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PETROGRAPHIC, PETROPHYSICAL,  
AND SEISMIC DATA FROM THE  
WESTERN SACKVILLE SUBBASIN  
OF THE MARITIMES BASIN,  
SOUTHEASTERN NEW BRUNSWICK

Open

Holly J. Stewart

2011

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WESTERN SACKVILLE SUBBASIN  
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**Hon. Bruce Northrup**  
Minister of Natural Resources

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## **ABSTRACT**

The Sackville Subbasin is one of several depocentres in the southeastern New Brunswick segment of the Maritimes Basin of Atlantic Canada. The western part of the subbasin includes Late Devonian to Early Carboniferous sedimentary rocks. Detailed petrographic and petrophysical analyses were conducted of cuttings from three deep exploration wells near Dorchester in the western subbasin. These analyses, in combination with reinterpreted seismic survey data from the area, revealed information of relevance to hydrocarbon exploration in the region. Specifically, they helped to more precisely define the stratigraphy and, to a lesser extent, structure of the western Sackville Subbasin. They demonstrated that the depth to pre-Late Devonian basement rocks was shallower than previously interpreted. They also helped to delineate the distribution and internal stratigraphy of the hydrocarbon-bearing Early Carboniferous Albert Formation (Horton Group) in the report area.

The Albert Formation typically contains three conformable units that, in ascending order, are the Dawson Settlement, Frederick Brook, and Hiram Brook members. All three members contain kerogenous sandstone, mudstone, and shale; and regionally, all members have produced economic quantities of oil and gas. The Hiram Brook Member typically is the main exploration and development target for conventional gas, whereas the Frederick Brook Member hosts unconventional gas. The current study identified the Dawson Settlement and Frederick Brook members in the three deep wells near Dorchester. However, study results indicate that the Hiram Brook Member was absent in the wells, apparently having been eroded during a basin inversion event in the area during the Early Carboniferous. The lack of Hiram Brook strata in these wells suggests that hydrocarbon resources in the western part of the Sackville Subbasin may be restricted to unconventional gas.

## RÉSUMÉ

Le sous-bassin de Sackville figure parmi quelques-uns des centres de sédimentation de la partie sud-est du Nouveau-Brunswick du bassin des Maritimes, au Canada atlantique. La partie occidentale du sous-bassin comprend des roches sédimentaires dont la formation remonte à la période comprise entre le Dévonien tardif et le Carbonifère précoce. Des analyses pétrographiques et pétrophysiques approfondies ont été réalisées sur des déblais de forage de trois puits d'exploration en profondeur, près de Dorchester, dans le sous-bassin de l'ouest. De concert avec des données de levé sismique réinterprétées, les résultats de ces analyses ont permis d'obtenir de l'information pertinente pour les travaux de prospection d'hydrocarbures dans la région. Ces données ont notamment permis de définir avec plus de précision la stratigraphie et, dans une moindre mesure, la structure de la partie ouest du sous-bassin de Sackville. Elles ont notamment établi que les roches du socle antérieures au Dévonien tardif se trouvaient à une profondeur moindre que ce que l'on avait déduit auparavant. Cette étude a également aidé à délimiter dans le secteur concerné la répartition et la stratigraphie interne de la Formation d'Albert, du Carbonifère précoce (groupe de Horton), qui contient des hydrocarbures.

Pour l'essentiel, la Formation d'Albert contient trois unités concordantes, que voici (en ordre ascendant) : ce sont les membres de Dawson Settlement, du ruisseau Frederick, et du ruisseau Hiram. Tous ces membres renferment du grès, du mudstone et du schiste bitumineux et ils ont fourni au plan régional des volumes rentables de pétrole et de gaz. Le membre du ruisseau Hiram est généralement la principale cible d'exploration et de mise en valeur du gaz classique, tandis que le membre du ruisseau Frederick renferme du gaz non traditionnel. L'étude actuelle n'a permis que de détecter la présence des membres de Dawson Settlement et du ruisseau Frederick dans trois puits creusés en profondeur près de Dorchester. Les résultats d'étude indiquent que le membre du ruisseau Hiram n'est pas présent dans ces puits, car il aurait subi une érosion au cours d'une inversion de bassin survenue dans la région au début du Carbonifère. L'absence de strates du membre du ruisseau Hiram dans ces puits porte à croire que les hydrocarbures présents dans la partie occidentale du sous-bassin de Sackville se composeraient uniquement de gaz non traditionnel.

## INTRODUCTION

The Late Devonian to Early Permian Maritimes Basin of Atlantic Canada (Fig. 1, inset 2) is an extensive successor basin that developed during the waning stages of, and following, the Middle Devonian Acadian Orogeny. The basin has a rich sedimentological and structural history that involved subaerial to marine sedimentation over a period of 90 Ma. Remnants of the basin occur throughout the region (Roliff 1962; St. Peter and Johnson 2009, and references therein).

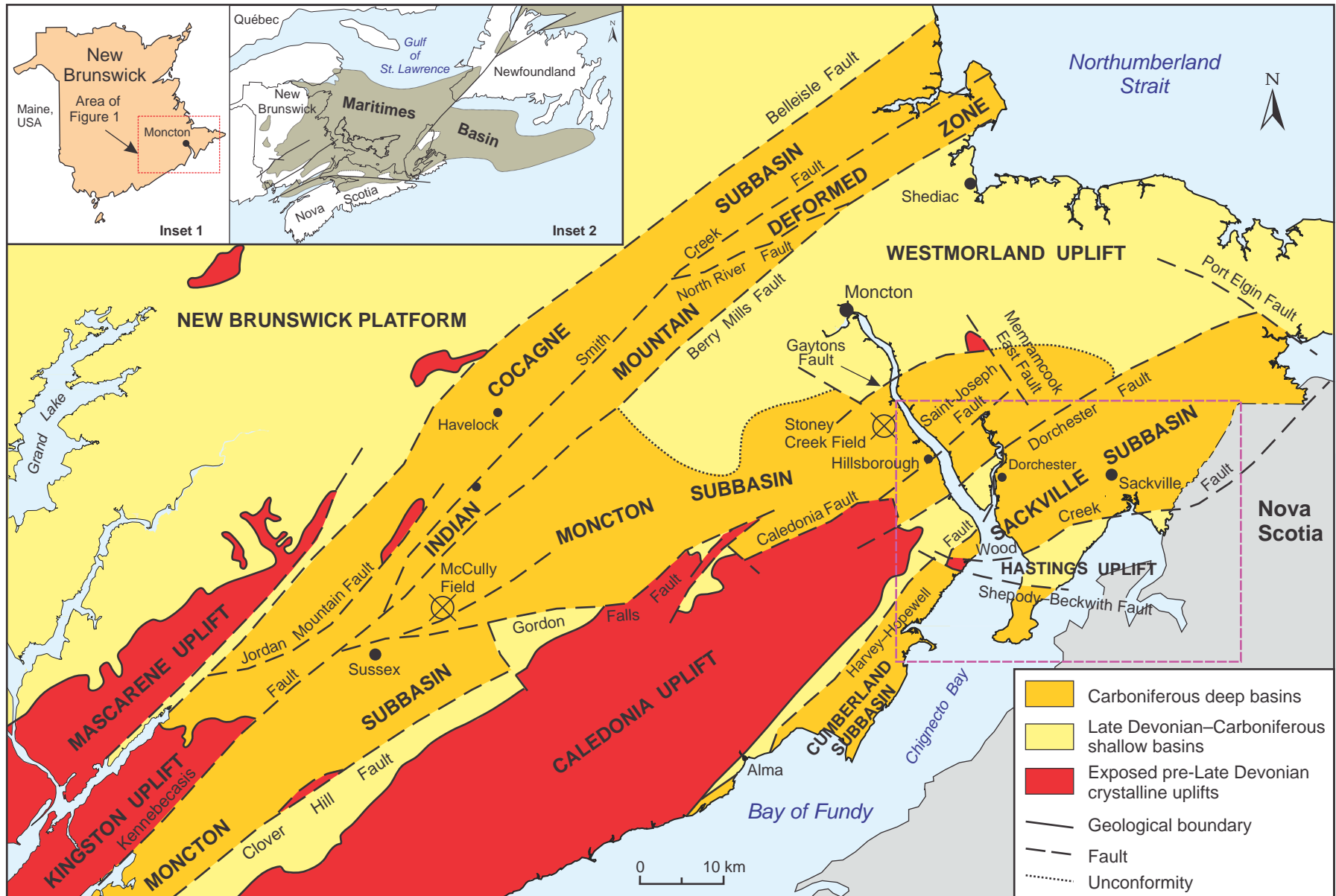
In New Brunswick, the Maritimes Basin is subdivided into four major Early Carboniferous subbasins or depocentres (Fig. 1), those being the Moncton, Cocagne, Cumberland, and Sackville subbasins (van de Poll 1995; St. Peter 2006). The subbasins are now delineated by major faults and basement uplifts and in places may be partially concealed by younger Carboniferous strata and their boundaries (Fig. 1; St. Peter 2000; St. Peter and Johnson 2009).

The hydrocarbon deposits within Late Devonian to Carboniferous rocks of the Maritimes Basin were first recognized during the mid-19<sup>th</sup> century and have since been the subject of numerous government, industry, and academic studies. Recent exploration work confirms what many of these reports concluded: namely, that rocks of the Late Devonian to Early Carboniferous Horton Group of the Maritimes Basin in southeastern New Brunswick—particularly those of the Albert Formation—contain the most economically significant resources of gas (conventional and unconventional) and oil in the province.

The Albert Formation consists predominantly of fluvial and lacustrine sedimentary rocks that were deposited within the isolated, Early Mississippian depocentres of the Maritimes Basin. The most easterly of these depocentres, the Sackville Subbasin (Fig. 1, 2), was defined by Martel (1987) and is one of the least studied. The work by Martel (1987) was based mainly on seismic surveys completed by Chevron Canada Resources Ltd. between 1982 and 1985, and on limited surface outcrop and borehole information.

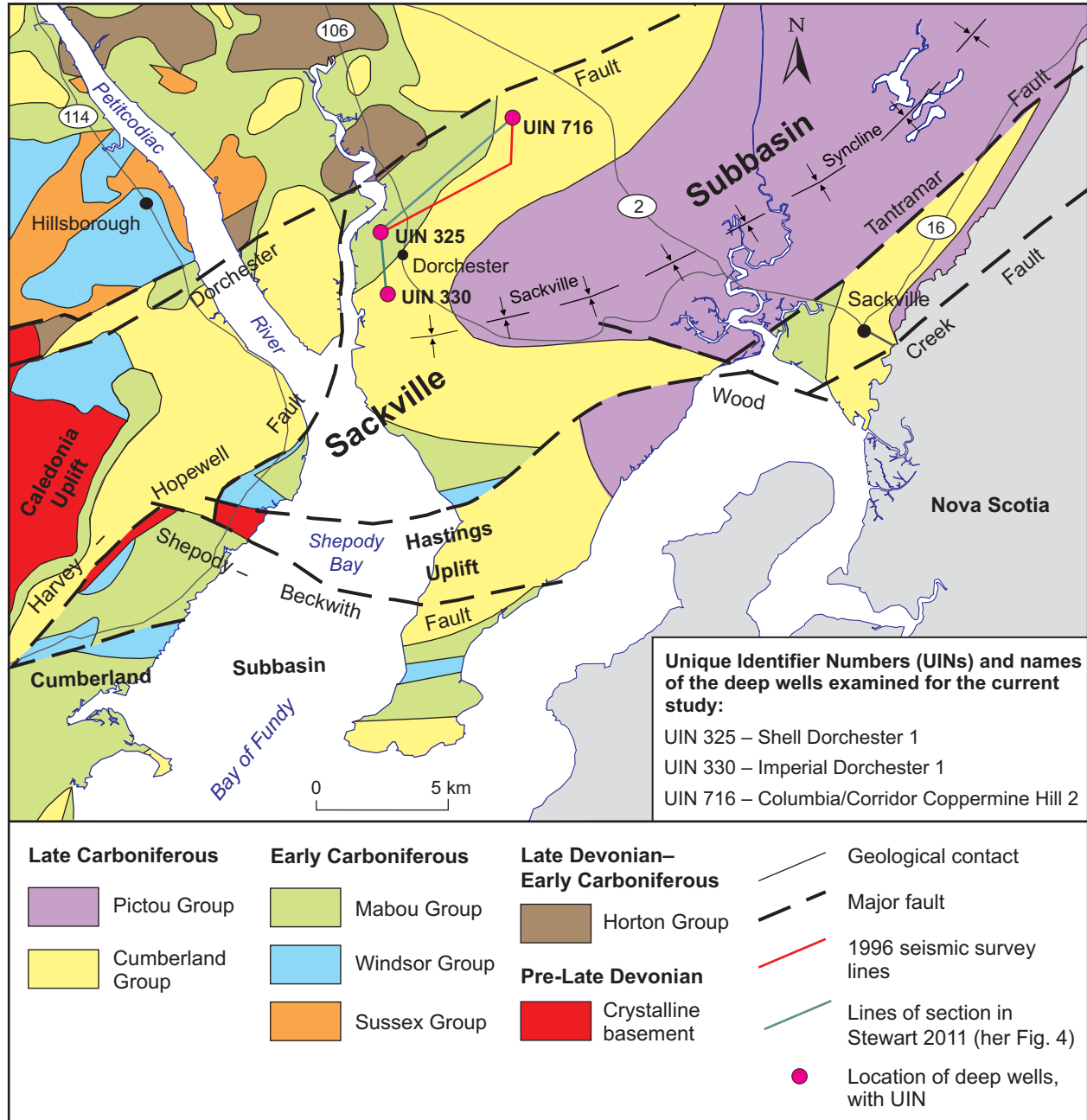
At the time of Martel's report, only two deep wells had been drilled in the Sackville Subbasin, both of them near Dorchester in the western part of the subbasin (Fig. 1, 2). They were Shell Dorchester 1 drilled by Shell Oil Company in 1949, and Imperial Dorchester 1 drilled by Imperial Oil Limited in 1960. A third deep well, Columbia/Corridor Coppermine Hill 2 (hereafter, Coppermine Hill 2), was drilled northeast of Dorchester in 2001 by Columbia Natural Resources Canada Limited (Fig. 2). The three wells were reviewed by St. Peter (2001) and referred to by St. Peter and Johnson (2009). These authors combined well data with geological mapping results in the western subbasin and offered a number of stratigraphic and structural interpretations.

The recently published study of stratigraphic and structural relationships in the western Sackville Subbasin by Stewart (2011) is based in large part on the petrological and petrophysical analyses and strip logs that form the core of the present report. Stewart (2011)



**Figure 1.** Distribution of subbasins and crystalline uplifts in the Maritimes Basin of southeastern New Brunswick. Geology is after Potter et al. (1979), Howie (1986), Martel (1987), St. Peter (1993, 2006), Ryan and Boehner (1994), and St. Peter and Johnson (2009). The dashed purple line outlines the area of Figure 2.





**Figure 2.** Simplified geological map of the western Sackville Subbasin, southeastern New Brunswick, modified after St. Peter and Johnson (2009) and Webb and Stewart (2011). See Figure 1 for the location of this map area.

presents fairly detailed descriptions of the stratigraphy and structure within the report area, as well as a more comprehensive interpretation of the analytical data than is highlighted herein under **Summary and Conclusions**.

Note: The three deep wells referred to above are catalogued in the New Brunswick Department of Natural Resources (NBDNR) borehole database by their Unique Identifier Numbers (UINs), which are shown on Figure 2. Additional information about the wells is available in this online database (NBDNR 2011).

## METHODOLOGY

This study presents detailed petrographic and petrophysical analyses of the Shell Dorchester 1, Imperial Dorchester 1, and Coppermine Hill 2 wells near Dorchester (Fig. 2). They are the only deep exploration wells in the report area of the western Sackville Subbasin. The analytical results were integrated with data from a seismic survey conducted between the Shell Dorchester 1 and Coppermine Hill 2 wells by Corridor Resources Inc. in 1996 (Fig. 2). The combined information helped to confirm or, in cases, to re-evaluate some interpretations of Late Devonian to Carboniferous stratigraphy and structure around Dorchester.

Well cuttings for the petrographic examination were selected at 10 ft [3.03 m] intervals for the two older wells (Shell Dorchester 1, Imperial Dorchester 1) and at 3 m intervals for the younger, Coppermine Hill 2 well. Chip samples were observed under a stereoscopic microscope at 10x to 70x magnification to determine lithotype, colour, grain size, constituents, sorting, rounding, cementation, and potential for hydrocarbon content. Late Devonian to Carboniferous lithotypes identified in the study included conglomerate, sandstone, siltstone, anhydrite, halite, limestone, and shale; pre-Late Devonian lithotypes consisted of granitic and metasedimentary rocks. The sequences and combinations of these lithotypes were used to identify the different rock facies.

The petrophysical analysis involved comparing and interpreting the wireline log signatures that characterize the various lithofacies identified during petrographic examination. Table 1 summarizes the function of each wireline tool.

**Table 1.** Basic function of wireline tools used in the present study (modified after Parks 2010). Schlumberger Limited (2010) describes the theory behind wireline log functions.

Petrophysical Log	Units	Standard Scale	Function	Primary Uses
Gamma Ray (GR)	API	0 to 150 (linear)	Indicates the natural radioactivity of wall rock	Lithological identification
Spontaneous Potential (SP)	mV	-80 to 20 (linear)	Indicates the electrical potential produced by the interaction of formation water, drilling fluid, and some ion-selective rocks	Permeability
Density Log	%	45 to -15 (linear)	Indicates the formation density by emitting gamma rays from a radioactive source into the wall rock, and recording the remaining energy upon arrival at the detector	Porosity
Neutron Log	%	45 to -15 (linear)	Indicates formation porosity based on the effect of the formation on fast neutrons emitted by a source	Porosity
Sonic Porosity	%	45 to -15 (linear)	Indicates formation porosity based on transit time between an acoustic transmitter and receivers	Porosity
Sonic (DT Comp / Shear)	µs/m	500 to 100 / 1000 to 200 (linear)	Indicates formation transit times of both compressional and shear waveforms between an acoustic transmitter and receivers	Porosity
Array Induction	ohms	0.2 to 2000 (logarithmic)	Indicates formation resistivity based on the principle of inducing alternating current loops in the formation and measuring the resultant signal in a receiver	Resistivity

Wireline logs were available only for the Shell Dorchester 1 and Coppermine Hill 2 wells. Those for Shell Dorchester 1 consisted of self-potential, sonic, and various resistivity logs; those for Coppermine Hill 2 comprised gamma ray, neutron, density, sonic, and assorted resistivity logs. The integration of petrographic and petrophysical well data is key to creating an accurate strip log of lithofacies in hydrocarbon-bearing rocks of the Maritimes Basin. A reliance solely on wireline data without an accompanying microscopic examination of well cuttings from the same depth can lead to false identification of some rock types.

After the petrographic and petrophysical analyses were completed, standardized strip logs were generated for all three wells. The strip logs display the abbreviated lithologic descriptions (see Appendix 1 for generic abbreviations) alongside the wireline data (where available) and the drilling parameters. Figure 3 shows the symbols used on strip logs to denote the lithotypes and other characteristics observed during the petrographic analysis.

ROCK TYPES					
	Anhydrite		Limestone		Schist
	Claystone		Metasedimentary rocks		Shale
	Conglomerate		Salt		Shale Col
	Granite		Sandstone		Shale Gy
	Gypsum		Sandstone uncon		Siltstone (gy, gn)
					Siltstone (red, brn)
					Siltstone-vfss (red)
ACCESSORIES					
<b>Mineral</b>				<b>Texture</b>	
	Anhy		Hvymn		Boundst
	Arggrn		Kaol		Chalky
	Arg		Marl		Cryxln
	Bent		Minxl		Earthy
	Bit		Nodule		Finexln
	Brecfrag		Phos		Grainst
	Calc		Pyr		Lithogr
	Carb		Salt		Microxln
	Chtdk		Sandy		Mudst
	Chtlt		Silt		Packst
	Dol		Sil		Wackest
	Feldspar		Sulphur		
	Ferrpel		Tuff		
	Ferr	<b>Fossil</b>			
	Glau		Algae		
	Gyp		Amph		
			Belm		Plant
			Bioclst		Strom
			Brach		
			Bryozoa	<b>Stringer</b>	
			Cephal		Anhy
			Coral		Gyp
			Crin		Limestone
			Echin		Sltstrg (red, brn)
			Fish		Sltstrg (gy, gn)
			Foram		Ssstrg
			Fossil		Conglomerate
			Gastro		Salt
			Oolite		
			Ostra		
			Pelec		
			Pellet		
			Pisolite		
OTHER SYMBOLS					
<b>Porosity</b>		<b>Sorting</b>		<b>Event</b>	
	Earthy		Vuggy		Rft
	Fenest		Well		Sidewall
	Fracture		Moderate		
	Inter		Poor		
	Moldic			<b>Interval</b>	
	Organic				Core
	Pinpoint				Dst
		<b>Rounding</b>			Spotted
			Rounded		Ques
			Subrnd		Dead
			Subang		
			Angular		
		<b>Oil Show</b>			
			Even		

**Figure 3.** Symbols used on the strip log legends of Appendices 2 to 4 to denote lithotypes and other petrographic characteristics of cuttings from the Shell Dorchester 1, Imperial Dorchester 1, and Coppermine Hill 2 wells near Dorchester, southeastern New Brunswick (modified after Parks 2010).

Appendices 2, 3, and 4 show the complete strip logs for the Shell Dorchester 1, Imperial Dorchester 1, and Coppermine Hill 2 wells, respectively. Data from these strip logs were used to propose a revised stratigraphy for the western part of the Sackville Subbasin (Fig. 4) and to plot two stylized cross-sections of facies between the wells (see Stewart 2011; her Fig. 4a, 4b).

## **PETROGRAPHIC CHARACTERISTICS**

The petrographic descriptions of lithofacies in the three wells are presented below according to group, formation, and (for the Albert Formation) member. Descriptions of cuttings from the individual wells represent an average of all observed lithologic characteristics of each formation in that well. All wells were drilled vertically, and all numbered depths in metres represent the 'measured depth' or MD (Table 2).

### **Shell Dorchester 1 (UIN 325)**

#### ***Horton Group***

The Horton Group in this well (Table 2) is represented by the McQuade Brook Formation, Albert Formation, and probably Memramcook Formation (see Stewart 2011 for additional information). The McQuade Brook Formation was intersected at the base of the well in the 2277 m to 2508 m depth interval. It is dominated by siltstone that varies from light to dark grey, is siliceous, and has calcite veining. Sandstone, the second most abundant lithology, is maroon to grey, fine- to medium-grained, micromicaceous, poorly sorted, and well consolidated; and has subangular constituents. This sandstone is noteworthy, being pebbly with schistose clasts. Between the depths of 2277 m and 2343 m, a coarse-grained facies of blue to green conglomerate and sandstone (likely equivalent to the Memramcook Formation: see Stewart 2011) was observed in association with the finer grained, siltstone-dominated sequence.

The Dawson Settlement Member of the Albert Formation overlies the McQuade Brook Formation and is present in the 1958 m to 2277 m depth interval. The dominant lithology is dark grey, silty, calcareous, and slightly micaceous shale that contains evidence of plant fragments. Intervals of medium to dark grey, calcareous, and commonly siliceous siltstone occur throughout the section, decreasing in abundance with depth in each interval. Lenses of very fine-grained calcareous sandstone occur throughout the section; the sandstone is white to grey with high concentrations of quartz and muscovite. Also present are white to light grey, microcrystalline dolomitic limestones that reach a maximum concentration at 2035 m, then decrease in abundance with depth.

Two types of conglomerate occur in the lowermost section of the Dawson Settlement Formation. One type is blue to green with chlorite, muscovite, granitic clasts, and subangular to angular quartz clasts; it closely resembles the blue to green conglomeritic facies in the underlying Memramcook–McQuade sequence. The other conglomerate has a pink to maroon, fine- to coarse-grained matrix with chlorite, muscovite, and quartz, as well as subangular to angular granitic clasts. Some intervals contain up to 10% grey to green, slightly calcareous siltstone.

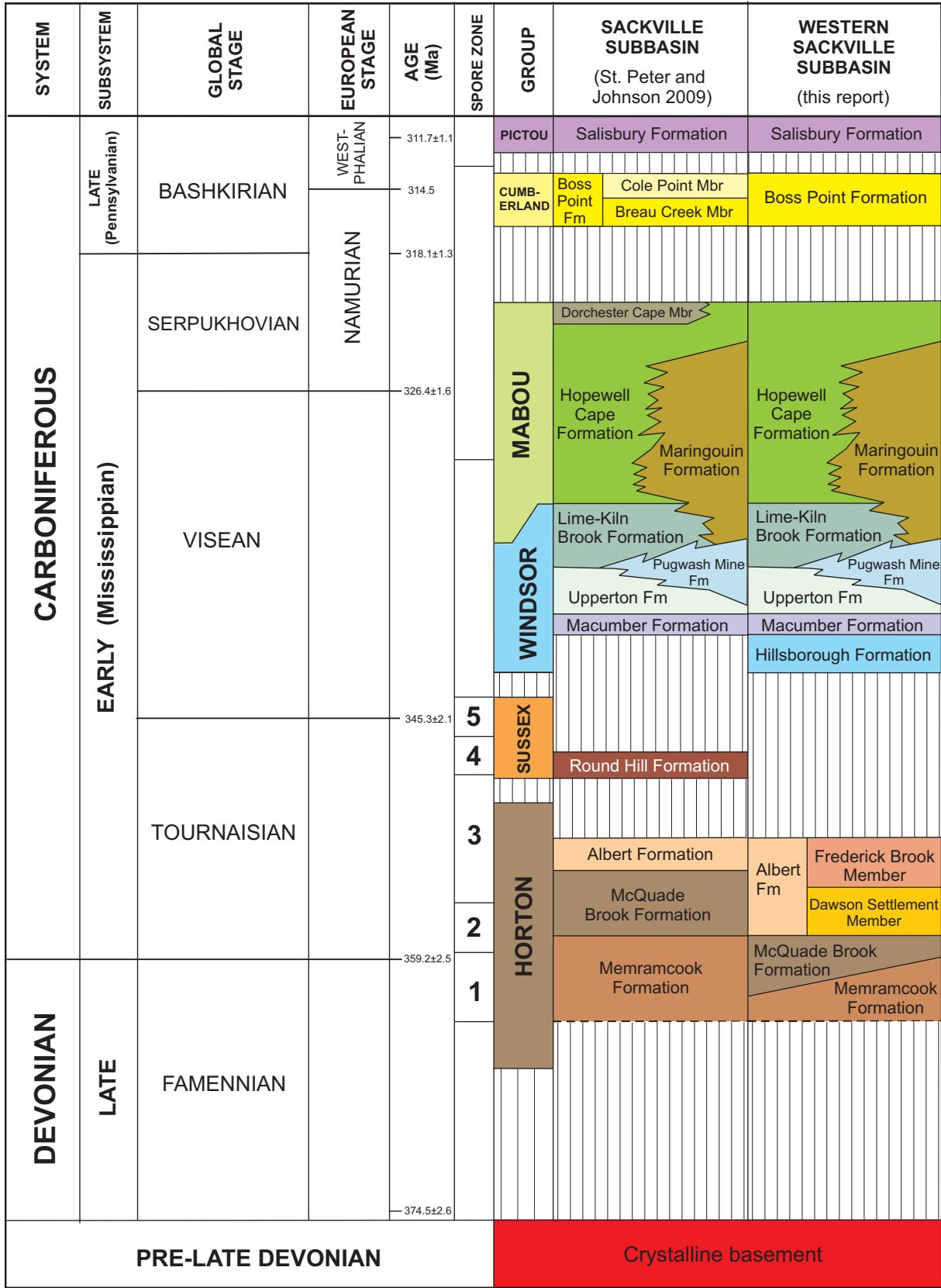


Figure 4. General stratigraphy of the Sackville Subbasin according to St. Peter and Johnson (2009) and of the western part of the subbasin as revised according to Stewart (2011) and the current report.

**Table 2.** Tops of pre-Late Devonian to Carboniferous formations in the western Sackville Subbasin, southeastern New Brunswick, as interpreted from a petrographic examination of well cuttings in the Dorchester area.

	Name of Well	Shell Dorchester 1		Imperial Dorchester 1		Coppermine Hill 2	
		KB (m)		24.08		145.3	
		GRD (m)		19.51		140	
		Tops of Formations (m)					
GROUP	FORMATION / MEMBER	MD/ TVD	SS	MD/ TVD	SS	MD/ TVD	SS
<b>Cumberland</b>	Boss Point Formation			0	24.08	0	145.3
<b>Mabou</b>	Hopewell Cape Formation	0	6.4	536	-511.92	177	-31.7
	Maringouin Formation			1204	-1179.92	1026	-929.7
<b>Windsor</b>	Lime-Kiln Brook Formation	119	-112.6	1472	-1447.92	1426	-1280.7
	Pugwash Mine Formation	530	-523.6	1576	-1551.92	1745	-1599.7
	Upperton Formation	1539	-1532.6	2335	-2310.92	2100.5	-1955.2
	Macumber–Gays River formations	1564	-1557.6			2150.5	-2005.2
	Hillsborough Formation	1600	-1593.6			2218	-2072.7
<b>Horton</b>	Albert Formation ( <i>Frederick Brook Member</i> )	1695	-1688.6				
	Albert Formation ( <i>Dawson Settlement Member</i> )	1958	-1951.6				
	Memramcook–McQuade Brook formations	2277	-2270.6			2553	-2407.7
—	Crystalline basement					2862	-2716.7
<b>Total depth of well</b>		<b>2508</b>	<b>-2501.6</b>	<b>2420</b>	<b>-2395.92</b>	<b>3420</b>	<b>-3274.7</b>

**Notes:** GRD = Ground elevation, KB = Kelly bushing elevation, MD = Measured depth, SS = Sub-sea level, TVD = True vertical depth

The Frederick Brook Member lies above the Dawson Settlement Member and was intersected in the 1695 m to 1958 m depth interval. Shale, the dominant lithology, is dark grey, silty, calcareous, and slightly micaceous with evidence of plant fragments. Intervals of medium to dark grey calcareous siltstone decrease in abundance with depth; typically, the siltstone is siliceous. Lenses of minor, very fine-grained, white to grey calcareous sandstone are present throughout the section in association with predominant quartz and muscovite and minor selenite stringers; the sandstone lenses are slightly less extensive than in the underlying Dawson Settlement Member. A 20 m thick interval of white microcrystalline anhydrite was intersected in the 1828 m to 1848 m depth interval.

### **Windsor Group**

The Windsor Group lies above the Horton Group and represents a significant portion of the stratigraphy in this well (Table 2). The basal Hillsborough Formation was intersected in the 1600 m to 1695 m depth interval. The formation consists mainly of polymictic conglomerate that varies between greyish green and reddish brown with clasts of subangular to subrounded

quartz and a variety of igneous lithologies. The conglomerate grades into sandstone toward the base of the section. Minor limestone observed in this section may be the result of cavings.

The overlying Macumber–Gays River formations were intersected in the 1564 m to 1600 m depth interval. The main lithology is grey, frosted limestone with minor conglomerate near the base that apparently grades into the Hillsborough Formation below.

Overlying the Macumber–Gays River formations is a thin bed of Upperton Formation, between 1539 m and 1564 m. The dominant Upperton lithology is anhydrite with minor gypsum, salt, and limestone near the base of the interval. The anhydrite is white to grey and microcrystalline with minor orange staining. The Upperton Formation is overlain by the Pugwash Mine Formation, which was intersected between 530 m and 1539 m. The Pugwash Mine Formation in this well is represented by a thick succession of relatively clean, clear to white salt, except near the top of the section, where the salt is orange. Minor siltstone stringers and selenite crystals are present in some sections.

At the top of the Windsor section, the Lime-Kiln Brook Formation was intersected in the 119 m to 530 m depth interval. The formation in this well consists mainly of white to grey microcrystalline anhydrite with stringers of gypsum, selenite, and salt.

### ***Mabou Group***

The Mabou Group in this well (Table 2) is represented only by the Hopewell Cape Formation, which occurs from the collar to a depth of 119 m. The formation consists of maroon to brown sandstone with poorly sorted, subrounded, poorly consolidated gravel and becomes coarser grained with depth.

### **Imperial Dorchester 1 (UIN 330)**

Late Devonian to Carboniferous rocks older than the upper Windsor Group (i.e., rocks of the Horton and Sussex groups and Windsor rocks older than the Upperton Formation) were not intersected in this well.

### ***Windsor Group***

The Upperton Formation (Table 2) is present between 2335 m and 2420 m, where it consists of salt, varied proportions of dirty anhydrite, and differing quantities of shale. The salt can be both clear and opaque and typically appears as large crystals. The dirty anhydrites, and what possibly may be gypsum, are white to light grey and in the form of powdered crystals. The shale is grey, calcareous, and fissile, and ranges from hard to soft throughout the entire section.

The overlying Pugwash Mine Formation (Table 2) is found in the 1576 m to 2335 m depth interval. Halite, which occurs throughout the interval, is predominantly white to light pink and less commonly light brown. Salt crystals vary from fine- to coarse-grained aggregates, and when the large crystals are clean, they are semitransparent to transparent. The Pugwash

Mine Formation in this section contains minor quantities of red to maroon and grey to green shales that are very slightly calcareous, fissile, and vary in hardness. Also present is minor white, powdery anhydrite.

The top of the Windsor Group is represented by the Lime-Kiln Brook Formation in the 1472 m to 1576 m depth interval (Table 2). The formation here consists of reddish maroon to brown, clay-coated siltstone, clay, and shale, with minor sandstone stringers. The shale is non-calcareous, micromicaceous, and moderately soft; it ranges from blocky to subfissile. The clay coating is grey, vuggy, and moderately consolidated.

The overlying Maringouin Formation (Table 2) was intersected between 1204 m and 1472 m and contains red, brown, and grey siltstone as the dominant lithology. Most of the siltstone is oxidized, blocky, and very slightly calcareous; it contains minor mica, is hard, and has a dirty coating. Minor sandstone and conglomerate lenses appear near the base of the formation. The sandstone is red to brown and less commonly grey, very fine to medium grained with a quartz matrix, slightly calcareous, well sorted, subangular, and well consolidated. Sandstone abundance increases near the base of the formation. The conglomerate is maroon to brown, very slightly calcareous, has biotite in the matrix, is poorly sorted, and is well consolidated. Subangular to angular clasts in the conglomerate are composed of quartz and a variety of igneous fragments.

The Hopewell Cape Formation (Table 2) overlies the Maringouin Formation at depths of between 536 m and 1204 m and consists of conglomerate and sandstone. The conglomerate is maroon to brown, poorly sorted and well consolidated with subangular clasts of quartz, igneous fragments, and schist in a matrix with extensive biotite. Red to brown sandstone varies from very coarse to fine grained, is highly calcareous, is poorly sorted, and has subangular grains. Minor lenses of maroon to brown siltstone also occur throughout the section; the siltstone is siliceous, blocky, slightly calcareous, and hard.

### ***Cumberland Group***

The Imperial Dorchester 1 well was collared in rocks of the Boss Point Formation, which extend down to a depth of 536 m (Table 2). Lithotypes of the formation consist of grey and maroon siltstone; grey, very fine- to coarse-grained grey and maroon sandstone; white to pink polymictic conglomerate; and minor, light to medium grey shale that is blocky and non-calcareous. Despite the lithologic variety, the grain sizes show an overall trend of becoming finer with depth.

### **Coppermine Hill 2 (UIN 716)**

#### ***Pre-Late Devonian Rocks***

This well intersected rocks of what is interpreted to be pre-Late Devonian basement between 3420 m and 2862 m (Table 2). The main basement lithologies comprise alternating sequences of schist, metasedimentary rocks, and weathered to unweathered granitic rocks. Gemmel and



Giles (2001) previously identified the schists as sandstones, the metasedimentary rocks as siltstones, and the granitic rocks as conglomerates (see Stewart 2011).

The schist appears in discrete zones devoid of other material. It is light to medium grey to green and poorly sorted; has abundant subrounded to elongated, grey to white quartz grains; and contains chlorite, biotite, and muscovite. The maroon to brown metasedimentary rocks are slightly calcareous, pyritiferous, and very hard. They resemble the pyritiferous, hard siltstones of the overlying McQuade Brook Formation (see below) but are much more indurated. The composition of the granitic rocks is somewhat similar to that of the schist, but the brown, grey, and orange quartz minerals are angular instead of subrounded. The granitic intervals also contain minor calcite (possibly vein material) and are pyritized, hard, and shiny.

### ***Horton Group***

Rocks of the McQuade Brook Formation (Horton Group) were intersected between 2862 m and 2553 m and overlie crystalline basement (Table 2). The formation consists mainly of dirty, dark grey and brown to dark maroon and brown siltstone that is very calcareous, blocky, and has minor grey clay content. This siltstone-dominated facies is maroon-brown at the base, medium to dark grey in the mid-section, and dark brown in the upper section. The McQuade Brook Formation in this well has high pyrite content and is very hard, suggesting deep burial.

The strip log for Coppermine Hill 2 (Appendix 4) shows thin intervals of brown, polymictic conglomerate within the siltstone facies, beginning at 2629 m and becoming more common uphole until the interpreted Windsor–Horton boundary is reached at 2553 m. At this depth, the brown conglomerates, which probably represent the Memramcook Formation (see Stewart 2011), ‘give way’ to maroon to brown conglomerates of the Hillsborough Group (Windsor Group).

### ***Windsor Group***

The Hillsborough Formation represents the base of the Windsor Group in this well and was intersected between 2218 m and 2553 m (Table 2). The main lithology is conglomerate, accompanied by a minor, 20 m section of sandstone and siltstone. The conglomerate is maroon to brown, polymictic with quartz and a variety of igneous clasts, poorly sorted, predominantly subrounded, and slightly calcareous. The sandstone is dark grey, fine grained, has a high percentage of quartz and biotite in the matrix, and is moderately sorted with subangular grains. The pebbly siltstone is maroon to brown, non-calcareous, and blocky. The siltstone section may be thicker than indicated, but a 10 m to 15 m interval of chip samples is missing from above and below the section.

The Macumber–Gays River formations were intersected in the 2150.5 m to 2218 m depth interval (Table 2) and consist mainly of dirty anhydrite, limestone, and salt. The anhydrite is white to light grey and has powdered crystals; the limestone is light grey with mud cement. The salt is white to light grey, semitransparent to transparent, and in both powdered and large-crystal form.

The Upperton Formation overlies the Macumber–Gays River formations and was intersected at a depth interval of 2100.5 m to 2150.5 m (Table 2). The Upperton Formation is a narrow, dirty section that consists mainly of white to light grey, powdered anhydrite crystals but also contains significant salt and siltstone stringers. The salt is white to light grey, semitransparent to transparent, and in both powdered and large-crystal form.

The halite-dominated Pugwash Mine Formation occurs in the 1745 m to 2100.5 m depth interval (Table 2). The salt is light brown to greyish with intermittent stringers of medium to dark grey siltstone and minor white powdery anhydrite. The larger halite crystals in general appear powdery but when cleaned are semitransparent to transparent.

The top of the Windsor Group is represented by the Lime-Kiln Brook Formation, which extends from 1745 m to 1426 m (Table 2) and features miniscule white clay throughout the formation. The formation consists of siltstone and sandstone with minor salt and significant limestone in various intervals. The siltstone is maroon to grey, siliceous, veined in places with calcite, micromicaceous with minor pyrite, moderately hard, and blocky to platy. The sandstone is maroon, very fine to fine grained, siliceous, veined with calcite, micromicaceous with biotite, moderately sorted, and subangular to subrounded. Salt occurs as large, white to orange, semitransparent crystals. Light grey, calcite-veined limestone is present in the 1587 m to 1662 m depth interval.

### ***Mabou Group***

The Mabou Group in this well is represented by the Maringouin and Hopewell Cape formations. The Maringouin Formation extends from 1026 m to 1426 m (Table 2) and alternates between siltstone and minor sandstone lenses at the base of the section. The siltstone is maroon to brown and grey, calcareous, micromicaceous, and brittle in places. The sandstone lenses are very fine to fine grained and non-calcareous with constituents that vary from subangular to subrounded. The top of the sequence is dominated by similar sandstone but is mainly fine grained to very coarse grained. A single section of shale occurs between 1158 m and 1170 m; the shale is light to dark grey, blocky, very hard, and at some depths is vitreous, subfissile, and micromicaceous.

The Hopewell Cape Formation was observed in the 177 m to 1026 m depth interval (Table 2) and consists predominantly of conglomerate with lesser amounts of interbedded sandstone and siltstone that exhibit properties similar to the sandstone and siltstone in the previous interval. The conglomerate is dark maroon to dark brown and grey, polymictic, calcareous, and poorly sorted with a cement of siltstone and sandstone. All finer grained rocks in this interval are red to brown siltstone.

### ***Cumberland Group***

The well was collared in rocks of the Boss Point Formation to a depth of 177 m. The section consists mainly of a mixture of white to brown sandstone and siltstone with minor red to brown

mudstone stringers. The sandstone is calcareous, poorly consolidated, and very fine to coarse grained with subrounded and subangular grains. The calcareous siltstone is predominantly red to brown and less commonly grey; it also is hematitic and very soft.

## **1996 SEISMIC SURVEY**

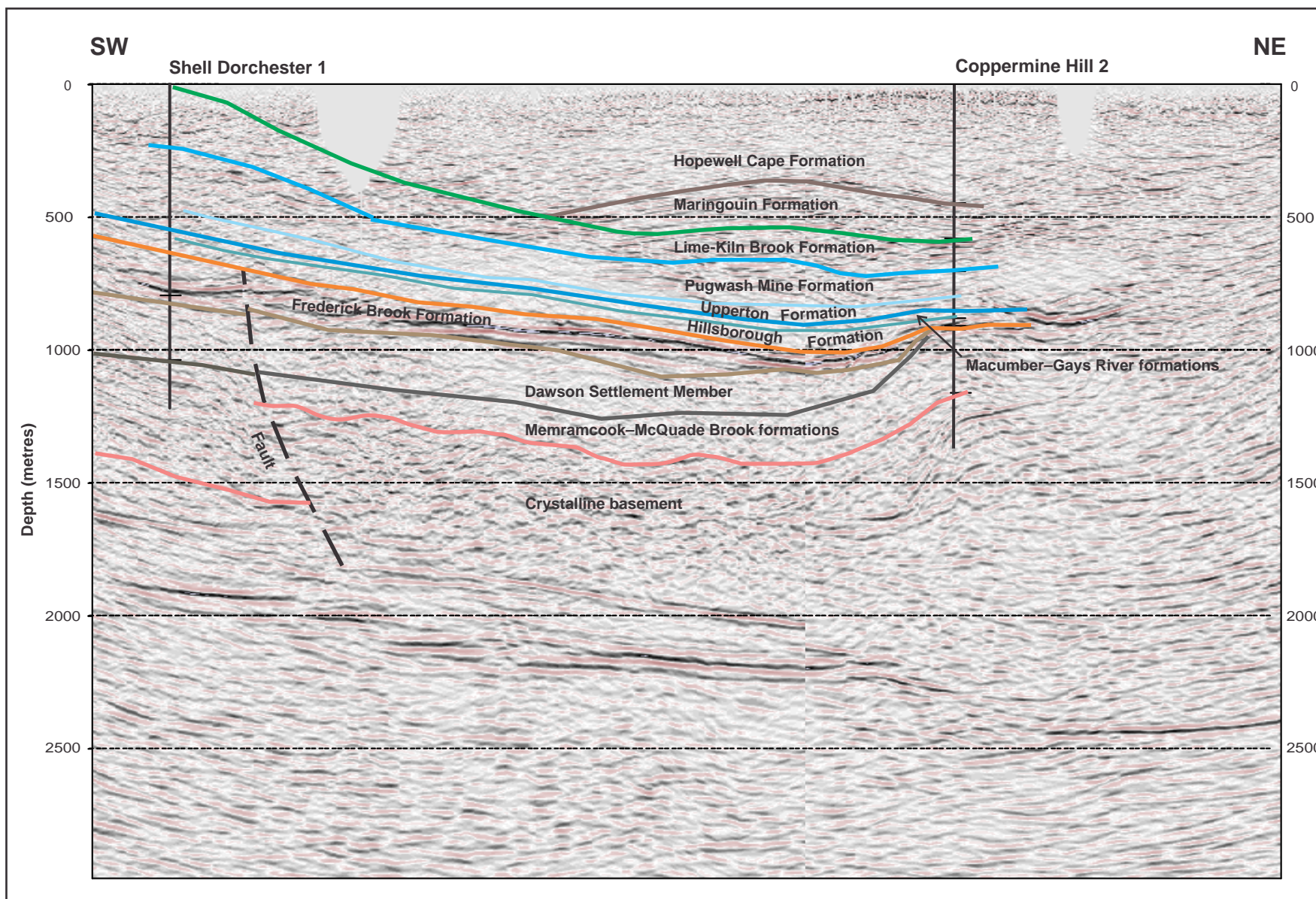
The seismic profile (Fig. 2, 5) conducted by Corridor Resources Inc. in 1996 reveals a fault that caused noticeable reverse displacement of pre-Late Devonian rocks near the Shell Dorchester 1 well. Rocks of the Horton Group appear to display only minor movement along this structure, indicating that the apparently significant basement displacement could have resulted from strike-slip movement along irregular basement topography. Martel (1987) interpreted similarly Horton-age and younger faults (e.g., the Dorchester Fault; Fig. 2) along a seismic line completed by Chevron Canada Resources Ltd.

The 1996 seismic profile also indicates that faulting and folding of the Horton strata took place before deposition of the Windsor Group (see St. Peter and Johnson 2009). It likely was during this interval that the Albert Formation was eroded to varied degrees, which would account for the missing Albert section in the Coppermine Hill 2 well. Importantly, the uppermost unit of the Albert Formation—the Hiram Brook Member, one of the main targets for conventional gas in the region—is absent from all deep wells in the Dorchester area and presumably was eroded completely during basin inversion in the Early Carboniferous.

## **SUMMARY AND CONCLUSIONS**

A detailed study was made of petrographic and petrophysical data from three deep wells near Dorchester in the western Sackville Subbasin, and the analytical results were integrated with existing seismic data. On the basis of the combined information, several earlier stratigraphic and structural interpretations of rocks in the report area have been refined or, in some cases, re-evaluated. Stewart (2011) provides a detailed discussion of these interpretations, the highlights of which are as follows.

- The contacts between some groups, formations, and members of Late Devonian to Carboniferous rocks in the report area have been more precisely defined.
- Granitic rocks mapped as Carboniferous conglomerate by earlier authors are herein identified as pre-Late Devonian crystalline basement, which indicates that the depth to basement in the report area is shallower than was previously interpreted.
- The total thickness of the Albert Formation in the report area is thinner than was previously interpreted, and the formation appears to pinch out to the northeast of Dorchester.
- The stratigraphic section of Albert Formation in the western Sackville Subbasin can be subdivided into the Dawson Settlement and Frederick Brook members.



**Figure 5.** Suggested interpretation of a seismic profile between the Shell Dorchester 1 and Coppermine Hill 2 wells in the western Sackville Subbasin. The survey was conducted in 1996 by Corridor Resources Inc. See Figure 2 for the two lines of the seismic survey.

- The Hiram Brook Member (Albert Formation), a key target for conventional gas in southeastern New Brunswick, is absent from all three deep wells in the report area. Nonetheless, the lack of Hiram Brook strata does not rule out the potential for conventional gas elsewhere in the basin or for unconventional gas buried at depth below the Hiram Brook Member.

Future work in the area will include petrographic and petrologic analysis of other wells in the western Sackville Subbasin, as well as additional field mapping and seismic interpretation.

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**APPENDIX 1:  
GENERIC STRIP LOG ABBREVIATIONS**

**Multi-word terms**

aa	as above
fsh:sc	fish scales
grntws	granite wash
ip	in part
los	live oil show
n/s	no shows
ns	no shows
nsoc	no stain or cut
qtzaren	quartz arenite
s&p	salt and pepper
sap	salt and pepper
vfg	very fine grained
vf	very fine
vps	very poor samples

**Hyphenated terms (do not use  
hypens in abbreviations)**

offwht	off-white
xbd	cross-bed
xbdg	cross-bedding
xbdd	cross-bedded
xlam	cross-laminated

&	and
@	at
abnt	abundant
abunt	abundant
abv	above
acic	acicular
aft	after
aglm	agglomerate
Alg	Algae
Alga	Algal
alt	altered
altg	altering
amb	amber
amor	amorphous
Amph	Amphipora
amt	amount
amts	amounts
amtg	amounting
ang	angular

anhed	anhedral
anhy	anhydrite
ANHY	ANHYDRITE
Anhy	Anhydrite
anhyc	anhydritic
app	appear
appnc	appearance
apps	appears
apr	apparent
aprox	approximate
apry	approximately
aren	arenaceous
arg	argillaceous
argl	argillite
ark	arkose
arkc	arkosic
asph	asphalt
asphc	asphaltic
bar	barite
bcm	becoming
bcmg	becoming
bd	bed
bdd	bedded
bds	beds
bdeye	birdseye
bdg	bedding
Belm	Belemnites
BENT	BENTONITE
Bent	Bentonite
bent	bentonite
bentc	bentonitic
bf	buff
biocl	bioclast
bioclc	bioclastic
bioturb	bioturbated
bit	bitumen
bitns	bituminous
bl	blue
blmg	blooming
biot	biotite
bldr	boulder
bldrs	boulders
blk	black

**General strip log abbreviations**

blky	blocky	clr	clear
bnd	band	clus	cluster
bndd	banded	cly	clay
bot	botroidal	CLYST	CLAYSTONE
boudg	boudinage	Clyst	Claystone
Brac	Brachiopod	clyst	claystone
brhg	branching	cmt	cement
Brec	Breccia	cmtd	cemented
BREC	BRECCIA	cmts	cements
brec	breccia	cncn	concentric
brect	brecciated	col	colour
bri	bright	cold	coloured
brit	brittle	cols	colours
brd	bored	coln	colonial
brn	brown	com	common
Bry	Bryzoa	conc	concretion
bulb	bulbous	concs	concretions
bur	burrow	concy	concretionary
burd	burrowed	conch	conchoidal
c	coarse	Cono	Conodont
csy	coarsely	con	contaminated
cal	calcite	cons	consolidated
calc	calcareous	coq	coquina
carb	carbonaceous	Cor	Coral
cbl	cobble	crbnt	carbonate
cbls	cobbles	crin	crinoid
Ceph	Cephalopod	Crin	Crinoid
CGL	CONGLOMERATE	crinal	crinal
CGLN	CONGLOMERATE	Crinal	Crinoidal
Cgl	Conglomerate	crm	cream
Cgln	Conglomerate	crptxl	cryptocrystalline
cgl	conglomerate	cyxln	cryptocrystalline
cgln	conglomerate	cryptoxln	cryptocrystalline
chal	chalcedony	ctd	coated
chit	chitin	ctg	coating
chitns	chitinous	ctc	contact
chk	chalk	cvg	caving
chky	chalky	cvgs	cavings
chlor	chlorite	dd	dead
CHT	CHERT	deb	debris
Cht	Chert	decr	decrease
cht	chert	decrng	decreasing
cl	clast	dend	dendrite
cls	clasts	dendc	dendritic
clc	clastic	desm	disseminated
cln	clean	dess	desiccation
clnr	cleaner	difse	difse

**General strip log abbreviations**



dk	dark	fos	fossil
dkr	darker	foss	fossils
dns	dense	fosus	fossiliferous
DOL	DOLOMITE	fr	fair
Dol	Dolomite	frm	firm
dol	dolomite	frac	fracture
dolc	dolomitic	fracs	fractures
dolmtz	dolomitize	fracd	fractured
dolmtzd	dolomitized	frag	fragment
dolst	dolostone	frags	fragments
drs	druse	fri	friable
drsy	drusy	frmwk	framework
drty	dirty	fros	frosted
dtrl	detrital	fus	fusilinid
dtrls	detrius	Fvst	Favosities
Ech	Echinoid	g	good
elg	elongate	Gast	Gastropod
est	estimated	gil	gilsonite
euhed	euedral	gl	glass
excel	excellent	gly	glassy
f	fine	glau	glaucinite
fy	finely	glauc	glaucinitic
fab	fabric	gn	green
fau	fauna	gns	gneiss
fe	ferruginous	gnsc	gneissic
ferr	ferruginous	gr	grained
fenst	fenestral	grnd	grained
fest	ironstone	grs	grains
fg	fine-grained	grn	grain
fib	fibrous	grns	grains
fis	fissile	grnst	grainstone
fiss	fissile	gran	granular
fl	fill	Grap	Graptolite
fld	feldspar	grd	grade
feld	feldspar	grds	grades
fldc	feldspathic	grdg	grading
flk	flake	grnl	granular
flks	flakes	grnt	granite
flky	flaky	gsy	greasy
flor	fluorescence	gvl	gravel
fls	flesh	gy	gray
flt	fault	GYP	GYP SUM
fltd	faulted	Gyp	Gypsum
fltg	floating	gyp	gypsum
fnt	faint	gywke	greywacke
fnty	faintly	hd	hard
Foram	Foraminifera	hrd	hard

**General strip log abbreviations**

hem	hemitite	lchd	leached
hemc	hemititic	len	lense
hex	hexagonal	lenc	lenticular
hi	high	lens	lenses
hornbl	hornblende	lig	lignite
hztl	horizontal	lith	lithographic
hvy	heavy	lithar	litharenite
hydc	hydrocarbon	lmn	limonite
ig	igneous	lmnc	limonitic
imbd	imbedded	lmpy	lumpy
immed	immediate	lmy	limy
imp	impression	lrg	large
incl	inclusion	lrgy	largely
incld	included	lrgr	larger
IG	IGNEOUS	ls	limestone
lg	Igneous	lsm	limestone
ig	igneous	lmst	limestone
incr	increase	LS	LIMESTONE
incrg	increasing	LSM	LIMESTONE
ind	indurated	LMST	LIMESTONE
indst	indistinct	Ls	Limestone
Inoc	Inoceramous	Lsm	Limestone
inst	instant	Lmst	Limestone
intbdd	interbedded	lse	loose
intbds	interbeds	lstr	lustre
intbd	interbed	lt	light
intcl	interclast	ltly	lightly
intclc	interclastic	ltr	lighter
intcls	interclasts	lthc	lithic
intfrag	interfragmental	magn	magnetic
intgr	intergranular	mar	maroon
ingwn	intergrown	mas	massive
intlam	interlaminated	mass	massive
intpt	interpretation	mss	massive
intr	intrusive	mat	material
intstl	interstitial	med	medium
intv	interval	meta	metamorphic
intxl	intercrystalline	Meta	Metamorphic
ireg	irregular	META	METAMORPHIC
irid	iridescent	mic	micro
kaon	kaolin	mics	micaceous
kaol	kaolinite	mmica	micromicaceous
kao	kaolinitic	micmica	micromicaceous
l	lower	mict	micritic
lam	laminated	microxln	microcrystalline
lamn	lamination	mcxln	microcrystalline
lav	lavender	mky	milky

**General strip log abbreviations**

mldc	moldic	ply	poorly
mnly	mainly	pel	pellet
mnr	minor	pels	pellets
mnrl	mineral	perm	permeability
min	mineral	petf	petroliferous
mnrlzd	mineralized	phen	phenocrysts
mnut	minute	phos	phosphate
mod	moderately	phosc	phosphatic
Mol	Mollusca	piso	pisolites
mot	mottled	pisoc	pisolitic
mrlst	marlstone	pit	pitted
MRLST	MARLSTONE	pk	pink
Mrlst	Marlstone	pnk	pink
mrly	marly	pckst	packstone
msm	metasomatic	pkst	packstone
mtx	matrix	plag	plagioclase
mudst	mudstone	plas	plastic
musc	muscovite	Plcy	Pelecypods
nod	nodules	pl	plant
nodr	nodular	plty	platy
num	numerous	poikt	poikilotopic
o	oil	pol	polish
occ	occasional	plod	polished
occly	occasionally	por	porosity
och	ochre	pors	porous
ocldd	occluded	pos	possible
od	odor	posy	possibly
olv	olive	pp	pinpoint
olvn	olivine	pred	predominant
onc	oncolites	predy	predominantly
ooc	ooclasts	pres	preserved
oocc	ooclastic	presd	preserved
ool	oolites	prphy	porphyry
oolc	oolitic	psdo	pseudo
oom	oomold	pt	part
oomc	oomoldic	pty	partly
op	opaque	ptch	patchy
org	organic	ptg	parting
orng	orange	prtng	parting
orth	orthoclase	prtng	parting
Ost	Ostracods	purp	purple
ovgth	overgrowths	pyr	pyrite
ox	oxidized	pyrc	pyritic
p	poor	pyrz	pyritized
parll	parallel	pybit	pyrobitumen
pbl	pebble	pyrxn	pyroxene
peb	pebble	qtz	quartz

### General strip log abbreviations

qtzs	quartzose	SID	SIDERITE
qtzt	quartzite	Sid	Siderite
rad	radiate	sid	siderite
radg	radiating	sidc	sideritic
rd	rounded	sil	silica
rnd	rounded	silc	siliceous
reac	reaction	silif	silicified
repl	replaced	slicksl	slickensides
replg	replacing	sksd	slickensided
replmt	replacement	sl	slightly
resd	residue	sln	solution
resdl	residual	slky	silky
rexl	recrystallized	slt	silt
rexlz	recrystallization	sly	silty
ribn	ribbon	sltst	siltstone
rhmb	rhomb	stst	siltstone
romb	rhomb	SLTST	SILTSTONE
rhmbc	rhombic	STST	SILTSTONE
rmn	remains	SlSt	Siltstone
remn	remnant	Slst	Siltstone
rr	rare	stst	Siltstone
rsns	resinous	sm	smooth
rthy	earthy	sol	solitary
rug	rugose	soln	solution
SA	SALT	Solen	Solenopora
Sa	Salt	sp	spotty
sa	salt	spd	spotted
sul	sulphur	spec	speck
sat	saturated	speckl	speckled
sb	sub	spg	spongy
sc	scales	sph	spherules
Scaph	Scaphopod	sphal	sphalerite
scat	scattered	spic	spicule
scatt	scattered	spicr	spicular
sch	schist	spl	sample
sd	sand	splt	splintery
sdv	sandy	spr	spore
sec	secondary	spty	spotty
sed	sediment	sr	subrounded
sedy	sedimentary	srt	sorted
sel	selenite	srtcd	sorted
sft	soft	srtg	sorting
sh	shale	srts	sorts
SH	SHALE	ss	sandstone
Sh	Shale	SS	SANDSTONE
shad	shadow	Ss	Sandstone
shy	shaly	Stach	Stachyodes

**General strip log abbreviations**

stmg	streaming	var	various
stn	stain	v	very
stnd	stained	vcol	varicolored
stns	stains	ves	vesicular
stng	staining	vgt	variegated
str	streaky	vit	vitreous
strs	streaks	vn	vein
strg	stringers	volc	volcanic
string	stringers	vert	vertical
strgs	stringers	vrvd	varved
stri	striated	vugy	vuggy
Strom	Stromatoporoid	vuglr	vugular
Stromat	Stromatolite	w	well
struc	structure	wh	white
strucs	structures	wht	white
styl	styolite	wi	with
stylc	styolitic	wackest	wackestone
suc	sucrosic	wkst	wackestone
sug	sugary	wk	weak
sup	supported	wthrd	weathered
surf	surface	wtr	water
Syring	Syringopora	wvy	wavy
spy	sparry	wxy	waxy
sz	size	xls	crystals
tab	tabular	xl	crystalline
Tent	Tenticulites	xln	crystalline
tex	texture	yel	yellow
Tham	Thamnopora	zeo	zeolite
thk	thick	zn	zone
thn	thin		
thru	throughout		
tns	tension		
tr	trace		
trs	traces		
trip	tripolitic		
trnsl	translucent		
trnsp	transparent		
tt	tight		
tty	tightly		
tub	tubular		
TUF	TUF		
tuf	tuffaceous		
u	upper		
uncons	unconsolidated		
unident	unidentifiable		
undif	undifferentiated		
up	upper		

**APPENDIX 2:**

**STRIP LOG OF SHELL DORCHESTER 1 WELL,**

**UNIQUE IDENTIFIER NUMBER 325**

# APPENDIX 2

Scale 1:240 (5"=100') Metric  
Measured Depth Log

Well Name: Shell Dorchester #1  
Location: 1.6 km West of Dorchester Penitentiary  
License Number: WLONG 49-325  
Spud Date: 1949  
Surface Coordinates: 45 54' 51", 64 31' 54"  
Region: Dorchester  
Drilling Completed: 1950  
Bottom Hole Coordinates: 45 54' 51", 64 31' 54"

Ground Elevation (m): 4.27  
Logged Interval (m): 0 To: 2508  
Formation: McQuade Brook  
Type of Drilling Fluid: water-based  
K.B. Elevation (m): 6.40  
Total Depth (m): 2508

Printed by STRIP.LOG from WellSight Systems 1-800-447-1534 www.WellSight.com

## OPERATOR

Company: Shell Oil Company Ltd.  
Address: Shell Canada Limited  
400-4th Avenue S.W.  
Calgary, Alberta

## GEOLOGIST





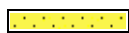
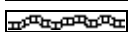


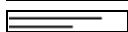

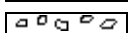
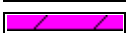



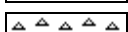



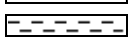

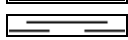
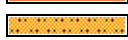
Name: Holly Stewart  
Company: New Brunswick Department of Natural Resources  
Address: P.O. Box 6000  
Fredericton, NB  
E3B 5H1

## Cores

## Comments

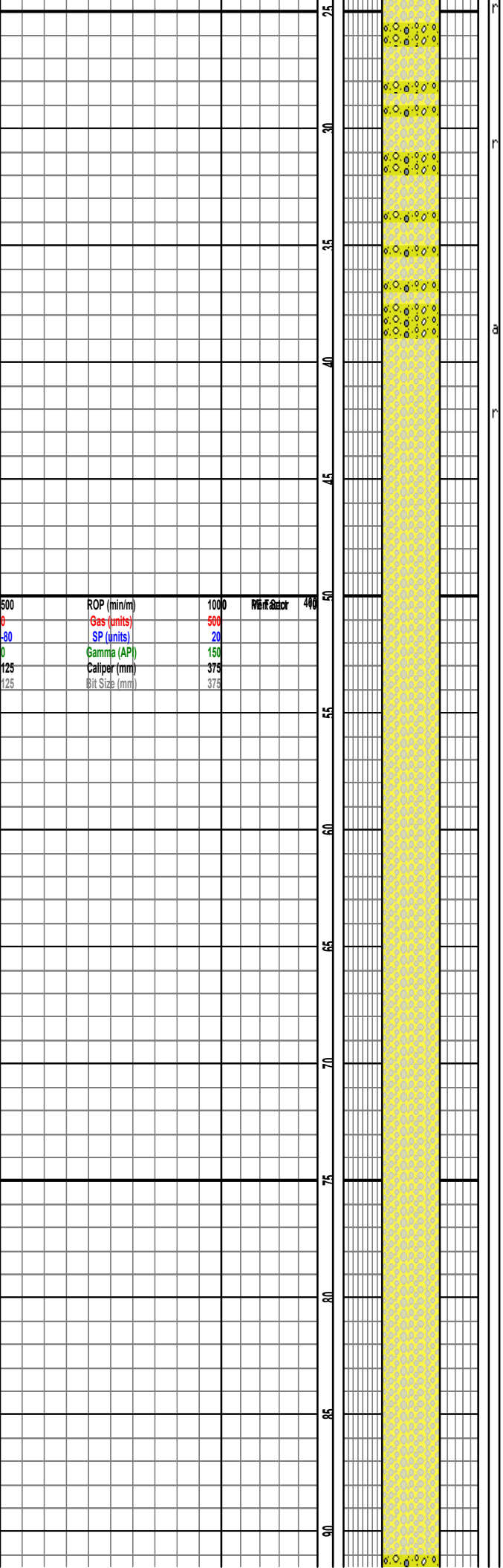
Compilation of work completed by Shell Oil Company Ltd. and N.B. Dept. of Natural Resources

## ROCK TYPES

	Anhy		Coal		Lmst		Shcol		Ss
	Bent		Congl		Meta		Shgy		Uncons ss
	Brec		Dol		Mrlst		Slst (gy, gn)		Till
	Cht		Gyp		Salt		Slst (red, brn)		
	Clyst		Igne		Shale		Slst-vfss (red)		







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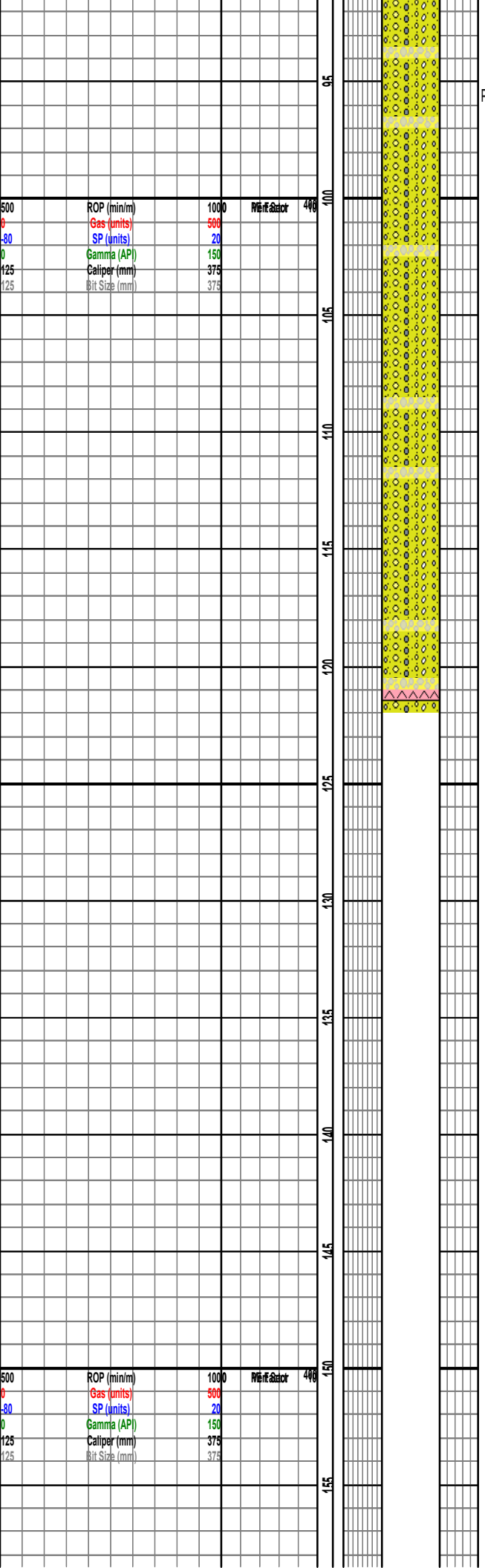
40-40 SS 100% brn, cg, silc, ply srt, sa, uncon

60-76 SS 100% brn, cg, silc, ply srt, sa, uncon

76-91 SS 100% brn, cg, silc, ply srt, sa, uncon

500	ROP (min/m)	1000	Rate of Penetration	400
0	Gas (units)	500		
80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

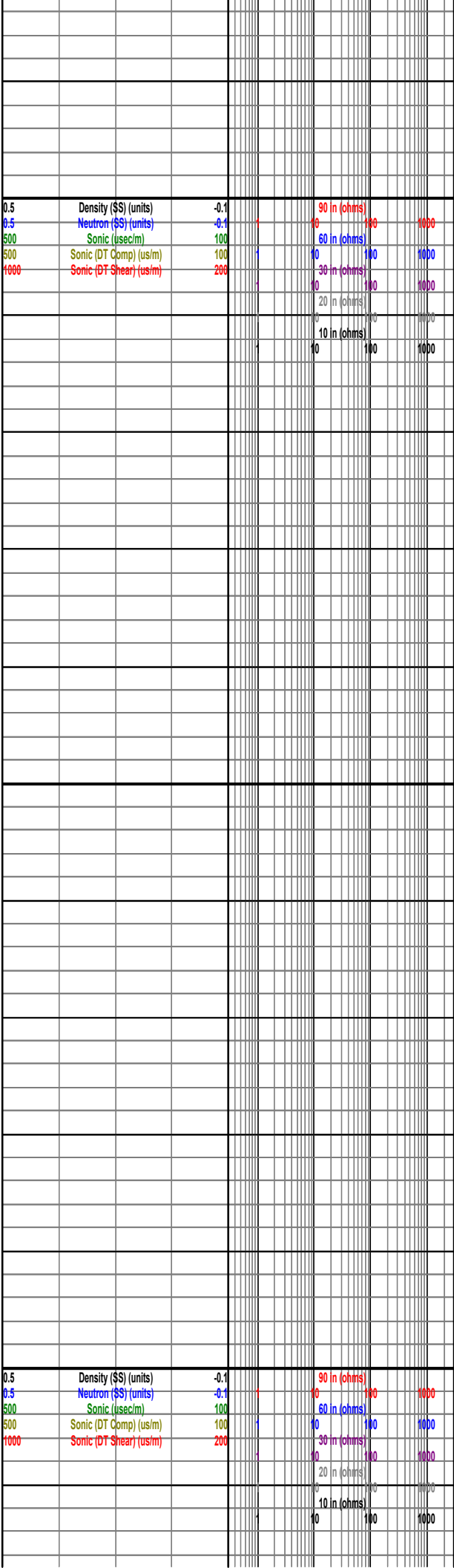


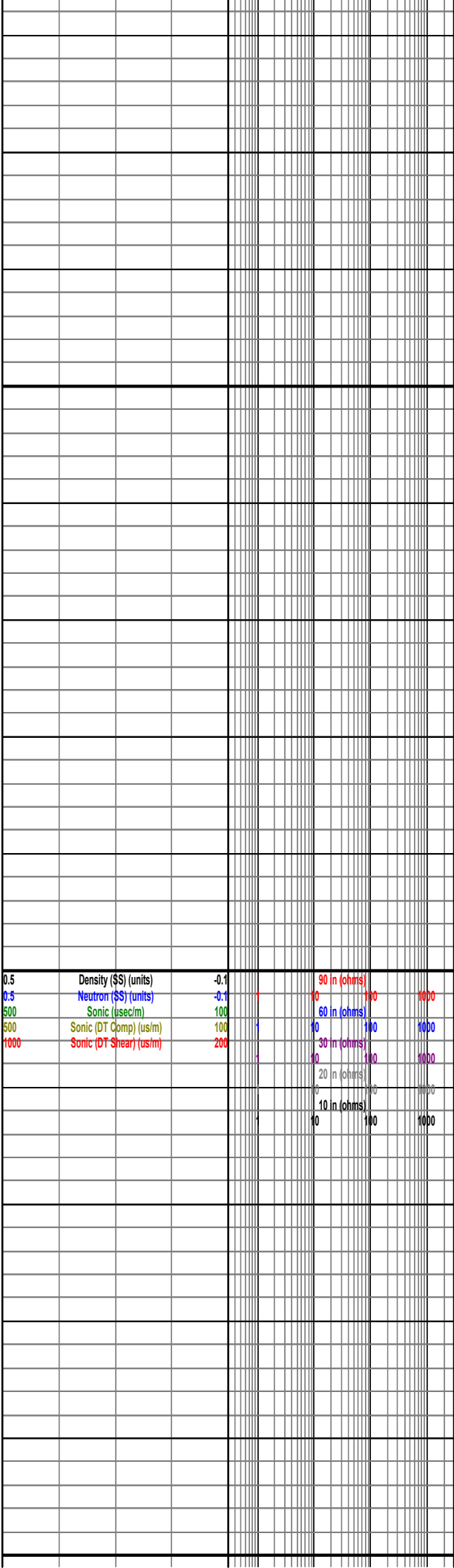
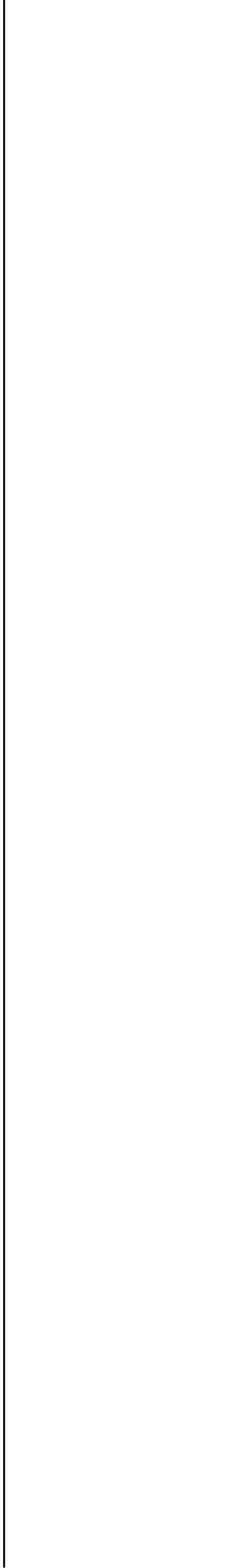
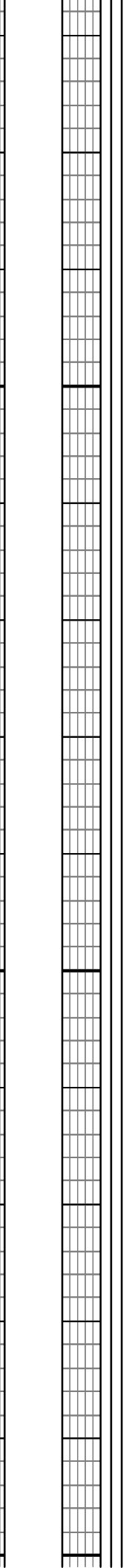
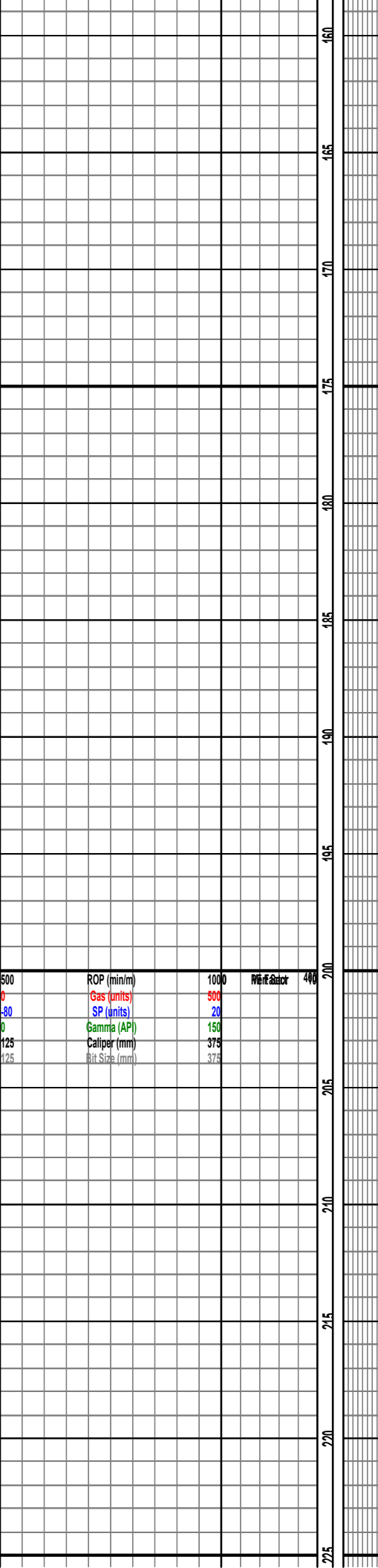
91-119 CGLN 95% mar to brn, gy, qtz, cht, ign frags  
ply srt, sr-sa, uncons; SS 5% br, cg, ply srt, sa,  
uncons

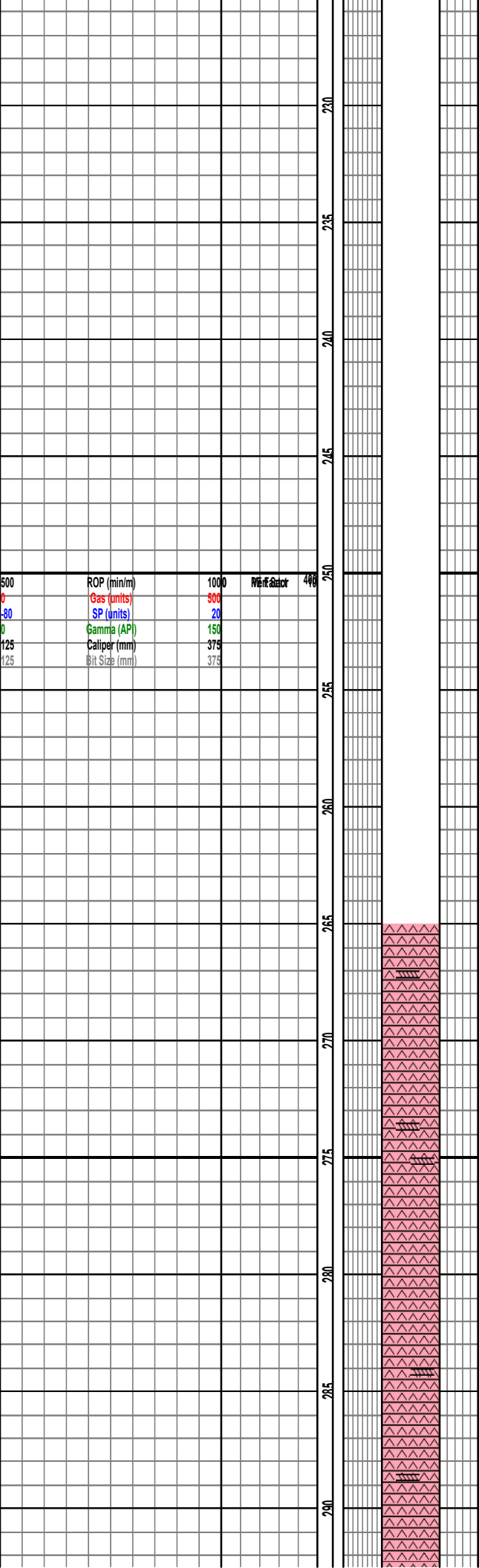
**WINDSOR GROUP**  
**-LIME-KILN BROOK FORMATION**  
**@119.0m MD, 119.0m TVD,**  
**-112.6m SS**

119-122 CGLN 75 % mar to brn, gy, qtz, cht, ign  
frags, ply srt, sr-sa, uncons; SS 20% br, cg, silc, ply  
srt, sa, uncons; ANHY 5% wht, gyp ctd, sa

