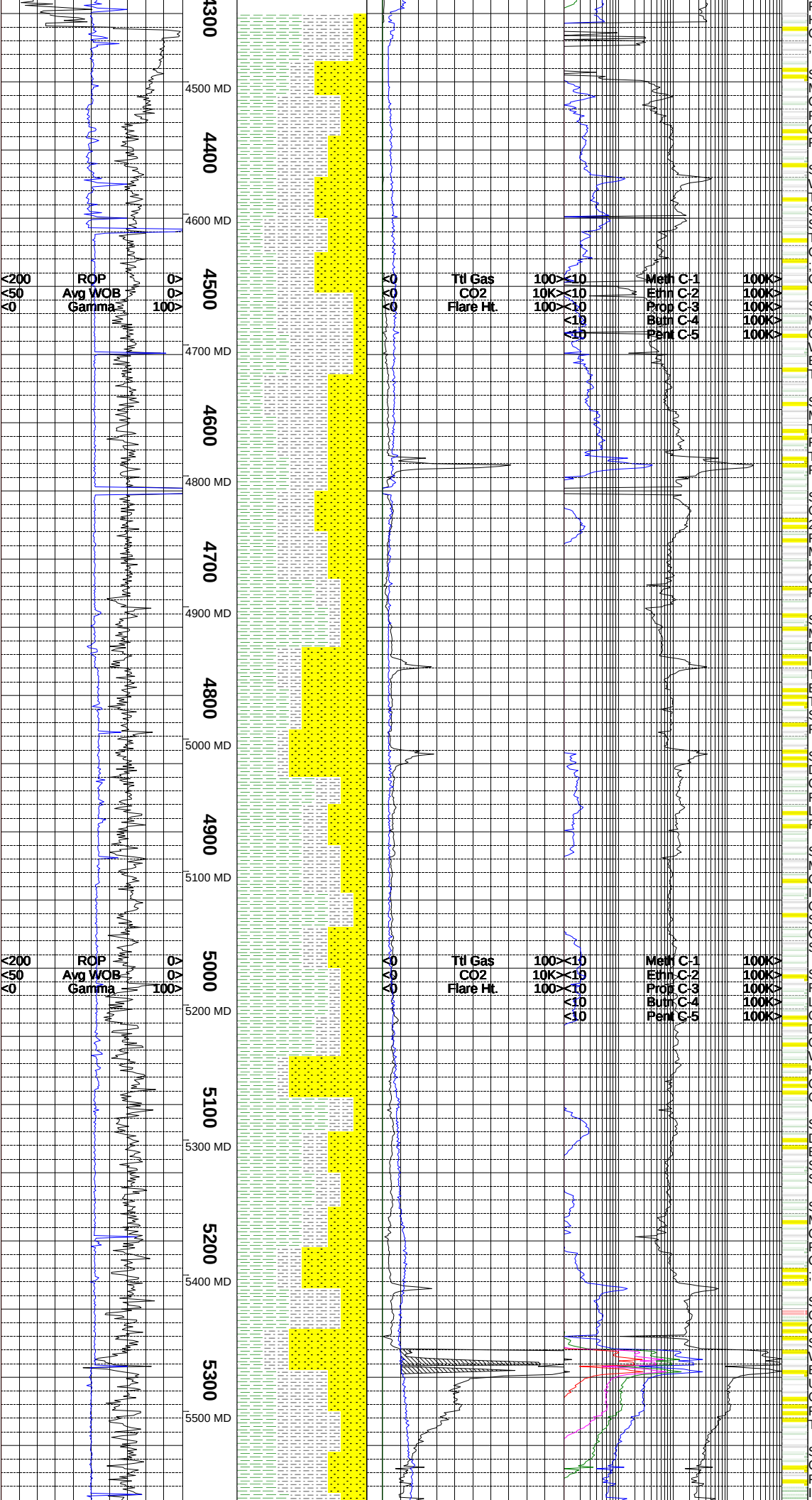
WHEN THE MUD IS RUN THROUGH THE MGS (MUD GAS SEPERATOR) THE INTERVAL IS MARKED ON THE LOG IN THE SLIDE COLUMN AND NOTED ON THE LOG.

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 4438'.

CANRIG DRILLING TECHNOLOGY LTD. COMMENCED FULL LOGGING SERVICES ON 04/13/2010.

SILTSTONE = TAN TO BROWN IN COLOR WITH MODERATE TO LOW SPHERIICYT; CRUNCHY TO



PULVERANT TENACITY WITH IRREGULAR TO HACKLY FRACTURES; ELONGATED TO TABULAR CTGS HABIT WITH A DULL TO EARTHY LUSTER ; SMOOTH TO SILTY TEXTURE.

SHALE = GRAY TO TAN IN COLOR WITH MODERATE TO LOW SPHERICITY; CRUMBLY TO CRUNCHY TENACITY WITH IRREGULAR TO PLANAR FRACTURES; WEDGELIKE TO ELONGATED CTGS HABIT WITH A DULL TO SLIGHTLY FROSTED LUSTER; SMOOTH TO SILTY TEXTURE.

SANDSTONE = MEDIUM TO FINE GRAIN SIZE WITH A TAN TO LIGHT GRAY IN COLOR; FAIR TO POOR SORTING WITH SUBROUND TO SUBANGULAR ANGULARITY; MODERATE TO LOW SPHERICITY WITH BRITTLE TO CRUNCHY TENACITY; WEDGELIKE TO ELONGATED CTGS HABIT WITH A DULL TO FROSTED LUSTER ; GRITTY TO GRANULAR TEXTURE WITH A CALCITIC FRAMEWORK.

SILTSTONE = TAN IN COLOR WITH LOW TO MODERATE SPHERICITY; CRUNCHY TO CRUMBLY TENACITY WITH ELONGATED TO WEDGELIKE CTGS HABIT WITH A DULL TO EARTHY LUSTER; SMOOTH TO SILTY TEXTURE.

