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# MUDLOG MD

**COMPANY** EXXONMOBIL  
**WELL** FRU197-33A2  
**FIELD** FREEDOM RANCH UNIT  
**REGION** ROCKIES  
**COORDINATES** 39.915658  
108.285631  
**ELEVATION** 6390'  
**COUNTY, STATE** RIO BLANCO, CO  
**API INDEX** 05-103-11098-00  
**SPUD DATE** 2/1/2009  
**CONTRACTOR** HELMRICH AND PAYNE  
**CO. REP.** KEVIN GARDNER  
**RIG/TYPE** 239 / Flex 3  
**LOGGING UNIT** MLU 033  
**GEOLOGISTS** LAYNE GOOD  
NICK BAUER  
**ADD. PERSONS** JASON REISENBICHLER  
**CO. GEOLOGIST** MELISSA SAURBORN

## LOG INTERVAL

## CASING DATA

**DEPTHS:** 4000' TO 12297'  
**DATES:** 6/26/2009 TO 7/10/2009  
**SCALE:** 1" = 100'

16" AT 130'  
10.75" AT 3956'  
7" AT 8536'  
AT

## MUD TYPES

## HOLE SIZE

SPUD MUD TO 3983'  
LSND TO 12297'  
TO  
TO

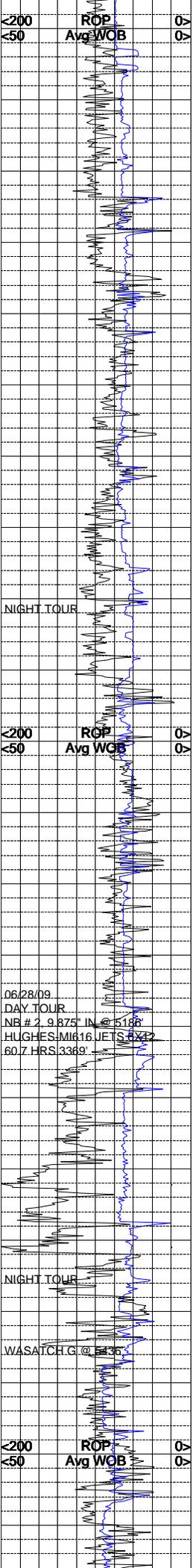
14.75" TO 3983'  
9.875" TO 8555'  
6.125" TO 12297'  
TO

## ABBREVIATIONS

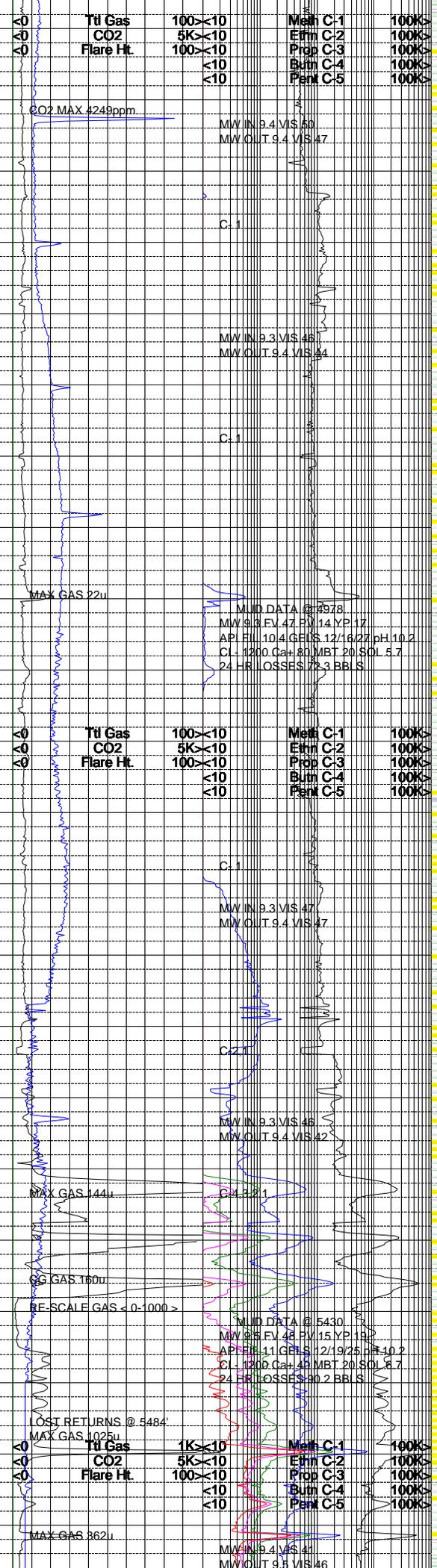
<i>NB</i> NEWBIT	<i>PV</i> PLASTIC VISCOSITY	<i>LC</i> LOST CIRCULATION
<i>RRB</i> RERUN BIT	<i>YP</i> YIELD POINT	<i>CO</i> CIRCULATE OUT
<i>CB</i> CORE BIT	<i>FL</i> FLUID LOSS	<i>NR</i> NO RETURNS
<i>WOB</i> WEIGHT ON BIT	<i>CL</i> PPM CLORIDE ION	<i>TG</i> TRIP GAS
<i>RPM</i> ROTARY REV/MIN	<i>Rm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





4500  
4600  
4700  
4800  
4900  
5000  
5100  
5200  
5300  
5400  
5500



GRITTY TEXTURE; GENERALLY MASSIVE STRUCTURE.

