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MUDLOG MD

COMPANY	ExxonMobil Production
WELL	PCU - 297-12A6
FIELD	Piceance Creek Unit
REGION	Rocky Mountain
COORDINATES	Lat: 39.889045 Long: 108.237271
ELEVATION	GL: 7183.6' KB: 7213.8'
COUNTY, STATE	Rio Blanco, CO.
API INDEX	051031116400
SPUD DATE	08/18/08
CONTRACTOR	HP Drilling
CO. REP.	M.Sadler / J. Woods
RIG/TYPE	326 / FLEX FOUR
LOGGING UNIT	Canrig Unit 36
GEOLOGISTS	Jeremiah Kokes Brandon Laiche
ADD. PERSONS	Huel Strickland Patty Strickland
CO. GEOLOGIST	Chris Alba

LOG INTERVAL

DEPTHS:	4133'	TO	13444'
DATES:	06/01/09	TO	11/12/09
SCALE:	1" = 100'		

CASING DATA

16.000"	AT	150'
10.750"	AT	4105'
7.000"	AT	9375'
4.500"	AT	13444'

MUD TYPES

WATER BASE	TO	4133'
LSND	TO	4134'
DSF	TO	5811'
LSND	TO	6185'

HOLE SIZE

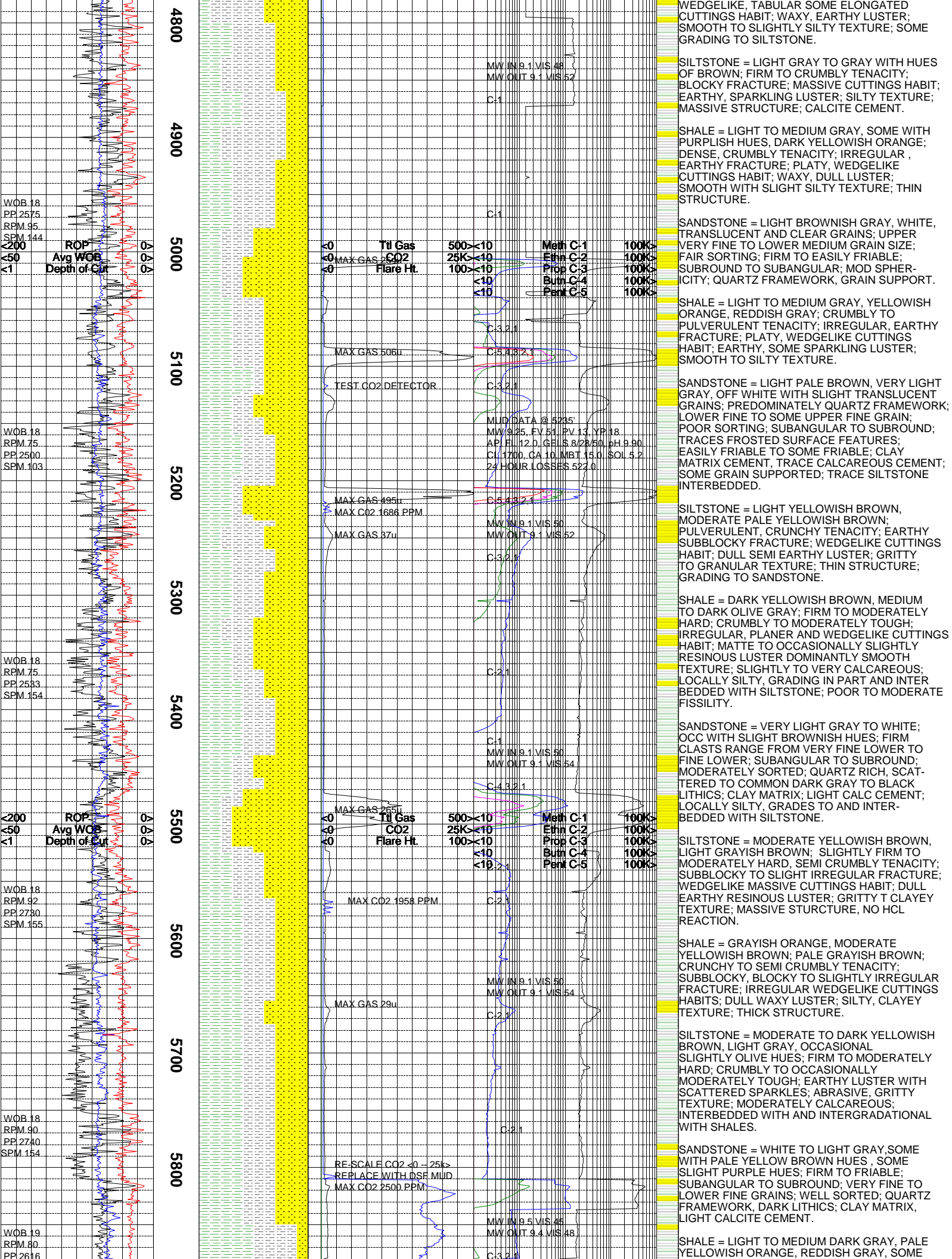
14.250"	TO	4133'
9.875"	TO	9390'
6.125"	TO	13444'
	TO	