SHALE = MEDIUM YELLOWISH BROWN TO MEDIUM GRAY COLOR; CRUMBLY TO CRUNCHY TEXTURE; IRREGULAR TO HACKLY TO BLOCKY FRACTRUE; EARTHY TO DULL LUSTER; CLAYEY TO SILTY TEXTURE; SLIGHT TO FAIR REACTION WITH 10% HCL.

SANDSTONE = MEDIUM LIGHT GRAY TO LIGHT GRAY COLOR; QUARTZ GRAINS WITH LESS THAN 2% DARK LITHIC FRAGMENT; VERY FINE TO FINE GRAIN SIZE; SUBROUNDED GRAINS WITH MODERATE TO HIGH SPHERICITY; FIRM HARDNESS; GRAIN SUPPORTED WITH CACITE CEMENTATION; FAIR REACTION WITH HCL; NO FLUORESCENCE UNDER UV LIGHT.

SHALE = MODERATE YELLOWISH BROWN TO MEDIUM GRAY TO BROWNISH GRAY COLOR; DENSE TO CRUNCHY TO CRUMBLY TENACITY; IRREGULAR TO HACKLY FRACTURE; WEDGELIKE TO BLADED TO NODULAR CUTTINGS HABIT; EARTHY TO DULL LUSTER; CLAYEY TO SILTY TO SMOOTH TEXTURE; TRACE OF LAMINAE ON SURFACE OF CUTTINGS; SLIGHT TO FAIR REACTION WITH HCL.

SILTSTONE = PALE YELLOWISH BROWN TO DARK YELLOWISH ORANGE COLOR; DENSE TO CRUNCHY TENACITY; IRREGULAR TO BLOCKY FRACTURE; NODULAR CUTTINGS HABIT; EARTHY LUSTER; MASSIVE STRUCTURE; SLIGHT REACTION TO 10% HCL.

SHALE = MODERATE YELLOWISH BROWN TO MEDIUM BLUISH GRAY TO MEDIUM GRAY COLOR; CRUNCHY TO DENSE TENACITY; HACKLY TO IRREGULAR FRACTURE; WEDGELIKE TO HACKLY CUTTINGS HABIT; DULL TO WAXY LUSTER; SMOOTH TO SILTY TO GRITTY TEXTURE; TRACE OF LAMINAE ON SURFACE OF CUTTINGS; SLIGHT REACTION WITH HCL.

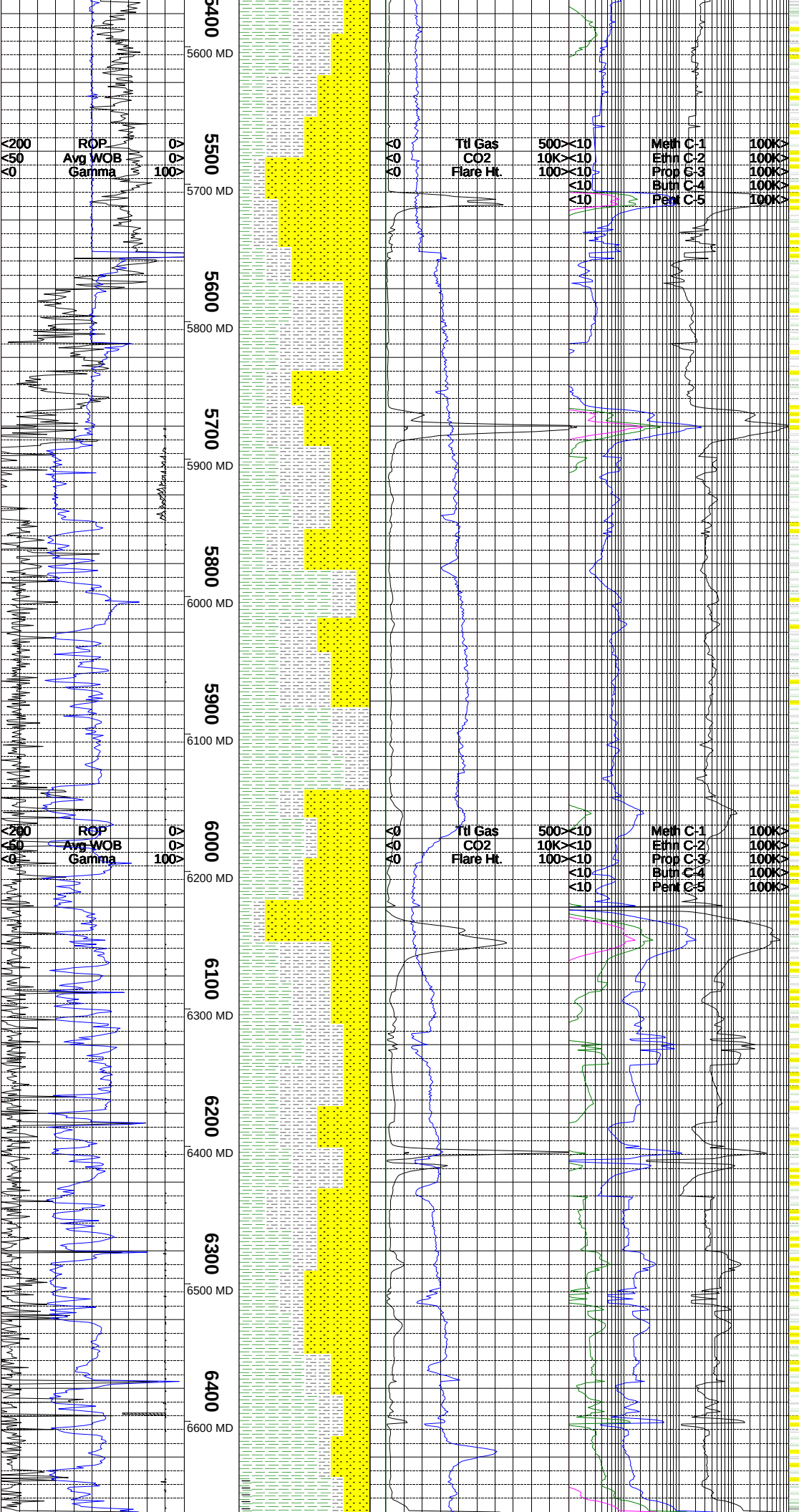
SANDSTONE = MEDIUM LIGHT GRAY TO GRAYISH RED TO BROWNISH GRAY COLOR; CLEAR TO LIGHT BROWNISH TO PALE REDDISH BROWN COLORED QUARTZ GRAINS WITH ABOUT 2% DARK LITHIC FRAGMENTS; FINE TO MEDIUM GRAIN SIZE; SUBANGULAR TO ANGULAR GRAINS WITH MODERATE TO LOW SPHERICITY; FIRM HARDNESS; GRAIN SUPPORTED; SILICA CEMENTATION; SURFACE ENCRUSTATION ON GRAINS; TRACE OF MECANICAL ABRASION ON