SANDSTONE = WHITE TO LIGHT GRAY TO DARK GRAY TO TAN TO TRANSLUCENT; QUARTZ FRAMEWORK; VERY FINE TO FINE TO MEDIUM GRAIN SIZE; GENERALLY FAIR TO WELL SORTED GRAINS WITH LOW TO MODERATE SPHERICITY; FRIABLE TO FIRM FRIABLE HARDNESS; CALCITE CEMENTATION; SAMPLE IS READILY ACTIVE TO HCL SOLUTION; SAMPLE CONTAINS DARK BROWN AND BLACK LITHIC FRAGMENTS.

SHALE = LIGHT BLUISH GRAY TO LIGHT YELLOW BROWN TO GRAY; BRITTLE TO CRUMBLY TENACITY; IRREGULAR TO BLOCKY TO OCC PLANAR FRACTURE; TABULAR TO WEDGELIKE TO OCC NODULAR CUTTINGS HABIT; DULL TO EARTHY TO OCC WAXY LUSTER; SMOOTH TO CLAYEY TEXTURE; THICK TO MASSIVELY BEDDED.

SANDSTONE = COLOR RANGES FROM GRAY TO WHITE TO TAN TO TRANSLUCENT; FINE TO MEDIUM GRAIN; FAIR TO WELL SORTED GRAINS ; SUB-ANGULAR TO SUB-ROUND TO ROUND GRAINS WITH LOW TO MODERATE SPHERICITY; EASILY FRIABLE TO FRIABLE; CALCITE CEMENTATION; SAMPLE IS HIGHLY REACTIVE TO HCL SOLUTION; APPROX. TWO TO FIVE PERCENT OF SAMPLE CONSISTS OF BROWN AND BLACK LITHIC FRAGMENTS; NO FLUORESCENCE UNDER UV LIGHT.

SHALE = LIGHT BLUISH GRAY TO LIGHT GRAY TO OCC HUES OF DARK YELLOWISH BROWN; CRUMBLY TO CRUNCHY TENACITY; IRREGULAR TO BLOCKY TO OCC PLANAR FRACTURE; TABULAR TO WEDGELIKE TO OCC NODULAR AND ELONGATED HABIT; VERY EARTHY TO DULL LUSTER; SMOOTH TO SILTY TEXTURE WHEN CLEAN WITH CLAYEY FEEL BEFORE MUD IS WASHED OUT OF SAMPLE; THICK TO OCC THIN AND BANDED STRUCTURE; OVERALL WELL CONSOLIDATED SHALE MATRIX WITH GRAINS OF QUARTZ SAND AND KAOLINITE PRESENT <10%.

SANDSTONE = WHITE TO OPAQUE WITH TRACES OF LIGHT PINKISH HUES COMMON, DARK BROWN TO BLACK LITHICS APPEAR THROUGHOUT SAND GRAIN MATRIX; FINE TO MEDIUM LOWER TO OCC COARSE UPPER GRAINED; MODERATELY WELL SORTED; SUBROUNDED TO SUBANGULAR; MODERATE SPHERICITY WITH SOME ROUNDED GRAINS PRESENT <5%; FIRM TO BRITTLE TO OCC HARD; MODERATE TO VERY CALCAREOUS; KAOLINITE ALTERATION COMMON THROUGHOUT SAMPLE TRAY; NO VISIBLE HYDROCARBON INDICATORS PRESENT.

NOTE: TOOH @ 5186' MD FOR DIRECTIONAL TOOL AND NEW BIT.

SHALE = COLOR VARIES FROM LIGHT GRAY TO GRAY TO BLACK TO TAN; SLIGHTLY DENSE TO BRITTLE TO CRUNCHY TENACITY; PLANAR TO BLOCKY TO IRREGULAR FRACTURE; PLATY TO FLAKY TO SCALY TO WEDGE LIKE TO MASSIVE CUTTINGS HABIT; EARTHY TO DULL TO WAXY TO OCCASIONALLY FROSTED LUSTER; SMOOTH TO CLAYEY TEXTURE.

SILTSTONE = DARK GRAY TO LIGHT BROWN; CRUMBLY TO CRUNCHY TO OCC BRITTLE TENACITY; BLOCKY TO PLANAR FRACTURE TO IRREGULAR FRACTURE; SCALY TO TABULAR TO OCC WEDGELIKE HABIT; DULL TO EARTHY WITH RARE SPARKLY LUSTER; SMOOTH TO SILTY TEXTURE; THIN TO THICK STRUCTURE; BREAKS APART INTO PLANAR FRACTURES WITH GRITTY PROPERTIES; VERY FEW BUBBLES OCCUR IN HCL SOLUTION.

SANDSTONE = OFF WHITE TO TRANSLUCENT TO WHITE TO OCC LIGHT GREEN HUES AND DARK LITHICS COMMON; FINE TO MEDIUM GRAINED WITH SOME LOOSE COARSE GRAINS; FAIR TO WELL SORTED; ANGULAR TO SUBANGULAR TO OCC SUBROUNDED; LOW TO MODERATE SPHERICITY; VERY CLEAN QUARTZ GRAINED SAND VERY COMMON IN SAMPLE TRAY; NON TO VERY SLIGHTLY CALCAREOUS OVERALL; PYRITE CLUSTERS ABUNDANT AT WASATCH G CONTACT; NO FLUORESCENCE UNDER UV LIGHT.

