

**GEOLOGICAL WELL LOGGING**

# trata-graphic

**Corp.**

P.O. Box 41468 Sacramento, CA 95841

COMPANY: SANDIA TECHNOLOGIES, LLC  
 WELL: CITIZEN GREEN WELL NO. 1  
 API NO.: 04-077-20688  
 FIELD: KING ISLAND GAS FIELD  
 LOCATION 2380'W & 3900'N from SE corner of  
 Sec. 28, T3N - R5E, MDB&M.

ELEVATION: GL -6' KB 11'  
 COUNTY SAN JOAQUIN  
 STATE CALIFORNIA  
 SPUD DATE: 12/03/2011 TIME 6:30 pm  
 LOGGING DATE:  
 FROM 12/03/2011 TO  
 LOGGING DEPTH:  
 FROM 800' TO  
 WELL SITE GEOL.  
 OP. GEOL. & ENG. JOHN BEYER/ DONALD STEHLE  
 DRLG. FORMAN TED COFFEE  
 DRLG. CONTR. PAUL GRAHAM DRILLING  
 RIG 6  
 TOOL PUSHER DAVE LANDERS  
 MUD CONTR. GEO DRILLING FLUIDS, INC.  
 MUD ENG. BERNIE RELYEA  
 LOGGING GEOL. 1. R.L. SWARENS  
 2. TRISTAN R.M. MULLEN  
 3. J. LOCKE / M. ADAMSON

ABBREVIATIONS		MUD DATA		LITHOLOGY		HOLE SIZE	
NEW BIT	NB	MUD WEIGHT	MW	CLAY		7-7/8"	to _____
RE - RUN BIT	RRB	MUD VISCOSITY	MV	SHALE		_____	to _____
RE - TIP BIT	RTB	WATER LOSS	WL	SILTSTONE		_____	to _____
CORE BIT	CB	SAND %	SD	SANDY SILTSTONE		CASING SIZE	
CHECK FLOW	CF	SALINITY	SAL	FINE SAND			
CIRCULATE OUT	CO	RESISTIVITY	RM	MEDIUM SAND		_____	to _____
TRIP GAS	TG	FILTRATE RESIS.	RMF	COARSE SAND		_____	to _____
CONNECTION GAS	CG	PLASTIC VISC.	PV	SANDSTONE		MUD TYPE	
WIPE HOLE GAS	WHG	YIELD POINT	YP	CONGLOMERATE			
SURVEY GAS	SG	SOLIDS	SOL	LIGNITE		_____	to _____
NO RETURNS	NR	PH	PH	LIMESTONE		_____	to _____
LOG AFTER TRIP	LAT			DOLOMITE		_____	to _____
DRILL STEM TEST	DST			VOLCANIC		MUD PUMPS	
				IGNEOUS			
				METAMORPHIC		1. 6" X 9"	
				CHERT		TYPE 2 - MUD KING PZ-9	
				CEMENT		2. 6" X 9"	

SYMBOLS	
	DRILL STEM TEST
	CASING SHOE
	CORED INTERVAL NO RECOVERY
	SIDEWALL CORE

GAS DETECTOR CALIBRATION 100 UNITS 2% METHANE BY VOLUME SCALE 2" = 100'

DRILLING RATE FT./HR.		CORE DEPTH TEST	LITH.	TOTAL GAS		CUTTINGS	REMARKS
SLIDE	DRILL RATE		IN PERCENT	AGITATED GAS	PETROLEUM VAPORS	CUTTING GAS	LITH DESCRIPTION MUD DATA DRILLING DATA TEST & CORE DATA
	_____	100	0	_____	_____	_____	

West Coast Directional  
LCC Casey Summit

NE# 2 - SMITH, MD# 13 - 7 7/8" (4X13) jets in @ 595'

800

Survey @ 806  
S 6.90° E 115.40°  
TVD 805.13'  
S 14.61  
E 11.44

Sand & Clay: medium to fine, clear to cloudy, round to sub-angular quartz, and subround mafic rock fragments, sticky, bluegray, semi-soluble clay

900

Survey @ 992  
S 8.80° E 114.80°  
TVD 899.99'  
S 20.88  
E 24.81

Sand & Clay: medium to fine, clear to cloudy, round to sub-angular quartz, and subangular mafic rock fragments, semi-sticky, bluegray, semi-soluble clay

WHG 9u

1000

Survey @ 1003  
S 8.8° E 115.7°  
TVD 999.80'  
S 38.73  
E 27.59

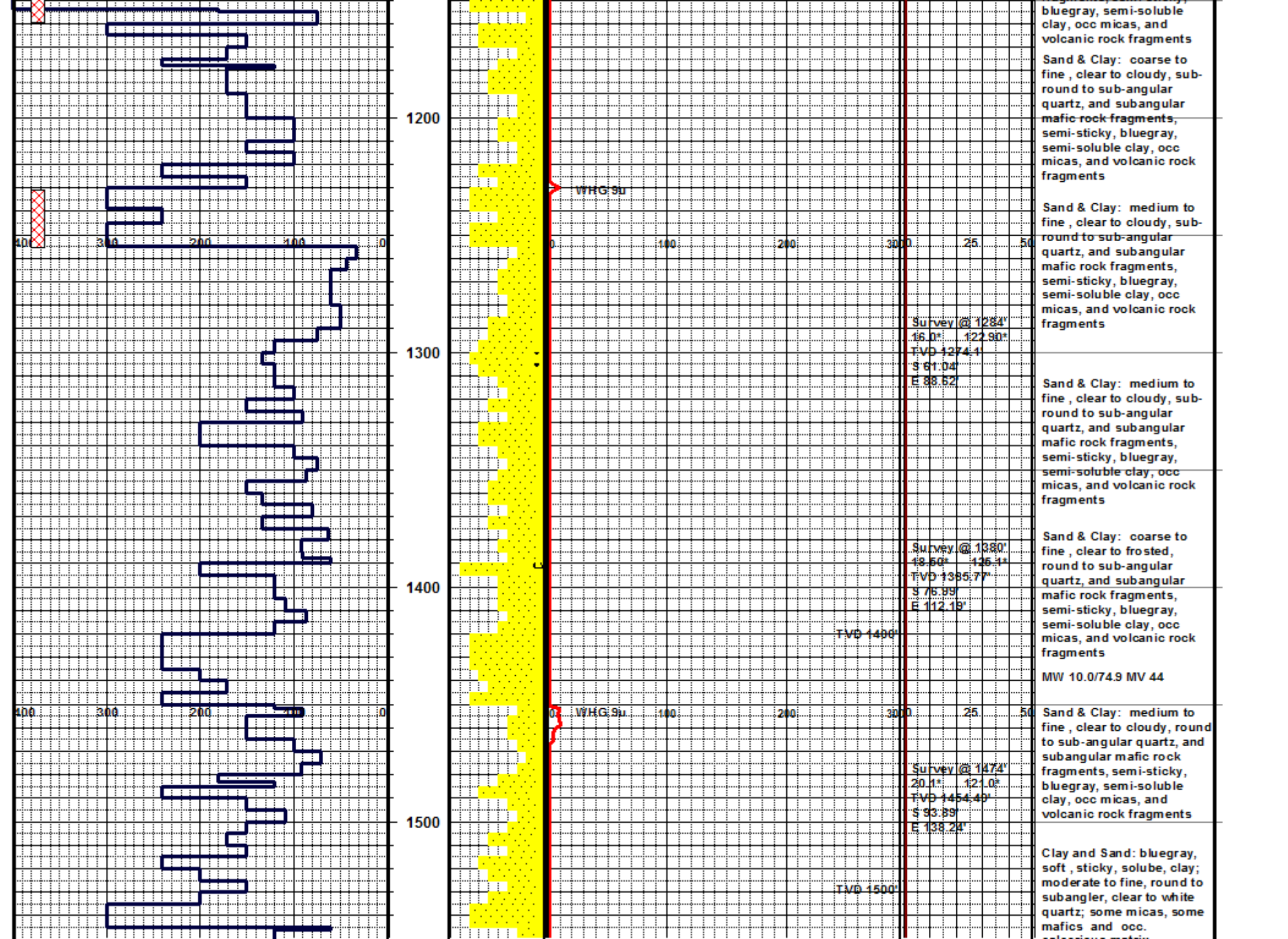
Sand & Clay: coarse to fine, clear to cloudy, round to sub-angular quartz, and subangular mafic rock fragments, semi-sticky, bluegray, semi-soluble clay, occ micas, rare volcanic rock fragments