Sample missing between 122-265 m

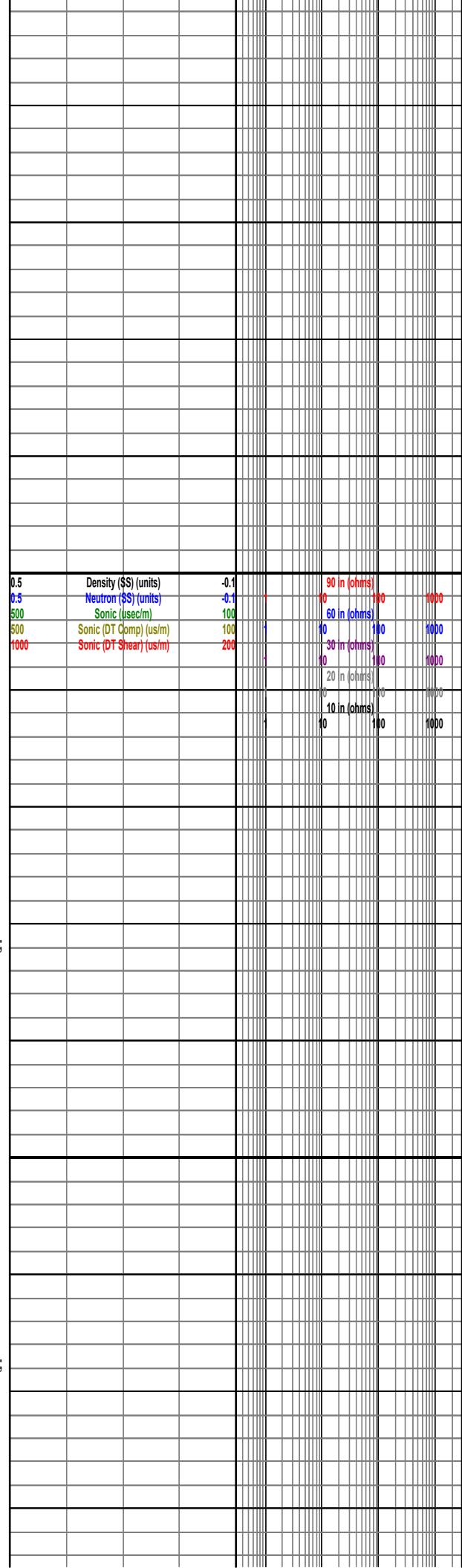






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500	ROP (min/m)	1000	Rate of Penetration
0	Gas (units)	500	
30	SP (units)	20	
0	Gamma (API)	150	
125	Caliper (mm)	375	
125	Bit Size (mm)	375	



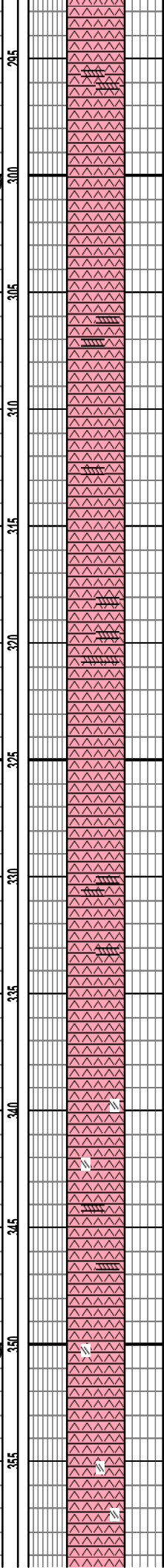
0.5	Density (SS) (units)	-0.1	90 in (ohms)
0.5	Neutron (SS) (units)	-0.1	0 100 1000
500	Sonic (usec/m)	100	60 in (ohms)
500	Sonic (DT Comp) (us/m)	100	0 100 1000
1000	Sonic (DT Shear) (us/m)	200	30 in (ohms)
			0 100 1000
			20 in (ohms)
			0 100 1000
			10 in (ohms)
			0 100 1000

Sample missing between 122-265 m

265-283 ANHY 100% wht-gy, predom microxln, sa;  
gyp strgs, occ sel xls

283-305 ANHY 100% wht-gy, predom microxln, sa;  
gyp strgs, occ sel xls

500	ROP (min/m)	1000	Perf #	499
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (AP)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		



305-320 ANHY 100% wht-gy, predom microxln, sa;  
gyp strgs, occ sel xls

320-332 ANHY 100% wht-gy, predom microxln, sa;  
gyp strgs, occ sel xls

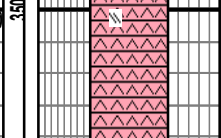
332-341 ANHY 100% wht-gy, predom microxln, sa;  
gyp strgs, occ sel xls

341-344 ANHY 100% wht-gy, pnk, predom microxln  
gyp ctd, sa

344-347 ANHY 100% pnk-brn, predom microxln, sa,  
drty; gyp strgs, occ sel xls

347-366 ANHY 100%wht-gy, pnk, predom microxln,  
gyp ctd, sr

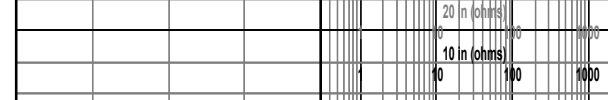
500	ROP (min/m)	1000	Perf #	499
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (AP)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

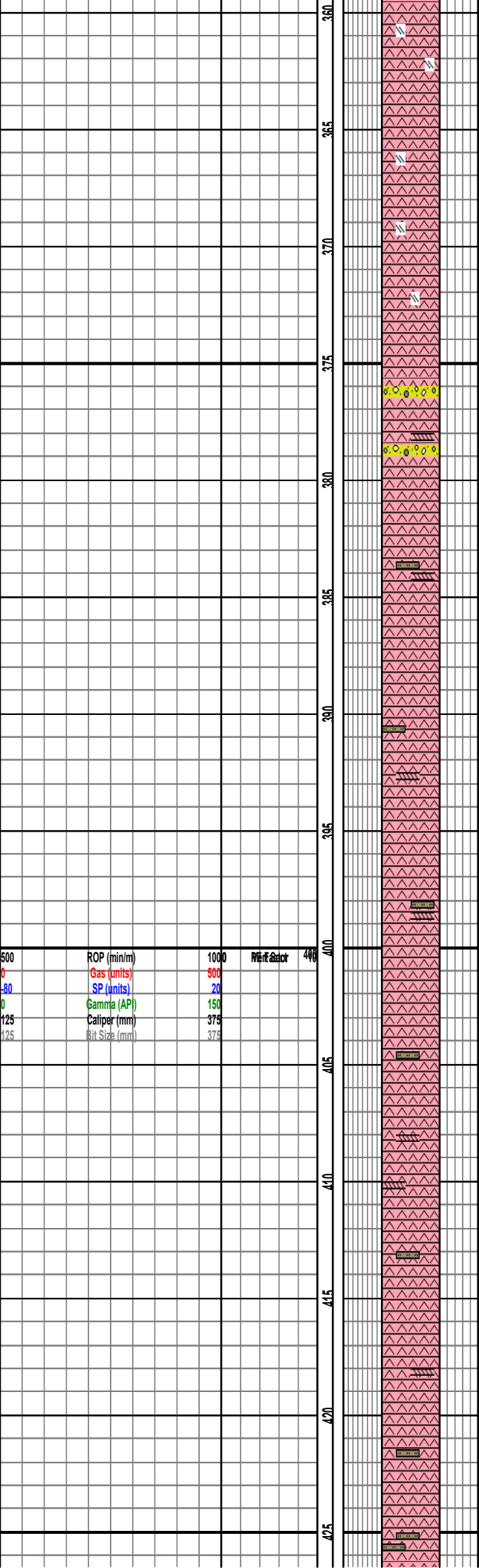


0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000



0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000





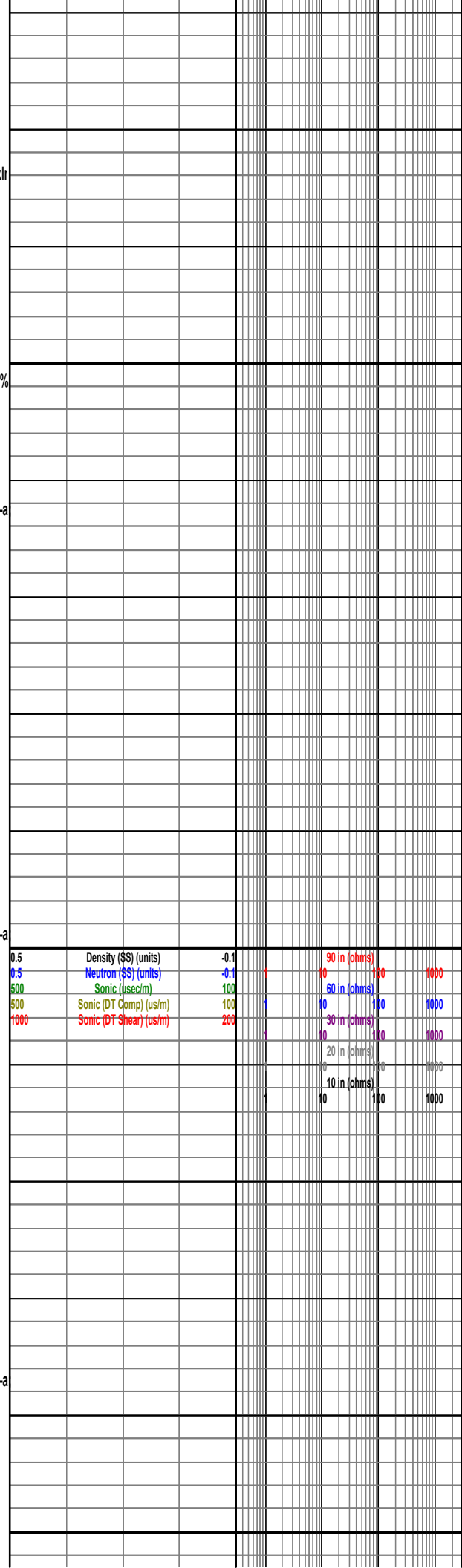
366-375 ANHY 100% wht, pnk-brn, predom microxl  
sily gyp ctd, sr, drty; occ sel xls

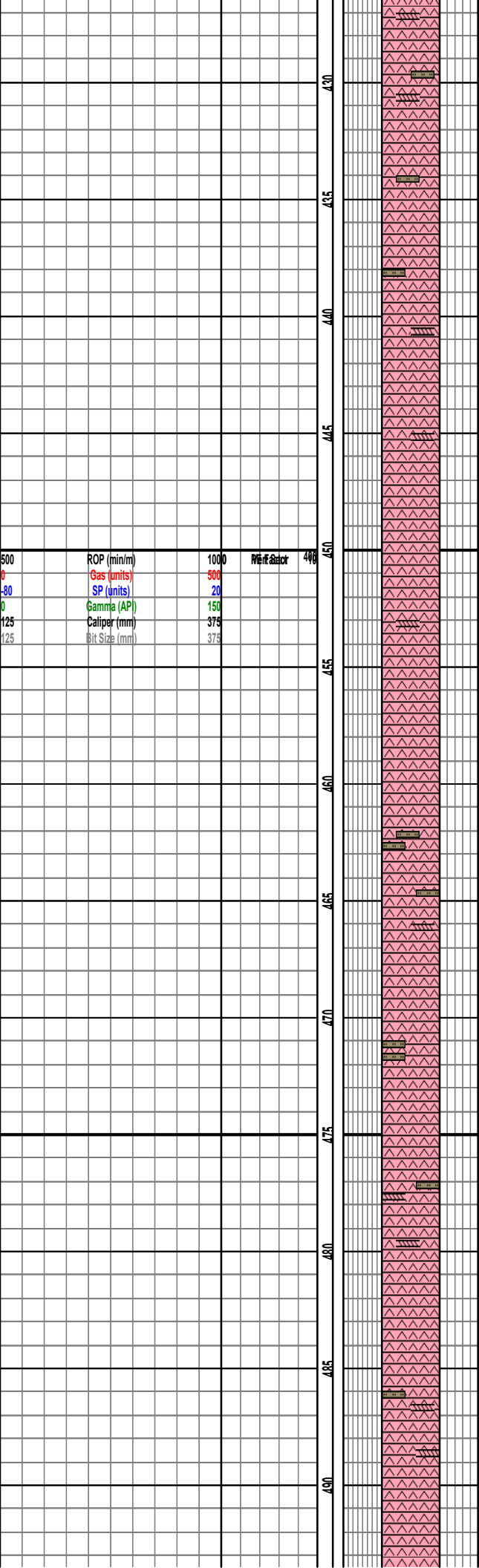
375-381 ANHY 80% wht-gy, pnk, sa, drty CGLN 20%  
pnk-gy, qtz, cht, ign frags, ply srt, sr-sa, uncon;  
gyp strgs

381-399 ANHY 100% wht-gy, predom microxl, sa-a  
sltst strgs, gyp strgs, occ sel xls

399-418 ANHY 100% wht-gy, predom microxl, sa-a  
gyp strgs, sltst strgs, occ sel xls

418-427 ANHY 100% wht-gy, predom microxl, sa-a  
gyp strgs, sltst strgs, occ sel xls





427-442 ANHY 100% wht-gy, predom microxln, sa-a  
gyp strgs, sltst strgs, occ sel xls

442-448 ANHY 100% wht-gy, lrg xls, sa-a, cln; gyp  
strgs

448-454 ANHY 100% wht-gy, brn, lrg-microxln xls,  
sa-a, sily drty

454-460 ANHY 100% wht, sa-a, cln; gyp strgs

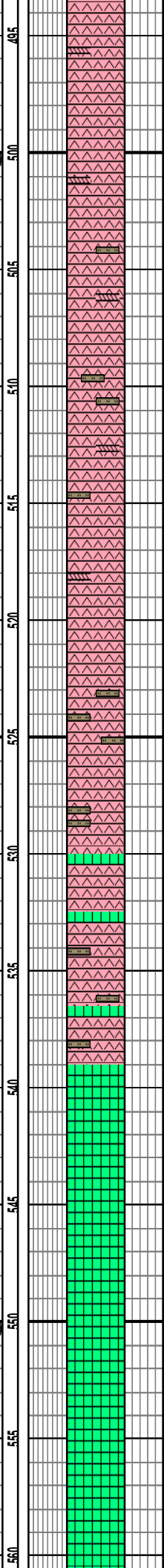
460-463 ANHY 100% wht-gy, microxln-lrg xls, sa-a;  
sltst strgs

463-479 ANHY 100% wht-gy, pnk-brn, microxln-lrg  
xls, sa-a, sily drty; sltst strgs, gyp strgs

479-503 ANHY 100% wht-gy, microxln-lrg xls, sa-a,  
sily drty; gyp strgs, sltst strgs

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	30 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	20 in (ohms)	100	1000
			10 in (ohms)	100	1000
			0	100	1000

500	ROP (min/m)	1000	Weight	40%
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		



503-515 ANHY 100% wht-pnk brn, predom microfn xls, sa-sr, drty; gyp strgs, sltst strgs

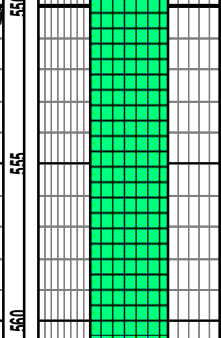
515-530 ANHY 100% wht-gy, predom microfn xls, predom sr; gyp strgs, sltst strgs, occ sel xls

530-539 ANHY 80% wht-gy, lrg xls, sa; SA 20% wh, pnk-org, sa-a; sltst strgs, occ sel xls

**WINDSOR GROUP  
-PUGWASH MINE FORMATION  
@530.0m MD, 530.0m TVD,  
-523.6m SS**

539-564 SA 100% wht, mnr org stng microfn-lrg xls, sa-a, occlly clr; occ sel xls

500	ROP (min/m)	1000	Weight	40%
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		



0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000



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564-582 SA 100% wht, mnr org stng microIn-Irg xls, sa-a, occlly clr; occ sel xls

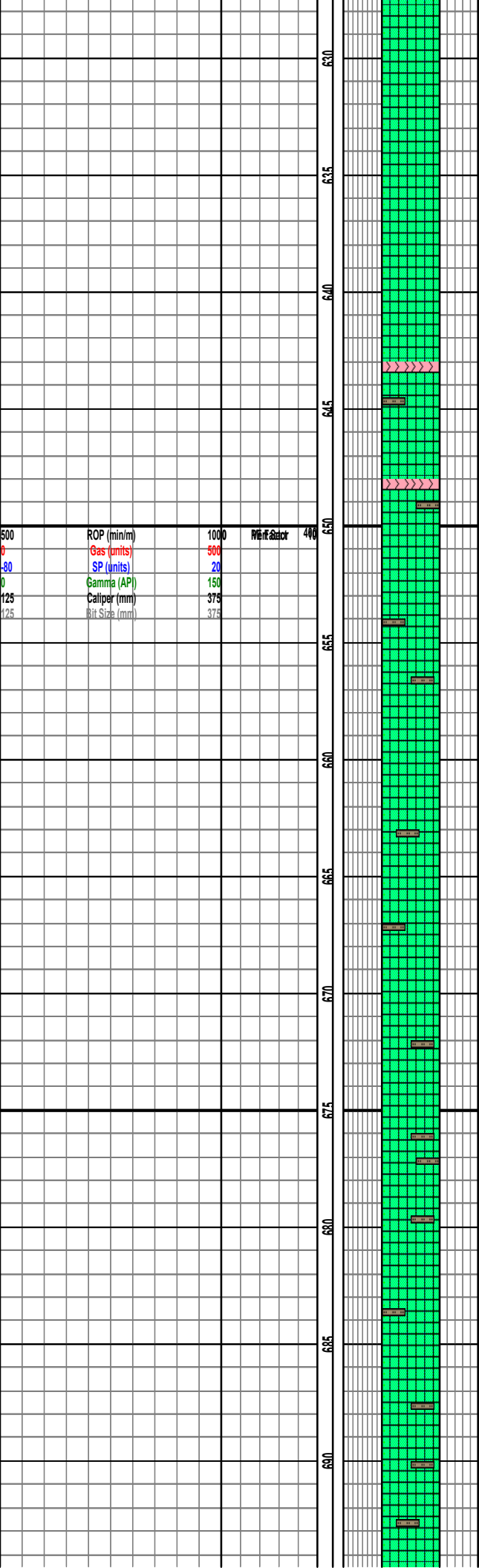
582-600 SA 100% wht-gy, mnr org stng microIn-Irg xls, sa-a, occlly clr; occ sel xls

600-619 SA 100% wht-gy, mnr org stng microIn-Irg xls, sa-a, occlly clr; occ sel xls

619-631 SA 100% wht-gy, mnr org stng, microIn-Irg xls, sa-a, occlly clr; occ sel xls

500	ROP (min/m)	1000	Perf Size	4 1/2
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (AP)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usac/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000



631-643 SA 100% wht-gy, mnr org stng, microxln-lrg xls, sa-a, occly clr; occ sel xls

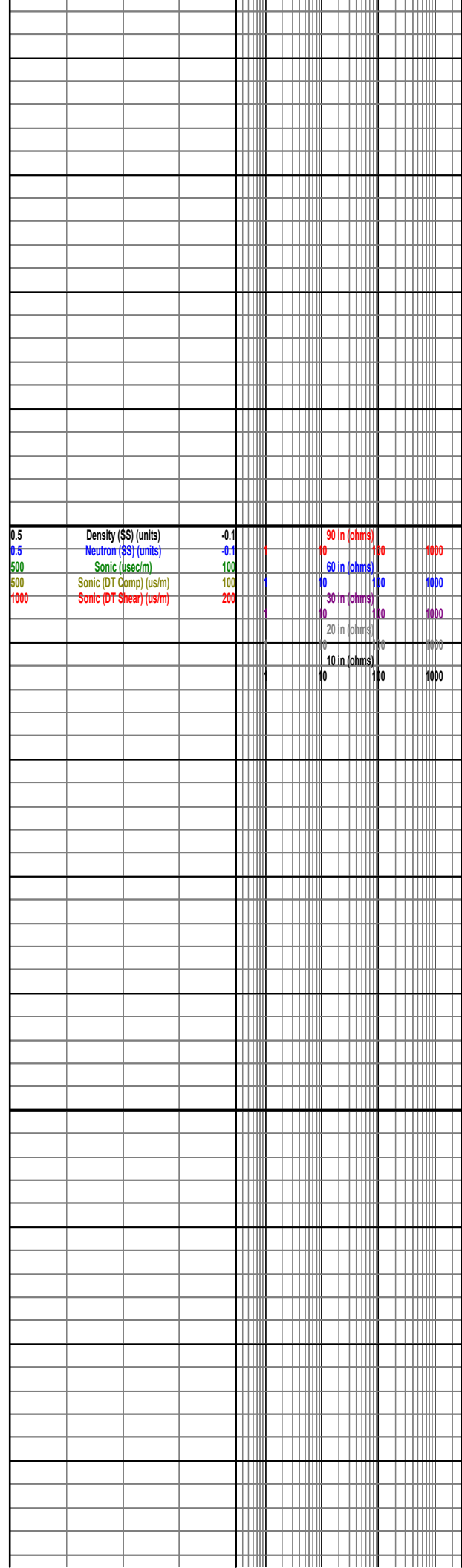
643-652 SA 90% wht-gy, mnr org stng, occly clr; GYP 10% wht-pnk, org, sa-a; sltst strgs, occ sel xls

652-658 SA 100% wht, mnr org stng, sa-a, occly clr; sltst strgs, occ sel xls

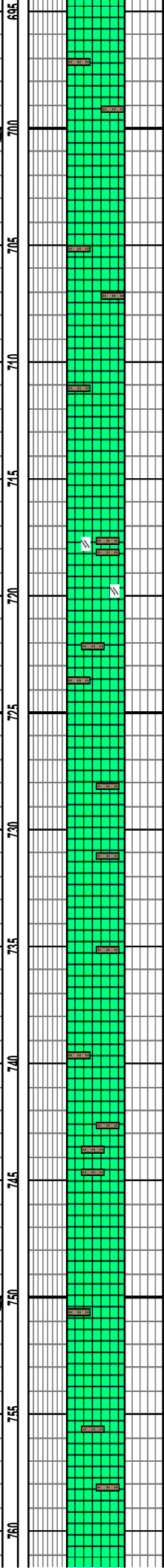
658-707 SA 100% wht, mnr org stng, sa-a, occly clr; sltst strgs, occ sel xls

674-692 SA 100% wht, mnr org stng, sa-a, occly clr; sltst strgs, occ sel xls

692-707 SA 100% wht, mnr org stng, sa-a, occly clr; sltst strgs, occ sel xls



500	ROP (min/m)	1000	Weight	400
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (AP)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		



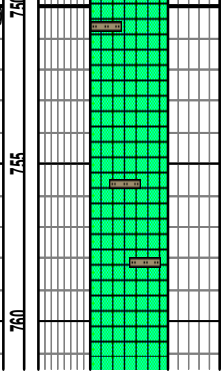
707-716 SA 100% wht, mnr org stng, sa-a, occly clr; sltst strgs, occ sel xls

716-722 SA 100% wht-gy, mnr org stng, sa-a, occly gyp ctd; sltst strgs, occ sel xls

722-744 SA 100% wht, mnr org stng, sa, occly clr; sltst strgs, occ sel xls

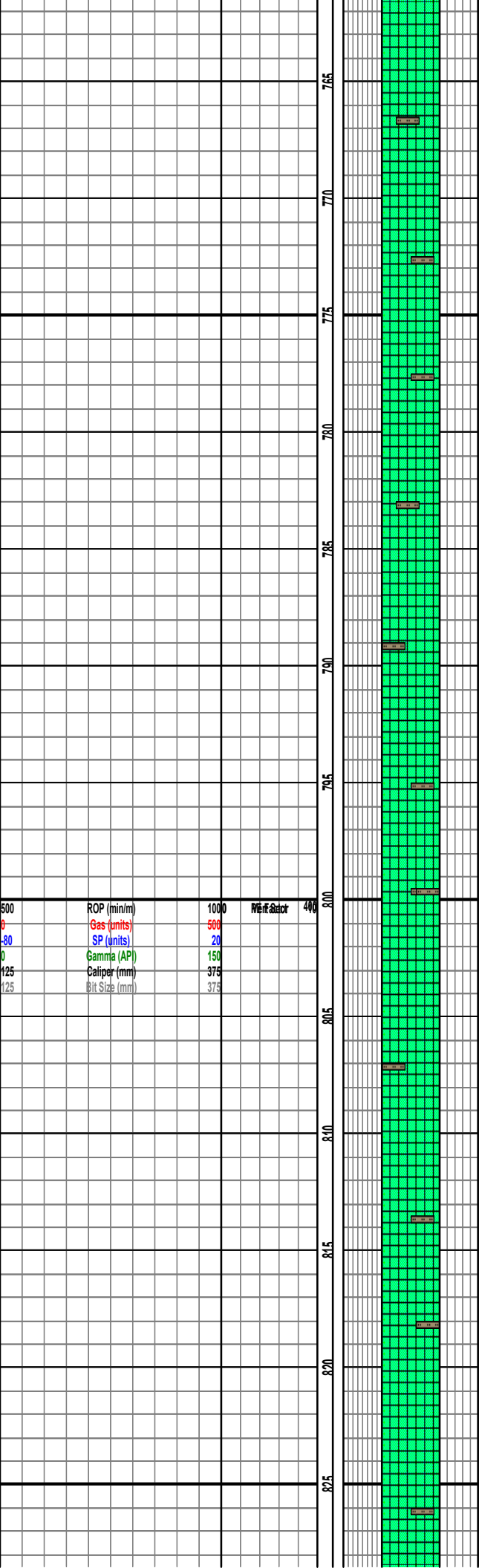
744-768 SA 100% wht, mnr org stng, sa, occly clr; sltst strgs, occ sel xls

500	ROP (min/m)	1000	Weight	400
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (AP)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		



0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 m (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 m (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000



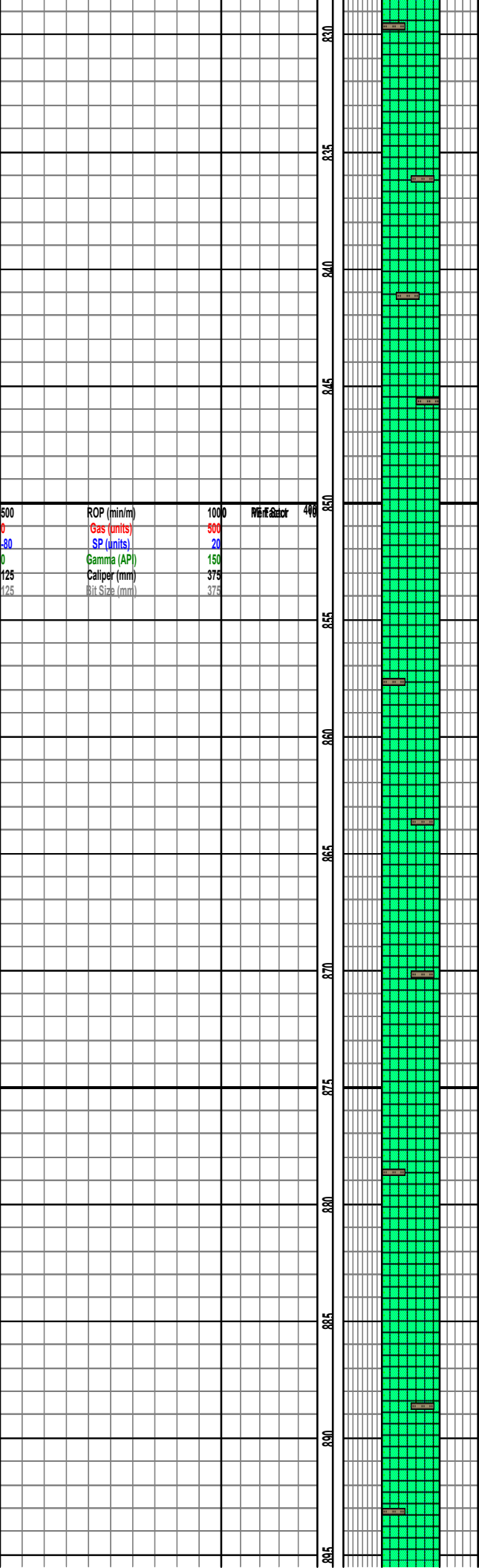
768-792 SA 100% wht, mnr org stng, sa, occlly cl;  
sltst strgs, occi sel xls

792-817 SA 100% wht, mnr org stng, sa, occlly cl;  
sltst strgs, occ sel xls

817-844 SA 100% wht, mnr org stng, sa, occlly cl;  
sltst strgs, occ sel xls

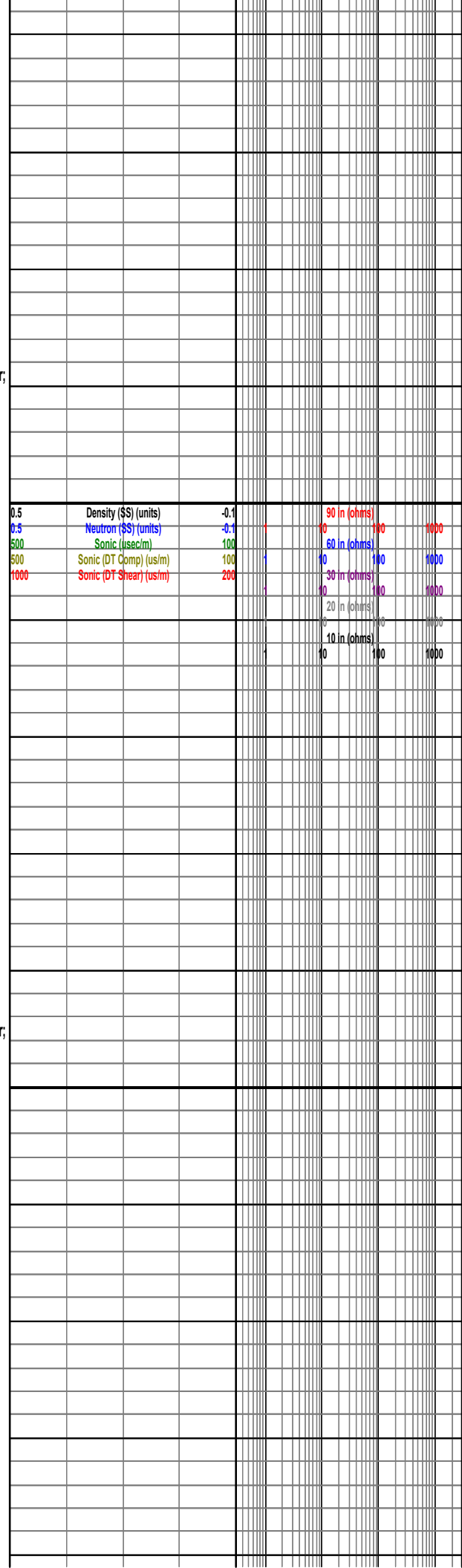
500	ROP (min/m)	1000	Perf & Calc	400
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (AP)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000



844-872 SA 100% wht, mnr org stng, sa, occlly cl; sltst strgs, occ sel xls

500	ROP (min/m)	1000	Weight	400
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		



872-902 SA 100% wht, mnr org stng, sa, occlly cl; sltst strgs, occ sel xls

0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	0	100	1000
500	Sonic (usec/m)	100	60 in (ohms)		
500	Sonic (DT Comp) (us/m)	100	0	100	1000
1000	Sonic (DT Shear) (us/m)	200	30 in (ohms)		
			0	100	1000
			20 in (ohms)		
			0	100	1000
			10 in (ohms)		
			0	100	1000

500	ROP (min/m)	1000	Weight Factor	40%
0	Gas (units)	500		
80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

910

902-930 SA 100% wht, mnr org stng, sa, occlly clr, slitst strgs, occ sel xls

915

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930-954 SA 100% wht, mnr org stng, sa, occlly clr, slitst strgs, occ sel xls

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950

500	ROP (min/m)	1000	Weight Factor	40%
0	Gas (units)	500		
80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

955

954-972 SA 100% wht, mnr org stng, sa, occlly clr, slitst strgs, occ sel xls

960

0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

0			10 in (ohms)	100	1000
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0			10 in (ohms)	100	1000
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0			10 in (ohms)	100	1000
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0			10 in (ohms)	100	1000
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0			10 in (ohms)	100	1000
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0			10 in (ohms)	100	1000
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0			10 in (ohms)	100	1000
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0			10 in (ohms)	100	1000
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0			10 in (ohms)	100	1000
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0			10 in (ohms)	100	1000
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0			10 in (ohms)	100	1000
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0			10 in (ohms)	100	1000
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0			10 in (ohms)	100	1000
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0			10 in (ohms)	100	1000
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0			10 in (ohms)	100	1000
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0			10 in (ohms)	100	1000
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0			10 in (ohms)	100	1000
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0			10 in (ohms)	100	1000
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0			10 in (ohms)	100	1000
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0			10 in (ohms)	100	1000
---	--	--	--------------	-----	------

0			10 in (ohms)	100	1000
---	--	--	--------------	-----	------

0			10 in (ohms)	100	1000
---	--	--	--------------	-----	------

0			10 in (ohms)	100	1000
---	--	--	--------------	-----	------

0			10 in (ohms)	100	1000
---	--	--	--------------	-----	------

0			10 in (ohms)	100	1000
---	--	--	--------------	-----	------

0			10 in (ohms)	100	1000
---	--	--	--------------	-----	------

0			10 in (ohms)	100	1000
---	--	--	--------------	-----	------

0			10 in (ohms)	100	1000
---	--	--	--------------	-----	------

0			10 in (ohms)	100	1000
---	--	--	--------------	-----	------

0			10 in (ohms)	100	1000
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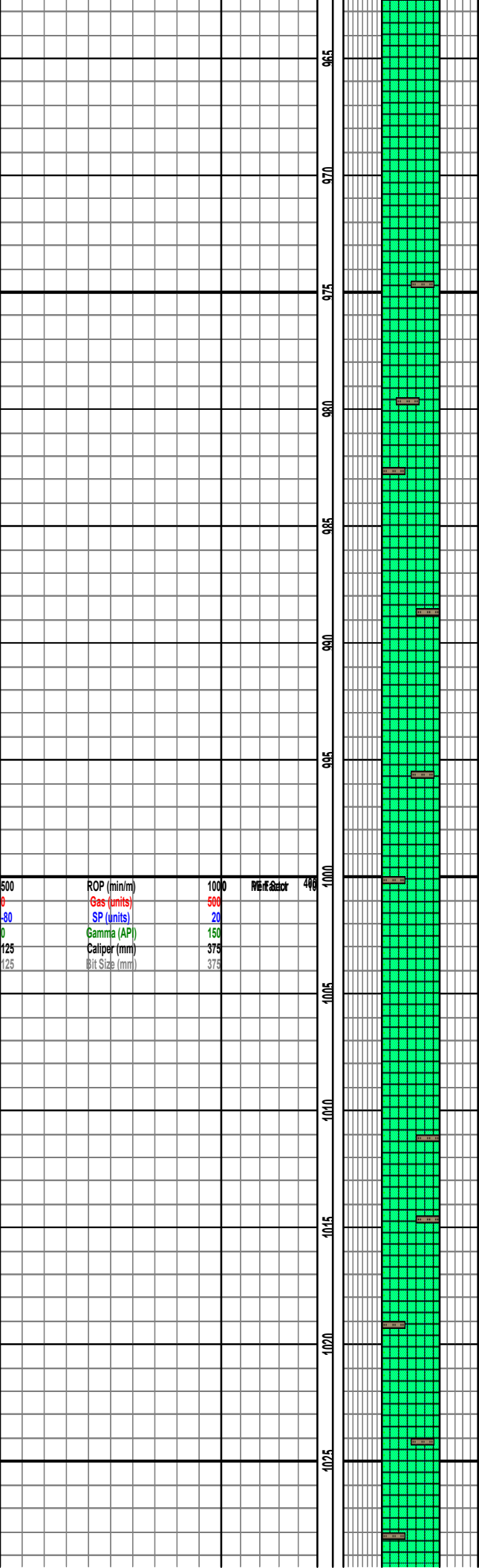
0			10 in (ohms)	100	1000
---	--	--	--------------	-----	------

0			10 in (ohms)	100	1000
---	--	--	--------------	-----	------

0			10 in (ohms)	100	1000
---	--	--	--------------	-----	------

0			10 in (ohms)	100	1000
---	--	--	--------------	-----	------

0			10 in (ohms)	100	1000
---	--	--	--------------	-----	------



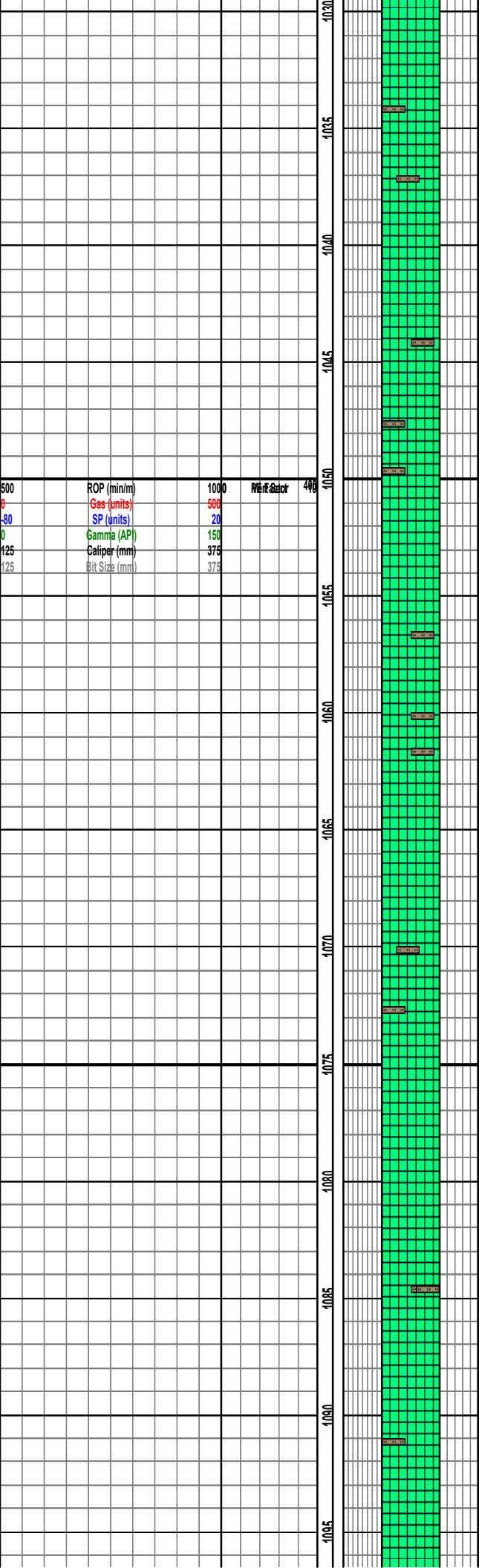
972-994 SA 100% wht, mnr org stng, sa, occlly clr, siltst strgs, occ sel xls

994-1021 SA 100% wht-brn, mnr org stng, sa, occlly clr, siltst strgs, occ sel xls

1021-1045 SA 100% wht-brn, mnr org stng, sa, occlly clr, siltst strgs, occ sel xls

500	ROP (min/m)	1000	Perf & Calc	40%
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000



1045-1070 SA 100% wht-brn, mnr org stng, sa,  
occly clr; sltst strgs, occ sel xls

1070-1094 SA 100% wht-brn, mnr org stng, sa,  
occly clr; sltst strgs, occ sel xls

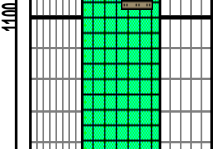
1094-1119 SA 100% wht-brn, mnr org stng, sa,  
occly clr; sltst strgs, occ sel xls

500	ROP (min/m)	1000	Weight	400
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

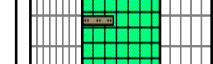
0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	60 in (ohms)		
500	Sonic (DT Comp) (us/m)	100	30 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000
			20 in (ohms)		
			10 in (ohms)		
			40 in (ohms)		



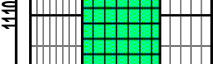
500	ROP (min/m)	1000	Weight	400
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		



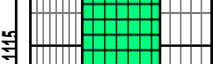
1100  
1105



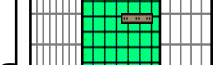
1110  
1115



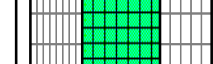
1115  
1120



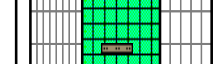
1120  
1125



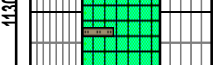
1125  
1130



1130  
1135



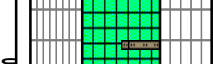
1135  
1140



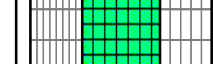
1140  
1145



1145  
1150



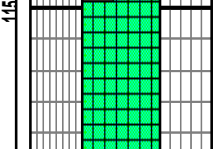
1150  
1155



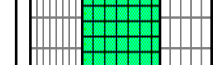
1155  
1160



500	ROP (min/m)	1000	Weight	400
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		



1155  
1160



1160

1119-1140 SA 100% wht-brn, mnr org stng, sa, occly clr; sltst strgs, occ sel xls

1140-1164 SA 100% wht-brn, mnr org stng, sa, occly clr; sltst strgs, occ sel xls

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

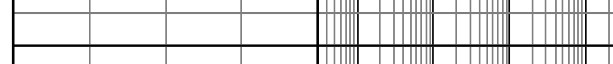
1100  
1105



1110  
1115



1115  
1120



1120  
1125



1125  
1130



1130  
1135



1135  
1140



1140  
1145



1145  
1150



1150  
1155



1155  
1160



1160

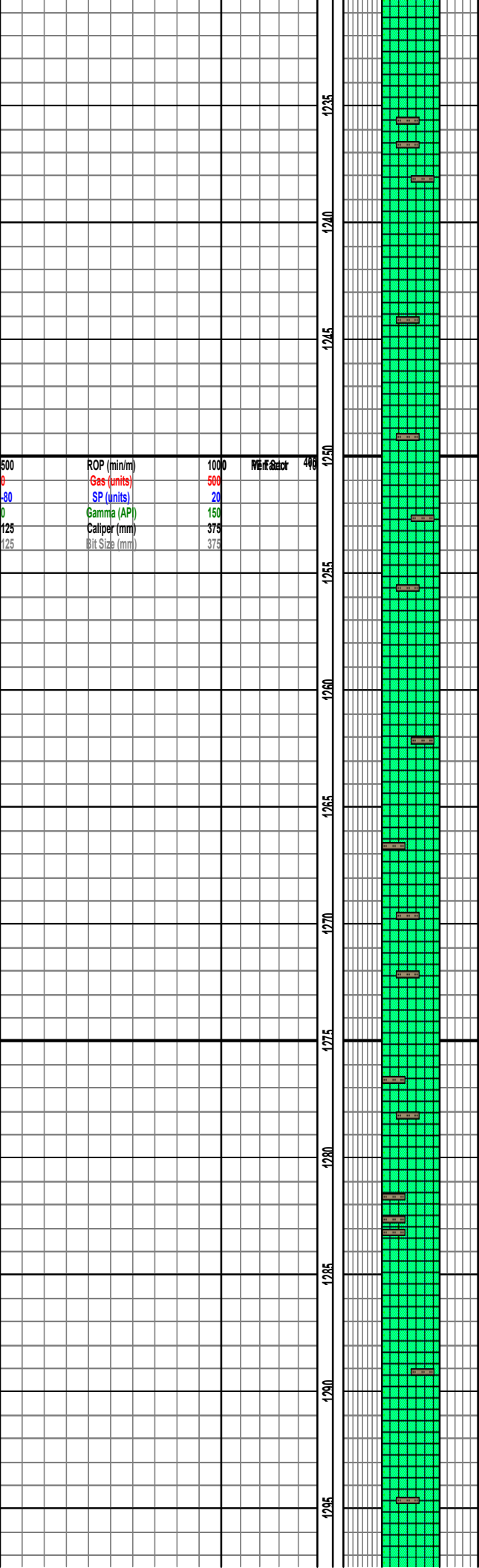
1164-1192 SA 100% wht-brn, mnr org stng, sa,  
occlly clr; sltst strgs, occ sel xls

1192-1213 SA 100% wht-brn, mnr org stng, sa,  
occlly clr; sltst strgs, occ sel xls

1213-1234 SA 100% wht-brn, mnr org stng, sa,  
occlly clr; sltst strgs, occ sel xls

500	ROP (min/m)	1000	Ref: 40%
0	Gas (units)	500	
80	SP (units)	20	
0	Gamma (API)	150	
125	Caliper (mm)	375	
125	Bit Size (mm)	375	

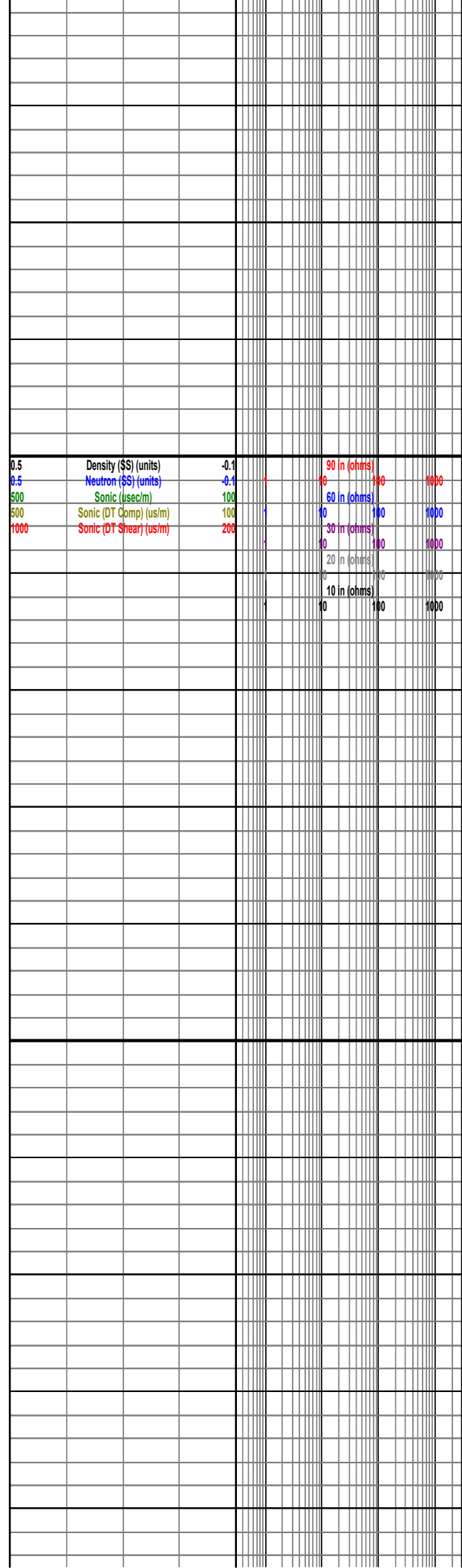
0.5	Density (SS) (units)	-0.1	90 in (ohms)	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	1000
500	Sonic (usec/m)	100	30 in (ohms)	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	1000



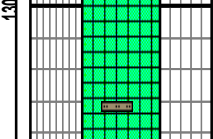
1234-1256 SA 100% wht-brn, mnr org stng, sa, occly clr; sltst strgs, occ sel xls

1256-1280 SA 100% wht-brn, mnr org stng, sa, occly clr; sltst strgs, occ sel xls

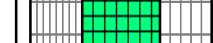
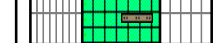
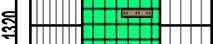
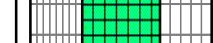
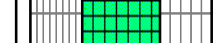
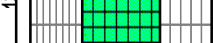
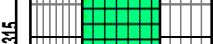
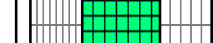
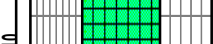
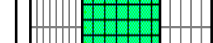
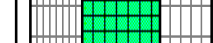
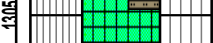
1280-1305 SA 100% wht-brn, mnr org stng, sa, occly clr; sltst strgs, occ sel xls



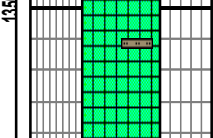
500	ROP (min/m)	1000	Well #	406
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		



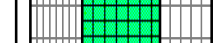
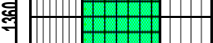
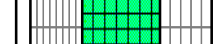
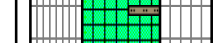
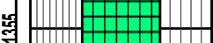
1305-1326 SA 100% wht-brn, mnr org stng, sa, occly clr; sltst strgs, occ sel xls



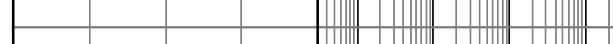
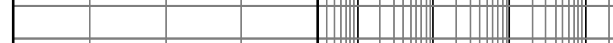
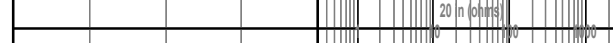
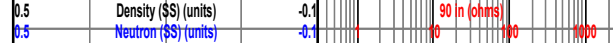
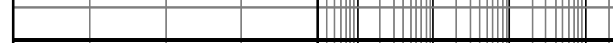
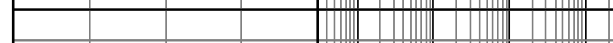
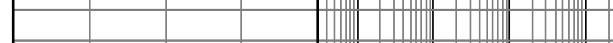
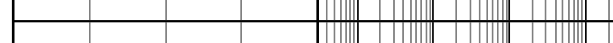
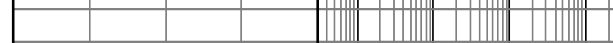
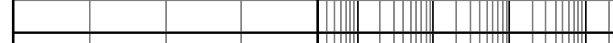
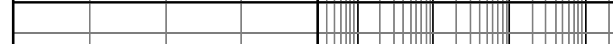
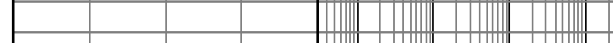
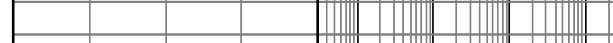
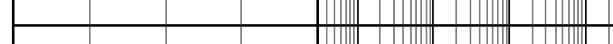
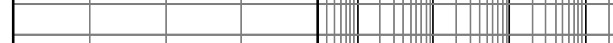
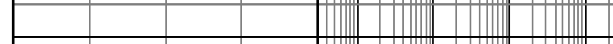
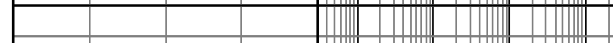
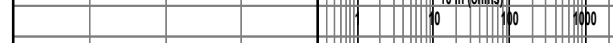
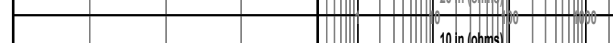
500	ROP (min/m)	1000	Well #	406
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

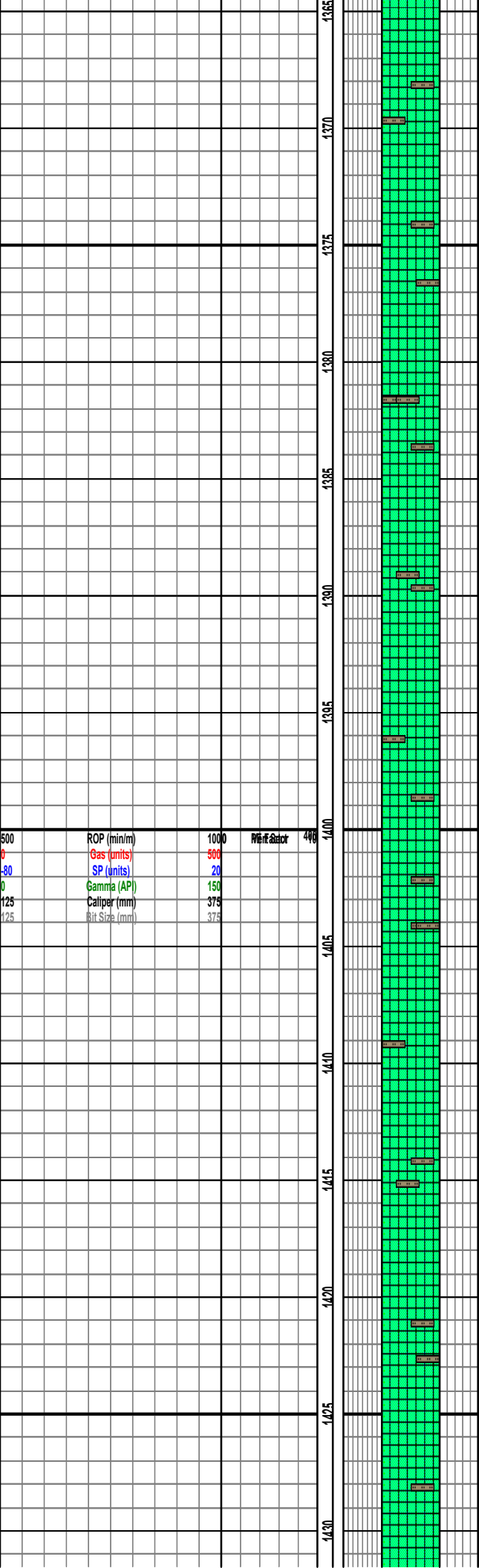


1326-1347 SA 100% wht-brn, mnr org stng, sa, occly clr; sltst strgs, occ sel xls



0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	10 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	20 in (ohms)	100	1000





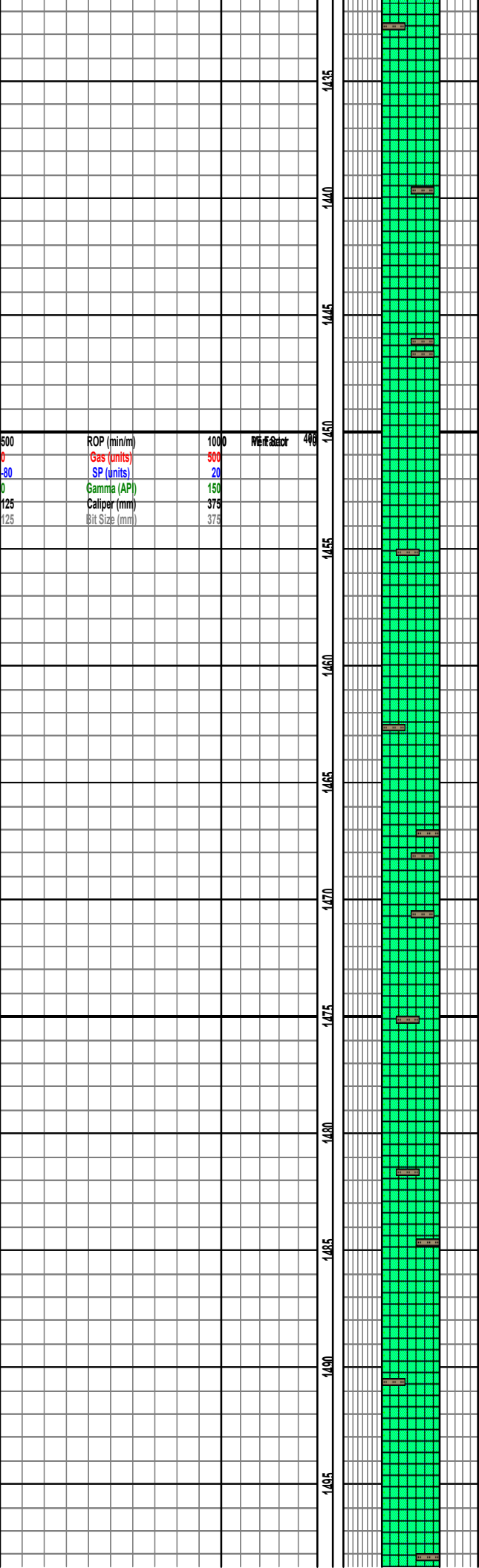
1369-1390 SA 100% wht-brn, mnr org stng, sa,  
occlly clr; sltst strgs, occ sel xls

1390-1411 SA 100% wht-brn, mnr org stng, sa,  
occlly clr; sltst strgs, occ sel xls

1411-1430 SA 100% wht-brn, mnr org stng, sa,  
occlly clr; sltst strgs, occ sel xls

1430-1451 SA 100% wht-brn, mnr org stng, sa,  
occlly clr; sltst strgs, occ sel xls

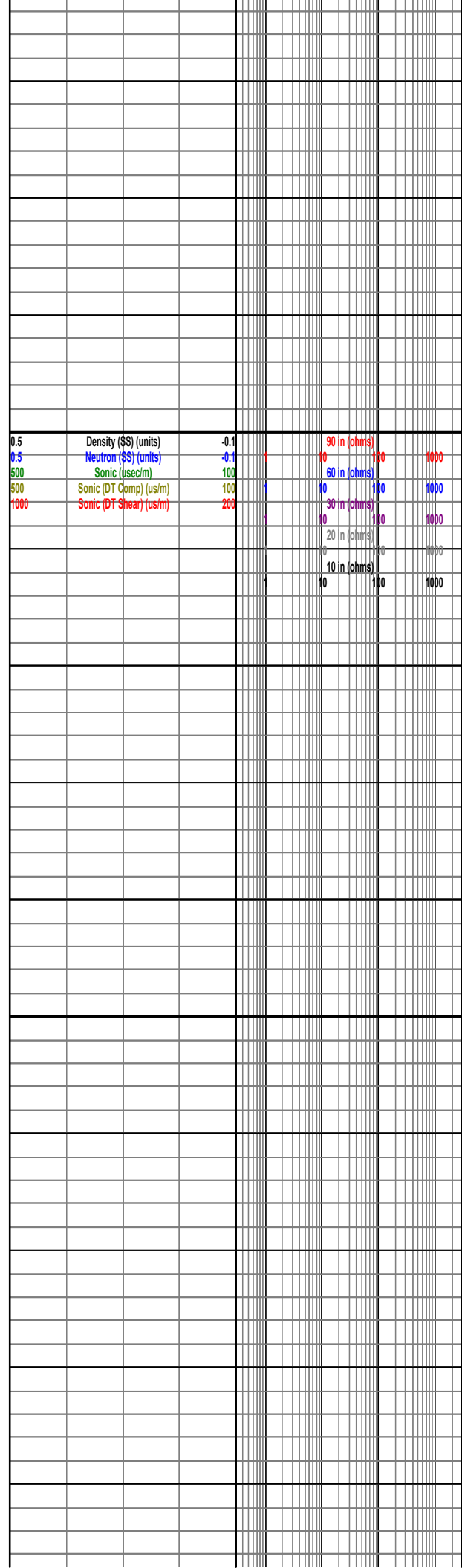
0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000



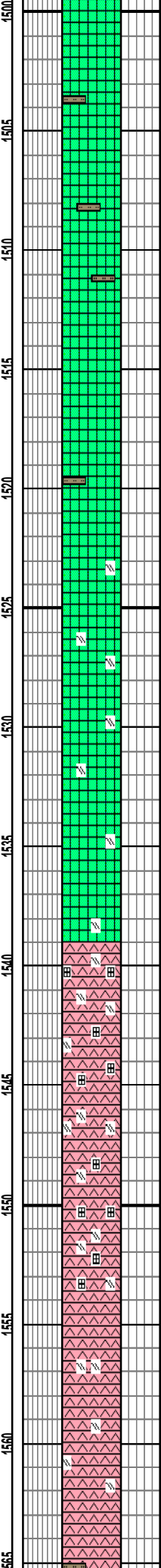
1451-1472 SA 100% wht-brn, mnr org stng, sa, occly clr; sltst strgs, occ sel xls

1472-1494 SA 100% wht-brn, mnr org stng, sa, occly clr; sltst strgs, occ sel xls

1494-1521 SA 100% wht-brn, mnr org stng, sa, occly clr; sltst strgs, occ sel xls



500	ROP (min/m)	1000	Wear Factor	40%
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		



1521-1533 SA 100% wht-gy, mnr org stng, sa, gyp  
ctd, occlly clr; occ sel xls

1533-1539 SA 100% wht-gy, mnr org stng, sa, gyp  
ctd, drty; occ sel xls

1539-1554 ANHY 100% wht-gy, mnr org stng, gyp  
ctd, sr-r, drty; mnr sa cvgs, occ sel xls

**WINDSOR GROUP  
JUPPERTON FORMATION  
@1539.0m MD, 1539.0m TVD,  
-1532.6m SS**

1554-1564 ANHY 100% wht-gy, mnr org stng, gyp  
ctd, sr-r, drty

1564-1576 ANHY 40% wht-gy, mcroxln, mnr org

0.5	Density (SS) (units)	-0.1	90 in (ohms)
0.5	Neutron (SS) (units)	-0.1	0 100 1000
500	Sonic (usec/m)	100	60 in (ohms)
500	Sonic (DT Comp) (us/m)	100	0 10 100 1000
1000	Sonic (DT Shear) (us/m)	200	30 in (ohms)
			0 10 100 1000
			20 in (ohms)
			0 10 100 1000
			10 in (ohms)
			0 10 100 1000

0.5	Density (SS) (units)	-0.1	90 in (ohms)
0.5	Neutron (SS) (units)	-0.1	0 100 1000
500	Sonic (usec/m)	100	60 in (ohms)
500	Sonic (DT Comp) (us/m)	100	0 10 100 1000
1000	Sonic (DT Shear) (us/m)	200	30 in (ohms)
			0 10 100 1000
			20 in (ohms)
			0 10 100 1000
			10 in (ohms)
			0 10 100 1000

stng; LS 40% gy, fros; GYP 15% wht, sr-r; SA 5% wht, sa, occlly clr; sltst strgs, occ sel xls

**WINDSOR GROUP**  
**-MACUMBER/GAYS RIVER FORMATIONS**  
 @1564.0m MD, 1564.0m TVC,  
 -1557.6m SS

1576-1594 LS 70% gy, fros; ANHY 30% cvgs, wht-gy, mcroxln; gyp strgs, mnr sltst strgs

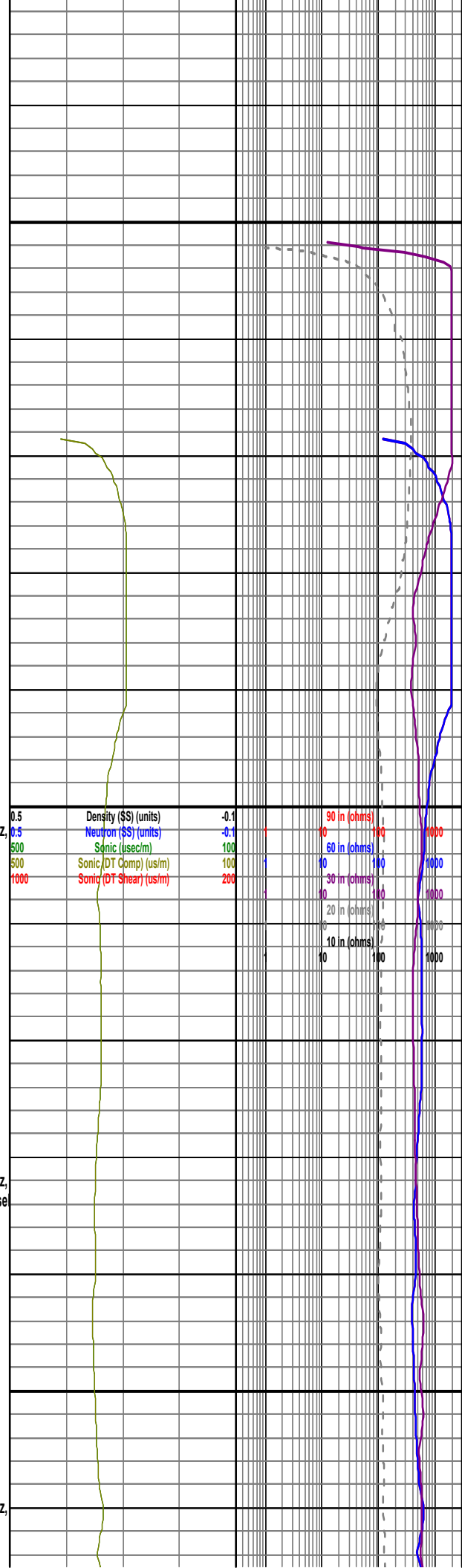
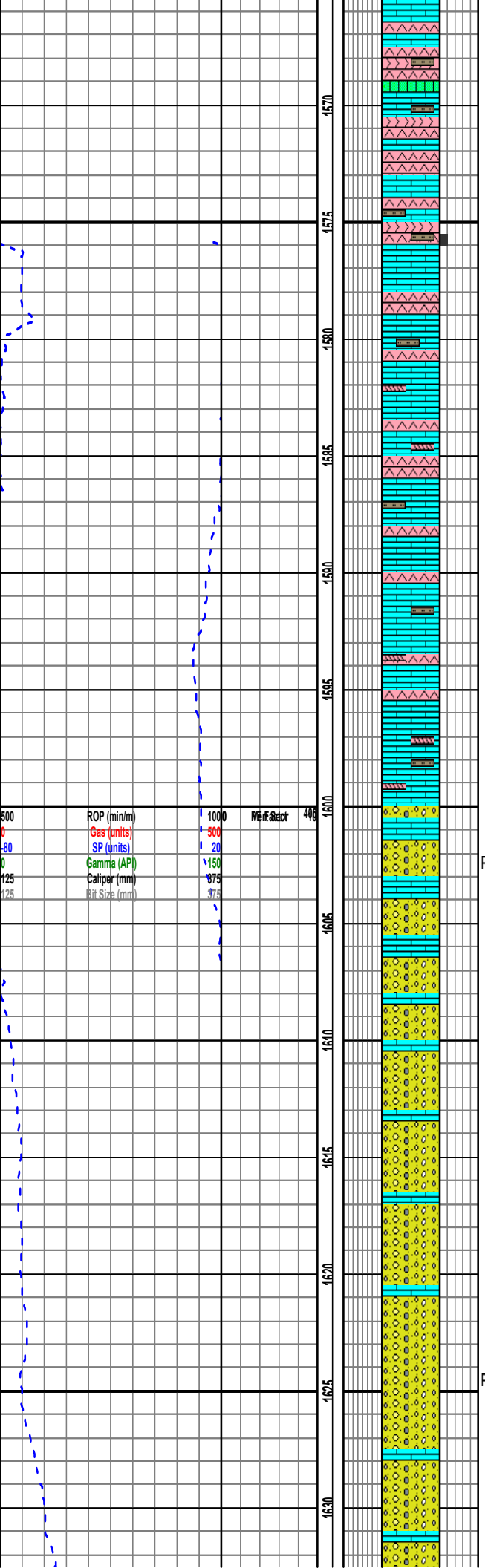
1594-1600 LS 90% gy, fros; ANHY 10% cvgs, wht-gy, mcroxln; gyp strgs, mnr sltst strgs

1600-1615 CGLN 75% dk gy-gn & red-brn, poly, qtz, var ign frags, ply srt, sa-sr; LS 25% gy, fros; occl sel xls

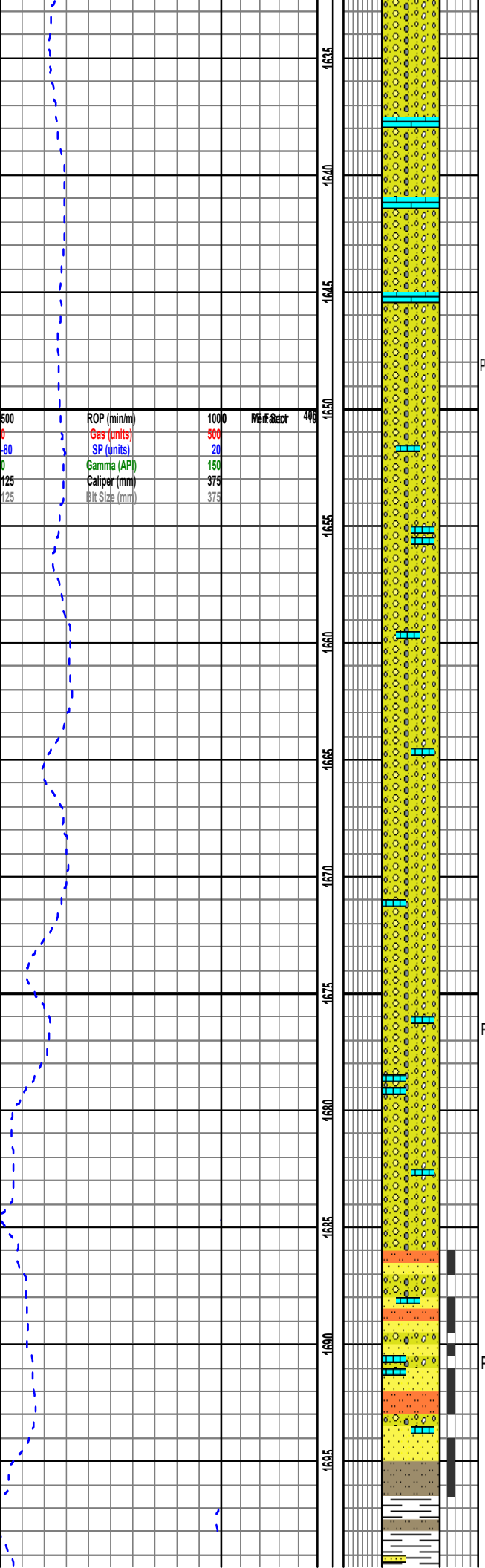
**WINDSOR GROUP**  
**-HILLSBOROUGH FORMATION**  
 @1600.0m MD, 1600.0m TVD,  
 -1593.6m SS

1615-1631 CGLN 90% dk gy-gn & red-brn, poly, qtz, var ign frags, ply srt, sa-sr; LS 10% gy, fros; occ sel xls

1631-1649 CGLN 90% dk gy-gn & red-brn, poly, qtz, var ign frags, ply srt, sa-sr; LS 10% gy, fros; gyp strgs occ sel xls







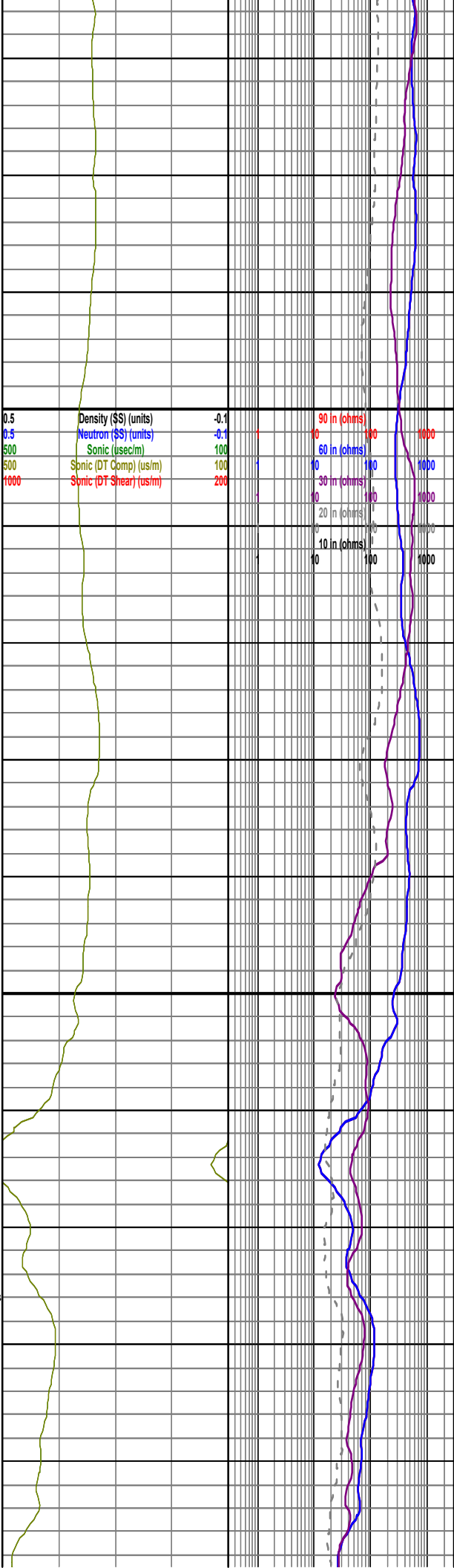
1649-1667 CGLN 100% dk gy-gn & red-brn, poly, qtz  
var ign frags, ply srt, sa-sr; ls strgs

1667-1686 CGLN 100% dk gy-gn & red-brn, poly, qtz  
var ign frags, ply srt, sa-sr; ls strgs

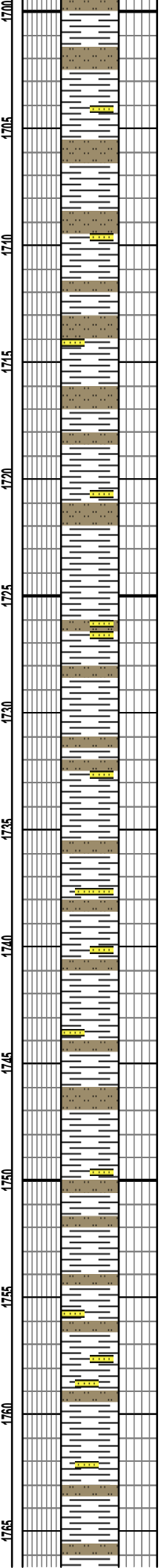
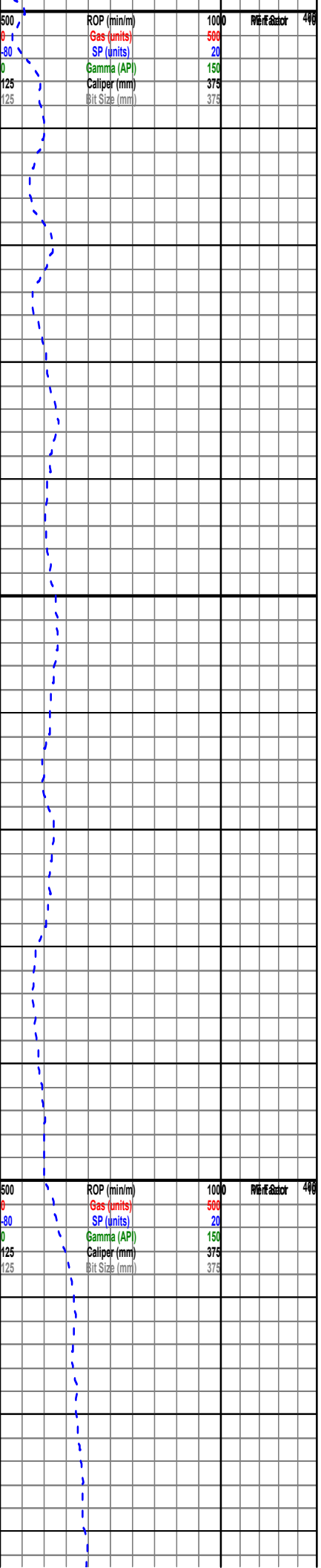
1686-1695 SS 70% med-dk gy & red-brn, fg, sily  
calc, silc, w srt, sr-r, w cons; CGLN 30% dk gy-gn &  
red-brn, poly, qtz, var ign frags, ply srt, sa-sr; ls  
strgs

1695-1719 SH 70% dk gy, silty, calc, sily mics;  
SLTST 30% med-dk gy, sily calc, silc; ss strgs

**HORTON GROUP**



0.5	Density (SS) (units)	-0.1	90 in (ohms)
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)
500	Sonic (DT Comp) (us/m)	100	30 in (ohms)
500	Sonic (DT Shear) (us/m)	200	20 in (ohms)
1000			10 in (ohms)
			0



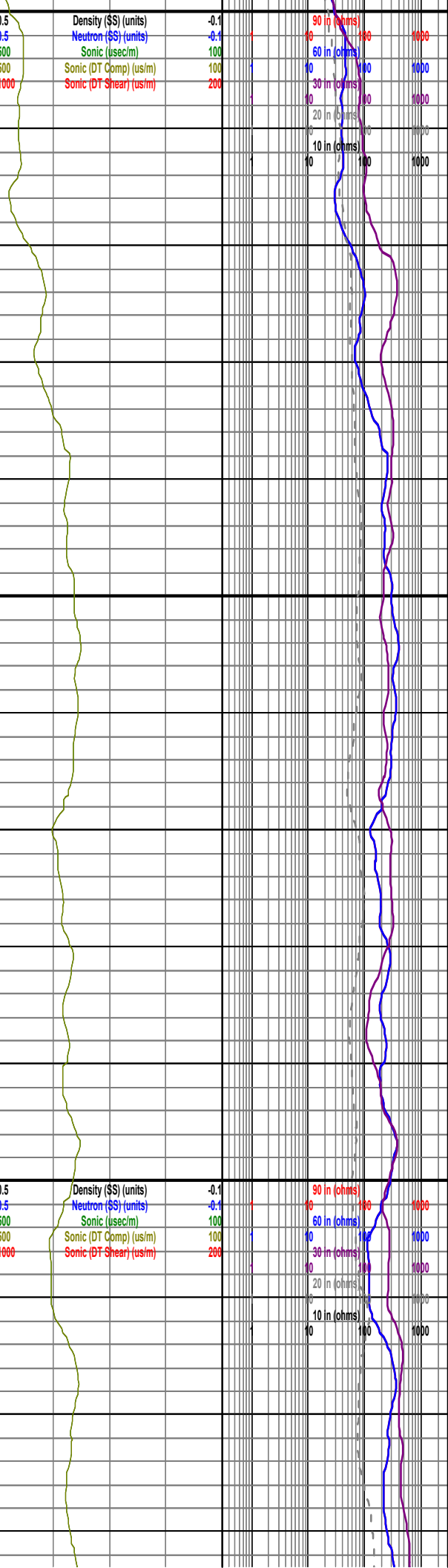
**-ALBERT FORMATION  
-FREDERICK BROOK MEMBER  
@1695.0m MD, 1695.0m TVD,  
-1688.6m SS**

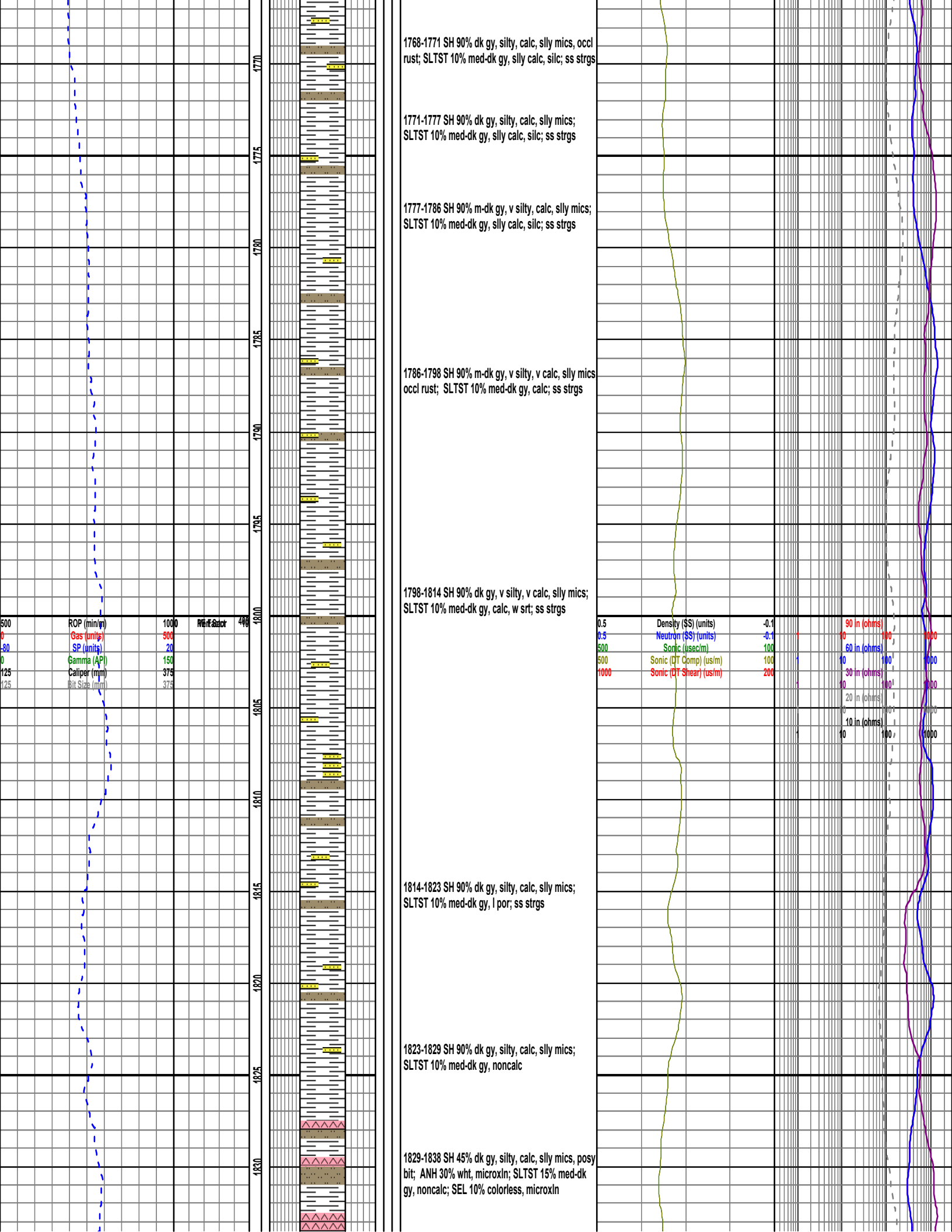
1719-1740 SH 80% dk gy, silty, calc, sily mics;  
SLTST 20% med-dk gy, sily calc, silc; ss strgs