SHALE = COLOR VARIES FROM LIGHT BLUISH GRAY TO LIGHT GRAY TO REDDISH BROWN AND OCC LIGHT PURPLE GRAY; BRITTLE TO CRUMBLY TO OCC CRUNCHY TENACITY; BLOCKY TO IRREGULAR TO OCC HACKLY FRACTURE; VERY EARTHY TO DULL LUSTER; MAINLY SMOOTH TO SILTY TO OCC GRITTY TEXTURE; THIN TO THICK TO BECOMING MASSIVELY BEDDED OUTSIDE OF SANDSTONE BEDDING PLANES; TRACES OF AGGREGATED PYRITE

<200  
50 ROP  
Avg WOB

Til Gas 100x<10  
CO2 5Kx<10  
Flare Hit 100x<10  
Meth C-1 100Kx  
Ethn C-2 100Kx  
Prop C-3 100Kx  
Butn C-4 100Kx  
Perw C-5 100Kx

06/28/09  
DAY TOUR  
NB # 2, 9.875" IN @ 5186  
HUGHES/MIR16 JETS 8X22  
60.7 HRS 3369'

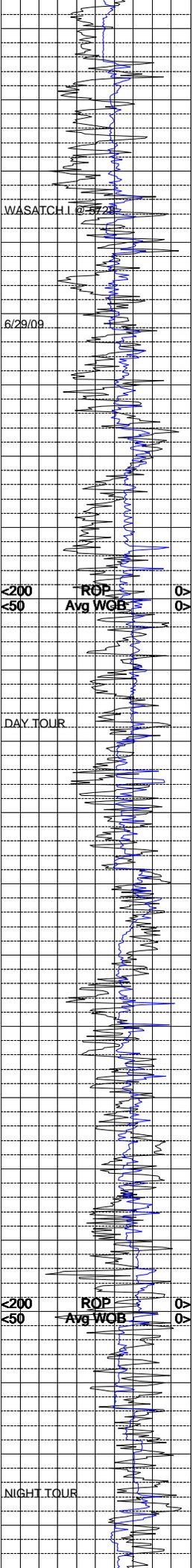
MUD DATA @ 4978  
MW IN 9.3 VIS 46  
MW OUT 9.4 VIS 44  
C.1

<200  
50 ROP  
Avg WOB

Til Gas 1Kx<10  
CO2 5Kx<10  
Flare Hit 100x<10  
Meth C-1 100Kx  
Ethn C-2 100Kx  
Prop C-3 100Kx  
Butn C-4 100Kx  
Perw C-5 100Kx

MUD DATA @ 5430  
MW IN 9.3 VIS 46  
MW OUT 9.4 VIS 42  
C.1  
C.2  
C.3  
C.4  
C.5

LOST RETURNS @ 5484'  
MAX GAS 1025u  
Til Gas 1Kx<10  
CO2 5Kx<10  
Flare Hit 100x<10  
Meth C-1 100Kx  
Ethn C-2 100Kx  
Prop C-3 100Kx  
Butn C-4 100Kx  
Perw C-5 100Kx



5600

5700

5800

5900

6000

6100

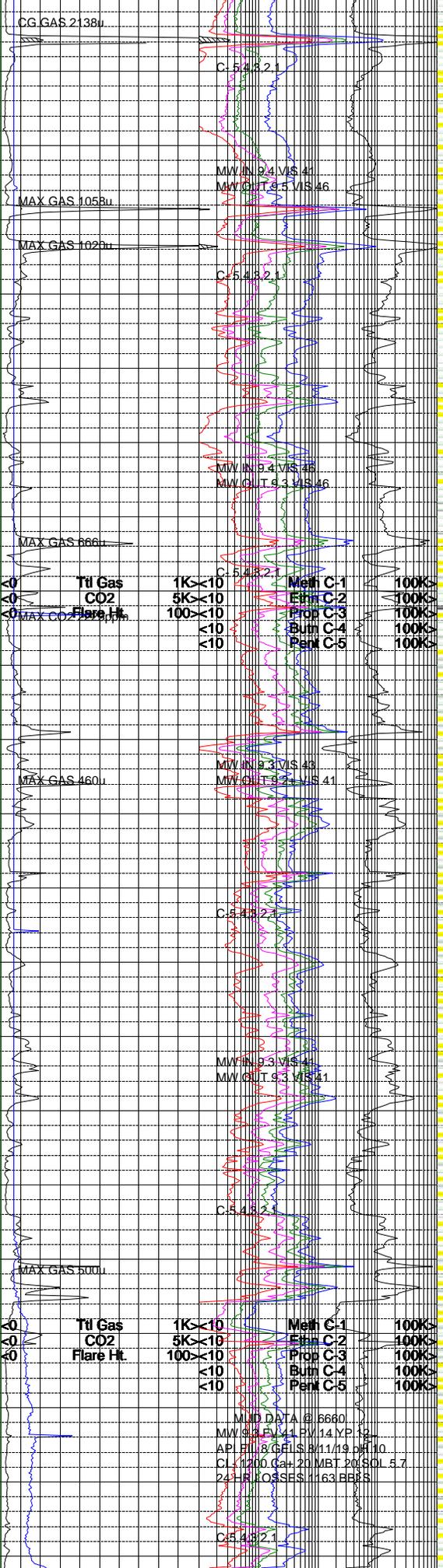
6200

6300

6400

6500

6600



FOUND THROUGHOUT SAMPLE TRAY; OVERALL NON CALCAREOUS.