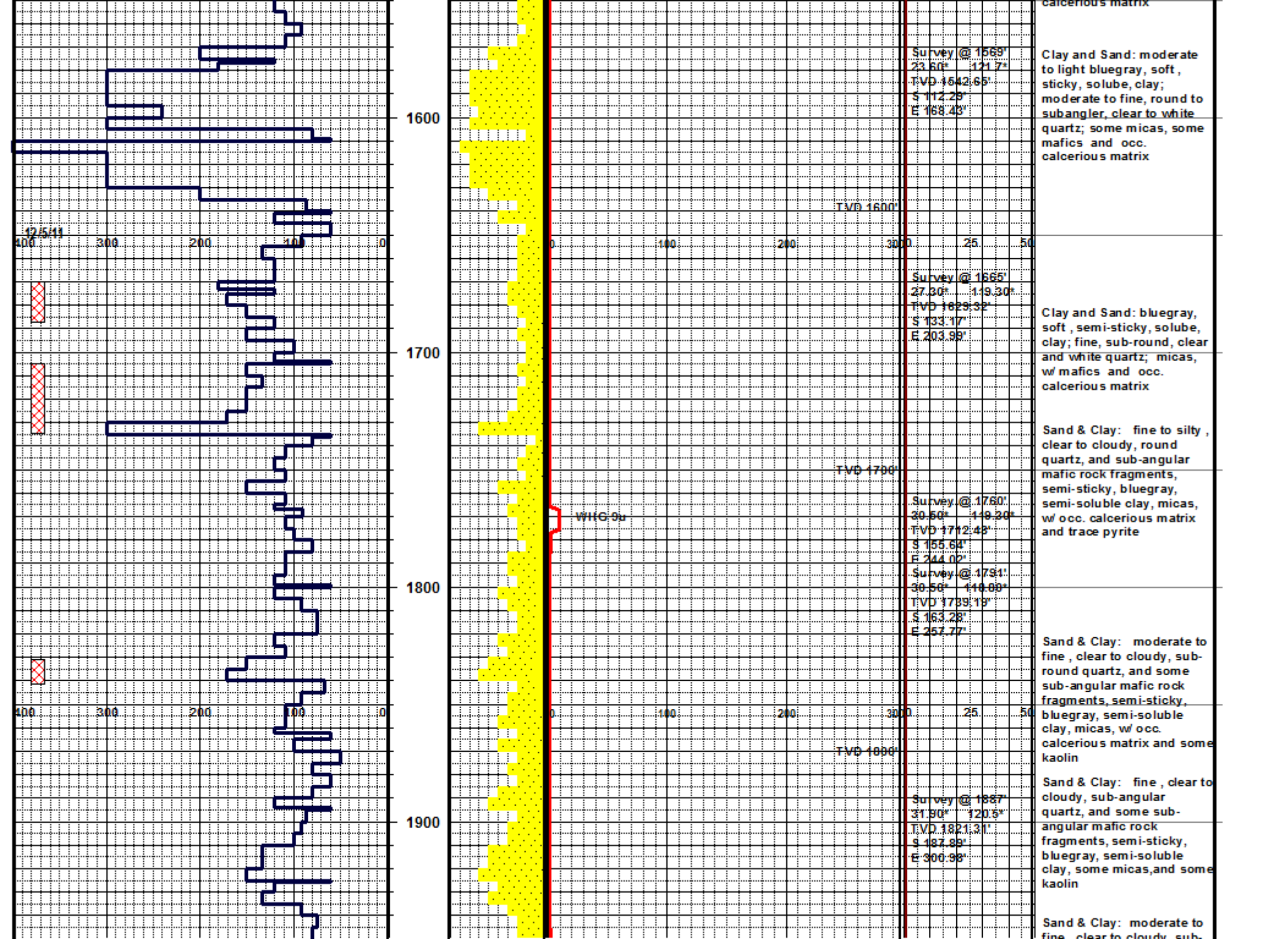
1100

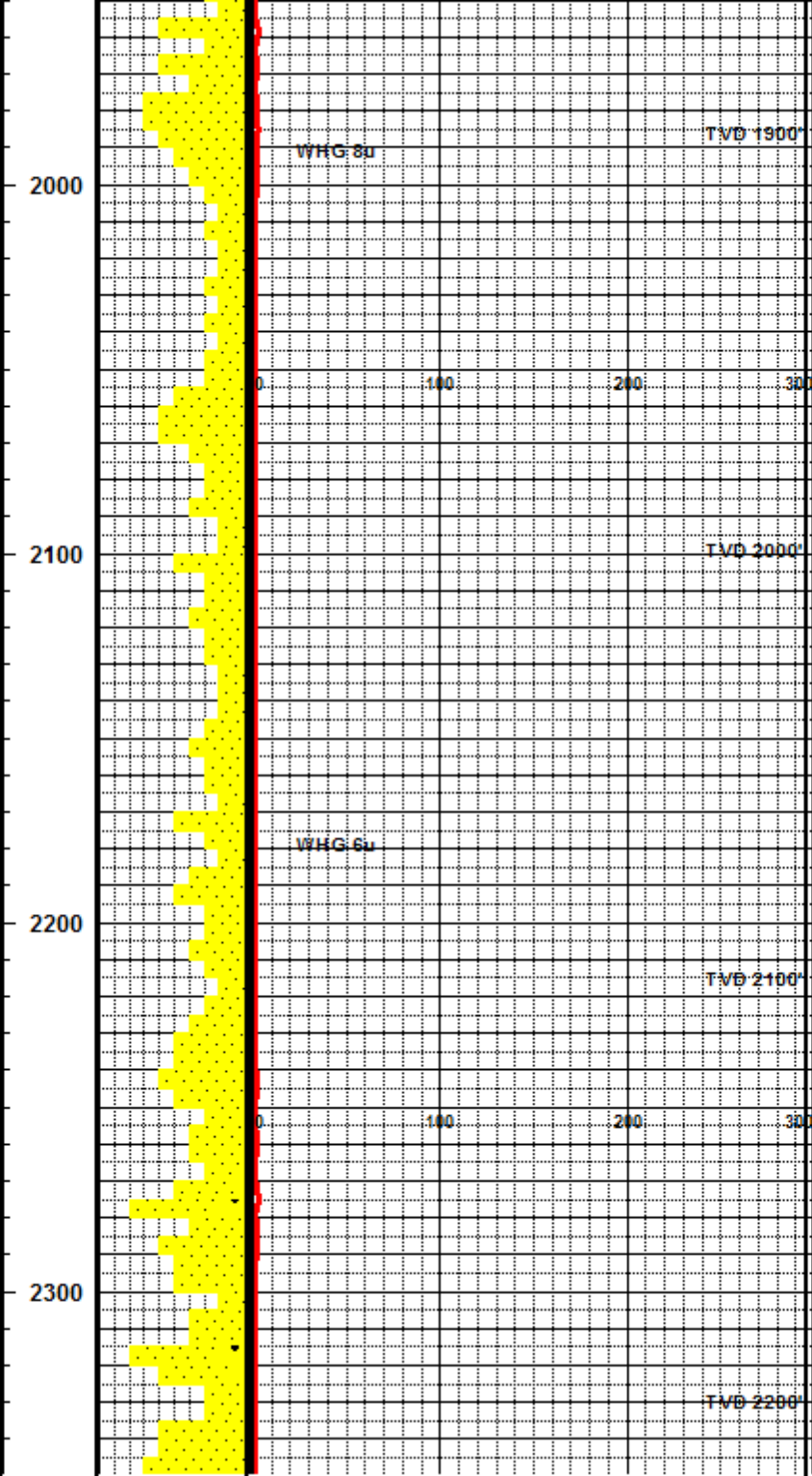
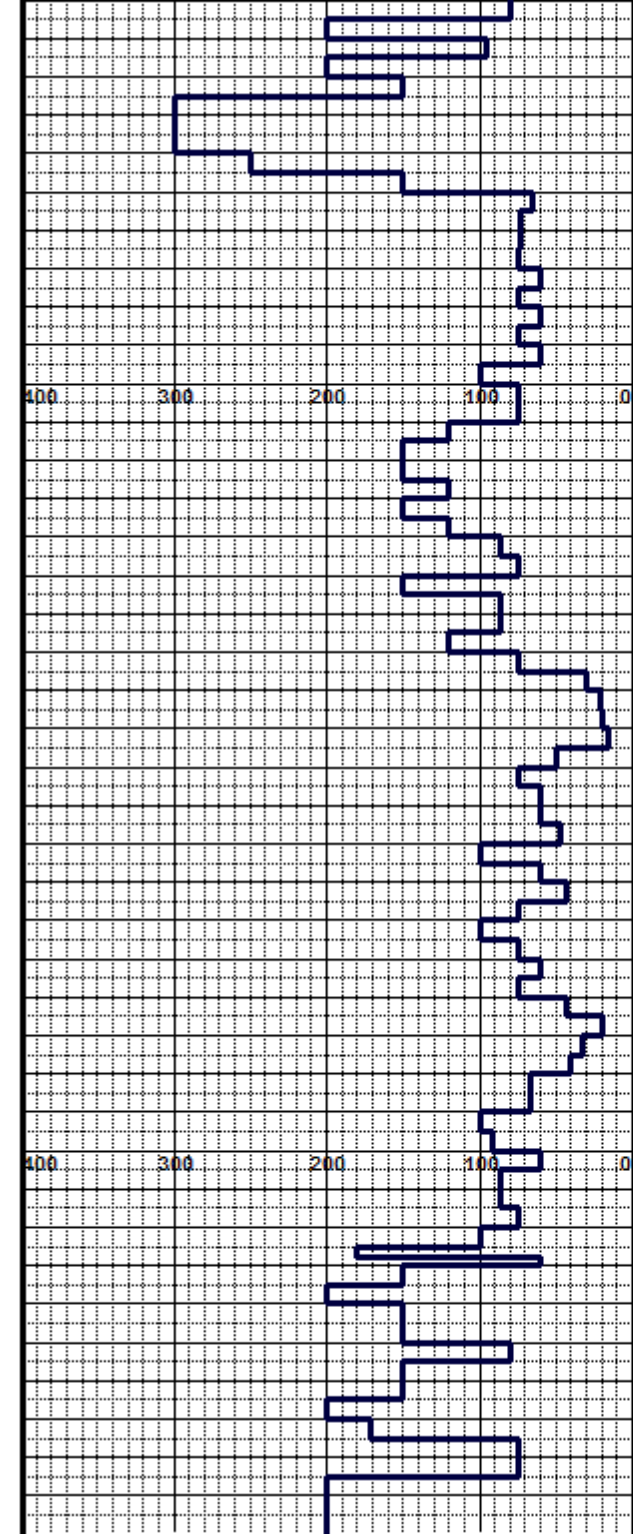
Survey @ 1096  
S 11.0° E 125.4°  
TVD 1091.41'  
S 35.93  
E 52.32

Sand & Clay: coarse to fine, clear to cloudy, round to sub-angular quartz, and subangular mafic rock fragments, semi-sticky, bluegray, semi-soluble clay, occ micas, and volcanic rock fragments

Sand & Clay: medium to fine, clear to cloudy, round to sub-angular quartz, and subangular mafic rock fragments, semi-sticky.







fine, clear to cloudy, sub-round quartz, and some sub-round mafic rock fragments, semi-sticky, bluegray, semi-soluble clay, some micas, and some kaolin

Clay and Sand: bluegray, soft, semi-sticky, soluble, clay; fine to medium, sub-round, clear and white quartz; micas, w/ mafics

Clay and Sand: bluegray, soft, semi-sticky, soluble, clay; fine to medium, sub-round, clear quartz; micas, w/ mafics and occ. volcanic rock fragments

Clay and Sand: bluegray, soft, semi-sticky, soluble, clay; fine to medium, sub-round, clear quartz; micas, w/ mafics and occ. volcanic rock fragments

MW 10.2 /74.9 MV 44

Clay and Sand: bluegray, soft, semi-sticky, soluble, clay; fine to medium, sub-round to sub-angular, clear to cloudy quartz; micas, w/ mafics and occ. volcanic rock fragments

Clay and Sand: bluegray, soft, semi-sticky, soluble, clay and claystone; fine to medium, sub-round to sub-angular, clear to cloudy quartz; occ. micas, mafic volcanic rock fragments

Clay and Sand: bluegray, soft, semi-sticky, soluble, clay and claystone; fine to medium, sub-round to sub-angular, clear to cloudy

WHG 8u

TVD 1900'

Survey @ 2012°  
 31.10° 120.6°  
 TVD 1927.88'  
 S 221.08'  
 E 357.25'

TVD 2000'

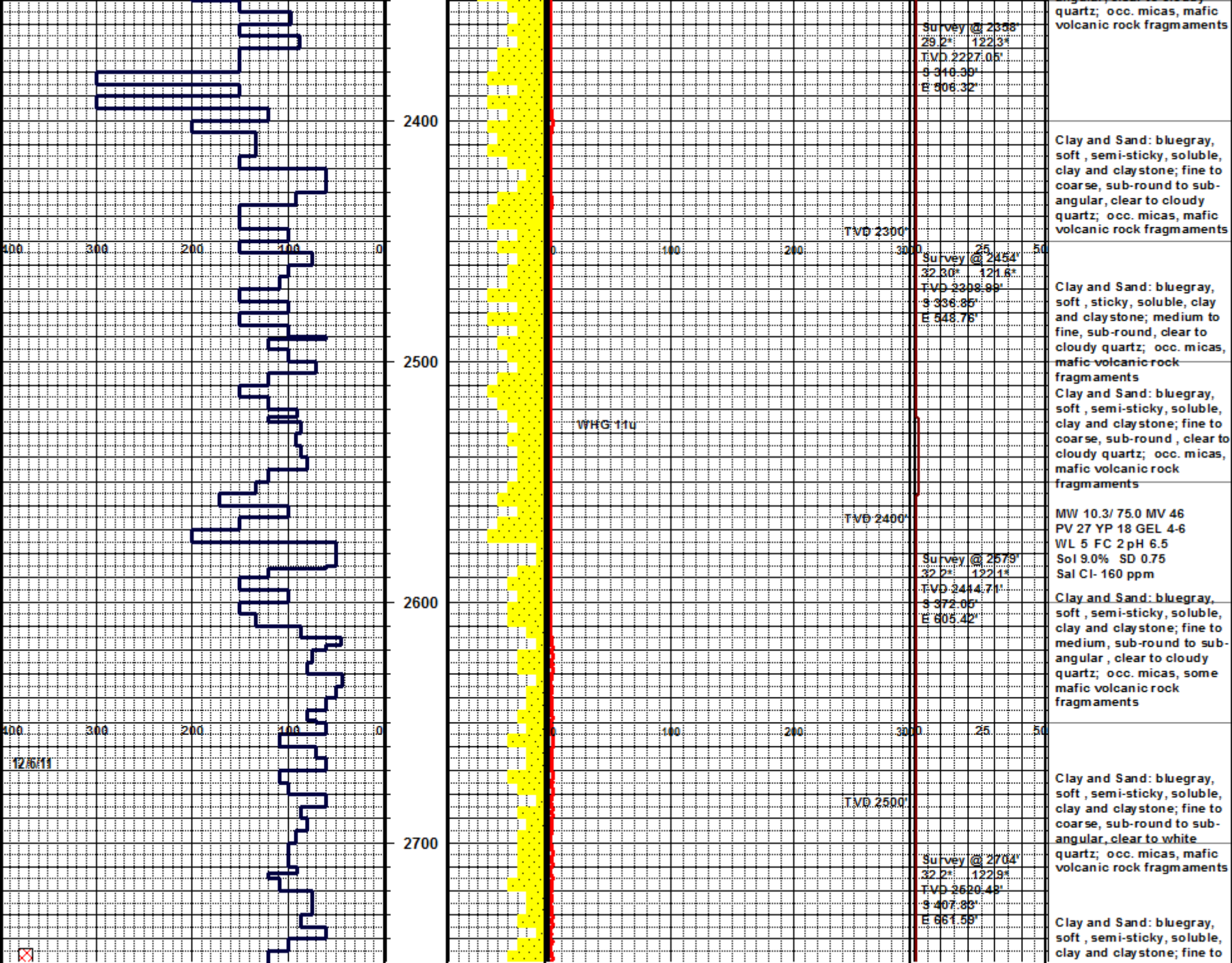
Survey @ 2136°  
 31.4° 120.4°  
 TVD 2034.45'  
 S 253.25'  
 E 411.85'

