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GEOCHEMICAL REPORT FOR WELL NOCS 2/8-14

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SUMMARY

Well NOCS 2/8-14 is situated in the Norwegian sector of the North Sea, in the Central Graben Area at 56°15'49.07"N and 3°21'23.40"E. The water depth was 70 m and elevation of Kelly Bushing 22 m. All depth references are given relative to Kelly Bushing.

Samples were analysed between 2886 m and 4392 m.

Based on the geochemical results, the well was divided into three sections, Section 1 ranges 2800 - 3205 m, Section 2 ranges 3205 - 3550 m and Section 3 ranges 3550 - 4392 m. Based on geochemical data, lithology observations, information from Amoco and wire-line log data, these sections are suggested to represent the following units:

Chalk Group	(? - 2895.5 m)
Cromer Knoll Gp.	(2895.5 - 3165 m)
Reworked Mandal Fm. material*	(3165 - 3195 m)
Weathered Mandal Fm.	(3195 - 3205 m)
Mandal Fm.	(3205 - 3550 m)
Farsund Fm.	(3550 - 4392 m, TD)

* This section is most likely strongly affected by reworked (thoroughly weathered) Mandal Fm. material, but mixed with "new" marl and limestone. It is probably a matter of definition whether this interval or parts of it belong to the Cromer Knoll Gp. or to the Mandal Fm.

The Mandal Fm. (3205 - 3550 m) has a very rich potential for oil generation. It is presently early mature, but is nevertheless currently generating oil. The Farsund Fm. (3550 - 4392 m) has a rich to fair potential for oil and gas generation. The potential apparently decreases with depth, but this is at least mostly due to the increase in maturity. It is believed that the entire interval originally had a rich potential for oil and gas generation. The interval presently has a maturity ranging from about the top of the oil window (0.6 % Ro) to past peak oil generation (> 0.8 % Ro) at the base and is at present actively generating oil and gas.

The top of the oil window (0.6 % Ro) occurs close to 3600 m, while the well becomes early mature close to 3200 m. The base of the oil window (1.0 % Ro) occurs below TD and extrapolation suggests it to occur close to 4700 m. The maturity gradient for the well changes around 3200 m. This change in the thermal gradient appears to be connected with the change in lithology around 3200 m.

Migrated hydrocarbons have been detected in the Chalk and Cromer Knoll Gps., especially in limestones. These hydrocarbons are most likely sourced from the underlying Mandal Fm. and possibly also from the Farsund Fm., although this is not confirmed by biomarker or isotope analysis (none performed). Hydrocarbons are also present in the Mandal and Farsund Fms. and these are most likely generated in-situ. Some hydrocarbons in the Mandal Fm. could be affected by migrated hydrocarbons from the more mature Farsund Fm. below. The relative amount of free hydrocarbons in the lower part of the Farsund Fm. (below about 4300 m) is higher than usual and it is suggested that equilibrium between generation and expulsion has not yet been reached, i.e. that expulsion lags behind generation in the interval below 4300 m.

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INTRODUCTION

Well NOCS 2/8-14 is situated in the Norwegian sector of the North Sea, in the Central Graben area. The total drilled depth is 4392 m. All depths are uncompensated sample depths. Samples were supplied by Amoco Norway Oil Company. A total of 273 samples was washed (only the 253 cuttings samples) and described. The analysed section of the well is from 2886 to 4392 m, with a sampling interval of mostly 6 m for the cuttings samples and a variable sampling interval for the side-wall core samples. The analytical program was set up in cooperation with Amoco Norway Oil Company (authorised by Ron White/Arnold Østvold). One hundred and fifty-four samples were analysed by Rock-Eval pyrolysis and from the data obtained samples were chosen for follow-up analyses. These were:

Thermal extraction - pyrolysis - gas chromatography	35 samples
Extraction, MPLC fractionation, saturated and aromatic hydrocarbon gas chromatography	13 samples
Vitrinite reflectance microscopy	20 samples
Visual kerogen analysis	9 samples

Tables listing in detail which samples were analysed and the results are located in Appendix 1. No complete stratigraphy was available at time of writing, in fact data from the analyses of the samples included in this report is intended to aid the establishment of a stratigraphy for the well.