1740-1750 SH 80% dk gy, silty, calc, sily mics;  
SLTST 20% med-dk gy, sily calc, silc; ss strgs

1750-1762 SH 85% dk gy, silty, calc, sily mics;  
SLTST 15% med-dk gy, sily calc, silc; ss strgs

1762-1768 SH 90% dk gy, silty, calc, sily mics;  
SLTST 10% med-dk gy, sily calc, silc; ss strgs





1768-1771 SH 90% dk gy, silty, calc, sily mics, occl rust; SLTST 10% med-dk gy, sily calc, silc; ss strgs

1771-1777 SH 90% dk gy, silty, calc, sily mics; SLTST 10% med-dk gy, sily calc, silc; ss strgs

1777-1786 SH 90% m-dk gy, v silty, calc, sily mics; SLTST 10% med-dk gy, sily calc, silc; ss strgs

1786-1798 SH 90% m-dk gy, v silty, v calc, sily mics occl rust; SLTST 10% med-dk gy, calc; ss strgs

1798-1814 SH 90% dk gy, v silty, v calc, sily mics; SLTST 10% med-dk gy, calc, w srt; ss strgs

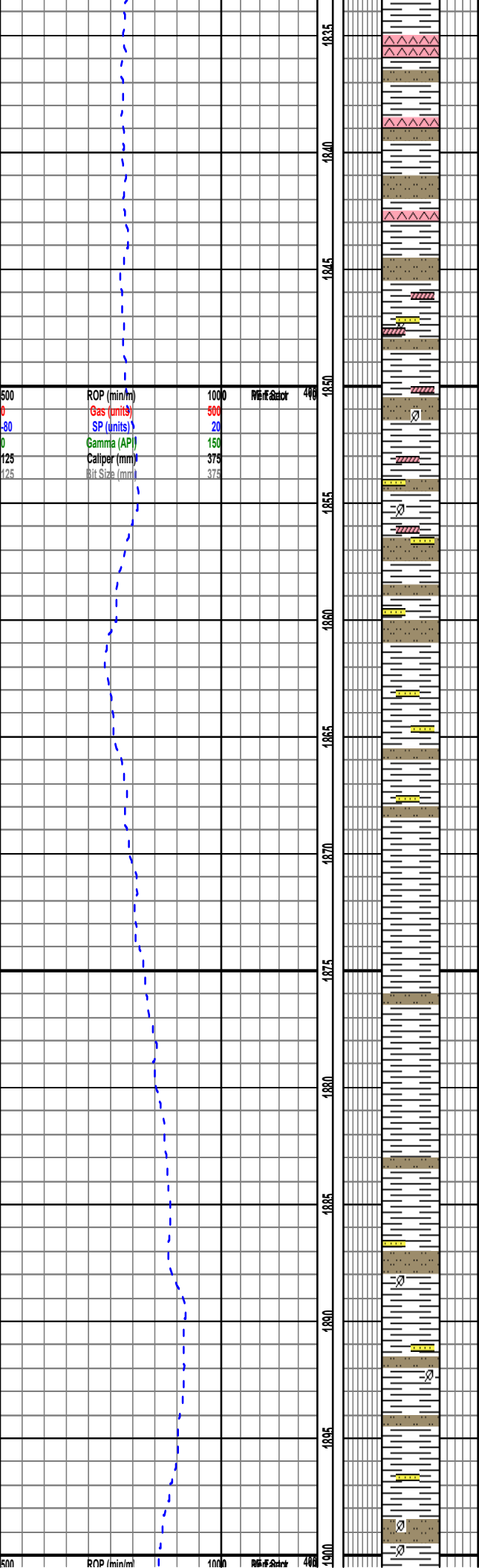
1814-1823 SH 90% dk gy, silty, calc, sily mics; SLTST 10% med-dk gy, l por; ss strgs

1823-1829 SH 90% dk gy, silty, calc, sily mics; SLTST 10% med-dk gy, noncalc

1829-1838 SH 45% dk gy, silty, calc, sily mics, posy bit; ANH 30% wht, microxln; SLTST 15% med-dk gy, noncalc; SEL 10% colorless, microxln

500	ROP (min/m)	1000	400
0	Gas (units)	500	
-80	SP (units)	20	
0	Gamma (API)	150	
125	Caliper (mm)	375	
125	Bit Size (mm)	375	

0.5	Density (SS) (units)	-0.1	90 in (ohms)
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)
500	Sonic (usec/m)	100	30 in (ohms)
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)



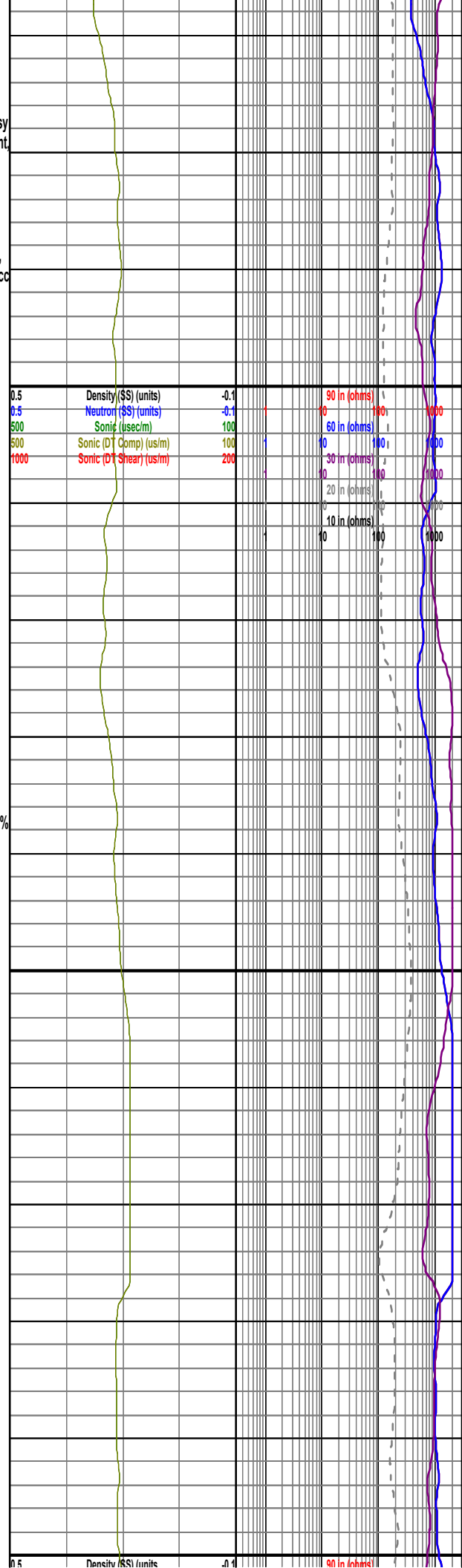
1838-1844 SH 70% dk gy, silty, calc, sily mics, posy bit; SLTST 20% med-dk gy, noncalc; ANH 10% wht microxln; occ sel xls

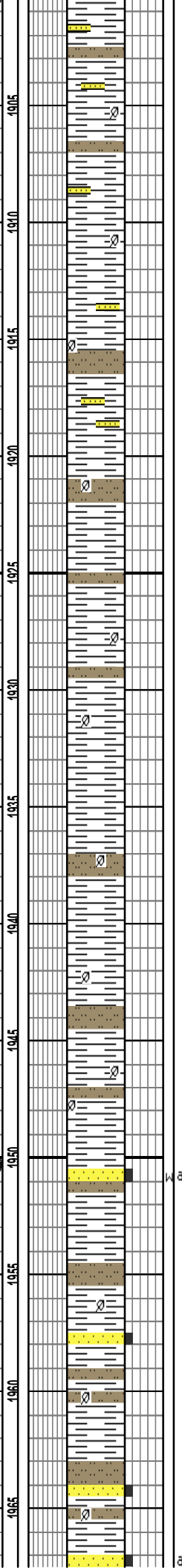
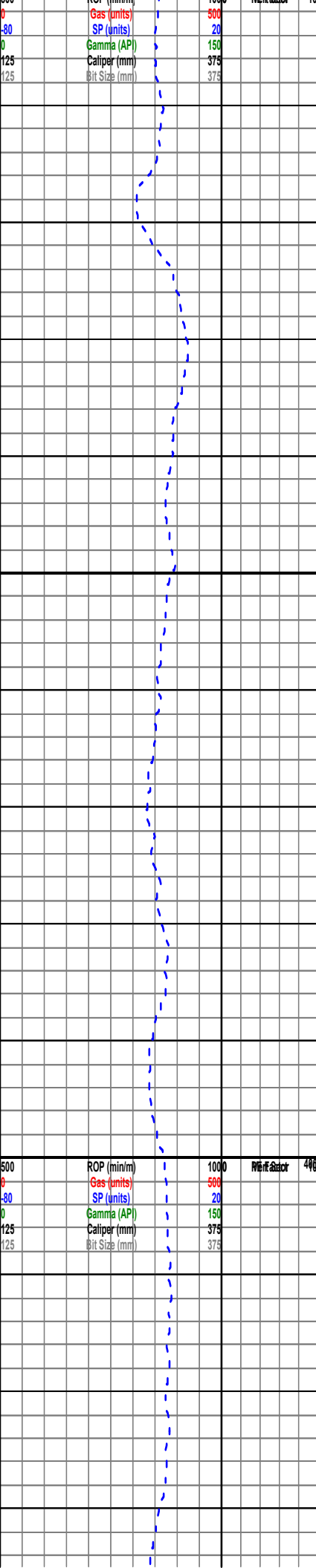
1844-1856 SH 80% dk gy, silty, sily calc, sily mics, occ rust; SLTST 20% med-dk gy, calc; ss strgs, occ sel xls, plant frags, anh strgs

1856-1868 SH 80% dk gy, silty, calc, sily mics; SLTST 20% med-dk gy, sily calc; ss strgs

1868-1887 SH 95% dk gy, calc, sily mics; SLTST 5% med-dk gy, calc; ss strgs, occ sel xls

1887-1902 SH 90% dk gy, calc, sily mics, plant frags, posy bit; SLTST 10% med-dk gy, calc; ss strgs, occ sel xls, slcks





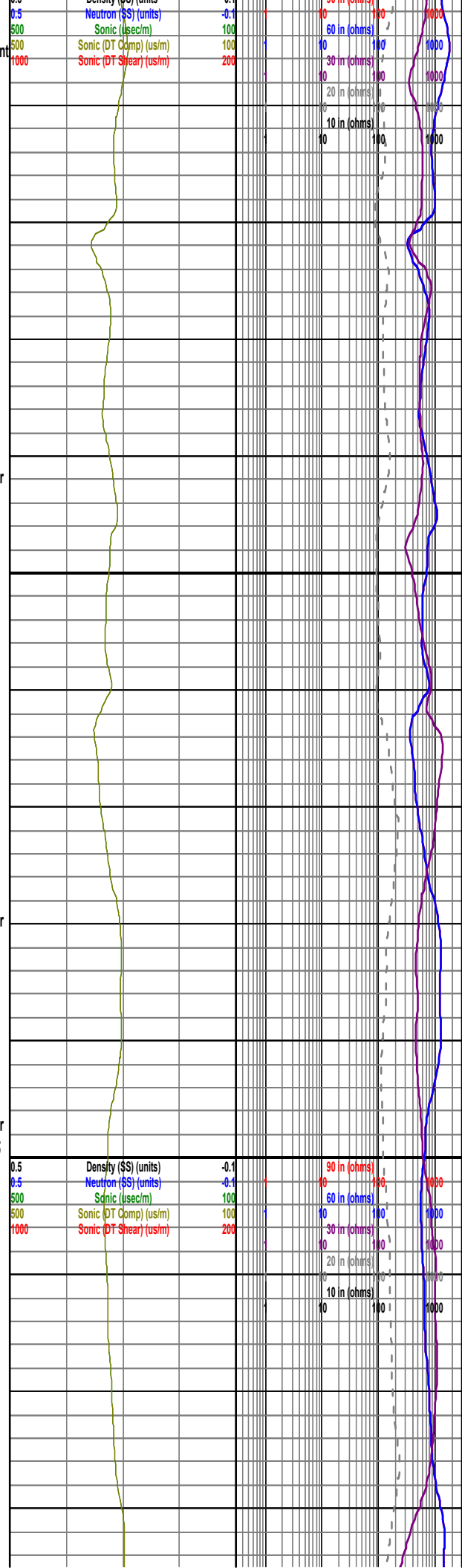
1902-1920 SH 90% dk gy, silty, calc, sily mics, plant frags, posy bit; SLTST 10% med-dk gy, calc; ss strgs, occ sel xls, sickls

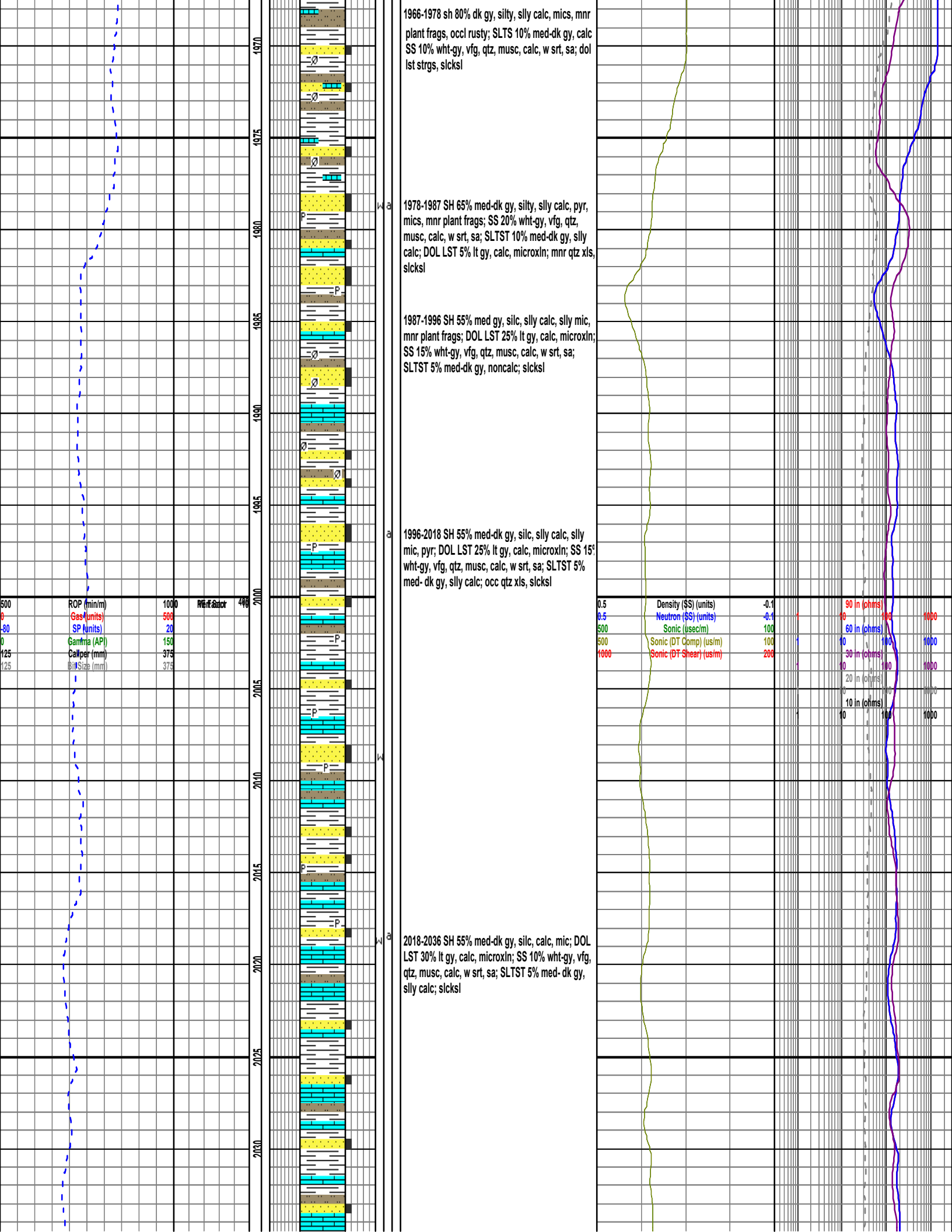
1920-1939 SH 90% dk gy, silty, calc, sily mics, mn plant frags, posy bit; SLTST 10% med-dk gy, calc

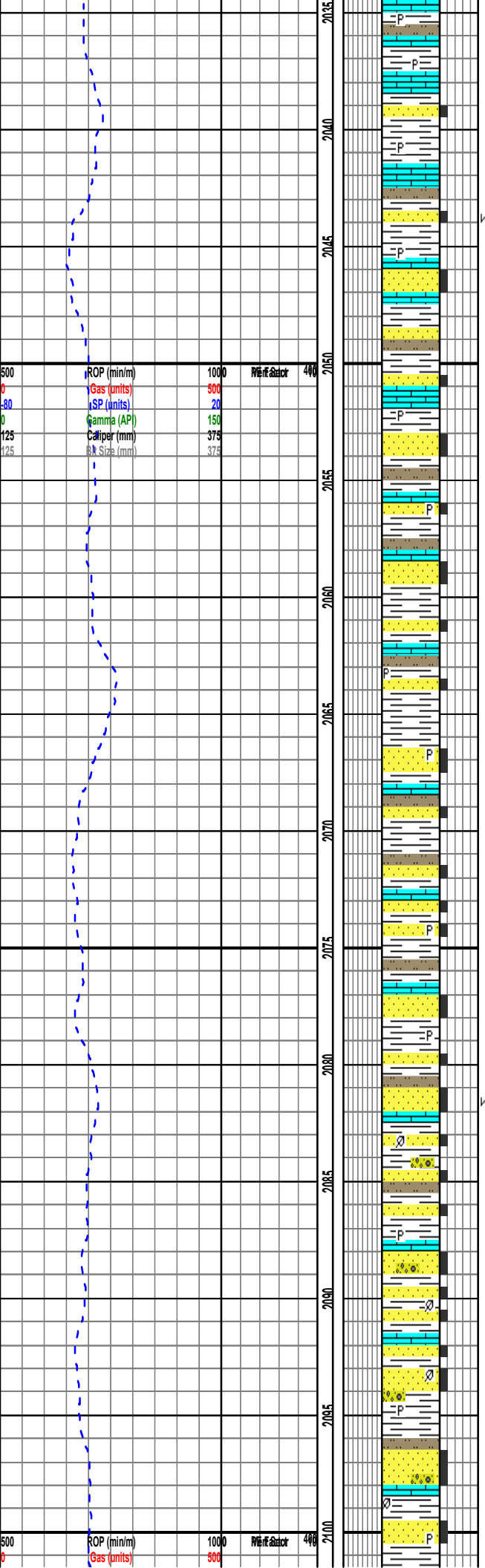
1939-1948 SH 90% dk gy, silty, calc, sily mics, mn plant frags, posy bit; SLTST 10% med-dk gy, calc

1948-1966 SH 85% dk gy, silty, calc, sily mics, mn plant frags, posy bit; SLTST 10% med-dk gy, calc; SS 5% wht-gy, vfg, qtz, musc, calc, w srt, sa; occ qtz xls, sickls

**HORTON GROUP**  
**-ALBERT FORMATION**  
**-DAWSON SETTLEMENT MEMBER**  
**@1958.0m MD, 1958.0m TVD,**  
**-1951.6m SS**





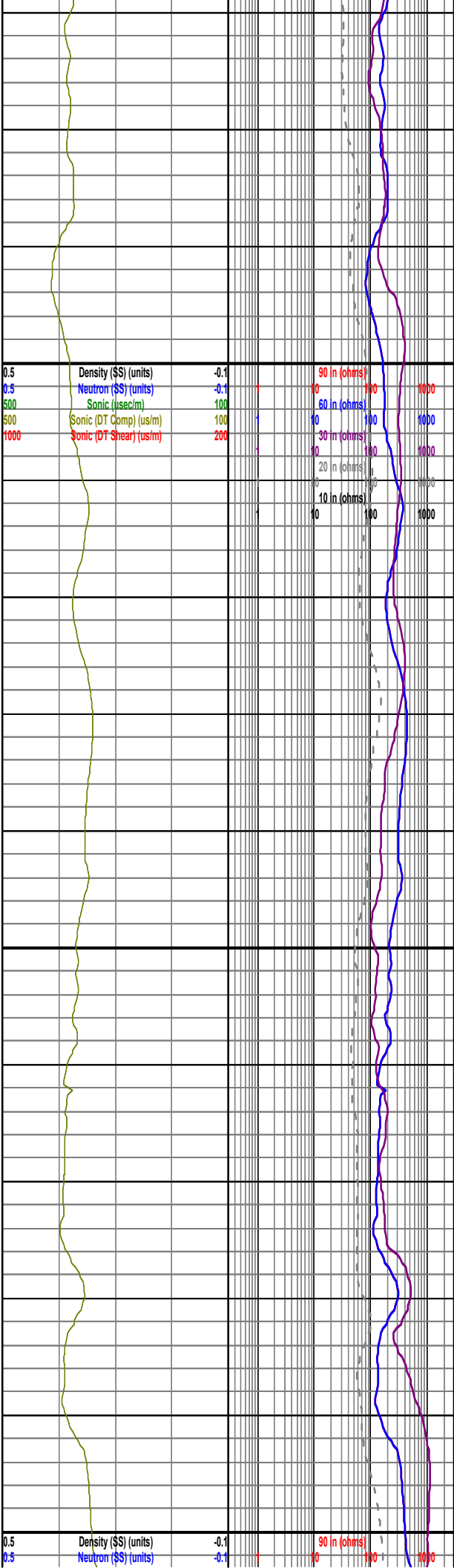


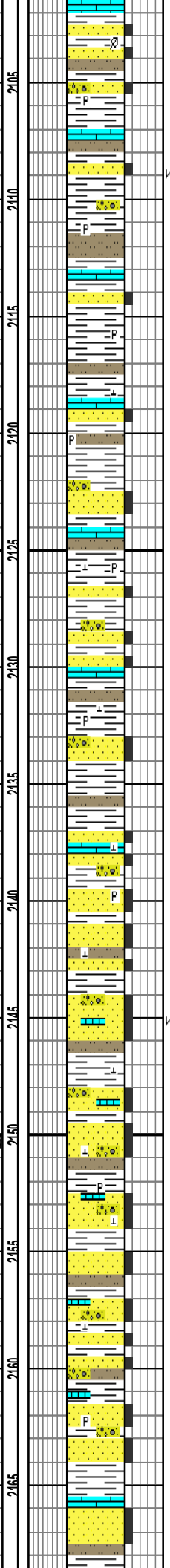
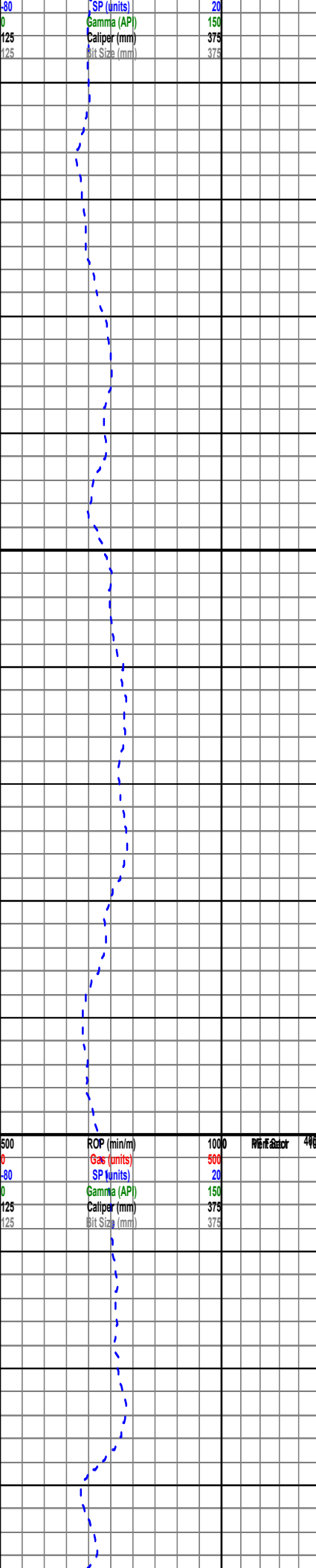
2036-2045 SH 55% med-dk gy, silc, sily calc, mic, pyr; DOL LST 30% wht-lt gy, calc microxln; SS 10% wht-gy, vfg, qtz, musc, calc, w srt, sa; SLTST 5% med- dk gy, sily calc; occ qtz xls

2045-2057 SH 45% med-dk gy, silc, sily calc, mic, pyr; SS 30% wht-gy, vfg, qtz, musc, calc, w srt, sa; DOL LST 20% wht-lt gy, microxln, calc; SLTST 5% med- dk gy, sily calc; occ qtz xls

2057-2079 SH 50% med-dk gy, silc, sily calc, mic, pyr; SS 30% wht-gy, vfg, qtz, musc, calc, w srt, sa; DOL LST 15% wht-lt gy, microxln, calc; SLTST 5% med- dk gy, sily calc; occ qtz xls

2079-2106 SH 45% dk gy, silc, sily calc, pyr, mic, mnr plant frags; SS 40% wht-gy, vfg, qtz, musc, calc, w srt, sa; DOL LST 10% wht-lt gy, calc, microxln; SLTST 5% med- dk gy, noncalc; cgl n strgs



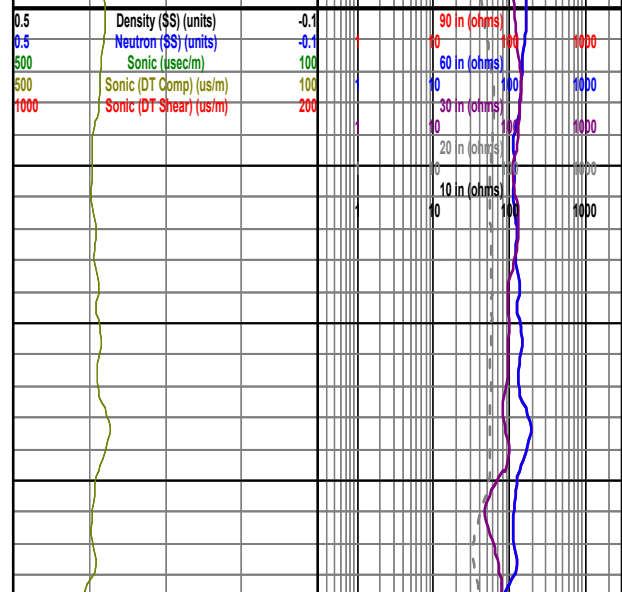
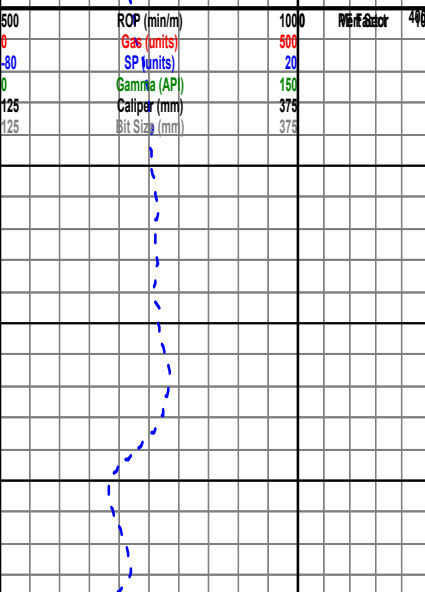
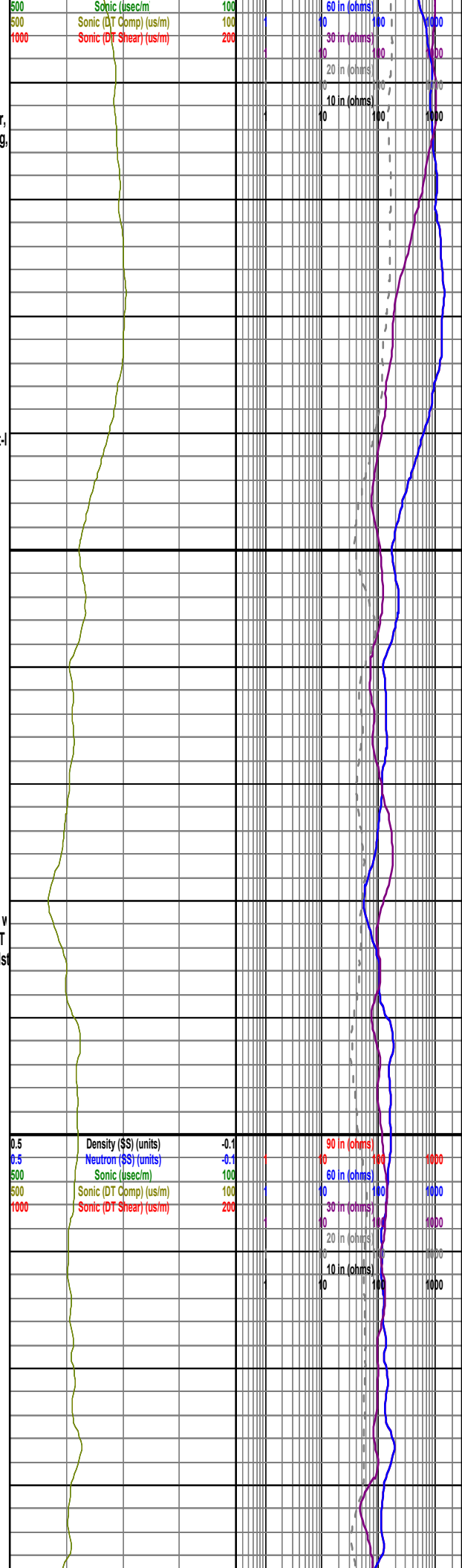


2106-2118 SH 75% dk gy, v silty, sily calc, mic, pyr, blkcy; SLTST 15% brn, noncalc; SS 5% wht-gy, vfg, qtz, musc, calc, w srt, sa; DOL LST 5% wht-lt gy, calc, microxln; cgltn strgs

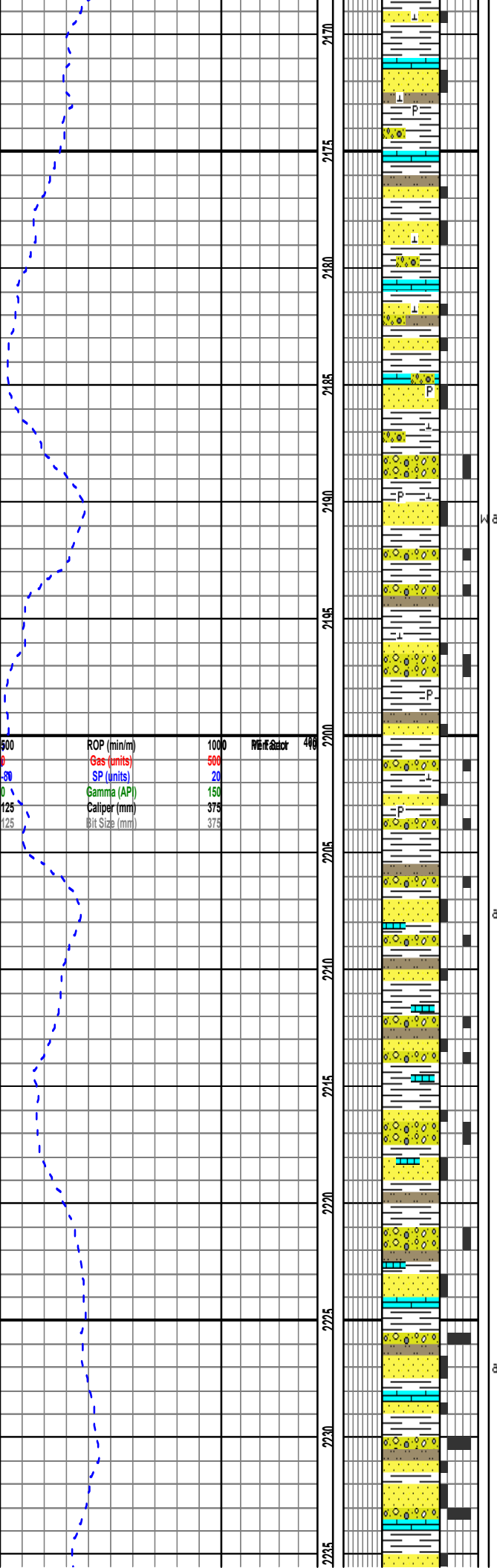
2118-2140 SH 55% dk gy, silc, calc vns, mic, pyr, blkcy; SS 30% wht-gy, vfg, qtz, musc, calc, w srt, sa; SLTST 10% gy-brn, sily calc; DOL LST 5% wht-lt gy, calc, microxln; cgltn strgs

2140-2164 SS 50% wht-gy, vfg-fg, qtz, musc, calc, v srt, sa; SH 40% dk gy, silc, calc veins, mic; SLTST 10% dk gy, sily calc; occ qtz xls, occ pyr, cal xls, slt strgs, cgltn strgs

2164-2188 SS 45% wht-gy, vfg, qtz, musc, calc, w srt, sa; SH 35% dk gy, silc, calc veins, mic, pyr; DOL LST 15% wht-lt gy, microxln; SLTST 10% dk gy, sily calc; cgltn strgs



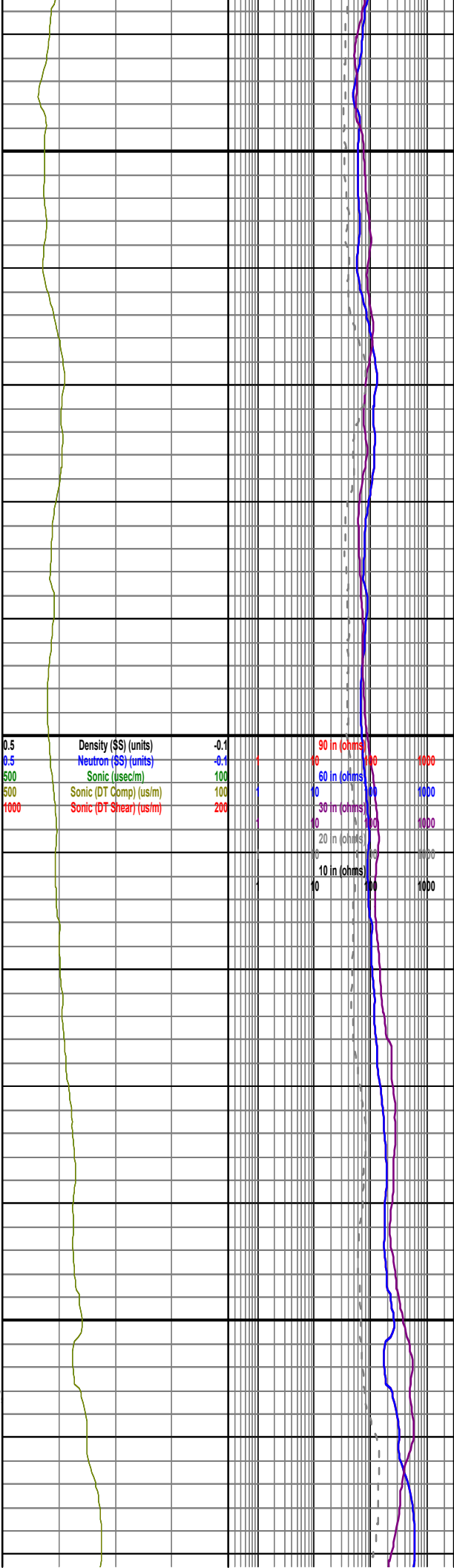


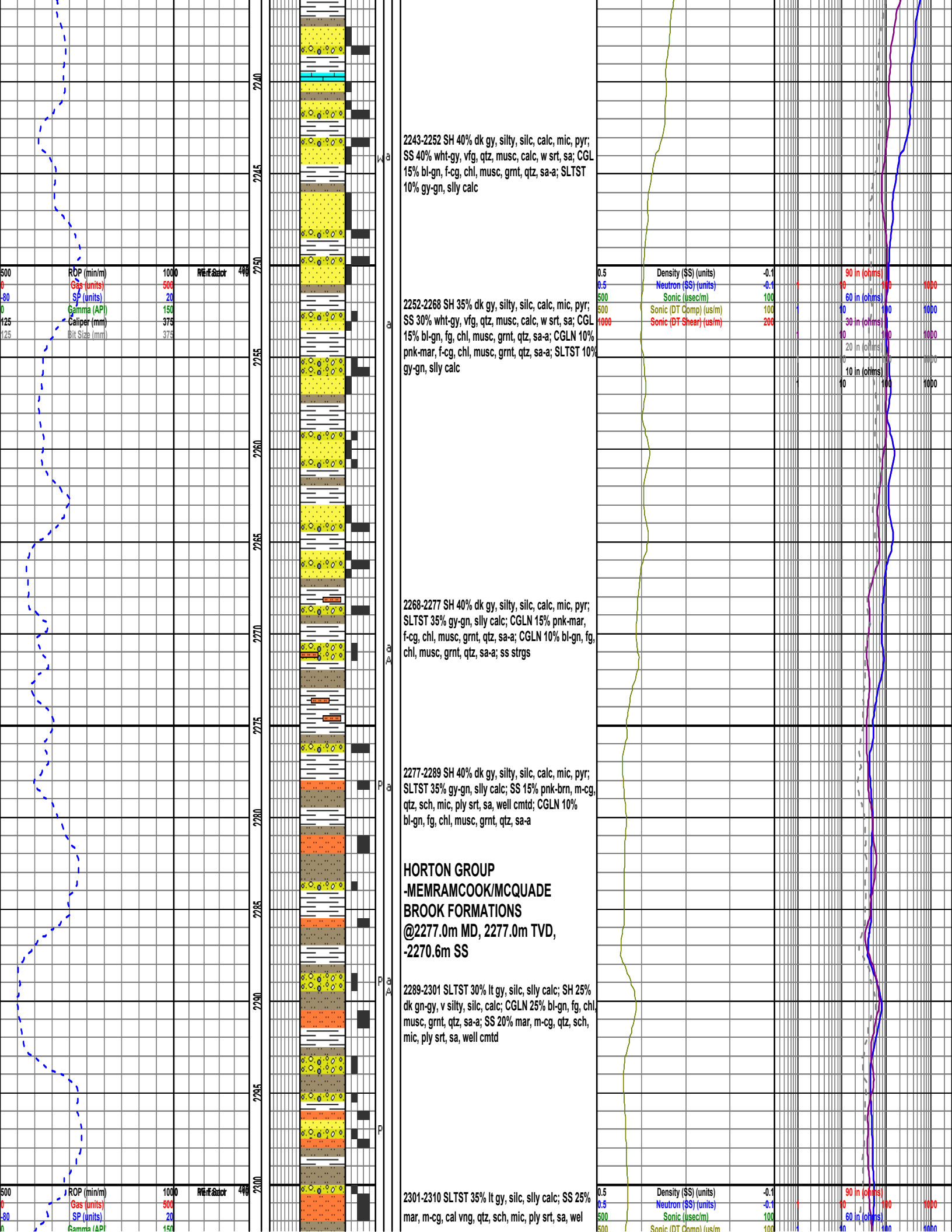


2188-2207 SH 45% dk gy, silc, calc, mic, pyr; CGLN 30% bl-gn, cg, chl, musc, grnt, qtz, sa-a; SS 15% wht-gy, vfg, qtz, musc, calc, w srt, sa; SLTST 10% dk gy, sily calc

2207-2225 SH 35% dk gy, silc, calc, mic, pyr; CGLN 30% bl-gn, vf-cg, chl, musc, grnt, qtz, sa-a; SS 25% wht-gy, vfg, qtz, musc, calc, w srt, sa; SLTST 10% gy-gn, noncalc; dol lst strgs

2225-2243 SH 40% dk gy, silty, silc, sily calc, mic, pyr; SS 30% wht-gy, vfg, qtz, musc, calc, w srt, sa; CGLN 10% bl-gn, f-cg, chl, musc, grnt, qtz, sa-a; SLTST 10% gy-gn, noncalc; DOL LST 10% wht-ly microxln





2243-2252 SH 40% dk gy, silty, silc, calc, mic, pyr;  
 SS 40% wht-gy, vfg, qtz, musc, calc, w srt, sa; CGL  
 15% bl-gn, f-cg, chl, musc, grnt, qtz, sa-a; SLTST  
 10% gy-gn, sily calc

2252-2268 SH 35% dk gy, silty, silc, calc, mic, pyr;  
 SS 30% wht-gy, vfg, qtz, musc, calc, w srt, sa; CGL  
 15% bl-gn, fg, chl, musc, grnt, qtz, sa-a; CGLN 10%  
 pnk-mar, f-cg, chl, musc, grnt, qtz, sa-a; SLTST 10%  
 gy-gn, sily calc

2268-2277 SH 40% dk gy, silty, silc, calc, mic, pyr;  
 SLTST 35% gy-gn, sily calc; CGLN 15% pnk-mar,  
 f-cg, chl, musc, grnt, qtz, sa-a; CGLN 10% bl-gn, fg,  
 chl, musc, grnt, qtz, sa-a; ss strgs

2277-2289 SH 40% dk gy, silty, silc, calc, mic, pyr;  
 SLTST 35% gy-gn, sily calc; SS 15% pnk-brn, m-cg,  
 qtz, sch, mic, ply srt, sa, well cmtd; CGLN 10%  
 bl-gn, fg, chl, musc, grnt, qtz, sa-a

**HORTON GROUP**  
**-MEMRAMCOOK/MCQUADE**  
**BROOK FORMATIONS**  
**@2277.0m MD, 2277.0m TVD,**  
**-2270.6m SS**

2289-2301 SLTST 30% lt gy, silc, sily calc; SH 25%  
 dk gn-gy, v silty, silc, calc; CGLN 25% bl-gn, fg, chl,  
 musc, grnt, qtz, sa-a; SS 20% mar, m-cg, qtz, sch,  
 mic, ply srt, sa, well cmtd

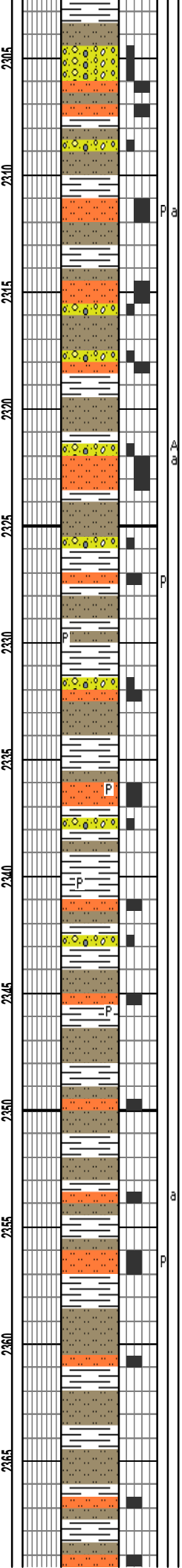
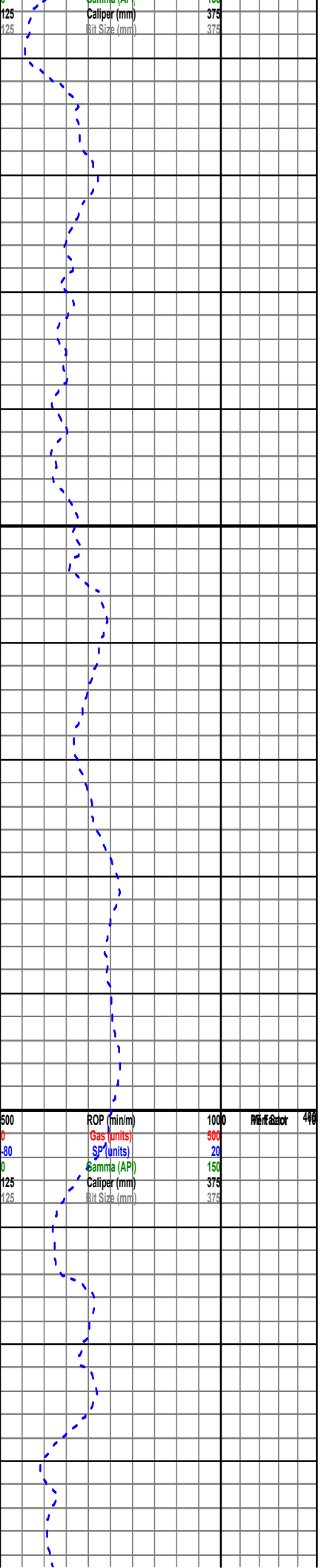
2301-2310 SLTST 35% lt gy, silc, sily calc; SS 25%  
 mar, m-cg, cal vng, qtz, sch, mic, ply srt, sa, wel

500	ROP (min/m)	1000	Weight	40%
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

500	ROP (min/m)	1000	Weight	40%
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000



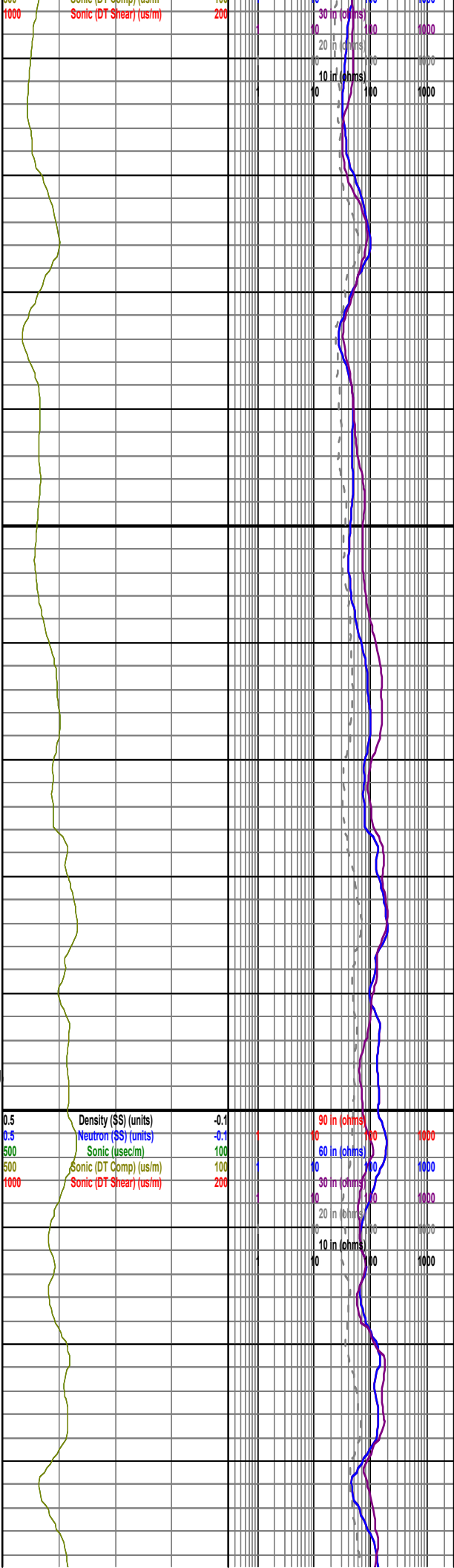
cmtd, l por; CGLN 25% bl-gn, fg, chl, musc, grnt, qtz, sa-a; SH 15% dk gn-gy, v silty, silc, calc

2310-2326 SLTST 50% lt gy, silc, sily calc; SS 25% mar-gy, m-cg, cal vng, qtz, sch, mic, ply srt, sa, well cmtd; SH 20% dk gn-gy, v silty, silc, calc, mic; CGLN 5% bl-gn, fg, chl, musc, grnt, qtz, sa-a

2326-2347 SH 50% dk gy, sily silty, calc, mic, pyr; SLTST 35% med-dk gy, silc, sily calc; SS 10% mar-gy, f-mg, qtz, sch, mic, ply srt, sa, well cmtd; CGLN 5% bl-gn, fg, chl, musc, grnt, qtz, sa-a

2347-2356 SLTST 50% med gy, silc, v sily calc; SH 40% dk gy, sily silty, calc, mic SS 10% mar-gy, f-mg qtz, sch, mic, ply srt, sa, well cmtd; occ qtz xls

2356-2371 SLTST 50% med gy, silc, sily calc; SH 40% dk gy, calc, mic; SS 10% mar-gy, f-mg, qtz, sch, mic, ply srt, sa, well cmtd, l por; occl qtz xls





2371-2384 SH 40% dk gy, calc, mic; SS 40% mar, f-cg, pred fg, mic, ply srt, sa, well cmttd; SLTST 20% med gy, silc, v sily cal; occ qtz xls

2384-2393 SS 70% mar, f-cg, mic, ply srt, sa, well cmttd; SLTST 25% lt-med gy, silc, sily cal; SH 5% m-dk gy, calc, mic; occ qtz xls, occ qtzt xls

2393-2402 SLTST 45% lt-med gy, silc, cal; SS 40% mar-gy, f-mg, sch clsts, mic, ply srt, sa, well cmttd; SH 15% m-dk gy, calc, mic; occ qtz xls, occ qtzt xls

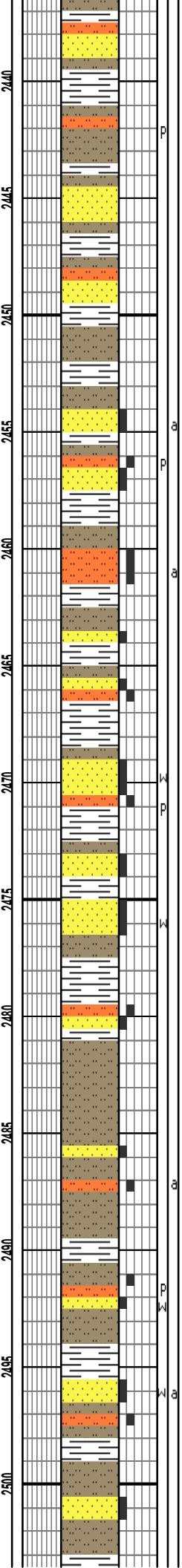
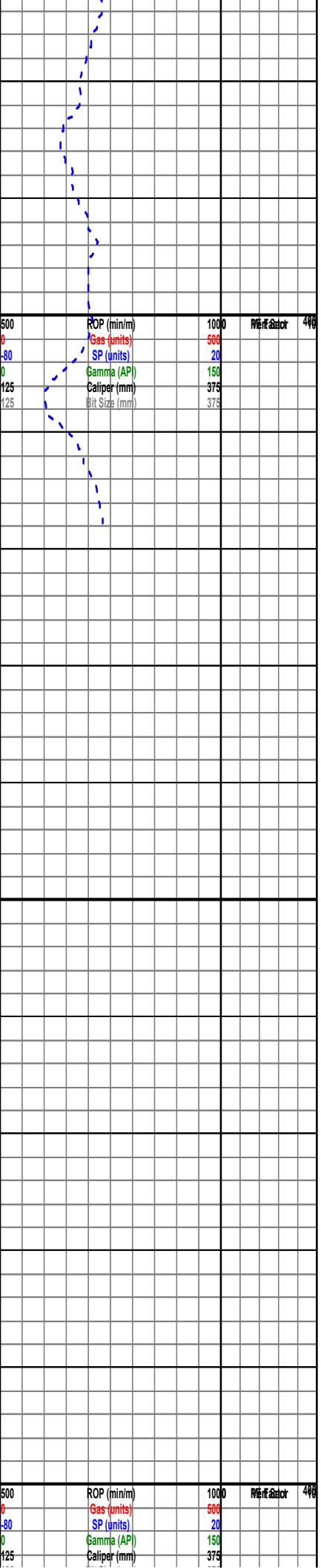
2402-2411 SLTST 85% lt-med gy, silc, cal; SS 10% mar-gy, fg, mic, ply srt, sa, well cmttd; SH 5% m-dk gy, calc, mic; occ qtz xls, occ qtzt xls

2411-2414 SLTST 70% m gy, silc, cal; SH 25% dk gy, calc, mic; SS 5% mar-gy, f-mg, mic, ply srt, sa, well cmttd; occ qtzt xls

2414-2426 SLTST 70% m-dk gy, silc, cal vng; SH 20% m-dk gy, calc, mic; SS 10% mar-gy, f-mg, mic, ply srt, sa, well cmttd; occ qtzt xls

2426-2435 SLTST 55% dk gy, silc, cal vng; SH 35% m-dk gy, calc, mic; SS 10% mar-gy, fg, mic, ply srt, sa, well cmttd; occ qtzt xls

2435-2454 SLTST 35% m-dk gy, highly silc, highly cal, pyr, SH 30% dk gy, calc, mic; SS 30% wht-gy,



vfg, qtz, musc, calc, ply glau, w srt, sa; SS 5% mar-gy, fg, mic, ply srt, sa, well cmtd;

2454-2457 SS 50% wht-gy, vfg, qtz, musc, calc, ply glau, w srt, sa; SLTST 25% m-dk gy, highly silc, sily cal; SH 20% dk gy, mic; SS 5% mar, fg, mic, ply srt, sa, well cmtd

2457-2466 SH 35% dk gy, v sily calc, mic; SLTST 30% m-dk gy, highly silc; SS 30% mar, fg, mic, ply srt, sa, well cmtd; SS 5% wht-gy, vfg, qtz, musc, calc, ply glau, w srt, sa

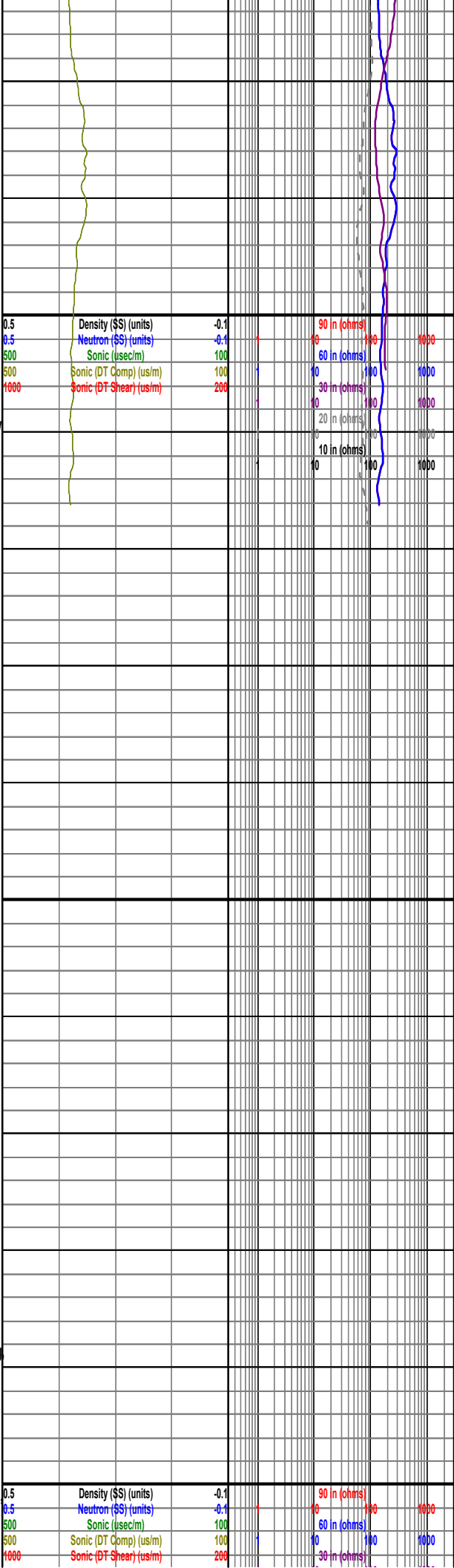
2466-2475 SH 50% dk gy, v sily calc, mic; SS 30% wht-gy, vfg, qtz, musc, calc, ply glau, w srt, sa; SLTST 15% m-dk gy, silc; SS 5% mar, fg, mic, ply srt, sa, well cmtd; occ qtz xls

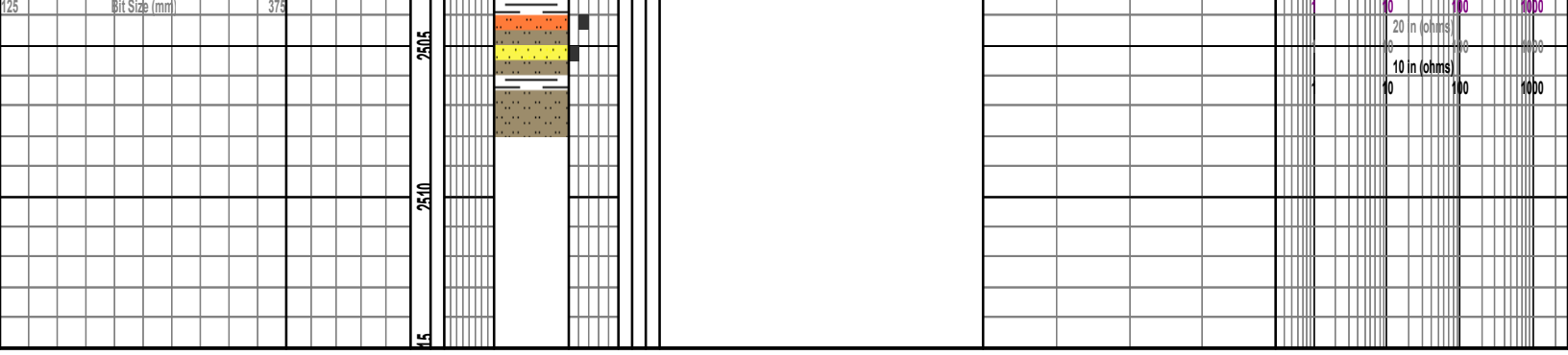
2475-2481 SH 40% dk gy, v sily calc, mic; SS 30% wht-gy, vfg, qtz, musc, calc, ply glau, w srt, sa; SLTST 25% m-dk gy, silc; SS 5% mar, fg, mic, ply srt, sa, well cmtd; occ qtz xls

2481-2493 SLTST 80% lt-med gy, sily calc; SH 10% dk gy, sily calc, mic; SS 5% wht-gy, vfg, qtz, musc, calc, ply glau, w srt, sa; SS 5% mar, fg, mic, ply srt, sa, well cmtd

2493-2499 SLTST 50% lt-med gy, sily calc; SH 30% dk gy, highly pyr, sily calc, mic; SS 15% wht-gy, vfg, qtz, musc, calc, ply glau, w srt, sa; SS 5% mar, fg, mic, ply srt, sa, well cmtd

2499-2508 SLTST 50% lt-med gy, sily calc; SH 30% dk gy, sily calc, mic; SS 15% wht-gy, vfg, qtz, musc, calc, ply glau, w srt, sa; SS 5% mar, fg, mic, ply srt, sa, well cmtd





**APPENDIX 3:**

**STRIP LOG OF IMPERIAL DORCHESTER 1 WELL,**

**UNIQUE IDENTIFIER NUMBER 330**

# APPENDIX 3

Scale 1:240 (5"=100') Metric  
Measured Depth Log

Well Name: Imperial N.B.O. Dorchester #1  
Location: Dorchester, N.B.  
License Number: WLONG 60-330  
Spud Date: 1960  
Surface Coordinates: 45°53'21", 64°31'25"

Region: Dorchester  
Drilling Completed: 1960

Bottom Hole Coordinates: 45°53'21", 64°31'25"

Ground Elevation (m): 19.51                      K.B. Elevation (m): 24.08  
Logged Interval (m): 0                      To: 2420                      Total Depth (m): 2420  
Formation: Upperton  
Type of Drilling Fluid: Assumed to be air drilled

Printed by STRIP.LOG from WellSight Systems 1-800-447-1534 www.WellSight.com

## OPERATOR

Company: Imperial Oil Limited/New Brunswick Oilfields Ltd.  
Address: Imperial Oil Resources  
2480-237 4 Ave SW  
Calgary, AB, Canada

## GEOLOGIST


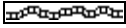
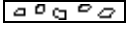

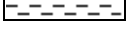
Name: Holly Stewart  
Company: New Brunswick Department of Natural Resources  
Address: P.O. Box 6000  
Fredericton, NB  
E3B 5H1


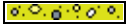



## Cores



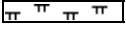


## Comments

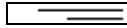
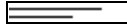






Compilation of work completed by Imperial Oil Limited/New Brunswick Oilfields Ltd. and New Brunswick Department of Natural Resources

## ROCK TYPES

 Anhy  
 Bent  
 Brec  
 Cht  
 Clyst

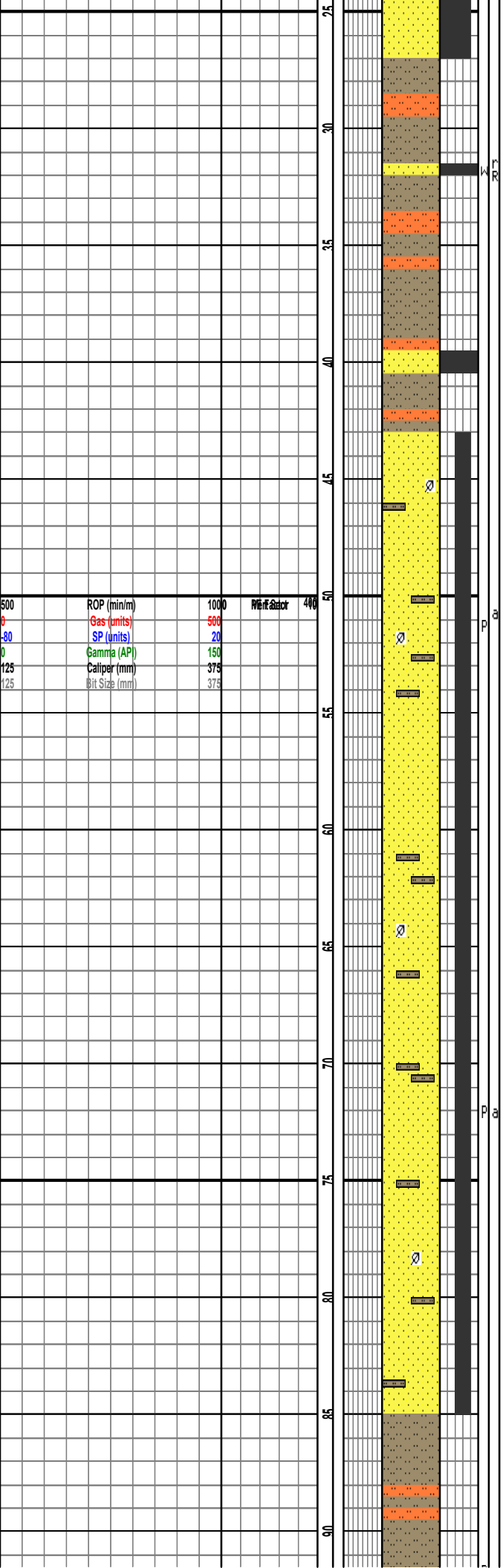
 Coal  
 Congl  
 Dol  
 Gyp  
 Igne

 Lmst  
 Meta  
 Mrlst  
 Salt  
 Shale

 Shcol  
 Shgy  
 Slstst (gy, gn)  
 Slstst (red, brn)  
 Slstst-vfss (red)  
 Ss  
 Uncons ss  
 Till







27-43 SLTST 90% gy, purp-mar, qtz fros; SST 10% gy, purp mar, vf-vcg, qtz, w srt, sr-r, mod cons

43-67 SST 100% lt gy-gn, qtz, m-cg, musc, sily calc, ply srt, sa, w cons, plant frags (?); dk gy sltst strgs

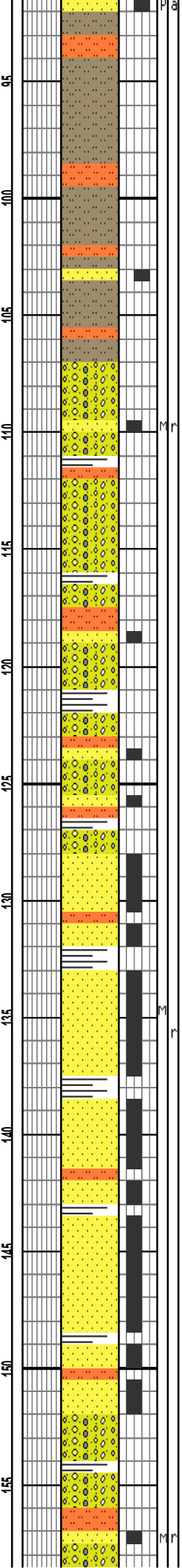
67-85 SST 100% lt gy-gn, qtz, m-cg, qtz, musc, plag, ortho, sily calc, ply srt, sa, w cons, plant frags (?); dk gy sltst strgs

85-107 SLTST 95% mar-gy, arg, sily mic, hrd, noncalc; SST 5% lt gy-gn, qtz, m-cg, qtz, musc, plag, ortho, sily calc, ply srt, sa, w cons

500	ROP (min/m)	1000	Rate of Penetration
0	Gas (units)	500	
80	SP (units)	20	
0	Gamma (API)	150	
125	Caliper (mm)	375	
125	Bit Size (mm)	375	

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

500	ROP (min/m)	1000	Perf #	496
0	Gas (units)	500		
80	SP (units)	20		
0	Gamma (AP)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		



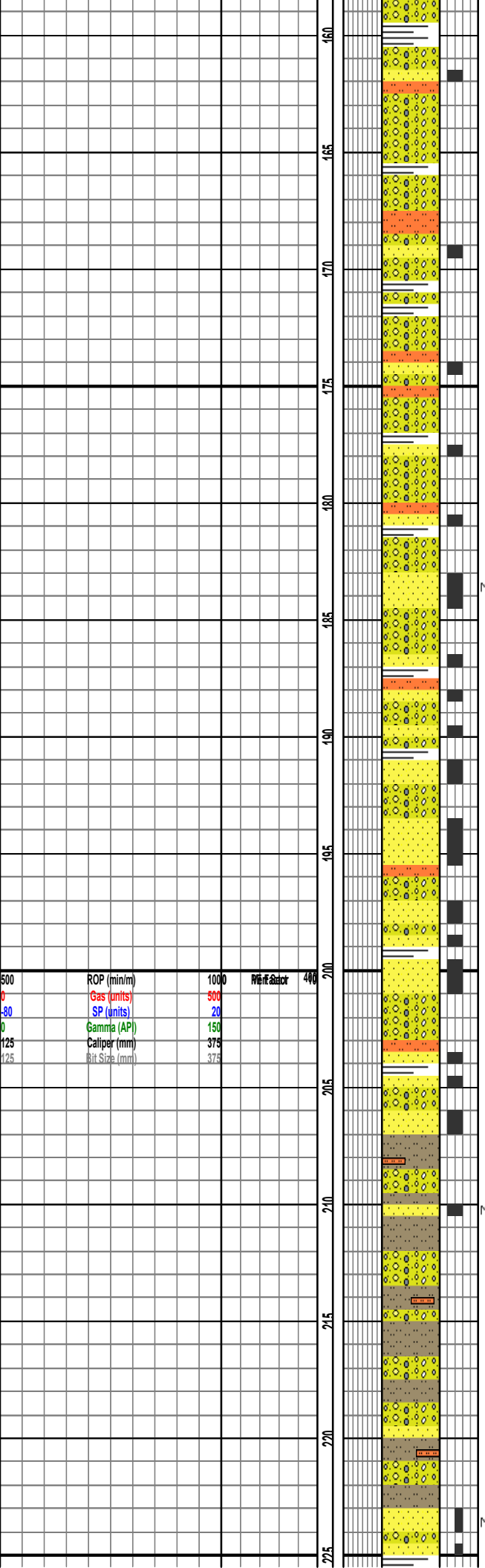
107-128 CGLN 60% wht-pnk, qtz, qtz, ig frags, gns, biot, mnr pyr, plag, ply srt, sa, uncon; SLTST 15% brn, mnr pyr, sft, fiss-bcky; SH 15% lt-med gy, subfiss-fiss, noncalc; SST 10% lt gy, f-mg, qtz, plag biot, mod srt, sr, well cons; wht cly strgs

128-152 SST 80% lt gy, f-mg, qtz, plag, biot, mod srt sr, well cons; SH 15% lt-med gy, subfiss-fiss, noncalc; SLTST 5% brn, mnr pyr, hrd, fiss-bcky

152-180 CGLN 60% wht-pnk, cg cmt, qtz, qtz, ig frags, gns, biot, mnr pyr, plag, ply srt, sa, uncon; SLTST 15% brn, mnr pyr, sft, fiss-bcky; SH 15% lt-med gy, subfiss-fiss, noncalc; SST 10% lt gy, f-mg, qtz, plag, biot, mod srt, sr, w cons; wht cly strgs

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

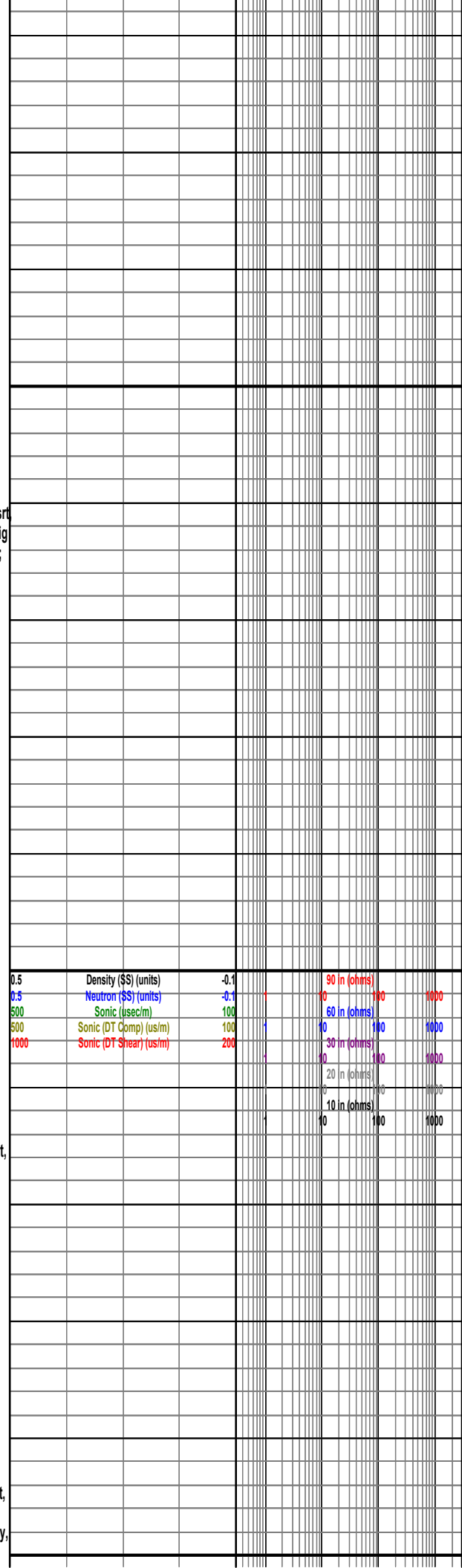
0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

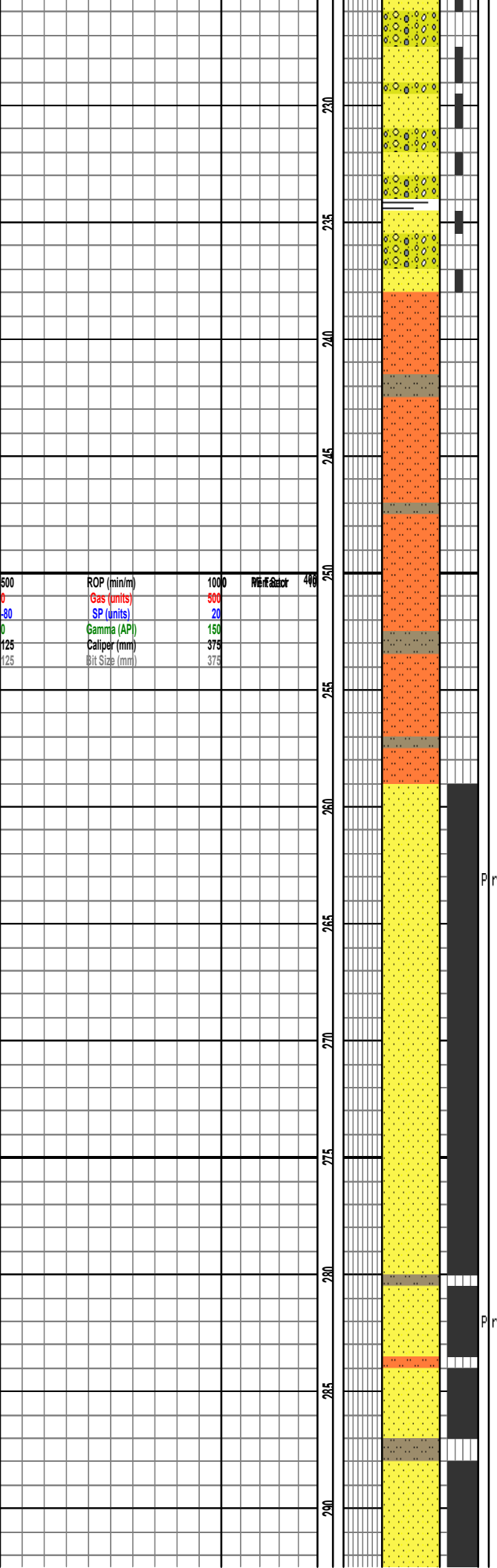


180-207 SST 40% lt gy, f-mg, qtz, plag, biot, mod srt sr, w cons; CGLN 40% wht-pnk, cg cmt, qtz, qtz, ig frags, gns, biot, mnr pyr, plag, ply srt, sa, uncons; SH 10% lt-med gy, subfiss-fiss, noncalc; SLTST 10% brn, mnr pyr, hrd, fiss-blcky; wht cly strgs

207-223 SLTST 50% med-dk gy, blkcy, noncalc; CGLN 40% wht-pnk, qtz, qtz, ig frags, plag, ply srt, sa, ply cons; SST 10% lt gy, f-mg, qtz, plag, biot, mod srt, sr, w cons; brn sltst strgs

223-238 SST 50% lt gy, mg, qtz, plag, biot, mod srt, sr, w cons; CGLN 40% wht-pnk, qtz, qtz, ig frags, plag, ply srt, sa, uncons; SH 10% med-dk gy, blkcy, noncalc; wht-pnk, cly strgs





238-259 SLTST 85% red-brn, blkcy, noncalc, predom hrd, occ sft; SLTST 15% lt gy, silc, blkcy, noncalc, hrd

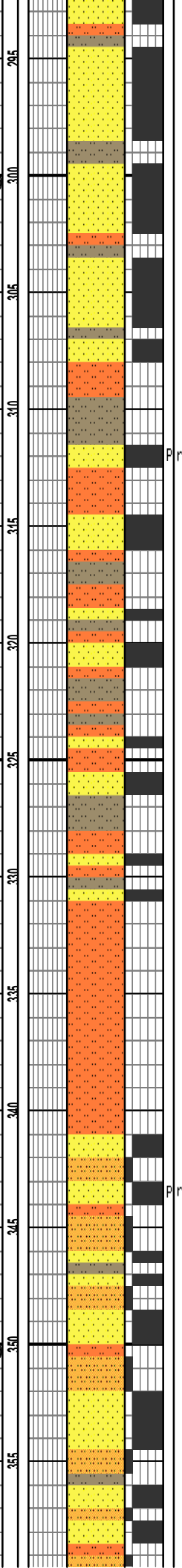
259-280 SST 100% lt gy, f-vcg, qtz, plag, biot, v sily calc, ply srt, sr, w cons

280-308 SST 80% lt gy, f-vcg, qtz, plag, biot, v sily calc, ply srt, sr, w cons; SLTST 15% med-dk gy, silc blkcy, noncalc, hrd; SLTST 5% red-brn, blkcy, noncalc, predom hrd, occ sft; wht-pnk cly strgs; dk gy sh strgs

500	ROP (min/m)	1000	Rate of Penetration
0	Gas (units)	500	
80	SP (units)	20	
0	Gamma (API)	150	
125	Caliper (mm)	375	
125	Bit Size (mm)	375	

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

500	ROP (min/m)	1000	Weight Factor	40%
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (AP)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		



308-332 SLTST 40% red-brn, blkcy, noncalc, predom hrd, occ sft; SLTST 30% med-dk gy, silc, blkcy, noncalc, hrd; SST 30% lt gy, vf-vcg, qtz, plag biot, v sily calc, ply srt, sr, w cons; wht-pnk cly strgs; dk gy sh strgs

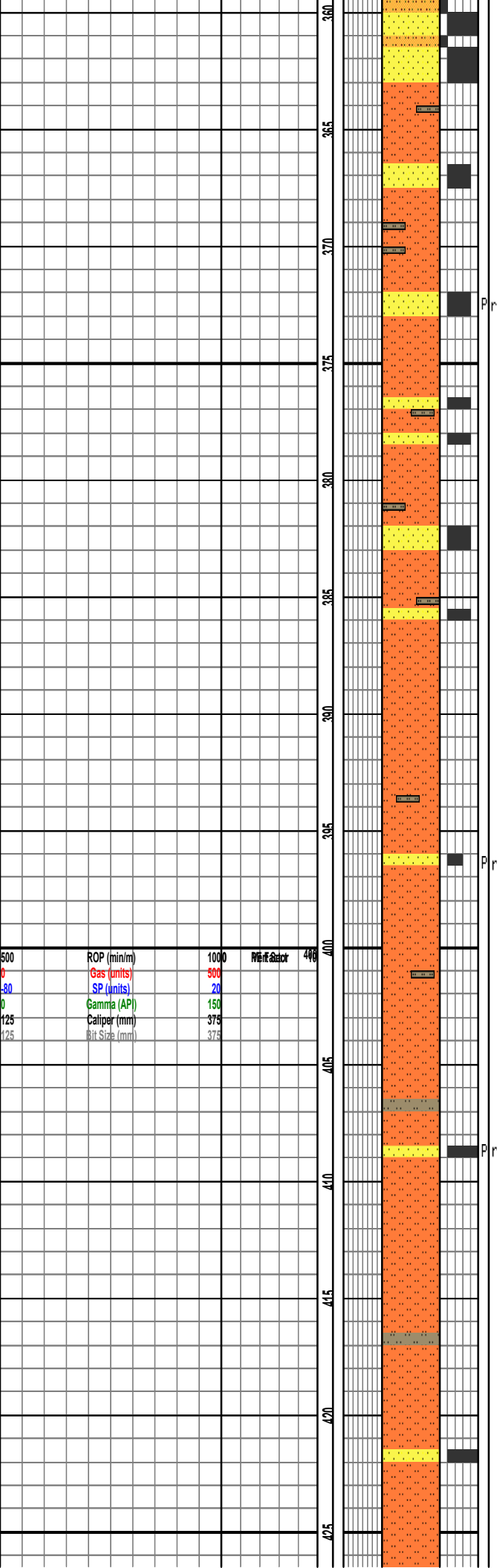
332-341 SLTST 100% red-brn, blkcy, noncalc, hrd

341-363 SST 45% lt gy, f-vcg, qtz, plag, biot, v sily calc, ply srt, sr, w cons; SST 40% mar-brn, vfg, qtz, plag, biot, v sily calc, ply srt, sr, w cons; SLTST 10% red-brn, blkcy, noncalc, predom hrd, occ sft; SLTST 5% red-gy, silc, blkcy, noncalc, hrd; wht-pnk cly strgs

500	ROP (min/m)	1000	Weight Factor	40%
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (AP)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000