WHG 6u

TVD 2100'

Survey @ 2262°  
 29.2° 121.1°  
 TVD 2143.78'  
 S 285.27'  
 E 485.87'

TVD 2200'



Survey @ 2338  
 N 29.2° E 122.3'  
 TVD 2227.05'  
 S 316.39'  
 E 806.32'

quartz; occ. micas, mafic volcanic rock fragments

Clay and Sand: bluegray, soft, semi-sticky, soluble, clay and claystone; fine to coarse, sub-round to sub-angular, clear to cloudy quartz; occ. micas, mafic volcanic rock fragments

TVD 2300'

Survey @ 2454  
 N 32.30° E 121.6'  
 TVD 2308.99'  
 S 336.85'  
 E 548.75'

Clay and Sand: bluegray, soft, sticky, soluble, clay and claystone; medium to fine, sub-round, clear to cloudy quartz; occ. micas, mafic volcanic rock fragments

Clay and Sand: bluegray, soft, semi-sticky, soluble, clay and claystone; fine to coarse, sub-round, clear to cloudy quartz; occ. micas, mafic volcanic rock fragments

WHG: 11u

TVD 2400'

Survey @ 2479  
 N 32.2° E 122.1'  
 TVD 2414.71'  
 S 372.05'  
 E 605.42'

MW 10.3/ 75.0 MV 46  
 PV 27 YP 18 GEL 4-6  
 WL 5 FC 2 pH 6.5  
 Sol 9.0% SD 0.75  
 Sal Cl- 160 ppm

Clay and Sand: bluegray, soft, semi-sticky, soluble, clay and claystone; fine to medium, sub-round to sub-angular, clear to cloudy quartz; occ. micas, some mafic volcanic rock fragments

12/6/11

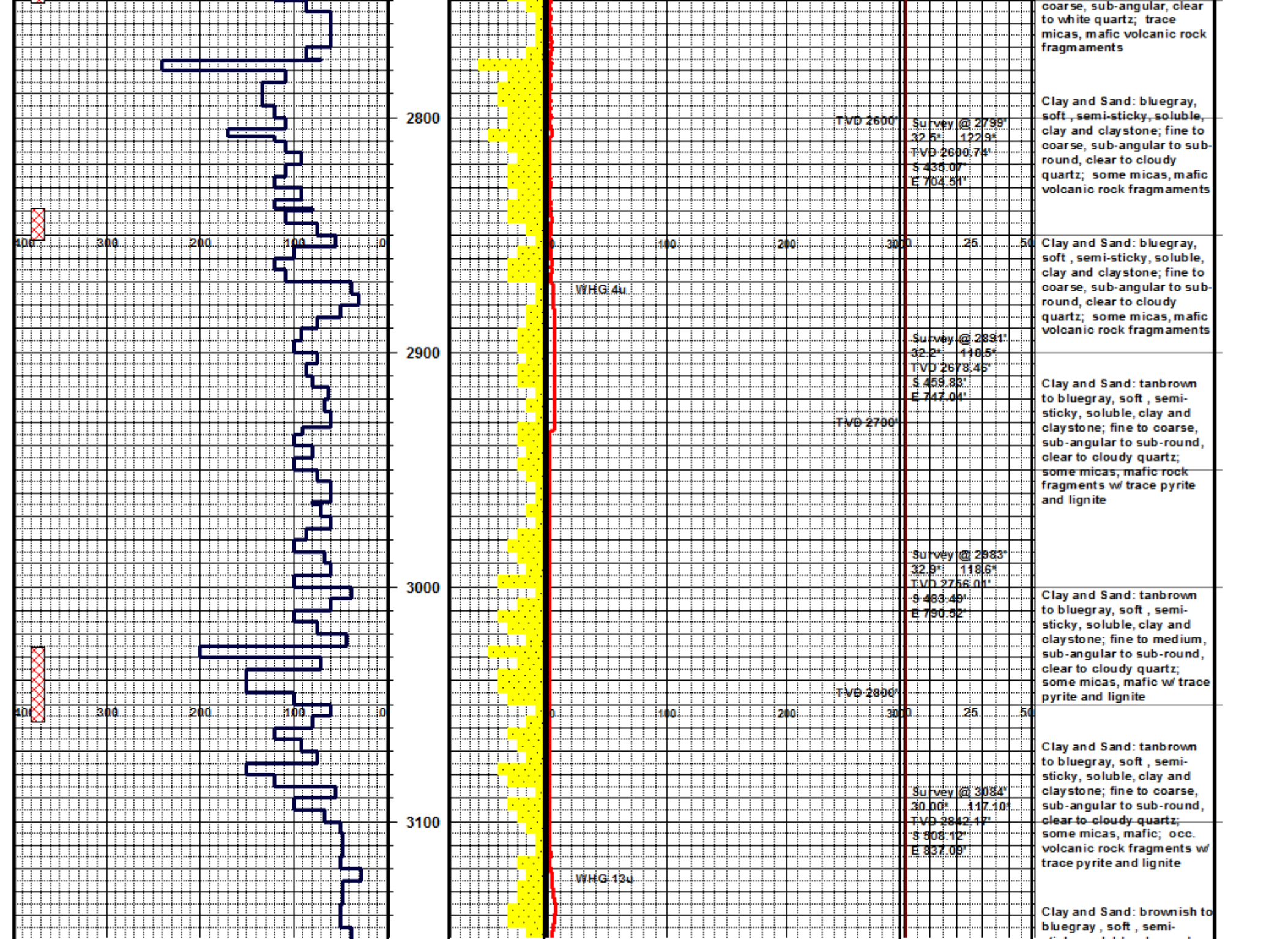
TVD 2500'

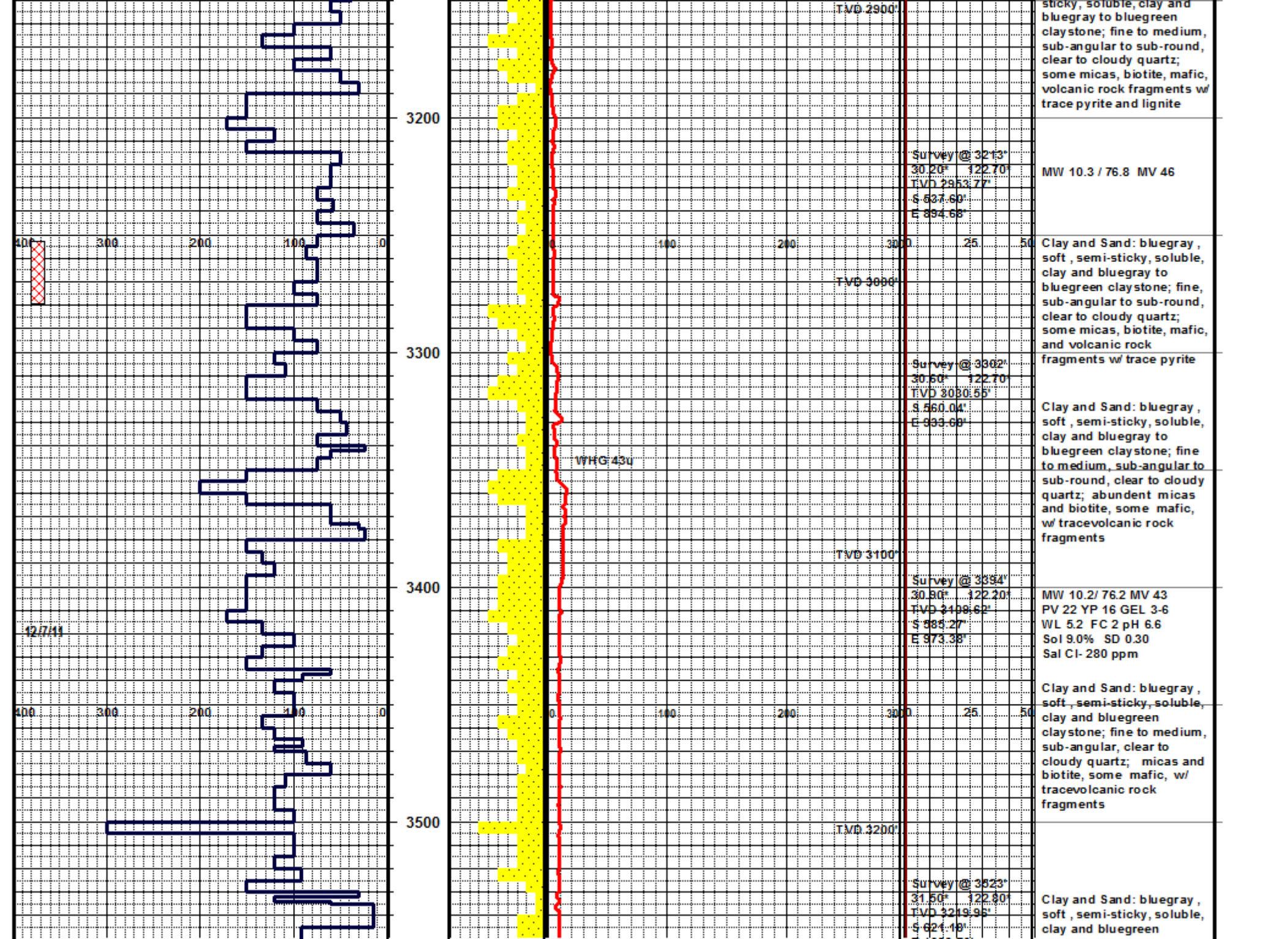
Survey @ 2704  
 N 32.2° E 122.9'  
 TVD 2620.43'  
 S 407.83'  
 E 661.59'

Clay and Sand: bluegray, soft, semi-sticky, soluble, clay and claystone; fine to coarse, sub-round to sub-angular, clear to white quartz; occ. micas, mafic volcanic rock fragments