SILTSTONE = DARK YELLOWISH BROWN COLOR; DENSE TO CRUNCHY TENACITY; IRREGULAR TO BLOCKY FRACTURE; NODULAR CUTTINGS HABIT; SILTY TO GRITTY TEXTURE; MASSIVE STRUCTURE; NO REACTION WITH HCL.

SHALE = TAN TO GRAY IN COLOR WITH LOW TO MODERATE SPHERICITY; CRUMBLY TO CRUNCHY TENACITY WITH IRREGULAR TO PLANAR FRACTURES; ELONGATED TO TABULAR CTGS HABIT WITH A DULL TO EARTHY LUSTER ; SMOOTH TO SILTY TEXTURE.

SANDSTONE = GRAY TO TAN IN COLOR WITH A CALCITIC FRAMEWORK; MEDIUM TO FINE GRAIN SIZE WITH FAIR TO WELL SORTING; SUBROUND TO SUBANGULAR ANGULARITY WITH HIGH TO MODERATE SPHERICITY; BRITTLE TO CRUNCHY TENACITY WITH 20% UNCONSOLIDATED; NODULAR TO ELONGATED CTGS HABIT WITH A DULL TO SLIGHTLY FROSTED LUSTER; GRITTY TO GRANULAR TEXTURE.

SILTSTONE = TAN TO YELLOWISH BROWN IN COLOR WITH LOW TO MODERATE SPHERICITY; PULVERANT TO CRUMBLY TENACITY WITH IRREGULAR TO MOTTLED FRACTURES;



ELONGATED TO WEDGELIKE CTGS HABIT WITH A DULL TO EARTHY LUSTER; SMOOTH TO SILTY TEXTURE.

SHALE = GRAY TO TAN IN COLOR WITH MODERATE TO LOW SPHERICITY; CRUNCHY TO CRUMBLY TO BRITTLE TENACITY WITH IRREGULAR TO PLANAR FRACTURES; TABULR TO WEDGELIKE TO ELONGATED CTGS HABIT WITH A DULL TO FROSTED LUSTER; SMOOTH TO SILTY TEXTURE.

SILTSTONE = MODERATE YELLOWISH BROWN COLOR; CRUNCHY TENACITY; IRREGULAR FRACTURE; NODULAR CUTTINGS HABIT; EARTHY LUSTER; SILTY TO GRITTY TEXTURE, GRADING INTO SANDSTONE; MASSIVE STRUCTURE; FAIR REACTION WITH 10% HCL.

SANDSTONE = MEDIUM LIGHT GRAY TO MEDIUM BROWNISH GRAY COLOR; PREDOMINANTLY QUARTZ GRAINS, CLEAR TO A LIGHT BROWNISH COLOR; LESS THAN 2% DARK LITHIC FRAGMENTS; FAIR SORTING; ANGULAR TO SUB-ANGULAR GRAINS; WITH LOW TO MODERATE SPHERICITY; FIRM HARDNESS; SILICA CEMENTATION; SLIGHT REACTION WITH HCL; NO FLUORESCENCE UNDER UV LIGHT.

SHALE = BROWNISH GRAY TO BLUISH GRAY COLOR; BRITTLE TO DENSE TO CRUMBLY TENACITY; IRREGULAR TO CONCHOIDAL FRACTURE; WEDGELIKE TO ELONGATED TO NODULAR CUTTINGS HABIT; DULL TO WAXY LUSTER; CLAYEY TO SMOOTH TEXTURE; NO REACTION WITH HCL.

SILTSTONE = GRAYISH BROWN TO DARK YELLOWISH BROWN COLOR; DENSE TO CRUNCHY TENACITY; IRREGULAR TO BLOCKY FRACTURE; NODULAR TO TABULAR CUTTINGS HABIT; EARTHY TO SPARKLING LUSTER; SILTY TEXTURE; MASSIVE STRUCTURE; TRACE REACTION WITH HCL.

SANDSTONE = MEDIUM GRAY TO BROWISH GRAY TO DUSKY RED COLOR; QUARTZ AND FELDSPAR GRAINS WITH ABOUT 2% DARK LITHIC FRAGMENTS; FINE TO VERY FINE TO MEDIUM GRAIN SIZE WITH POOR TO FAIR SORTING; SUBANGULAR TO ANGULAR GRAINS; MODERATE TO LOW SPHERICITY; FIRM TO FIRMLY FRIABLE; GRAIN AND MATRIX SUPPORTED; DUSKY RED MATRIX; SLIGHT TO TRACE REACTION WITH HCL; NO FLUORESCENCE UNDER UV LIGHT.

SHALE = GRAY TO BROWN IN COLOR WITH MODERATE TO LOW SPHERICITY; BRITTLE TO CRUNCHY TENACITY WITH IRREGULAR TO MOTTLED FRACTURES; TABULAR TO WEDGELIKE CTGS HABIT WITH A DULL TO FROSTED LUSTER ; SMOOTH TO SILTY TEXTURE.

SILTSTONE = TAN TO LIGHT GRAY IN COLOR WITH MODERATE TO LOW SPEHRICITY; CRUMBLY TO CRUNCHY CTGS HABIT WITH DULL TO EARTHY LUSTER; HACKLY TO MOTTLED FRACTURES WITH ELONGATED TO WEDGELIKE CTGS HABIT; SMOOTH TO SILTY TEXTURE.