SANDSTONE = OFF WHITE TO WHITE TO LIGHT GRAY WITH BLACK AND BROWN LITHICS FOUND WITHIN GRAIN MATRIX; FINE TO MEDIUM LOWER TO MEDIUM AND COARSE UPPER GRAINED; WELL TO FAIRLY SORTED; SUBANGULAR TO SUBROUNDED WITH FEW ROUNDED GRAINS PRESENT; LOW TO MODERATE SPHERICITY; BRITTLE TO FIRM TO MODERATELY HARD; DISSEMINATED PYRITE COMMON ON OUTSIDE OF QUARTZ GRAINS; VERY SLIGHTLY REACTIVE IN HCL SOLUTION; NO APPARENT OIL INDICATORS PRESENT.

SHALE = COLOR VARIES FROM LIGHT BLUISH GRAY TO LIGHT GRAY TO REDDISH BROWN AND OCC DARK GRAY TO BLACK; BRITTLE TO CRUMBLY TO OCC CRUNCHY TENACITY; BLOCKY TO IRREGULAR TO OCC HACKLY FRACTURE; VERY EARTHY TO DULL LUSTER; MAINLY SMOOTH TO SILTY TO OCC GRITTY TEXTURE; THIN TO THICK TO BECOMING MASSIVELY STRUCTURED WITH COARSE GRAINS COMMON THROUGHOUT SAMPLE TRAY; OVERALL NON CALCAREOUS.

CARBONACEOUS SHALE = VERY DARK GRAY TO BLACK; CRUMBLY TO CRUNCHY TO PULVERULENT TENACITY; BLOCKY TO IRREGULAR FRACTURE; WEDGELIKE TO TABULAR TO OCC FLAKY CUTTINGS HABIT; RESINOUS TO GREASY TO OCC EARTHY LUSTER; SMUTGES BLACK ONTO SKIN WHEN DRY; THIN TO LAMINAE TO OCC THICK STRUCTURE; NODULES OF VISIBLY DEGASSING COAL FOUND IN SAMPLE TRAY VERY COMMON <10%.

COAL = BLACK TO VERY DARK BROWN; DENSE TO BRITTLE TENACITY; CONCHOIDAL TO BLOCKY FRACTURE; TABULAR TO WEDGELIKE CUTTINGS HABIT; VITREOUS LUSTER ON BIT CUT FACE; SMOOTH TO SILTY TEXTURE; DEGASSES REGULARLY WHEN WET UNDER SAMPLE MICROSCOPE.

SANDSTONE = COLOR RANGES FROM GRAY TO WHITE TO TAN TO TRANSLUCENT; FINE TO MEDIUM GRAIN; FAIR TO WELL SORTED GRAINS ; SUB-ANGULAR TO SUB-ROUND TO ROUND GRAINS WITH LOW TO MODERATE SPHERICITY; EASILY FRIABLE TO FRIABLE; CALCITE CEMENTATION; SAMPLE IS HIGHLY REACTIVE TO HCL SOLUTION; APPROX. TWO TO FIVE PERCENT OF SAMPLE CONSISTS OF DARK BROWN AND BLACK LITHIC FRAGMENTS; NO FLUORESCENCE UNDER UV LIGHT.