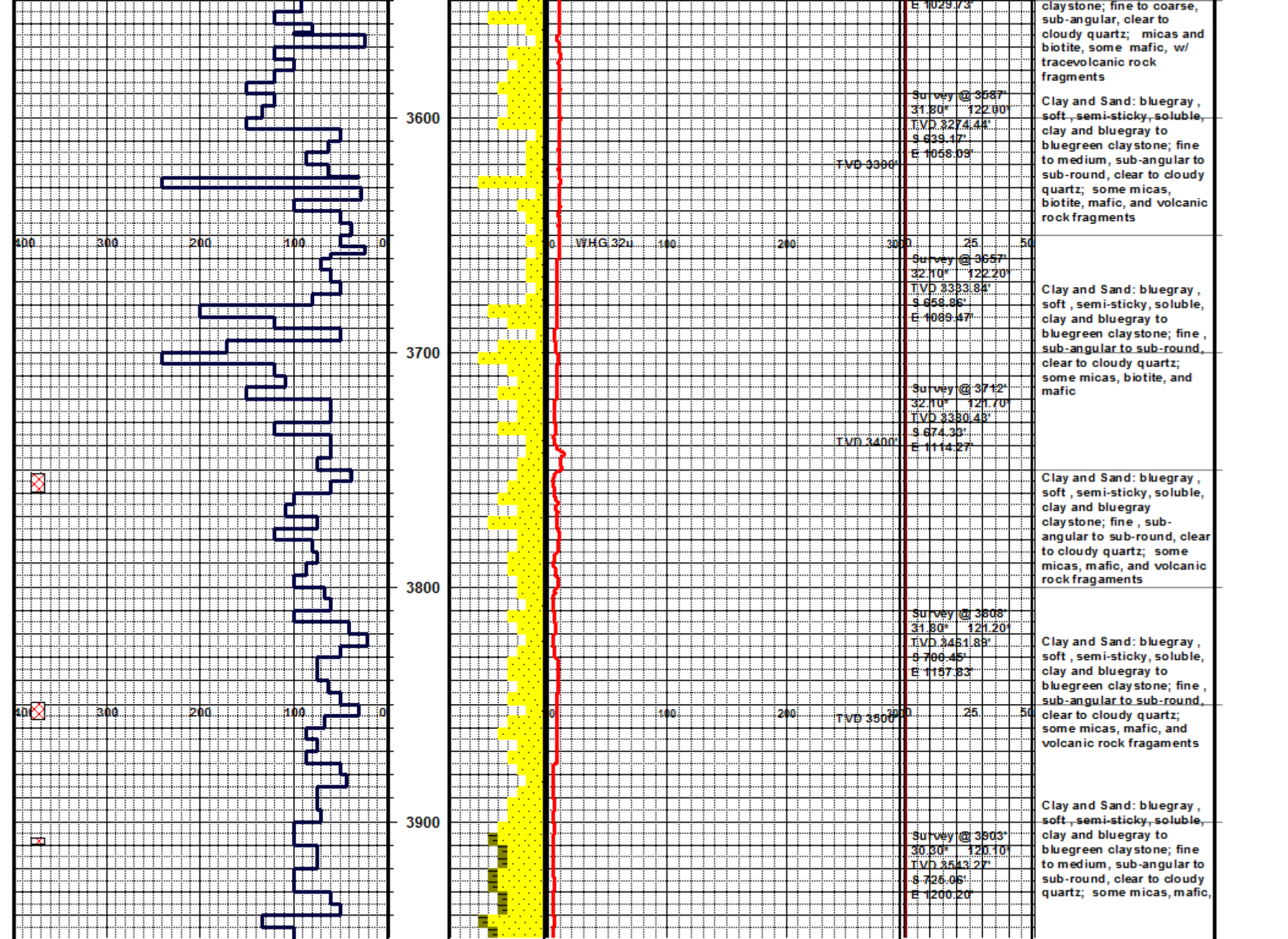
Clay and Sand: bluegray, soft, semi-sticky, soluble, clay and claystone; fine to

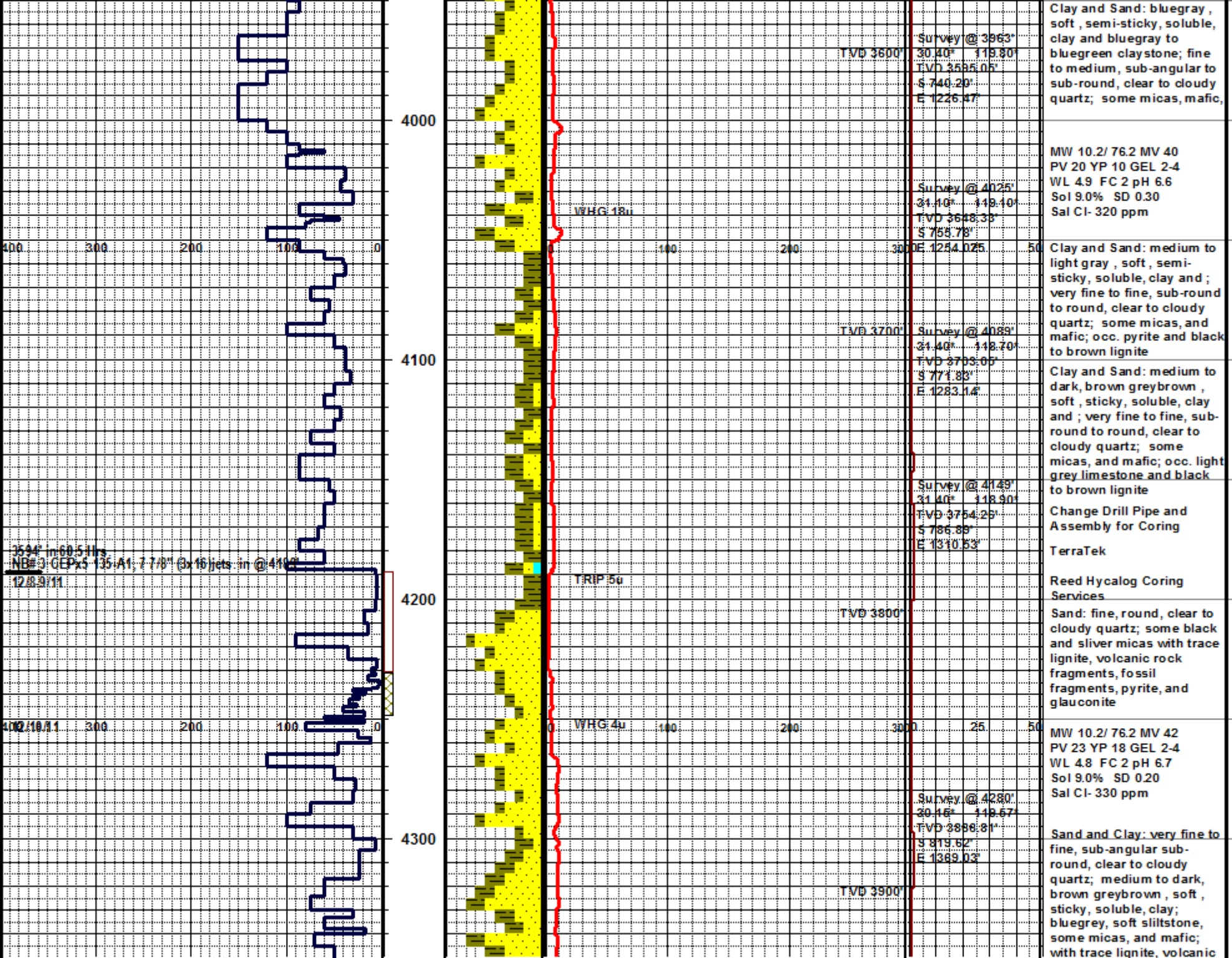


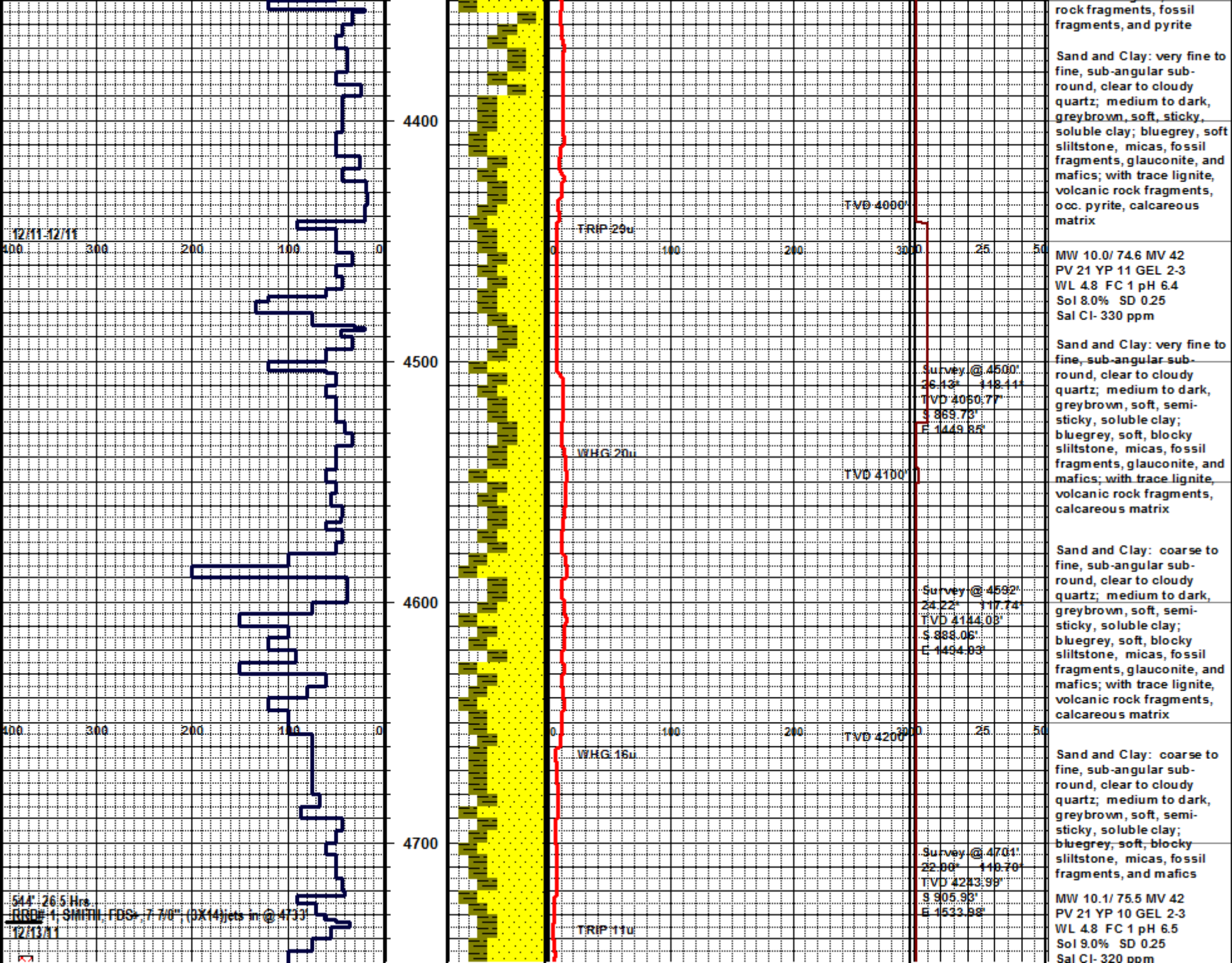












12/11-12/11  
400 300 200 100 0

400 300 200 100 0

544 26.5 Hrs  
RDD# 1-SMITH-FDS-7.76" (DX14)ets in @ 4733'  
12/13/11

4400

4500

4600

4700

TRIP 20u

WHG 20u

WHG 15u

TRIP 11u

TVD 4000'

TVD 4100'

TVD 4200'

Survey @ 4500'  
26.13° 148.11'  
TVD 4060.77'  
S 869.73'  
E 1449.88'

Survey @ 4592'  
24.22° 117.74'  
TVD 4114.03'  
S 888.06'  
E 1494.93'

Survey @ 4701'  
22.90° 149.70'  
TVD 4213.95'  
S 905.93'  
E 1533.98'

rock fragments, fossil fragments, and pyrite

Sand and Clay: very fine to fine, sub-angular sub-round, clear to cloudy quartz; medium to dark, greybrown, soft, sticky, soluble clay; bluegrey, soft siltstone, micas, fossil fragments, glauconite, and mafics; with trace lignite, volcanic rock fragments, occ. pyrite, calcareous matrix

