Landing and Characterizing STACK Laterals using AHS's RVStrat[sm]

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AHS's RVStrat[sm] is now being successfully applied to pick landing zones in pilot holes, and to characterize the pay distribution and variation in rock properties in laterals, especially in the STACK.

This talk will discuss the lessons now realized from 23 STACK wells we've analyzed, as well as some Permian Basin wells, and other wells from basins around the world. The focus will be mostly on more than a dozen STACK laterals.

Determining landing zones and characterizing STACK laterals for WBM wells are both best done using washed and gently dried WBM cuttings sealed at least 24 hours after capture from drilling wells. Older WBM cuttings can also be used.

OBM cuttings can potentially be analyzed immediately at the well site, as the diesel in the OBM sufficiently ages the cuttings to reveal these details as soon as they reach the surface.

The best lateral production is had by landing the lateral in the middle of an oil pay zone.

Pay zone cuttings have low aromatics/(aromatics+naphthenes) ratios, other cuttings have higher values. This reflects the greater tendency for aromatic hydrocarbons to be left behind adhering to rocks as oil moves through formations, as opposed to the naphthenes.

In STACK laterals, AHS data reveals the sections of the lateral in the pay zone, and the variations of rock properties.

6 rock property categories are mapped out. 1) larger natural oil filled fractures; 2) smaller natural oil filled fractures; 3) Low Oil and Low Gas; 4) Low Oil and High Gas; 5) High Oil and Low Gas; and 6) High Oil and High Gas. The significance of these mapped zones is actively being researched and will be discussed. Natural Oil filled fractures show up as oil spikes on RVStrat[sm] logs. Examples of several STACK laterals are shown below.

AHS RVStrat[sm] data base of STACK laterals is now allowing successful prediction of how significant oil production will be in new STACK laterals, within a day or two of reaching TD.

If a pilot well is drilled, or if the lateral is heel-down, AHS RVStrat[sm] can be used to locate the best landing zone before the lateral is drilled by rapid analyses of cuttings back at our Tulsa Lab. A well site unit is under design to help steer laterals in real time.