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	

ROP			Depth	Lithology	Ttl Gas			Meth C-1					Interp Lith	Remarks
<200 ft/hr	Avg WOB kibs	Depth of Cut in/rev			units	CO2	Flare Ht.	<10	Ethn C-2	Prop C-3	Butn C-4	Pent C-5		
					MGS									
			3900											ALL ROCK COLORS ARE REFERENCED TO THE CONNECTION GASES AS WELL AS TRIP AND DOWNTIME GASES ARE NOTED ON THE LOG. LARGE CONNECTION GASES WHICH APPEAR ON THE MUD LOG USUALLY REFLECT UPHOLE GAS INTERVALS BLEEDING GAS INTO THE BOREHOLE DURING CONNECTIONS.
			4000											GAS CHROMATOGRAPHY EQUIPMENT IS CALIBRATED TO A TEST GAS COMPOSED OF METHANE = 10040 PPM ETHANE = 990 PPM PROPANE = 1000 PPM I-BUTANE = 1010 PPM N-BUTANE = 1000 PPM I-PENTANE = 1000 PPM N-PENTANE = 1000 PPM
			4100											WHEN THE MUD IS CIRCULATED THROUGH THE GAS BUSTER, THE INTERVAL IS MARKED IN THE MGS COLUMN AND SIZE OF FLARES ARE NOTED.
			4200											EVIDENCE OF FRACTURE FILL IS NOTED ON THE MUD LOG. KAOLIN PERCENTAGE IN SS INTERVALS IS ALSO NOTED ON THE MUD LOG.
			4300											I UNIT OF GAS = 200 PPM METHANE
			4400											SET 10 3/4" SURFACE CASING AT 4118'
			4500											EPOCH COMMENCED LOGGING ON 6/03/2009 AT 4133' MD.
			4600											SHALE = MODERATE YELLOWISH BROWN; CRUMBLY, TENACITY; SUBBLOCKY FRACTURE; WEDGE LIKE , TABULAR CUTTINGS HABIT; DULL EARTHY LUSTER, SILTY, CLAYEY TEXTURE; MASSIVE TO THICK STRUCTURE.
			4700											SILTSTONE = PURPLISH BROWN, LIGHT TO MEDIUM GRAY; FIRM TO MODERATELY HARD; CRUMBLY TO OCCASIONALLY TOUGH; IRREG AND SUBBLOCKY OR WEDGE LIKE CUTTINGS HABIT; MATTE LUSTER WITH SCATTERED SPARKLES; MODERATELY CALCAREOUS; SCATTERED CARBONACEOUS SPECKS; LOCALLY COMMON VERY FINE SAND, OCC SANDY, GRADES IN PART TO VERY FINE SANDSTONE.
														SILTSTONE = LIGHT YELLOWISH BROWN, MODERATE PALE YELLOWISH BROWN; PULVERULENT, CRUNCHY TENACITY; EARTHY SUBBLOCKY FRACTURE; WEDGE LIKE CUTTINGS HABIT; DULL SEMI EARTHY LUSTER; GRITTY TO GRANULAR TEXTURE; THIN STRUCTURE; GRADING TO SANDSTONE.
														SHALE = MEDIUM GRAY, LIGHT BLuish GRAY, BROWNISH YELLOW ORANGE, SOME SLIGHT GRAYISH RED; CRUMBLY TO PULVERULENT TENACITY; IRREGULAR EARTHY FRACTURE; TABULAR TO WEDGE LIKE CUTTINGS HABIT; DULL EARTHY LUSTER; CLAYEY TO SILTY TEXTURE; THIN STRUCTURE.
														SANDSTONE = WHITE, TRANSLUCENT, PALE BROWN WITH DARK LITHICS; VERY FINE TO FINE GRAINS; WELL SORTED; EASILY FRIABLE SUBANGULAR TO ANGULAR; LOW SPHERICITY; QUARTZ FRAMEWORK; CALCITE CEMENT; STRONG REACTION TO DILUTE HCL.
														SILTSTONE = YELLOWISH BROWN, LIGHT GRAY, SOME WITH PURPLISH HUES, LIGHT OLIVE GRAY; FIRM TO FRIABLE; BRITTLE CRUNCHY TENACITY; EARTHY LUSTER SOME SPARKLING; THIN STRUCTURE, SOME GRADING TO SAND-STONE.
														SHALE = MEDIUM GRAY, DARK YELLOWISH ORANGE, HUES OF DARK REDDISH GRAY; DENSE CRUNCHY TENACITY; EARTHY, HACKLY FRACTURE; TABULAR WEDGE LIKE CUTTINGS HABIT; WAXY, EARTHY LUSTER; SILTY TEXTURE; THIN STRUCTURE.
														SANDSTONE = WHITE TO LIGHT GRAY WITH SALT PEPPER APPEARANCE; VERY FINE TO LOWER FINE GRAINS; WELL SORTED; SUBROUND TO SUBANGULAR; MODERATE SPHERICITY; EASILY FRIABLE; QUARTZ FRAMEWORK, LIGHT CALCITE CEMENT.
														SHALE = MEDIUM GRAY, YELLOWISH ORANGE, PALE BROWN, GRAYISH RED; CRUMBLY, PULVERULENT TENACITY; EARTHY FRACTURE;