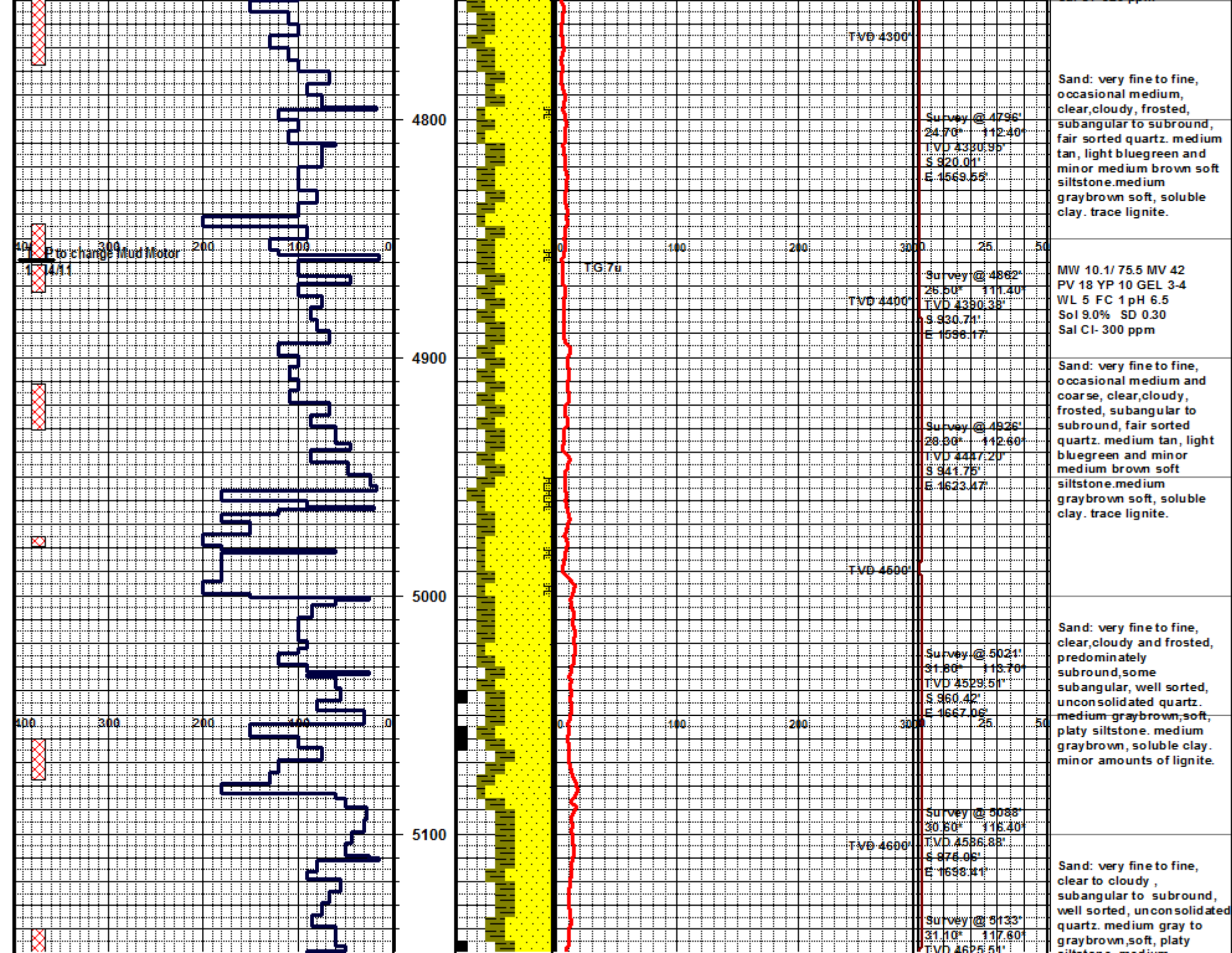
MW 10.0/ 74.6 MV 42  
PV 21 YP 11 GEL 2-3  
WL 4.8 FC 1 pH 6.4  
Sol 8.0% SD 0.25  
Sal Cl- 330 ppm

Sand and Clay: very fine to fine, sub-angular sub-round, clear to cloudy quartz; medium to dark, greybrown, soft, semi-sticky, soluble clay; bluegrey, soft, blocky siltstone, micas, fossil fragments, glauconite, and mafics; with trace lignite, volcanic rock fragments, calcareous matrix

Sand and Clay: coarse to fine, sub-angular sub-round, clear to cloudy quartz; medium to dark, greybrown, soft, semi-sticky, soluble clay; bluegrey, soft, blocky siltstone, micas, fossil fragments, glauconite, and mafics; with trace lignite, volcanic rock fragments, calcareous matrix

Sand and Clay: coarse to fine, sub-angular sub-round, clear to cloudy quartz; medium to dark, greybrown, soft, semi-sticky, soluble clay; bluegrey, soft, blocky siltstone, micas, fossil fragments, and mafics

MW 10.1/ 75.5 MV 42  
PV 21 YP 10 GEL 2-3  
WL 4.8 FC 1 pH 6.5  
Sol 9.0% SD 0.25  
Sal Cl- 320 ppm



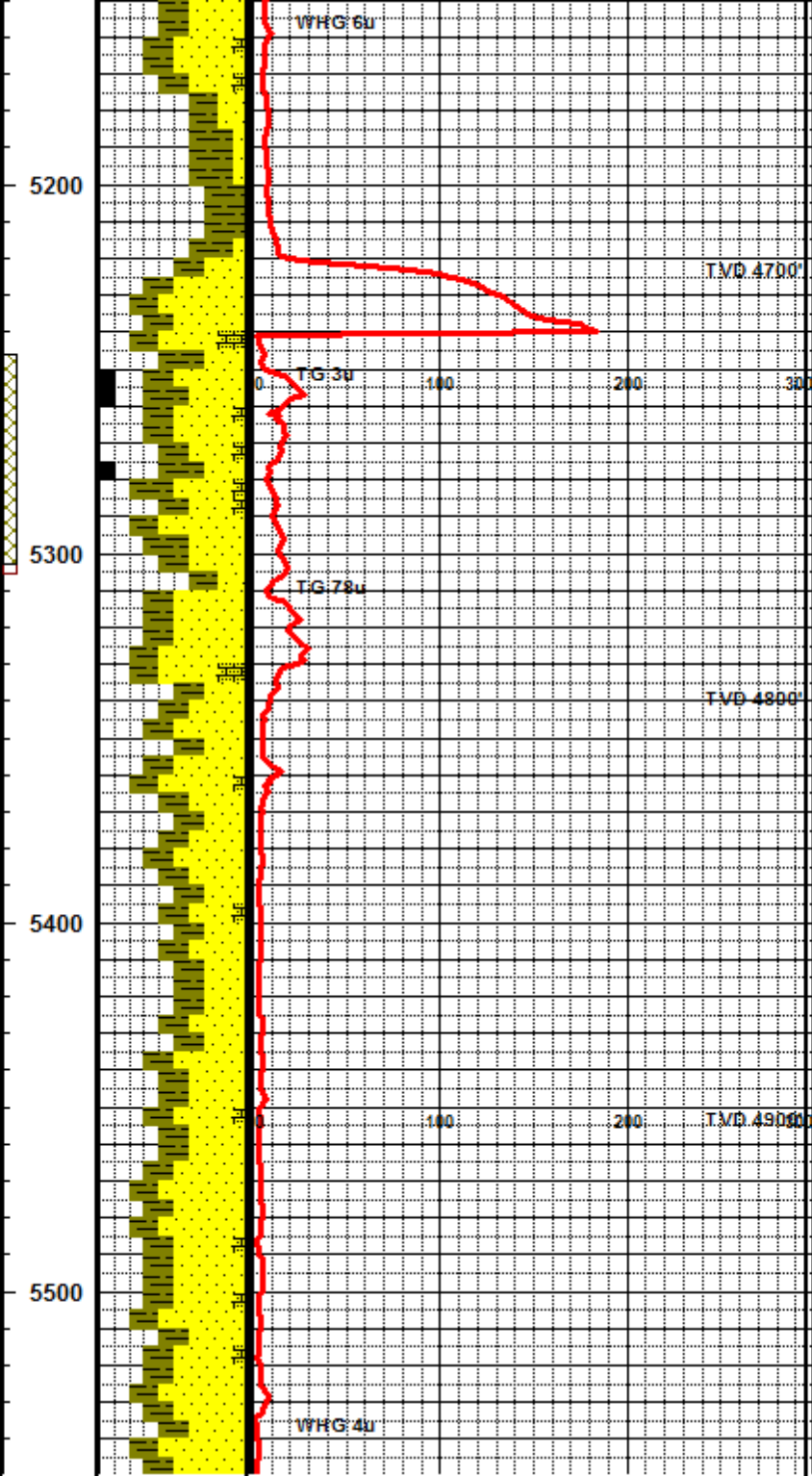
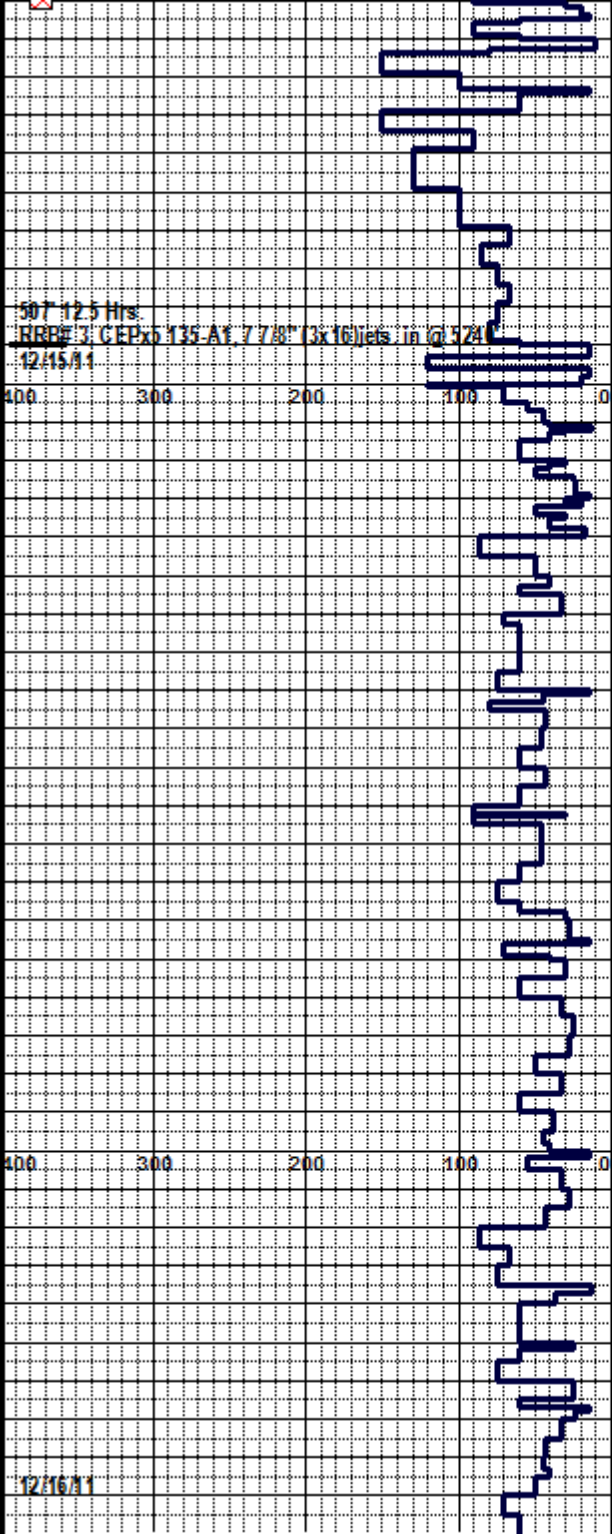
Sand: very fine to fine, occasional medium, clear,cloudy, frosted, subangular to subround, fair sorted quartz. medium tan, light bluegreen and minor medium brown soft siltstone.medium graybrown soft, soluble clay. trace lignite.