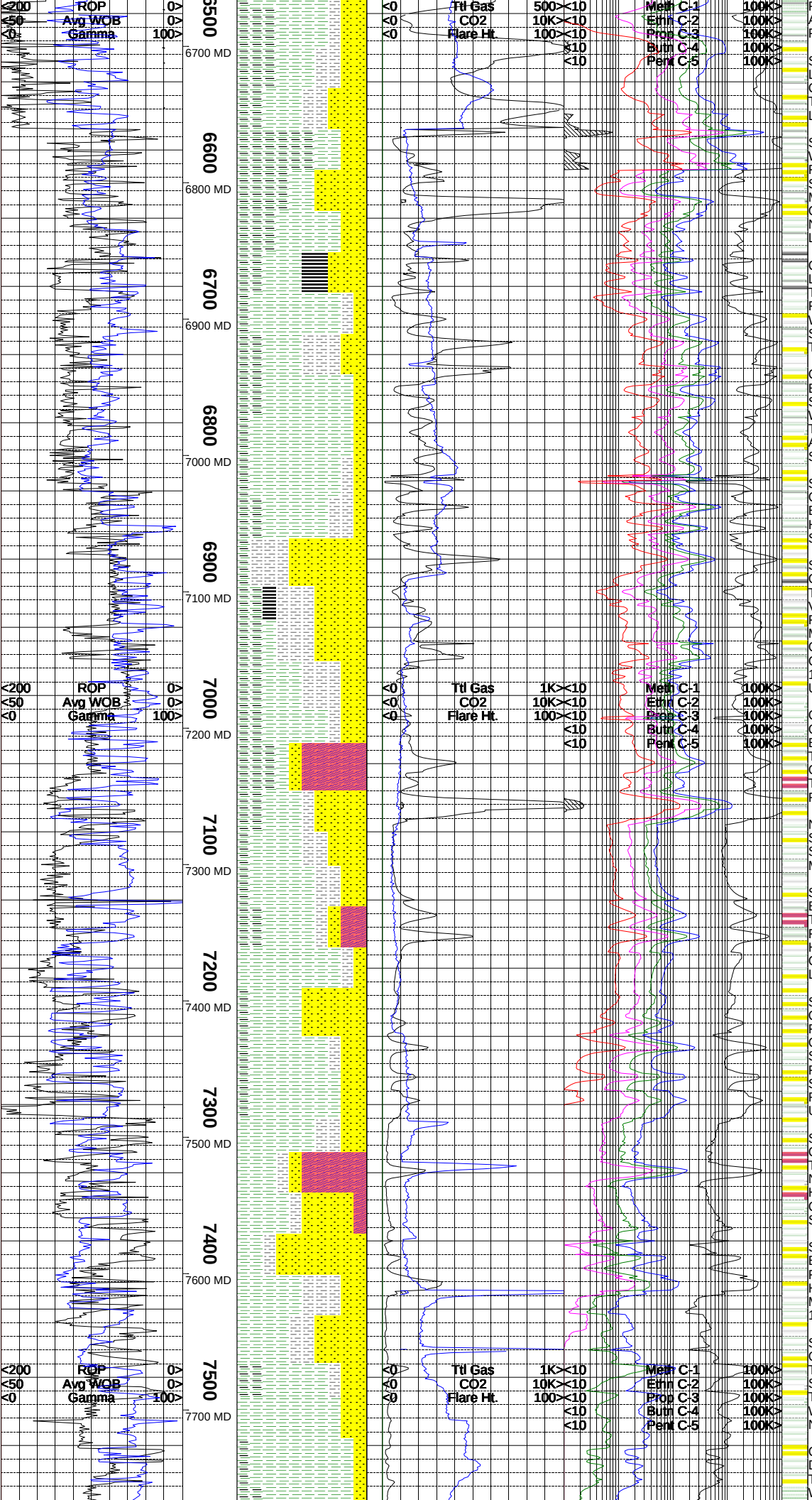
SANDSTONE = GRAY TO BROWN TO LIGHT GRAY IN COLOR; FINE TO MEDIUM GRAIN SIZE WITH FAIR TO WELL SORTING; SUBROUND TO SUBANGULAR ANGULARITY WITH MODERATE TO HIGH SPHERICITY; BRITTLE TO CRUNCHY TENACITY WITH NODULAR TO ELONGATED CTGS HABIT; FROSTED TO WAXY LUSTER WITH A GRITTY TO GRANULAR TEXTURE .

SHALE = BROWN TO GRAY IN COLOR WITH MODERATE TO LOW SPHERICITY; CRUNCHY TO BRITTLE TENACITY WITH IRREGULAR TO HACKLY FRACTURES; TABULAR TO WEDGELIKE CTGS HABIT WITH A DULL TO FROSTED LUSTER WITH A SMOOTH TO SILTY TEXTURE.

SILTSTONE = LIGHT GRAY TO TAN IN COLOR WITH MODERATE TO LOW SPHERICITY; CRUNCHY TO CRUMBLY TENACITY WITH WEDGELIKE TO ELONGATED CTGS HABIT; IRREGULAR TO MOTTLED FRACTURES WITH DULL TO EARTHY LUSTER WITH A SMOOTH TO SILTY TEXTURE.

SANDSTONE = GRAY TO BROWN IN COLOR WITH A CALCITIC FRAMEWORK; FINE TO MEDIUM GRAIN SIZE WITH SUBROUND TO SUBANGULAR ANGULARITY; MODERATE TO HIGH SPHERICITY WITH BRITTLE TO CRUNCHY TENACITY; NODULAR TO WEDGELIKE CTGS HABIT WITH WAXY TO DULL LUSTER WITH GRITTY TO GRANULAR TEXTURE.

CARBONACEOUS SHALE = DARK BROWN TO BLACK IN COLOR WITH LOW TO VERY LOW SPHERICITY; BRITTLE TO CRUNCHY TENACITY WITH PLANAR TO IRREGULAR FRACTURES; WEDGELIKE TO SCALY CTGS HABIT WITH



RESINOUS TO DULL LUSTER; SILTY TO ABRASIVE TEXTURE WITH ACCESSORY MINERAL PYRITE PRESENT.