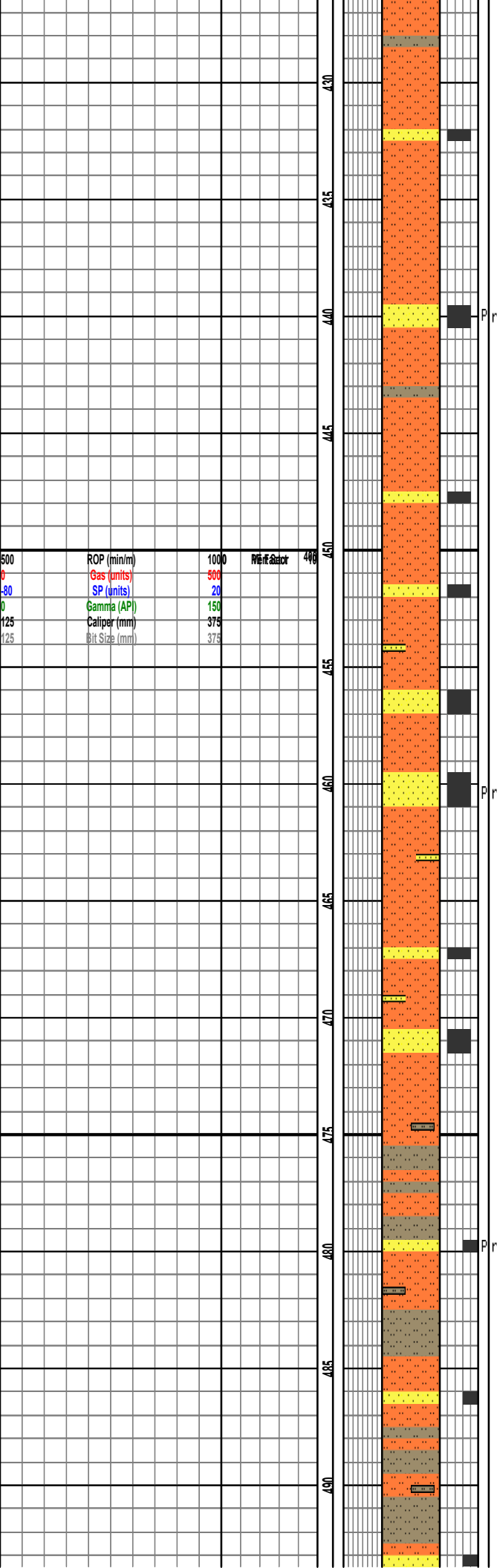
363-387 SLTST 80% red-brn, bicky, noncalc, predom hrd, occ sft, chips are wr; SST 20% mar-brn, f-cg, qtz, plag, biot, v sily calc, ply srt, sr, w cons; lt gr-gy sltst strgs

387-405 SLTST 95% red-brn, redox spots, bicky, noncalc, predom hrd, occ sft, chips are wr; SST 5% mar-brn, f-mg, qtz, plag, biot, v sily calc, ply srt, sr, w cons; mnr med gy sltst strgs

405-430 SLTST 90% red-brn, redox spots, bicky, noncalc, predom hrd, occ sft, chips are wr; SST 5% lt gy, f-vcg, qtz, plag, biot, v sily calc, ply srt, sr, w cons; SLTST 5% lt-med gy, silc, bicky, noncalc, hrd

500	ROP (min/m)	1000	Perf @acr	496
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usac/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000



430-454 SLTST 85% red-brn, redox spots, blkcy, noncalc, predom hrd, occ sft, chips are wr; SST 10% mar-brn, f-cg, qtz, plag, biot, v sily calc, ply srt sr, w cons; SLTST 5% red-gy, silc, blkcy, noncalc, hrd

454-475 SLTST 40% red-gy, silc, blkcy, noncalc, hrd; SLTST 30% red-brn, redox spots, blkcy, noncalc, predom hrd, occ sft, chips are wr; SST 30% mar-brn, f-cg, qtz, plag, biot, v sily calc, ply srt sr, w cons; wht-gy sst strgs

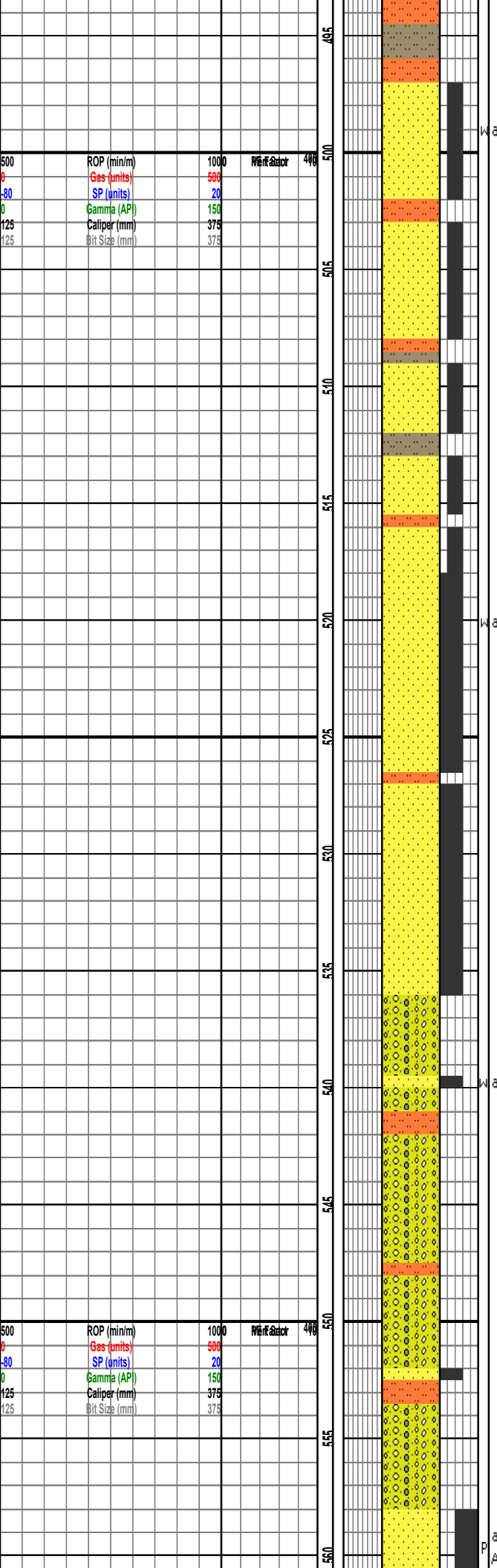
475-497 SLTST 50% mar-gy, silc, blkcy, noncalc, hrd; SLTST 40% red-brn, redox spots, blkcy, noncalc, predom hrd, occ sft, chips are wr; SST 10% mar-brn, c-vcg, qtz, plag, biot, v sily calc, ply srt, sr, w cons; med gy sltst strgs

500	ROP (min/m)	1000	Weight	400
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	0	100	1000
500	Sonic (usec/m)	100	60 in (ohms)		
500	Sonic (DT Comp) (us/m)	100	0	100	1000
1000	Sonic (DT Shear) (us/m)	200	30 in (ohms)		

20 in (ohms)		
10 in (ohms)		
0	100	1000





497-518 SST 80% lt brn, f-mg, qtz, sily calc, w srt, sa, unconc; SLTST 20% mar-gy, silc, blkcy, noncalc, hrd

518-536 SST 95% red-brn, vf-mg, qtz, sily calc, w srt, sa, unconc (85%), w cons (10%); SLTST 5% mar-gy, silc, blkcy, noncalc, hrd

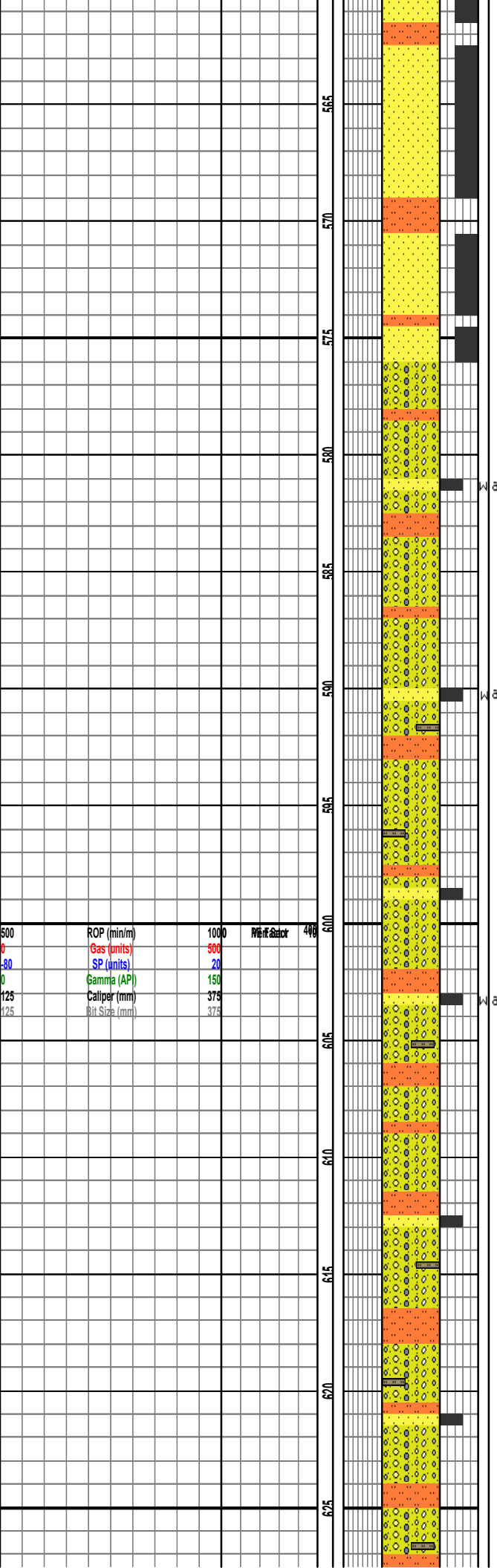
**MABOU GROUP**  
**-HOPEWELL CAPE FORMATION**  
**@536.0m MD, 536.0m TVD,**  
**-511.92m SS**

536-558 CGLN 80% mar-brn, m-vcg, qtz, ign frags, sch, sily calc, ply srt, sa-a, w cons; SLTST 15% mar-gy, silc, blkcy, noncalc, hrd; SST 5% red-brn, vf-mg, qtz, sily calc, w srt, sa, w cons

558-576 SST 80% mar-brn, m-vcg, qtz, ign frags, sch, sily calc, ply srt, sa-a; SLTST 20% mar-gy, silc, blkcy, noncalc hrd

0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000



576-588 CGLN 80% mar-brn, qtz, ign frags, sch, sily calc, ply srt, sa-a, w cons; SLTST 15% mar-brn, silc bicky, noncalc, redox spots, hrd; SST 5% red-brn, vf-mg, qtz, sily calc, w srt, sa, mod cons

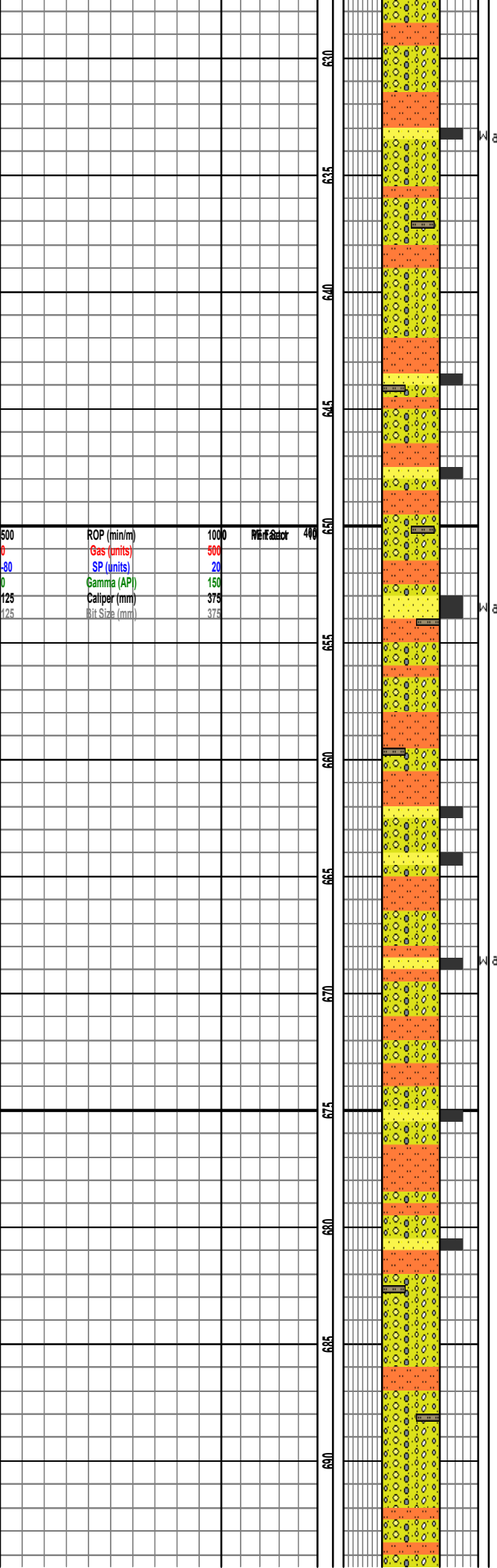
588-600 CGLN 80% mar-brn, qtz, ign frags, sch, v calc, ply srt, sa-a, w cons; SLTST 15% mar-brn, silc bicky, noncalc, hrd, redox spots; SST 5% red-brn, vf-mg, qtz, calc, w srt, sa, w cons; med gy sltst strgs

600-622 CGLN 70% mar-brn, qtz, ign frags, sch, v calc, ply srt, sa-a, w cons; SLTST 25% mar-brn, silc bicky, noncalc, hrd, redox spots; SST 5% red-brn, vf-mg, qtz, calc, w srt, sa, w cons; med gy sltst strgs

622-640 CGLN 65% mar-brn, qtz, ign frags, sch, v calc, ply srt, sa-a, w cons; SLTST 30% mar-brn, silc bicky, noncalc, hrd, redox spots; SST 5% red-brn, vf-mg, qtz, calc, w srt, sa, w cons; med gy sltst strgs; interval is highly altered

500	ROP (min/m)	1000	Perforator	400
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (AP)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

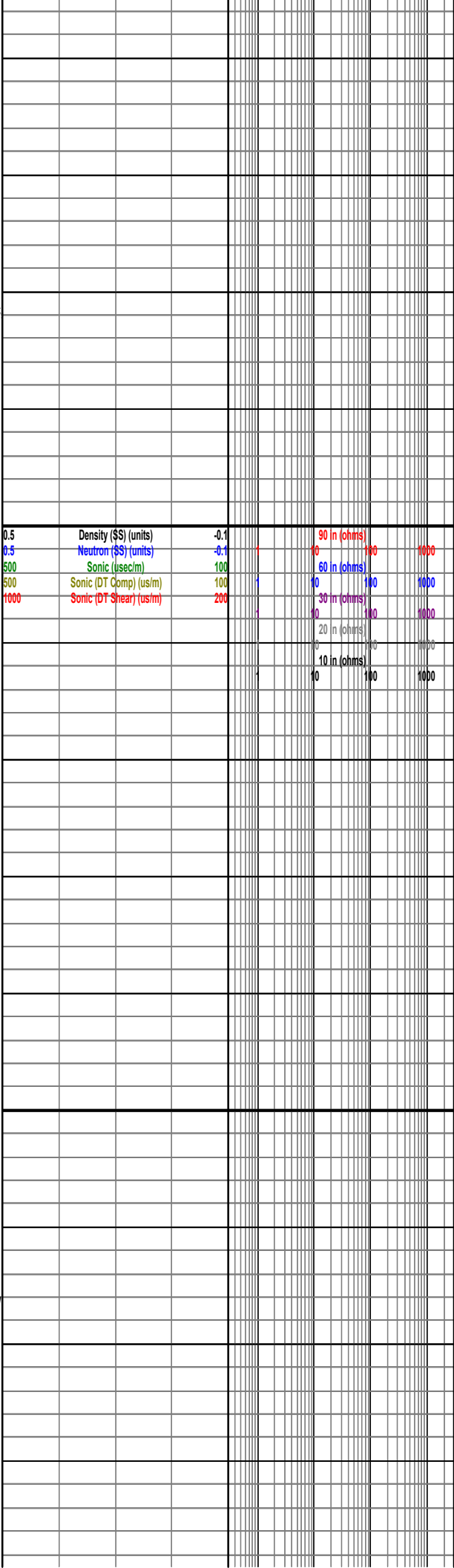
0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	0	100	1000
500	Sonic (us/cm)	100	60 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	0	100	1000
1000	Sonic (DT Shear) (us/m)	200	30 in (ohms)	100	1000
			20 in (ohms)	100	1000
			10 in (ohms)	100	1000
			0	100	1000



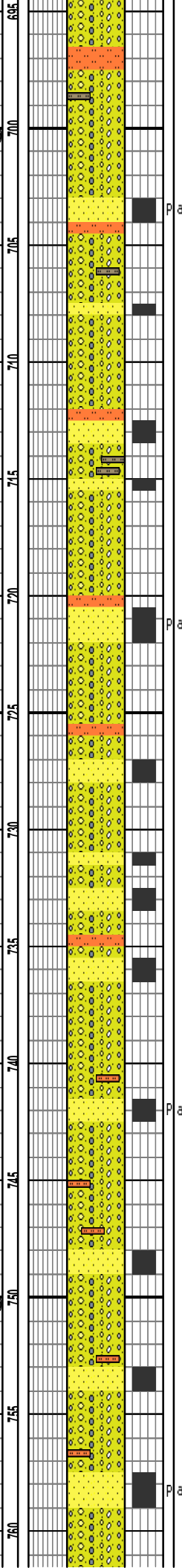
640-664 CGLN 50% mar-brn, qtz, ign frags, sch, v calc, ply srt, sa-a, w cons; SLTST 40% mar-brn, silc bicky, noncalc, sft-hrd, redox spots; SST 10% red-brn, vf-mg, qtz, calc, w srt, sa, w cons; med gy sltst strgs; interval is altered

664-683 CGLN 45% mar-brn, qtz, ign frags, sch, v calc, ply srt, sa-a, w cons; SLTST 45% mar-brn-gy, silc, bicky, noncalc, sft-hrd, redox spots; SST 10% red-brn, vf-mg, qtz, calc, w srt, sa, w cons; med gy sltst strgs; interval is altered

683-701 CGLN 80% mar-brn, qtz, ign frags, sch, sly calc, ply srt, sa-a, w cons, mar sltst matrix; SLTST 20% mar-brn-gy, silc, bicky, noncalc, sft-hrd, redox spots; med gy sltst strgs



600	ROP (min/m)	1000	Weight	400
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		



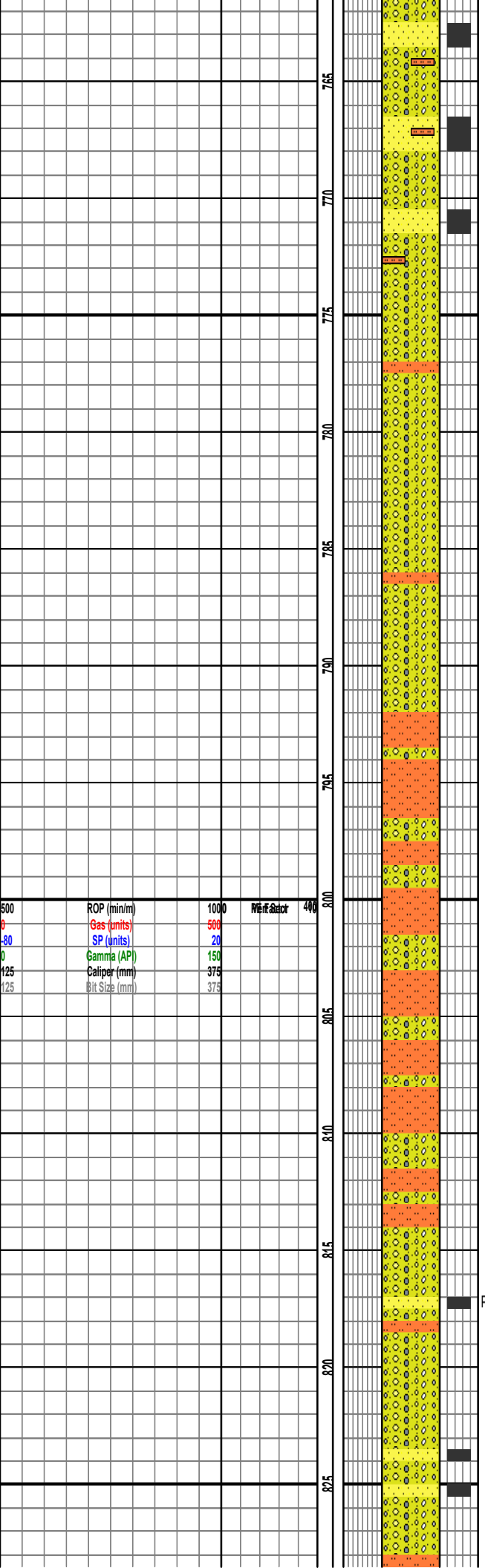
701-719 CGLN 80% mar-brn, qtz, ign frags, sch, noncalc, ply srt, sa-a, w cons; SST 15% red-brn, f-cg, qtz, calc, ply srt, sa, w cons; SLTST 5% mar-brn-gy, silc, blicky, noncalc, sft-hrd, redox spots; med gy sltst strgs

719-738 CGLN 70% mar-brn, qtz, ign frags, sch, bio noncalc, ply srt, sa-a, w cons; SST 25% red-brn, f-cg, qtz, calc, ply srt, sa, w cons; SLTST 5% mar-brn-gy, silc, blicky, noncalc, hrd

738-756 CGLN 80% mar-brn, qtz, ign frags, sch, bio noncalc, ply srt, sa-a, w cons; SST 20% red-brn, f-cg, qtz, calc, ply srt, sa, w cons; wht cly strgs, mar-brn sltst strgs

756-774 CGLN 75% mar-brn, qtz, ign frags, sch, bio noncalc, ply srt, sa-a, w cons; SST 25% red-brn, f-cg, qtz, calc, ply srt, sa, w cons; mar-brn sltst strgs

0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 m (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000



774-792 CGLN 95% mar-brn, qtz, ign frags, sch, bio noncalc, ply srt, sa-a, w cons; SLTST 5% mar-brn, silc, blkcy, noncalc, hrd, redox spots

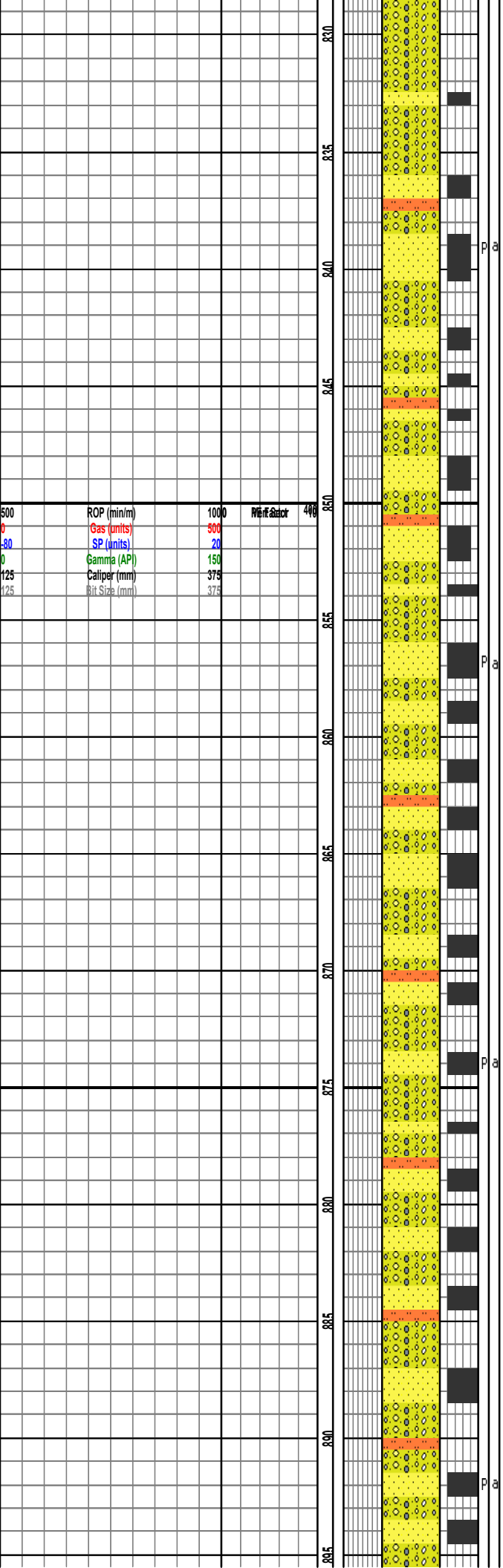
792-814 SLTST 55% mar-brn, silc, blkcy, noncalc, hrd, redox spots; CGLN 45% mar-brn, qtz, ign frags sch, biot, noncalc, ply srt, sa-a, w cons

814-835 CGLN 85% mar-brn, qtz, ign frags, sch, calc, biot, ply srt, sa-a, w cons; SST 10% red-brn, f-cg, qtz, calc, ply srt, sa, w cons; SLTST 5% mar-brn, silc, blkcy, v calc, hrd

500	ROP (min/m)	1000	PG# of 240	400
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (AP)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

Pa



835-853 CGLN 50% mar-brn, qtz, ign frags, sch, v calc, biot, ply srt, sa-a, w cons; SST 45% red-brn-gy, f-cg, qtz, v calc, ply srt, sa, w cons; SLTST 5% mar-brn, silc, bicky, v calc, hrd; wht cly strgs

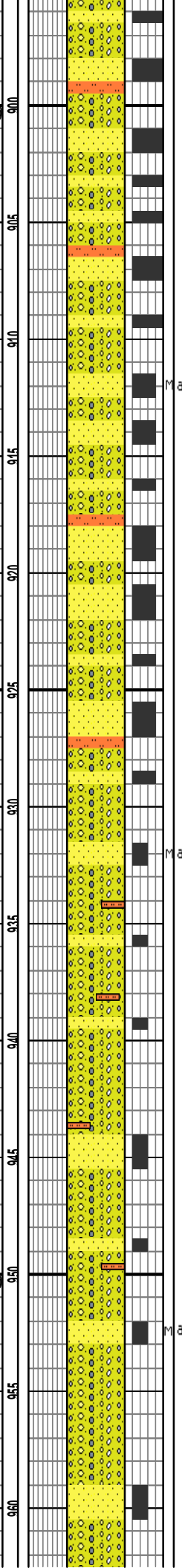
853-872 CGLN 50% mar-brn, qtz, ign frags, sch, sily calc, biot, ply srt, sa-a, w cons; SST 45% red-brn-gy, f-vcg, qtz, v calc, ply srt, sa, w cons; SLTST 5% mar-brn, silc, bicky, v calc, hrd; mnr wht cly strgs

872-890 CGLN 60% mar-brn, qtz, ign frags, sch, sily calc, biot, ply srt, sa-a, w cons; SST 35% red-brn-gy, f-vcg, qtz, v calc, ply srt, sa, w cons; SLTST 5% mar-brn, silc, bicky, v calc, hrd; mnr wht cly strgs

890-911 CGLN 60% mar-brn, qtz, ign frags, sch, sily calc, biot, ply srt, sa-a, w cons; SST 35% red-brn-gy, f-vcg, qtz, v calc, ply srt, sa, w cons; SLTST 5% mar-brn, silc, bicky, v calc, hrd; mnr wht cly strgs

0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	0	100	1000
500	Sonic (usec/m)	100	60 in (ohms)		
500	Sonic (DT Comp) (us/m)	100	0	100	1000
1000	Sonic (DT Shear) (us/m)	200	30 in (ohms)		
			20 in (ohms)		
			10 in (ohms)		
			0	100	1000

500	ROP (min/m)	1000	Weight	40%
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

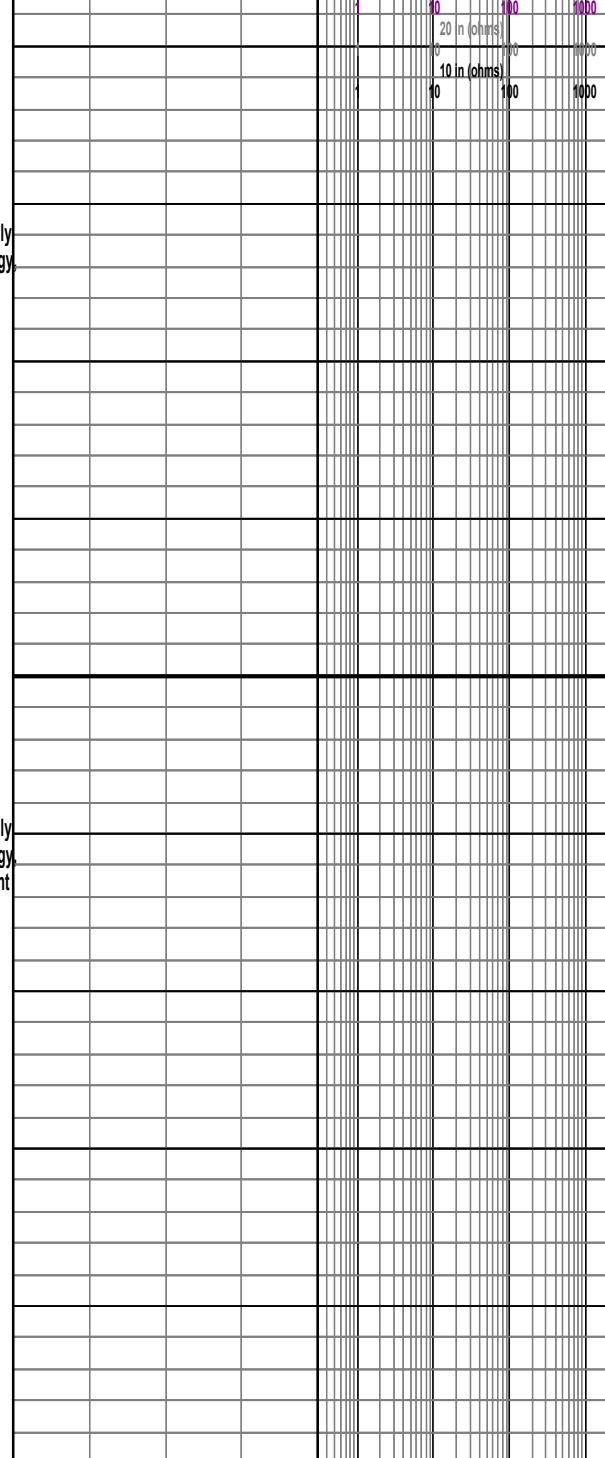


911-930 CGLN 55% mar-brn, qtz, ign frags, sch, sily calc, biot, ply srt, sa-a, w cons; SST 40% red-brn-gy f-cg, qtz, biot, v calc, mod srt, sa, w cons; SLTST 5% mar-brn, silc, bicky, v calc, hrd; mnr wht cly strgs

930-951 CGLN 80% mar-brn, qtz, ign frags, sch, sily calc, biot, ply srt, sa-a, w cons; SST 20% red-brn-gy f-mg, qtz, biot, v calc, mod srt, sa, w cons; mnr wht cly strgs; mar-brn-gy sltst strgs

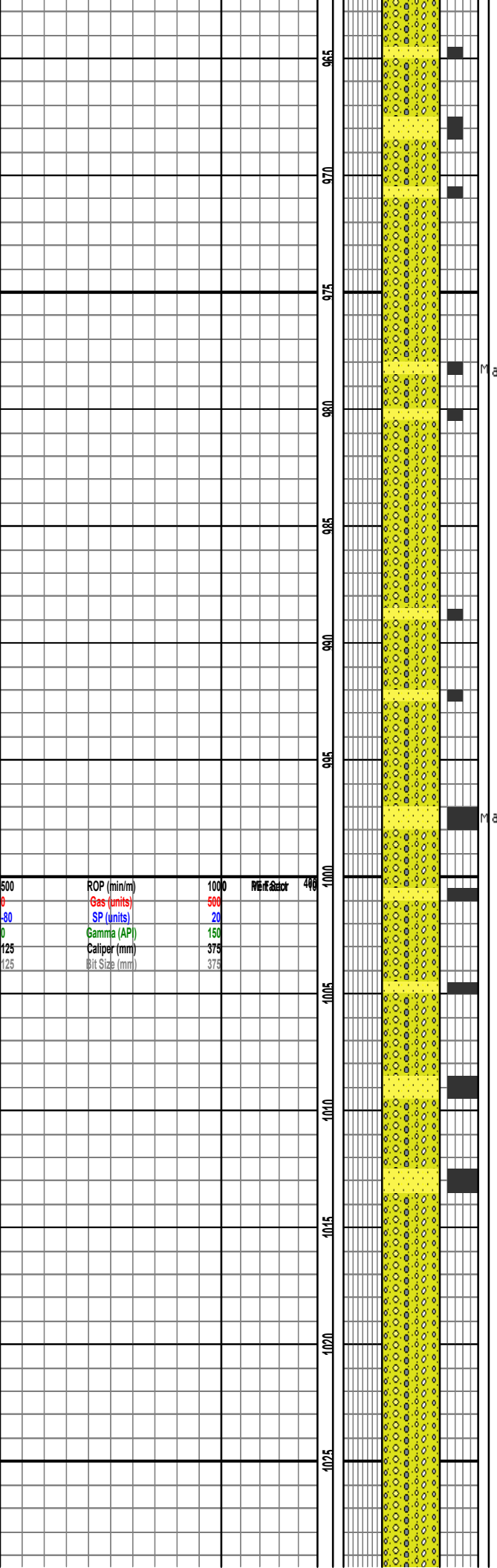
951-972 CGLN 80% mar-brn, qtz, ign frags, sch, sily calc, biot, ply srt, sa-a, w cons; SST 20% red-brn-gy f-mg, qtz, biot, v calc, mod srt, sa, w cons; mnr wht cly strgs

0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	0	100	1000
500	Sonic (usec/m)	100	60 in (ohms)		
500	Sonic (DT Comp) (us/m)	100	0	100	1000
1000	Sonic (DT Shear) (us/m)	200	30 in (ohms)		



0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	0	100	1000
500	Sonic (usec/m)	100	60 in (ohms)		
500	Sonic (DT Comp) (us/m)	100	0	100	1000
1000	Sonic (DT Shear) (us/m)	200	30 in (ohms)		

500	ROP (min/m)	1000	Weight	40%
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		



972-994 CGLN 90% mar-brn, qtz, ign frags, sch, sily calc, biot, ply srt, sa-a, w cons; SST 10% red-brn-gy, f-mg, qtz, biot, v calc, mod srt, sa, w cons; mnr wht cly strgs

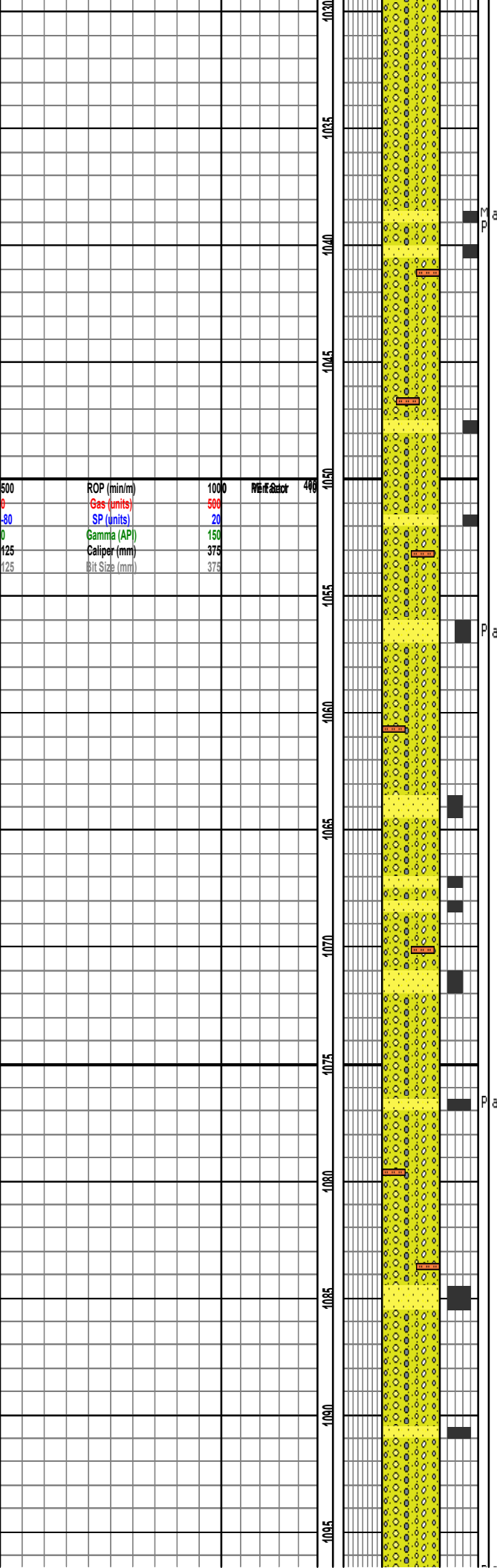
994-1015 CGLN 80% mar-brn, qtz, ign frags, sch, sily calc, biot, ply srt, sa-a, w cons; SST 20% red-brn-gy, f-vcg, qtz, biot, v calc, mod srt, sa, w cons; mnr wht cly strgs

1015-1036 CGLN 100% mar-brn, qtz, ign frags, sch, sily calc, biot, ply srt, sa-a, w cons; mnr wht cly strgs

500	ROP (min/m)	1000	Ref: 2000
0	Gas (units)	500	
-80	SP (units)	20	
0	Gamma (API)	150	
125	Caliper (mm)	375	
125	Bit Size (mm)	375	

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000



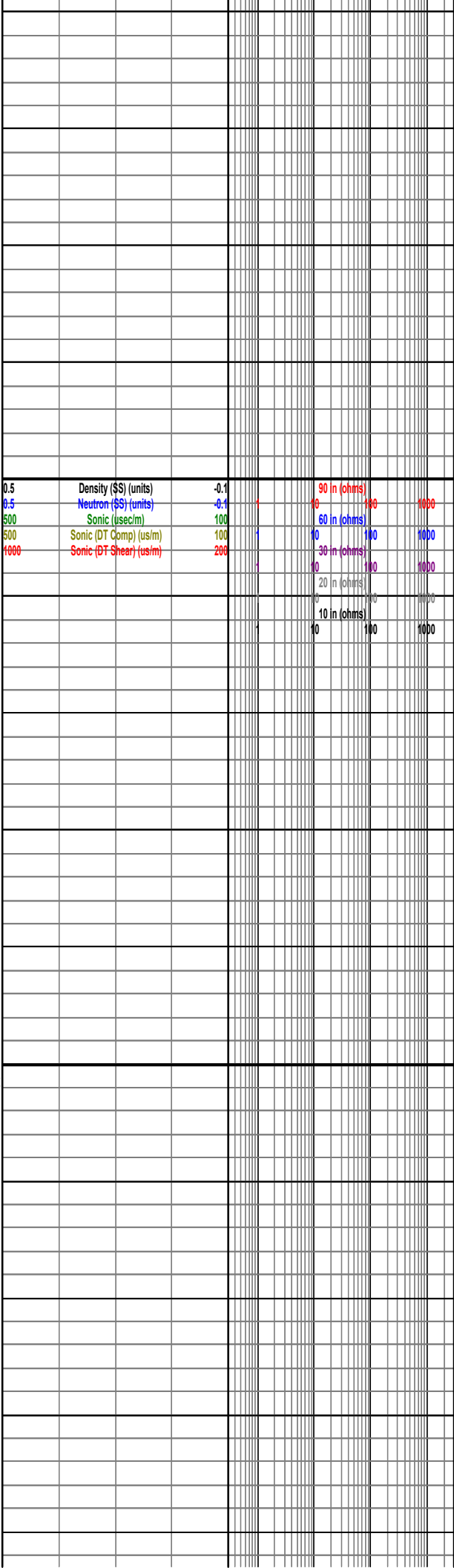


1036-1055 CGLN 90% mar-brn, qtz, ign frags, sch, sily calc, biot, ply srt, sa-a, w cons; SST 10% red-brn, c-vcg, qtz, biot, calc, mod-ply srt, sa, w cons; mnr brn sltst strgs

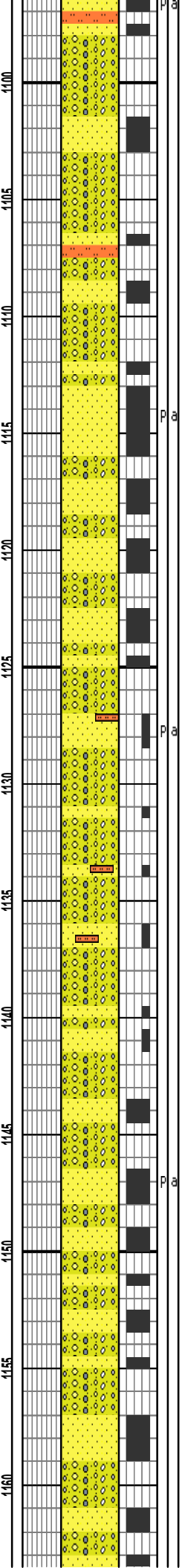
1055-1073 CGLN 80% mar-brn, qtz, ign frags, sch, sily calc, biot, ply srt, sa-a, w cons; SST 20% red-brn, m-cg, qtz, biot, calc, ply srt, sa, w cons; mnr brn sltst strgs

1073-1094 CGLN 85% mar-brn, qtz, ign frags, sch, calc, biot, ply srt, sa-a, w cons; SST 10% red-brn, f-cg, qtz, v calc, ply srt, sa, w cons; SLTST 5% mar-brn, silc, bckly, sily calc, hrd, redox spots; wht cly strgs

1094-1113 CGLN 70% mar-brn, qtz, ign frags, sch, calc, biot, ply srt, sa-a, w cons; SST 25% red-brn, f-cg, qtz, v calc, ply srt, sa, w cons; SLTST 5%



500	ROP (min/m)	1000	Wef	400
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		



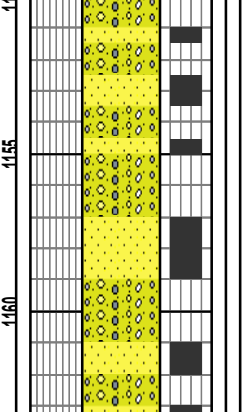
mar-brn, silc, blkcy, silly calc, hrd; mnr wht cly strgs; interval silt ctd

1113-1125 SST 60% red-brn, f-cg, qtz, v calc, ply srt sa, w cons; CGLN 40% mar-brn, qtz, ign frags, sch, calc, biot, ply srt, sa-a, w cons; interval v silt ctd

1125-1143 CGLN 75% mar-brn, qtz, ign frags, sch, calc, biot, ply srt, sa-a, w cons; SST 25% red-brn, cg, qtz, v calc, ply srt, sa, w cons; mnr brn sltst strgs

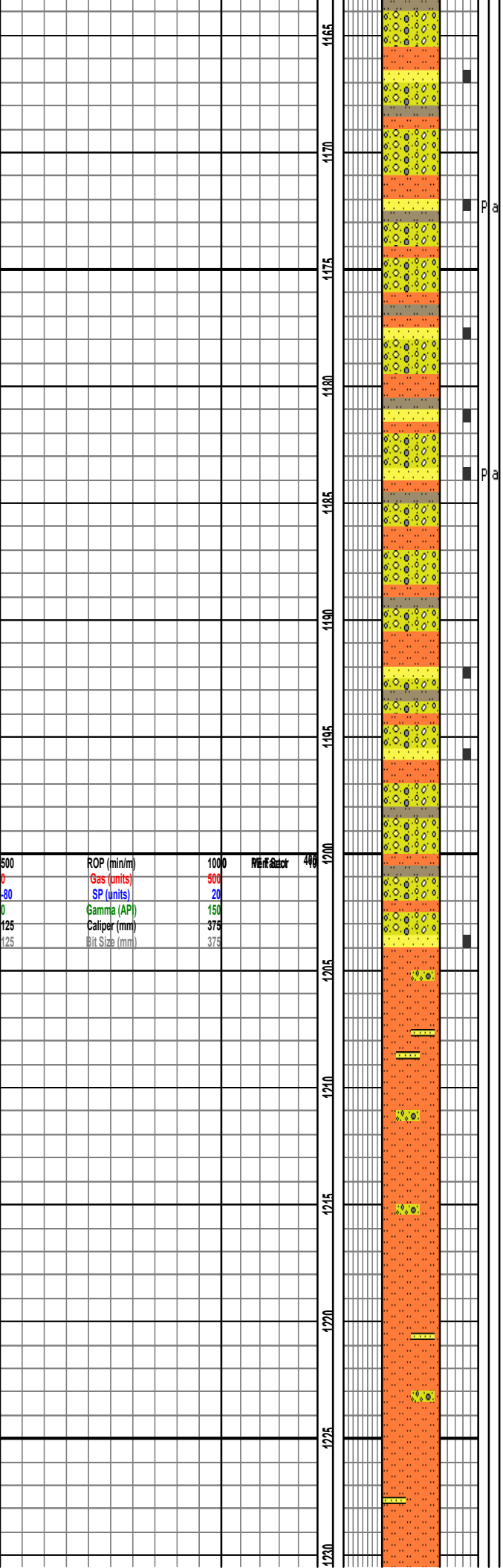
1143-1164 CGLN 55% mar-brn, qtz, ign frags, sch, calc, biot, ply srt, sa-a, w cons; SST 45% red-brn, f-cg, qtz, v calc, ply srt, sa, w cons; mnr wht cly strgs

500	ROP (min/m)	1000	Wef	400
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		



0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000



1164-1183 CGLN 45% mar-brn, qtz, ign frags, sch, calc, biot, ply srt, sa-a, w cons; SLTST 45% mar-brn-gy, silc, blkcy, sily calc, hrd, occ redox spots; SST 10% red-brn-gy, cg, qtz, v calc, ply srt, sa, w cons; mnr brn siltst strgs; mnr wht cly strgs

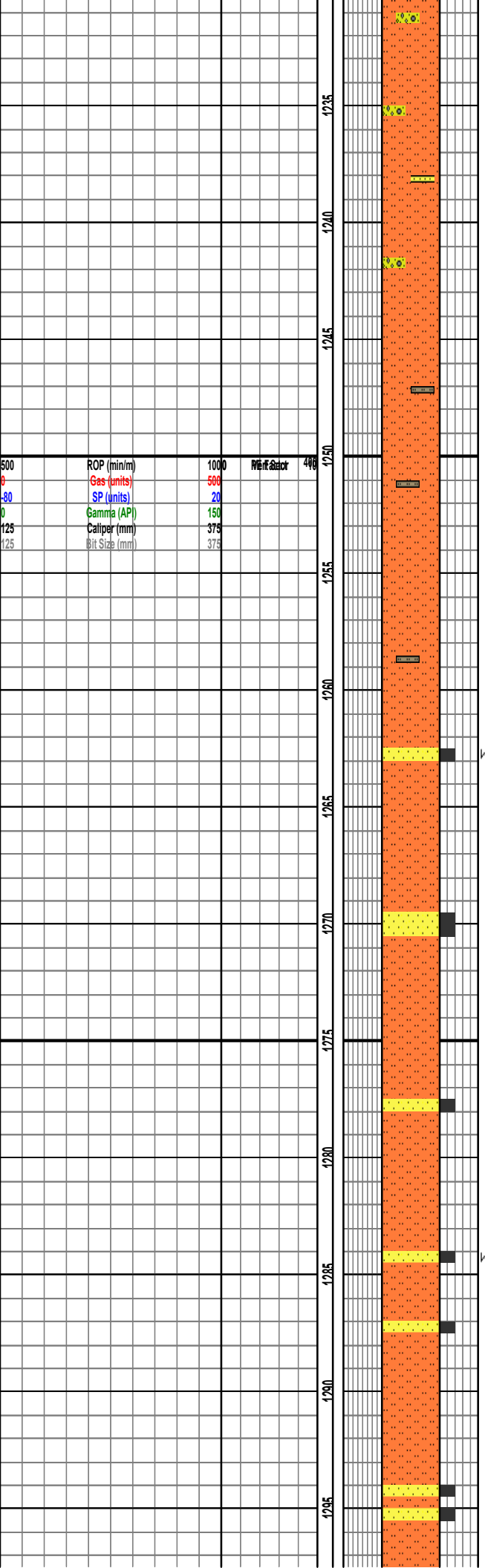
1183-1204 CGLN 45% mar-brn, qtz, ign frags, sch, calc, biot, ply srt, sa-a, w cons; SLTST 45% mar-brn-gy, silc, blkcy, sily calc, hrd, occ redox spots; SST 10% red-brn-gy, cg, qtz, v calc, ply srt, sa, w cons; mnr brn siltst strgs; mnr wht cly strgs

**MABOU GROUP**  
**-MARINGOUIN FORMATION**  
**@1204.0m MD, 1204.0m TVD,**  
**-1179.92m SS**

1204-1225 SLTST 100% red-brn, blkcy, sily calc, mnr mic, hrd, occ redox spots; cglin strgs; sst strgs

1225-1244 SLTST 100% red-brn, blkcy, v sily calc, mnr mic, hrd, occ redox spots; cglin strgs, sst strgs

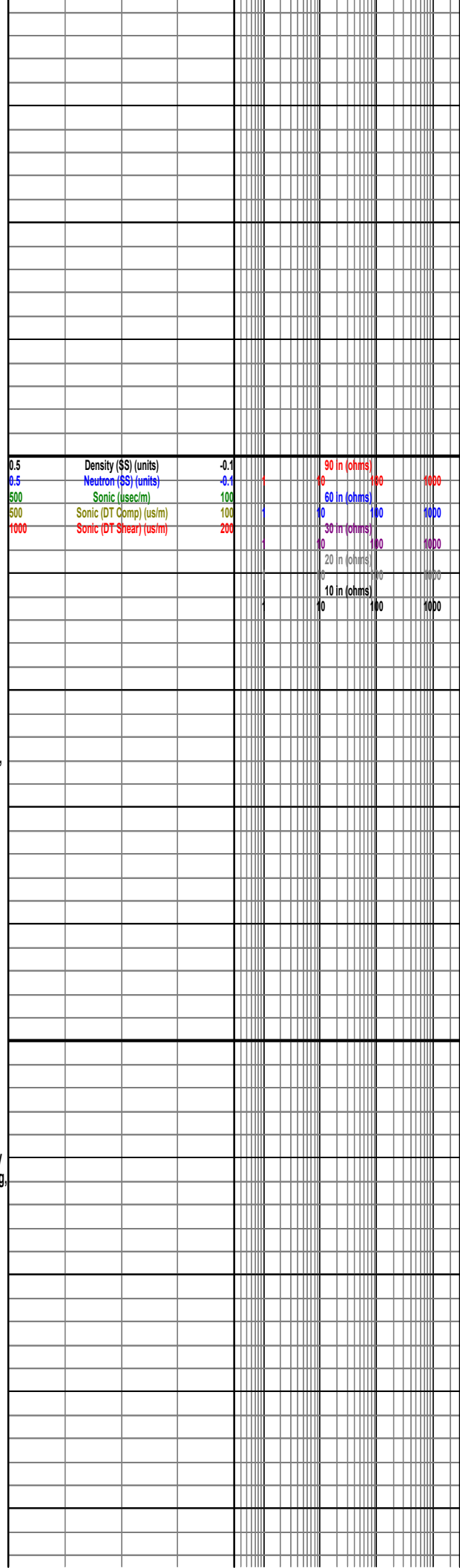
0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 m (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000



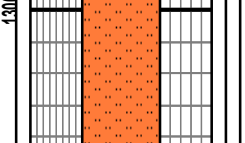
1244-1262 SLTST 100% red-brn, blkcy, v sily calc, mnr mic, hrd; gy sltst strgs

1262-1280 SLTST 90% red-brn, blkcy, v sily calc, mnr mic, hrd, drty ctg; SST 10% red-brn, vf-fg, qtz, calc, w srt, sa, w cons

1280-1301 SLTST 90% red-brn, gy, ox, blkcy, v sily calc, mnr mic, hrd, drty ctg; SST 10% red-brn, vf-fg, qtz, calc, w srt, sa, w cons

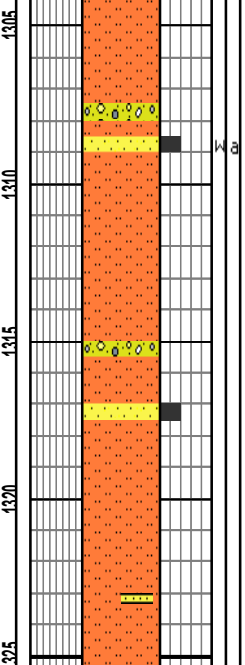
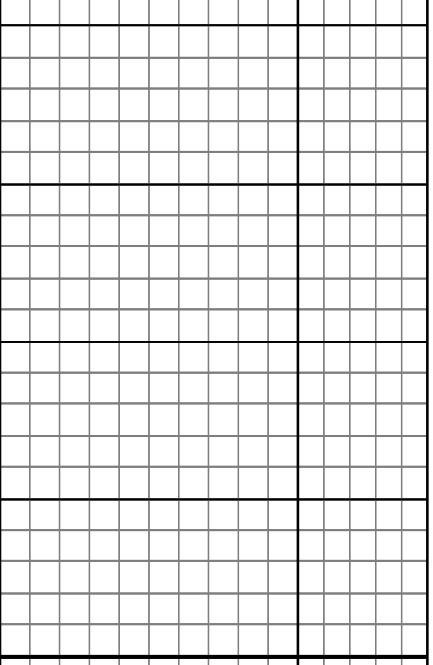


500	ROP (min/m)	1000	Well #	406
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

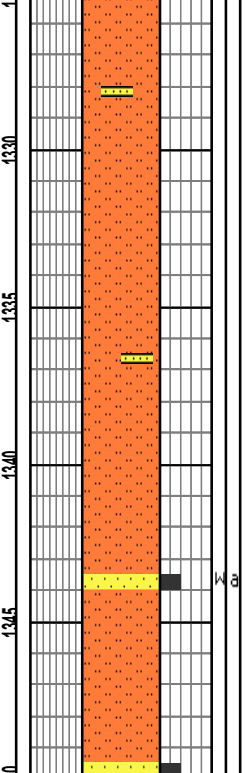
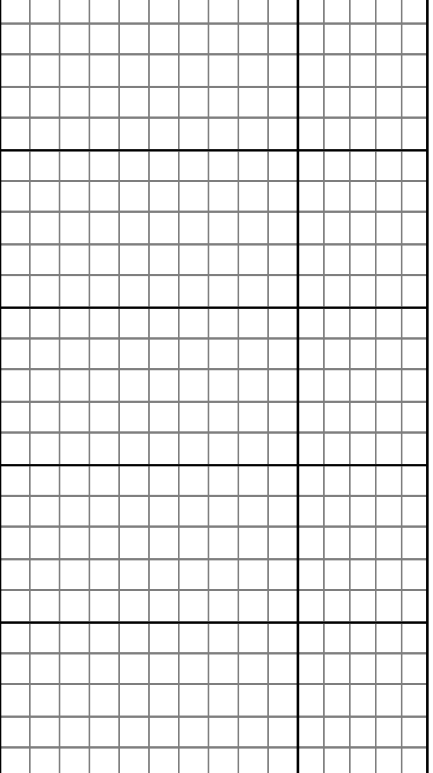
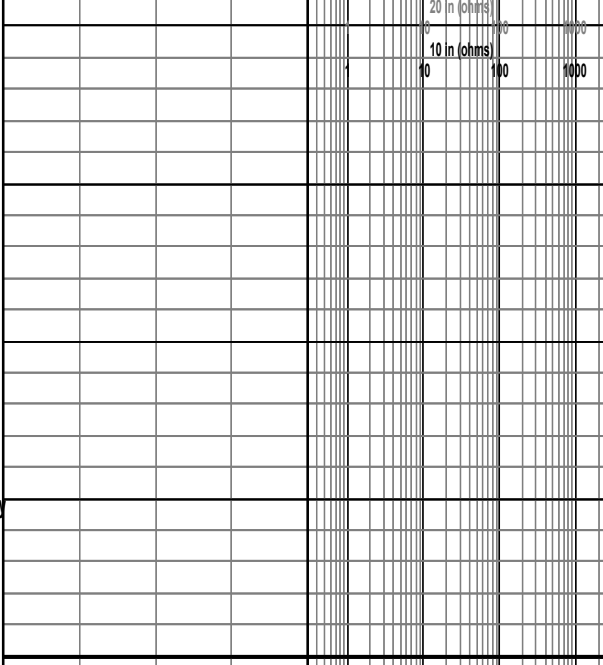


1301-1320 SLTST 90% red-brn, gy, ox, blkcy, v sily calc, mnr mic, hrd, drty ctg; SST 5% red-brn, vf-fg, qtz, sily calc, w srt, sa, w cons; CGLN 5% mar-brn, qtz, ign frags, v sily calc, biot, ply srt, sa-a, w cons

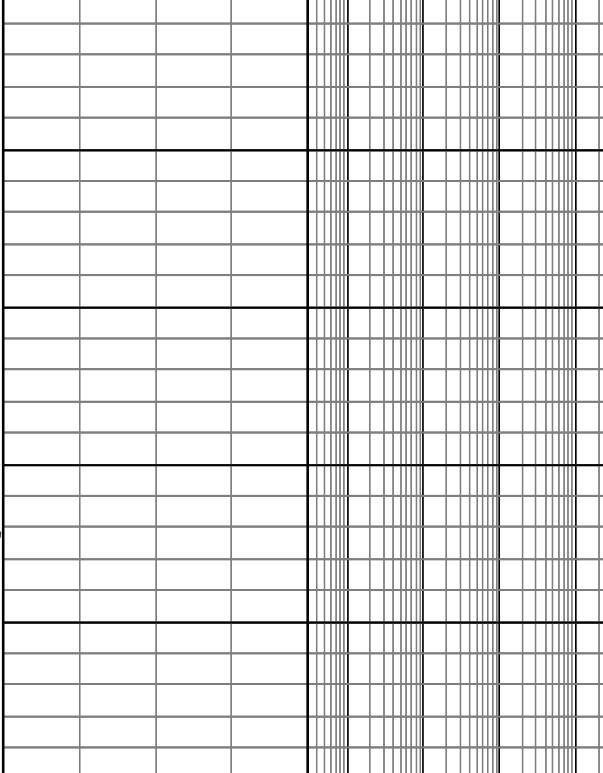
0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000



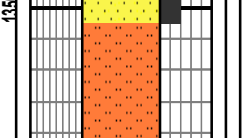
1320-1341 SLTST 100% red-brn, gy, ox, blkcy, v sily calc, mnr mic, hrd, drty ctg; red-brn sst strgs



1341-1362 SLTST 90% red-brn, gy, ox, blkcy, v sily calc, mnr mic, hrd, drty ctg; SST 10% red-brn, vf-fg, qtz, calc, w srt, sa, w cons

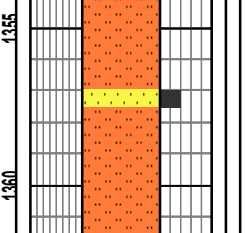
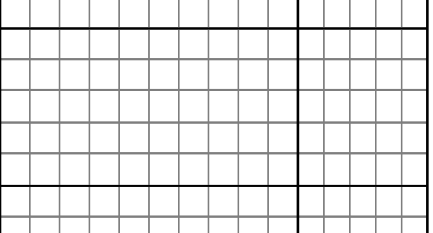


500	ROP (min/m)	1000	Well #	406
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

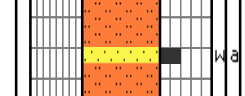
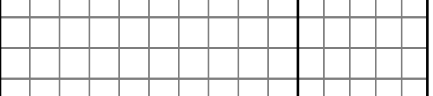
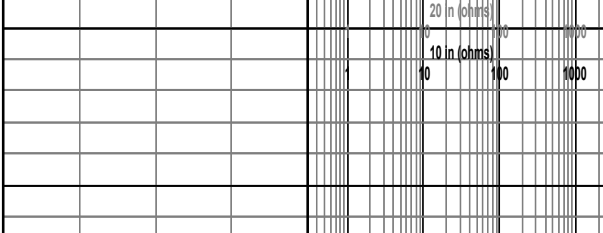


1362-1378 SLTST 85% red-brn, gy, ox, blkcy, v sily calc, mnr mic, hrd, drty ctg; SST 15% red-brn, vf-fg, qtz, calc, w srt, sa, w cons

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

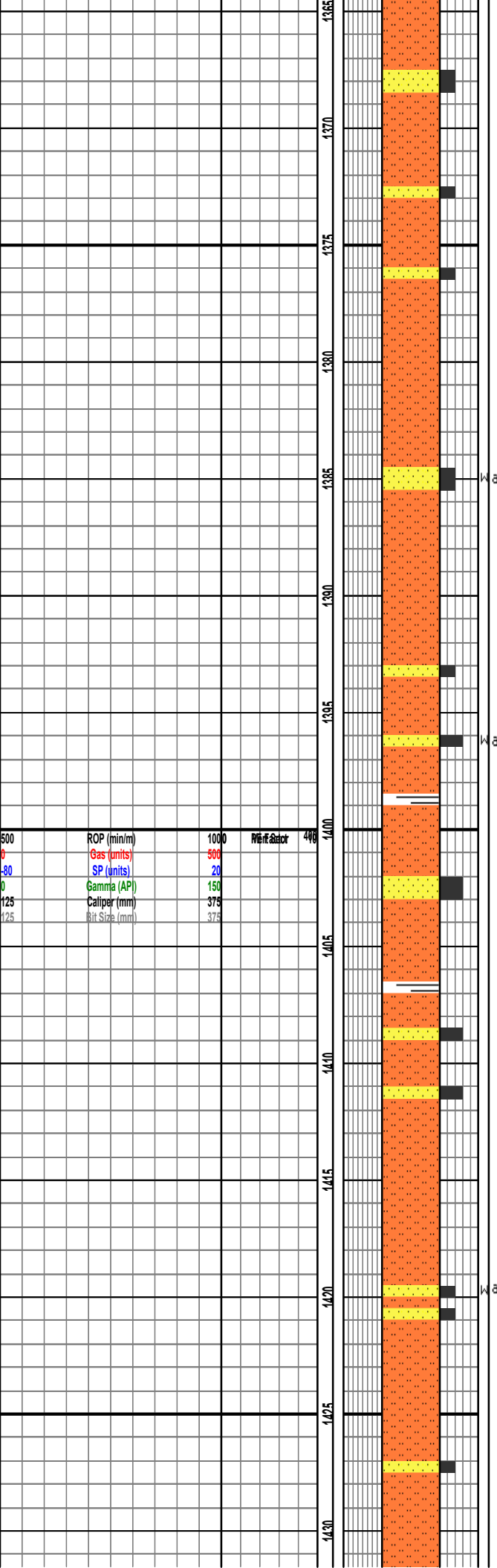


1362-1378 SLTST 85% red-brn, gy, ox, blkcy, v sily calc, mnr mic, hrd, drty ctg; SST 15% red-brn, vf-fg, qtz, calc, w srt, sa, w cons



1362-1378 SLTST 85% red-brn, gy, ox, blkcy, v sily calc, mnr mic, hrd, drty ctg; SST 15% red-brn, vf-fg, qtz, calc, w srt, sa, w cons





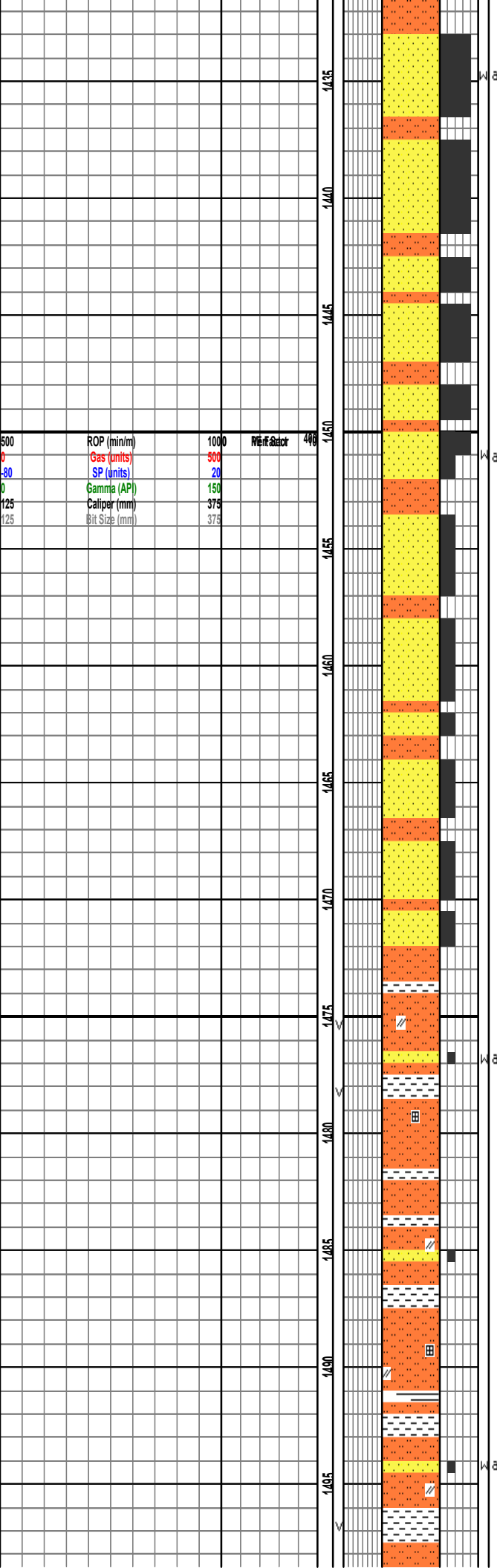
1378-1396 SLTST 90% red-brn, gy, ox, bckly, v sily calc, mnr mic, hrd, drty ctg; SST 10% red-brn, vf-fg, qtz, calc, w srt, sa, w cons; interval is v org-brn cly ctd

1396-1414 SLTST 80% red-brn, gy, ox, sily mic, bckly, v sily calc, hrd, redox spots, drty ctg; SST 15% red-brn, vf-mg, qtz, sily calc, w srt, sa, w cons; SH 5% mar, gy, subfiss, hrd

1414-1433 SLTST 90% brn, mic, bckly, noncalc, hrd SST 10% brn, gy, vf-fg, qtz, noncalc, w srt, sa, w cons

500	ROP (min/m)	1000	Ref: 200	400
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000



1433-1451 SST 75% brn, gy, vf-cg, predom fg, qtz, noncalc, w srt, sa, w cons; SLTST 25% brn, mic, blicky, cal vng, hrd

1451-1472 SST 75% red-brn, vf-fg, qtz, noncalc, w srt, sa, w cons; SLTST 25% red-brn, gy, ox, blicky, noncalc, mnr mic, hrd, drty ctg; interval is v org-brn cly ctd; red-brn sh strgs

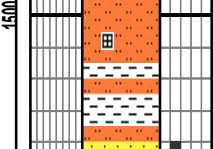
**WINDSOR GROUP**  
**-LIME-KILN BROOK FORMATION**  
**@1472.0m MD, 1472.0m TVD,**  
**-1447.92m SS**

1472-1490 SLTST 70% red-brn, blicky, noncalc, mnr mic, mod sft, vugy, some drty gy cly ctg w sa & anh; CLY 20% gy, vugy, mod cons; SH 5% red, mic, noncalc, subfiss, occ silty; SST 5% red-brn, fg, noncalc, w srt, sa, w cons

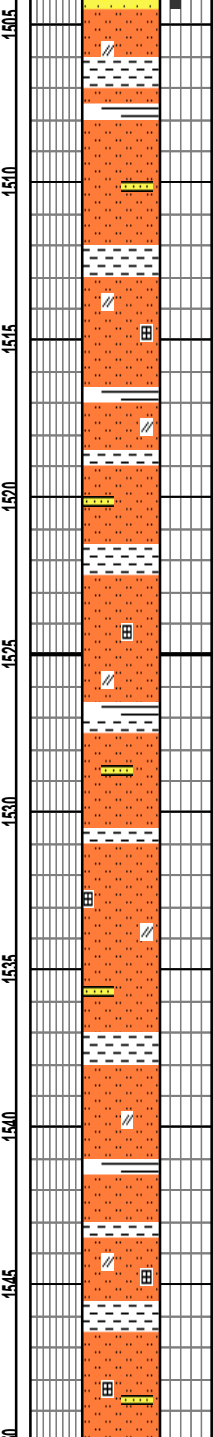
1490-1509 SLTST 65% red-brn, blicky, noncalc, mnr mic, mod sft, some drty gy cly ctg w sa & anh; CLY 25% gy, vugy, mod cons; SH 5% red, mic, noncalc, subfiss, occ silty; SST 5% red-brn, fg, noncalc, w srt, sa, w cons

0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	0	100	1000
500	Sonic (usec/m)	100	60 in (ohms)		
500	Sonic (DT Comp) (us/m)	100	0	100	1000
1000	Sonic (DT Shear) (us/m)	200	30 in (ohms)		
			0	100	1000
			20 in (ohms)		
			0	100	1000
			10 in (ohms)		
			0	100	1000

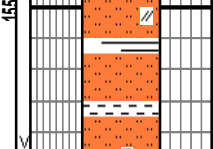
500	ROP (min/m)	1000	Wire & Bit	400
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		



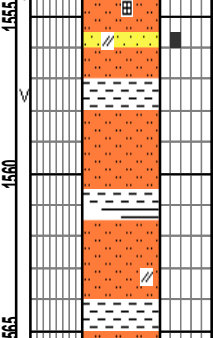
1509-1533 SLTST 80% red-brn, blkcy, noncalc, mnr mic, mod sft, some drty gy cly ctg w sa & anh; CLY 15% gy, mod cons; SH 5% red, mic, noncalc, subfiss, occ silty; red-brn sst strgs



1533-1554 SLTST 80% red-brn, blkcy, noncalc, mnr mic, mod sft, some drty gy cly ctg w sa & anh; CLY 15% gy, mod cons; SH 5% red, mic, noncalc, subfiss, occ silty; red-brn sst strgs



1554-1576 SLTST 65% mar-brn, blkcy, noncalc, mnr mic, mod sft, vugy, some drty gy cly ctg w sa & anh; CLY 25% gy, vugy, mod cons; SH 5% red, mic, noncalc, subfiss, occ silty; SST 5% red-brn, fg, noncalc, w srt, sa, w cons



0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000



**WINDSOR GROUP**  
**-PUGWASH MINE FORMATION**  
**@1576.0m MD, 1576.0m TVD,**  
**-1551.92m SS**

1576-1599 SA 55% wht-gy, semi-trans-opaque, lrg xls; SH 25% red, mic, noncalc, subfiss, occ silty; CLYST 10% gy, mod cons; SLTST 10% mar-brn, bicky, noncalc, mnr mic, mod sft; mnr anhy strgs posy from ctg from above

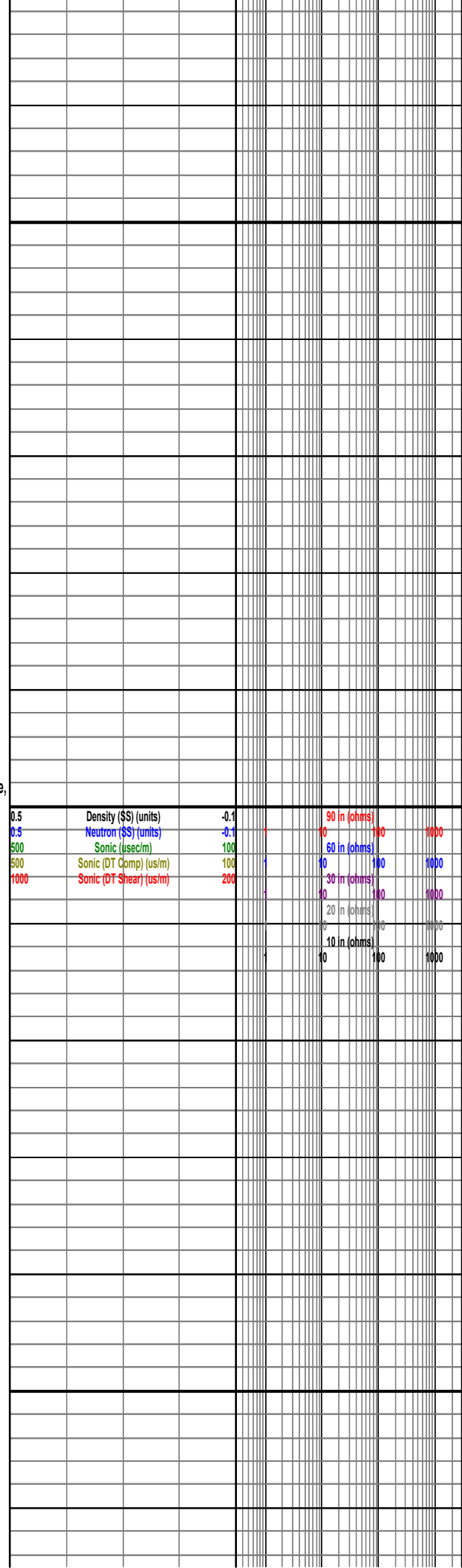
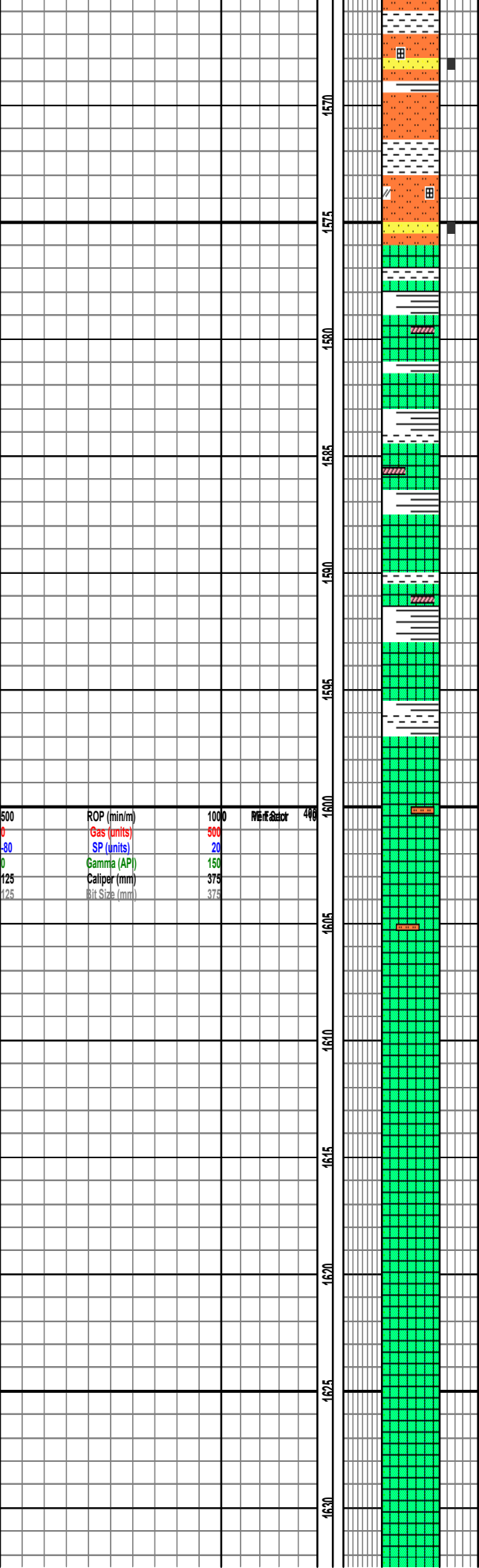
1599-1609 SA 100% wht-lt brn, semi-trans-opaque, lrg xls; mar-brn sltst strgs, mar cly strgs

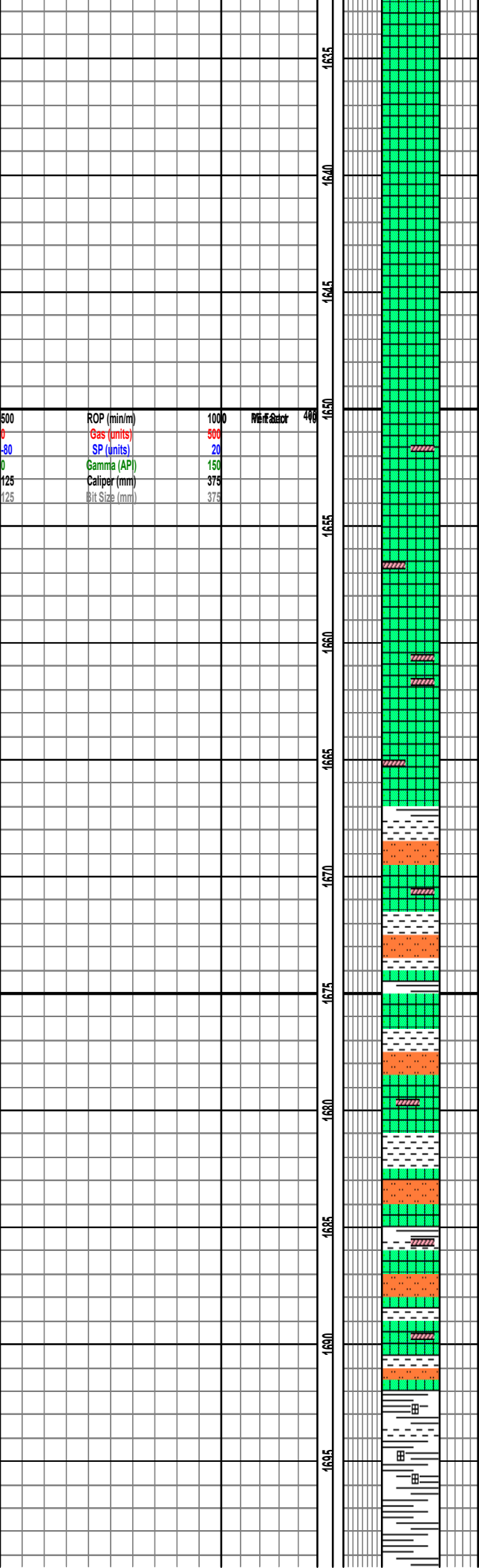
1609-1628 SA 100% wht-lt pnk, semi-trans-clr, lrg xls