The following preliminary formation tops were tentatively suggested by Amoco:

Top Hidra Formation	2847.5 m
Top Cromer Knoll Group	2895.5 m
Top Tyne Group	3189.0 m

Based on geochemical information presented in this report, the well is tentatively divided into three sections:

Section 1	2800.0 - 3205.0 m
Section 2	3205.0 - 3550.0 m
Section 3	3550.0 - 4392.0 m

Total Depth (TD)(?)	4392.0 m

Section 1 represents the lowermost part of the Chalk Gp. plus the Cromer Knoll Gp. It could also include the very uppermost part of the Mandal Fm. if the low organic carbon content claystones between 3189 and 3205 m represent the severely eroded/weathered top of the Mandal Fm.

Section 2 is geochemically identical to the Mandal Fm. as commonly found in the Central Graben area.

Section 3 is slightly leaner in organic content and is fairly similar geochemically to the Farsund and/or Haugesund Fms. as they commonly occur in the area.

LITHOLOGY AND TOTAL ORGANIC CARBON CONTENT

Two hundred and seventy-three samples were described and one hundred and fifty-four of these were analysed for TOC content. Figure 2 shows the variation in TOC over the analysed interval of the well plotted with a generalised lithological column. A similar plot of TOC versus the observed lithology is shown in Enclosure 1. The TOC data are listed in Tables 1 and 2, while the lithology description can be found in Table 1.

Section 1 (2800 - 3205 m)

The thirty-six samples from this section are dominated by carbonate rocks (limestones) down to about 2900 m. Below this depth the lithology becomes generally more argillaceous and is mostly described as marl. Below about 3160 m the lithology becomes even more argillaceous and is best described as claystone. The transition at the base to Section 2 cannot be clearly defined based on lithology.

Twenty-nine of the samples from Section 1 were analysed for TOC content. The content varies considerably from poor (0.26 %) to rich (6.59 %). However, the rich TOC contents are usually those of carbonates with high contents of free hydrocarbons and are thought to reflect the presence of migrated hydrocarbons and possibly asphaltene precipitation in these rocks rather than indicating any source rock potential.

Section 2 (3205 - 3550 m)

The sixty-three samples from Section 2 have a brown-grey to dark grey claystone as the dominant lithology, although carbonates were occasionally observed. In places the claystone grades to siltstone and it is mostly fairly soft. Many of the samples were severely contaminated, especially with baryte. The claystone observed in this section is typical in appearance for the Mandal Fm.

Twenty-six samples were analysed for TOC content from Section 2, twenty-three of these were of the dominant claystone (siltstone), one was caved? marl, one was carbonate and one was a bulk sample. The claystones all have rich TOC contents (2.36 to 6.86 %), mostly above 5 %. This represents a genuine source rock.

The caved? marl has a good TOC content of 1.21 %, the carbonate sample has a good TOC content of 1.10 % and the bulk sample has a fair TOC content of 0.75 %. The latter sample represents claystone strongly diluted by baryte.

Section 3 (3550 - 4392 m)

One hundred and seventy-four samples were described from this section. The dominant lithology is a claystone somewhat similar to that found in Section 2, but with a more greyish hue, generally darker and possibly slightly less silty. Contamination by drilling additives is very common in this section and many of the samples are totally dominated by additives, primarily baryte, but also coal-like additives.

Sixty-two samples were analysed, all of the same clayey lithology (some described as siltstones). The TOC content is good to rich (1.03 to 4.31 %), mostly between 1.5 and 3.0 %. Although these data indicate a rich source rock (and a genuine one), it is significantly lower than for Section 2 and must signify a change in the depositional environment between the two sections.

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ROCK-EVAL ANALYSIS

One hundred and fifty-four samples were analysed. The data are listed in Table 2. Production index is plotted in Figure 3a, S_1 versus depth in Figure 3b, S_2 versus depth in Figure 3c, Tmax in Figure 4, Tmax versus hydrogen index in Figure 5a and hydrogen index versus depth in Figure 5b. Rock-Eval data versus the observed lithology is plotted in Enclosure 1.