WASATCH G @ 5935

06/05/2009

ROP <200
Avg WOB <50
Depth of Cut <1

LOST RETURNS

WOB 18
RPM 92
PP 2700
SPM 154

SHORT TRIP TO SHOE

06/06/2009

WOB 18
RPM 65
PP 2620
SPM 155

WOB 17
RPM 68
PP 2570
SPM 155

ROP <200
Avg WOB <50
Depth of Cut <1

LOSING MUD

LOSING MUD

LOSING MUD

WOB 18
RPM 78
PP 2604
SPM 155

LOSING MUD

LOSING MUD

WOB 18
RPM 65
SPM 77
PP 2538

6/7/2009

CG 81u
MAX GAS 171u

MAX GAS 176u

Ti Gas
CO2
Flare Ht

MAX GAS 1145u

MAX GAS 167u
MAX GAS 91u

REPLACE WITH LSND MUD

MAX GAS 330u

MAX GAS 330u

MAX GAS 34u

CG 868u

Ti Gas
CO2
Flare Ht

MAX GAS 285u

MAX GAS 287u

MAX GAS 187u

CG 261u

MAX GAS 278u

MAX GAS 86u

CG 69u

MAX GAS 82u

MAX GAS 64u

CG 105u

MUD DATA @ 6185
MW 9.40, EV 50, PV 16, YB 18
API FL 12.0, GELS 5.15/30, pH 8.90
CL 1700, CA 10, MBT 17.5, SOL 5.7
24 HOUR LOSSES 775.6

MW IN 9.0 VIS 52
MW OUT 9.0 VIS 52

MW IN 9.3 VIS 47
MW OUT 9.2 VIS 45

MUD DATA IN @ 6495
MW 9.30, EV 45, PV 14, YB 16
API FL 12.4, GELS 9.29/47, pH 10.00
CL 2000, CA 20, MBT 20, SOL 5.2
24 HOUR LOSSES 791.8

MW IN 9.3 VIS 42
MW OUT 9.2 VIS 43

MW IN 9.1 VIS 38
MW OUT 9.1 VIS 46

MW IN 9.1 VIS 51
MW OUT 9.2 VIS 45

MW IN 9.1 VIS 42
MW OUT 9.1 VIS 44

SANDSTONE = WHITE TO LIGHT GRAY SOME WITH GREENISH HUES; HARD TO FRIABLE; VERY FINE TO LOWER MEDIUM GRAIN SIZE; MODERATELY SORTED; SUBANGULAR TO SUBROUND; QUARTZ FRAMEWORK WITH DARK LITHICS; DOMINANTLY GRAIN SUPPORTED WITH LIGHT CALCITE CEMENT; SOME INTERBEDDING WITH SILTSTONE.

SANDSTONE = PALE TANNISH STAIN OFF WHITE LIGHT YELLOWISH PALE BROWN; SOME CLEAR TRANSLUCENT QUARTZ FRAMEWORK; UPPER VERY FINE, PREDOMINATELY FINE GRAIN; POOR SORTING; TRACES SUBROUND, SUBANGULAR IN ANGULARITY; LOW SPHERICITY; SLIGHT SEMI FROSTED SURFACE FEATURES; FRIABLE TO SEMI FIRM FRIABLE; CLAY MATRIX CEMENT, VERY MINOR CALCAREOUS CEMENT; DARK GRAY TO GRAYISH BLACK LITHICS AND SOME DARK BROWNISH SILTS INTERBEDDED.