1628-1649 SA 100% wht-lt pnk, semi-trans-clr, lrg xls

500	ROP (min/m)	1000	Rate of Penetration	40%
0	Gas (units)	300		
80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

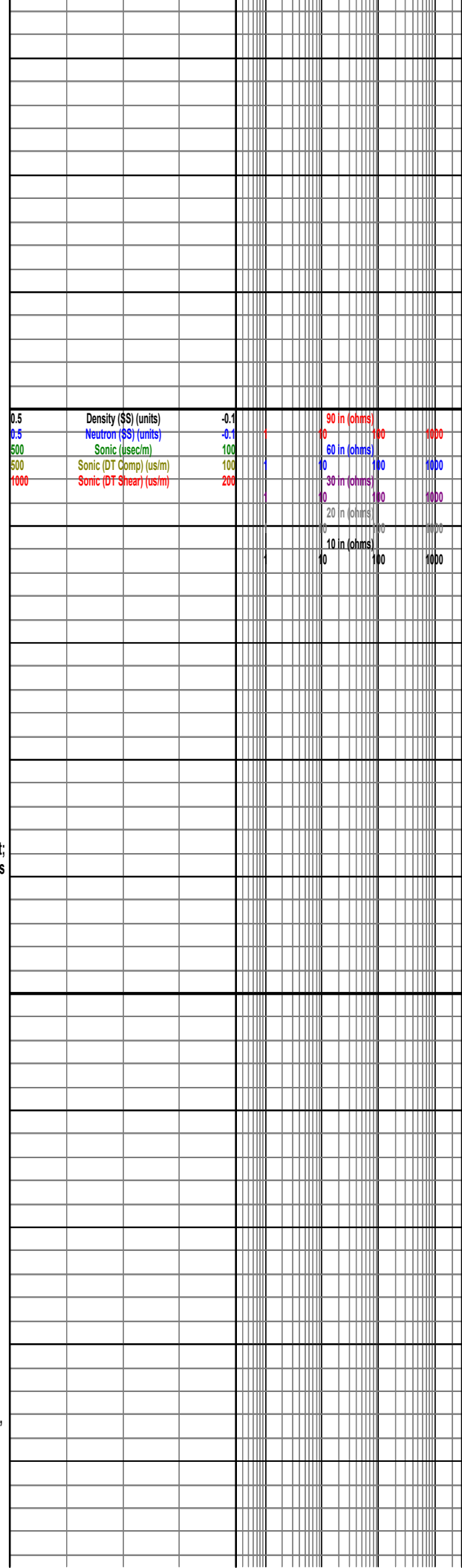




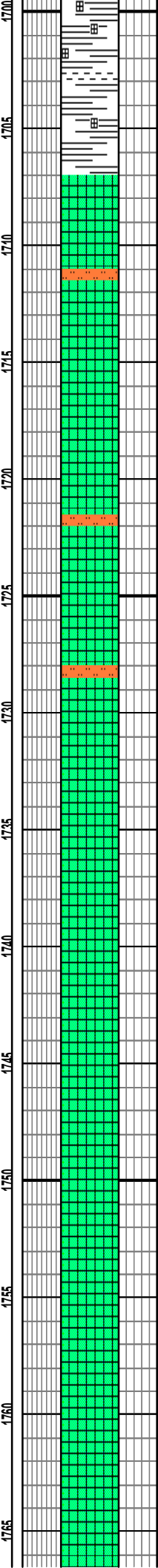
1649-1667 SA 100% wht-lt pnk, semi-trans-clr, gran-lrg xls; anhy strgs

1667-1692 SA 50% wht-lt pnk, semi-trans-clr, gran-lrg xls, occ silty; CLYST 25% gy, mod cons; SLTST 20% mar-brn, blkcy, calc, mnr mic, mod sft; SH 5% red, mic, calc, subfiss, occ silty; anhy strgs

1692-1707 SH 50% dk brn-blk, sily calc, fiss, rust ctg; SH 45% red, mic, sily calc, subfiss, occ blkcy, occ silty; CLYST 5% gy, mod cons; sa cvgs posy



500	ROP (min/m)	1000	Weight	40%
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

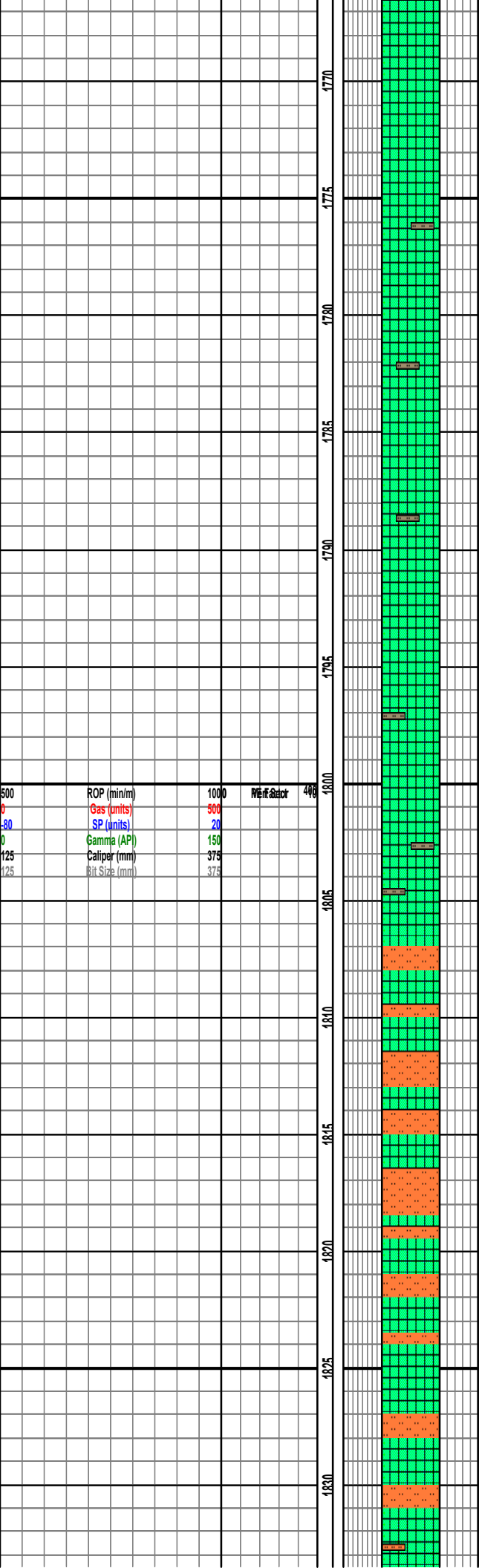


1707-1731 SA 95% wht-lt pnk, semi-trans-clr, gran-irg xls, occ silty; SLTST 5% lt mar, blkky, calc, mnr mic, mod sft; calc dk brn-blk sh strgs, posy cvgs

1731-1753 SA 100% wht-lt pnk, semi-trans-clr, lrg xls

1753-1774 SA 100% wht-lt pnk, semi-trans-clr, lrg xls

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000



1774-1795 SA 100% wht-lt pnk, semi-trans-clr, lrg xls; mnr gy sltst strgs

1795-1807 SA 100% wht-lt pnk, semi-trans-clr, lrg xls; mnr gy sltst strgs

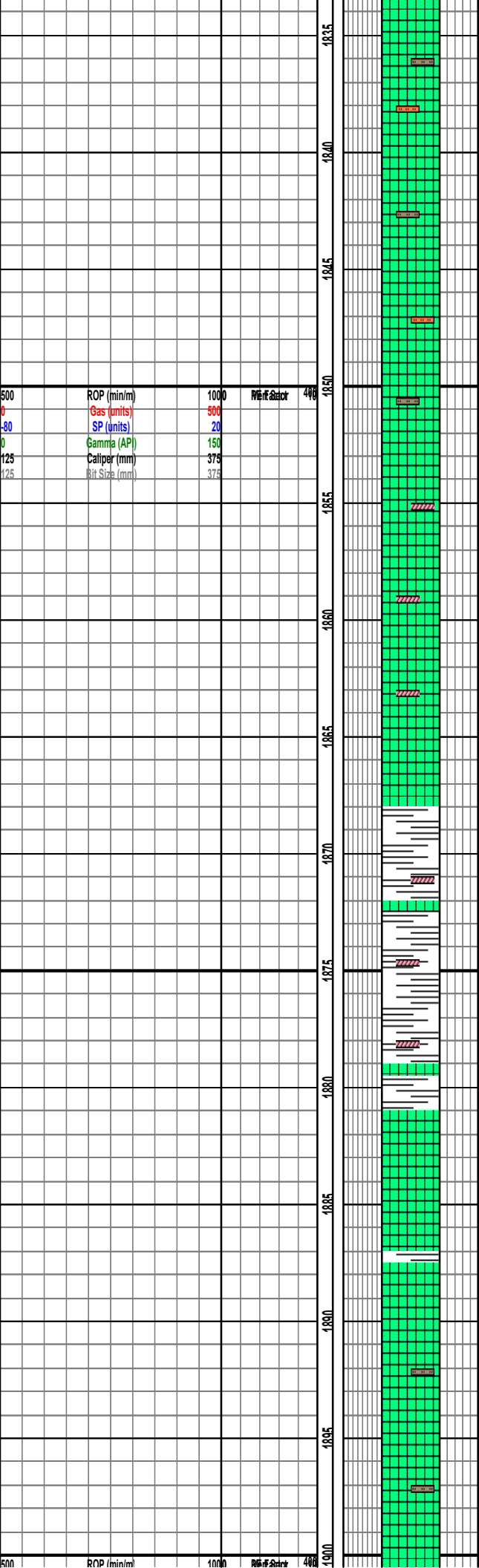
1807-1820 SA 50% wht-lt pnk, semi-trans-clr, gran-lrg xls, occ silty; SLTST 50% mar, gy, bicky-subfiss, noncalc, mnr mic, mod sft

1820-1832 SA 75% wht-lt pnk, semi-trans-clr, gran-lrg xls, occ silty; SLTST 25% mar, gy, bicky-subfiss, noncalc, mnr mic, mod sft

1832-1853 SA 100% wht-lt pnk, semi-trans-clr, lrg xls; mnr gy, mar sltst strgs

500	ROP (min/m)	1000	400
0	Gas (units)	500	
80	SP (units)	20	
0	Gamma (API)	150	
125	Caliper (mm)	375	
125	Bit Size (mm)	375	

0.5	Density (\$S) (units)	-0.1	90 in (ohms)		
0.5	Neutron (\$S) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)		
500	Sonic (DT Comp) (us/m)	100	10 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	20 in (ohms)		
			10 in (ohms)	100	1000

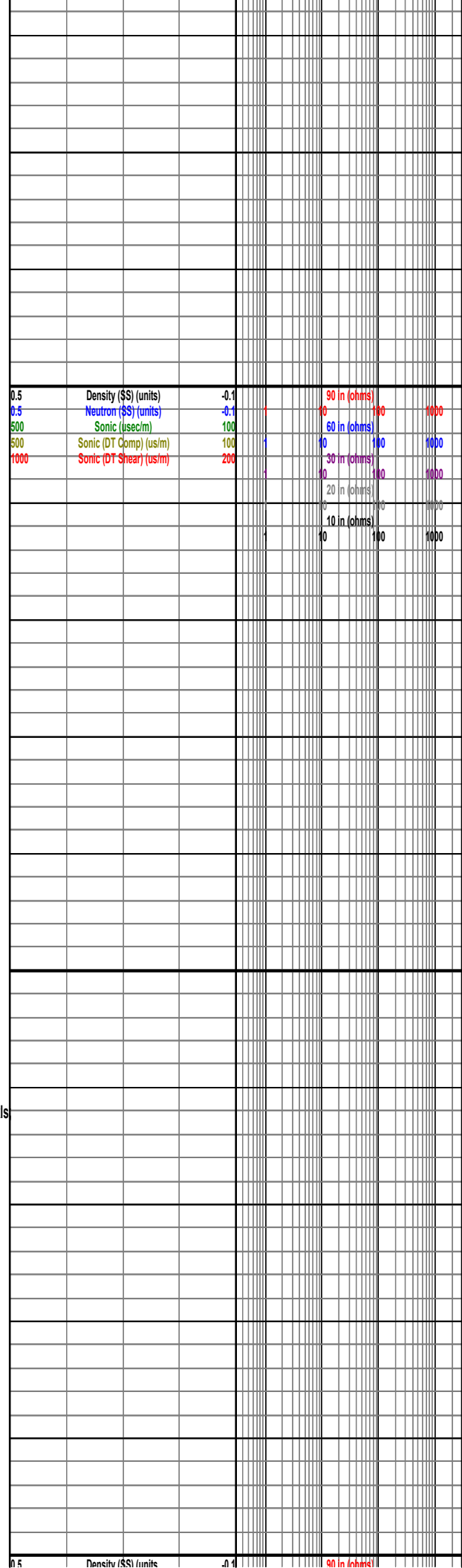


1853-1868 SA 100% wht-lt pnk, semi-trans-clr, lrg xls; mnr gy, mar sltst strgs; anhy strgs

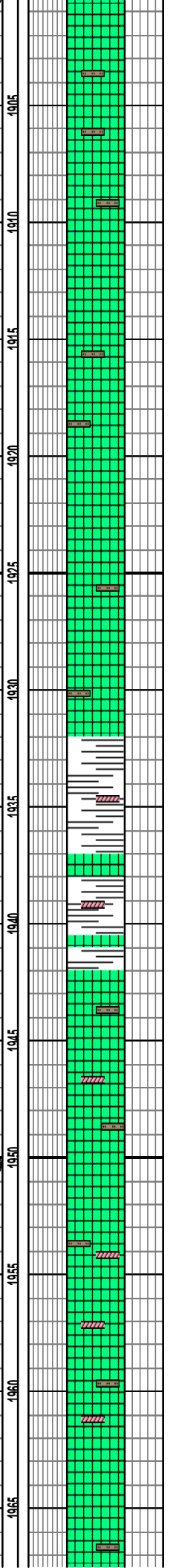
1868-1881 SH 70% red-mar, v sily calc, fiss, hard-sft; SH 20% gr-gy, noncalc, fiss, hrd-sft; SA 10% wht-lt pnk, semi-trans-clr, lrg xls; anhy strgs

1881-1890 SA 85% wht-lt pnk, semi-trans-clr, lrg xls SH 10% red-mar, v sily calc, fiss, hard-sft; SH 5% gr-gy, noncalc, fiss, hrd-sft

1890-1911 SA 100% wht-lt pnk, semi-trans-clr, lrg xls; v sily calc mar, gy sltst strgs



0	ROP (min/m)	1000	Well #	400
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		



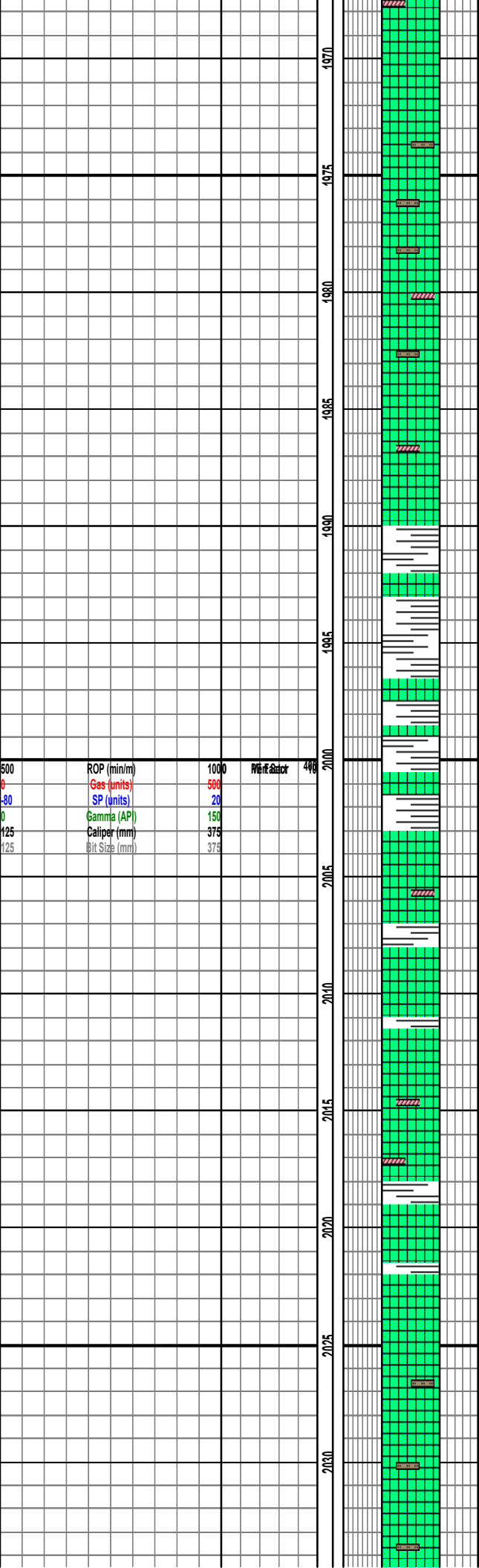
1911-1932 SA 100% wht-lt pnk, semi-trans-clr, lrg xls; v sily calc mar, gy sltst strgs

1932-1942 SH 60% red-mar, v sily calc, fiss, hard-sft; SH 20% gr-gy, noncalc, fiss, hrd-sft; SA 20% wht-lt pnk, semi-trans-clr, lrg xls; anhy strgs

1942-1963 SA 100% wht-lt pnk, semi-trans-clr, lrg xls; v sily calc mar, gy sltst strgs; mnr anhy strgs

1963-1990 SA 100% wht-lt pnk, semi-trans-clr, lrg xls; v sily calc mar, gy sltst strgs; mnr anhy strgs

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000



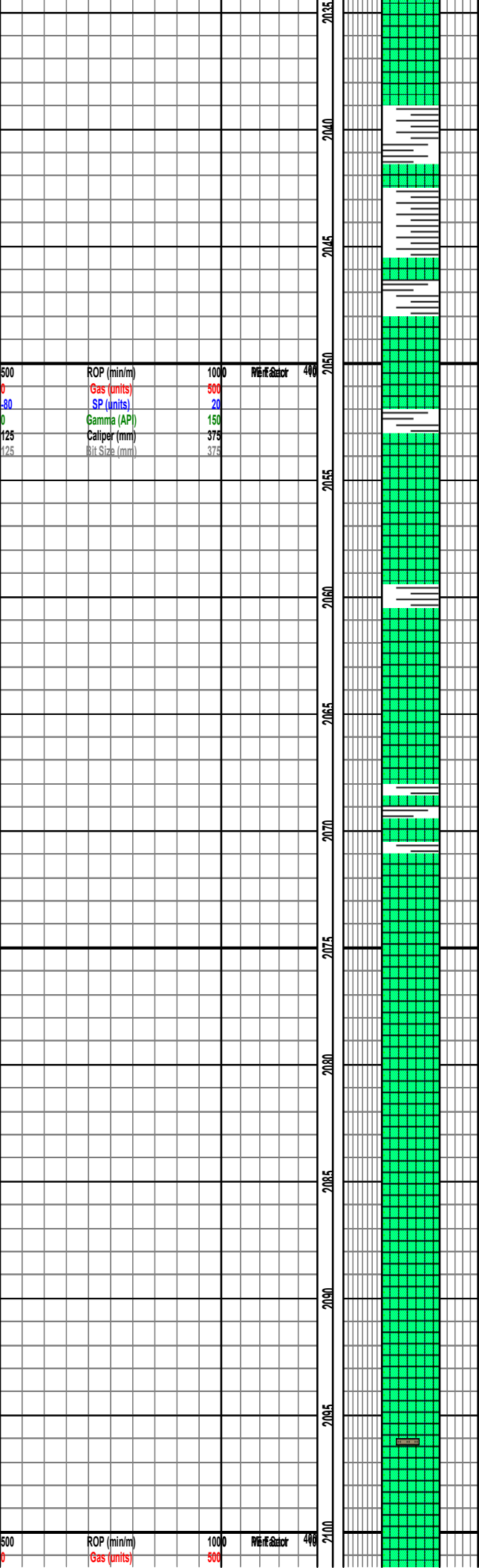
1990-2003 SH 55% red-mar, v sily calc, fiss, hard-sft; SA 25% wht-lt pnk, semi-trans-clr, gran-lrg xls; SH 20% gr-gy, noncalc, fiss, hrd-sft; mnr anhy strgs

2003-2024 SA 85% wht-lt pnk, semi-trans-clr, gran-lrg xls; SH 10% red-mar, v sily calc, fiss, hard-sft; SH 5% gr-gy, noncalc, fiss, hrd-sft; mnr anhy strgs

2024-2039 SA 100% wht-lt pnk, semi-trans-clr, gran-lrg xls; v sily calc mar, gy sltst strgs

500	ROP (min/m)	1000	Reference	40%
0	Gas (units)	500		
80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

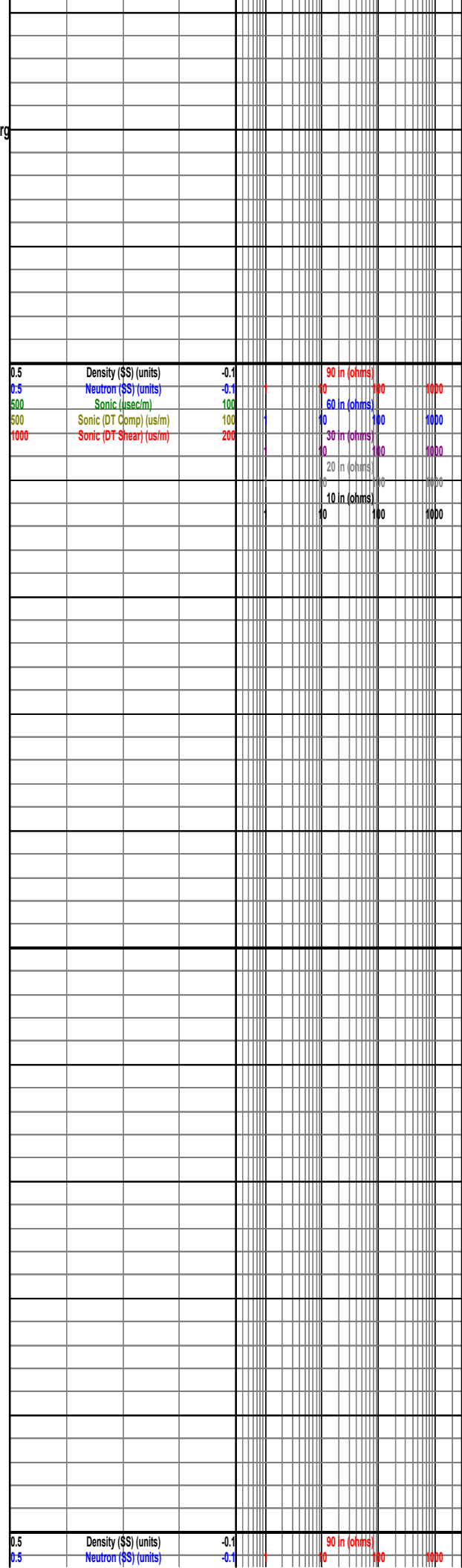


2039-2048 SH 65% red-mar, v silty calc, fiss, hard-sft; SA 20% wht-lt pnk, semi-trans-clr, gran-lrg xls; SH 15% gr-gy, noncalc, fiss, hrd-sft

2048-2076 SA 85% wht-lt pnk, semi-trans-clr, gran-lrg xls; SH 10% red-mar, v silty calc, fiss, hard-sft; SH 5% gr-gy, noncalc, fiss, hrd-sft

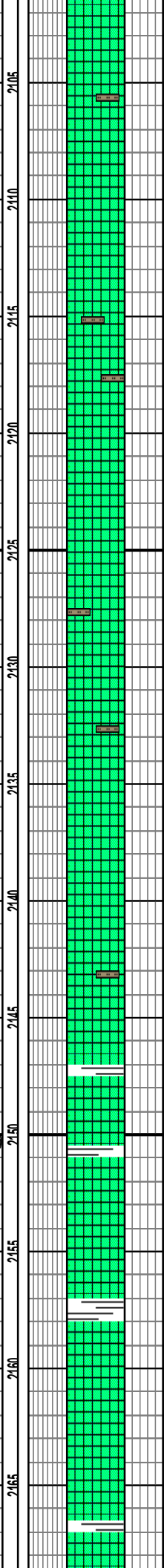
2076-2097 SA 100% wht-lt pnk, semi-trans-clr, gran-lrg xls

2097-2124 SA 100% wht-lt pnk, semi-trans-clr, gran-lrg xls; mnr mr, gy sltst strgs





80	SP (units)	20
0	Gamma (API)	150
125	Caliper (mm)	375
125	Bit Size (mm)	375



2124-2146 SA 100% wht-lt pnk, semi-trans-clr, gran-lrg xls; mnr mr, gy sltst strgs

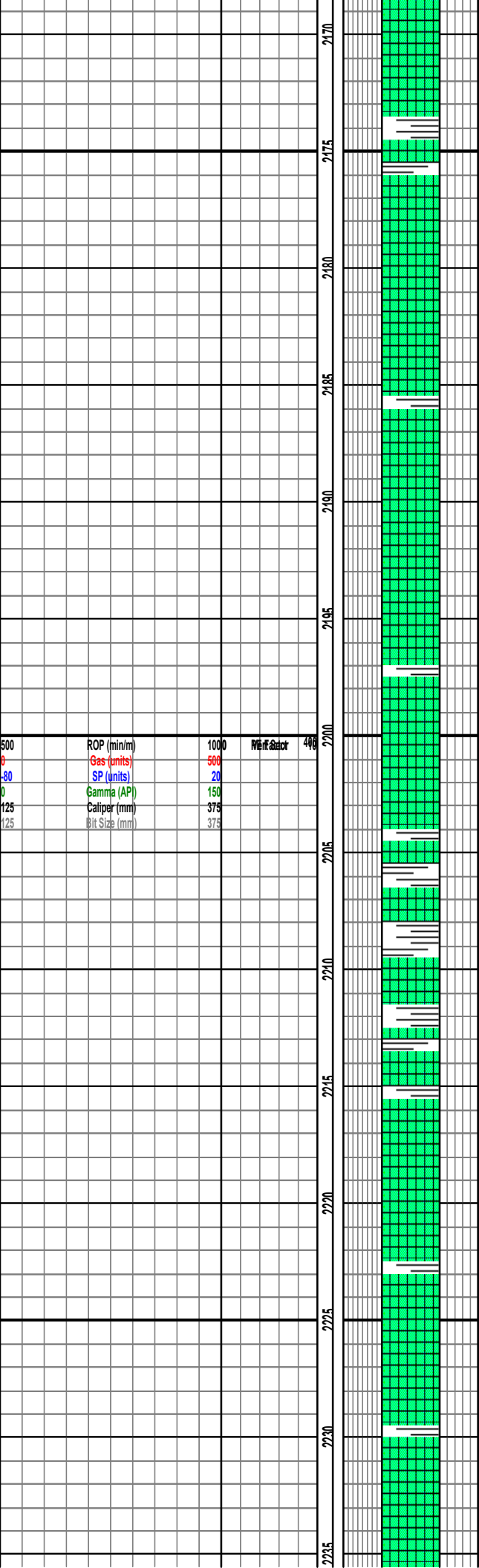
2146-2161 SA 90% wht-lt pnk, semi-trans-clr, gran-lrg xls; SH 5% red-mar, v sly calc, fiss, hard-sft; SH 5% gr-gy, noncalc, fiss, hrd-sft

2161-2173 SA 95% wht-lt pnk, semi-trans-clr, gran-lrg xls; SH 5% red-mar, gy, fiss, hard-sft

500	ROP (min/m)	1000	Weight Factor	40%
0	Gas (units)	500		
80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

500	Sonic (usec/m)	100		60 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100		30 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200		10 in (ohms)	100	1000

0.5	Density (SS) (units)	-0.1		90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1		30 in (ohms)	100	1000
500	Sonic (usec/m)	100		10 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100		20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200		10 in (ohms)	100	1000



2173-2176 SA 65% wht-lt pnk, semi-trans-clr, gran-lrg xls; SH 30% red-mar, v sily calc, fiss, hard-sft; SH 5% gy, noncalc, fiss, hrd-sft

2176-2192 SA 95% wht-lt pnk, semi-trans-clr, gran-lrg xls; SH 5% red-mar, gy, fiss, hard-sft

2192-2204 SA 95% wht-lt pnk, semi-trans-clr, gran-lrg xls; SH 5% red-mar, gy, fiss, hard-sft

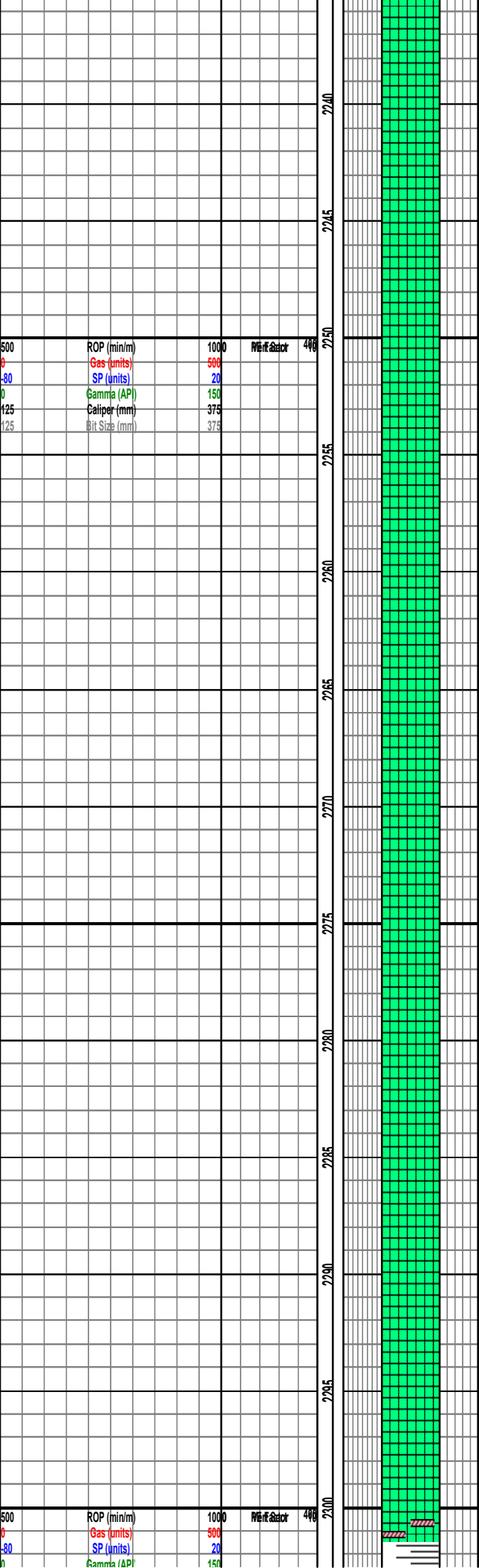
2204-2210 SA 60% wht-lt pnk, semi-trans-clr, gran-lrg xls; SH 30% red-mar, v sily calc, fiss, hard-sft; SH 10% gr-gy, noncalc, fiss, hrd-sft

2210-2216 SA 75% wht-lt pnk, semi-trans-clr, gran-lrg xls; SH 20% red-mar, v sily calc, fiss, hard-sft; SH 5% gr-gy, noncalc, fiss, hrd-sft

2216-2231 SA 95% wht-lt pnk, semi-trans-clr, gran-lrg xls; SH 5% red-mar, gy, fiss, hard-sft

2231-2252 SA 100% wht-lt pnk, semi-trans-clr, lrg xls

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

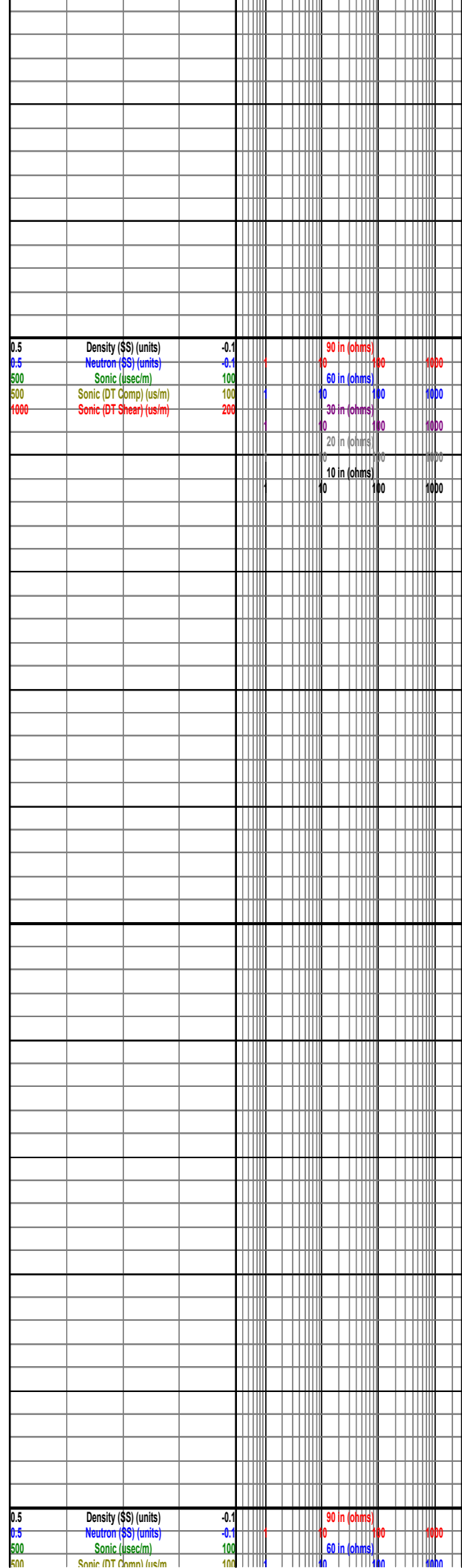


2252-2271 SA 100% wht-lt pnk, semi-trans-clr, lrg xls

2271-2292 SA 100% wht-lt pnk, semi-trans-clr, lrg xls

2292-2301 SA 100% wht-lt pnk, semi-trans-clr, lrg xls

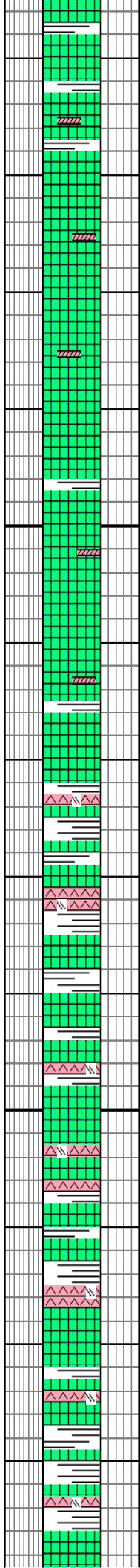
2301-2304 SA 70% wht-lt pnk, semi-trans-clr, gran-lrg xls; SH 20% red-mar, v silty calc, fiss, hard sft; SH 10% gy, noncalc, fiss, hrd sft; anhy strgs



125  
125  
Caliper (mm)  
Bit Size (mm)

375  
375

2305  
2310  
2315  
2320  
2325  
2330  
2335  
2340  
2345  
2350  
2355  
2360  
2365



2304-2310 SA 90% wht-lt pnk, semi-trans-clr, lrg xls  
SH 5% red-mar, v sily calc, fiss, hard-sft; SH 5% gy,  
noncalc, fiss, hrd-sft; mnr anhy strgs

2310-2320 SA 100% wht-lt brn, semi-trans- opaque,  
lrg xls; mnr anhy strgs

2320-2335 SA 95% wht-lt brn, semi-trans- opaque,  
lrg xls; SH 5% red-mar, gy, v calc, subfiss, hard-sft;  
anhy strgs

**WINDSOR GROUP**  
**-UPPERTON FORMATION**  
**@2335.0m MD, 2335.0m TVD,**  
**-2310.92 m SS**

2335-2347 SA 50% wht-lt pnk, semi-trans-clr, lrg xls  
SH 30% red-mar, calc, fiss, hard-sft; ANHY 15% wht  
microxln, sft, ply some gyp; SH 10% gy, calc, fiss,  
hrd-sft

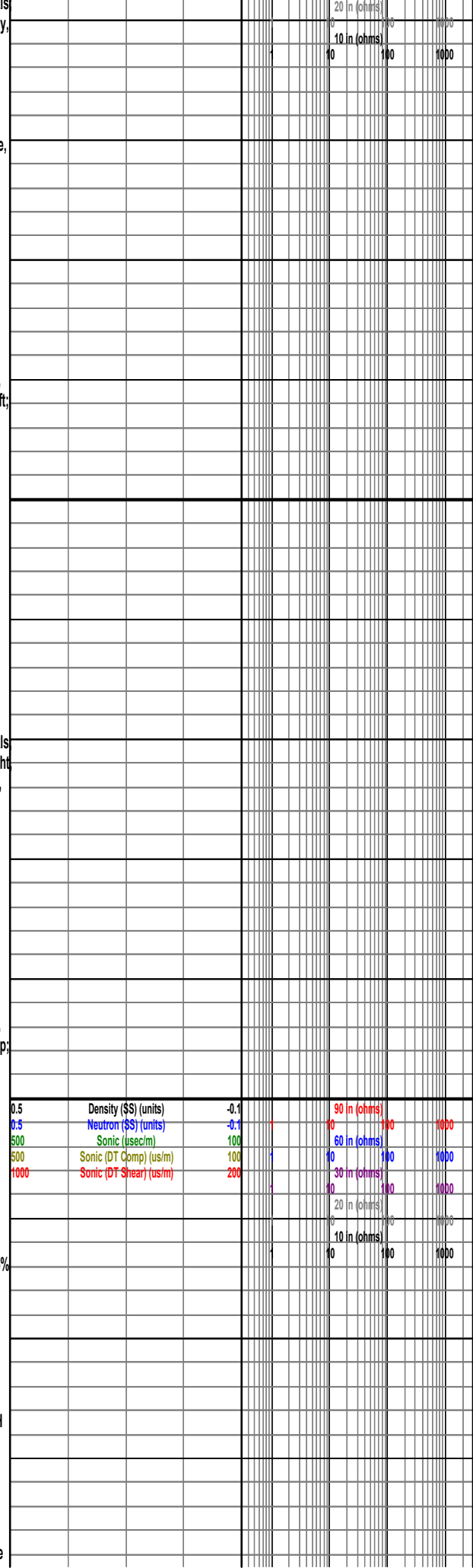
2347-2356 SA 80% wht-lt brn, semi-trans- opaque,  
lrg xls; ANHY 15% wht, microxln, sft, ply some gyp;  
SH 5% red-mar, gy, v calc, subfiss, hard-sft

2356-2365 SA 60% wht-gy, semi-trans-opaque, lrg  
xls; SH 20% red-mar, calc, fiss, hard-sft; ANHY 15%  
wht, microxln, sft, ply some gyp; SH 5% gy, calc,  
fiss, hrd-sft

2365-2368 SH 50% red-mar, calc, fiss, hard-sft; SH  
35% gy, calc, fiss, hrd-sft; SA 15% wht-gy,  
semi-trans-opaque, lrg xls; ANHY 10% wht,  
microxln, sft, ply some gyp

2368-2377 SA 65% wht-gy, semi-trans-opaque, lrg  
xls; v dirty; ANHY 15% wht, microxln, sft, ply some

1000  
Sonic (DT Comp) (us/m)  
200



500  
0  
-80  
0  
125  
125  
ROP (min/m)  
Gas (units)  
SP (units)  
Gamma (API)  
Caliper (mm)  
Bit Size (mm)

1000  
500  
20  
150  
375  
375

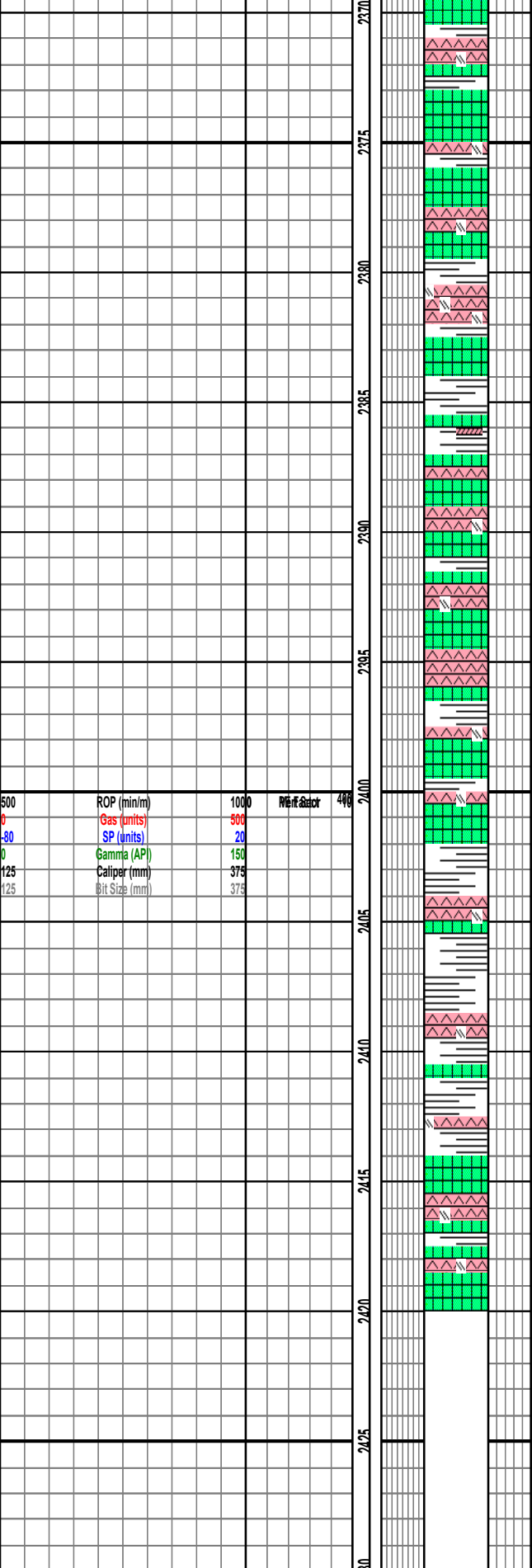
Weight Factor  
490

0.5  
0.5  
500  
500  
1000  
Density (SS) (units)  
Neutron (SS) (units)  
Sonic (usecm)  
Sonic (DT Comp) (us/m)  
Sonic (DT Shear) (us/m)

-0.1  
-0.1  
100  
100  
200

90 in (ohms)  
10  
60 in (ohms)  
10  
30 in (ohms)  
10  
20 in (ohms)  
10  
10 in (ohms)  
10

100  
100  
1000  
1000  
1000  
1000  
1000  
1000  
1000  
1000



gyp; SH 15% red-mar, calc, fiss, hard-sft; SH 5% g y calc, fiss, hrd-sft

2377-2384 SA 50% wht-gy, semi-trans-opaque, lrg xls, v drty; ANHY 30% wht, microxln, sft, ply some gyp; SH 15% red-mar, calc, fiss, hard-sft; SH 5% g y calc, fiss, hrd-sft; anhy strgs

2384-2387 SH 50% red-mar, calc, fiss, hard-sft; SH 45% gy, calc, fiss, hrd-sft; SA 5% wht-gy, semi-trans-opaque, lrg xls; anhy strgs

2387-2402 SA 50% wht-gy, semi-trans-opaque, lrg xls, v drty; ANHY 30% wht, microxln, sft, ply some gyp; SH 15% red-mar, calc, fiss, hard-sft; SH 5% g y calc, fiss, hrd-sft; anhy strgs

2402-2414 SH 40% red-mar, calc, fiss, hard-sft; SH 25% gy, calc, fiss, hrd-sft; ANHY 25% wht, microxln sft, ply some gyp; SA 10% wht-gy, semi-trans-opaque, lrg xls

2414-2420 SA 60% wht-gy, semi trans-opaque, lrg xls; ANHY 30% wht, microxln, sft, ply some gyp; SH 10% red-mar, calc, fiss, hard-sft

0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	60 in (ohms)		
500	Sonic (DT Comp) (us/m)	100	30 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	30 in (ohms)	100	1000
			20 in (ohms)		
			10 in (ohms)		
			10	100	1000

**APPENDIX 4:**

**STRIP LOG OF COPPERMINE HILL 2 WELL,**

**UNIQUE IDENTIFIER NUMBER 716**

# APPENDIX 4

Scale 1:240 (5"=100') Metric  
Measured Depth Log

Well Name: Columbia/Corridor Copper Mine Hill 2/F-88-2329  
Location: Copper Mine Hill  
License Number: WLONG 01-03  
Spud Date: July 22, 2001  
Surface Coordinates: 45.9545000, 64.4658000

Region: Dorchester  
Drilling Completed: March 31, 2001

Bottom Hole Coordinates: 45.9545000, 64.4658000

Ground Elevation (m): 140.00      K.B. Elevation (m): 145.30  
Logged Interval (m): 0      To: 3420      Total Depth (m): 3420  
Formation: Crystalline Basement  
Type of Drilling Fluid: Drilling with air

Printed by STRIP.LOG from WellSight Systems 1-800-447-1534 www.WellSight.com

## OPERATOR

Company: Columbia Natural Resources Canada Limited  
Address: NB Rights acquired by Contact Exploration Inc.  
#2650, 520-Avenue SW  
Calgary, AB T2P 3R7




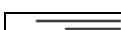
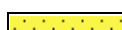
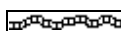


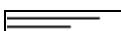

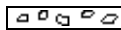

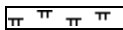


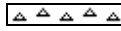




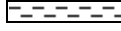

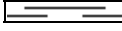


## GEOLOGIST

Name: Holly Stewart  
Company: New Brunswick Department of Natural Resources  
Address: P.O. Box 6000  
Fredericton, NB  
E3B 5H1

## Comments

Compilation of work completed by Columbia Natural Resources Canada Ltd. and New Brunswick Department of Natural Resources

## ROCK TYPES

 Anhy	 Coal	 Lmst	 Shcol	 Ss
 Bent	 Congl	 Meta	 Shgy	 Uncons ss
 Brec	 Dol	 Mrlst	 Slst (gy, gn)	 Till
 Cht	 Gyp	 Salt	 Slst (red, brn)	 Granite
 Clyst	 Igne	 Shale	 Slst-vfss (red)	 Schist

### ACCESSORIES

#### MINERAL

- Anhy
- Arggrn
- Arg
- Bent
- Bit
- Breclfrag
- Calc
- Carb
- Chtdk
- Chtlt
- Dol
- Feldspar
- Ferrpel
- Ferr
- Glau
- Gyp

- Hvymin
- Kaol
- Marl
- Minxl
- Nodule
- Phos
- Pyr
- Salt
- Sandy
- Silt
- Sil
- Sulphur
- Tuff

#### FOSSIL

- Algae
- Amph

- Belm
- Bioclst
- Brach
- Bryozoa
- Cephal
- Coral
- Crin
- Echin
- Fish
- Foram
- Fossil
- Gastro
- Oolite
- Ostra
- Pelec
- Pellet
- Pisolite

- Plant
- Strom

#### STRINGER

- Anhy
- Arg
- Bent
- Coal
- Dol
- Gyp
- Igne
- Ls
- Mrst
- Sltstrg (red, brn)
- Sltstrg (gy,gn)
- Ssstrg

#### TEXTURE

- Boundst
- Chalky
- Cryxln
- Earthy
- Finexln
- Grainst
- Lithogr
- Microxln
- Mudst
- Packst
- Wackest

#### POROSITY

- Earthy
- Fenest
- Fracture
- Inter
- Moldic
- Organic
- Pinpoint

- Vuggy

#### SORTING

- Well
- Moderate
- Poor

### OTHER SYMBOLS

#### ROUNDING

- Rounded
- Subrnd
- Subang
- Angular

#### OIL SHOW

- Even

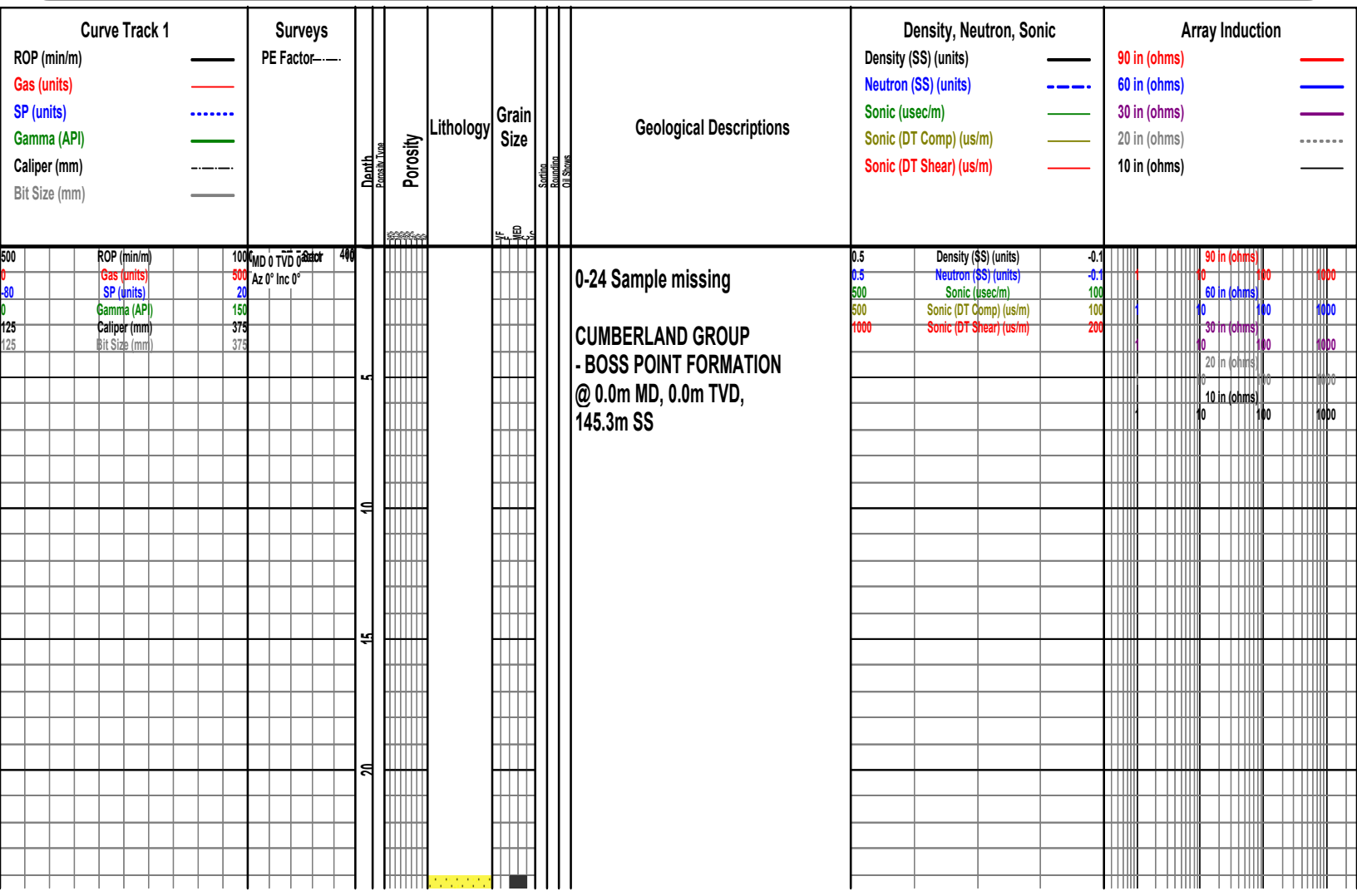
- Spotted
- Ques
- Dead

#### EVENT

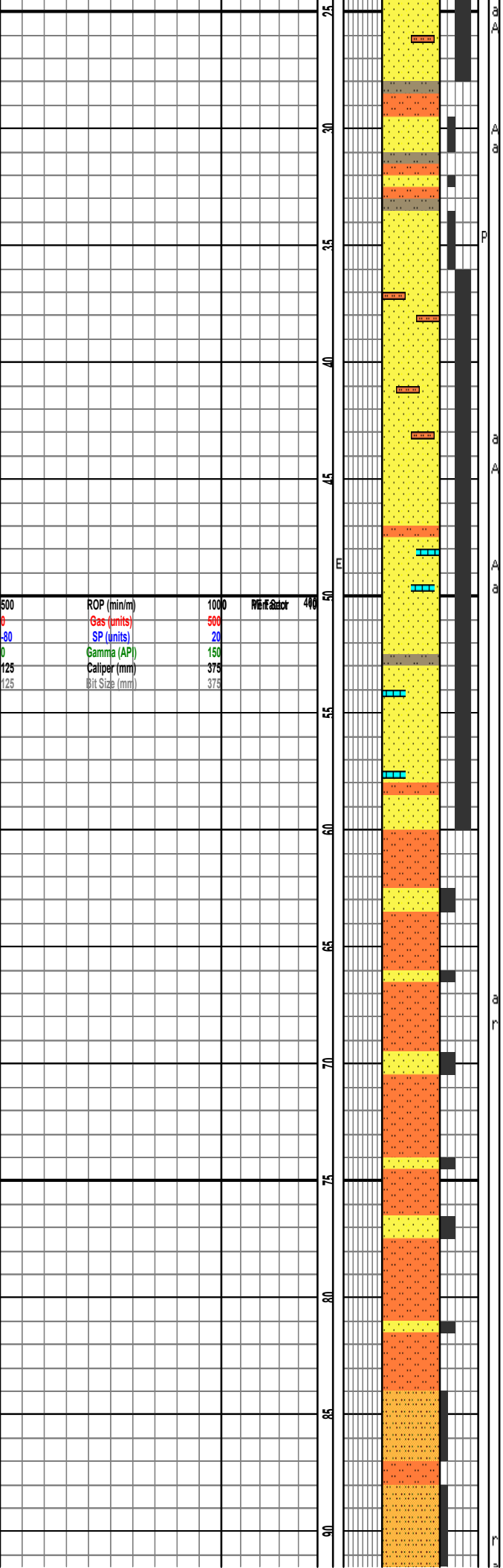
- Rft
- Sidewall

#### INTERVAL

- Core
- Dst







24-27% SS 95% wht-brn, m-cg, qtz, calc, sa-a, uncons, siltst strgs

27-36 SS 65% wht-gy, vf-fg, qtz, calc, ply srt, sr-sa, uncons; SLTST 35% gy-rd, henc, calc

36-45 SS 95% wht-brn, m-cg, qtz, calc, sa-a, uncons; siltst strgs

45-60 SS 90% wht-brn, m-cg, qtz, sily calc, sa-a, uncons, occ rust; SLTST 10% m gy-rd, calc, henc, sft; lst strgs

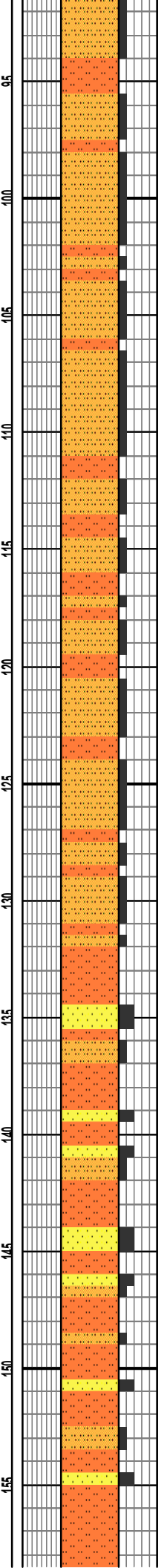
60-84 SLTST 70% red-brn, mic, sily calc, henc, v sft; SS 25% wht-gy, vf-fg, qtz, w srt, sr-sa, uncons; MUDST 5% dk red-brn, noncalc, v sft

84-108 SS 75% pnk-red, vfg, occ wht, qtz, w srt, sr-sa, uncons; SLTST 20% red-brn, occ gy, mic, sily calc, henc, v sft; MUDST 5% dk red-brn, noncalc, v sft

500	ROP (min/m)	1000	Rate of Penetration
0	Gas (units)	500	
80	SP (units)	20	
0	Gamma (API)	150	
125	Caliper (mm)	375	
125	Bit Size (mm)	375	

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

500	ROP (min/m)	1000	Perf #	400
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (AP)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		



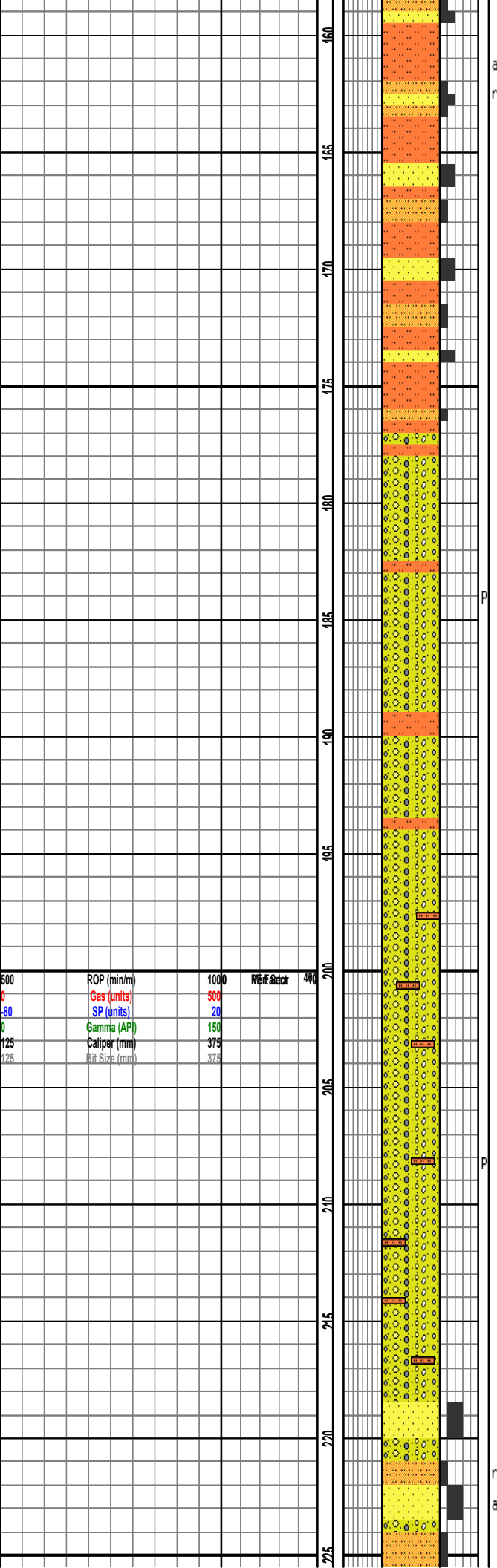
108-132 SS 55% pnk-red, vfg, occ wht, qtz, musc, sr-sa, uncons; SLTST 40% red-brn, occ gy, mic, wh cal vng, henc, v sft; MUDST 5% dk red-brn, noncalc, v sft

132-156 SLTST 60% red-brn, occ gy, mic, henc, v sft; SS 40% wht-red, vf-fg, occ wht, qtz, musc, sr-sa uncons, drty; mudst strgs

156-177 SLTST 70% red-brn, occ gy, mic, cal vng, henc, v sft; SS 30% wht-red, vf-fg, occ wht, qtz, musc, sr-sa, uncons, drty; mudst strg

0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

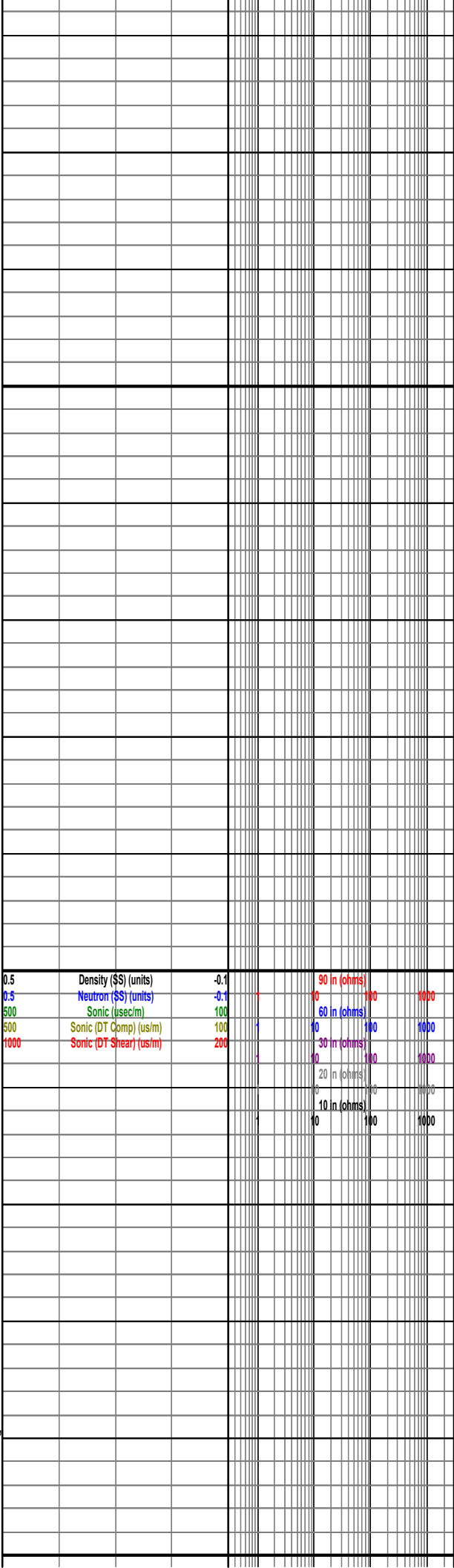


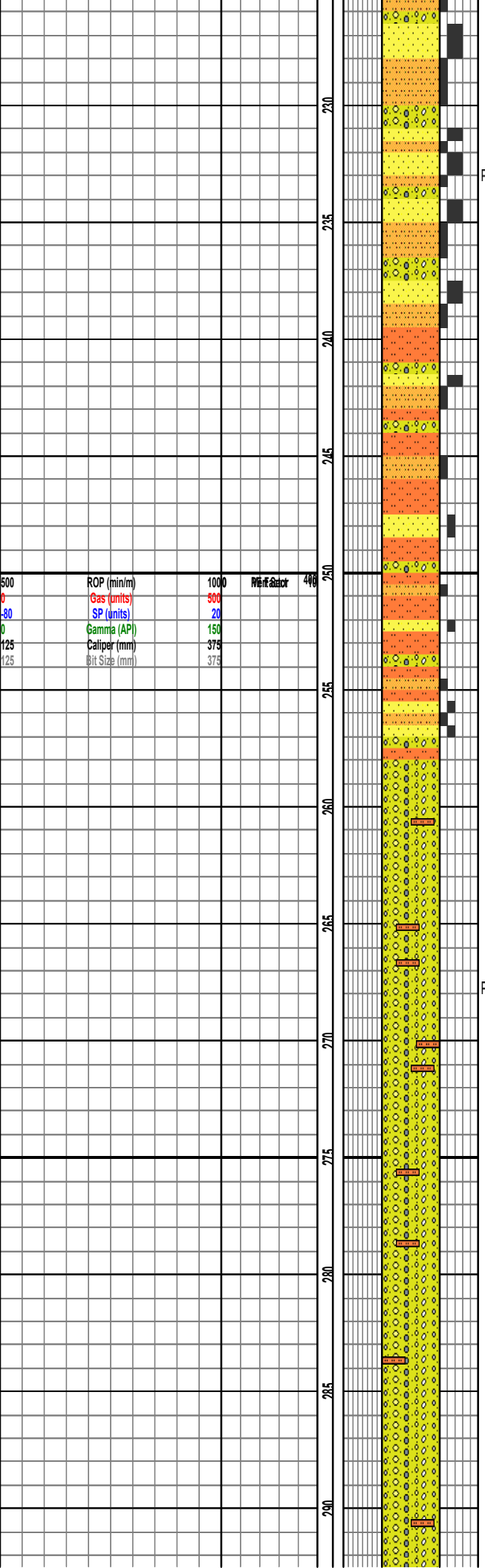
**CUMBERLAND GROUP**  
**-HOPEWELL CAPE FORMATION**  
**@ 177.0m MD, 177.0m TVD,**  
**-31.7m SS**

177-195 CGLN 90% red-brn, polymictic, qtz, ign frags, musc, biot, ply srt; SLTST 10% red-brn, occ gy, mic, henc, v sft

195-219 CGLN 100% red-brn, polymictic, qtz, ign frags, orth, musc, biot, sch, ply srt; red slit strgs

219-240 SS 75% wht-red, vf-mg, occ wht, qtz, musc, hem, sr-sa, uncons, drty; CGLN 20% red-brn, polymictic, qtz, ign frags, orth, musc, biot, sch, ply srt; MUDST 5% yel, v sft





240-258 SLTST 60% red-brn, occ gy, mic, cal vng, henc, v sft; SS 30% wht-red, vf-fg, occ wht, qtz, musc, hem, sr-sa, uncons, drty; CGLN 10% red-brn, polymictic, qtz, ign frags, orth, musc, biot, sch, henc, ply srt; mudst strgs

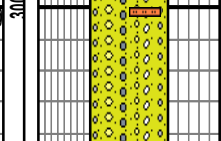
258-282 CGLN 100% red-brn, polymictic, qtz, ign frags, orth, musc, biot, sch, henc, ply srt; red sltst strgs

282-303 CGLN 100% red-brn, polymictic, qtz, ign frags, orth, musc, biot, sch, mag, henc, ply srt; red sltst strgs

500	ROP (min/m)	1000	Rate of Penetration
0	Gas (units)	500	
80	SP (units)	20	
0	Gamma (API)	150	
125	Caliper (mm)	375	
125	Bit Size (mm)	375	

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

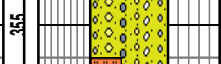
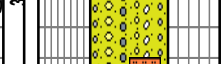
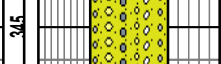
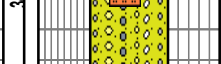
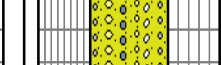
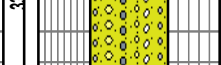
500	ROP (min/m)	1000	Weight Factor	40%
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (AP)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		



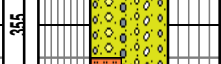
303-327 CGLN 100% red-brn, polymictic, qtz, ign frags, orth, musc, biot, sch, mag, hemc, ply srt; red siltst strgs



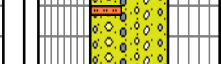
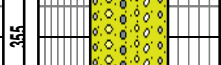
327-345 CGLN 100% red-brn, polymictic, qtz, ign frags, orth, musc, biot, sch, mag, hemc, ply srt, siltst cmt



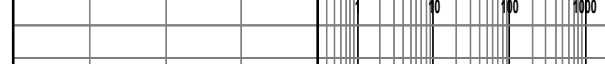
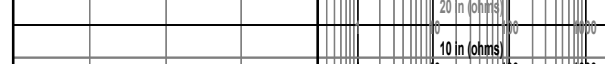
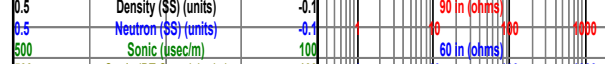
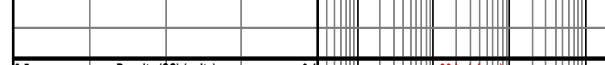
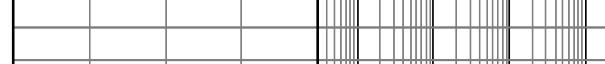
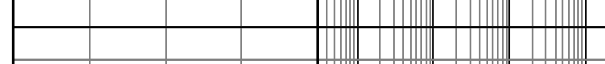
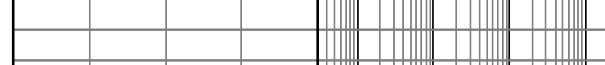
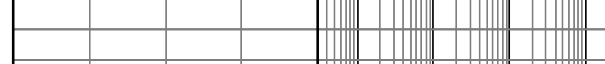
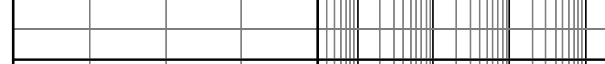
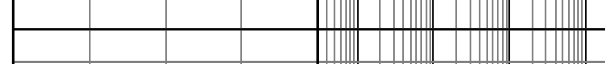
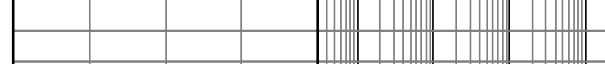
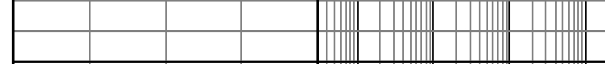
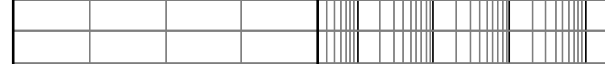
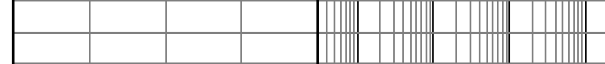
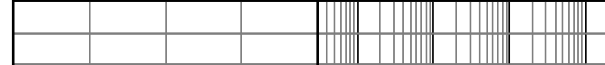
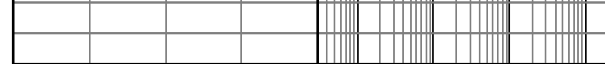
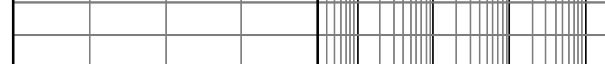
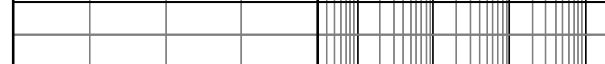
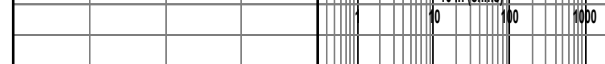
500	ROP (min/m)	1000	Weight Factor	40%
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (AP)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

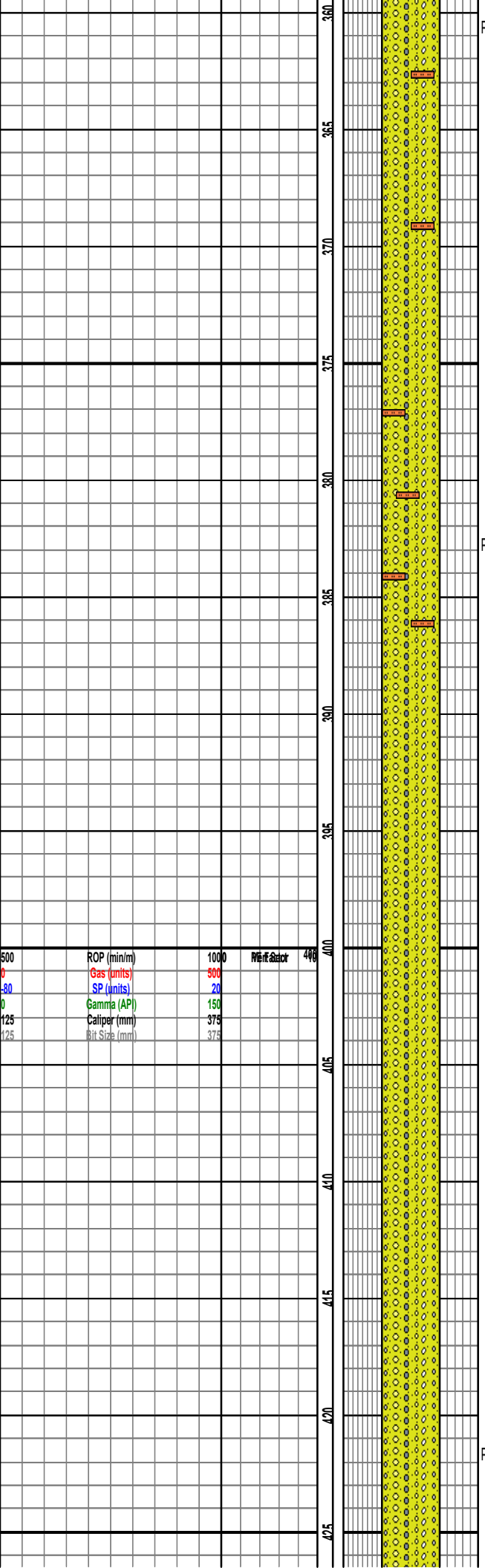


345-366 CGLN 100% red-brn, polymictic, qtz, ign frags, orth, musc, biot, sch, mag, hemc, ply srt, siltst cmt; siltst strgs



0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000





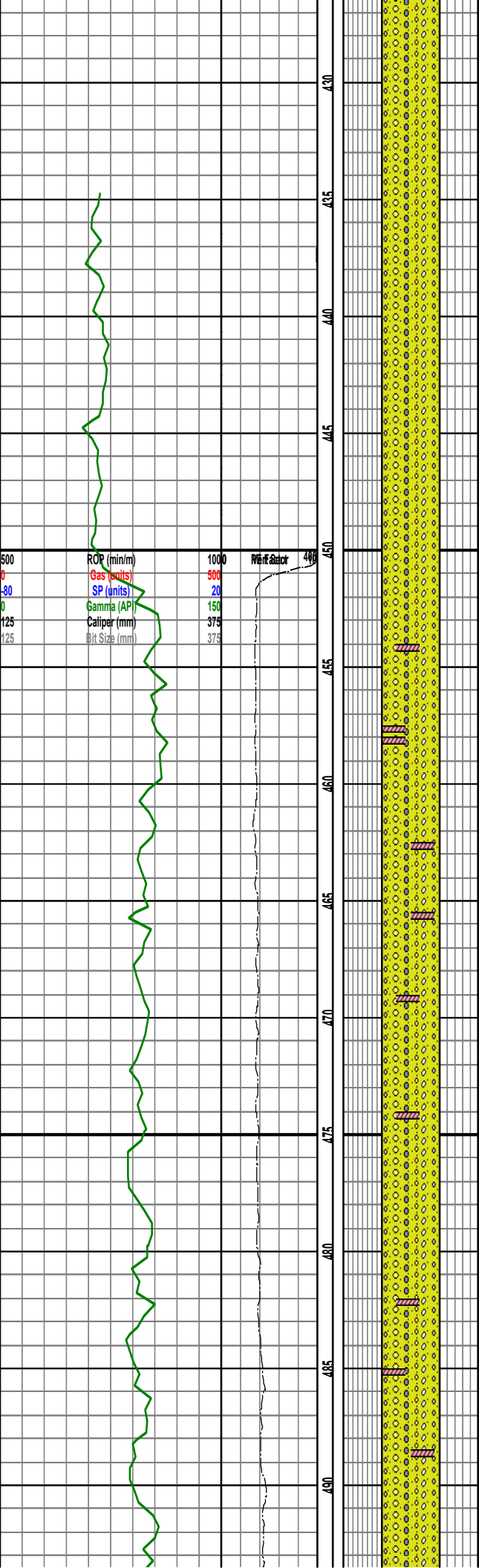
366-387 CGLN 100% red-brn, polymictic, qtz, ign frags, orth, musc, biot, sch, mag, hemic, ply srt, siltst cmt; siltst strgs

387-410 CGLN 100% dk red-brn, polymictic, qtz, ign frags, orth, musc, biot, sch, mag, hemic, ply srt, siltst cmt; mudst strgs

410-432 CGLN 100% dk red-brn, polymictic, qtz, ign frags, orth, musc, biot, sch, mag, hemic, ply srt, siltst cmt; mudst strgs

500	ROP (min/m)	1000	Ref: 496
0	Gas (units)	500	
-80	SP (units)	20	
0	Gamma (API)	150	
125	Caliper (mm)	375	
125	Bit Size (mm)	375	

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usac/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000

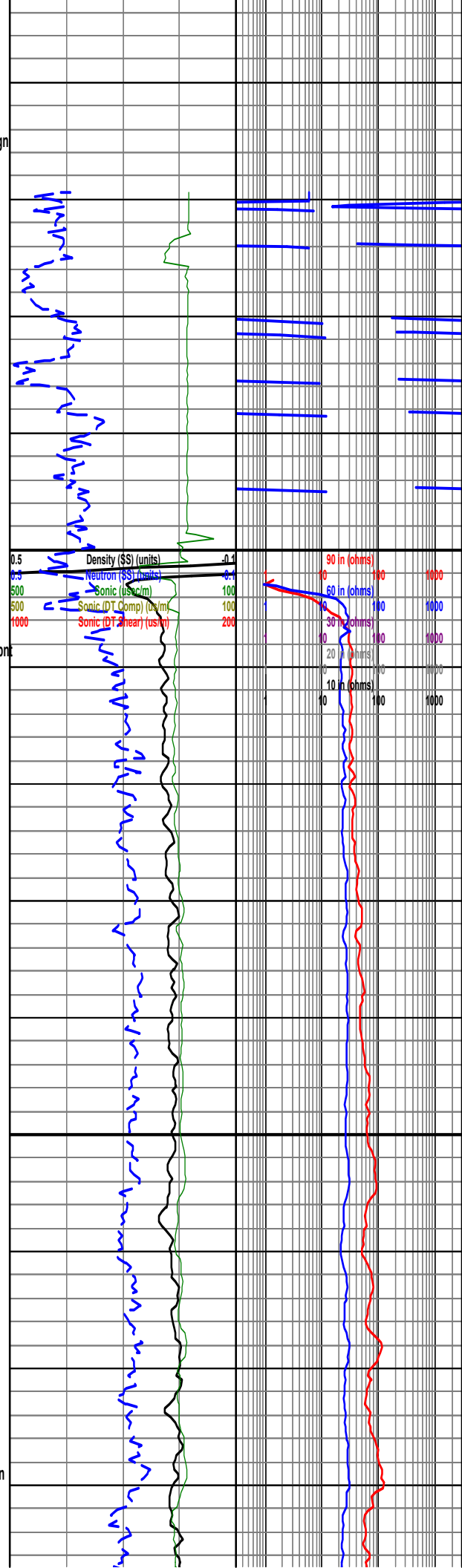


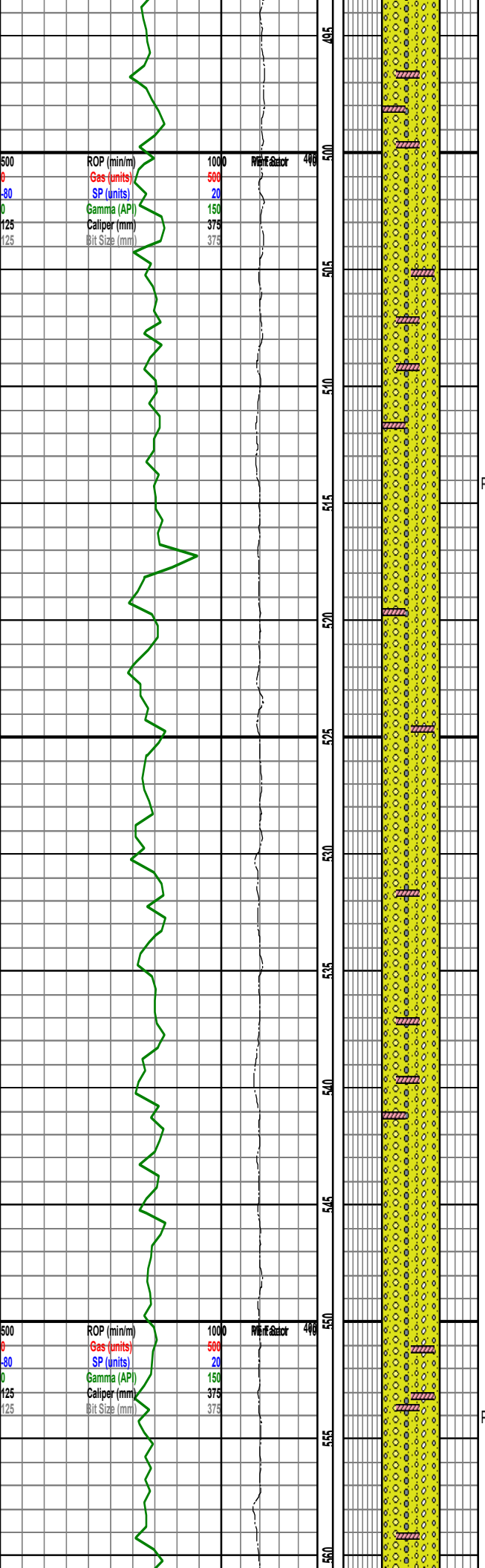
432-453 CGLN 100% dk red-brn, polymictic, qtz, ign frags, orth, musc, biot, sch, mag, hemic, ply srt, siltst cmt; mudst strgs

453-473 CGLN 100% dk brn, polymictic, qtz, ign frags, orth, musc, biot, sch, mag, hemic, ply srt, abnt siltst cmt; anh strgs

473-489 CGLN 100% dk brn, polymictic, qtz, ign frags, orth, musc, biot, sch, mag, hemic, ply srt, predom siltst cmt; anh strgs

489-507 CGLN 100% dk brn-gy, polymictic, qtz, ign frags, orth, ply srt, predom siltst cmt; anh strgs