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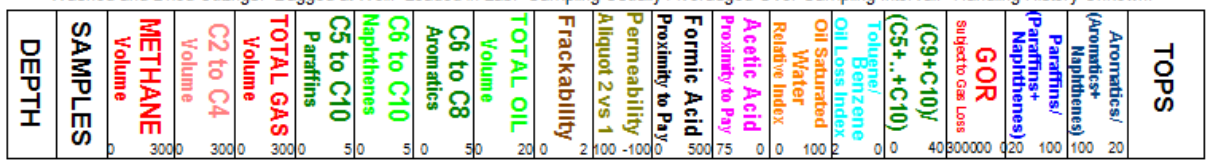
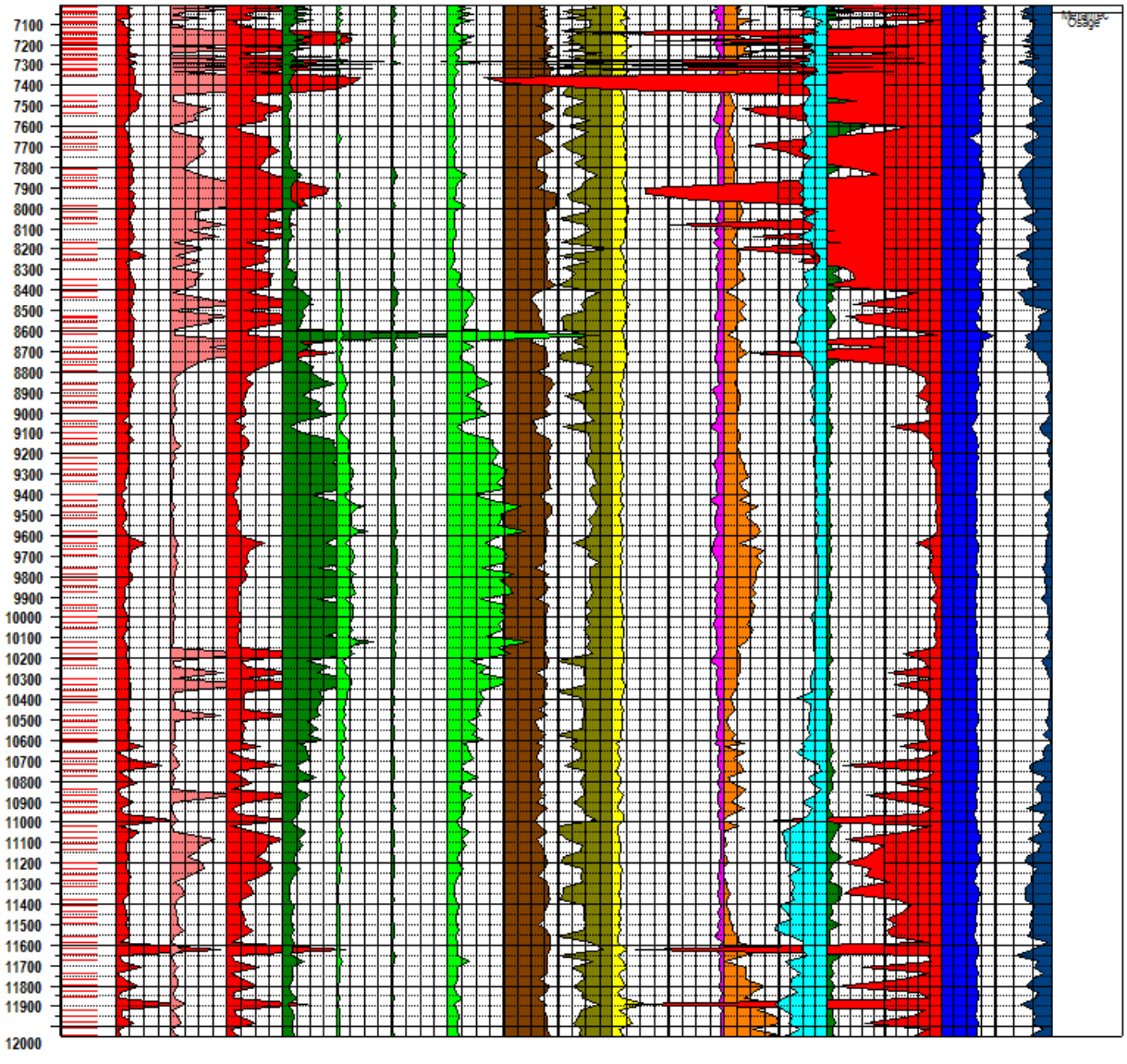
AHS Loaded-In-Lab Rock-Volatiles Property-Log

Washed and Dried Cuttings. Bagged at Well. Loaded in Lab. Sampling Usually Averadged Over Sampling Interval. Handling History Unkown.



GAS <-Analytical Values, ppm(Rock Volume) SUM ALL DATA-> OIL RESERVOIR (THIS ALIQUOT) PRODUCT (SUM ALL DATA)



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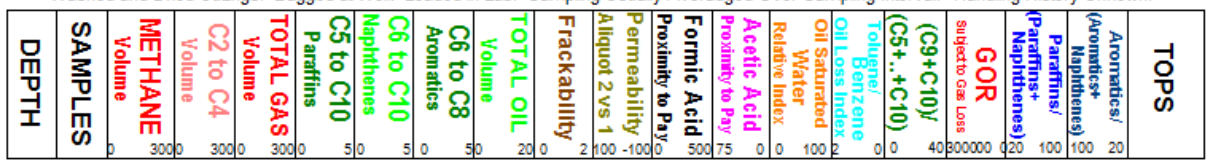