MW 10.1/ 75.5 MV 42  
PV 18 YP 10 GEL 3-4  
WL 5 FC 1 pH 6.5  
Sol 9.0% SD 0.30  
Sal Cl- 300 ppm

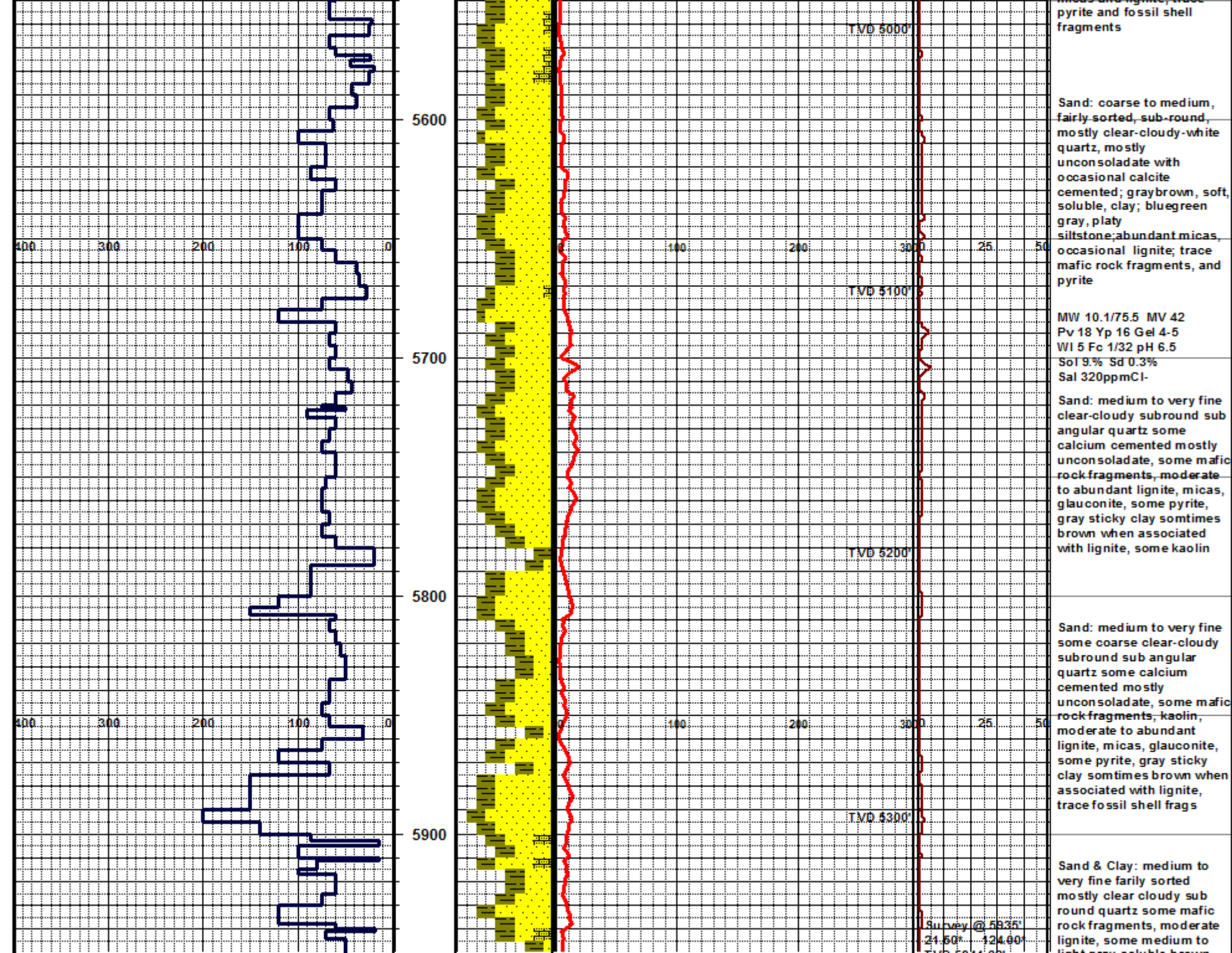
Sand: very fine to fine, occasional medium and coarse, clear,cloudy, frosted, subangular to subround, fair sorted quartz. medium tan, light bluegreen and minor medium brown soft siltstone.medium graybrown soft, soluble clay. trace lignite.

Sand: very fine to fine, clear,cloudy and frosted, predominately subround,some subangular, well sorted, unconsolidated quartz. medium graybrown,soft, platy siltstone. medium graybrown, soluble clay. minor amounts of lignite.

Sand: very fine to fine, clear to cloudy , subangular to subround, well sorted, unconsolidated quartz. medium gray to graybrown,soft, platy siltstone. medium



<p>S 985.53 E 1718.97 Survey @ 5165' 31.20° 117.90° TVD 4652.90' S 893.24' E 1733.62'</p>	<p>siltstone: medium graybrown, slick, soluble clay. occasional trace of lignite, fossil shell fragments.</p>
<p>Survey @ 5200' 31.20° 128.70° TVD 4682.94' S 1003.08' E 1748.56'</p>	<p>Clay: medium bluegray to gray, soft, soluble. lignite, glauconite, fossil fragment. some gray siltstone.</p>
<p>TVD 4700'</p>	<p>MW 10.1/ 75.5 MV 42 PV 18 YP 13 GEL 3-4 WL 5 FC 1 pH 6.5 Sol 9.0% SD 0.25 Sal Cl- 320 ppm</p>
<p>Survey @ 5300' 28.70° 128.60° TVD 4769.14' S 1034.73' E 1788.12'</p>	<p>Sand: medium to fine mostly sorted, sub round to subangular mostly clear quartz, abundant glauconite, lignite, abundant micas, gray clay and claystone-siltstone</p>
<p>TVD 4800'</p>	<p>Sand: coarse to medium fairly sorted, mostly clear-cloudy-white quartz, mostly unconsolidate, trace-some mafic rock fragments, abundant micas, lignite, trace pyrite, glauconite, trace fossil shell fragments</p>
<p>Survey @ 5400' 28.20° 128.10° TVD 4836.65' S 1054.77' E 1826.10'</p>	<p>MW 10.1/ 75.5 MV 42 PV 18 YP 16 GEL 4-5 WL 5 FC 1 pH 6.5 Sol 9.0% SD 0.30 Sal Cl- 320 ppm</p>
<p>TVD 4900'</p>	<p>Sand: coarse to medium, fairly sorted, sub-round, mostly clear-cloudy-white quartz, mostly unconsolidate; graybrown, soft, soluble, clay; bluegreen gray, platy siltstone; trace-some mafic rock fragments, abundant micas, lignite, trace pyrite, glauconite, trace fossil shell fragments</p>
<p>TVD 4900'</p>	<p>Sand: coarse to medium, fairly sorted, sub-round, mostly clear-cloudy-white quartz, mostly unconsolidate; graybrown, soft, soluble, clay; bluegreen gray, platy siltstone; trace-some mafic rock fragments, abundant micas and lignite; trace</p>



pyrite and fossil shell fragments

Sand: coarse to medium, fairly sorted, sub-round, mostly clear-cloudy-white quartz, mostly unconsolidate with occasional calcite cemented; graybrown, soft, soluble, clay; bluegreen gray, platy siltstone; abundant micas, occasional lignite; trace mafic rock fragments, and pyrite

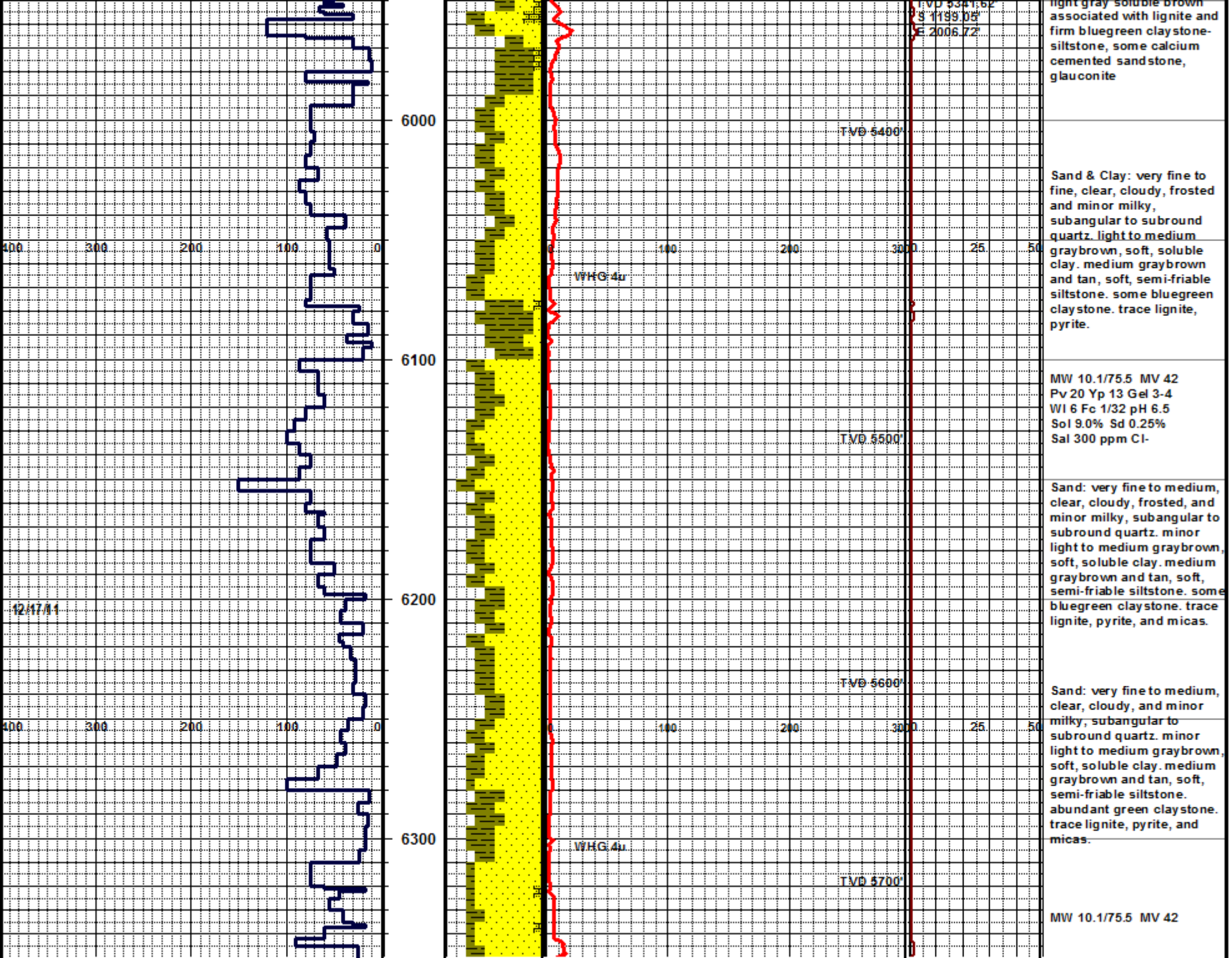
MW 10.1/75.5 MV 42  
Pv 18 Yp 16 Gel 4-5  
WI 5 Fc 1/32 pH 6.5  
So 9.9% Sd 0.3%  
Sal 320ppmCl-

Sand: medium to very fine clear-cloudy subround sub angular quartz some calcium cemented mostly unconsolidate, some mafic rock fragments, moderate to abundant lignite, micas, glauconite, some pyrite, gray sticky clay sometimes brown when associated with lignite, some kaolin

Sand: medium to very fine some coarse clear-cloudy subround sub angular quartz some calcium cemented mostly unconsolidate, some mafic rock fragments, kaolin, moderate to abundant lignite, micas, glauconite, some pyrite, gray sticky clay sometimes brown when associated with lignite, trace fossil shell frags