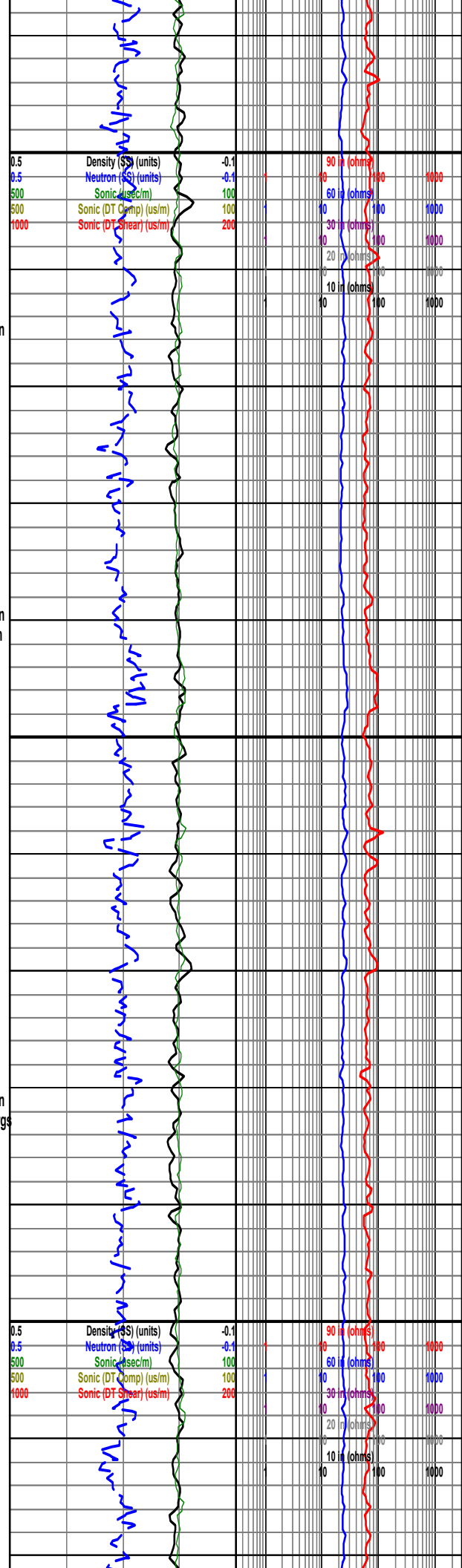




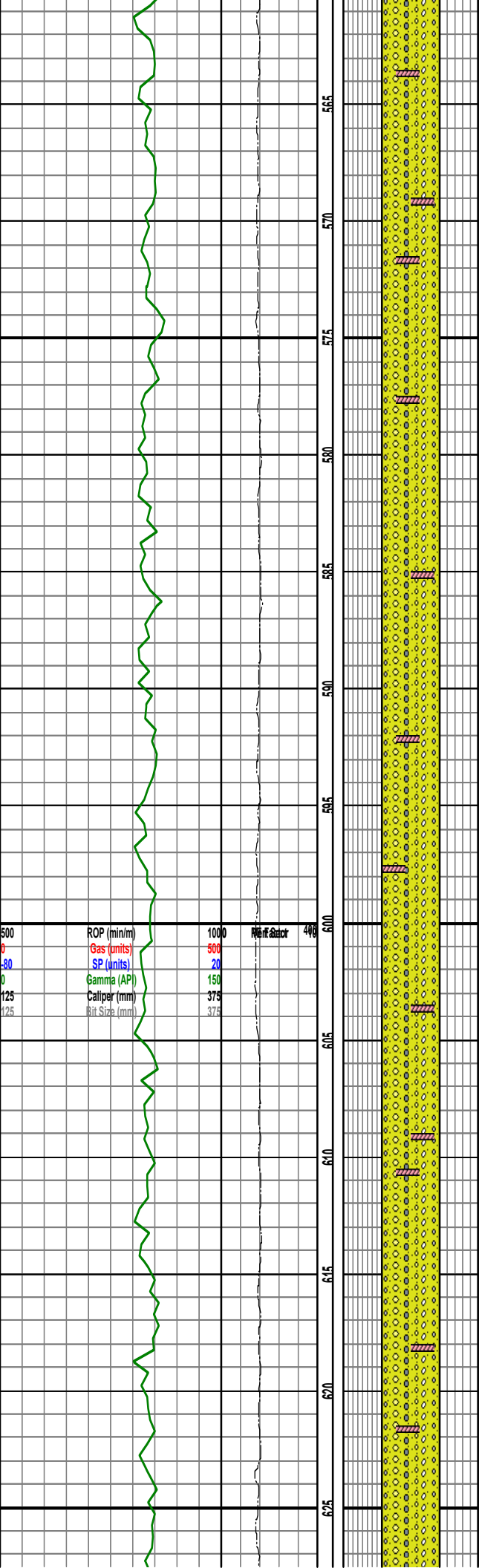
507-519 CGLN 100% dk brn-gy, polymictic, qtz, ign frags, orth, ply srt, predom siltst cmt; anh strgs

519-540 CGLN 100% dk brn-gy, polymictic, qtz, ign frags, orth, cal vng, ply srt, predom siltst cmt; anh strgs

540-564 CGLN 100% dk brn-gy, polymictic, qtz, ign frags, sch, orth, ply srt, predom siltst cmt, anh strgs



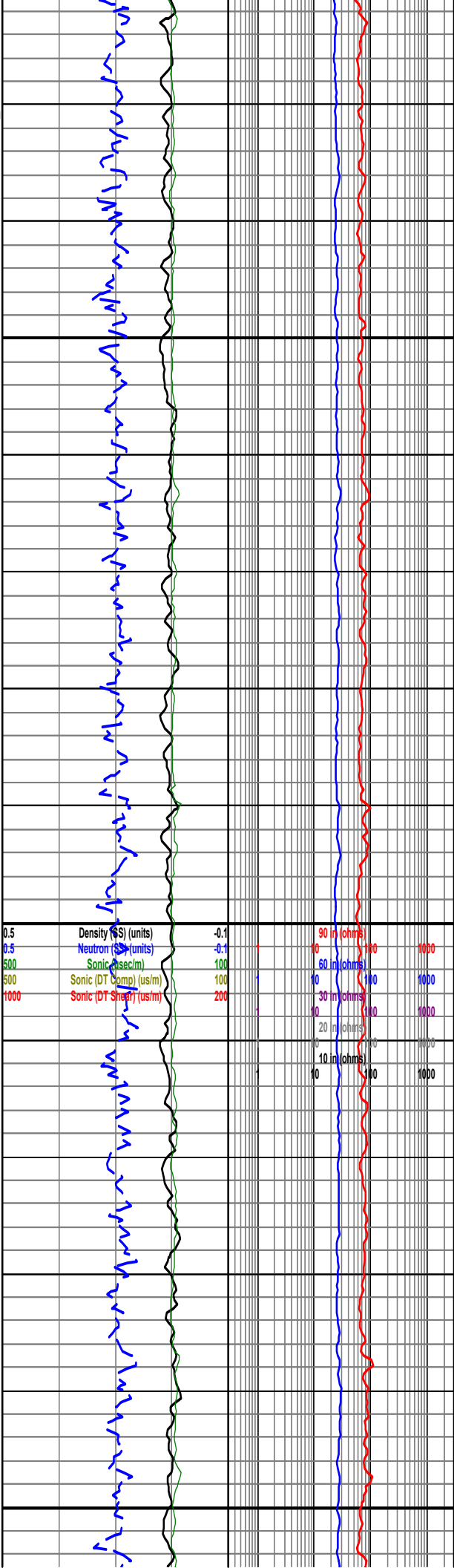


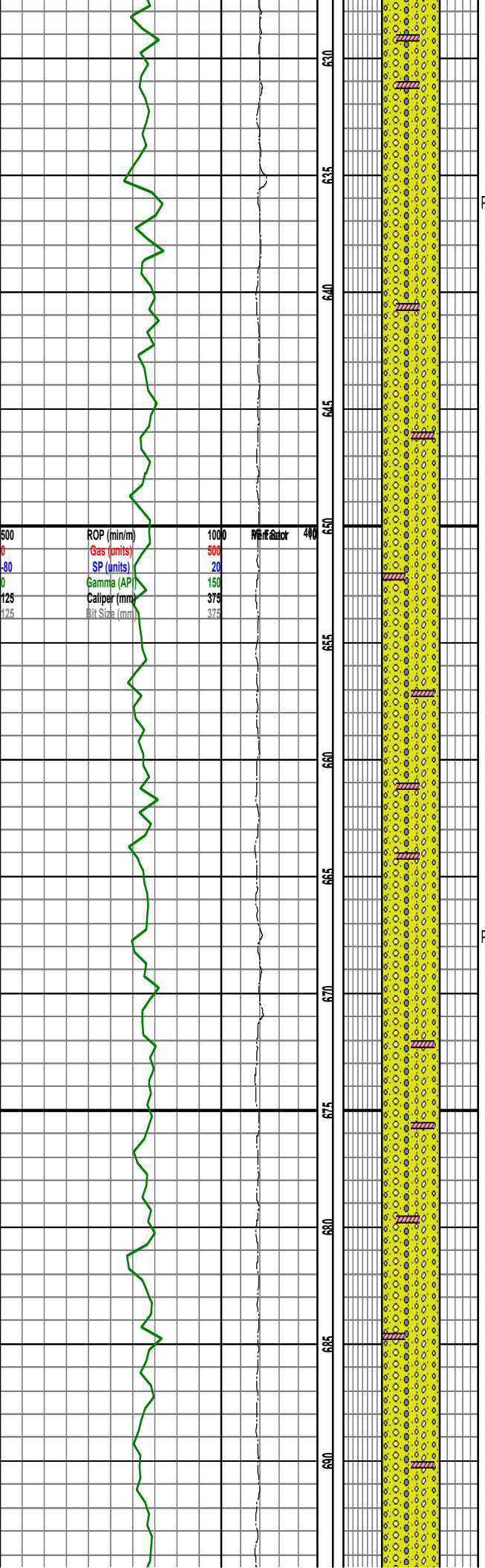


564-588 CGLN 100% dk brn-gy, polymictic, qtz, ign frags, sch, orth, cal vng, mic, ply srt, siltst cmt, anh strgs

588-609 CGLN 100% dk brn-gy, polymictic, qtz, ign frags, sch, orth, cal vng, sly mic, ply srt, ss cmt, siltst cmt, anh strgs

609-633 CGLN 100% dk brn-gy, polymictic, qtz, ign frags, sch, orth, cal vng, sly mic, ply srt, siltst cmt, ss cmt, anh strgs



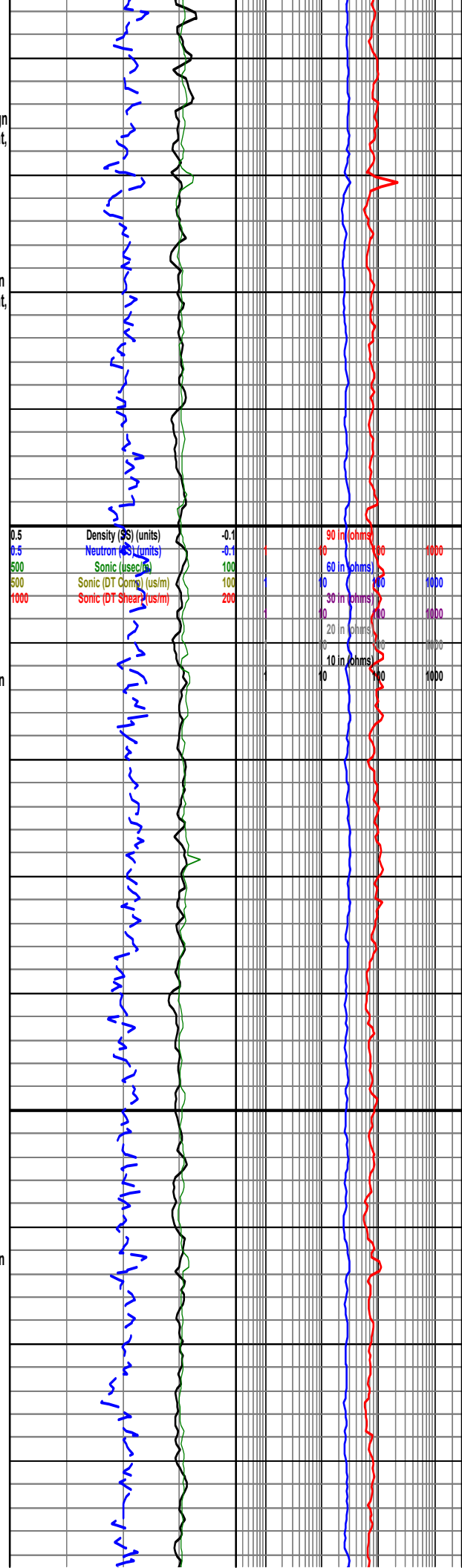


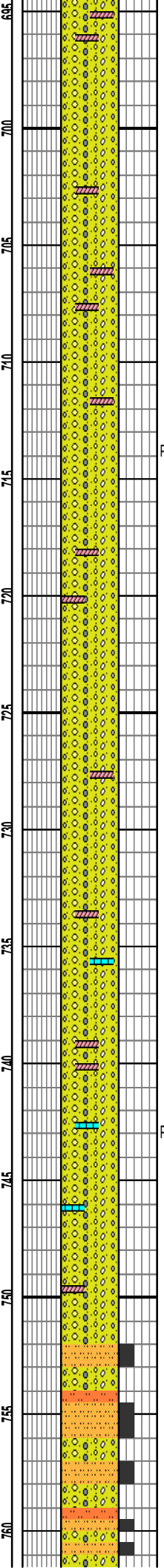
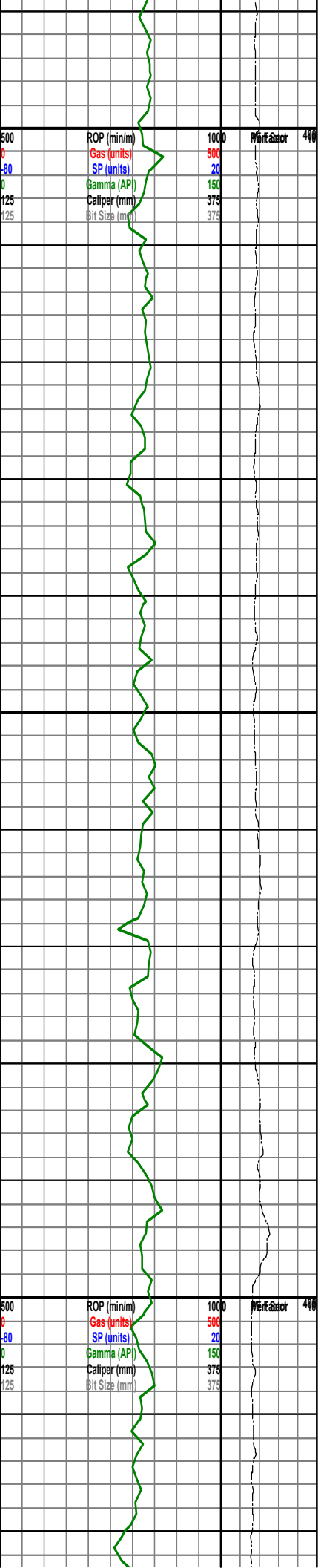
633-639 CGLN 100% dk brn-gy, polymictic, qtz, ign frags, sch, orth, cal vng, silly mic, ply srt, siltst cmt, ss cmt, anh strgs

639-657 CGLN 100% dk brn-gy, polymictic, qtz, ign frags, sch, orth, cal vng, silly mic, ply srt, siltst cmt, ss cmt, anh strgs

657-681 CGLN 100% dk brn-gy, polymictic, qtz, ign frags, sch, orth, cal vng, silly mic, ply srt, predom siltst cmt, ss cmt, yel stng, anh strgs

681-708 CGLN 100% dk brn-gy, polymictic, qtz, ign frags, orth, silly mic, ply srt, predom siltst cmt, ss cmt, anh strgs

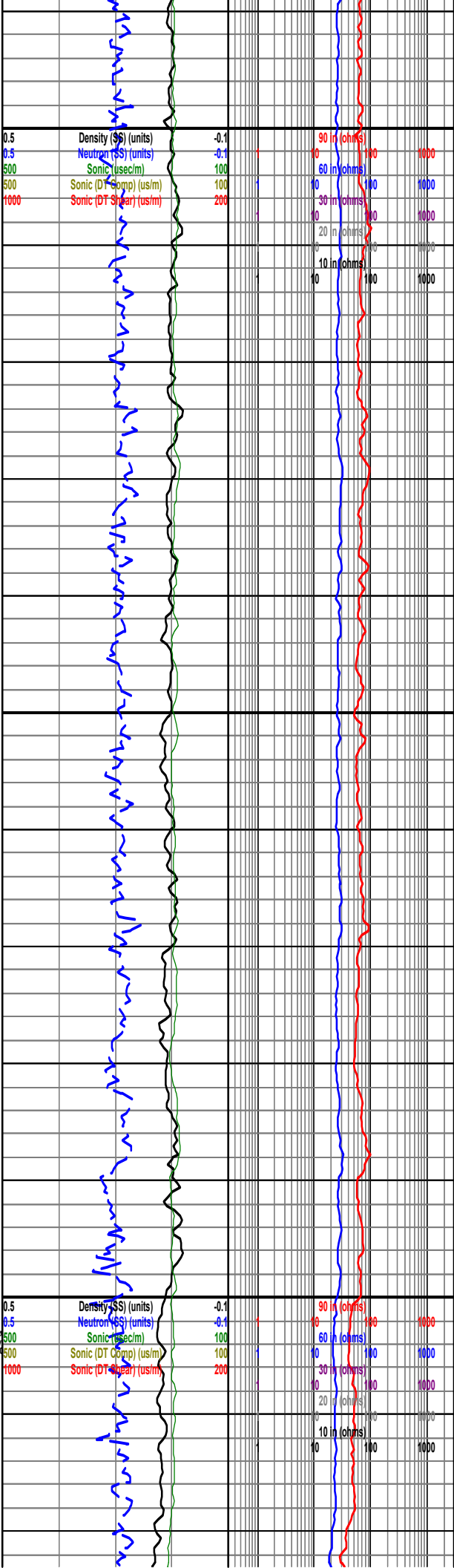


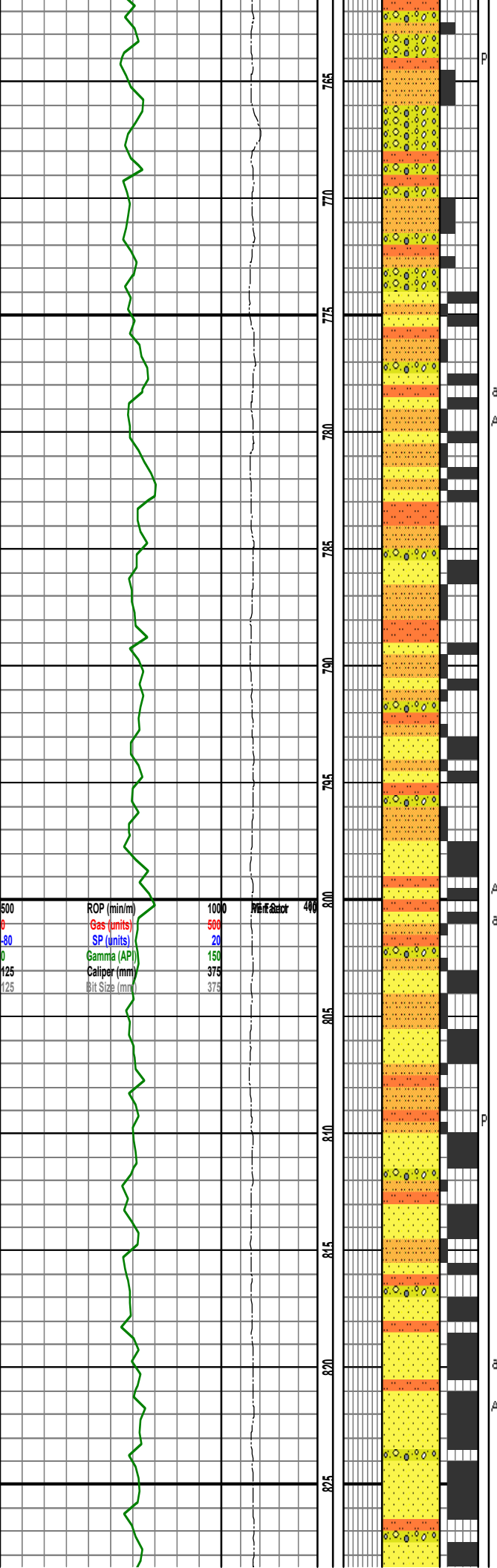


708-729 CGLN 100% dk brn-gy, polymictic, qtz, ign frags, orth, sily mic, ply srt, predom siltst cmt, ss cmt, anh strgs

729-750 CGLN 100% dk gy-brn, polymictic, qtz, ign frags, orth, sily mic, ply srt, predom siltst cmt, ss cmt, anh strgs, lst strgs

750-774 CGLN 60% pnk-brn, polymictic, qtz, qtz, ign frags, orth, sily mic, ply srt; SS 30% dk mar-brn f-vfg, v sily calc, mod srt, sr-sa, w cons; SLTST 10% dk mar-brn, noncalc



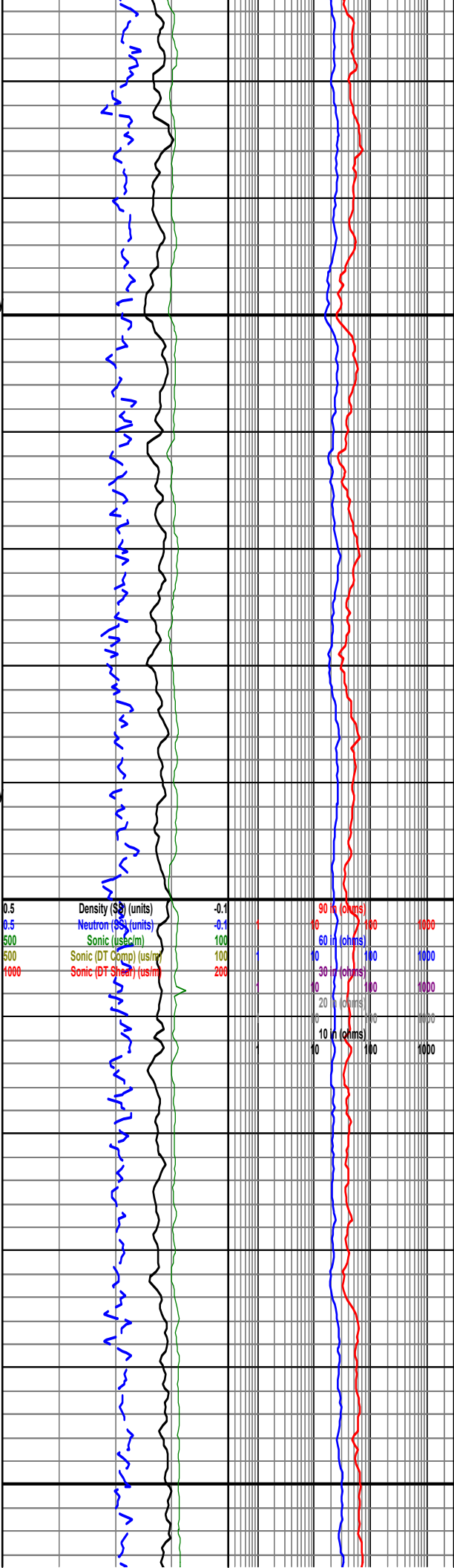


774-795 SS 80% dk mar-brn, gy, vf-vcg, noncalc, ply  
 srt, sa-a; SLTST 15% dk mar-br, noncalc; CGLN 5%  
 dk mar-brn, gy, polymictic, qtzt, ign frags, orth,  
 noncalc

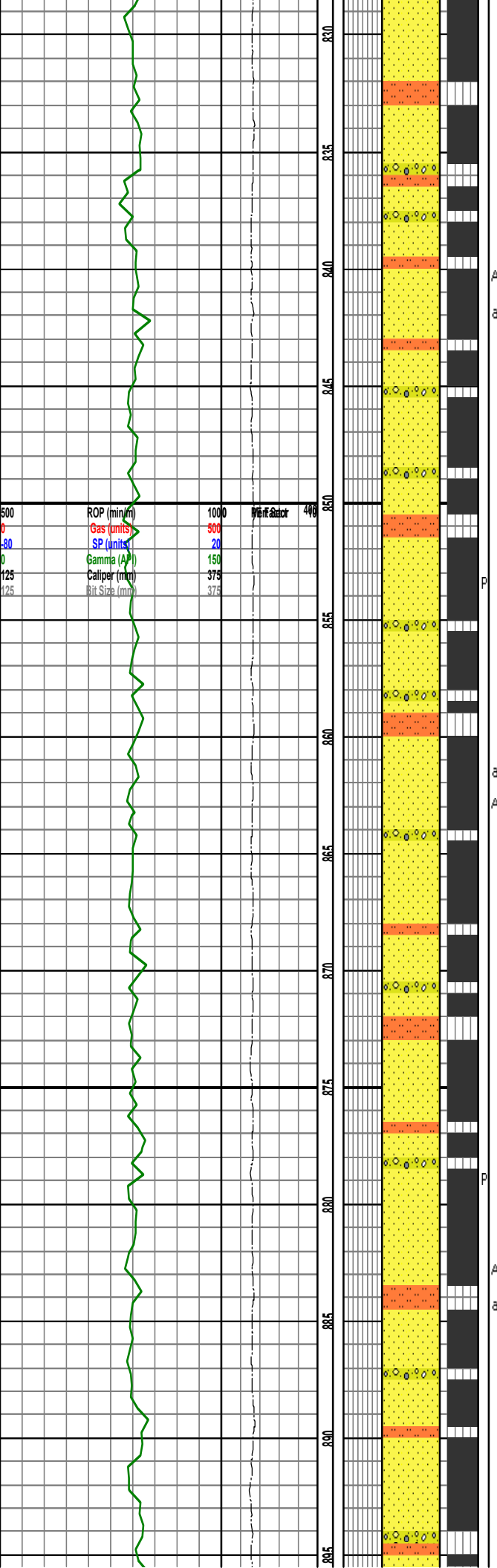
795-816 SS 80% dk mar-brn, gy, vf-vcg, noncalc, ply  
 srt, sa-a; SLTST 15% dk mar-br, noncalc; CGLN 5%  
 dk mar-brn, gy, polymictic, qtzt, ign frags, orth,  
 noncalc

816-837 SS 80% dk mar-brn, gy, f-vcg, noncalc, ply  
 srt, sa-a; SLTST 15% dk mar-br, noncalc; CGLN 5%  
 dk mar-brn, gy, polymictic, qtzt, ign frags, orth,  
 noncalc

500	ROP (min/m)	1000	Perforator	400
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		



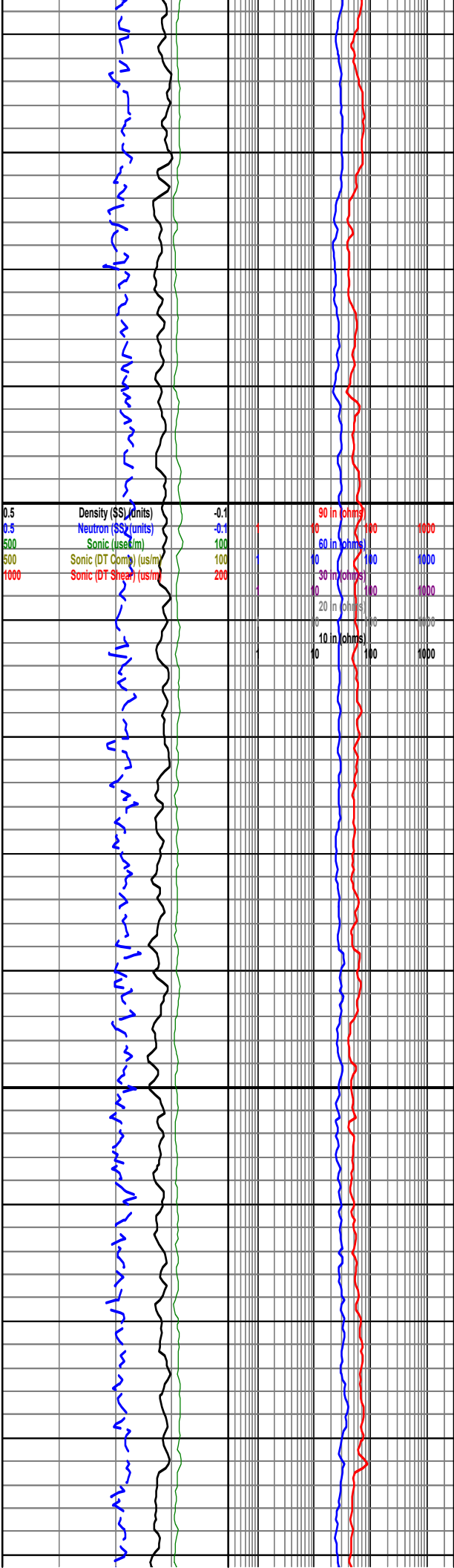
0.5	Density (SG) (units)	-0.1	90 ft (ohms)	1000
0.5	Neutron (SG) (units)	-0.1	60 ft (ohms)	1000
500	Sonic (us/cm)	100	30 ft (ohms)	1000
500	Sonic (DT Comp) (us/m)	100	20 ft (ohms)	1000
1000	Sonic (DT Shear) (us/m)	200	10 ft (ohms)	1000



837-858 SS 80% dk mar-brn, gy, f-vcg, noncalc, ply srt, sa-a; SLTST 15% dk mar-br, noncalc; CGLN 5% dk mar-brn, gy, polymictic, qtzt, ign frags, orth, noncalc

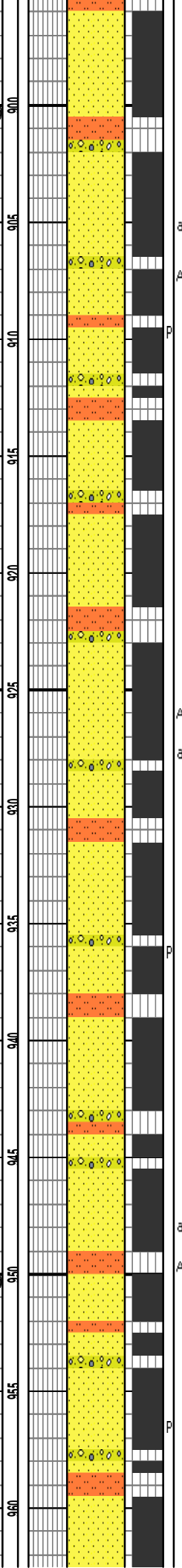
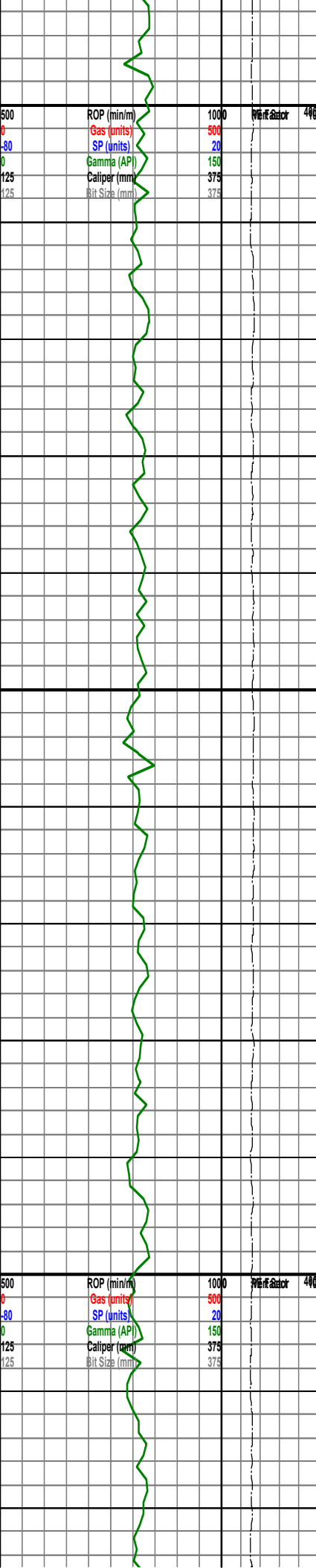
858-879 SS 80% dk mar-brn, gy, f-vcg, noncalc, ply srt, sa-a; SLTST 15% dk mar-br, noncalc; CGLN 5% dk mar-brn, gy, polymictic, qtzt, ign frags, orth, noncalc

879-900 SS 80% dk mar-brn, gy, f-vcg, mnr pyr, sly mic, noncalc, ply srt, sa-a; SLTST 15% dk mar-br, noncalc; CGLN 5% dk mar-brn, gy, polymictic, qtzt, ign frags, orth, noncalc



500	ROP (min/m)	1000	400
0	Gas (units)	500	
80	SP (units)	20	
0	Gamma (API)	150	
125	Caliper (mm)	375	
125	Bit Size (mm)	375	

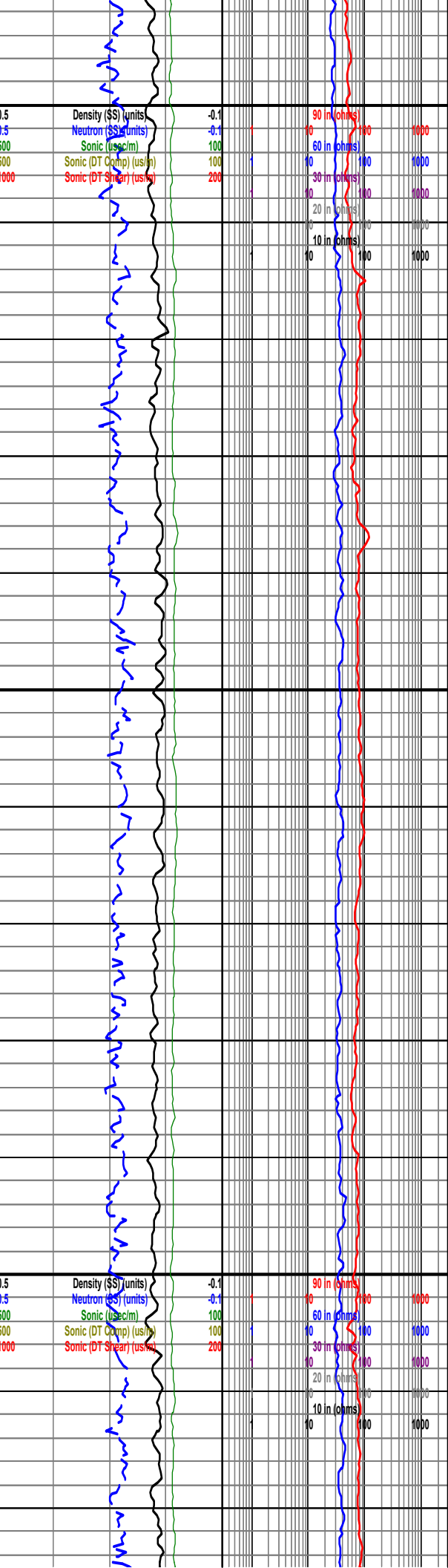
0.5	Density (SS) (units)	-0.1	90 in (ohms)
0.5	Neutron (SS) (units)	-0.1	0
500	Sonic (us/cm)	100	60 in (ohms)
500	Sonic (DT Comp) (us/m)	100	0
1000	Sonic (DT Shear) (us/m)	200	30 in (ohms)
			20 in (ohms)
			10 in (ohms)
			0



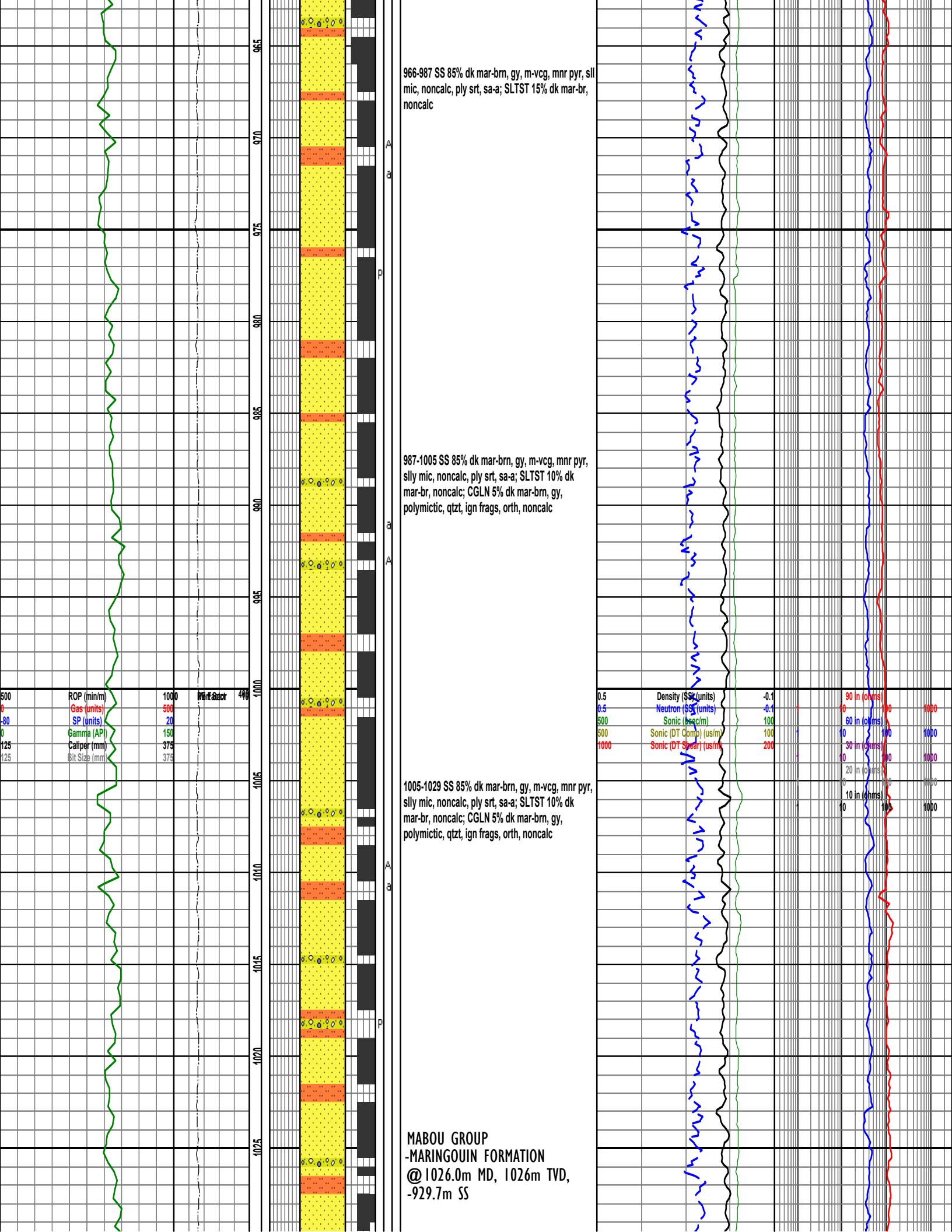
900-921 SS 80% dk mar-brn, gy, f-vcg, mnr pyr, sily mic, noncalc, ply srt, sa-a; SLTST 15% dk mar-br, noncalc; CGLN 5% dk mar-brn, gy, polymictic, qtz, ign frags, orth, noncalc

921-945 SS 80% dk mar-brn, gy, f-vcg, mnr pyr, sily mic, noncalc, ply srt, sa-a; SLTST 15% dk mar-br, noncalc; CGLN 5% dk mar-brn, gy, polymictic, qtz, ign frags, orth, noncalc

945-966 SS 80% dk mar-brn, gy, f-vcg, mnr pyr, sily mic, noncalc, ply srt, sa-a; SLTST 15% dk mar-br, noncalc; CGLN 5% dk mar-brn, gy, polymictic, qtz, ign frags, orth, noncalc







966-987 SS 85% dk mar-brn, gy, m-vcg, mnr pyr, sll mic, noncalc, ply srt, sa-a; SLTST 15% dk mar-br, noncalc

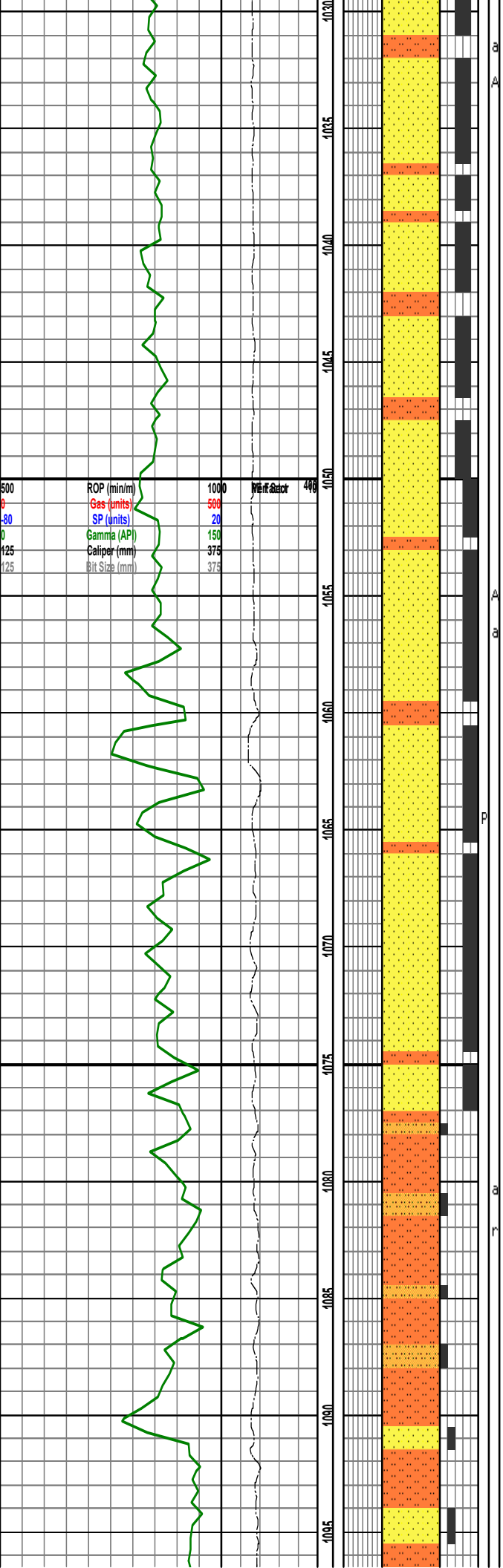
987-1005 SS 85% dk mar-brn, gy, m-vcg, mnr pyr, sll mic, noncalc, ply srt, sa-a; SLTST 10% dk mar-br, noncalc; CGLN 5% dk mar-brn, gy, polymictic, qtz, ign frags, orth, noncalc

1005-1029 SS 85% dk mar-brn, gy, m-vcg, mnr pyr, sll mic, noncalc, ply srt, sa-a; SLTST 10% dk mar-br, noncalc; CGLN 5% dk mar-brn, gy, polymictic, qtz, ign frags, orth, noncalc

500	ROP (min/m)	1000	Wireline	40%
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

0.5	Density (SG (units))	-0.1	90 in (ohms)	1000
0.5	Neutron (SG (units))	-0.1	60 in (ohms)	1000
500	Sonic (us/cm)	100	30 m (ohms)	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	1000

MABOU GROUP  
 -MARINGOUIN FORMATION  
 @ 1026.0m MD, 1026m TVD,  
 -929.7m SS

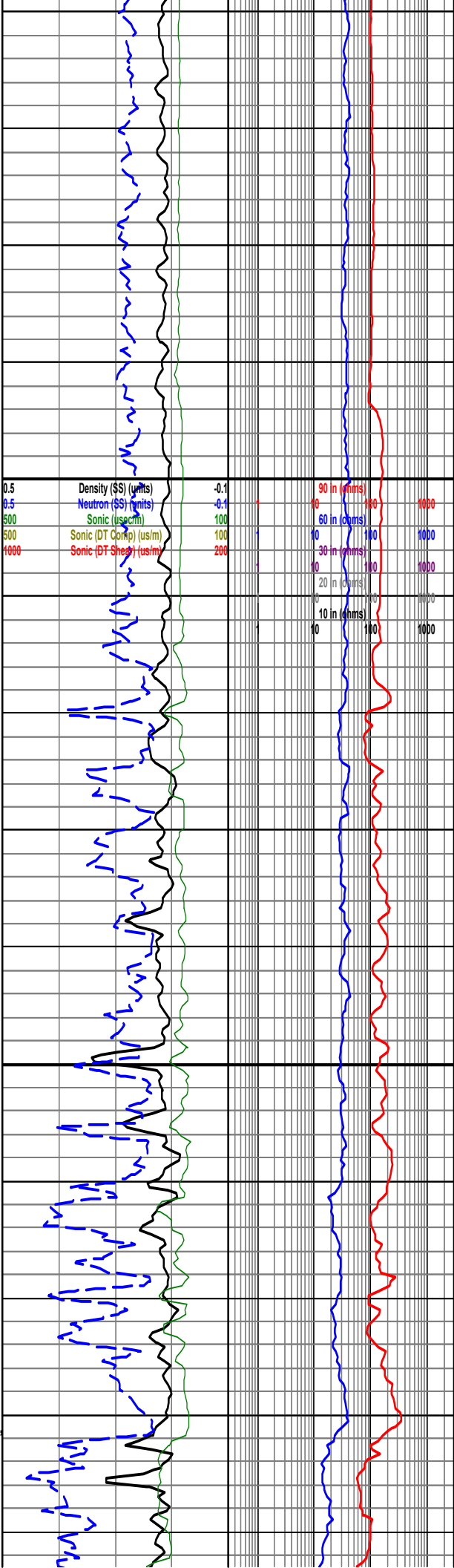


1029-1050 SS 90% dk mar-brn, gy, m-cg, silc, mn pyr, sily mic, noncalc, ply srt, sa-a; SLTST 10% dk mar-br, noncalc, drty

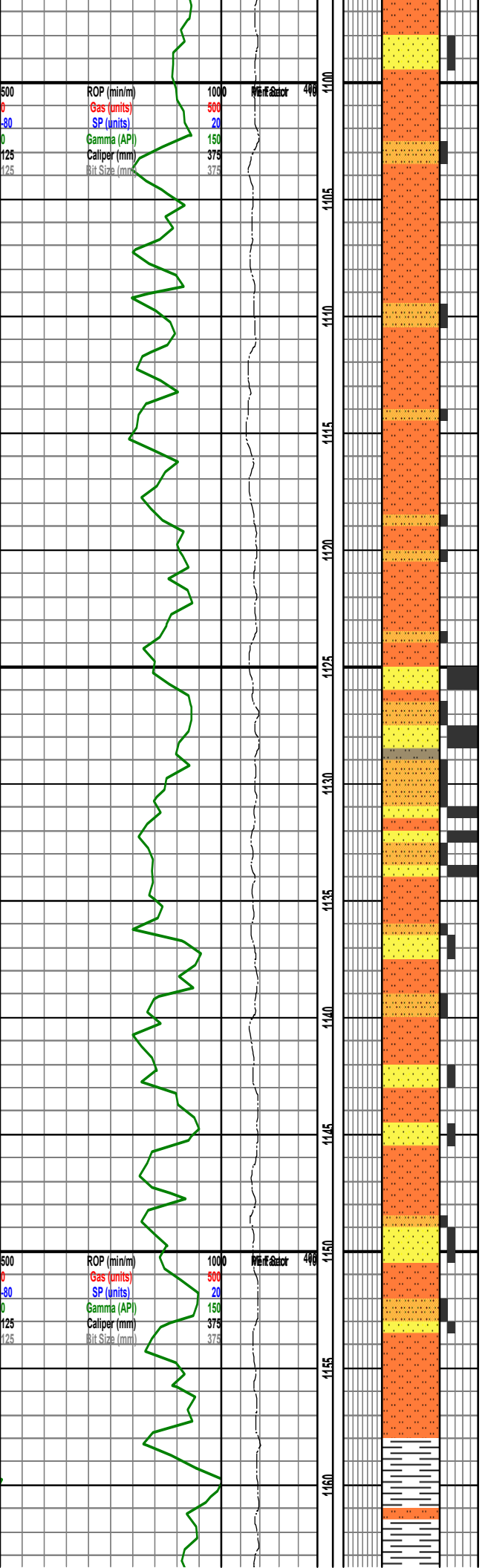
1050-1077 SS 95% dk mar-brn, gy, c-vcg, mn pyr, sily mic, noncalc, ply srt, sa-a, drty; SLTST 5% dk mar-br, noncalc, v drty

1077-1089 SLTST 85% dk mar-gy, noncalc, v sft, occ brit; SS 15% dk mar-brn, gy, vfg, sily mic, noncalc, sa-sr

1089-1101 SLTST 60% dk mar-gy, sily calc, sily mic, v sft, occ brit; SS 40% dk mar-brn, gy, vf-fg, silc, noncalc, sa-sr







a  
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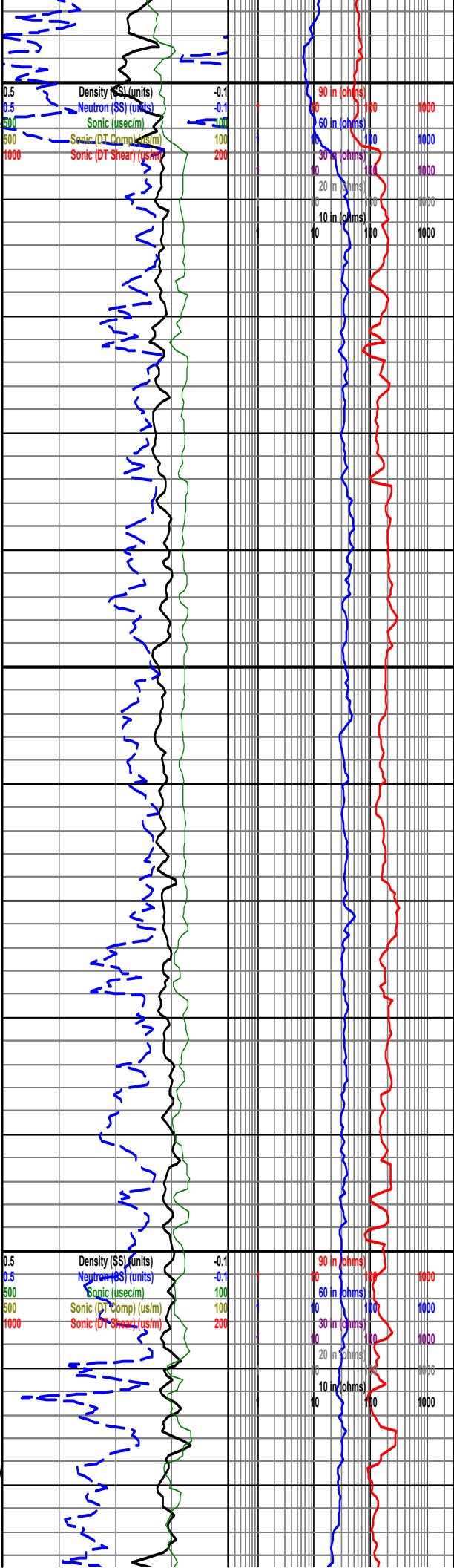
1101-1125 SLTST 85% dk mar-gy, sly calc, sly mic  
occ brit; SS 15% dk mar-brn, gy, vfg, silc, noncalc,  
sa-sr

1125-1134 SS 95% dk mar-brn, gy, f-vcg, silc,  
noncalc, sa-sr; SLTST 5% dk mar-gy, noncalc, sly  
mic, occ brit

1134-1155 SLTST 60% dk mar-brn, noncalc, sly  
mic, occ brit, v hrd; SS 40% dk mar-brn, vf-fg, silc,  
noncalc, sa-sr

1155-1158 SLTST 100% dk mar-brn, gy, noncalc,  
occ drty, brit, hrd

1158-1170 SH 95% lt-dk gy, occ mic, blkly, occ  
subfiss, v hard, occ vit; SLTST 10% dk mar-brn, sly  
calc, occ drty, brit, hrd



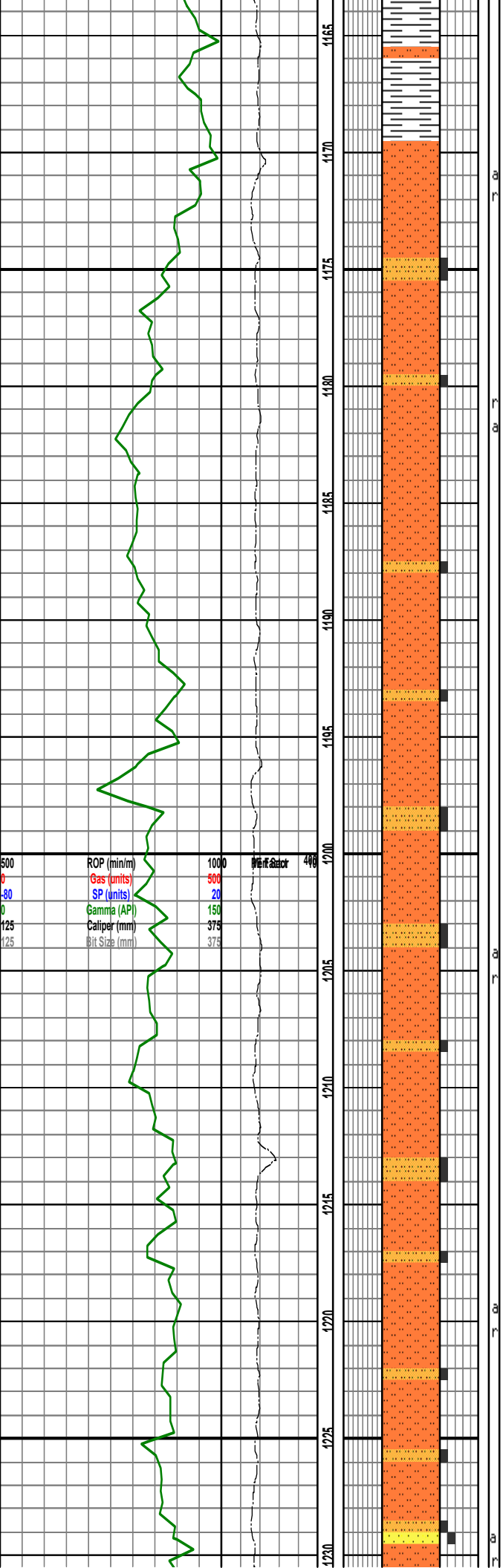
1101-1125 SLTST 85% dk mar-gy, sly calc, sly mic  
occ brit; SS 15% dk mar-brn, gy, vfg, silc, noncalc,  
sa-sr

1125-1134 SS 95% dk mar-brn, gy, f-vcg, silc,  
noncalc, sa-sr; SLTST 5% dk mar-gy, noncalc, sly  
mic, occ brit

1134-1155 SLTST 60% dk mar-brn, noncalc, sly  
mic, occ brit, v hrd; SS 40% dk mar-brn, vf-fg, silc,  
noncalc, sa-sr

1155-1158 SLTST 100% dk mar-brn, gy, noncalc,  
occ drty, brit, hrd

1158-1170 SH 95% lt-dk gy, occ mic, blkly, occ  
subfiss, v hard, occ vit; SLTST 10% dk mar-brn, sly  
calc, occ drty, brit, hrd



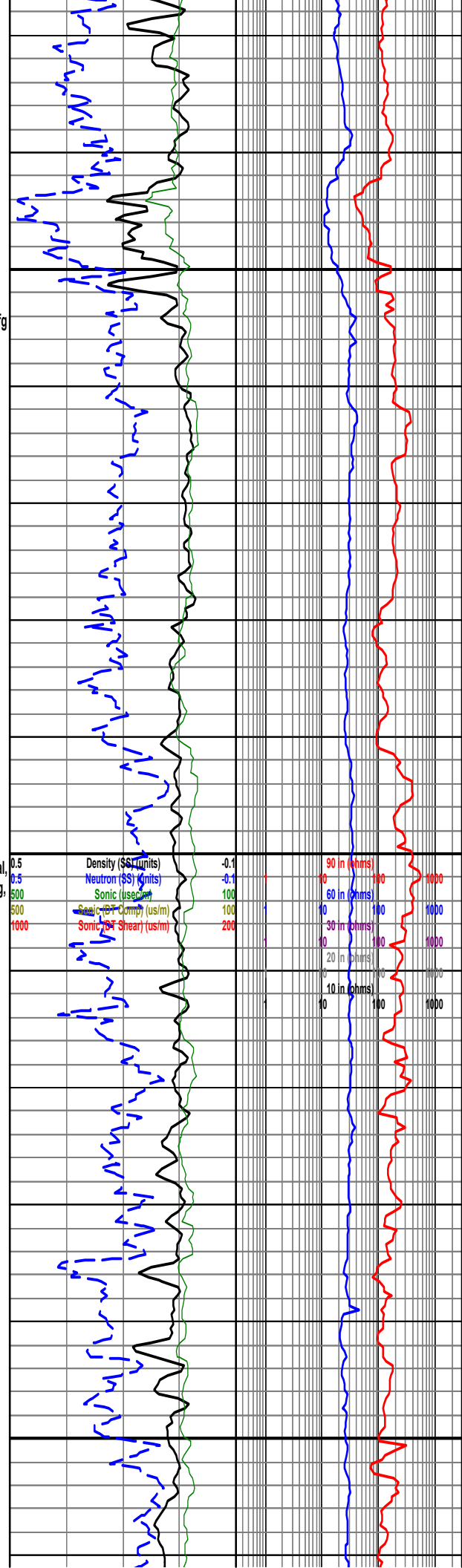
1170-1176 SLTST 95% dk mar-brn, noncalc, sily mic, occ brit, v hrd, occ wxy, occ vit; SS 5% dk mar-brn, vfg, silc, noncalc, sa-sr

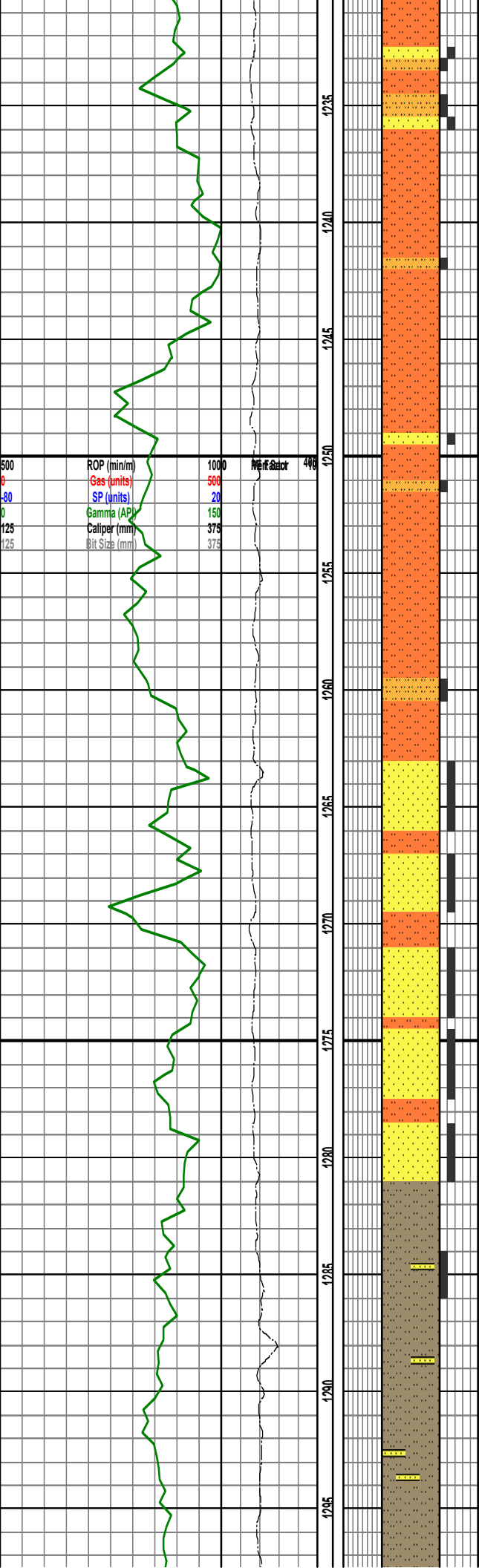
1176-1200 SLTST 95% dk mar-brn, occ pnk, sily calc, mic, v sft, occ wxy, vit; SS 5% dk mar-brn, vfg silc, noncalc, sa-sr

1200-1218 SLTST 85% dk mar-gy, occ pnk, mnr cal, mic, v sft, occ wxy, occ vit; SS 15% dk mar-gy, vfg, silc, sily calc, sa-sr

1218-1227 SLTST 95% dk mar-gy, noncalc, mic, v brit, occ wxy, vit; SS 5% dk mar-gy, vfg, silc, sily calc, sa-sr

1227-1239 SLTST 75% mar, noncalc, mic, v hrd, blkcy, occ wxy, vit; SS 25% dk mar-gy, vf-fg, silc, noncalc, sa-sr

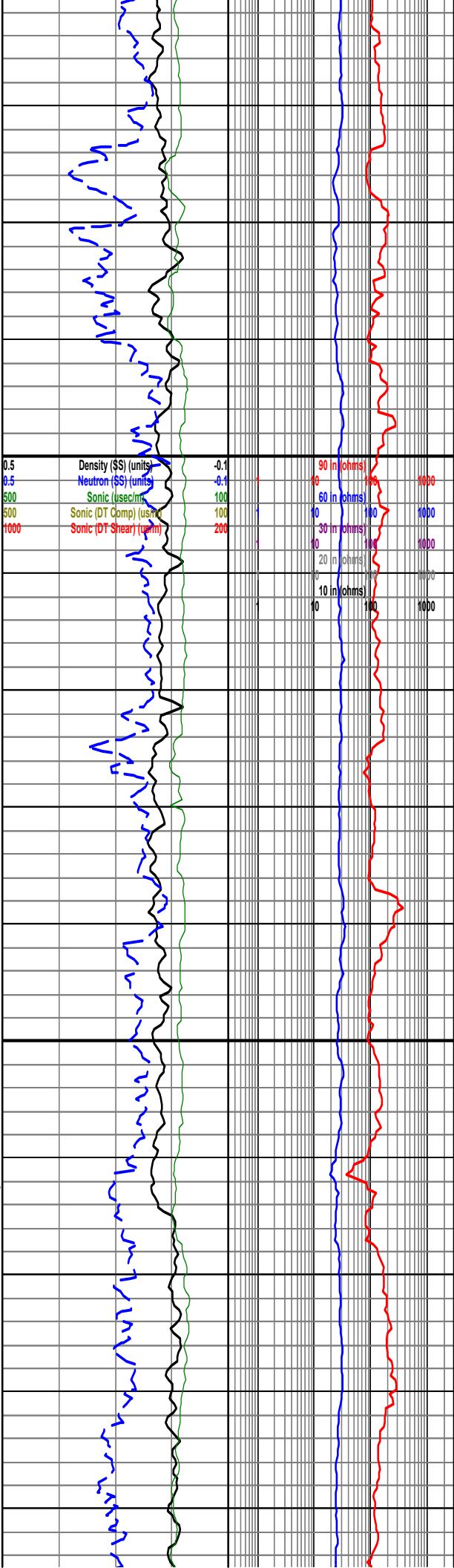




1239-1263 SLTST 90% mar-gy, noncalc, mic, v hrd, bicky, occ brit, occ wxy, vit; SS 10% dk mar-gy, vf-fg, silc, noncalc, sa-sr

1263-1281 SS 75% red-mar, fg, silc, noncalc, sa-sr; SLTST 25% mar-gy, noncalc, mic, v hrd, bicky, occ brit, occ wxy, vit

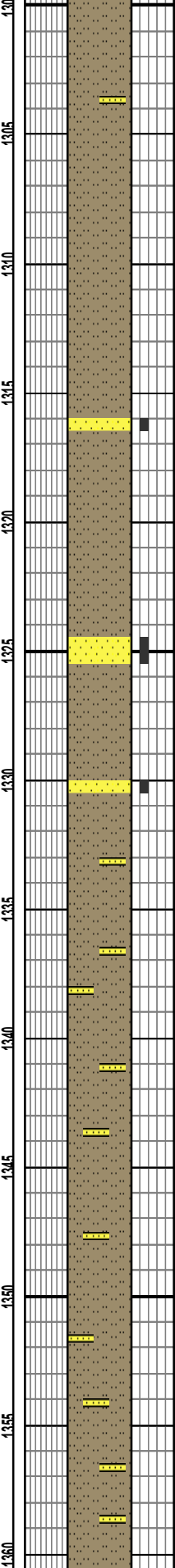
1281-1305 SLTST 100% gy-mar, noncalc, sly mic, v hrd, bicky, occ wxy; ss strgs



500	ROP (min/m)	1000	Weight Factor	400
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

0.5	Density (SS) (units)	-0.1	90 in (ohms)	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	1000
500	Sonic (usec/m)	100	30 in (ohms)	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	1000

500	ROP (min/m)	1000	400
0	Gas (units)	500	
-80	SP (units)	20	
0	Gamma (API)	150	
125	Caliper (mm)	375	
125	Bit Size (mm)	375	



1305-1314 SLTST 100% predom gy, mar, noncalc, sly mic, v hrd, bicky, occ wxy, drty

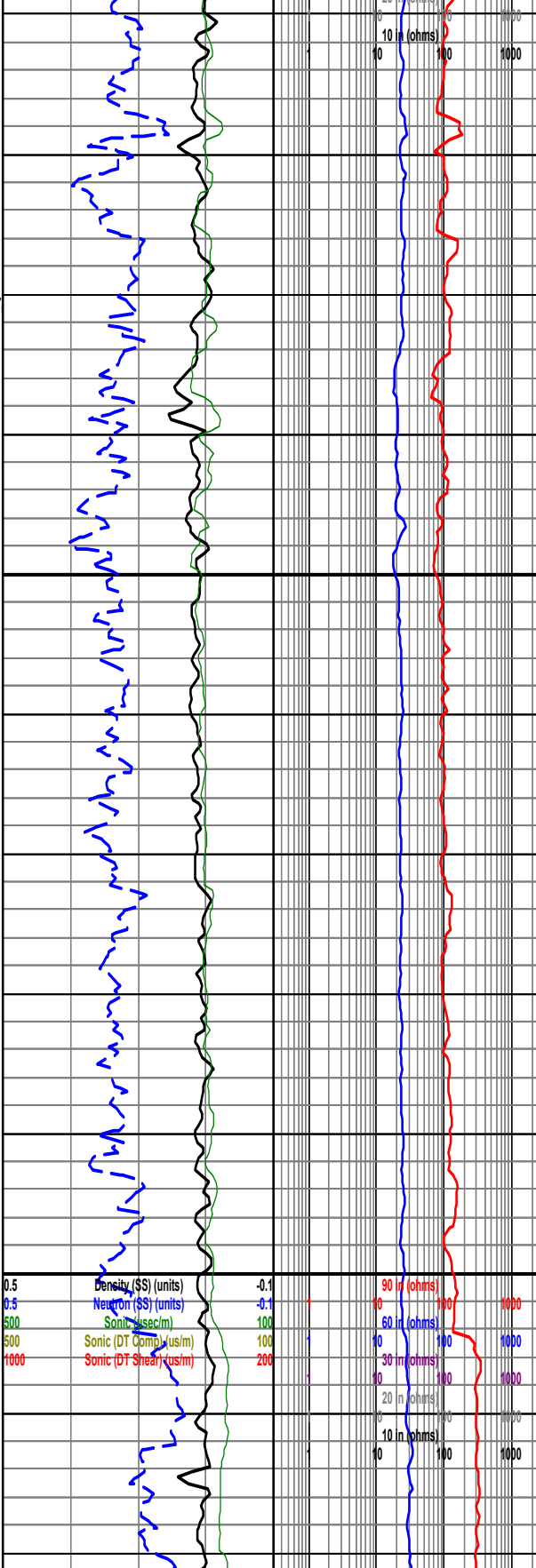
1314-1332 SLTST 95% predom gy, mar, noncalc, sly mic, v hrd, bicky, occ wxy, drty; SS 5% red-mar fg, silc, noncalc, sa-sr

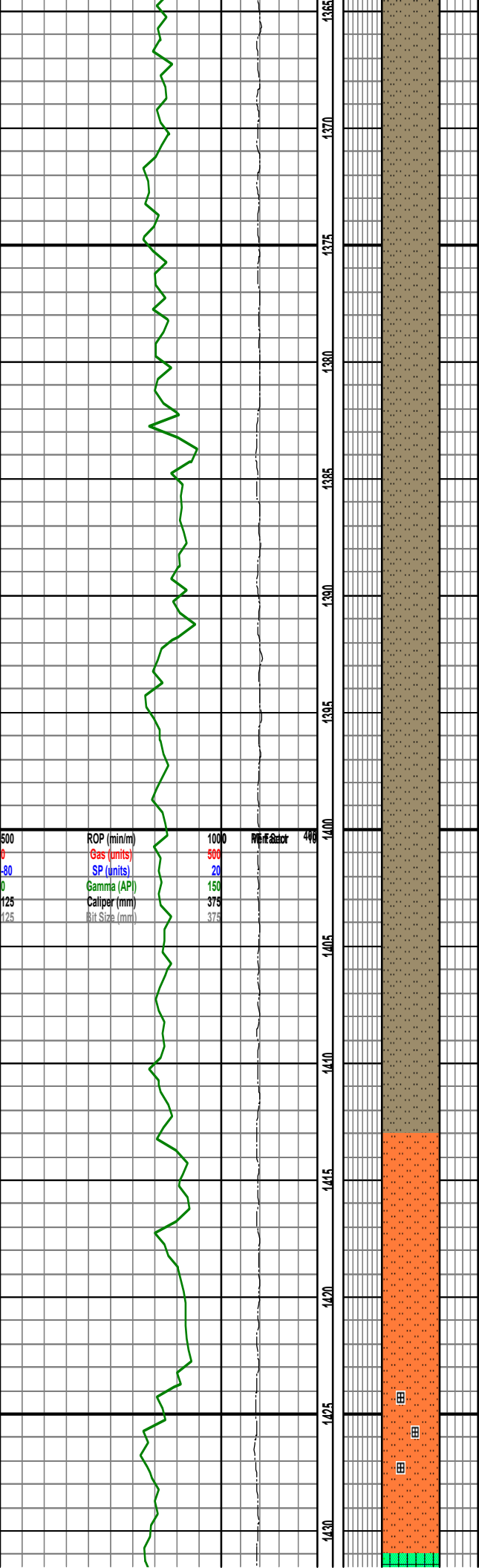
1332-1350 SLTST 100% predom gy, mar, cal vng, mnr pyr, sly mic, v hrd, bicky, occ wxy, drty; ss strgs

1350-1356 SLTST 100% predom gy, mar, sly calc, sly mic, hrd, bicky, sly drty; ss strgs

1356-1365 SLTST 100% predom gy, mar, noncalc, sly mic, hrd, bicky, sly drty; ss strgs

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (us/cm)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000





1365-1386 SLTST 100% gy-mar red, noncalc, sily mic, mnr pyr, hrd, blkcy, sily drty

1386-1392 SLTST 100% predom gy, mar-red, sily calc, sily mic, mnr pyr, hrd, blkcy

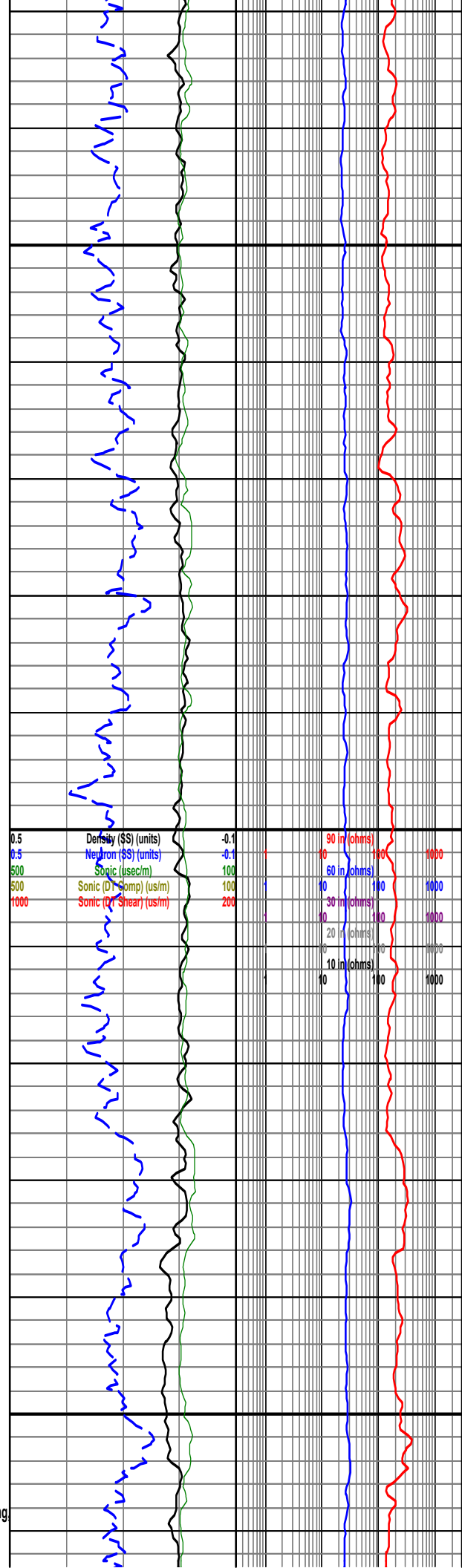
1392-1413 SLTST 100% predom gy, mar-red, cal vng, mic, mnr pyr, hrd, blkcy

1413-1422 SLTST 100% predom mar-gy, cal vng, mic, mnr pyr, hrd, blkcy, occ rust

1422-1428 SLTST 100% predom mar-gy, cal vng, mic, mnr pyr, hrd, blkcy; sa strgs

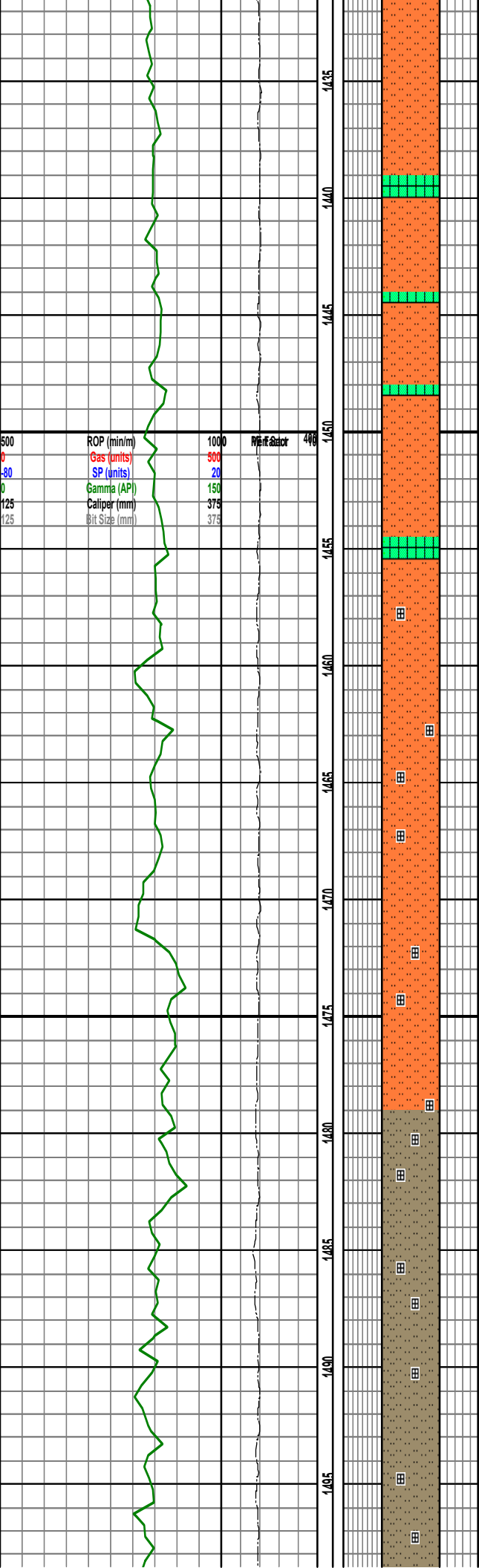
**WINDSOR GROUP  
- LIME-KILN BROOK FORMATION  
@ 1426.0m MD, 1426.0m TVD,  
-1280.7m SS**

1428-1449 SLTST 95% predom mar-gy, silc, cal vng, mic, mnr pyr, hrd, blkcy; SA 5% wht, semi-trnsp-trnsp, lrg xls



500	ROP (min/m)	1000	Perforator	496
0	Gas (units)	500		
-80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

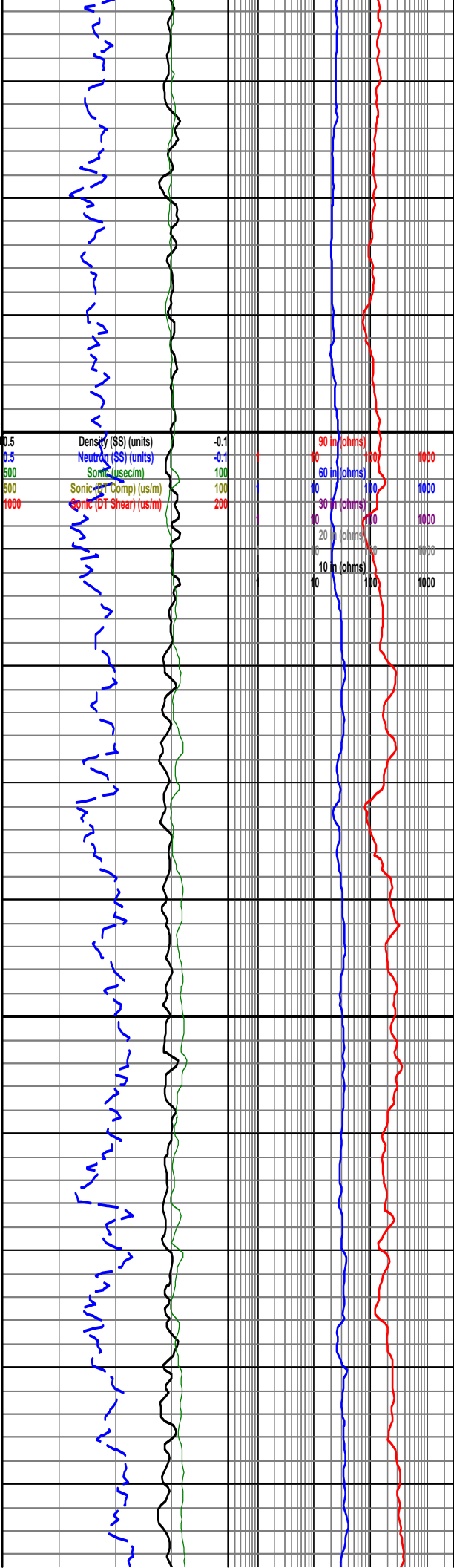
0.5	Density (SS) (units)	-0.1	90 in (ohms)	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	1000
500	Sonic (D) Comp (us/m)	100	30 in (ohms)	1000
500	Sonic (D) Comp (us/m)	100	20 in (ohms)	1000
1000	Sonic (D) Shear (us/m)	200	10 in (ohms)	1000