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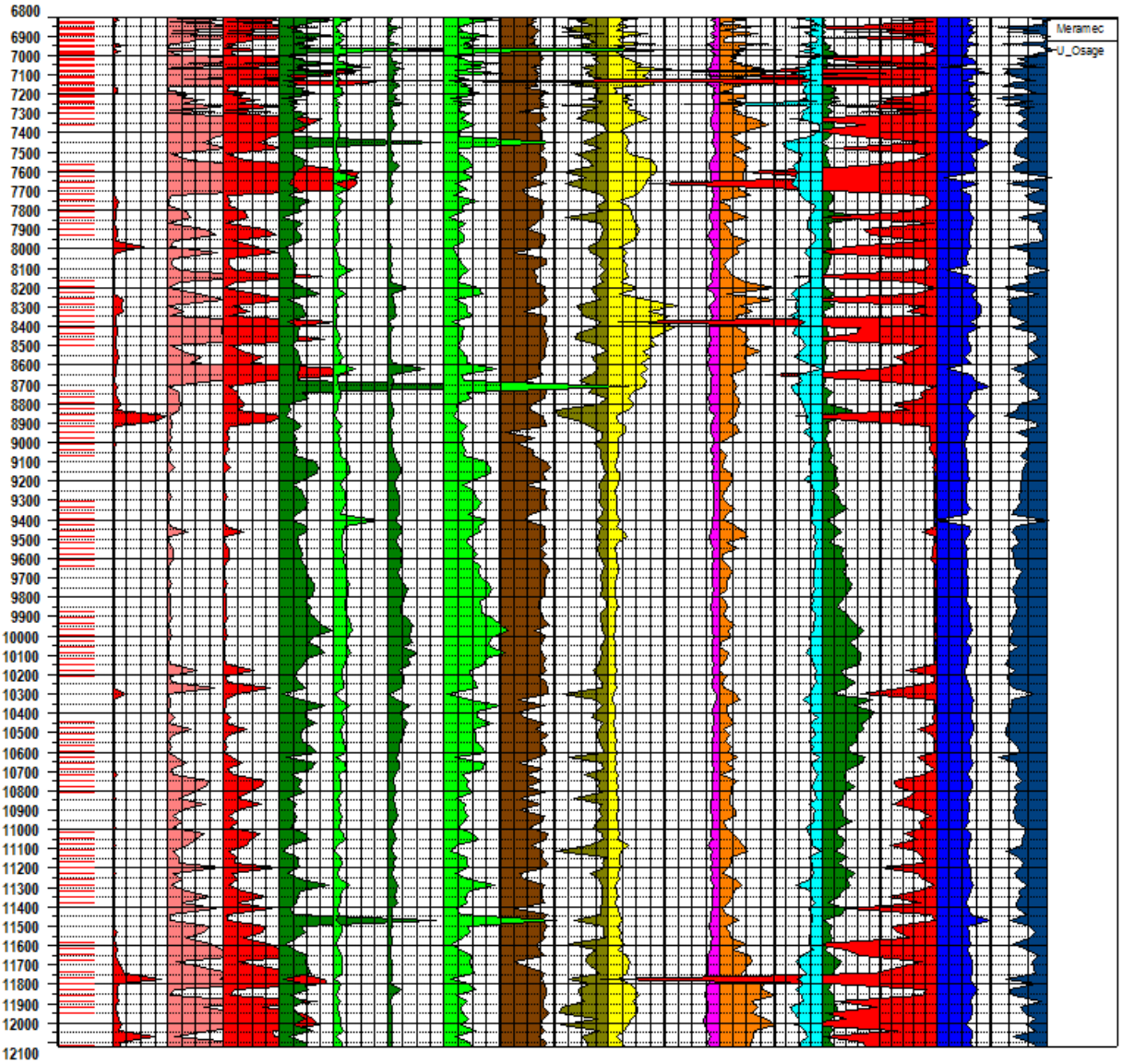

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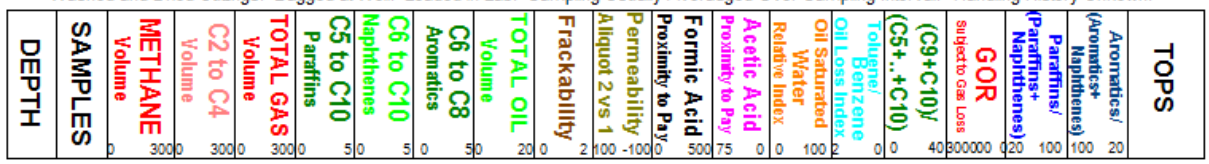