SHALE = GRAY TO DARK GRAY IN COLOR WITH LOW TO MODERATE SPHERICITY; BRITTLE TO CRUNCHY TENACITY WITH ELONGATED TO TABULAR CTGS HABIT; DULL TO RESINOUS LUSTER WITH A SMOOTH TO SILTY TEXTURE.

SANDSTONE = GRAY TO LIGHT GRAY IN COLOR WITH FINE TO MEDIUM GRAIN SIZE; CALCITIC FRAMEWORK WITH FAIR TO WELL SORTING; SUBROUND TO SUBANGULAR ANGULARITY WITH MODERATE TO HIGH SPHERICITY; BRITTLE TO CRUNCHY TENACITY WITH ELONGATED TO NODULAR CTGS HABIT; DULL TO FROSTED LUSTER WITH A GRITTY TO GRANULAR TEXTURE

COAL = BLACK IN COLOR WITH LOW TO VERY LOW SPHERICITY; BRITTLE TO CRUMBLY TENACITY WITH IRREGULAR TO PLANAR FRACTURES; TABULAR TO SCALY CTGS HABIT WITH A RESINOUS TO VITREOUS LUSTER; SLIGHT DEGASSING OCCURRING WITH A SMOOTH TO MATTE TEXTURE.

CARBONACEOUS CHALE = DARK GRAY TO DARK BROWN IN COLOR WITH LOW TO VERY LOW SPHERICITY; BRITTLE TO DENSE TENACITY WITH BLOCKY TO IRREGULAR FRACTURES; TABULAR TO WEDGELIKE CTGS HABIT WITH A RESINOUS TO DULL LUSTER; SMOOTH TO SILTY TEXTURE.

SHALE = MEDIUM GRAY TO MEDIUM DARK GRAY COLOR; CRUNCHY TENACITY; IRREGULAR TO BLOCKY FRACTURE; WEDGELIKE CUTTINGS HABIT; DULL TO WAXY LUSTER; CLAYEY TO SILTY TEXTURE; SLIGHT REACTION WITH HCL.

SANDSTONE = LIGHT GRAY TO MEDIUM LIGHT GRAY COLOR; QUARTZ AND FELDSPAR GRAINS, TRACE AMOUNT OF DARK LITHIC FRAGMENTS; VERY FINE TO FINE GRAIN SIZE; WELL TO FAIR SORTING; SUBROUNDED GRAINS WITH MODERATE SPHERICITY; ETCHED SURFACES ON GAINS DUE TO CHEMICAL DISSOLUTION; CALCITE CEMENTATION; FAIR REACTION WITH 10% HCL; TRACE ON MINERAL FLUORESCENCE UNDER UV LIGHT.

CARBONACEOUS SHALE = BROWNISH BLACK TO GRAYISH BROWN COLOR; CRUNCHY TENACITY; BLOCKY TO IRREGULAR FRACTURE; ELONGATED TO TABULAR TO WEDGELIKE CUTTINGS HABIT; GREASY TO EARTHY LUSTER; SILTY TO CLAYEY TEXTURE; CARBONACEOUS LAMINAE; TRACE REACTION WITH HCL; TRACE OF PYRITE.

NOTE = ABUNDANT FINE GRAIN CALCITE IN SAMPLE AT 7240'; UNCONSOLIDATED WITH SUBROUNDED GRAINS; LOGGED AT METAMORPHICS; POSSIBLE FRACTURE FILL.

SHALE = LIGHT BROWNISH GRAY TO MEDIUM BLUISH GRAY COLOR; DENSE TO CRUNCHY TENACITY; IRREGULAR TO SPLINTERY FRACTURE; WEDGELIKE TO NODULAR CUTTINGS HABIT; WAXY TO DULL LUSTER; SMOOTH TO CLAYEY TEXTURE; TRACE OF CARBONACEOUS LAMINAE; NO REACTION WITH HCL.