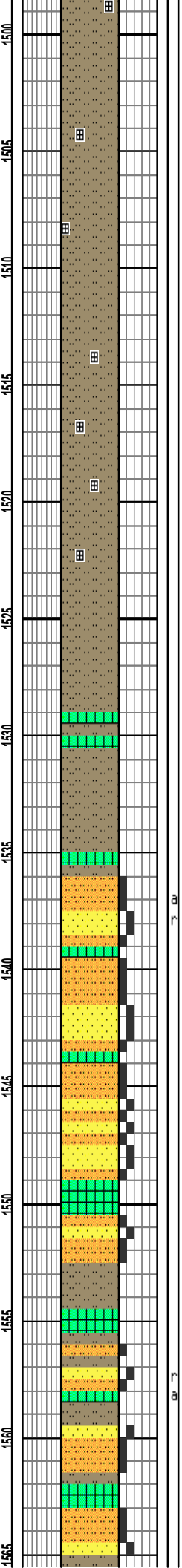
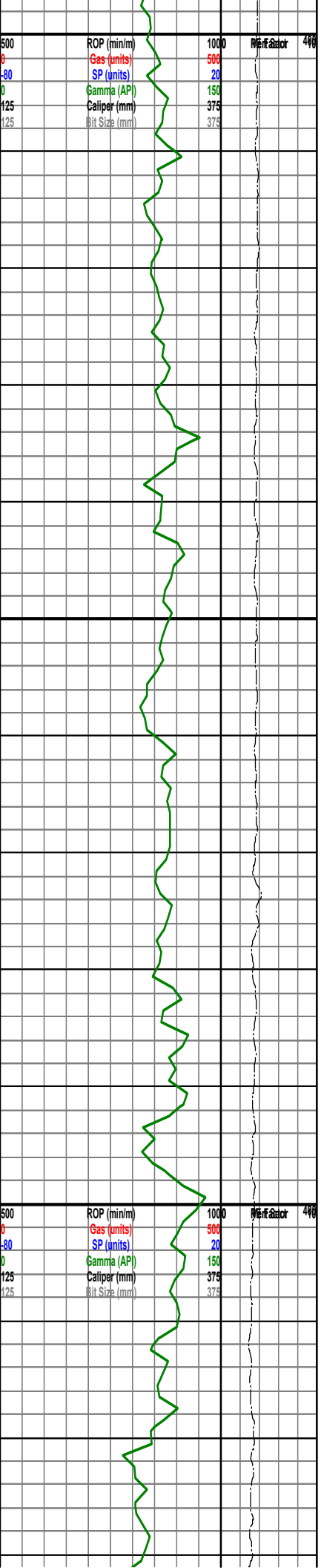


1449-1455 SLTST 95% predom mar-gy, silc, cal vng, mic, mnr pyr, hrd, blkcy, plty; SA 5% wht-org, sem trnsp-trnsp, lrg xls

1455-1479 SLTST 100% predom mar-gy, silc, cal vng, mic, mnr pyr, mod hrd, blkcy, plty; sa strgs

1479-1500 SLTST 100% gy, silc, cal vng, mic, mod hrd, blkcy, plty; sa strgs



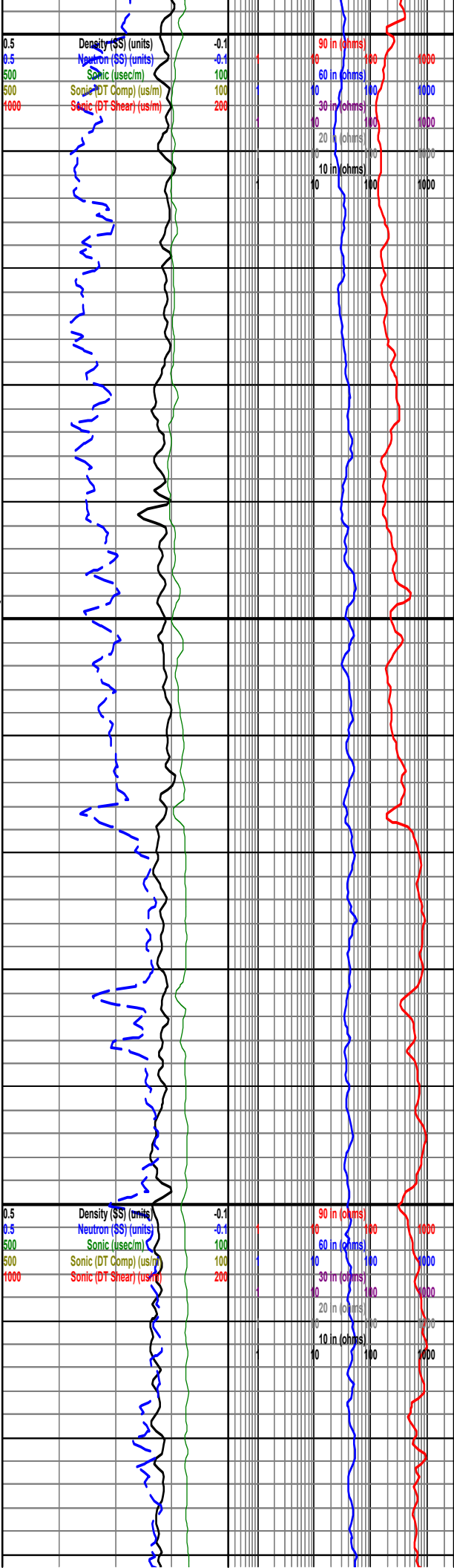


1500-1524 SLTST 100% dk gy, silc, cal vng, mic, mnr pyr, mod hrd, bicky, pty; sa strgs

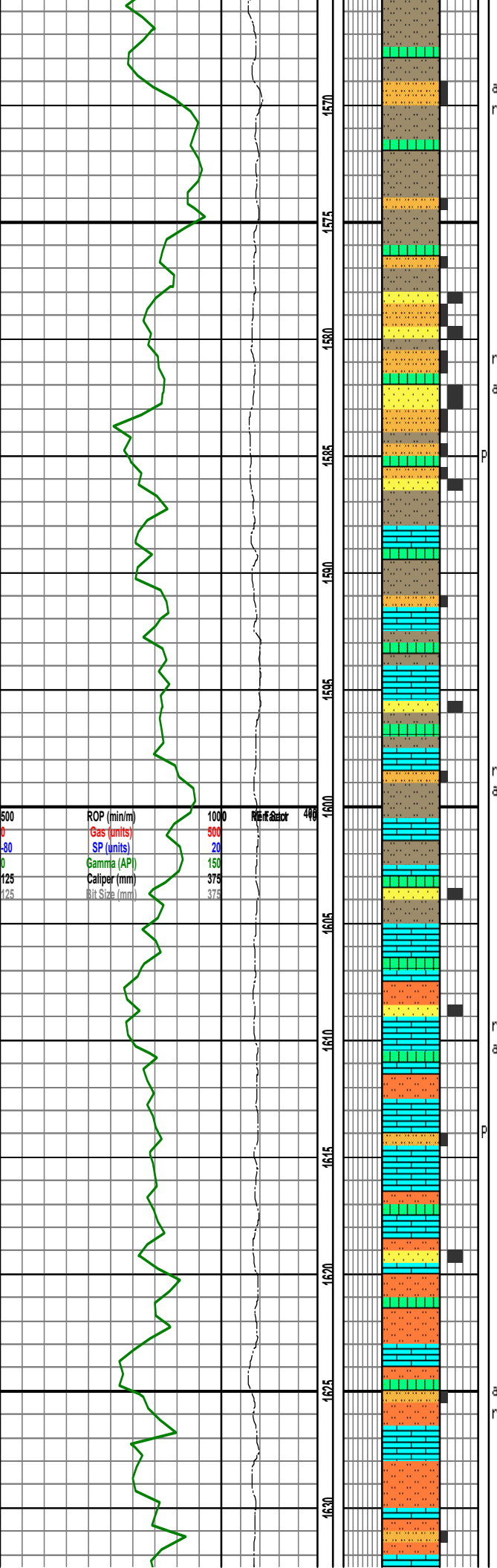
1524-1536 SLTST 95% dk gy, silc, cal vng, mic, mnr pyr, mod hrd, bicky, pty; SA 5% wht-orn, semi trnsp-trnsp, lrg xls

1536-1551 SS 90% mar, vf-fg, silc, mic, biot, mod srt, sa-sr, w cons; SLTST 5% dk gy, silc, noncalc, mic, mod hrd, bicky; SA 5% wht-orn, trnsp, lrg xls

1551-1566 SS 50% mar, vf-fg, silc, mic, biot, mod srt, sa-sr, w cons; SLTST 40% dk gy, silc, noncalc, mic, mod hrd, bicky; SA 10% wht-orn, semi trnsp







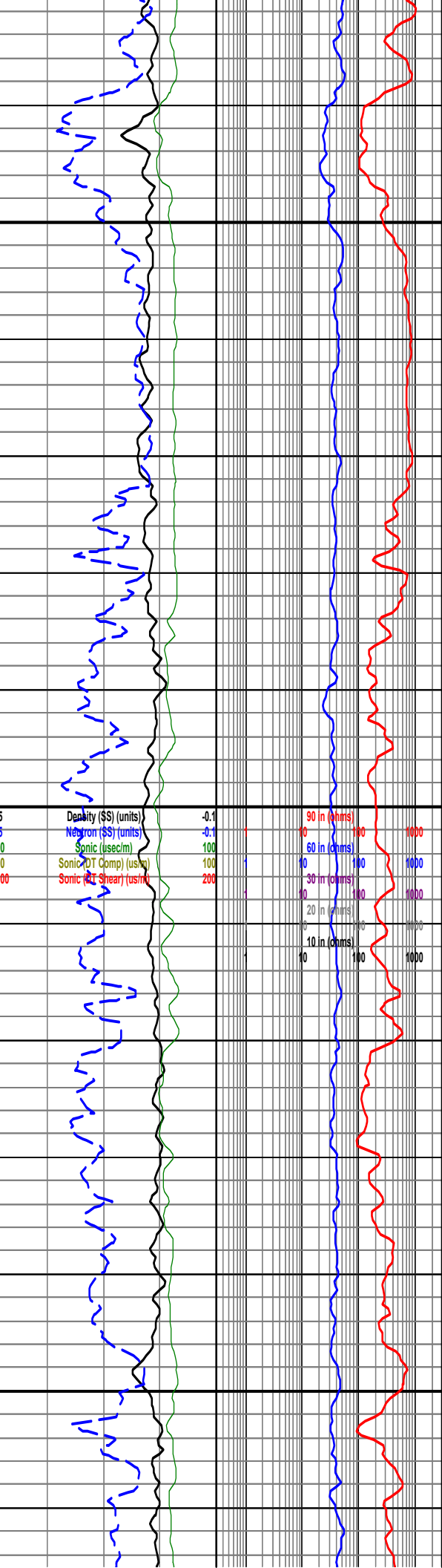
1566-1578 SLTST 90% dk gy, silc, noncalc, mic, mod sft, bicky; SS 5% mar, vfg, silc, mic, biot, mod srt, sa-sr, w cons; SA 5% wht-org, semi trnsp

1578-1587 SS 85% mar, vf-mg, silc, mic, biot, ply sr sa-sr, w cons, drty; SLTST 10% dk gy, silc, noncalc mic, mod hrd, bicky, plty; SA 5% wht-org, semi trnsp

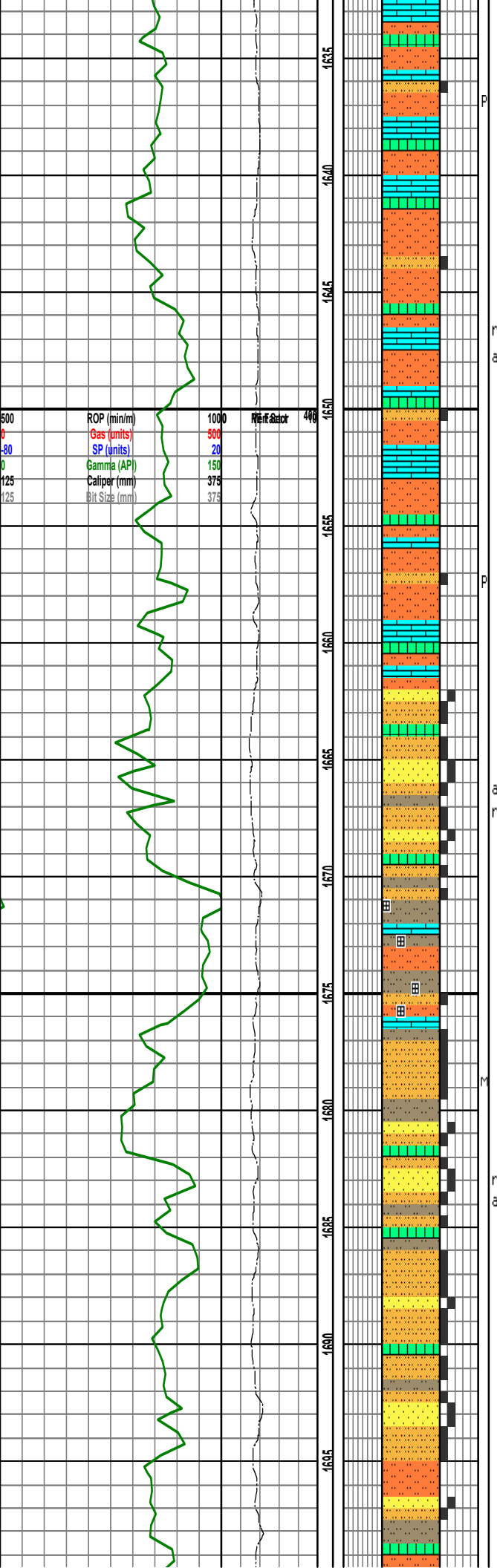
1587-1605 SLTST 55% dk gy, silc, noncalc, mic, mod hrd, bicky, plty; LST 35% lt gy, silc, noncalc, vf-mg, silc, mic, biot, ply srt, sa-sr, w cons, drty; SA 5% wht, semi trnsp

1605-1620 LST 60% lt gy, cal vng; SLTST 30% mar-lt gy, silc, noncalc, mic, mod hrd, bicky, plty; SS 5% mar, vf-mg, silc, mic, biot, ply srt, sa-sr, w cons, drty; SA 5% wht-org, semi trnsp

1620-1641 SLTST 50% mar-lt gy, silc, noncalc, mic, mod hrd, bicky, plty; LST 30% lt gy, cal vng; SS 10% mar, vfg, silc, mic, biot, ply srt, sa-sr, w cons, drty; SA 10% wht-org, semi trnsp; mnr red clay







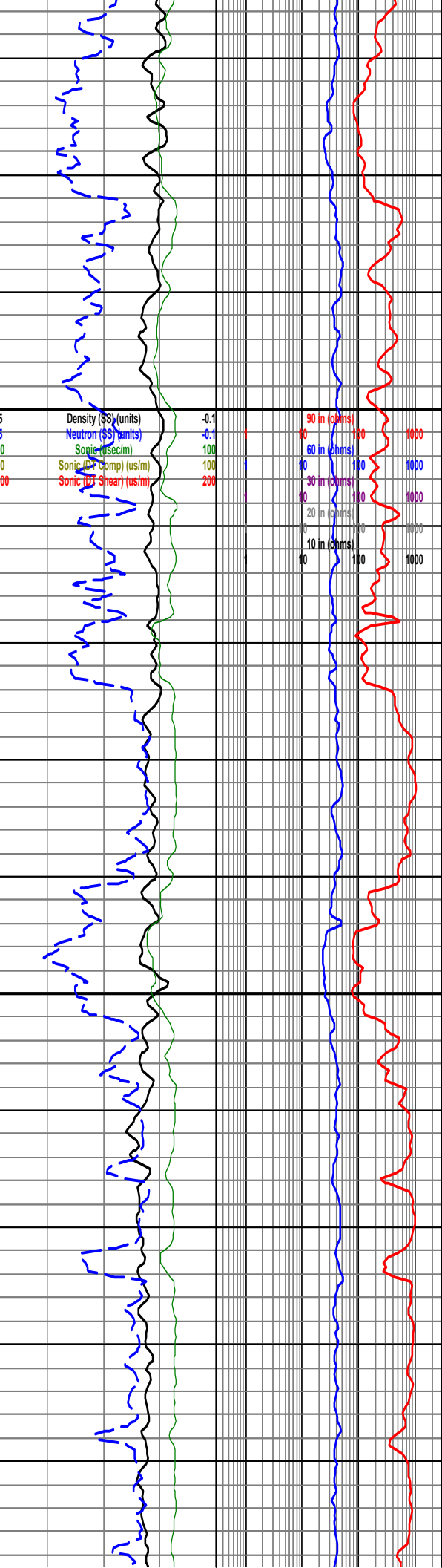
1641-1662 SLTST 50% mar-lt gy, silc, noncalc, mic, mod hrd, blkcy, pty; LST 30% lt gy, cal vng; SS 10% mar, vfg, silc, mic, biot, ply srt, sa-sr, w cons, drty; SA 10% wht-org, semi trnsp; mnr red clay, mnr wht clay

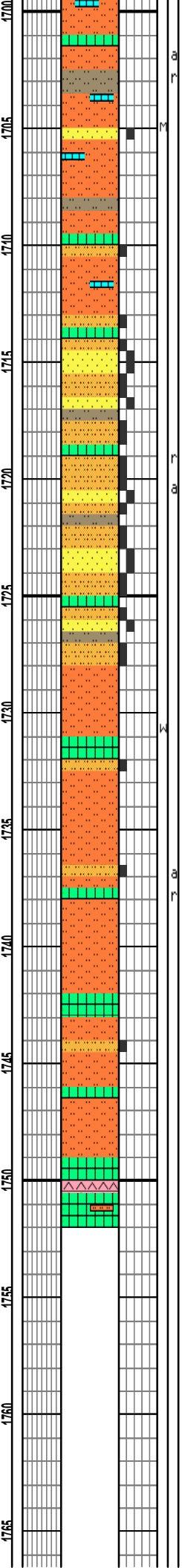
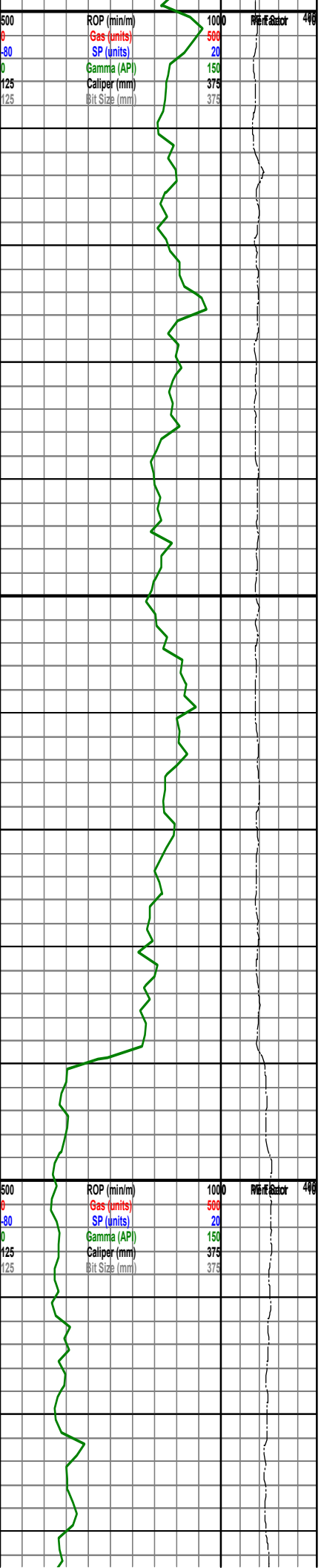
1662-1671 SS 85% mar, vf-fg, silc, mic, biot, mod srt, sa-sr, w cons; SLTST 10% dk gy, silc, sily calc, mic, mod hrd, blkcy; SA 5% wht-org, trnsp, lrg xls

1671-1677 SLTST 90% dk gy, mnr brick red, silc, cal vng, mic, mod hrd, blkcy, pty; LST 5% lt gy, cal vng; SS 5% mar, vfg, silc, mic, biot, ply srt, sa-sr, w cons, drty; sa strgs

1677-1695 SS 85% mar, vf-fg, silc, mic, biot, mod srt, sa-sr, w cons; SLTST 10% dk gy, silc, sily calc, mic, mod hrd, blkcy; SA 5% wht-org, trnsp, lrg xls

1695-1713 SLTST 75% mar-brick red (60%), dk gy (15%), silc, calc, mic, mod hrd, blkcy; SS 10% mar, vf-fg, silc, mic, biot, mod srt, sa-sr, w cons; SA 10% wht, trnsp, lrg xls; lst strgs





ar  
M  
ra  
W  
ar

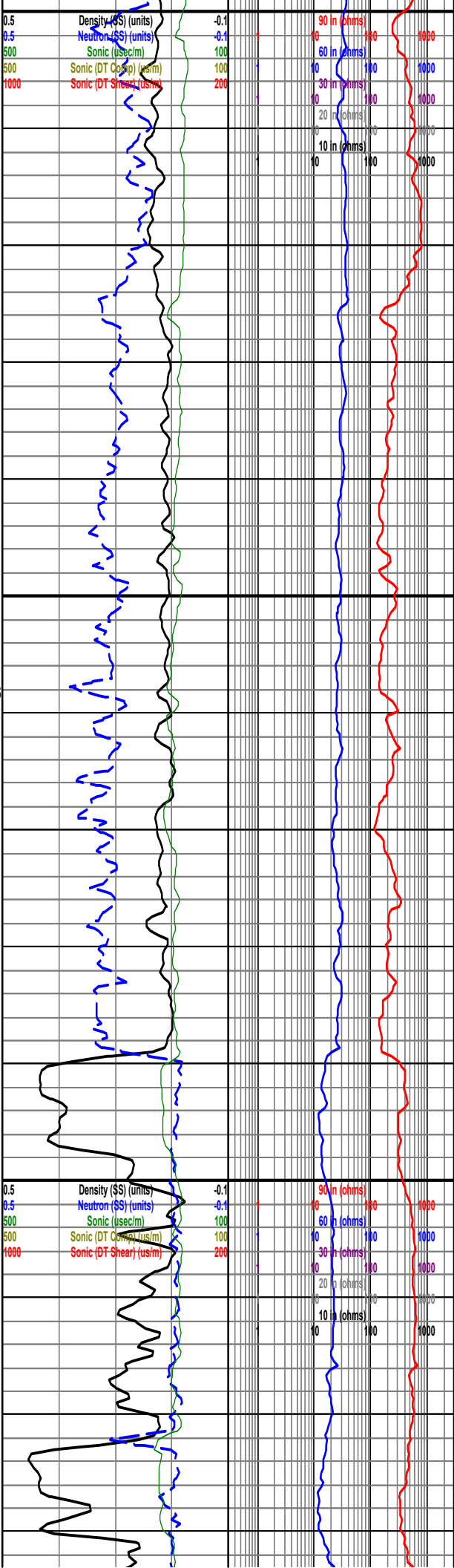
1713-1728 SS 85% mar, vf-fg, silc, mic, biot, mod srt, sa-sr, w cons; SLTST 10% dk gy, silc, sly calc, mic, mod hrd, bicky; SA 5% wht-org, trnsp, lrg xls

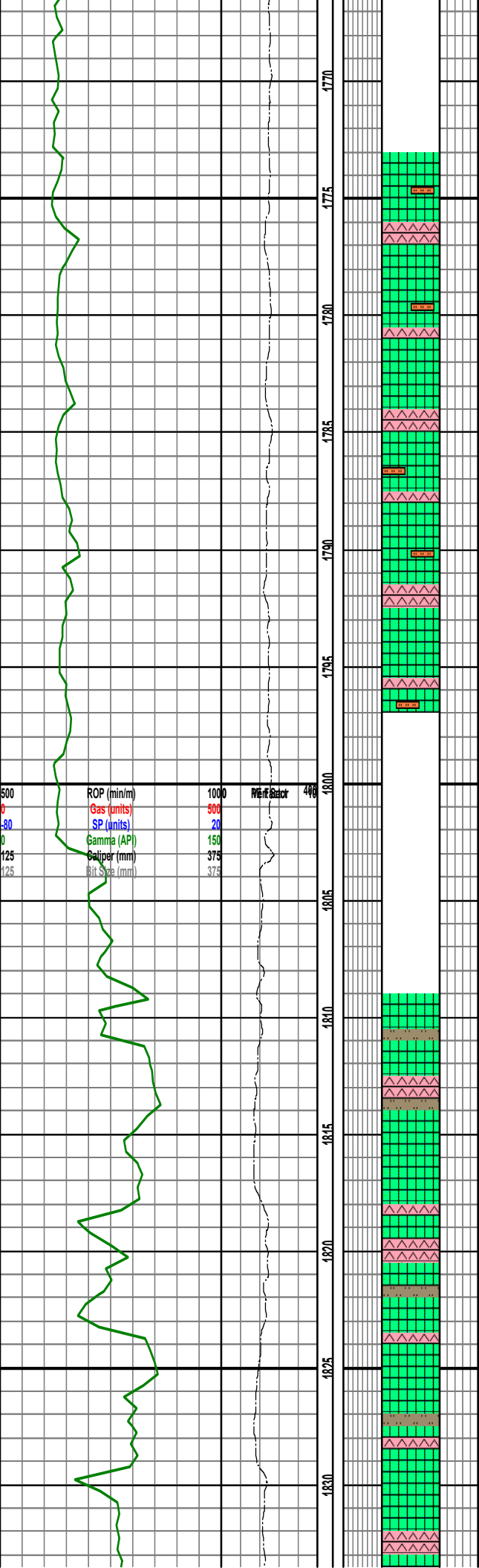
1728-1749 SLTST 75% lt mar, lt gy, cal vng, mic, v hrd, bicky, plty; SA 15% wht-org, trnsp, lrg xls; SS 10% lt mar, lt gy, vfg, silc, mic, w srt, sa-sr, w cons, drty; sa strgs, mnr brick red clay

**WINDSOR GROUP  
- PUGWASH MINE FORMATION  
@ 1745.0m MD, 1745.0m TVD,  
-1599.7m SS**

1749-1752 SA 75% wht, semi trnsp, powdered-lrg xls; ANHY 25% wht, powdered; siltst strgs

1752-1773 Sample missing from this interval





1751-1773 Sample missing from this interval

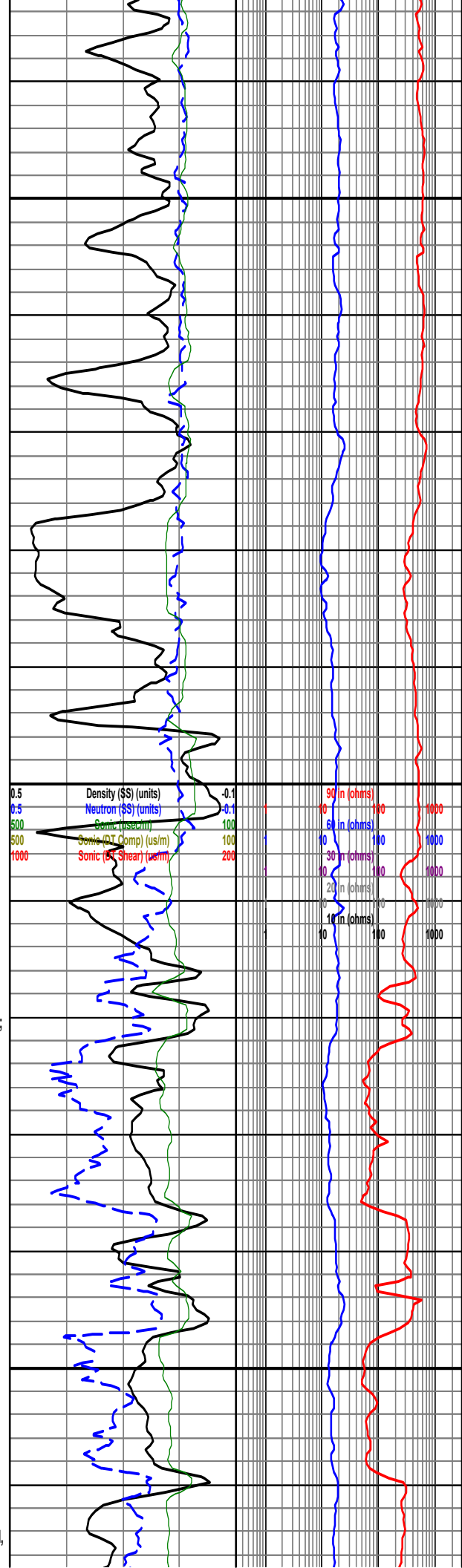
1773-1797 SA 75% wht-clr, gy, org, semi trnsp-trnsp, powdered-lrg xls; ANHY 25% wht, powdered; sltst strgs

1797-1809 Sample missing from this interval

1797-1809 Sample missing from this interval

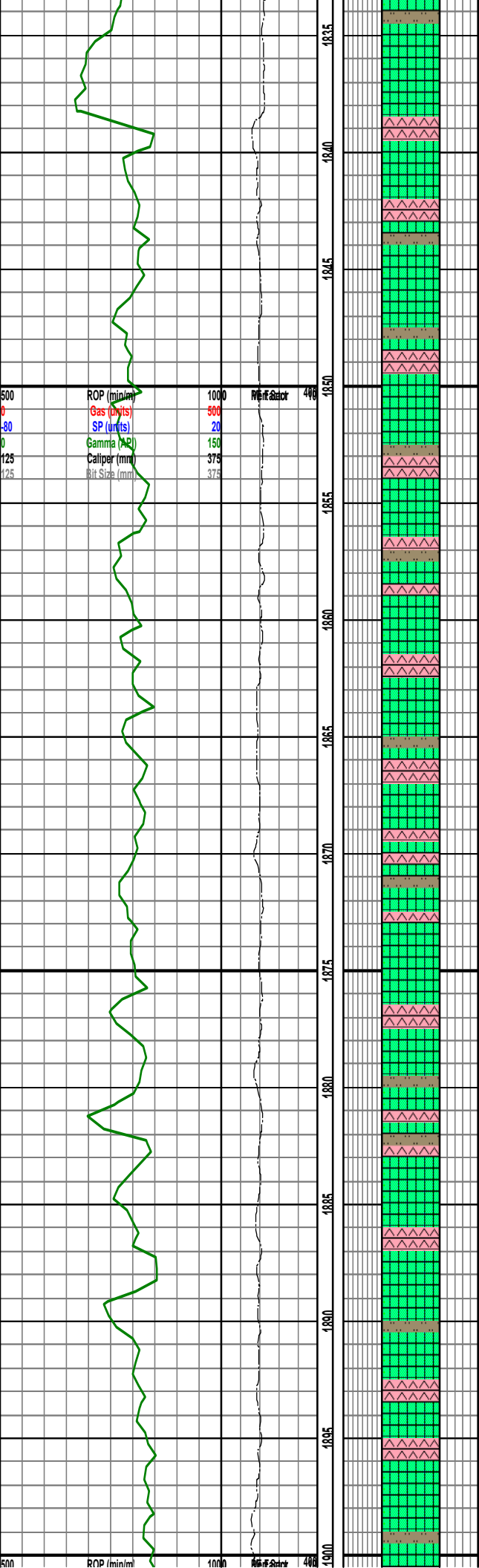
1809-1830 SA 70% lt brn, org, semi trnsp-trnsp, powdered-lrg xls, drty; ANHY 20% wht, powdered; SLTST 10% med gy, noncalc, mic, v hrd, blkcy

1830-1851 SA 75% lt brn, org, semi trnsp-trnsp, powdered-lrg xls, drty; ANHY 20% wht-brn, powdered; SLTST 5% med gy, noncalc, mic, v hrd, blkcy



500	ROP (min/m)	1000	APR 18 2008
0	Gas (units)	500	
80	SP (units)	20	
0	Gamma (API)	150	
125	Caliper (mm)	375	
125	Bit Size (mm)	375	

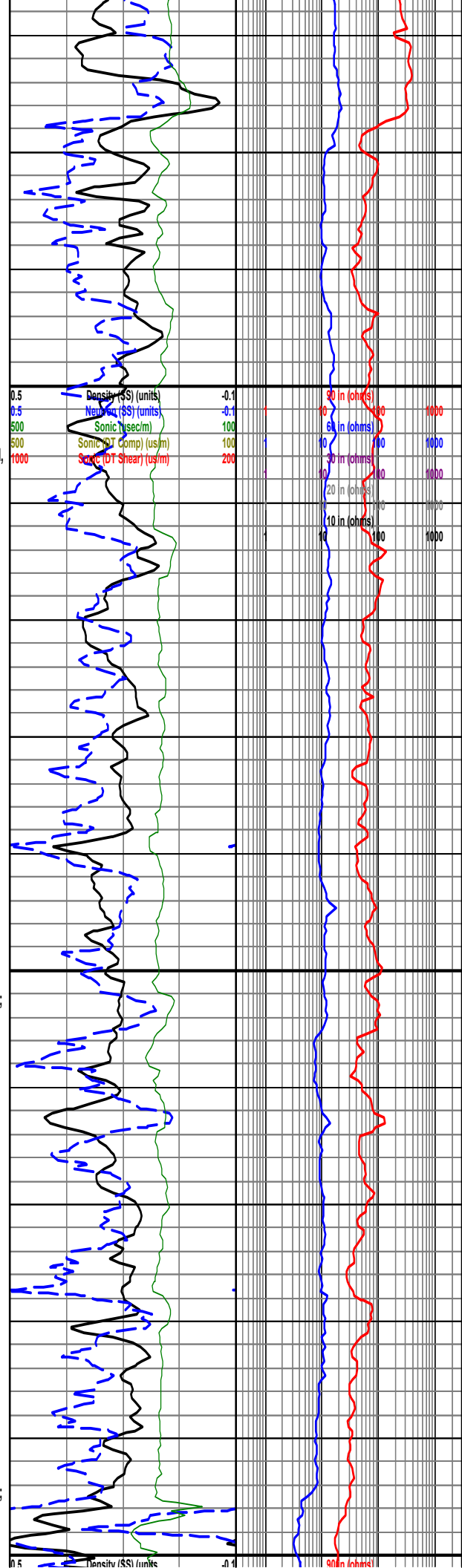
0.5	Density (SS) (units)	-0.1	90 in (ohms)
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)
500	Sonic (us/m)	100	30 in (ohms)
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)
1000	Sonic (5% Shear) (us/m)	200	10 in (ohms)

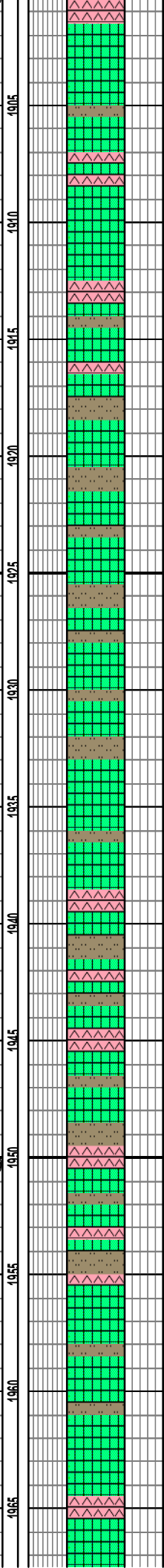
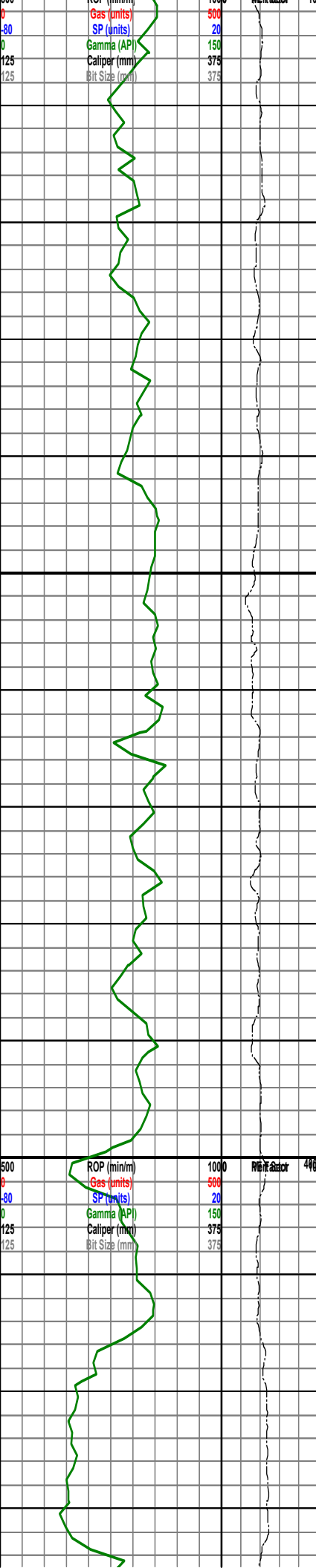


1851-1875 SA 75% lt brn, org, semi trnsp-trnsp, powdered-lrg xls, drty; ANHY 20% wht-brn, powdered; SLTST 5% med gy, noncalc, mic, v hrd, blicky

1875-1896 SA 75% lt brn, org, semi trnsp-trnsp, powdered-lrg xls, drty; ANHY 20% wht, powdered; SLTST 5% med gy, noncalc, mic, v hrd, blicky

1896-1917 SA 70% lt brn, org, semi trnsp-trnsp, powdered-lrg xls, drty; ANHY 20% wht, powdered; SLTST 10% med gy, noncalc, mic, v hrd, blicky

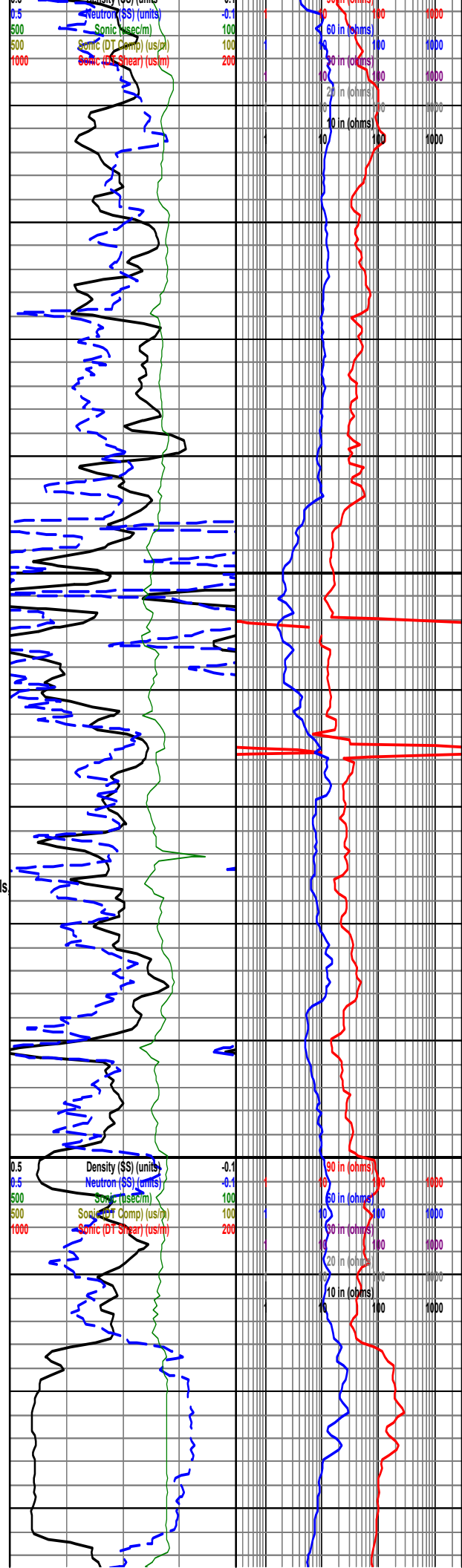


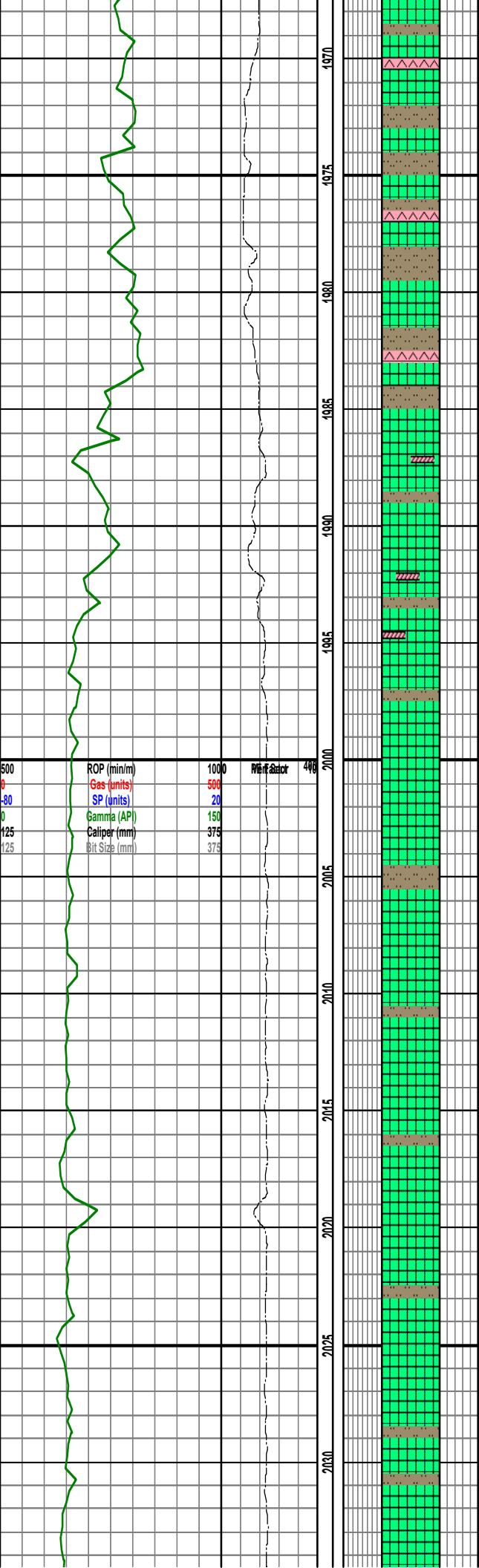


1917-1938 SA 50% lt brn, org, semi trnsp-trnsp, powdered-lrg xls, v drty; SLTST 30% med gy, noncalc, mic, v hrd, blkky; ANHY 20% wht, powdered

1938-1956 SA 50% lt brn, org, op, powdered- lrg xls v drty; SLTST 30% med gy, noncalc, mic, v hrd, blkky; ANHY 20% wht, powdered

1956-1971 SA 90% lt gy, org, op, powdered xls, v drty; SLTST 5% med gy, noncalc, mic, hrd, blkky; ANHY 5% wht, powdered





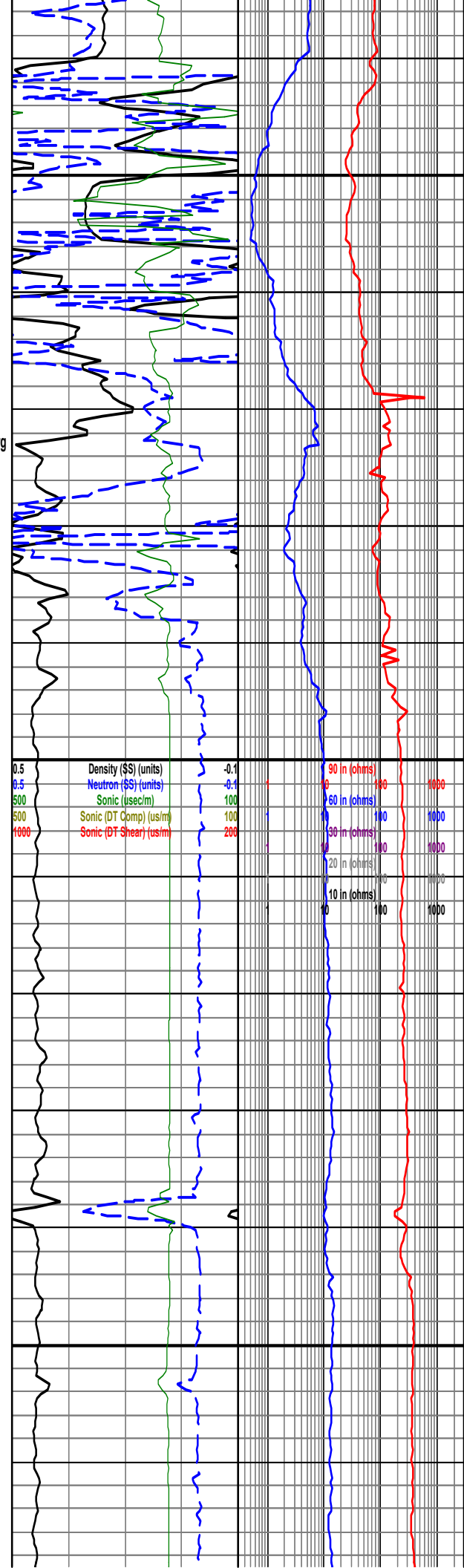
1971-1986 SA 50% lt gy, org, op, powdered xls, v drty; SLTST 45% med-dk gy, noncalc, mic, hrd, blkcy; ANHY 5% wht, powdered

1986-1995 SA 90% wht-lt gy, org, op, powdered-lrg xls, v drty; SLTST 10% med-dk gy, noncalc, mic, hrd, blkcy; anhy strgs

1995-2019 SA 90% wht-lt gy, semi trnsp-trnsp, powdered-lrg xls, v drty; SLTST 10% med-dk gy, noncalc, mic, hrd, blkcy

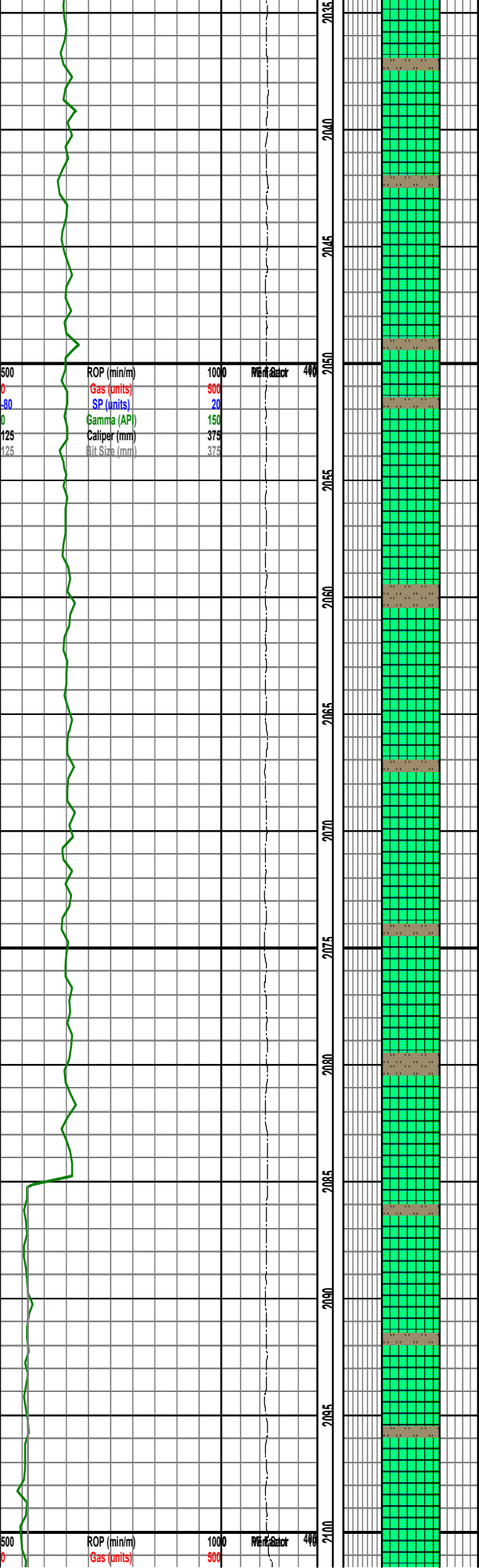
2019-2040 SA 90% wht-lt gy, semi trnsp-trnsp, powdered-lrg xls, v drty; SLTST 10% med-dk gy, noncalc, mic, hrd, blkcy

500	ROP (min/m)	1000	Ref Factor	40%
0	Gas (units)	500		
80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		



0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000



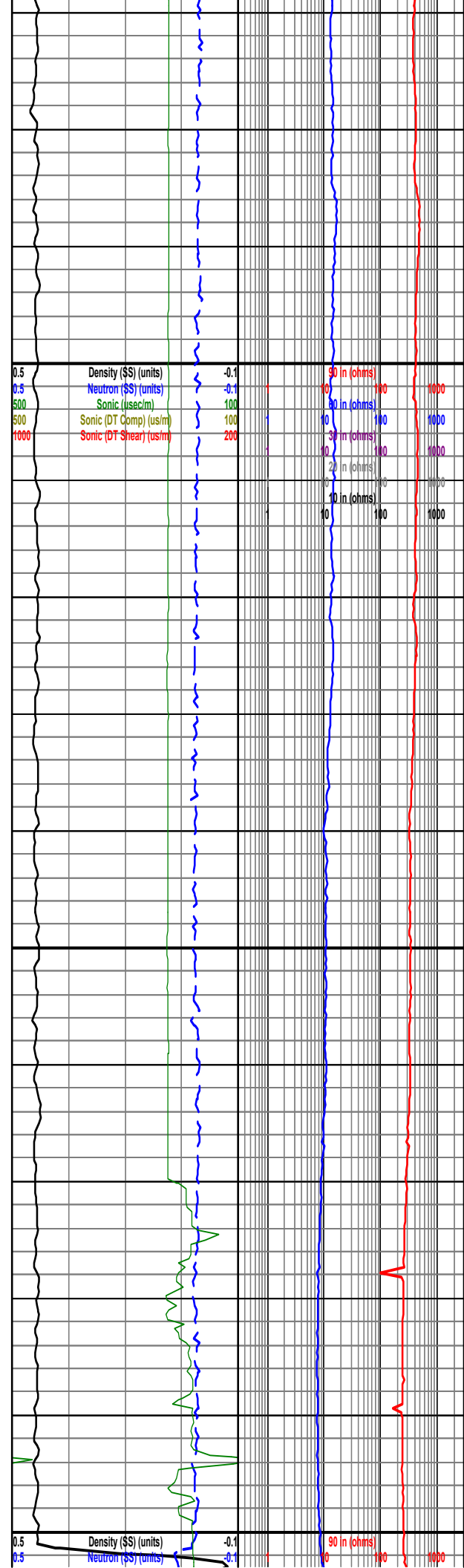


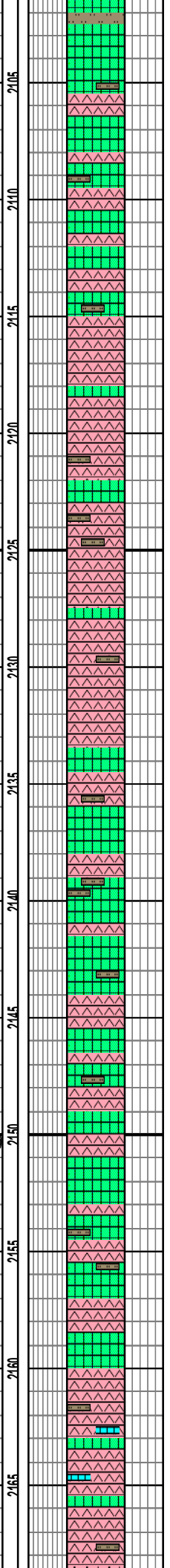
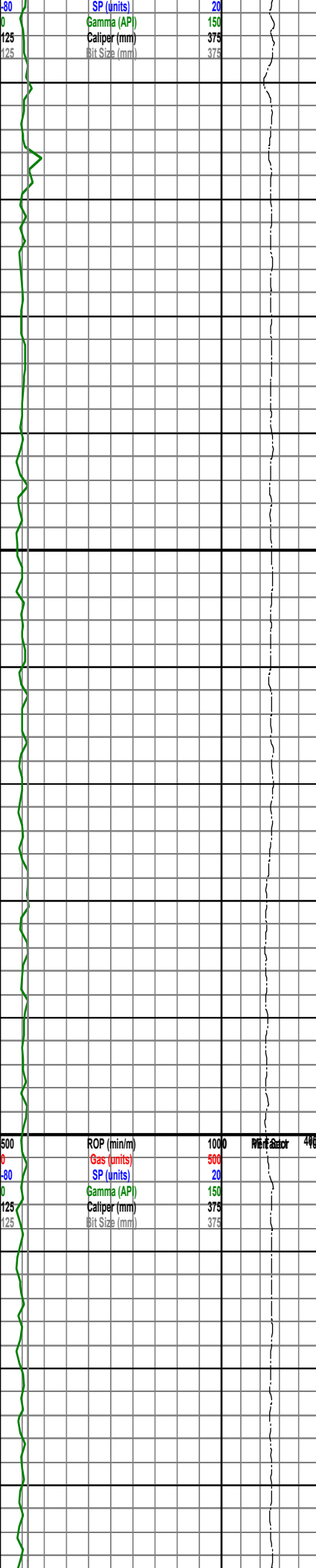
2040-2064 SA 90% wht-lt gy, semi trnsp-trnsp, powdered-lrg xls, v drty; SLTST 10% med-dk gy, noncalc, mic, hrd, blkcy

2064-2088 SA 90% wht-lt gy, semi trnsp-trnsp, powdered-lrg xls, v drty; SLTST 10% med-dk gy, noncalc, mic, hrd, blkcy

2088-2103 SA 90% wht-lt gy, semi trnsp-trnsp, powdered-lrg xls, v drty; SLTST 10% med-dk gy, noncalc, mic, hrd, blkcy

**WINDSOR GROUP**  
**-UPPERTON FORMATION**  
**@2100.5m MD, 2100.5m TVD,**





**-1955.2m SS**

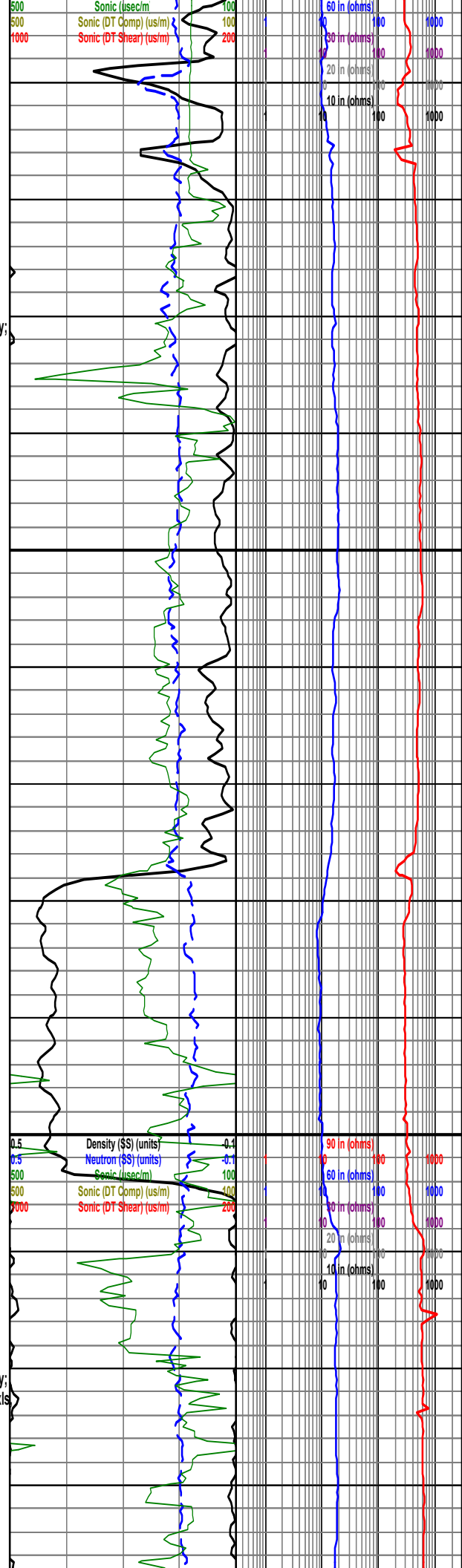
2103-2115 SA 60% wht-lt gy, semi trnsp-trnsp, powdered-lrg xls, v drty; ANHY 40% wht-lt gy, powdered xls, drty; sltst strgs

2115-2136 ANHY 85% wht-lt gy, powdered xls, drty; SA 15% wht-lt gy, semi trnsp-trnsp, powdered-lrg xls, v drty; sltst strgs

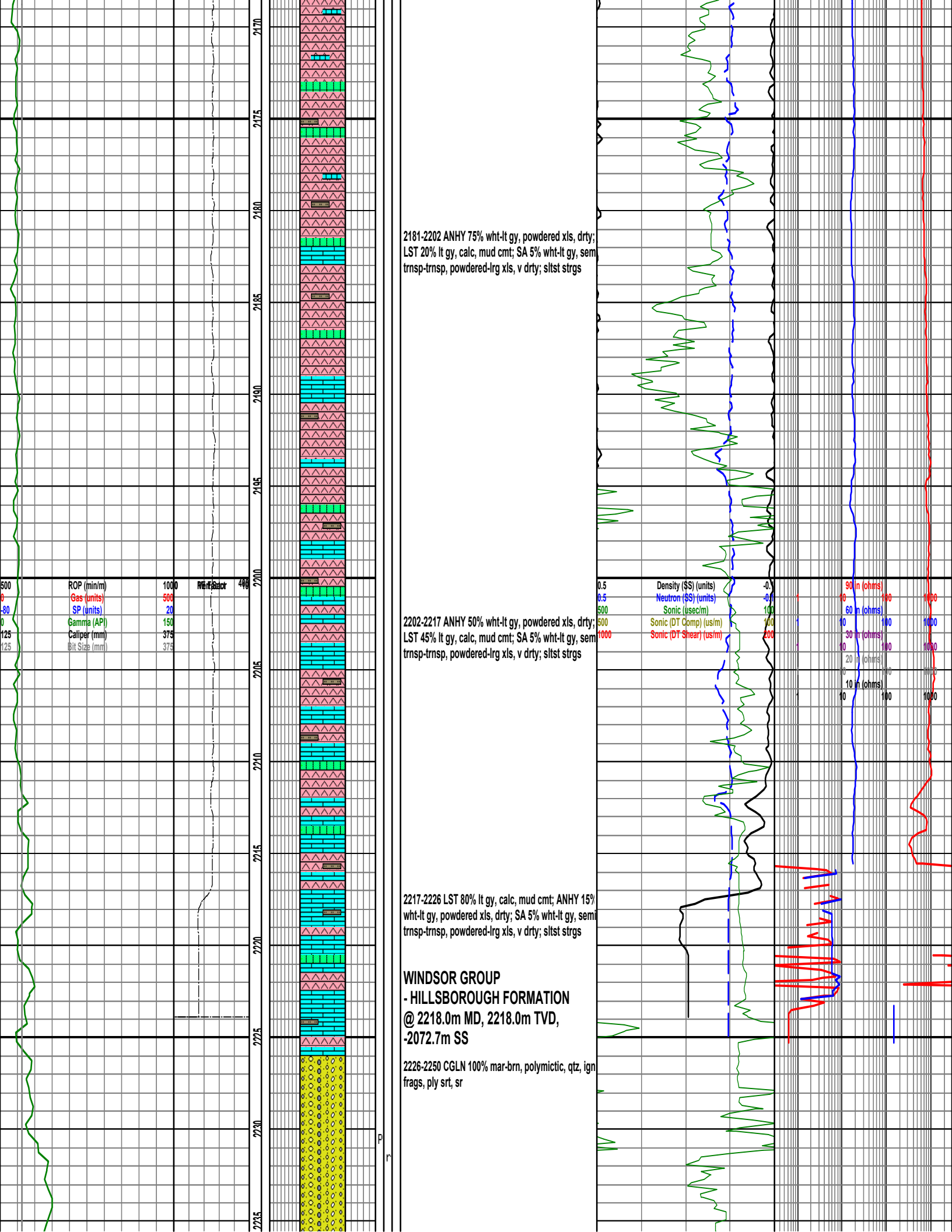
2136-2160 SA 60% wht-lt gy, semi trnsp-trnsp, powdered-lrg xls, v drty; ANHY 40% wht-lt gy, powdered xls, drty; sltst strgs

**WINDSOR GROUP  
- MACUMBER/GAYS RIVER  
FORMATIONS  
@ 2150.5m MD, 2150.5m TVD,  
-2005.2m SS**

2160-2181 ANHY 95% wht-lt gy, powdered xls, drty; SA 5% wht-lt gy, semi trnsp-trnsp, powdered-lrg xls v drty; sltst strgs; lst strgs







2181-2202 ANHY 75% wht-lt gy, powdered xls, drty;  
 LST 20% lt gy, calc, mud cmt; SA 5% wht-lt gy, sem  
 trnsp-trnsp, powdered-lrg xls, v drty; slst strgs

2202-2217 ANHY 50% wht-lt gy, powdered xls, drty;  
 LST 45% lt gy, calc, mud cmt; SA 5% wht-lt gy, sem  
 trnsp-trnsp, powdered-lrg xls, v drty; slst strgs

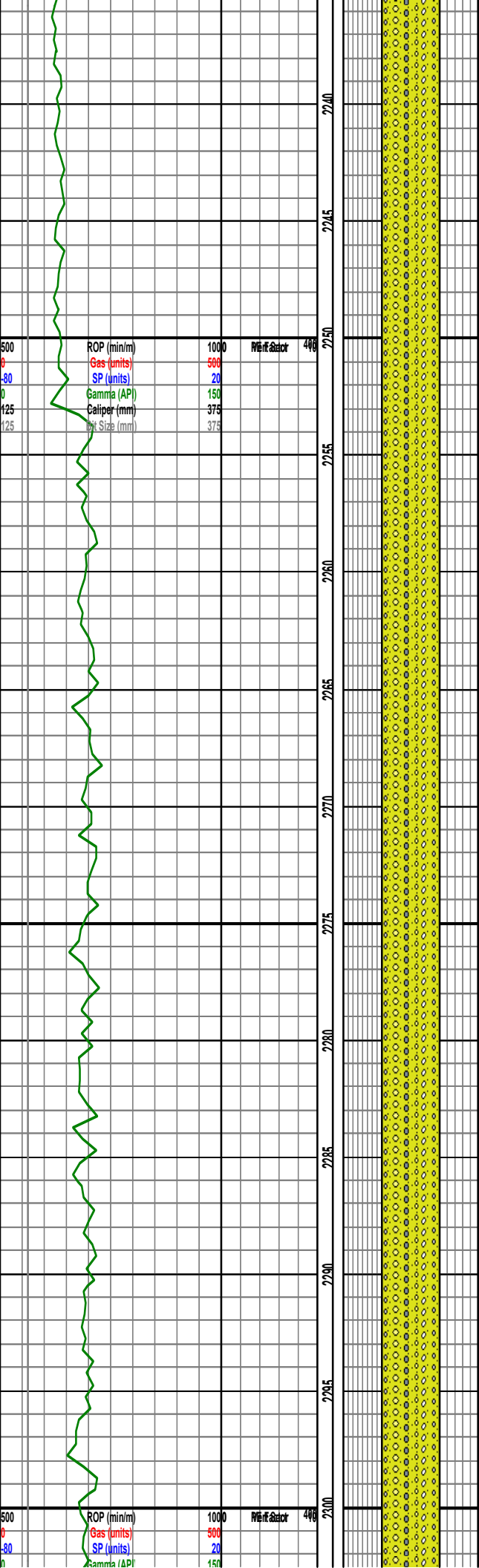
2217-2226 LST 80% lt gy, calc, mud cmt; ANHY 15%  
 wht-lt gy, powdered xls, drty; SA 5% wht-lt gy, sem  
 trnsp-trnsp, powdered-lrg xls, v drty; slst strgs

**WINDSOR GROUP**  
**- HILLSBOROUGH FORMATION**  
**@ 2218.0m MD, 2218.0m TVD,**  
**-2072.7m SS**

2226-2250 CGLN 100% mar-brn, polymictic, qtz, ign  
 frags, ply srt, sr

500	ROP (min/m)	1000	Rate of Penetration
0	Gas (units)	500	Gas
80	SP (units)	20	Spontaneous Potential
0	Gamma (API)	150	Gamma Ray
125	Caliper (mm)	375	Caliper
125	Bit Size (mm)	375	Bit Size

0.5	Density (SS) (units)	-0.1	90 in (ohms)
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)
500	Sonic (usec/m)	100	30 in (ohms)
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)

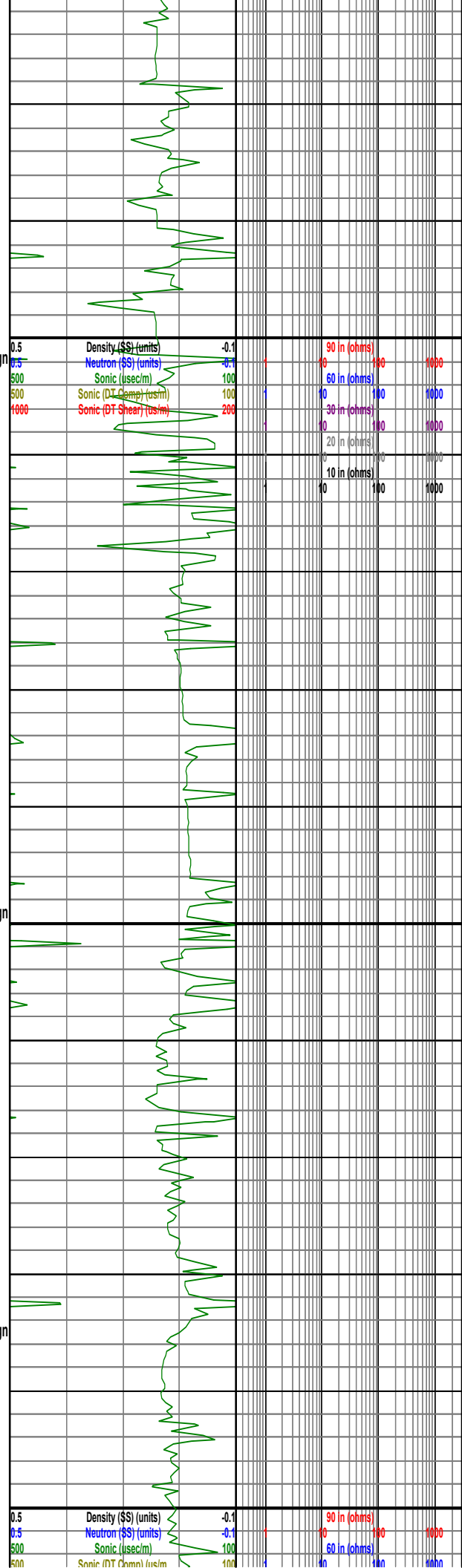


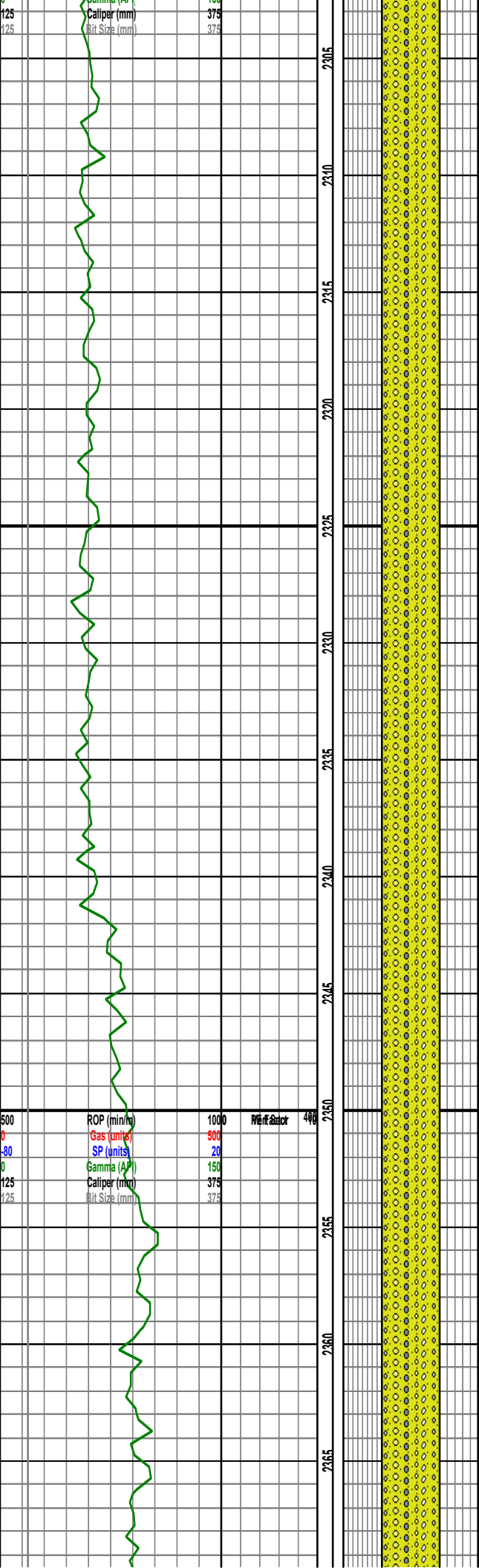
2250-Intermediate Casing Point

2250-2274 CGLN 100% mar-brn, polymictic, qtz, ign frags, ply srt, sr; wht cement, sily calc

2274-2292 CGLN 100% mar-brn, polymictic, qtz, ign frags, ply srt, sr; wht cement, sily calc

2292-2310 CGLN 100% mar-brn, polymictic, qtz, ign frags, ply srt, sr; wht cement, sily calc



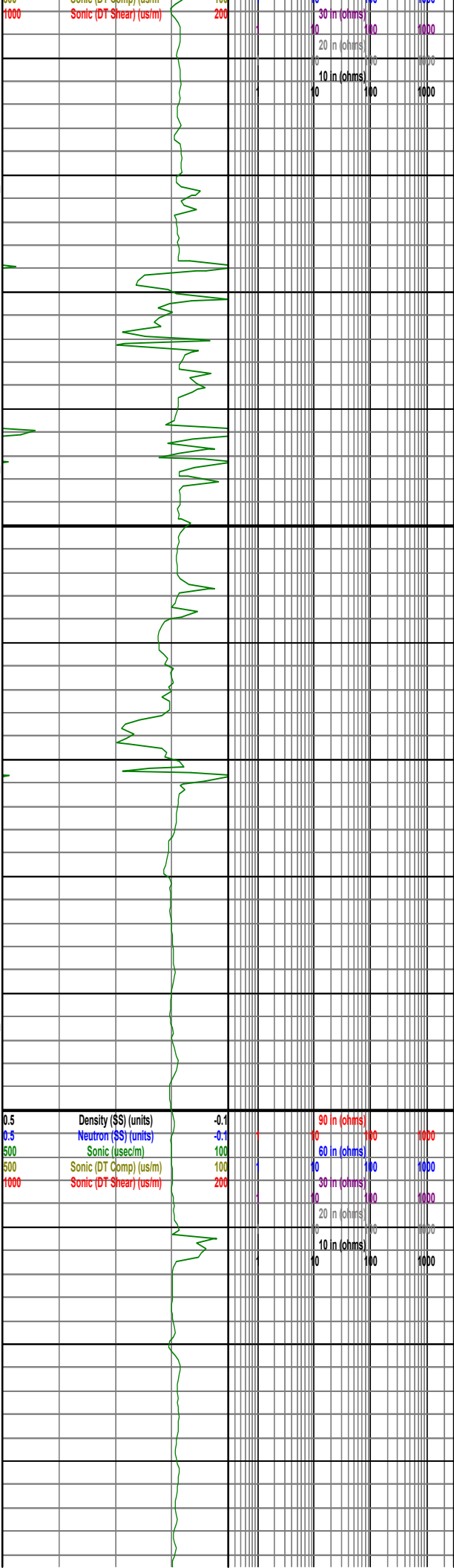


2310-2322 CGLN 100% mar-brn, polymictic, qtz, ign frags, ply srt, sr; wht cement, sly calc

2322-2346 CGLN 100% mar-brn, polymictic, qtz, ign frags, ply srt, sr; wht cement, sly calc

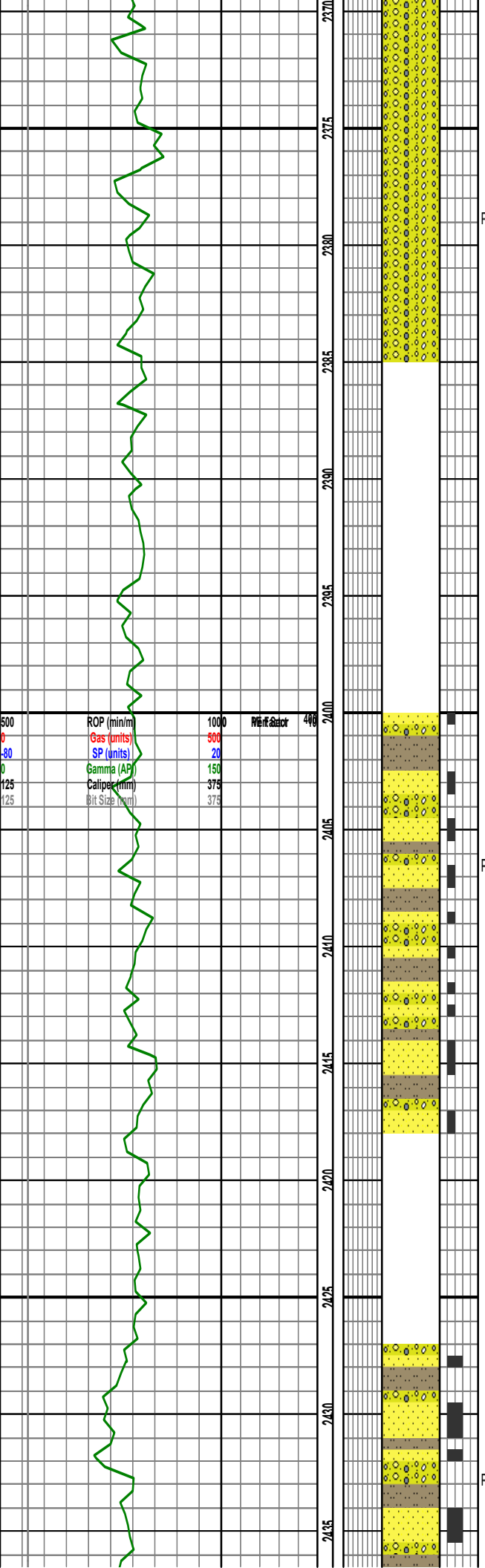
2342-Intermediate Casing Point 2

2346-2373 CGLN 100% mar-brn, polymictic, qtz, ign frags, ply srt, sr; wht cement, sly calc



500	ROP (min/hr)	1000	Weight Factor	400
0	Gas (units)	500		
80	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	0	100	1000
500	Sonic (usec/m)	100	60 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	30 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10	100	1000
			20 in (ohms)	100	1000
			10 in (ohms)	100	1000
			0	100	1000



2373-2385 CGLN 100% mar-brn, polymictic, qtz, ign frags, ply srt, sr, w cons mar sltst cmt; unconcs wht cly, sily calc

Sample missing from interval 2385-2400

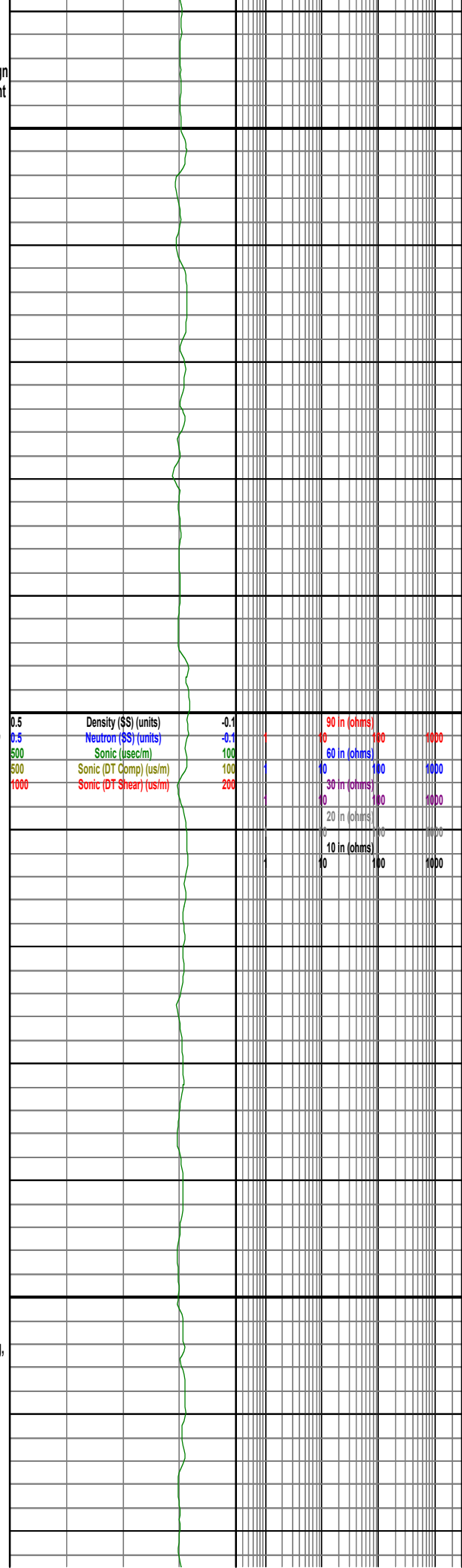
Sample missing from interval 2385-2400

2400-2418 SS 40% dk gy, fg, qtz, biot, mod srt, sa, well cons; SLTST 30% mar-brn, noncalc, blkcy; CGLN 30% mar-brn, polymictic, qtz, ign frags, ply srt, sr, w cons mar sltst cmt

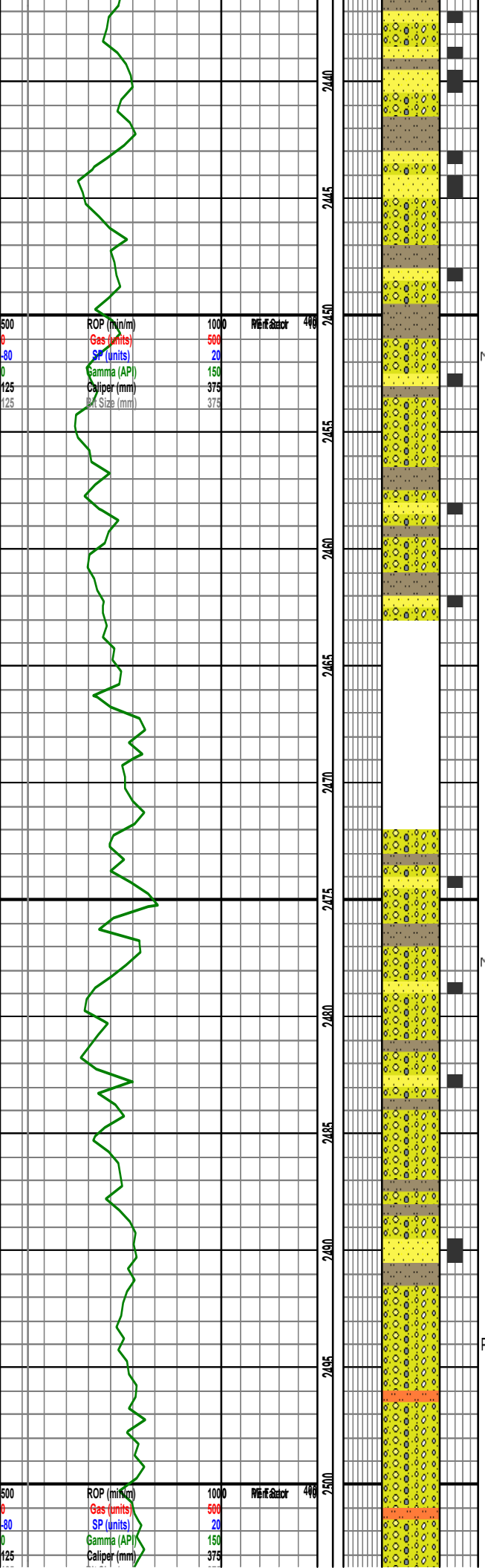
Sample missing from interval 2418-2427

Sample missing from interval 2418-2427

2427-2445 SS 40% (mar-brn 35%) (dk gy 5%), f-mg, qtz, biot, noncalc, mod srt, sa, well cons; SLTST 30% mar-brn, noncalc, blkcy; CGLN 30% mar-brn, polymictic, qtz, ign frags, ply srt, sr, w cons mar sltst cmt; mnr unconcs wht cly