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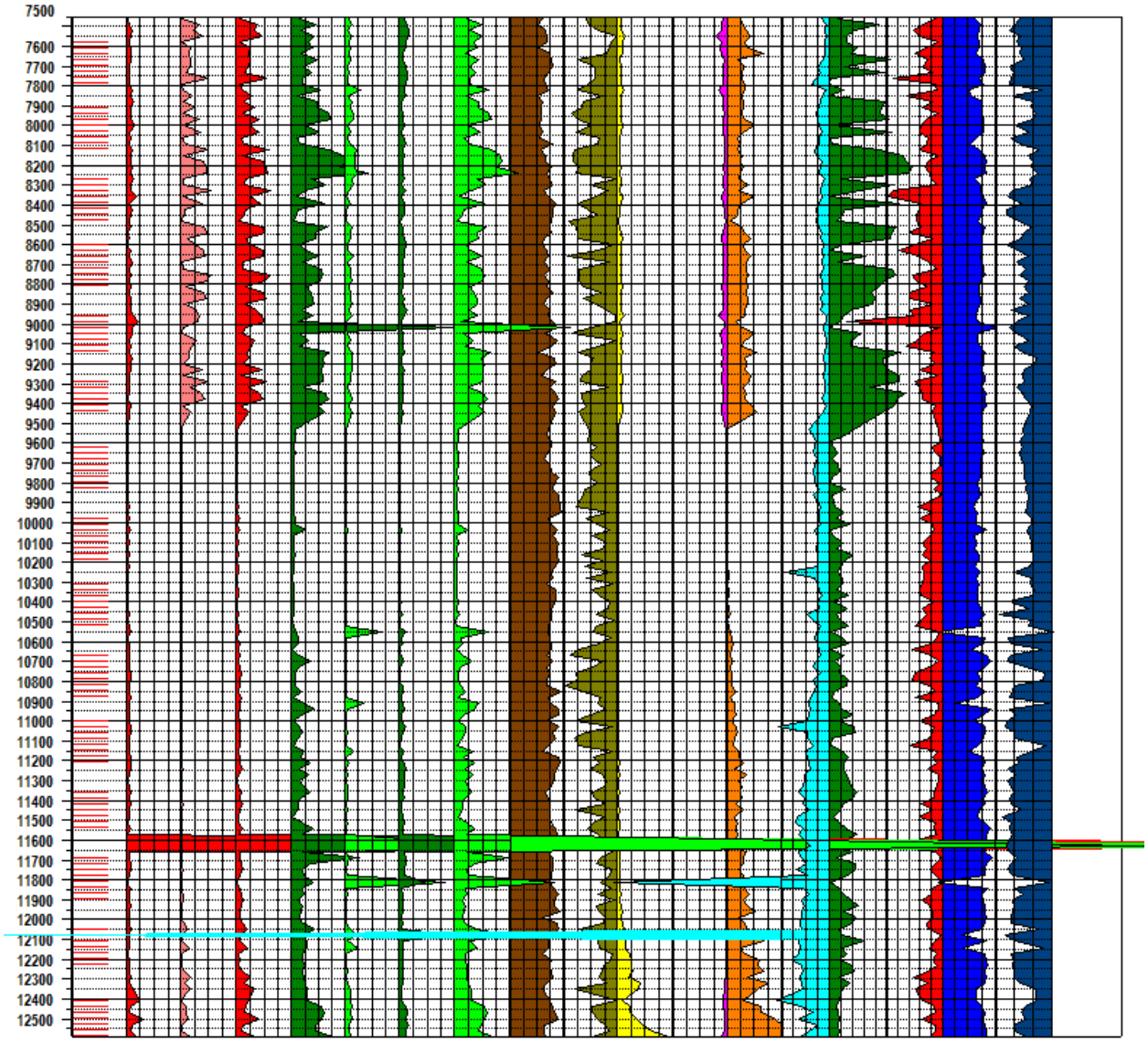

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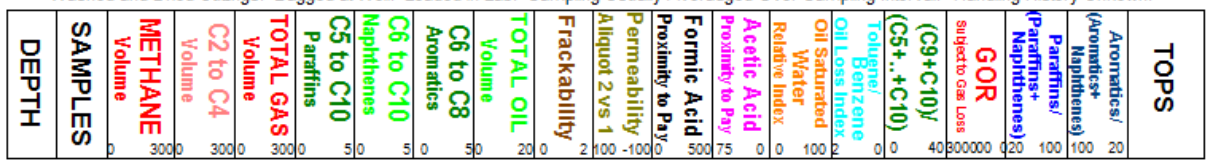