Kerogen Type and Richness

(Hydrogen Index, Oxygen Index and Petroleum Potential)

Section 1 (2800 - 3205 m)

Twenty-nine samples were analysed by Rock-Eval pyrolysis from this section. The hydrogen indices vary considerably (56 to 503 mg HC/g TOC) as do the petroleum potentials (0.6 to 29.8 mg HC/g rock). However, these variations are not thought to reflect variations in the source rock potential, but rather variations in the amounts of migrated hydrocarbons and asphaltenes present. This can be seen by comparing Figures 3b and 5b. High hydrogen indices in Section 1 correlate with high S_1 values. The S_2 values are generally much lower (the higher values are thought to be strongly affected by heavy molecular weight hydrocarbons and asphaltenes), Figure 3c, suggesting that Section 1 does not have any significant source rock potential.

Section 2 (3205 - 3550 m)

Twenty-six samples were analysed by Rock-Eval pyrolysis from this section. The hydrogen indices of the claystones/siltstones range 368 to 977 mg HC/g TOC and the oxygen indices range 1 to 53 mg CO_2/g TOC, suggesting kerogen type II. The samples all have rich petroleum potentials (21.9 to 41.8 mg HC/g rock). The marl sample has a hydrogen index of 356 and an oxygen index of 72 mg CO_2/g TOC, suggesting kerogen type II, but only a fair petroleum potential of 5.2 mg HC/g rock. The carbonate sample has a hydrogen index of 368 mg HC/g TOC and an oxygen index of 125 mg CO_2/g TOC, but only a fair petroleum potential of 5.3 mg HC/g rock. The bulk sample has a hydrogen index of 189 mg HC/g TOC and an oxygen index of 87 mg CO_2/g TOC, but only a poor petroleum potential of 1.9 mg HC/g rock.

The silty claystone which makes up the bulk of Section 2 has a rich potential for generation of oil. The Rock-Eval pyrolysis data is similar to those expected for pre-oil window mature Mandal Fm. source rocks in the Viking Graben. The data is a strong indication that Section 2 is equivalent to Mandal Fm.

Section 3 (3550 - 4392 m)

Sixty-two samples were analysed by Rock-Eval pyrolysis from this section. The samples have hydrogen indices ranging from 30 to 542 mg HC/g TOC and the oxygen index from 11 to 68 mg CO_2/g TOC. The hydrogen indices show a general decrease with depth as illustrated in Figure 5b. This suggests that the variations in the hydrogen index are mostly maturity dependent. It is also seen that the major decrease in the hydrogen index occurs below 4000 m, which is the approximate depth of peak oil generation (see later discussion). The petroleum potential shows a similar decrease with depth. This ranges from rich (31.3 mg HC/g rock) in the upper levels, to poor (1.8 mg HC/g rock) towards the base. A general decrease in kerogen content with depth can also be seen (Figure 3c).

The maturity of Section 3 ranges from top to base of oil window (see later discussion). The original potential of the formation is therefore preserved only in the upper part of the section. The data for the upper part of the section indicates a good to rich potential for generation of oil and gas. This potential is thought to have originally been fairly similar throughout the section. Section 3 is thought to be equivalent of the Farsund and/or Haugesund Fms.

Generation and Migration
(Production Index, $S_1/(S_1+S_2)$)

The production index data from Section 1 is quite variable, but generally high (Figure 3a), indicating the presence of migrated hydrocarbons in this section. This is supported by the generally high S_1 values (Figure 3b). As previously discussed, the section is not thought to have any inherent source rock potential of significance and hence the free hydrocarbons present must have migrated into the section.

The production index data from Section 2 is generally lower than in Section 1 and does not indicate that substantial amounts of free hydrocarbons are present. However, the amounts of free hydrocarbons (Figure 3b) are high, higher than for most of the other samples in the well. Section 2 is not within the oil window (see later discussion) and very little of the in-situ kerogen is yet converted to free hydrocarbons. The section does however, as previously discussed, contain a (very) rich source rock for oil. Hence only a small conversion of the kerogen could produce measurable amounts of free hydrocarbons. Later discussion will show that the hydrocarbons present in Section 2 are probably not only generated in-situ, but probably also migrated into the rock.