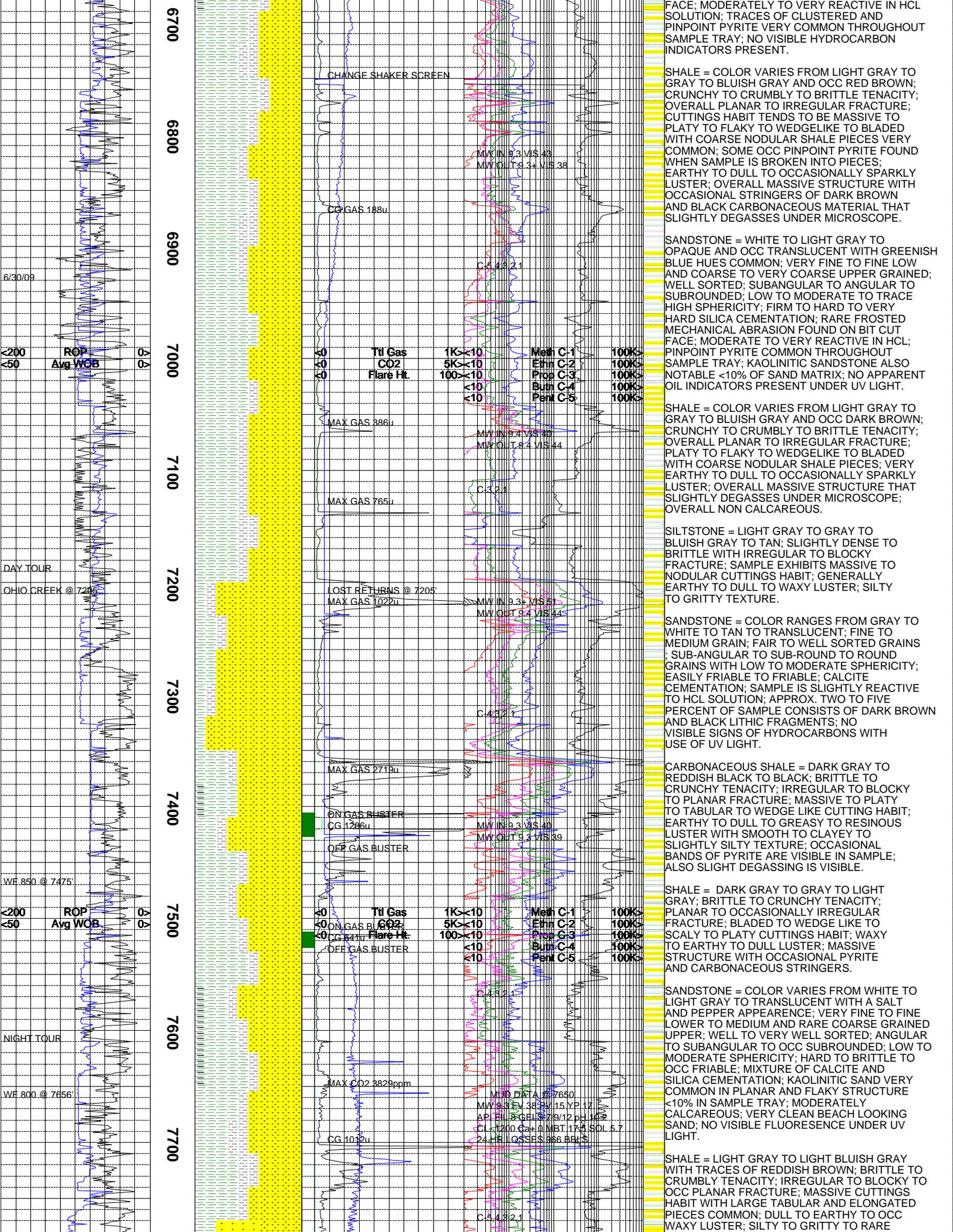
CARBONACEOUS SHALE = DARK GRAY TO REDDISH BLACK TO BLACK; BRITTLE TO CRUNCHY TENACITY; IRREGULAR TO BLOCKY TO PLANAR FRACTURE; MASSIVE TO PLATY TO TABULAR TO WEDGE LIKE CUTTING HABIT; EARTHY TO DULL TO GREASY TO RESINOUS LUSTER WITH SMOOTH TO CLAYEY TO SLIGHTLY SILTY TEXTURE; OCCASIONAL BANDS OF PYRITE ARE VISIBLE IN SAMPLE; ALSO SLIGHT DEGASSING IS VISIBLE.

SANDSTONE = WHITE TO LIGHT GRAY TO DARK GRAY TO TAN TO TRANSLUCENT; QUARTZ FRAMEWORK; VERY FINE TO FINE TO MEDIUM GRAIN SIZE; GENERALLY FAIR TO WELL SORTED GRAINS WITH LOW TO MODERATE SPHERICITY; FRIABLE TO FIRM FRIABLE HARDNESS; CALCITE CEMENTATION; SAMPLE IS READILY ACTIVE TO HCL SOLUTION; SAMPLE CONTAINS DARK BROWN AND BLACK LITHIC FRAGMENTS.

SHALE = COLOR VARIES FROM LIGHT GRAY TO GRAY TO DARK GRAY; SAMPLE IS CRUNCHY TO CRUMBLY TO BRITTLE TENACITY; GENERALLY PLANAR TO IRREGULAR FRACTURE; CUTTINGS HABIT TENDS TO BE MASSIVE TO PLATY TO FLAKY TO WEDGE LIKE TO BLADED; EARTHY TO DULL TO OCCASIONALLY WAXY LUSTER; OVERALL MASSIVE STRUCTURE WITH OCCASIONAL STRINGERS OF DARK BROWN AND BLACK CARBONACEOUS MATERIAL.