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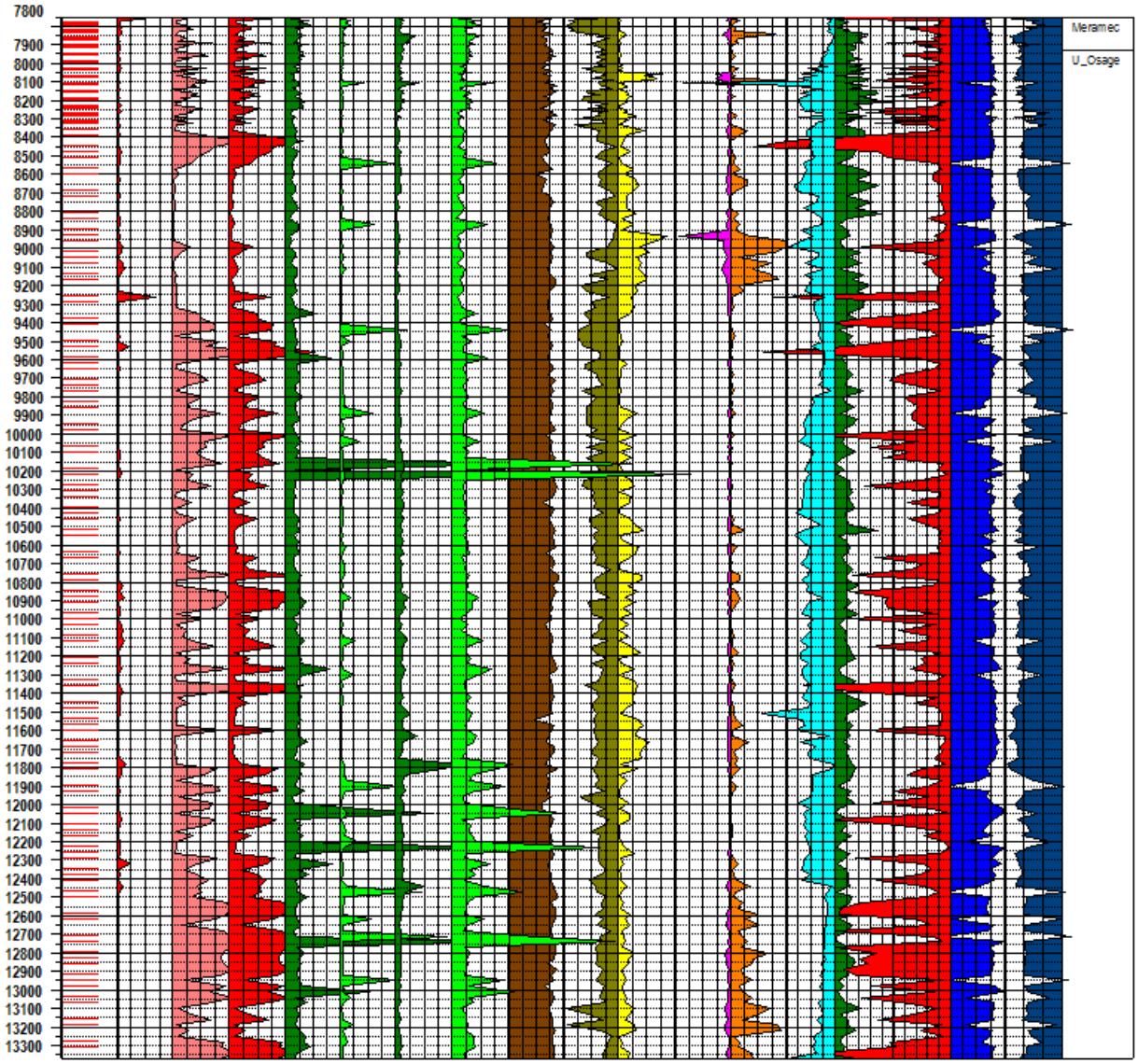