The production index data from Section 3 shows a regular increase downwards from about 4000 m, as can be seen in Figure 3a. This increase corresponds with peak oil maturity (see discussion below) and also with the absolute amounts of free hydrocarbons (Figure 3b). The Section appears to generate increasing amounts of free hydrocarbons downwards, corresponding with a decrease in the hydrogen index (Figure 5a, 5b). Most of the hydrocarbons present in this section are probably generated more or less in-situ.

Maturity (Tmax)

Most of the analysed samples below 3200 m consist of claystones or siltstones containing kerogen type II or II/III. This makes it one of the better wells for estimating maturity based on Tmax data. The data is plotted in Figure 4. Based on the Tmax data the well is immature (less than 0.5 % Ro) down to about 3325 m. It is early mature (0.5 to 0.6 % Ro) between 3325 m and 3575 m. The top of the oil window (0.6 % Ro) is encountered at 3575 m and the base of the oil window (1.0 % Ro) at about 4350 m. Peak oil generation (0.8 % Ro) occurs around 4000 m. The base of the condensate window (1.3 % Ro) is difficult to estimate exactly due to the none-linear nature of Tmax at such high maturities. It is however suggested that this would occur between 5000 m and 5600 m. This indicates that some liquid petroleum could still be found at depths down to at least 5000 m and that all liquids need not be cracked to gas before about 5600 m in this area.

PYROLYSIS - GAS CHROMATOGRAPHY

Thirty-five samples were analysed. Typical pyrograms can be seen in Figures 7a-e and a pyrolysis products triangle in Figure 8. Pyrolysis GC data are listed in Table 3.

Section 1 (2800 - 3205 m)

Four samples from this section were pyrolysed. The pyrograms of the two analysed carbonate samples are similar, showing only gaseous products and alkenes due to pyrolysation of asphaltenes (Figure 7a). The two pyrograms of the marl samples are barren, except for some gaseous products (Figure 7b). None of these four samples have any source rock potential.

Section 2 (3205 - 3550 m)

Nine samples from this section were pyrolysed, all claystones. All nine pyrograms are very similar. They are dominated by alkene/alkane doublets and feature a rising baseline. Aromatic compounds are present, but not prominent and phenol compounds are unsignificant (Figure 7c). The pyrograms show that the samples are all immature to early mature source rocks containing kerogen type II, i.e. oil-prone. However, the maturity is low and cannot explain all the mature hydrocarbons found in these samples. The pyrograms are those typically expected for immature to early mature Mandal Fm. source rocks in the Central Graben area.

Section 3 (3550 - 4392 m)

Twenty-two samples from this section were pyrolysed, all claystones. The pyrograms in the upper part of this section are similar to those from Section 2. The pyrograms in Section 3 do however show a regular change in pattern with depth. The rising baseline becomes less prominent and disappears towards the base of the section, the alkene/alkane doublets become less prominent (especially the late eluting peaks) and the gaseous compounds increase (Figure 7d and 7e). These changes are thought to be primarily due to increasing maturity. The greatest changes seem to occur around 4000 m and are probably associated with the onset of peak oil generation. Some variations can be seen between the pyrograms that are not maturity dependent, but due to slight variation in the kerogen content of the samples. Most of the samples contain kerogen type II to II/III, but some may grade almost to kerogen type III, making type II/III the average. The section is currently generating hydrocarbons and is thought to be the source of the observed hydrocarbons in this well. The generation of hydrocarbons is especially prominent in the lowermost 400 m of the well. Towards the base of the well most of the kerogen has been converted to hydrocarbons and it is probable that cracking of oil (top condensate window) will begin close to the base of the well.

EXTRACTION DATA

Thirteen samples between 2985 m and 4385 m were extracted, the EOM fractionated and the hydrocarbons analysed by gas chromatography. Data are listed in Tables 4a-e, 5 and 6 and plotted in Enclosure 2. The chromatograms are shown in Appendix 4. The contents of extractable organic material and extractable hydrocarbons are plotted versus depth in Figures 9a-d. Selected saturated hydrocarbons gas chromatograms are shown in Figures 10a-e. Selected aromatic hydrocarbon gas chromatograms are shown in Figures 11a-i. Figure 12 shows a plot of the various calculated vitrinite reflectances versus depth.