SHALE = LIGHT TO MEDIUM GRAY, BROWNISH BLACK, YELLOWISH ORANGE, REDDISH GRAY; CRUMBLY TO PULVERULENT TENACITY; IRREGULAR, EARTHY FRACTURE; WEDGELIKE, TABULAR WITH SOME EQUANT CUTTINGS HABIT; DULL EARTHY LUSTER; SMOOTH TO SLIGHTLY SILTY TEXTURE; THIN STRUCTURE.

SILTSTONE = MODERATE TO DARK YELLOWISH BROWN, LIGHT GRAY, OCCASIONAL SLIGHTLY OLIVE HUES; FIRM TO MODERATELY HARD; CRUMBLY TO OCCASIONALLY MODERATELY TOUGH; EARTHY LUSTER WITH SCATTERED SPARKLES; ABRASIVE, GRITTY TEXTURE; MODERATELY CALCAREOUS; INTERBEDDED WITH AND INTERGRADATIONAL WITH SHALES.

SHALE = GRAYISH ORANGE, MODERATE YELLOWISH BROWN; PALE GRAYISH BROWN; CRUNCHY TO SEMI CRUMBLY TENACITY; SUBBLOCKY, BLOCKY TO SLIGHTLY IRREGULAR FRACTURE; IRREGULAR WEDGELIKE CUTTINGS HABITS; DULL WAXY LUSTER; SILTY, CLAYEY TEXTURE; THIN COAL BEDS.

SILTSTONE = LIGHT BROWNISH ORANGE, LIGHT GRAYISH BROWN; SLIGHTLY FIRM, CRUMBLY TENACITY; SUBBLOCKY, IRREGULAR, FRACTURE; BLOCKY WEDGELIKE CUTTINGS HABIT; DULL WAXY RESINOUS LUSTER; GRITTY, CLAYEY TEXTURE; THICK MASSIVE STRUCTURE.

SHALE = DARK YELLOWISH BROWN, COM REDDISH HUES, OCCUR LIGHT GREENISH GRAY; MO HARD; CRUMBLY TO MODERATELY TOUGH; IRREGULAR, PLANER AND WEDGELIKE CUTTINGS HABIT; MATTE TO OCCASIONALLY SLIGHTLY RESINOUS LUSTER DOMINANTLY SMOOTH TEXTURE; SLIGHTLY TO NON CALCAREOUS; POOR TO MODERATELY FISSILE.

COAL = BLACK TO DUSKY YELLOWISH BROWN; FIRM; BRITTLE; IRREGULAR CUTTINGS WITH SHARP EDGES; RESINOUS LUSTER; SMOOTH SURFACE TEXTURE; OCCASIONAL THIN STREAKS CARBONACEOUS SHALE; THINLY INTERBEDDED WITH SHALE AND SILTSTONE

CARBONACEOUS SHALE = DUSKY REDDISH BROWN, DARK GRAYISH BROWN; FIRM TO CRUMBLY TENACITY; EARTHY, SUBBLOCKY BLOCKY SLIGHT IRREGULAR FRACTURE; SUBBLOCKY, WEDGELIKE, SEMI MASSIVE CUTTINGS HABIT; DULL, EARTHY LUSTER; SEMI MASSIVE STRUCTURE.

SANDSTONE = WHITE TO LIGHT GRAY WITH BLACK LITHS, SOME CLASTS WITH GREENISH HUES; FIRM TO EASILY FRIABLE; VERY FINE TO FINE GRAINS; WELL SORTED; SUBROUND TO SUBANGULAR; MODERATE SPHERICITY; DOMINATE QUARTZ, LIGHT CALCITE CEMENT.

SILTSTONE = LIGHT GRAY TO BLuish GRAY, GRAYISH RED, PALE BROWN; HARD TO FRIABLE SILTY TO GRITTY TEXTURE; EARTHY WITH SPARKLING LUSTER; SOME BANDED STRUCTURE WITH CARBONACEOUS MATERIAL; INTERGRADING WITH VERY FINE SANDSTONE.

SHALE = LIGHT TO MEDIUM GRAY, BROWNISH GRAY; DENSE, BRITTLE, CRUNCHY TENACITY; EARTHY TO BLOCKY FRACTURE; WEDGELIKE TABULAR SOME ELONGATED CUTTINGS HABIT; WAXY, EARTHY LUSTER WITH SOME SPARKLES; CLAYEY TO SILTY TEXTURE; THIN, WITH SOME SLIGHT FISSILE STRUCTURE.

SANDSTONE = WHITE TO LIGHT GRAY, PALE BROWN, OLIVE HUES, DARK LITHICS THROUGH-