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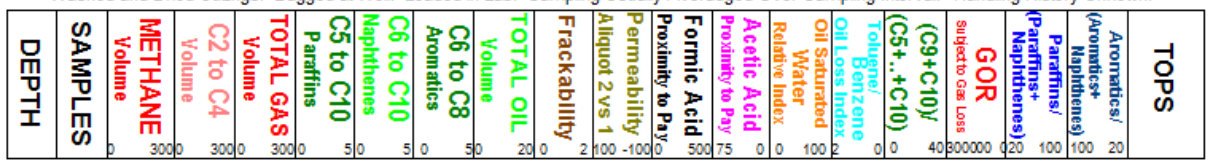

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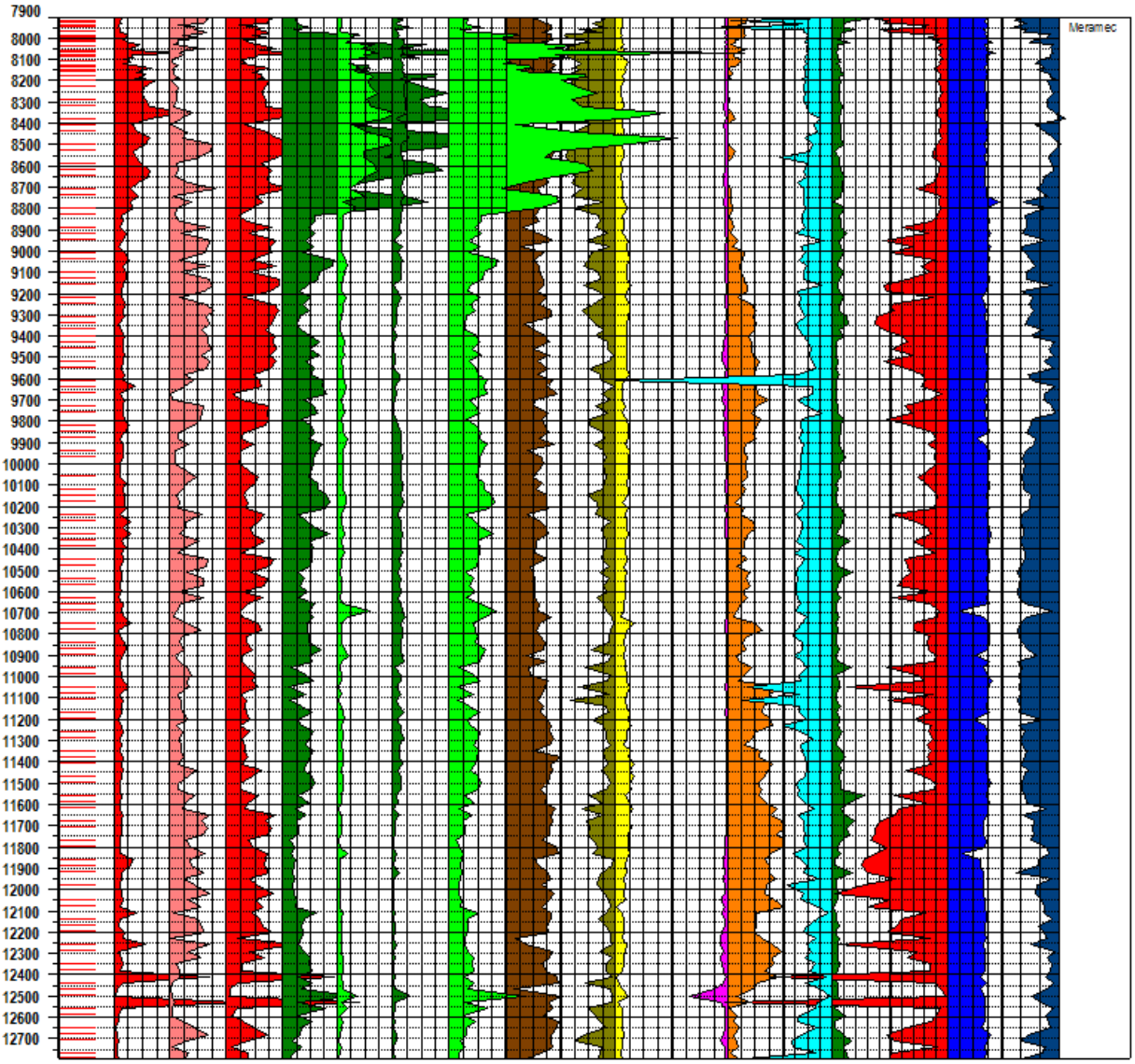