0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000



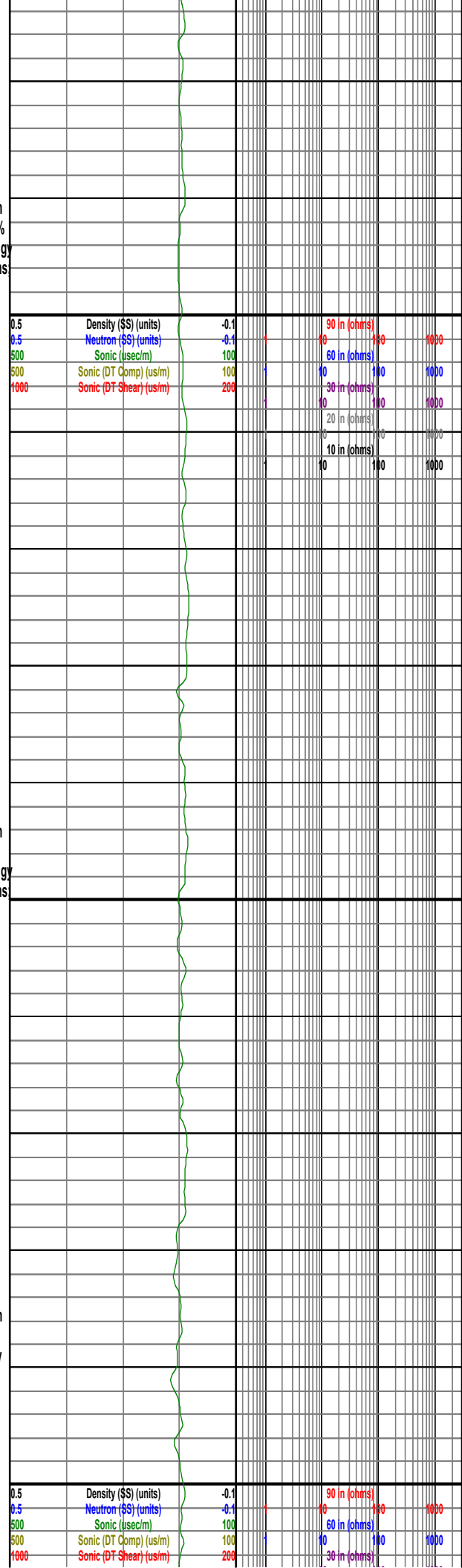
2445-2463 CGLN 60% mar-brn, polymictic, qtz, ign frags, ply srt, sr, w cons mar sltst cmt; SLTST 30% mar-brn, cal vng, bicky; SS 10% (mar-brn 5%) (dk gy 5%), f-mg, qtz, biot, sly calc, mod srt, sa, well cons mnr unconcs wht cly

Sample missing from interval 2463-2472

Sample missing from interval 2463-2472

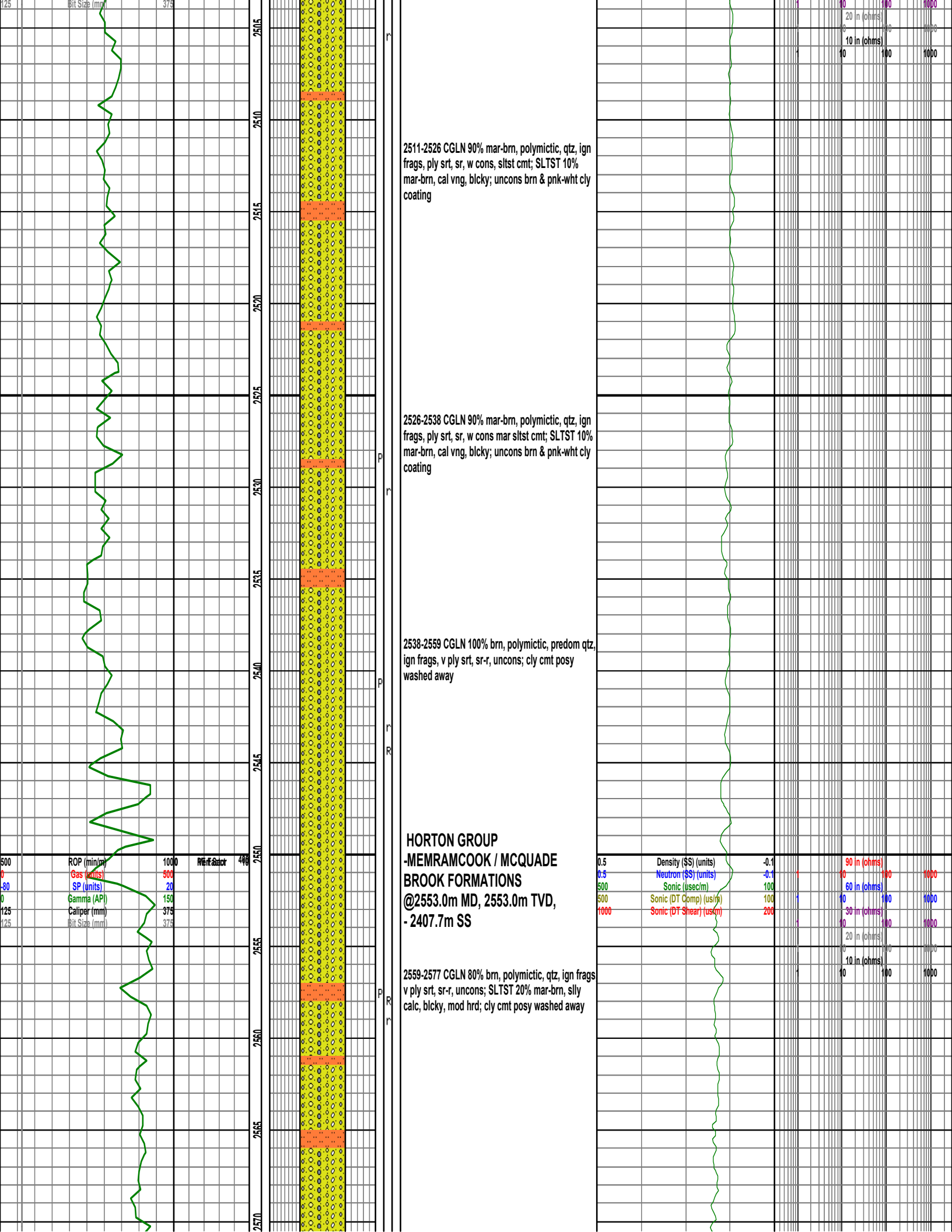
2472-2493 CGLN 70% mar-brn, polymictic, qtz, ign frags, ply srt, sr, w cons, sltst cmt; SLTST 20% mar-brn, cal vng, bicky; SS 10% (mar-brn 5%) (dk gy 5%), f-mg, qtz, biot, sly calc, mod srt, sa, well cons mnr unconcs brn cly

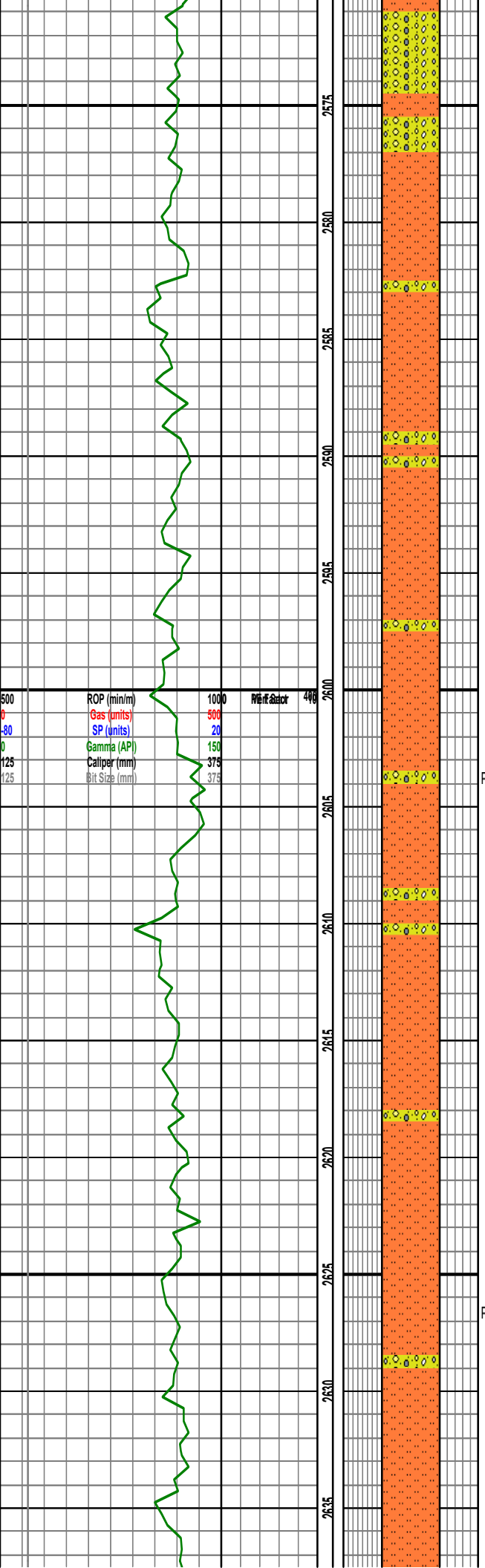
2493-2511 CGLN 90% mar-brn, polymictic, qtz, ign frags, ply srt, sr, w cons. sltst cmt; SLTST 10% mar-brn, cal vng, bicky; unconcs brn & pnk-wht cly coating



500	ROP (min/m)	1000	Weight Factor	40%
0	Gas (units)	500		
0	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		
125	Bit Size (mm)	375		

500	ROP (min/m)	1000	Weight Factor	40%
0	Gas (units)	500		
0	SP (units)	20		
0	Gamma (API)	150		
125	Caliper (mm)	375		



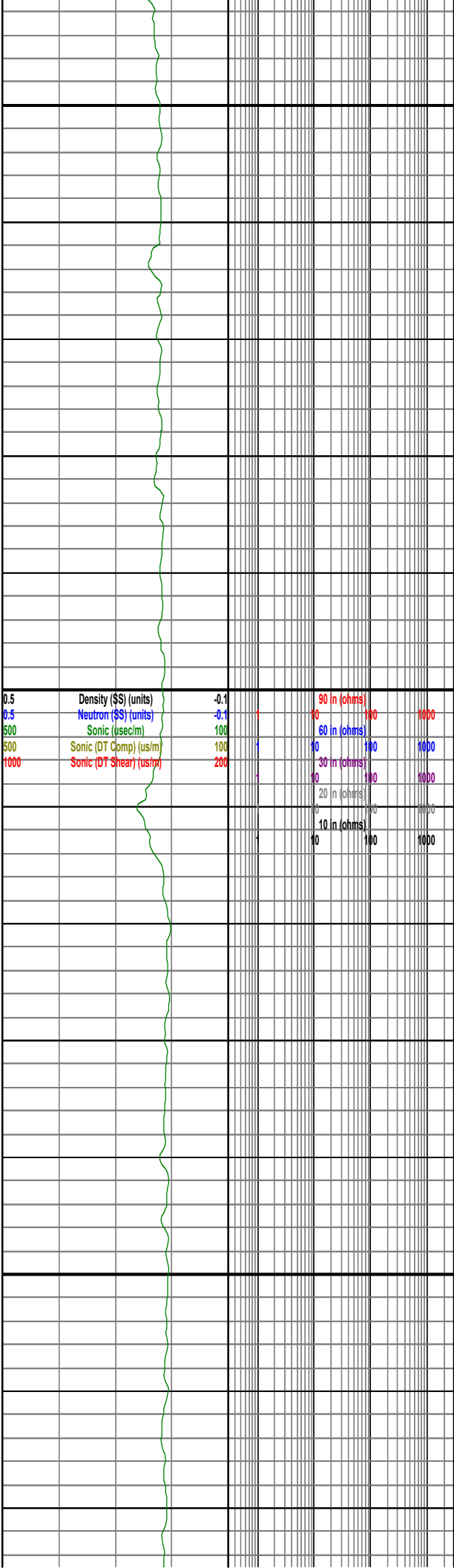


2577-2595 SLTST 90% dk brn, v calc, blkcy, v drty, high cly content, sft; CGLN 10% brn, polymictic, qt; ign frags, v ply srt, sr-r, uncons

2595-2616 SLTST 90% dk brn, v calc, blkcy, v drty, high cly content, sft; CGLN 10% brn, polymictic, qt; ign frags, v ply srt, sr-r, uncons

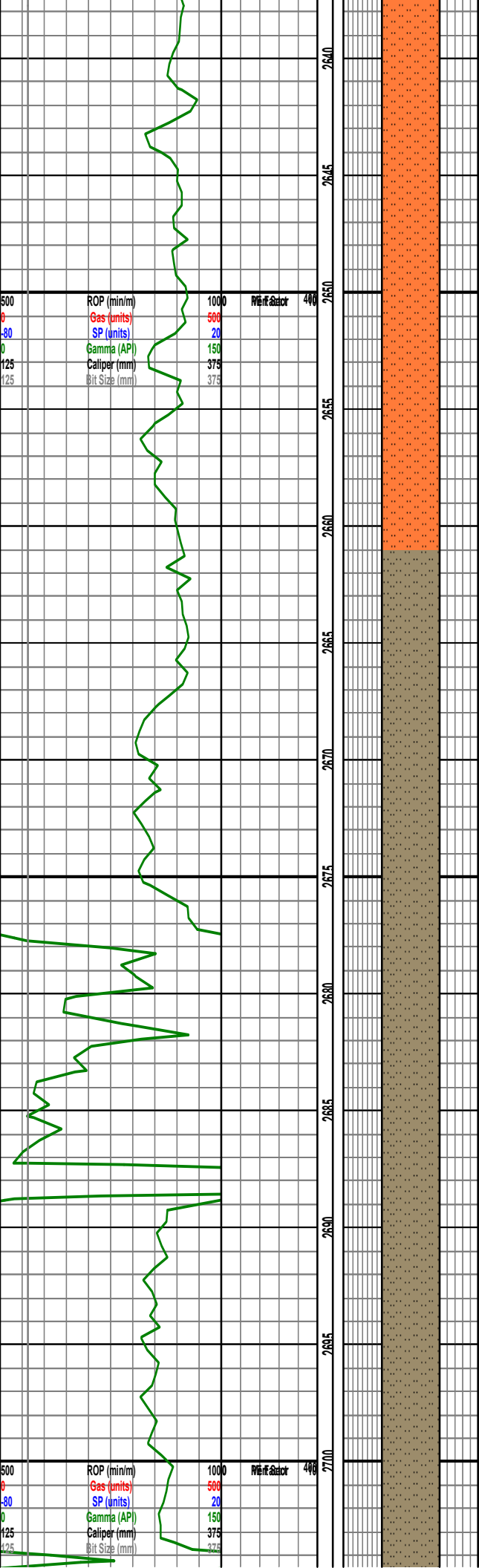
2616-2637 SLTST 95% dk brn, v calc, blkcy, v drty, high cly content, mod hrd; CGLN 5% brn, polymictic, qt, ign frags, v ply srt, sr-r, uncons

500	ROP (min/m)	1000	RW:R:G:Dr: 40%
0	Gas (units)	500	
80	SP (units)	20	
0	Gamma (API)	150	
125	Caliper (mm)	375	
125	Bit Size (mm)	375	



0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (usec/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	100	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	100	1000



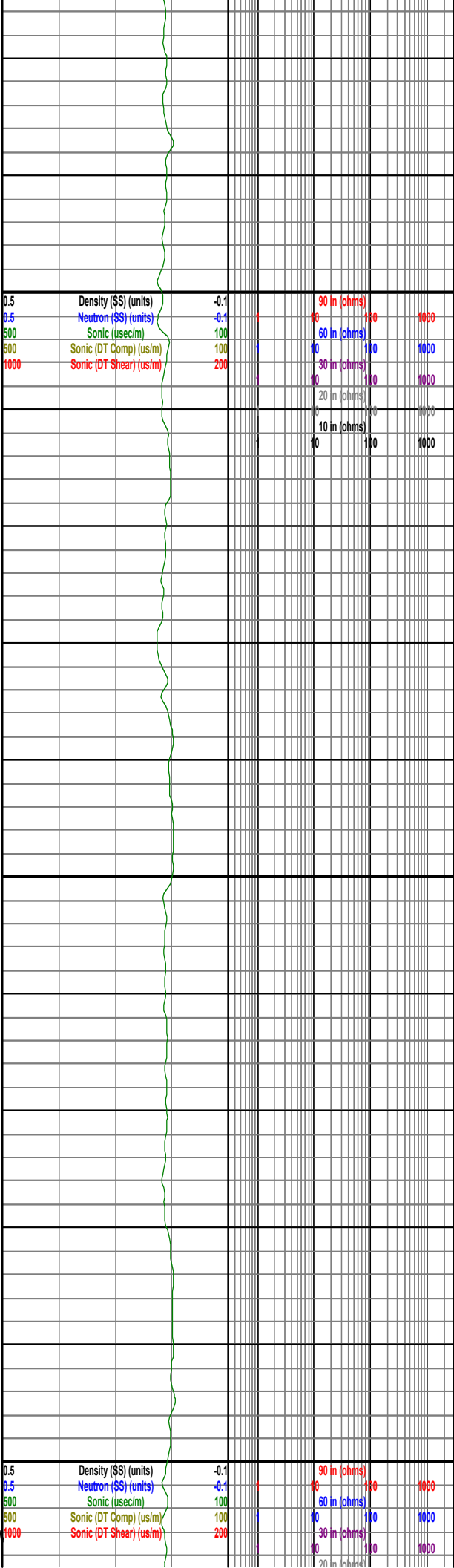


2637-2661 SLTST 100% dk brn, v calc, blkcy, v drty  
high cly content, mod hrd

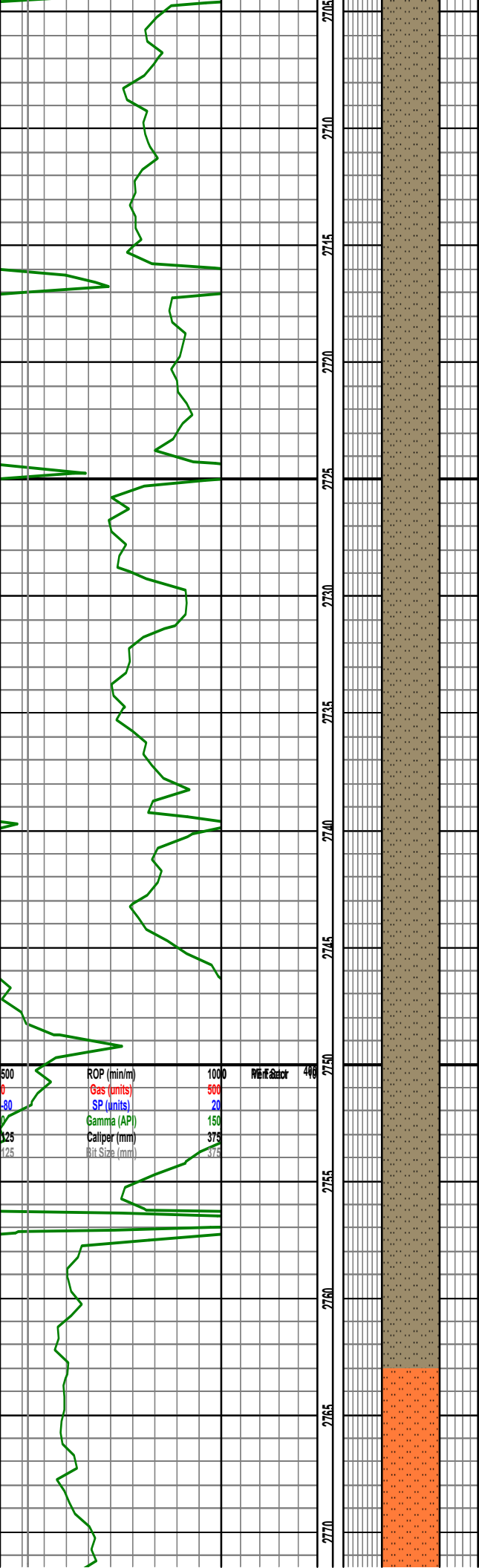
2661-2682 SLTST 100% dk gy-brn, v calc, blkcy, v drty,  
high cly content, mod hrd

2682-2703 SLTST 100% dk gy-brn, v calc, blkcy, v drty,  
some gy cly content, mod hrd

2703-2721 SLTST 100% dk gy-brn, v calc, pyr, blkcy  
v drty, some gy cly content, mod hrd



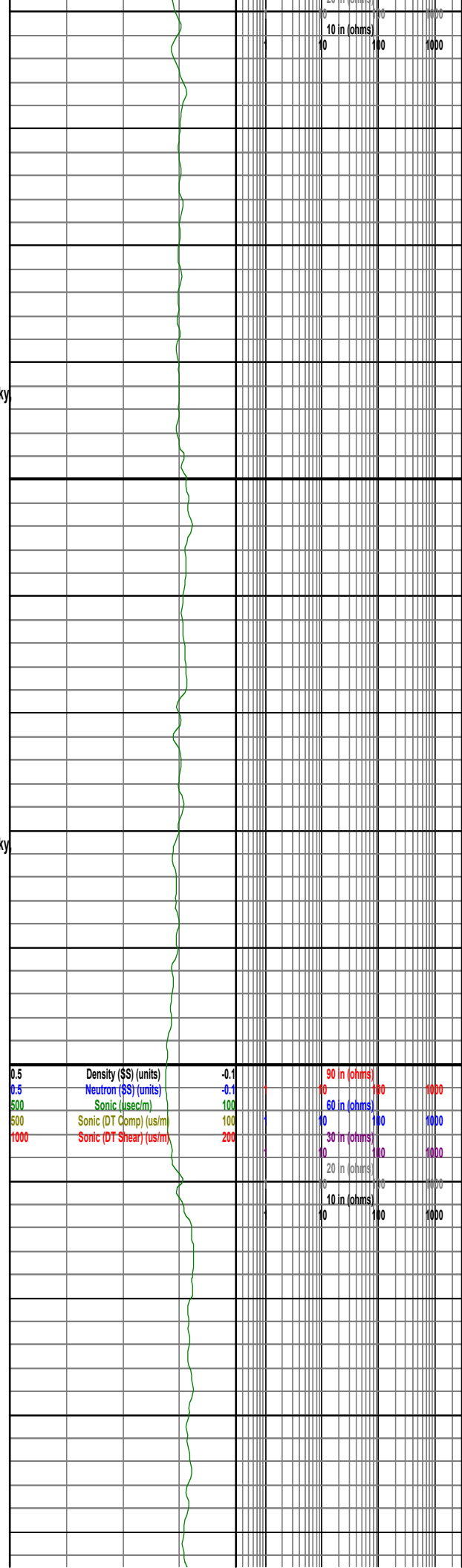




2721-2740 SLTST 100% dk gy-brn, v calc, pyr, blkky, v drty, some gy cly content, mod hrd

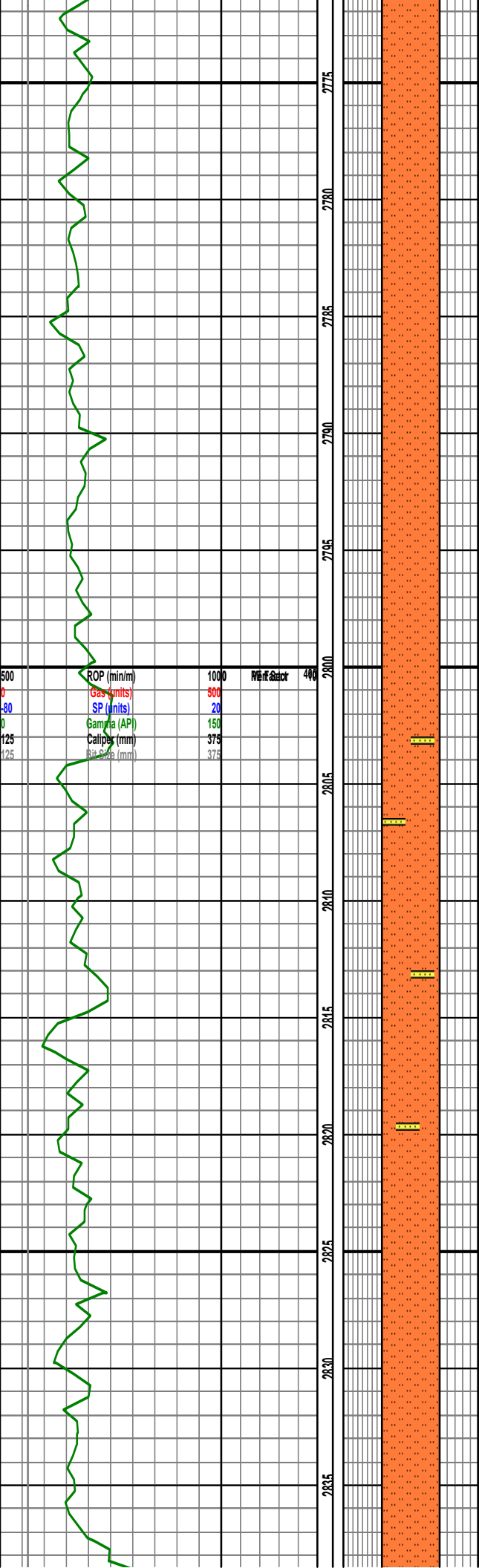
2740-2763 SLTST 100% dk gy-brn, v calc, pyr, blkky, v drty, some gy cly content, mod hrd

2763-2781 SLTST 100% dk mar-brn, v calc, pyr, blkky, silty hrd



500	ROP (min/m)	1000	Ref	400
0	Gas (units)	500		
80	SP (units)	20		
	Gamma (AP)	150		
325	Caliper (mm)	375		
125	Bit Size (mm)	375		

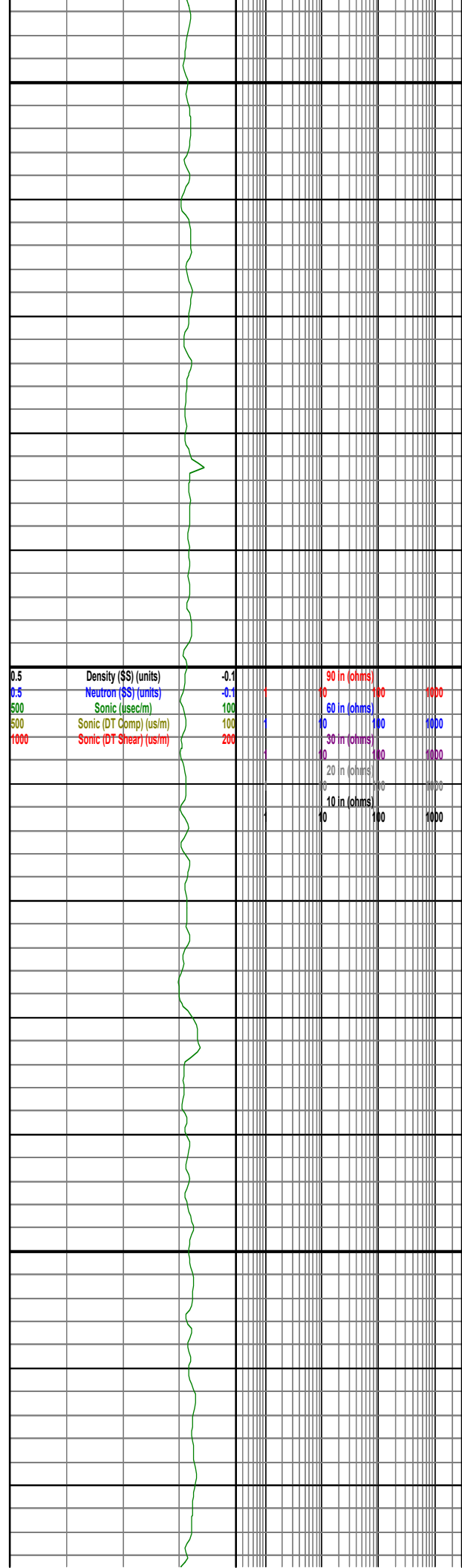
0.5	Density (SS) (units)	-0.1	90 in (ohms)		
0.5	Neutron (SS) (units)	-0.1	0	100	1000
500	Sonic (DT Comp) (us/m)	100	60 in (ohms)		
500	Sonic (DT Comp) (us/m)	100	0	100	1000
1000	Sonic (DT Shear) (us/m)	200	30 in (ohms)		
			0	100	1000
			20 in (ohms)		
			0	100	1000
			10 in (ohms)		
			0	100	1000

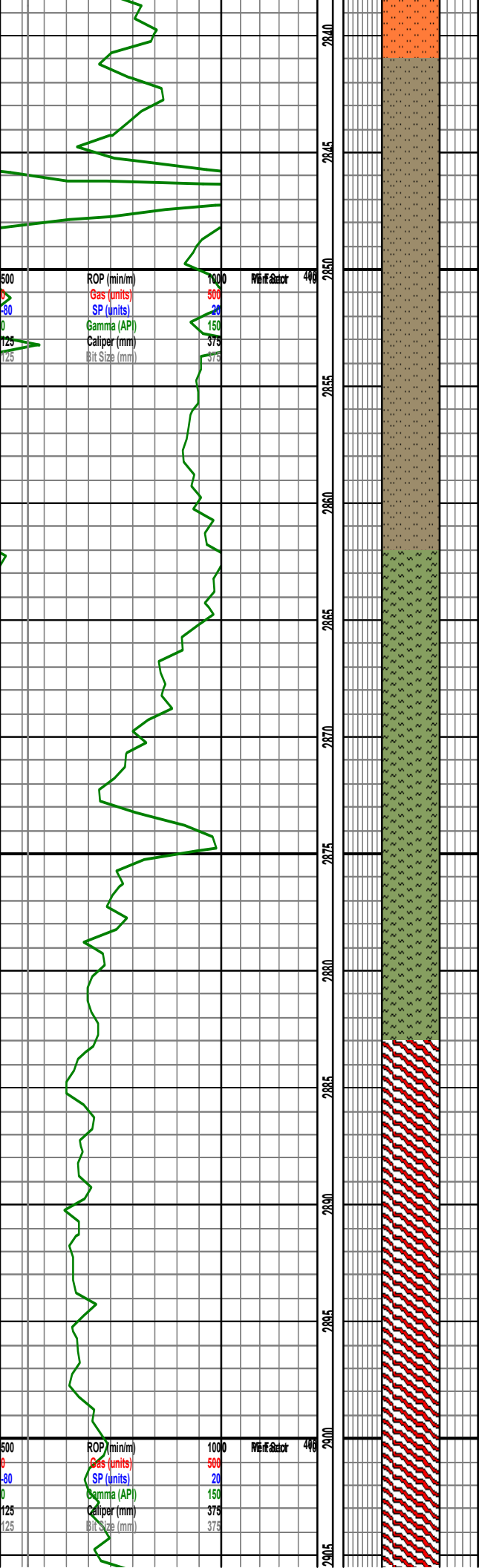


2781-2802 SLTST 100% dk mar-brn, v calc, pyr,  
blcky, sily hrd

2802-2823 SLTST 100% dk mar-brn, v calc, pyr,  
blcky, sily hrd; ss strgs

2823-2841 SLTST 100% dk mar-brn, v calc, pyr,  
blcky, sily hrd





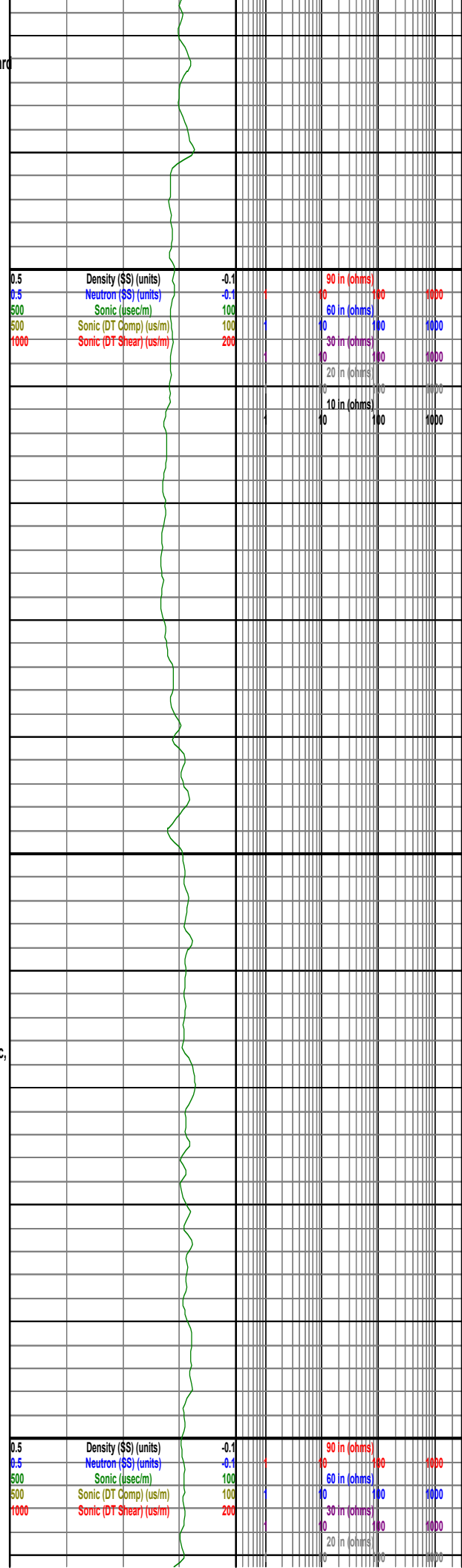
2841-2862 SLTST 100% med gy, calc, pyr, bicky, hrd

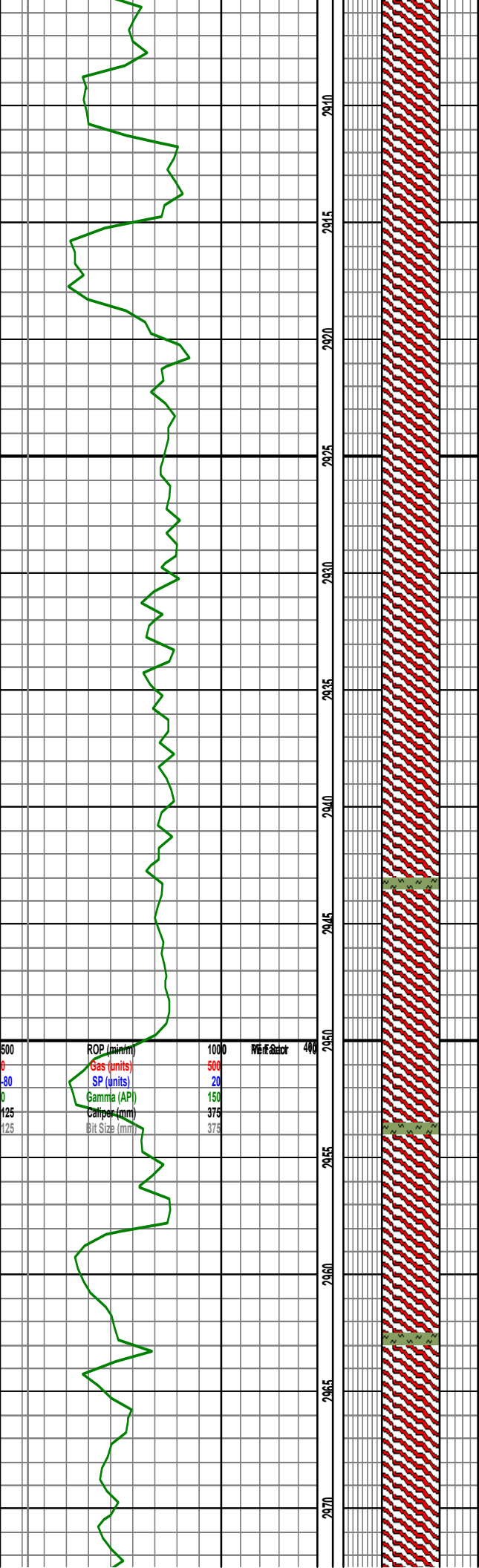
**BASEMENT**

2862-2883 SCH 100% med gy-gr, qtz, chl, biot, musc, biot, ply srt, sr

2883-2901 METASEDS 100% mar-brn, mnr gy, calc, pyr, orgn qtz, hrd

2901-2922 METASEDS 100% brn, v silty calc, pyr, hrd

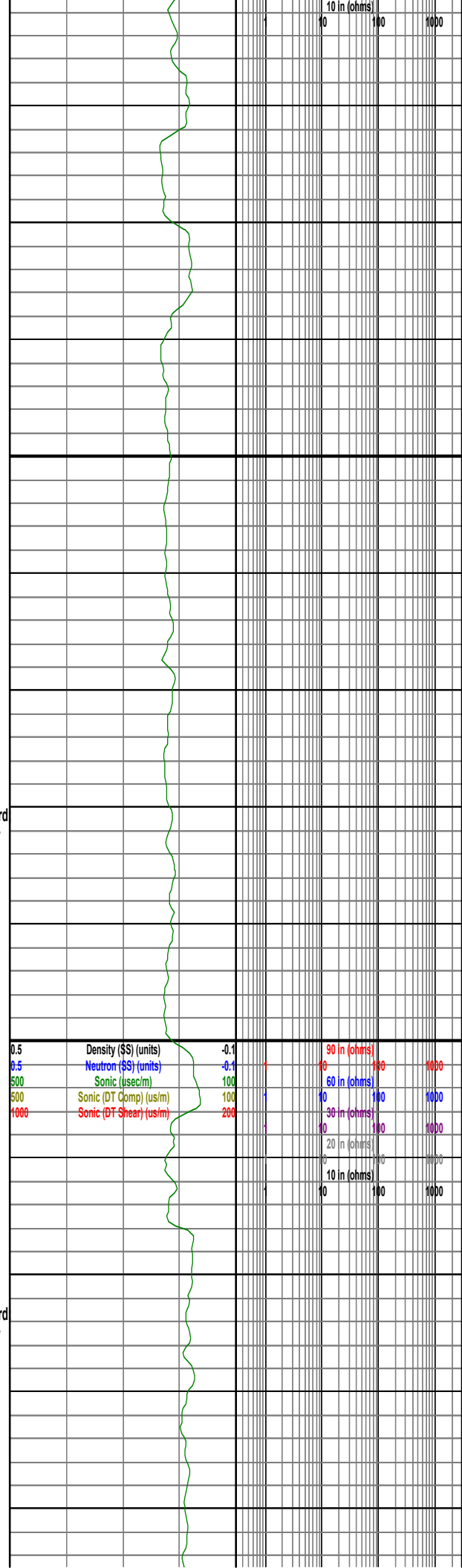


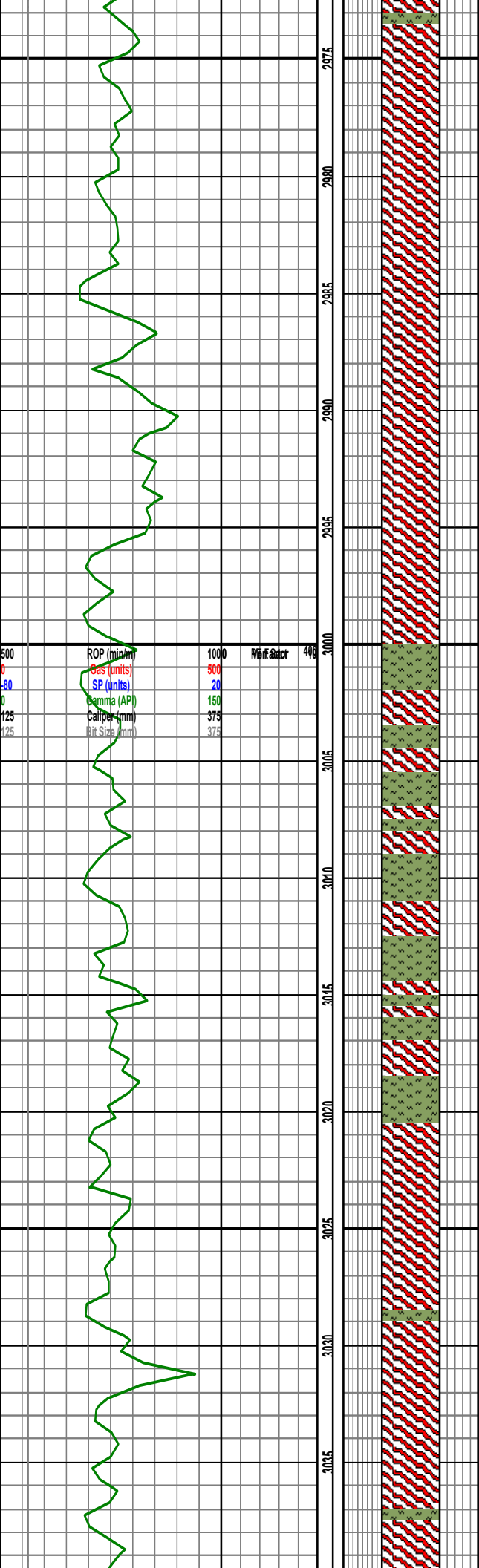


2922-2940 METASEDS 100% brn, v sily calc, pyr, hrd

2940-2961 METASEDS 95% brn, v sily calc, pyr, hrd  
SCH 5% med gy-gr, qtz, chl, biot, musc, ply srt, sr

2961-2982 METASEDS 95% brn, v sily calc, pyr, hrd  
SCH 5% med gy-gr, qtz, chl, biot, musc, ply srt, sr

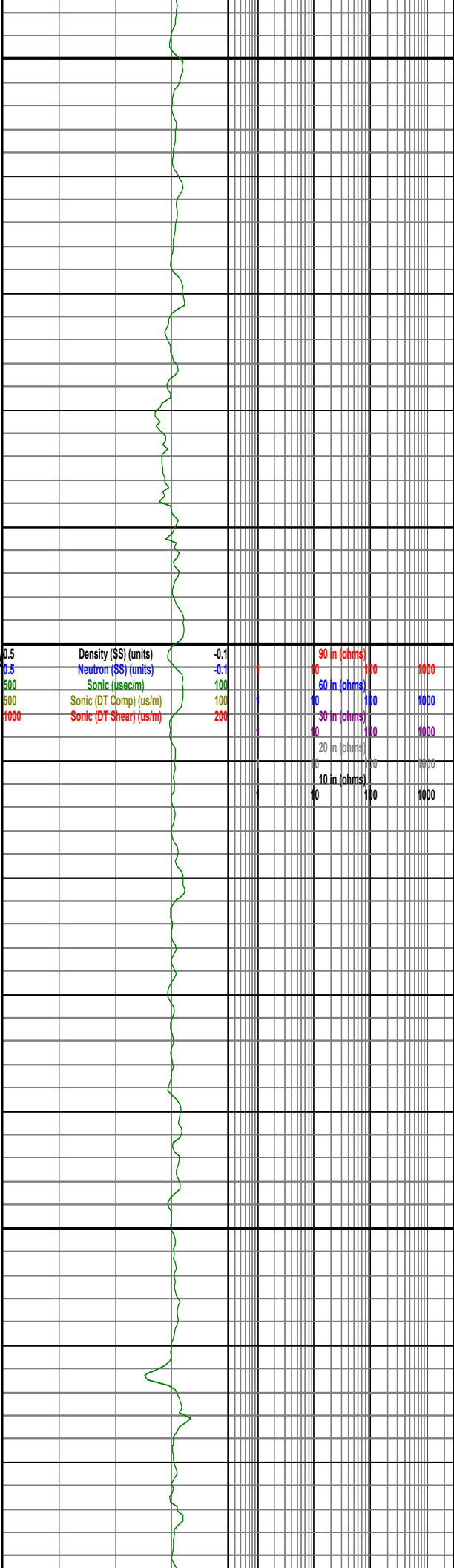


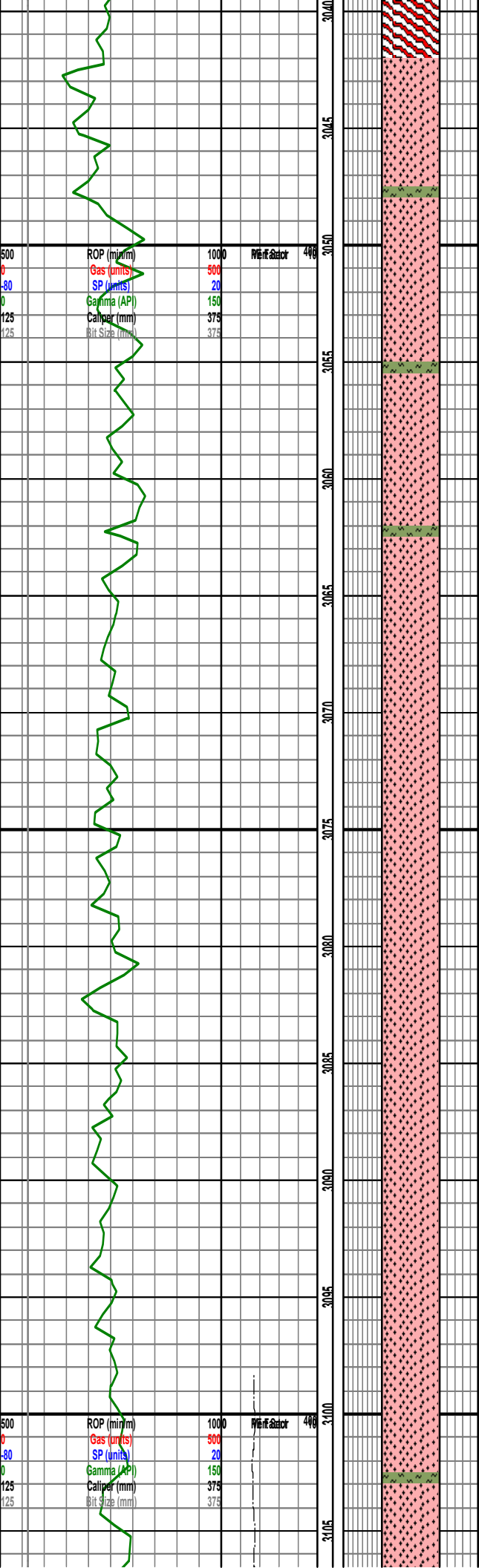


2982-3000 METASEDS 100% brn, v sily calc, pyr, hrd

3000-3021 SCH 60% lt gy-gr, qtz, chl, biot, musc, ply srt, sr; METASEDS 40% brn, org qtz, v sily calc, pyr, hrd, shiny

3021-3042 METASEDS 95% brn, org qtz, v sily calc, pyr, hrd, shiny; SCH 5% lt gy-gr, qtz, chl, biot, musc, ply srt, sr



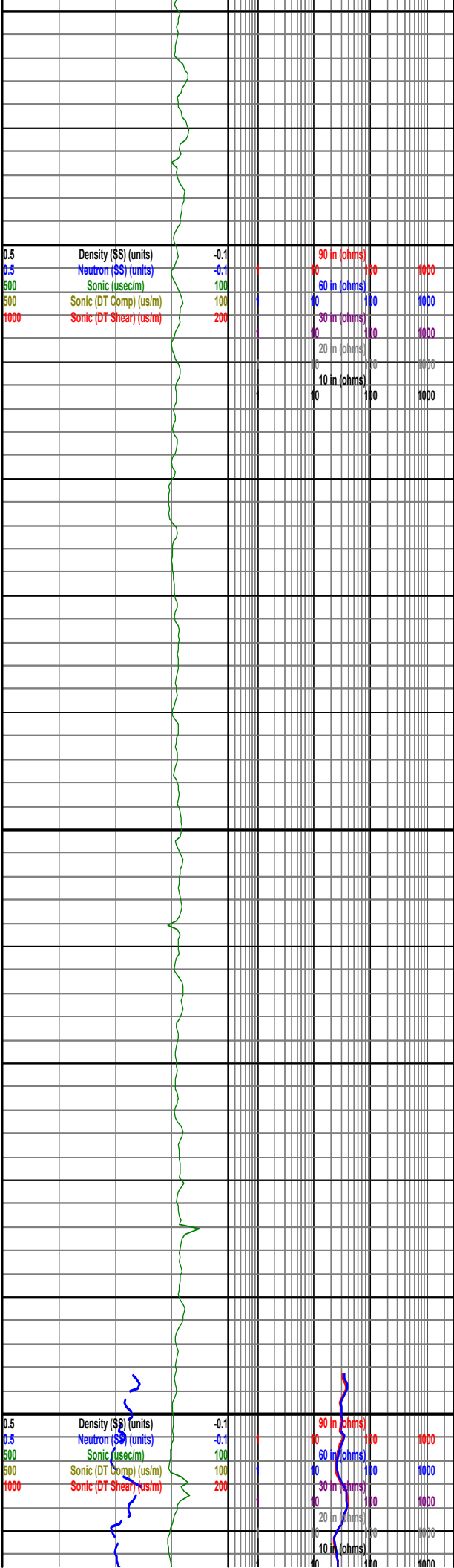


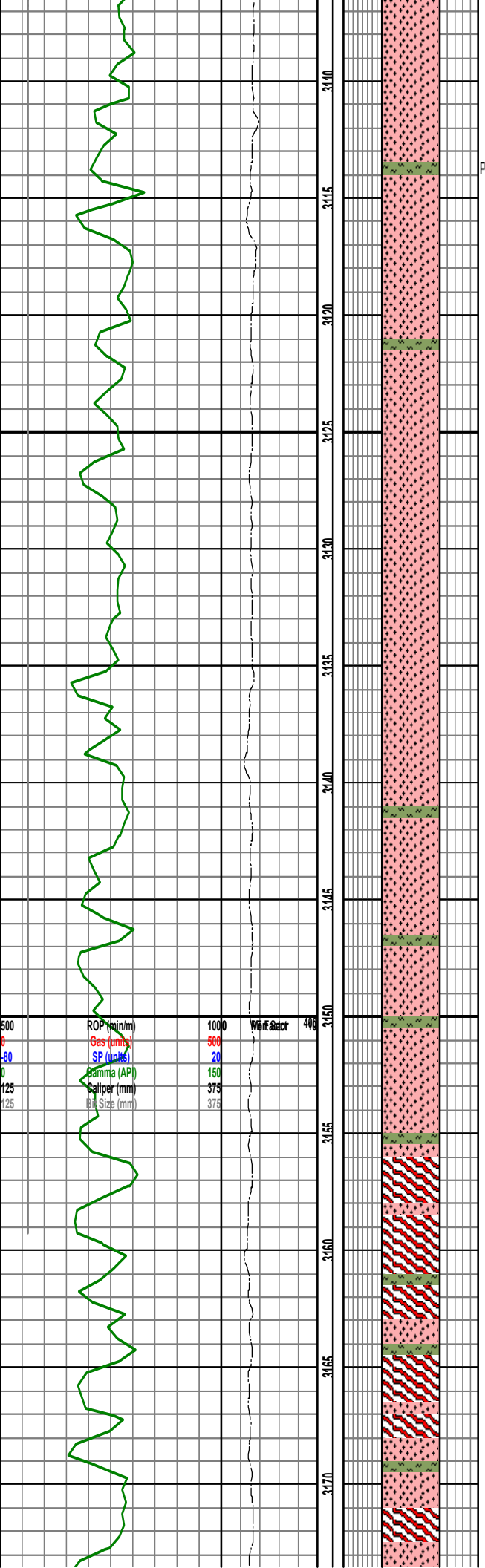
3042-3063 UNCONS GRNT 95% brn, mnr med gy, orgn qtz, v sily calc, pyr, sily hrd, shiny; SCH 5% lt gy-gr, qtz, chl, biot, musc, ply srt, sr

3063-3084 UNCONS GRNT 100% brn, mnr med gy, orgn qtz, v sily calc, pyr, sily hrd, shiny

3084-3102 UNCONS GRNT 100% brn, mnr med gy, orgn qtz, v sily calc, pyr, sily hrd, shiny

3102-3123 UNCONS GRNT 95% brn, mnr med gy, orgn qtz, v sily calc, pyr, sily hrd, shiny; SCH 5% lt gy-gr, qtz, chl, biot, musc, ply srt, sr



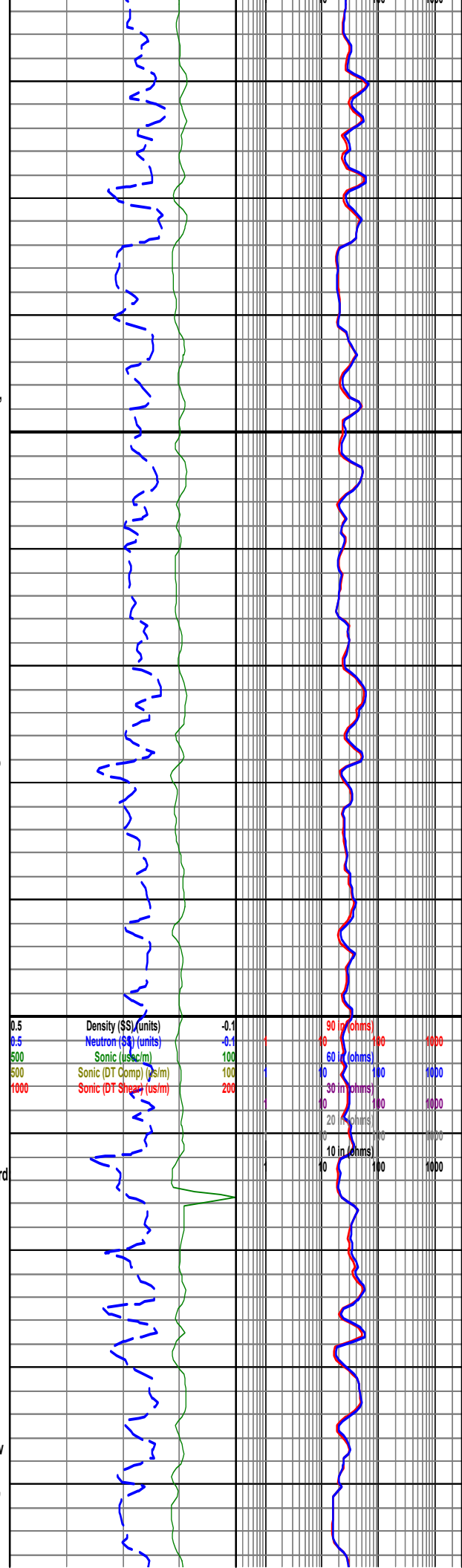


3123-3138 UNCONS GRNT 100% brn, mnr med gy, orgn qtz, v sily calc, pyr, sily hrd, shiny

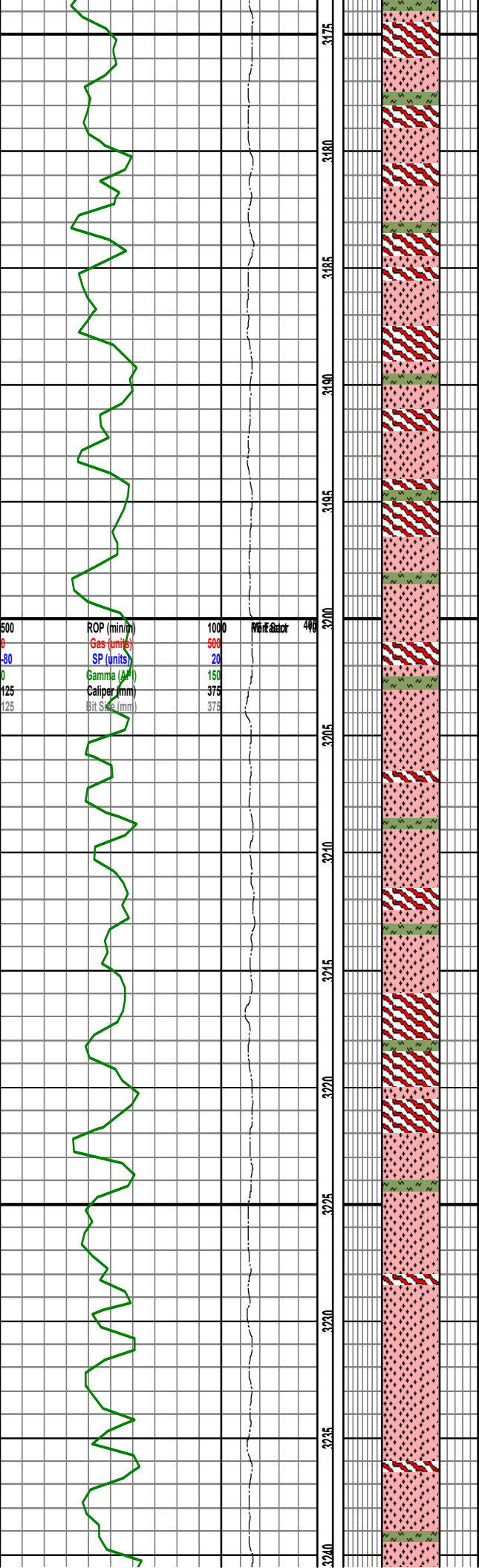
3138-3156 UNCONS GRNT 90% brn, mnr med gy, orgn qtz, v sily calc, pyr, sily hrd, shiny; SCH 10% med gy-gr, qtz, chl, biot, musc, ply srt, sr

3156-3168 METASEDS 75% brn, v sily calc, pyr, hrd GRNT 15% brn, mnr med gy, orgn qtz, v sily calc, pyr, sily hrd, shiny; SCH 10% lt-dk gy-gr, qtz, chl, biot, musc, ply srt, sr

3168-3177 GRNT 50% brn, mnr med gy, orgn qtz, v sily calc, musc, sily hrd, shiny; METASEDS 40% brn, v sily calc, pyr, hrd; SCH 10% lt-dk gy-gr, qtz, chl, biot, musc, ply srt, sr





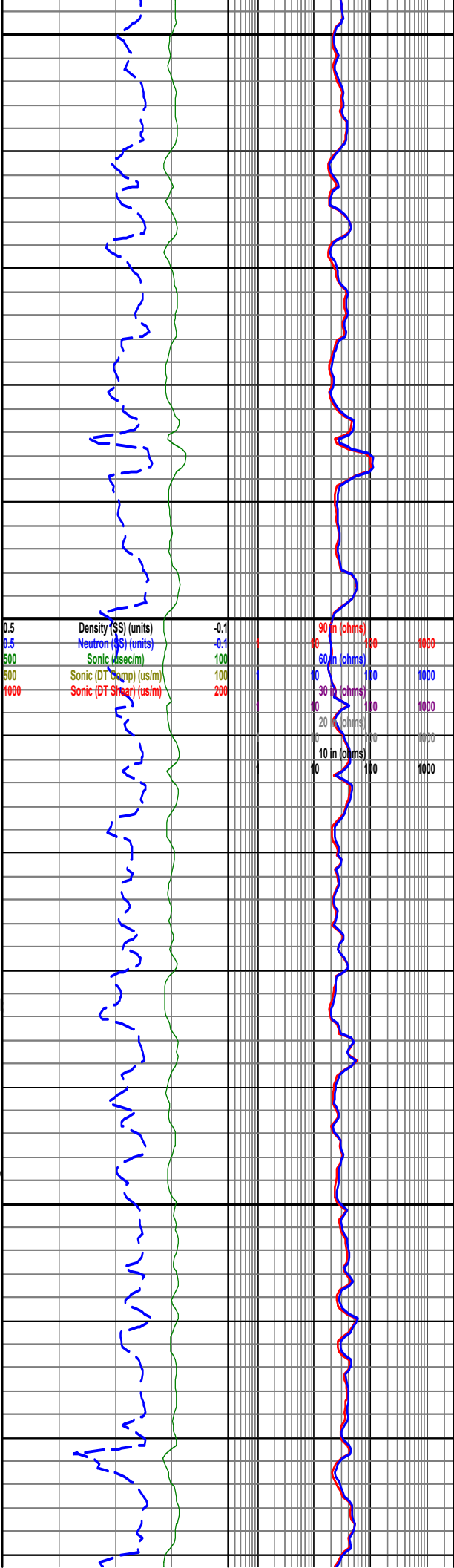


3177-3198 GRNT 75% brn, mnr med gy, orgn qtz, v sily calc, musc, sily hrd, shiny; METASEDS 15% brn, v sily calc, pyr, hrd; SCH 10% lt-dk gy-gr, qtz, chl, biot, musc, ply srt, sr

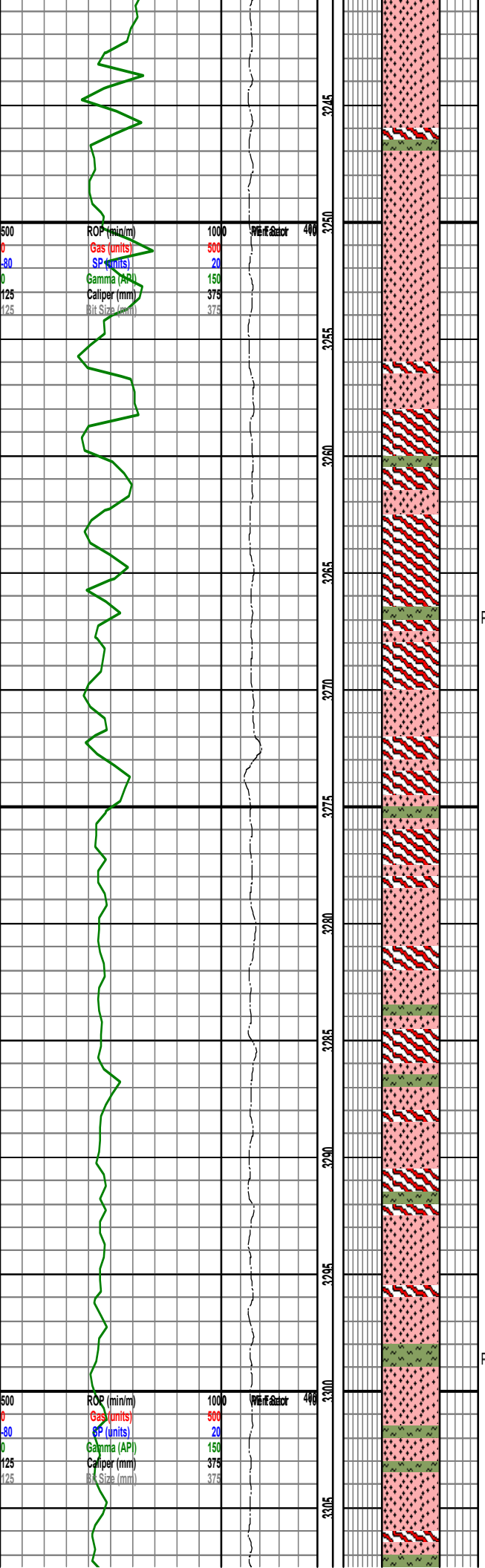
3198-3216 GRNT 75% brn, mnr med gy, orgn qtz, v sily calc, musc, sily hrd, shiny; METASEDS 15% brn, v sily calc, pyr, hrd; SCH 10% lt-dk gy-gr, qtz, chl, biot, musc, ply srt, sr

3216-3222 METASEDS 75% brn, v sily calc, pyr, hrd GRNT 15% brn, mnr med gy, orgn qtz, v sily calc, pyr, sily hrd, shiny; SCH 10% lt-dk gy-gr, qtz, chl, biot, musc, ply srt, sr

3222-3243 GRNT 90% brn, mnr med gy, orgn qtz, v sily calc, musc, sily hrd, shiny; METASEDS 5% brn, v sily calc, pyr, hrd; SCH 5% lt-dk gy-gr, qtz, chl, biot, musc, ply srt, sr







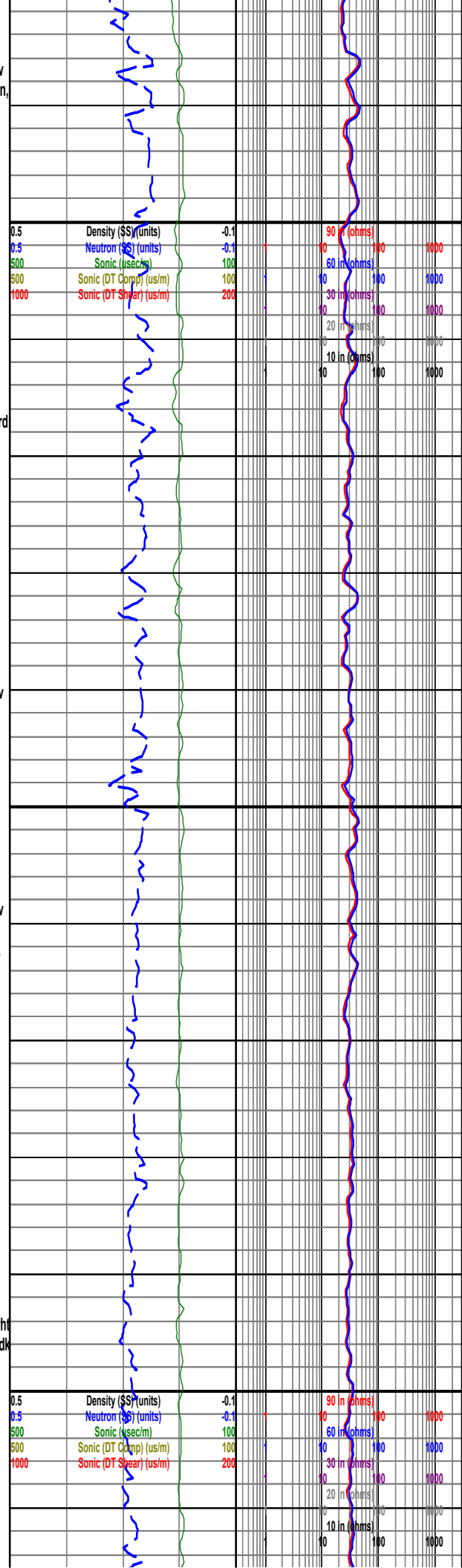
3243-3258 GRNT 90% brn, mnr med gy, orgn qtz, v sily calc, musc, sily hrd, shiny; METASEDS 5% brn, v sily calc, pyr, hrd; SCH 5% lt-dk gy-gr, qtz, chl, biot, musc, ply srt, sr

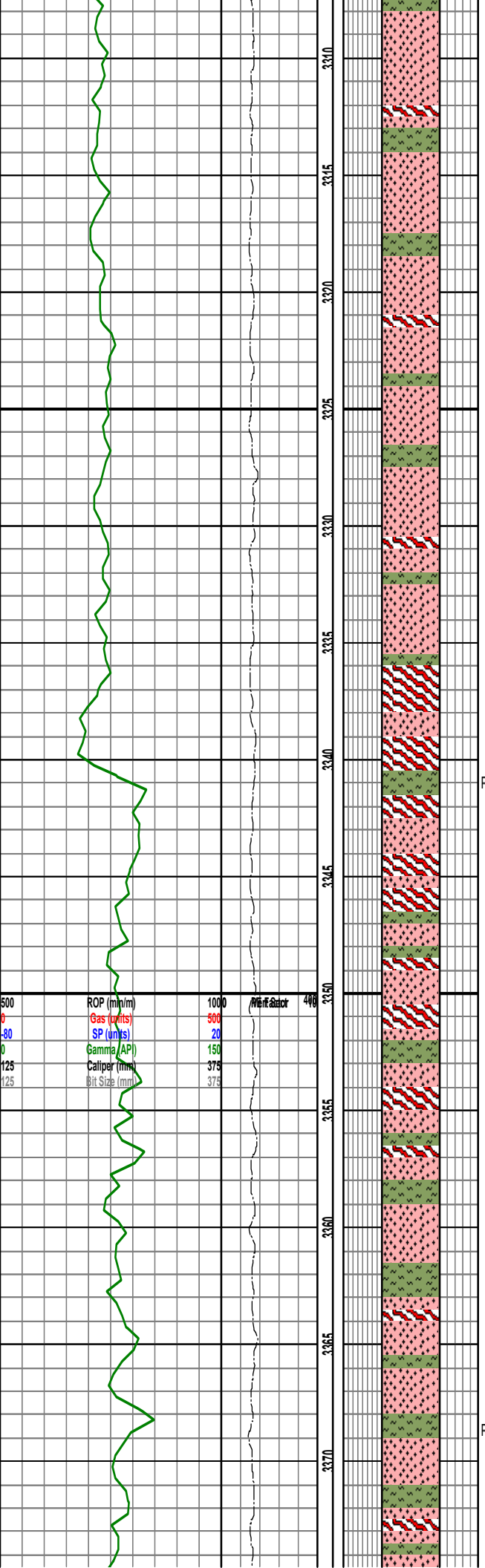
3258-3270 METASEDS 75% brn, v sily calc, pyr, hrd GRNT 15% brn, mnr med gy, orgn qtz, v sily calc, pyr, sily hrd, shiny; SCH 10% lt-dk gy-gr, qtz, chl, biot, musc, ply srt, sr

3270-3279 GRNT 50% brn, mnr med gy, orgn qtz, v sily calc, musc, sily hrd, shiny; METASEDS 45% brn, v sily calc, pyr, hrd; SCH 5% lt-dk gy-gr, qtz, chl, biot, musc, ply srt, sr

3279-3297 GRNT 60% brn, mnr med gy, orgn qtz, v sily calc, musc, sily hrd, shiny; METASEDS 30% brn, v sily calc, pyr, hrd; SCH 10% lt-dk gy-gr, qtz, chl, biot, musc, ply srt, sr

3297-3315 GRNT 75% brn, mnr med gy, predom wht qtz, v sily calc, musc, sily hrd, shiny; SCH 20% lt-dk gy-gr, qtz, chl, biot, musc, ply srt, sr; METASEDS 5% brn, v sily calc, pyr, hrd





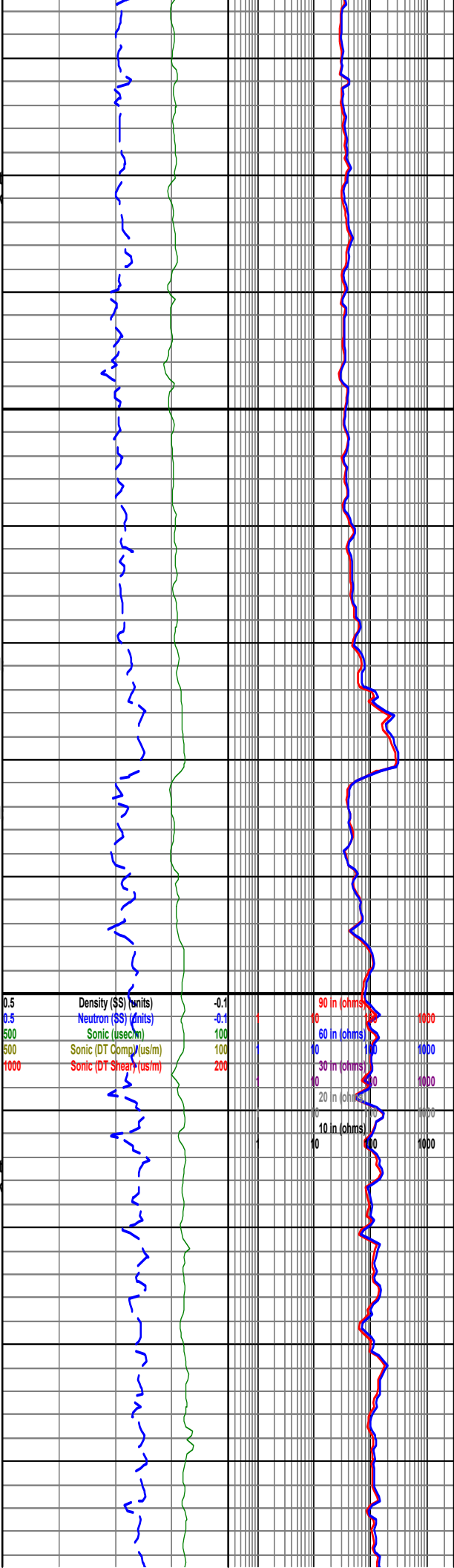
3315-3336 GRNT 80% brn, mnr med gy, predom wht  
 qtz, v sily calc, musc, sily hrd, shiny; SCH 15% lt-dk  
 gy-gr, qtz, chl, biot, musc, ply srt, sr; METASEDS  
 5% brn, v sily calc, pyr, hrd

3336-3342 METASEDS 75% brn, v sily calc, pyr, hrd  
 GRNT 15% brn, mnr med gy, orgn qtz, v sily calc,  
 pyr, sily hrd, shiny; SCH 10% lt-dk gy-gr, qtz, chl,  
 biot, musc, ply srt, sr

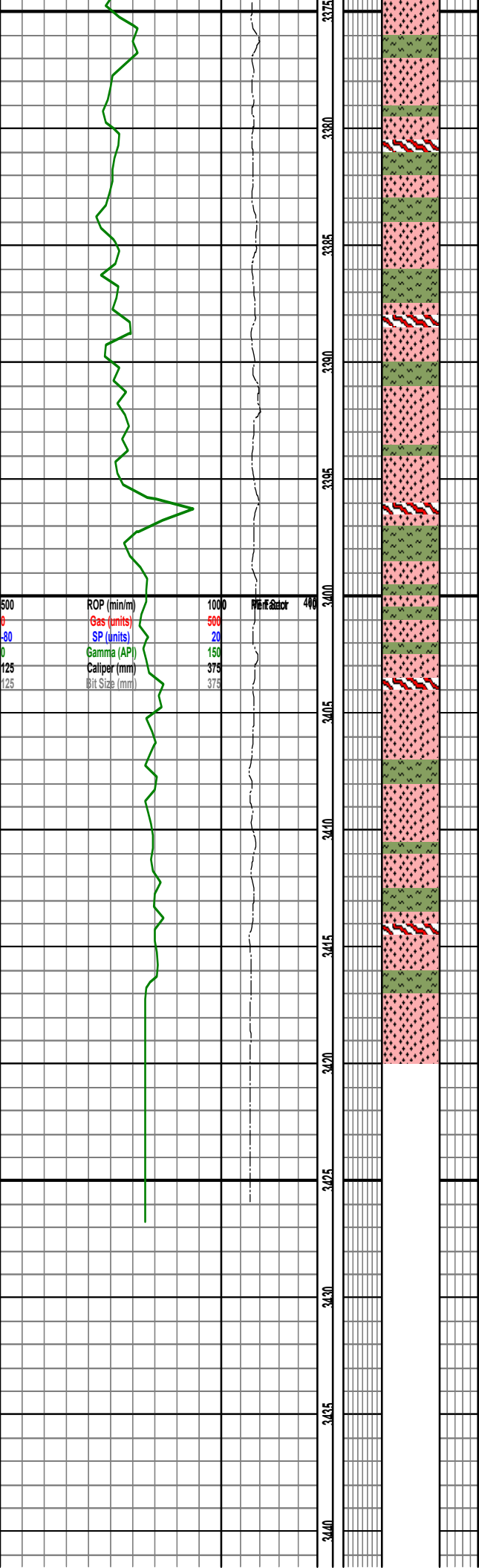
3342-3357 METASEDS 40% brn, v sily calc, pyr, hrd  
 GRNT 40% brn, mnr med gy, orgn qtz, v sily calc,  
 pyr, sily hrd, shiny; SCH 20% lt-dk gy-gr, qtz, chl,  
 biot, musc, ply srt, sr

3357-3378 GRNT 65% brn, mnr med gy, predom wht  
 qtz, v sily calc, musc, sily hrd, shiny; SCH 30% lt-dk  
 gy-gr, qtz, chl, biot, musc, ply srt, sr; METASEDS  
 5% brn, v sily calc, pyr, hrd

500	ROP (m/h)	1000	499
0	Gas (ppm)	500	
80	SP (m/s)	20	
0	Gamma (API)	150	
125	Caliper (mm)	375	
125	Bit Size (mm)	375	



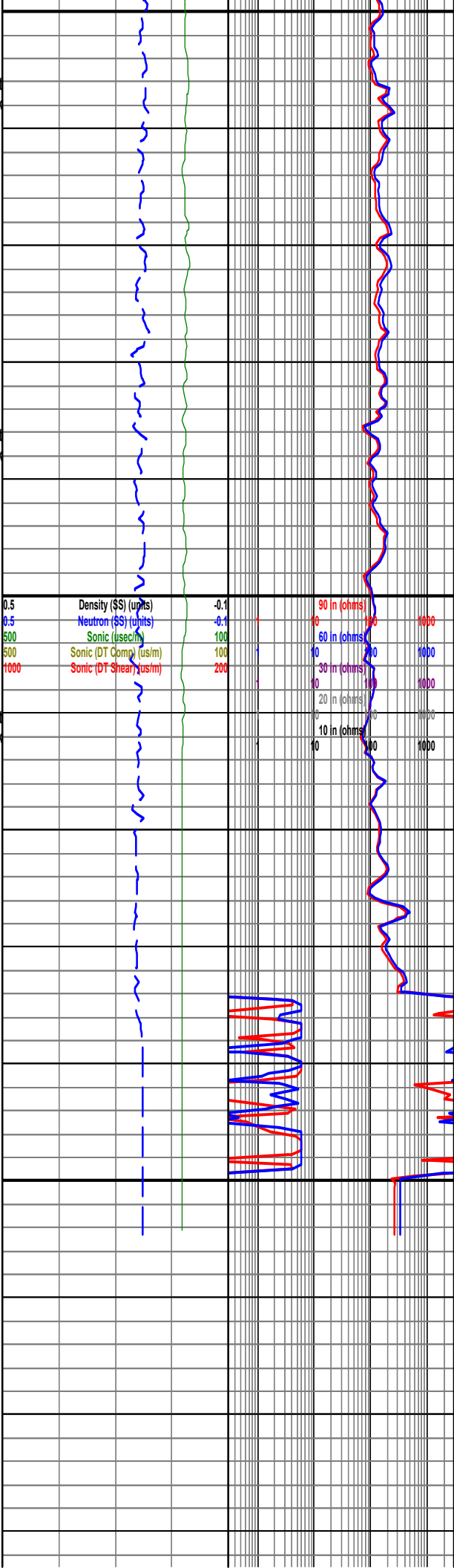
0.5	Density (SS) (units)	-0.1	90 in (ohms)	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	1000
500	Sonic (usec/m)	100	30 in (ohms)	1000
500	Sonic (DT Comp) (us/m)	100	20 in (ohms)	1000
1000	Sonic (DT Shear) (us/m)	200	10 in (ohms)	1000



3378-3393 GRNT 60% brn, mnr med gy, predom wht  
qtz, v sily calc, musc, sily hrd, shiny; SCH 35% lt-dk  
gy-gr, qtz, chl, biot, musc, ply srt, sr; METASEDS  
5% brn, v sily calc, pyr, hrd

3393-3405 GRNT 65% brn, mnr med gy, predom wht  
qtz, v sily calc, musc, sily hrd, shiny; SCH 30% lt-dk  
gy-gr, qtz, chl, biot, musc, ply srt, sr; METASEDS  
5% brn, v sily calc, pyr, hrd

3405-3420 GRNT 70% brn, mnr med gy, predom wht  
qtz, v sily calc, musc, sily hrd, shiny; SCH 25% lt-dk  
gy-gr, qtz, chl, biot, musc, ply srt, sr; METASEDS  
5% brn, v sily calc, pyr, hrd



0.5	Density (SS) (units)	-0.1	90 in (ohms)	100	1000
0.5	Neutron (SS) (units)	-0.1	60 in (ohms)	100	1000
500	Sonic (DT Comp) (us/m)	100	30 in (ohms)	100	1000
500	Sonic (DT Shear) (us/m)	200	20 in (ohms)	100	1000
1000			10 in (ohms)	100	1000