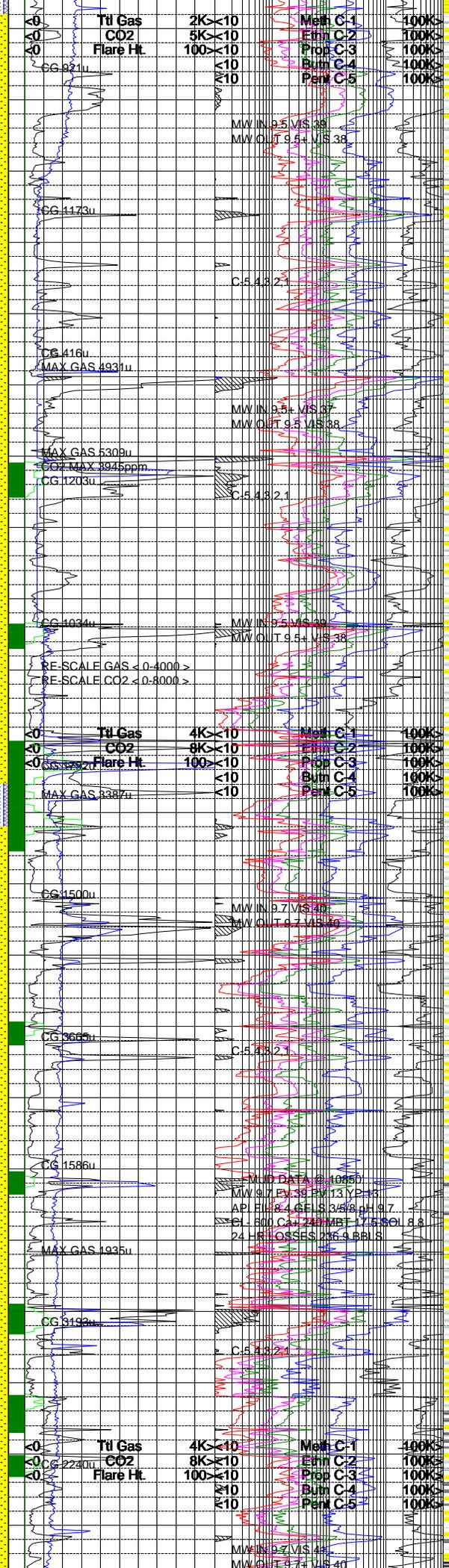
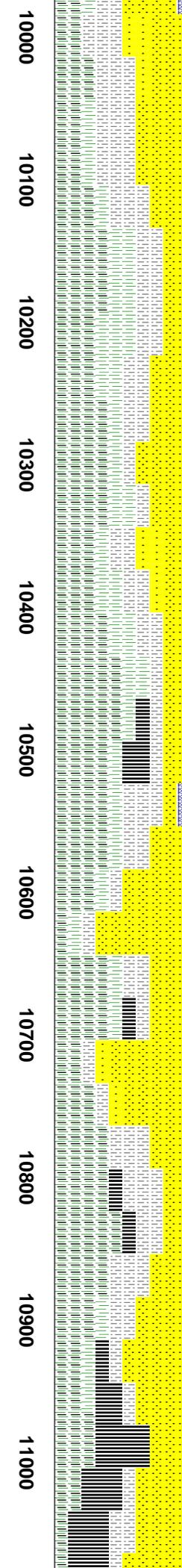
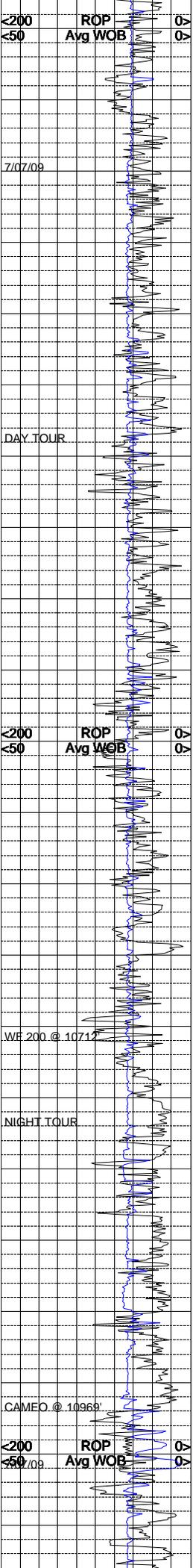
CARBONACEOUS SHALE = DARK GRAY TO REDDISH BLACK TO BLACK; BRITTLE TO CRUNCHY TENACITY; IRREGULAR TO BLOCKY TO PLANAR FRACTURE; MASSIVE TO PLATY TO TABULAR TO WEDGE LIKE CUTTING HABIT; EARTHY TO DULL TO GREASY TO RESINOUS LUSTER WITH SMOOTH TO SILTY TEXTURE.

SANDSTONE = WHITE TO LIGHT GRAY TO OPAQUE AND OCC TRANSLUCENT WITH GREENISH BLUE HUES COMMON; FINE TO MEDIUM LOWER AND COARSE TO VERY COARSE UPPER GRAINED; WELL SORTED; SUBANGULAR TO ANGULAR TO SUBROUNDED; LOW TO MODERATE TO TRACE HIGH SPHERICITY; FIRM TO HARD TO VERY HARD CALCITE CEMENTATION; RARE FROSTED MECHANICAL ABRASION FOUND ON BIT CUT









BRITTLE TENACITY; IRREGULAR TO PLATY TO OCC SPLITTERY AND PLANAR FRACTURE; PLATY TO FLAKY TO SCALY TO WEDGELIKE TO TRACE BLADED CUTTINGS HABIT; DULL TO WAXY TO EARTHY LUSTER; SMOOTH TO CLAYEY TEXTURE; OCCASIONAL STRINGERS OF PINPOINT PYRITE ARE COMMON ALONG WITH SLIGHTLY DEGASSING CARBONACEOUS SHALE FOUND WITHIN SAMPLE MATRIX.

SANDSTONE = COLOR RANGES FROM OFF WHITE TO TANNISH BROWN TO TRANSLUCENT WITH A SALT AND PEPPER APPEARANCE AND TRACES OF DARK GREENISH HUES; FINE TO MEDIUM LOWER TO COARSE AND OCC VERY COARSE UPPER GRAINED; POORLY TO FAIRLY SORTED WITH SOME WELL SORTED SILICA CEMENTATION; OVERALL SUBANGULAR TO SUBROUNDED; MODERATE TO LOW SPHERICITY; FIRM FRIABLE TO MODERATELY HARD AND OCC HARD; DARK BROWN AND BLACK LITHICS FOUND WITHIN SAND MATRIX; STRINGERS OF SHALE AND CARBONACEOUS SHALE COMMON; KAOLINITIC SAND ALSO VISIBLE WITHIN SAMPLE TRAY <10%; MODERATELY CALCAREOUS; NO VISIBLE HYDROCARBON INDICATORS PRESENT.