Sand & Clay: medium to very fine fairly sorted mostly clear cloudy sub round quartz some mafic rock fragments, moderate lignite, some medium to light gray soluble heavy

Survey @ 5835'  
21.50° 124.60°  
Elev 5044.2ft



TVD 5341.62  
 PS 1199.08  
 E 2006.72

light gray soluble brown associated with lignite and firm bluegreen claystone-siltstone, some calcium cemented sandstone, glauconite

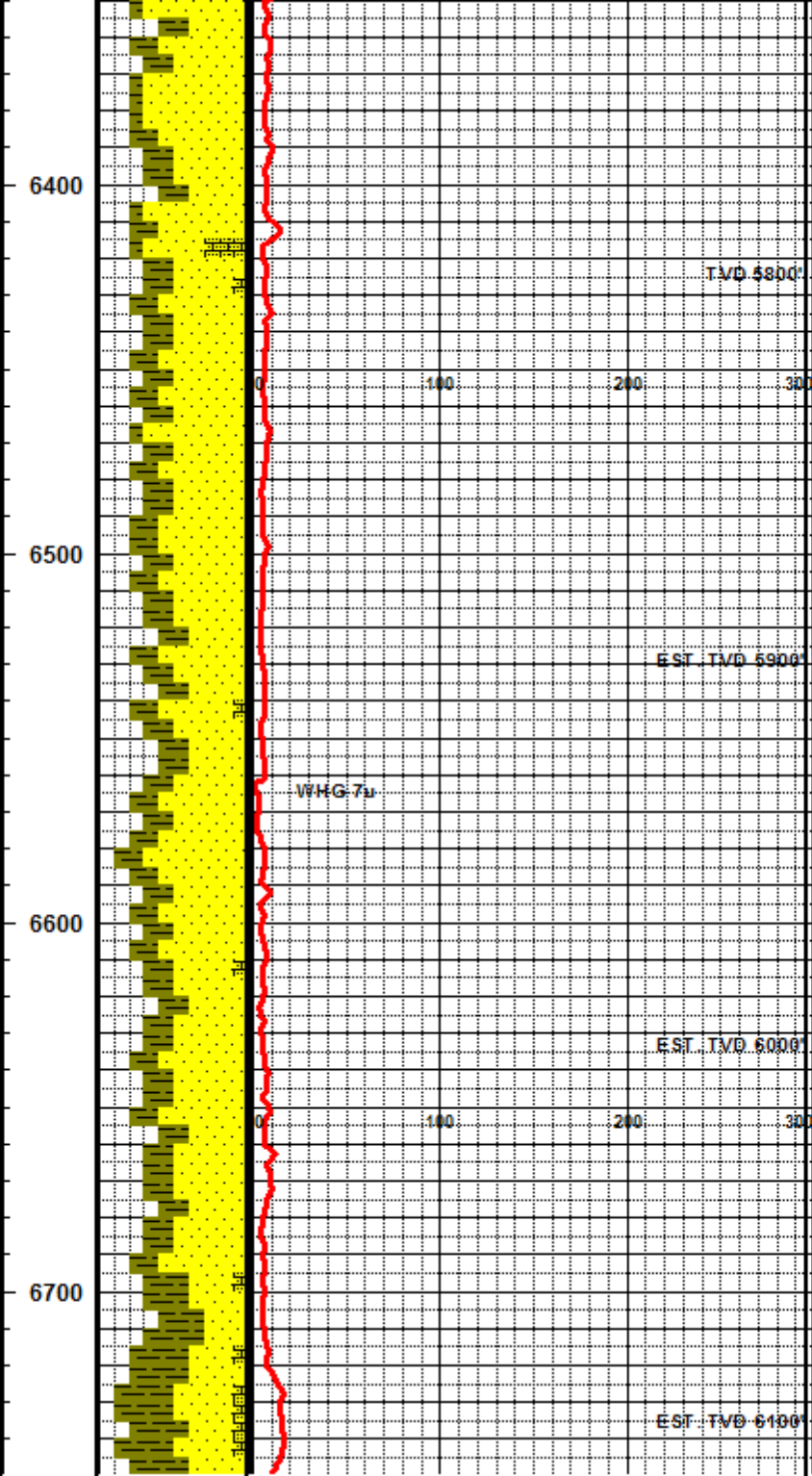
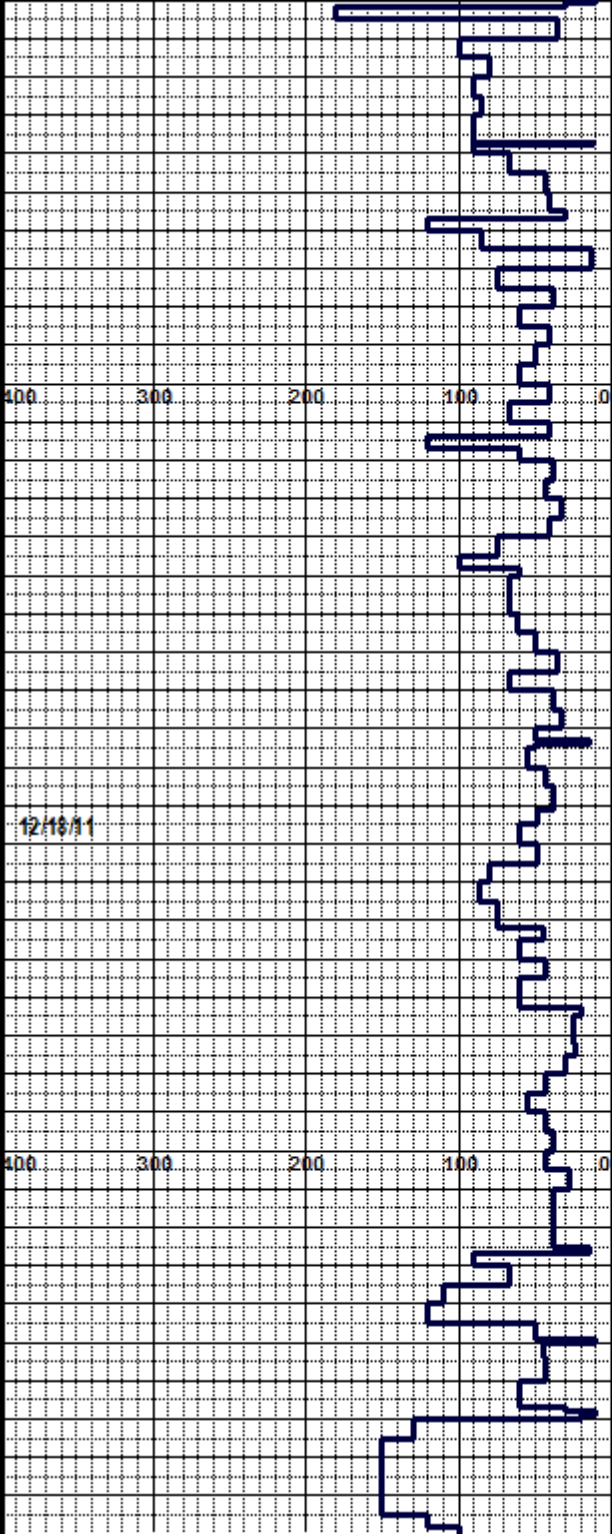
Sand & Clay: very fine to fine, clear, cloudy, frosted and minor milky, subangular to subround quartz. light to medium graybrown, soft, soluble clay. medium graybrown and tan, soft, semi-friable siltstone. some bluegreen claystone. trace lignite, pyrite.

MW 10.1/75.5 MV 42  
 Pv 20 Yp 13 Gel 3-4  
 WI 6 Fc 1/32 pH 6.5  
 Sol 9.0% Sd 0.25%  
 Sal 300 ppm Cl-

Sand: very fine to medium, clear, cloudy, frosted, and minor milky, subangular to subround quartz. minor light to medium graybrown, soft, soluble clay. medium graybrown and tan, soft, semi-friable siltstone. some bluegreen claystone. trace lignite, pyrite, and micas.

Sand: very fine to medium, clear, cloudy, and minor milky, subangular to subround quartz. minor light to medium graybrown, soft, soluble clay. medium graybrown and tan, soft, semi-friable siltstone. abundant green claystone. trace lignite, pyrite, and micas.

MW 10.1/75.5 MV 42



Sand: mostly very fine to fine, occasional medium, clear to cloudy, minor milky, subangular to subround, fairly sorted, unconsolidated quartz. med graybrown, soft, soluble clay. medium graybrown soft to moderately firm siltstone. minor bluegreen soft claystone. trace pyrite, lignite, fine mafics, calcium cemented sandstone.

Sand: mostly very fine to fine, clear to cloudy, minor frosted, subangular to subround, well sorted, unconsolidated quartz. med graybrown, soft, soluble clay. medium graybrown and minor tan, soft to semi firm siltstone. minor bluegreen soft claystone. trace pyrite, lignite. rare fine mafics.

MW 10.1/75.5 MV 42  
 Pv 19 Yp 14 Gel 3-4  
 Wl 5 Fc 1/32 pH 6.5  
 Sol 9.0% Sd 0.30%  
 Sal 300 ppm Cl-

Sand: mostly very fine to fine, clear to cloudy, minor frosted, subangular to subround, well sorted, unconsolidated quartz. med graybrown, soft, soluble clay. medium graybrown and minor tan, soft to semi firm siltstone. bluegreen soft claystone. trace pyrite, lignite. rare fine mafics.

TVD 5800'

Survey @ 6430'  
 17.20° 149.37'  
 TVD 5808.44'  
 S 1285.93° E 2146.13'

EST. TVD 5900'

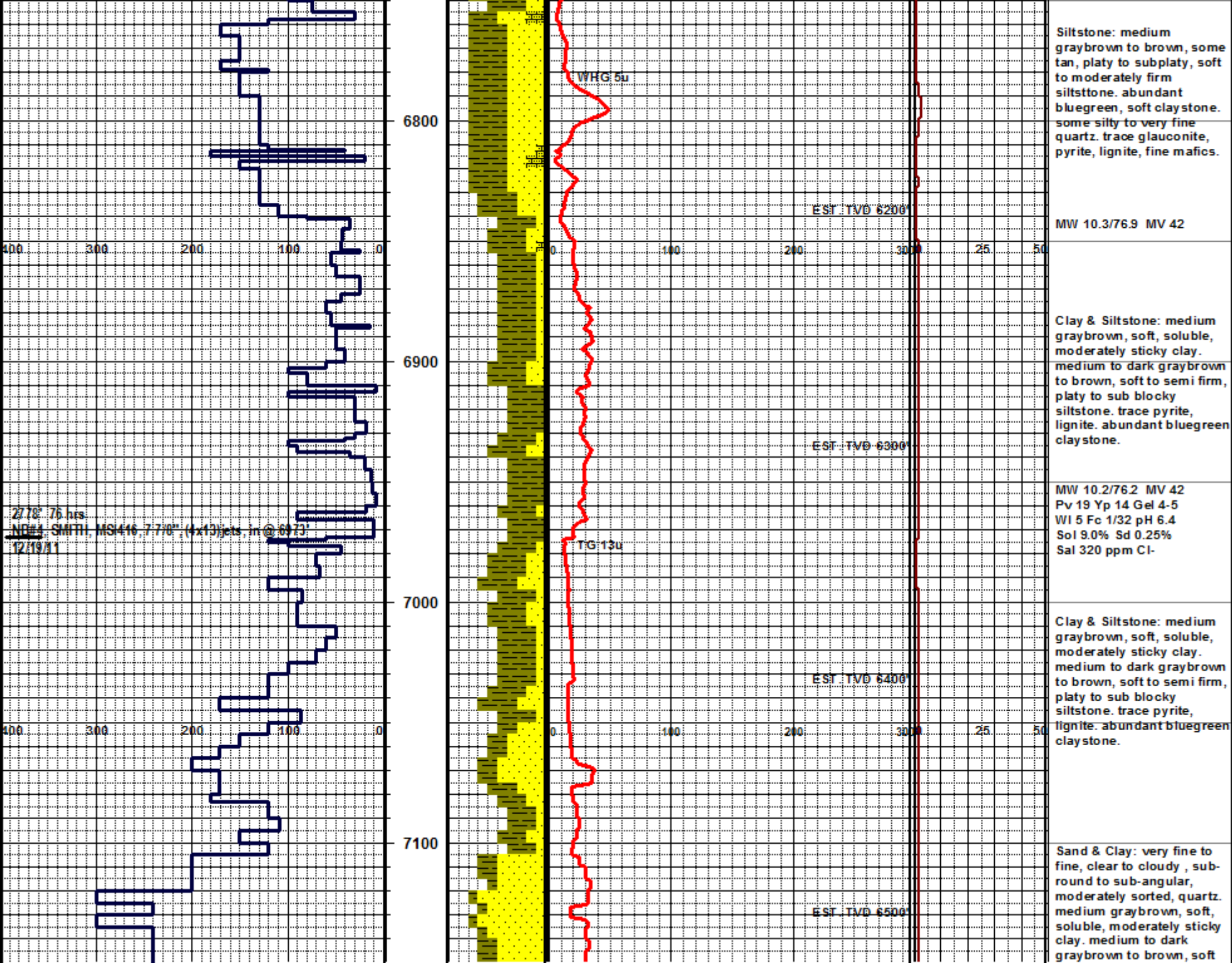
WHG-7u

EST. TVD 6000'