Section 1 (2800 - 3205 m)

One light orange to orange-grey limestone and two mainly light grey marls were analysed. The TOC content of the limestone is fairly high at 1.7 %, both marls have fair TOC contents. The amount of EOM and EHC in these three samples is high with TOC normalized values of > 300 mg EOM/g TOC, with EHC comprising over 70 % of the EOM. These values suggest that all three samples are stained by migrated hydrocarbons (see Figures 9a-d).

Section 2 (3205 - 3550 m)

Four brown-grey to dusky yellow-brown to brown-black claystones were analysed. These have rich TOC contents, with over 7 % for the uppermost (3228 m) and 3 - 5 % for the other three. EOM contents mirror TOC contents, although the richest TOC claystone has a slightly higher EOM/TOC and almost the double EHC/TOC content compared with the other three claystones, possibly due to slight staining by migrated hydrocarbons. EOM/TOC values of 100 - 150 mg EOM/g TOC and EHC/TOC values between 30 - 60 mg EHC/g TOC suggest that the claystones are at the onset of hydrocarbon generation, while considerable bitumen generation has already occurred. The higher ratio of saturate to aromatic hydrocarbons of the uppermost (highest TOC) sample is also probably due to slight staining by migrated hydrocarbons (possibly locally generated).

Section 3 (3550 - 4392 m, TD)

Six dark grey to brown-black claystones were analysed. The TOC content of these is fairly constant at around 2 % (a very slight decrease with increasing depth). EOM and EHC contents are similar to the lower samples from Section 2, hence the TOC normalized values of EOM and EHC are higher than in Section 2 and show a rough trend of increasing EOM and EHC with increasing depth (Figures 9a-b). EOM/TOC values from 117 - 300 mg EOM/g TOC and EHC/TOC values from 70 - 130 mg EOM/g TOC suggest these shales to be within the main oil generation stage. The samples with the highest EOM may be slightly enriched in EOM due to local migration.

Saturated Hydrocarbons

Section 1 (2800 - 3205 m)

The saturated hydrocarbon distribution of the two analysed marls are quite distinct from the analysed limestone. The two marls are characterised by a front-end biased n-alkane distribution ranging from nC_{12} - nC_{35} with a maximum at nC_{15} (Figure 10a). The n-alkane envelope from nC_{13} - nC_{20} totally dominates in these two samples. This distribution is typical of light oil or even condensate. In contrast, the limestone has an almost bimodal distribution of n-alkanes, with a total range from nC_{12} - nC_{40} and maxima at nC_{15}, nC_{21} and nC_{31} with the nC_{21} maximum predominant (Figure 10b). There is a large unresolved envelope or "hump" between nC_{18} and nC_{35} in this sample, with prominent peaks in the nC_{26} - nC_{35} range due to biomarkers such as steranes and triterpanes. Isoprenoid/n-alkane ratios are similar in all three samples, e.g. with pristane/nC_{17} ratios of ~ 0.5 typical of mature source rocks, in this case of mature migrated hydrocarbons. The higher pristane/phytane ratio of the marls may be related to the differences in dominant boiling point range of hydrocarbons rather than indicating source rock differences. The differences in hydrocarbon distribution may be related to differences in porosity/permeability of the marls and limestones, i.e. higher molecular weight hydrocarbons are present in the more porous/permeable limestones. There is also more migrated asphaltic material in the limestone than in the marls according to the extraction and fractionation data results.

Section 2 (3205 - 3550 m)

The four analysed claystones from this formation have very similar hydrocarbon distributions. The n-alkane distribution is front-end biased with a range from nC_{12} - nC40 and a maximum at nC15 (Figure 10c). Pristane/nC_{17} ratios vary from 0.58 - 0.66, indicating mature source rocks, pristane/phytane ratios range from 1.54 - 1.68, typical of mature anoxic marine source sequences. In addition, there are in the nC_{26} - nC_{34} range some peaks due to biomarkers such as steranes and triterpanes. Their presence suggests that the source rocks have not yet reached the peak oil generation stage, i.e. they are early mature. There is also a slight odd n-alkane preference at nC_{25}, nC_{27} and nC_{29} indicating some higher plant input.