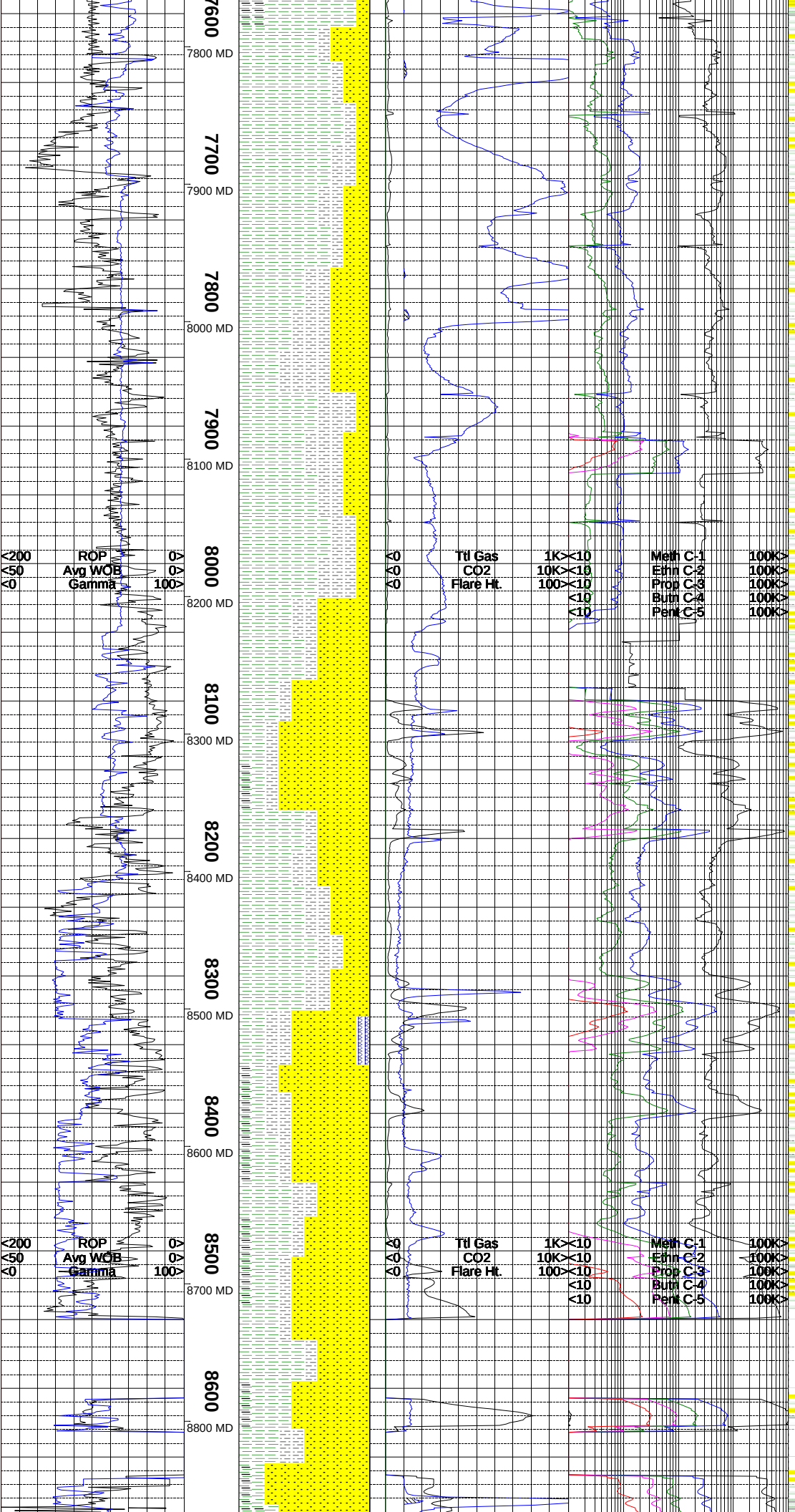
SANDSTONE = MEDIUM LIGHT GRAY COLOR; QUARTZ AND FELDSPAR GRAINS; VERY FINE TO FINE GRAIN SIZE; WELL SORTED; SUBROUNDED GRAINS; MODERATE SPHERICITY; GOUND SURFACES ON CUTTINGS DUE TO PDC BIT; FIRM HARDNESS; GRAIN AND MATRIX SUPPORTED WITH CALCITE CEMENTATION; REACTS WELL WITH HCL; NO FLUORESCENCE UNDER UV LIGHT.

SHALE = MEDIUM DARK GRAY TO GRAYISH RED COLOR; DENSE TO BRITTLE TO CRUNCHY TENACITY; IRREGULAR TO BLOCKY FRACTURE; NODULAR TO WEDGELIKE TO TABULAR CUTTINGS HABIT; WAXY TO DULL LUSTER SMOOTH TO CLAYEY LUSTER; TRACE OF LAMINAE ON SURFACE OF CUTTINGS; NO REACTION IN HCL.

SILTSTONE = MODERATE BROWN COLOR; BRITTLE TO DENSE TENACITY; IRREGULAR FRACTURE; NODULAR TO WEDGELIKE CUTTINGS HABIT; EARTHY LUSTER; SILTY TEXTURE; MASSIVE STRUCTURE; FAIR REACTION WITH 10% HCL.

SHALE = MEDIUM GRAY TO MEDIUM BLUISH GRAY TO LIGHT BLUISH GRAY COLOR; BRITTLE TO CRUNCHY TO CRUMBLY; IRREGULAR TO SPLINTERY TO HACKLY FRACTURE; WEDGELIKE TO NODULAR TO BLADED CUTTINGS HABIT; WAXY TO DULL LUSTER; TRACE OF PYRITE; NO REACTION IN HCL.

CARBONACEOUS SHALE = BROWNISH BLACK TO DUSKY BROWN COLOR; DENSE TO CRUNCHY TENACITY; BLOKY TO IRREGULAR FRACTURE; WEDGELIKE TO TABULAR TO NODULAR CUTTINGS



HABIT; GREASY TO SPARKLING LUSTER; SILTY TO GRITTY TEXTURE; CARBONACEOUS LAMINAE; TRACE OF PYRITE; NO REACTION WITH HCL.

SANDSTONE = LIGHT GRAY TO GRAY IN COLOR WITH FINE TO MEDIUM GRAIN SIZE; FAIR TO WELL SORTING WITH MODERATE TO HIGH SPHERICITY; DENSE TO BRITTLE TENACITY WITH NODULAR TO ELONGATED CTGS HABIT; FROSTED TO DULL LUSTER WITH GRITTY TO GRANULAR TEXTURE; 10% BLACK LITHICS PRESENT.

SHALE = GRAY TO LIGHT GRAY IN COLOR WITH LOW TO VERY LOW SPHERICITY; BRITTLE TO CRUNCHY TENACITY WITH IRREGULAR TO PLANAR FRACTURES; WEDGELIKE TO SCALY CTGS HABIT WITH A SLIGHTLY FROSTED TO DULL LUSTER; SMOOTH TO SILTY TEXTURE.

SILTSTONE = TAN TO BROWN TO LIGHT GRAY IN COLOR WITH MODERATE TO LOW SPHERICITY; BRITTLY TO CRUMBLY TENACITY WITH IRREGULAR TO MOTTLED FRACTURES; SCALY TO ELONGATED CTGS HABIT WITH A DULL TO EARTHY LUSTER; SMOOTH TO SILTY TEXTURE.

SHALE = GRAY TO DARK GRAY IN COLOR WITH MODERATE TO LOW SPHERICITY; CRUNCHY TO BRITTLE TENACITY WITH PLANAR TO IRREGULAR FRACTURES; WEDGELIKE TO TABULAR TO SCALY CTGS HABIT WITH A DULL TO FROSTED LUSTER; SMOOTH TO SILTY TEXTURE.

SANDSTONE = OFFWHITE TO TRANSLUCENT IN COLOR WITH FINE TO MEDIUM GRAIN SIZE; FAIR TO WELL SORTING WITH ROUND TO SUBROUND ANGULARITY; 90% UNCONSOLIDATED WITH A POLISHED TO WAXY LUSTER; GRITTY TO GRANULAR TEXTURE.