EST. TVD 6100'

1216/1





Siltstone: medium graybrown to brown, some tan, platy to subplaty, soft to moderately firm siltstone. abundant bluegreen, soft claystone. some silty to very fine quartz. trace glauconite, pyrite, lignite, fine mafics.

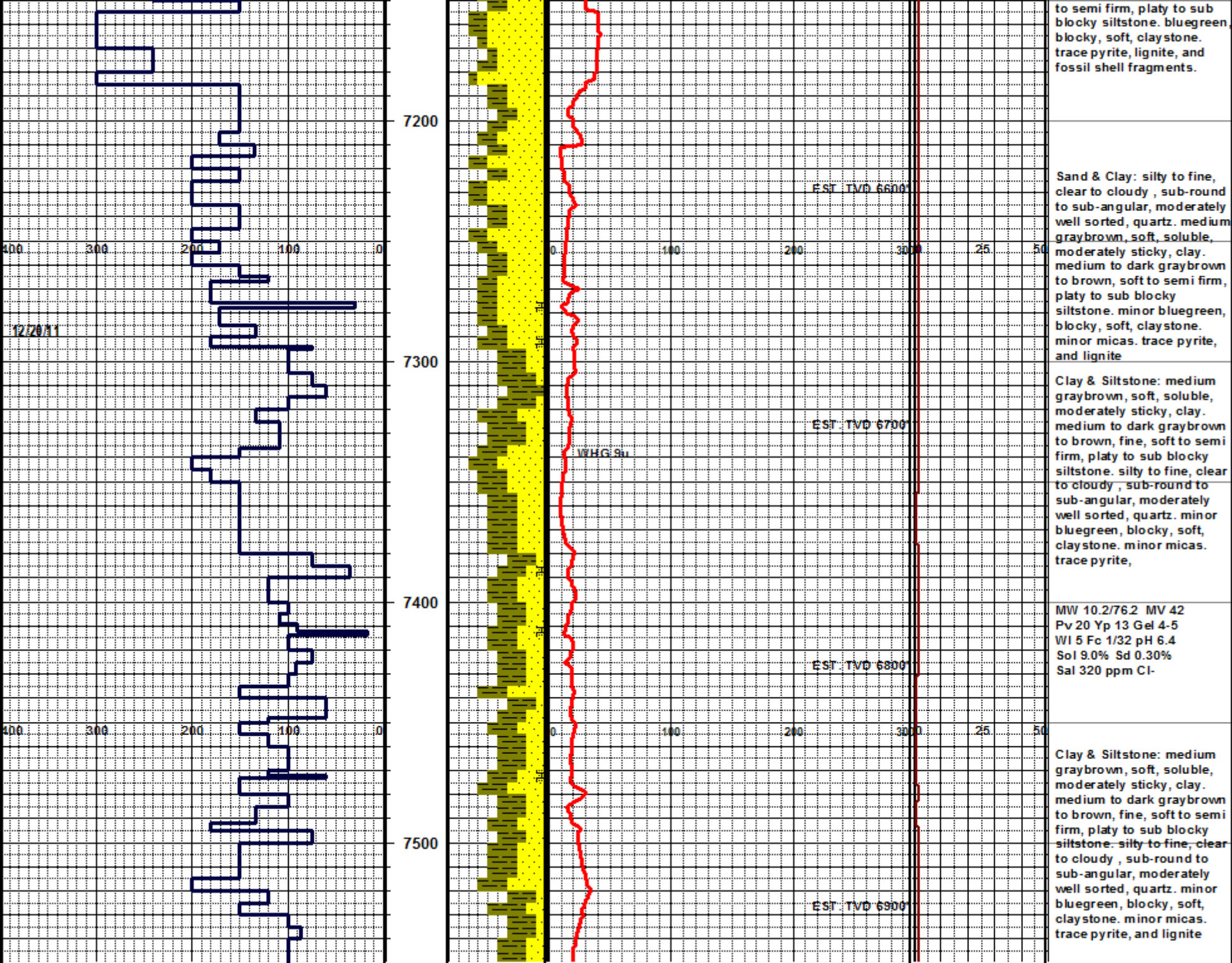
MW 10.3/76.9 MV 42

Clay & Siltstone: medium graybrown, soft, soluble, moderately sticky clay. medium to dark graybrown to brown, soft to semi firm, platy to sub blocky siltstone. trace pyrite, lignite. abundant bluegreen claystone.

MW 10.2/76.2 MV 42  
 Pv 19 Yp 14 Gel 4-5  
 Wl 5 Fc 1/32 pH 6.4  
 Sol 9.0% Sd 0.25%  
 Sal 320 ppm Cl-

Clay & Siltstone: medium graybrown, soft, soluble, moderately sticky clay. medium to dark graybrown to brown, soft to semi firm, platy to sub blocky siltstone. trace pyrite, lignite. abundant bluegreen claystone.

Sand & Clay: very fine to fine, clear to cloudy, sub-round to sub-angular, moderately sorted, quartz. medium graybrown, soft, soluble, moderately sticky clay. medium to dark graybrown to brown, soft



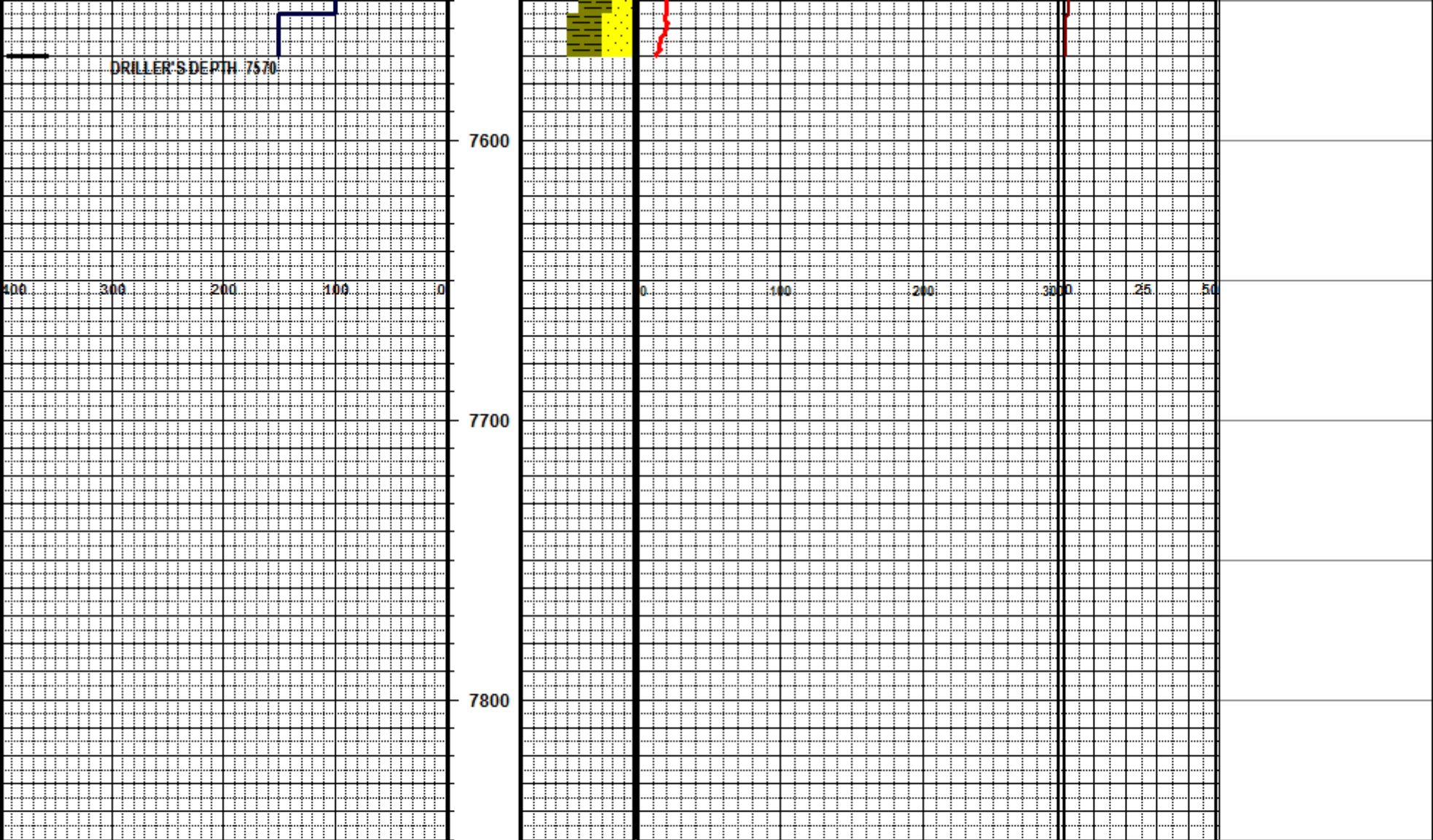
to semi firm, platy to sub blocky siltstone. bluegreen blocky, soft, claystone. trace pyrite, lignite, and fossil shell fragments.

Sand & Clay: silty to fine, clear to cloudy, sub-round to sub-angular, moderately well sorted, quartz. medium graybrown, soft, soluble, moderately sticky, clay. medium to dark graybrown to brown, soft to semi firm, platy to sub blocky siltstone. minor bluegreen, blocky, soft, claystone. minor micas. trace pyrite, and lignite

Clay & Siltstone: medium graybrown, soft, soluble, moderately sticky, clay. medium to dark graybrown to brown, fine, soft to semi firm, platy to sub blocky siltstone. silty to fine, clear to cloudy, sub-round to sub-angular, moderately well sorted, quartz. minor bluegreen, blocky, soft, claystone. minor micas. trace pyrite,

MW 10.2/76.2 MV 42  
Pv 20 Yp 13 Gel 4-5  
WI 5 Fc 1/32 pH 6.4  
Sol 9.0% Sd 0.30%  
Sal 320 ppm Cl-

Clay & Siltstone: medium graybrown, soft, soluble, moderately sticky, clay. medium to dark graybrown to brown, fine, soft to semi firm, platy to sub blocky siltstone: silty to fine, clear to cloudy, sub-round to sub-angular, moderately well sorted, quartz. minor bluegreen, blocky, soft, claystone. minor micas. trace pyrite, and lignite



DRILLER'S DEPTH 7570

7600

7700

7800

400 300 200 100 0

0 100 200 300 25 50