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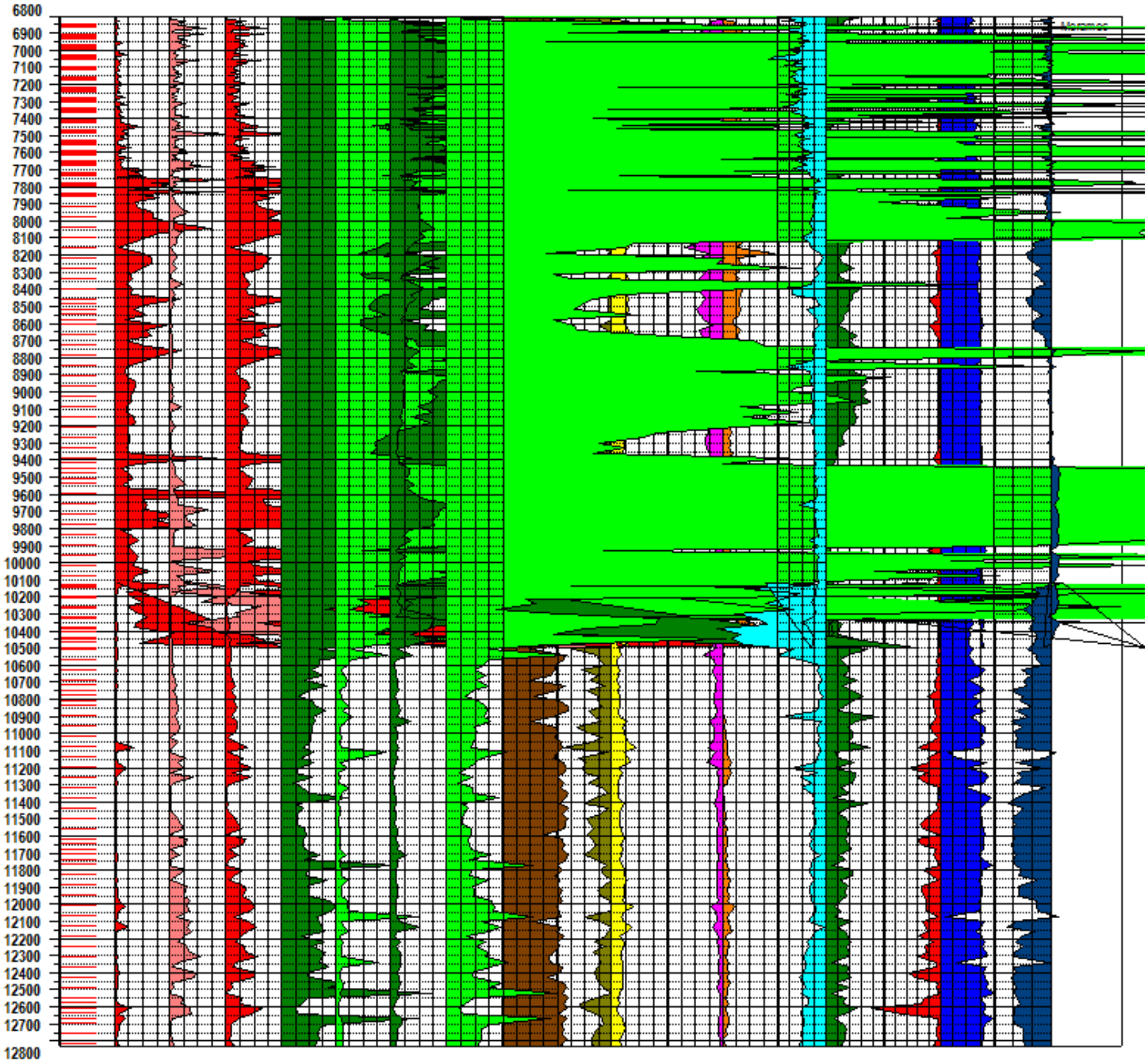

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