SHALE = GRAY TO BROWN IN COLOR WITH LOW TO VERY LOW SPHERICITY; CRUNCHY TO CRUMBLY TENACITY WITH IRREGULAR TO HACKLY FRACTURES; TABULAR TO WEDGELIKE CTGS HABIT WITH A DULL TO FROSTED LUSTER ; SMOOTH TO SILTY TEXTURE.

CARBONACEOUS SHALE = BLACK TO DARK BROWN IN COLOR WITH LOW TO VERY LOW SPHERICITY; BRITTLE TO CRUNCHY TENACITY WITH WEDGELIKE TO SCALY CTGS HABIT; RESINOUS TO DULL LUSTER WITH SMOOTH TO SILTY TEXTURE.

SANDSTONE = LIGHT GRAY TO MEDIUM LIGHT GRAY COLOR; PREDOMINANTLY QUARTZ GRAINS WITH LESS THAN 2% DARK LITHIC FRAGMENTS; FINE TO MEDIUM TO VERY FINE GRAIN SIZE; POOR SORTING; SUBANGULAR TO ANGULAR TO SUBROUNDED GRAINS; MODERATE TO LOW SPHERICITY; FIRMLY FRIABLE TO FRIABLE WITH ABUNDANT LOSE GRAINS IN TRAY; GRAIN SUPPORTED WITH TRACE OF SILICA CEMENTATION; TRACE REACTION WITH HCL; NO FLUORESCENCE UNDER UV LIGHT.

SHALE = MEDIUM GRAY TO DARK REDDISH BROWN COLOR; DENSE TO CRUNCHY TENACITY; IRREGULAR TO CONCHOIDAL TO BLOCKY FRACTURE; WEDGELIKE TO NODULAR CUTTINGS HABIT; WAXY TO DULL LUSTER; TRACE OF LAMINAE ON SURFACE OF GRAINS; NO REACTION WITH HCL.

SILTSTONE = DARK YELLOWISH ORANGE TO BROWNISH GRAY TO MODERATE REDDISH BROWN COLOR; CRUMBLY TO DENSE TO CRUNCHY TENACITY; IRREGULAR TO BLOCKY FRACTURE; NODULAR TO WEDGELIKE CUTTINGS HABIT; EARTHY LUSTER; SILTY TO GRITTY TEXTURE; MASSIVE STRUCTURE; SLIGHT REACTION WITH HCL.

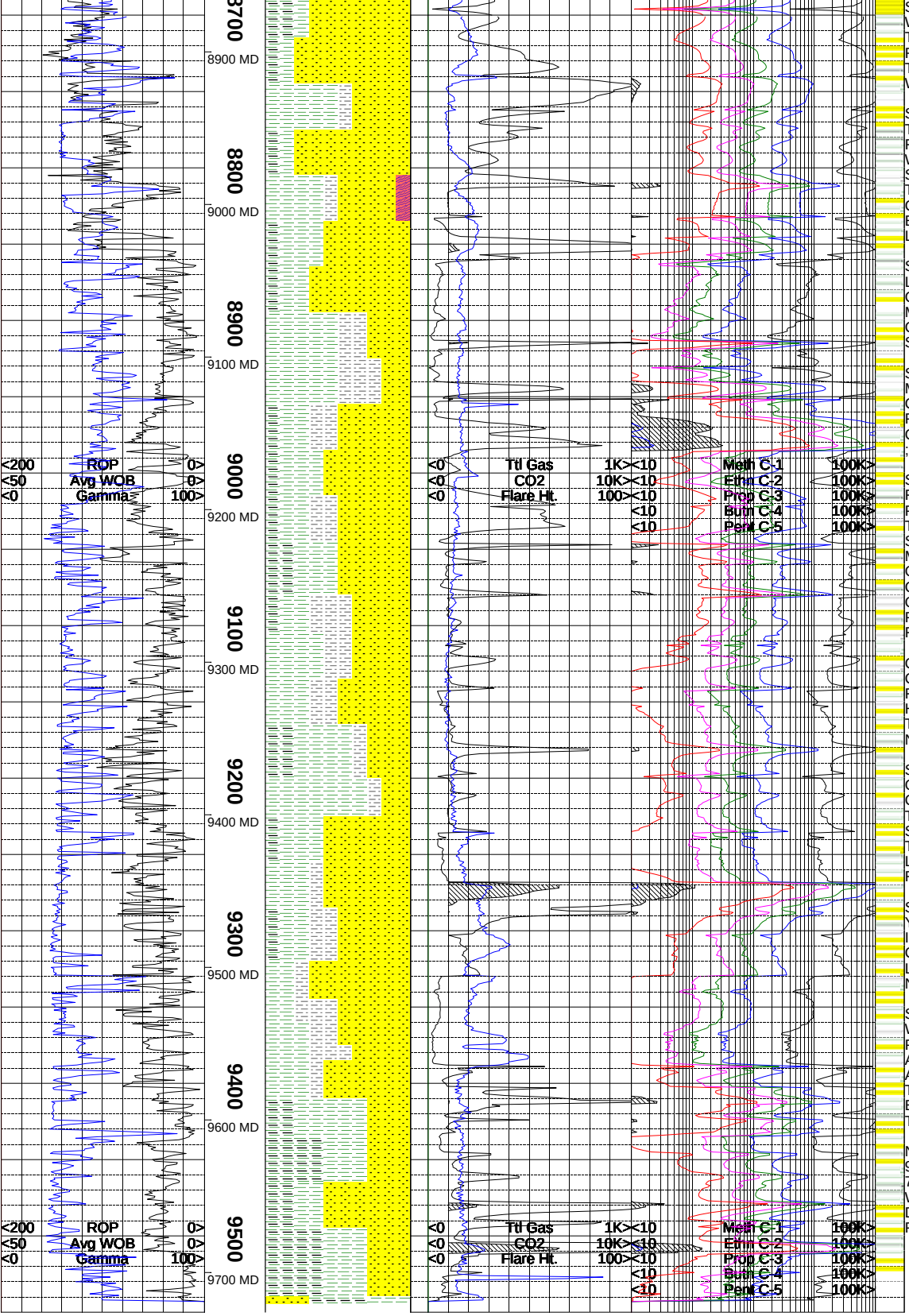
SANDSTONE = VERY LIGHT GRAY COLOR; PREDOMINANTLY QUARTZ GRAINS; FINE TO VERY FINE TO MEDIUM GRAIN SIZE; FAIR TO POOR SORTING; SUBROUNDED TO SUBANGULAR GRAINS; WITH MODERATE SPHERICITY; FRIABLE WITH ABUNDANT LOSE GRAINS IN TRAY; ABOUT 20% KAOLINITC SANDSTONE; SLIGHT REACTION WITH HCL; NO FLUORESCENCE UNDER UV LIGHT.