CARBONACEOUS SHALE = DARK GRAY TO REDDISH BLACK TO BLACK; BRITTLE TO CRUNCHY TENACITY; IRREGULAR TO BLOCKY TO PLANAR FRACTURE; MASSIVE TO PLATY TO TABULAR TO WEDGE LIKE CUTTING HABIT; EARTHY TO DULL TO GREASY TO RESINOUS LUSTER WITH SMOOTH TO CLAYEY TO SLIGHTLY SILTY TEXTURE; OCCASIONAL STRINGERS OF CARBONACEOUS MATERIAL AND PYRITE ARE VISIBLE IN SAMPLE.

SANDSTONE = COLOR VARIES FROM GRAY WHITE TO OCCASIONALLY TRANSLUCENT TO TRANSPARENT; QUARTZ FRAMEWORK; GRAIN SIZE TENDS TO BE FINE TO MEDIUM TO OCCASIONALLY COARSE; GRAINS ARE FAIR TO WELL SORTED WITH GENERALLY ROUND TO SUB-ROUND ANGULARITY AND LOW TO MODERATE SPHERICITY; SURFACE FEATURES INCLUDE OCCASIONALLY POLISHED AND FROSTED GRAINS; SAMPLE IS FRIABLE TO FIRM FRIABLE TO MODERATELY HARD; OVERALL SILICA CEMENTATION ALTHOUGH SLIGHT REACTION TO HCL SOLUTION; SAMPLE CONSISTS OF APPROX. TWO TO FIVE PERCENT DARK COLORED LITHIC FRAGMENTS; UNDER UV LIGHT NO VISIBLE SIGNS OF HYDROCARBONS.

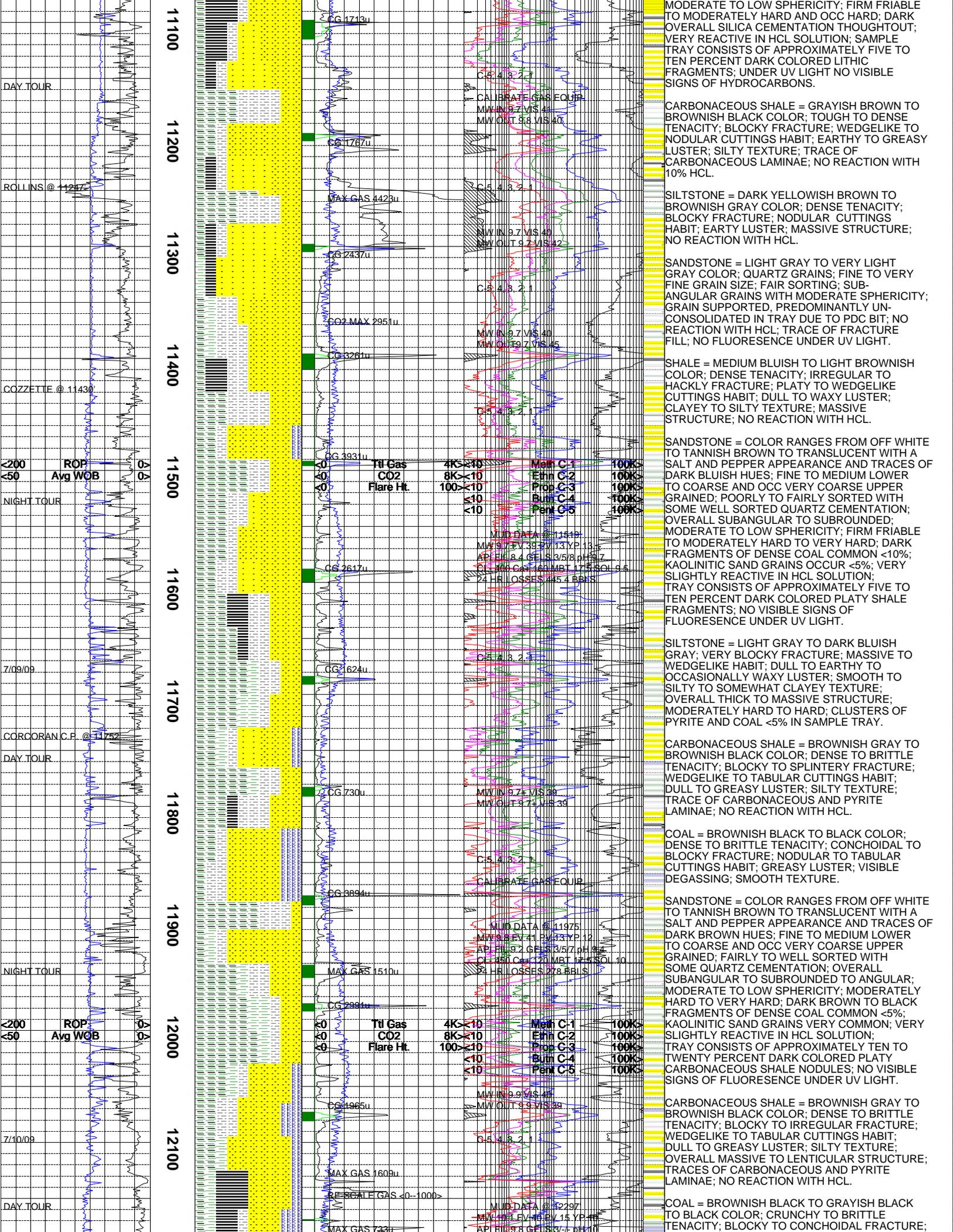
SHALE - COLOR VARIES FROM GRAY TO DARK GRAY TO OCCASIONALLY BLACK; CRUNCHY TO BRITTLE TO SLIGHTLY DENSE TENACITY; IRREGULAR TO PLANAR TO HACKLY FRACTURE; PLATY TO FLAKY TO WEDGE-LIKE TO BLADED CUTTINGS HABIT; SLIGHTLY WAXY TO DULL TO EARTHY LUSTER; TEXTURE IS GENERALLY SMOOTH TO SLIGHTLY CLAYEY; THIN LAMINAE TO MASSIVE STRUCTURE; OCCASIONAL CARBONACEOUS MATERIAL PRESENT IN SAMPLE.

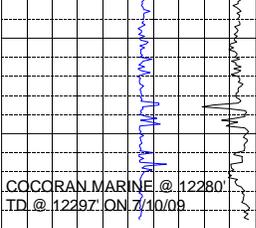
CARBONACEOUS SHALE = DARK GRAY TO GRAY TO REDDISH BLACK TO BLACK; BRITTLE TO CRUNCHY TENACITY; IRREGULAR TO BLOCKY TO PLANAR FRACTURE; MASSIVE TO PLATY TO TABULAR TO WEDGELIKE CUTTINGS HABIT; EARTHY TO DULL TO GREASY TO RESINOUS TO SLIGHTLY SPARKLY LUSTER; OVERALL HAS A SMOOTH TO CLAYEY TO ASHY AND SLIGHTLY SILTY TEXTURE; VERY COMMON OCCURENCE OF CARBONACEOUS MATERIAL AND PYRITE CLUSTERS ARE VISIBLE IN SAMPLE; NON CALCAREOUS OVERALL.

SHALE = GENERALLY GRAY TO DARK GRAY IN COLOR; BRITTLE TO CRUNCHY TENACITY; PLANAR TO IRREGULAR TO BLOCKY FRACTURE; MASSIVE TO TABULAR WITH OCCASIONALLY FLAKY TO SCALY TO WEDGELIKE TO BLADED CUTTINGS HABIT; DULL TO SOMEWHAT WAXY AND EARTHY LUSTER; SMOOTH TO CLAYEY TEXTURE; OCCASIONAL STRINGERS OF PYRITE AND LARGE CARBONACEOUS SHALE NODULES ARE VERY COMMON.

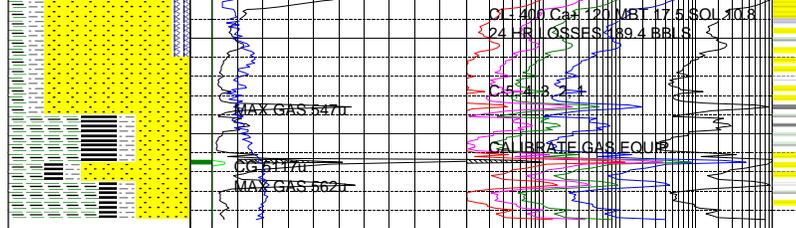
COAL = BLACK TO VERY DARK GRAY; CRUNCHY TO BRITTLE TO OCC DENSE TENACITY; BLOCKY TO CONCHOIDALLY FRACTURED; OVERALL MASSIVE TO TABULAR CUTTINGS HABIT; METALLIC TO VITREOUS LUSTER ON BIT CUT FACE; VERY SMOOTH TEXTURE; WELL LAMINATED TO THICK STRUCTURE; DISTINCT PLANAR FEATURES EMBEDDED WITHIN GRAIN MATRIX WITH VISIBLE DEGASSING COMMON.

SANDSTONE = COLOR RANGES FROM OFF WHITE TO TANNISH BROWN TO TRANSLUCENT WITH A SALT AND PEPPER APPEARANCE AND TRACES OF DARK GREENISH HUES; FINE TO MEDIUM LOWER TO COARSE AND OCC VERY COARSE UPPER GRAINED; POORLY TO FAIRLY SORTED WITH SOME WELL SORTED SILICA CEMENTATION; OVERALL SUBANGULAR TO SUBROUNDED;





12200  
123



TABULAR TO NODULAR TO WEDGELIKE CUTTINGS HABIT; GREASY TO DULL LUSTER; SMOOTH TO GRITTY TEXTURE; MASSIVE STRUCTURE; DE-GASSING IS VISIBLE.  
SILTSTONE = BROWNISH GRAY COLOR; BRITTLE TENACITY; IRREGULAR FRACTURE; NODULAR CUTTINGS HABIT; EARTHY LUSTER; SILTY TEXTURE; MASSIVE STRUCTURE.  
NOTE = TD PRODUCTION @ 12297' 07/10/09.

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