NOTE = TOTCO DOWN FROM 8725' TO 8783'; UNABLE TO PICK TOP OF WF 800.

SHALE = MEDIUM BLUISH GRAY COLOR; DENSE TO BRITTLE TENACITY; IRREGULAR FRACTURE; WEDGELIKE TO NODULAR CUTTINGS HABIT; WAXY LUSTER; SMOOTH TO CLAYEY TEXTURE; NO REACTION WITH HCL.

NOTE = TOTCO DOWN FROM 8807' TO 8838'

CARBONACEOUS SHALE = DARK BROWN TO DARK GRAY IN COLOR WITH LOW TO VERY LOW



SPHERICITY; BRITTLE TO CRUNCHY TENACITY WITH IRREGULAR TO PLANAR FRACTURES; TABULAR TO SCALY CTGS HABIT WITH RESINOUS TO DULL LUSTER; SMOOTH TO SILTY TEXTURE WITH SLIGHT DEGASSING OCCURRING WITHIN SAMPLE.

SANDSTONE = OFFWHITE TO LIGHT GRAY TO TRANSLUCENT IN COLOR WITH MEDIUM TO FINE GRAIN SIZE; FAIR TO WELL SORTING WITH A CALCITIC FRAMEWORK; ROUND TO SUBROUND ANGULARITY WITH HIGH TO MODERATE SPHERICITY; CRUNCHY TO CRUMBLY TENACITY WITH NODULAR TO ELONGATED CTGS HABIT; WAXY TO FROSTED LUSTER WITH GRITTY TO GRANULAR TEXTURE.

SILTSTONE = TAN TO BROWN IN COLOR WITH LOW TO MODERATE SPHERICITY; BRITTLE TO CRUNCHY TENACITY WITH IRREGULAR TO MOTTLED FRACTURES; TABULAR TO WEDGELIKE CTGS HABIT WITH A DULL TO EARTHY LUSTER; SMOOTH TO SILTY TEXTURE.

SHALE = GRAY TO DARK GRAY IN COLOR WITH MODERATE TO LOW SPHERICITY; BRITTLE TO CRUNCHY TENACITY WITH IRREGULAR TO PLANAR FRACTURES; TABULAR TO WEDGELIKE CTGS HABIT WITH A DULL TO FROSTED LUSTER ; SMOOTH TO SILTY TEXTURE.

SANDSTONE = MEDIUM LIGHT GRAY COLOR; FINE TO VERY FINE TO MEDIUM GRAIN SIZE; PREDOMINANTLY QUARTZ GRAINS WITH LESS THAN 2% DARK LITHIC FRAGMENTS; WELL SORTED; SUB ROUNDED GRAINS WITH MODERATE SPHERICITY; FIRM HARDNESS; GRAIN SUPPORTED WITH TRACE OF CALCITE CEMENTATION, SOME LOSE GRAINS IN TRAY OF MEDIUM TO FINE GRAIN SIZE DUE TO PDC BIT; SLIGHT REACTION WITH HCL; NO FLUORESCENCE UNDER UV LIGHT.

CARBONACEOUS SHALE = BROWNISH BLACK COLOR; CRUNCHY TENACITY; IRREGULAR FRACTURE; WEDGELIKE TO NODULAR CUTTINGS HABIT; DULL TO GREASY LUSTER; SILTY TO GRITTY TEXTURE; MASSIVE STRUCTURE; NO REACTION WITH HCL.

SHALE = MEDIUM BLUISH GRAY TO MEDIUM GRAY TO MODERATE YELLOWISH BROWN COLOR; CRUNCHY TO DENSE TO TOUGH TENACITY; HACKLY TO IRREGULAR TO SPLINTERY FRACTURE; BLADED TO WEDGLIKE TO NODULAR CUTTINGS HABIT; WAXY TO DULL LUSTER; SILTY TO SMOOTH TEXTURE; NO REACTION TO SLIGHT REACTION WITH HCL.

SILTSTONE = MEDIUM GRAY TO DARK YELLOWISH ORANGE COLOR; DENSE TENACITY; IRREGULAR FRACTURE; WEDGELIKE TO NODULAR CUTTINGS HABIT; DULL TO SPARKLING LUSTER; SILTY TEXTURE; MASSIVE STRUCTURE NO REACTION TO SLIGHT REACTION WITH HCL.

SANDSTONE = OFFWHITE TO OPAQUE IN COLOR WITH FINE TO MEDIUM GRAIN SIZE; FAIR TO POOR SORTING WITH A CALCITIC FRAMEWORK; ANGULAR TO SUBANGULAR ANGULARITY WITH A MODERATE TO LOW SPHERICITY; CRUNCHY TO BRITTLE TENACITY WITH WEDGELIKE TO ELONGATED CTGS HABIT; GRITTY TO GRANULAR TEXTURE WITH 10% BLACK LITHICS PRESENT.

NOTE = DRILLED INTERMEDIATE HOLE TO 9717' ON 04/19/2010; RUN CASING TO 7420' PACKED OFF; TRIPPED OUT OF HOLE WITH CASING; MISSING 6 JOINTS OF CASING DOWN HOLE; CEMENT PLUG IN HOLE AND PREPARE TO SIDTRACK.

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