The saturated hydrocarbon distribution is typical of an early mature to mature anoxic marine source rock with a minor terrestrial plant input.

Section 3 (3550 - 4392 m, TD)

Of the six analysed claystones from this sequence the uppermost has a very similar saturated hydrocarbon fraction to those of the Section 2 samples (Figure 10d), while at 3766.5 m and below there is a distinct change in certain parameters (Figure 10e), although the overall distribution is still very similar to the Section 2 samples. The main differences to the Section 2 samples are the lower pristane/ nC_{17} and pristane/phytane ratios and lower amounts nC_{25} alkanes relative to lighter n-alkanes (Figure 10d). There is also a slight trend in that these ratios decrease with increasing depth, suggesting that the changes are mainly due to a significant increase in maturity. The sample from 4044 m would appear to be an exception in that $C_{25}+$ alkanes are much <u>more</u> prominent (Figure 10e) than in any of the other analysed Jurassic samples. It is suspected that this is not due to source or maturity differences, but to depletion in higher n-alkanes caused by expulsion of mainly nC_{10} - nC_{20} hydrocarbons.

Aromatic Hydrocarbons

Section 1 (2800 - 3205 m)

The limestone and two marl samples show the same differences in dominant boiling point ranges in the aromatics as in the saturated. The limestone is dominated by a large unresolved hump, with abundant biomarker compounds which probably consist mainly of aromatic steranes (Figure 11a). The same components are also present in the aromatics of the marl samples, but are much less abundant relative to alkyl naphthalenes (Figure 11b). Phenanthrene and alkyl phenanthrenes are relatively minor constituents of all three samples, which is typical of fairly low mature source rocks with type II kerogen. In these stained samples it suggests that the migrated hydrocarbons are from an early mature source. The low values of MNR and DMNR support this conclusion. In the FPD GC of these samples, alkyl benzothiophenes are abundant as well as dibenzothiophenes and the 3+2/1 MDBT ratio is less than 1 (Figure 11c). This is also typical of oils of fairly low maturity. The high MPI1 values are due partly to coelution with sulphur aromatics which are abundant in these samples.

Section 2 (3205 - 3550 m)

The aromatic hydrocarbon distributions of the four analysed claystones resemble those in the overlying Section 1, except for variations in detail. These variations include slightly lower values of dibenzothiophene to phenanthrene and 4/1 MDBT and 3+2/1 MDBT ratios and slightly higher DMNR values. Although the calculated reflectance value based on the MPI1 index suggests a maturity close to the base of the oil window (~ 0.9 % Ro), the presence of aromatic steranes (Figure 11d), low MNR, DMNR and MDBT ratios mentioned and presence of abundant alkyl benzothiophenes (Figure 11e) suggest the sequence is less mature, probably early mature, i.e. 0.5 - 0.7 % Ro reflectance range. It may be that the migrated hydrocarbons occurring in the overlying marls and carbonates are locally sourced by Section 2 which is probably sufficiently mature in this well section to have expelled some oil.

Section 3 (3550 - 4392 m, TD)

The six analysed claystones show distinct differences in aromatic hydrocarbon distributons over those seen in Section 2. The major variations are considered to be due mainly to increasing maturity. Apart from in the uppermost sample, aromatic steranes are relatively less abundant than in the Section 2 samples and in addition the unresolved hump in this region decreases in size with increasing depth due to increased maturity (Figures 11f-g). Changes in the dominant resolved components, e.g. alkyl naphthalenes and phenanthrenes are very slight. There is a slight increase in DMNR towards the base of the well section. The MPI1 index shows a slight decrease which is mainly due to a decrease in co-eluting sulphur aromatics. There are more noticeable changes in the sulphur aromatic distribution. These include the disappearance of alkyl benzothiophenes and a decrease in the 3+2/1 MDBT ratio below 3600 m (cf Figure 11h with Figure 11e) and, near the base of the analysed section, the virtual disappearance of sulphur compounds.

There is a considerable variation in the relative abundance of alkyl naphthalenes to alkyl phenanthrenes (for example cf Figure 11f with 11i). This is taken to be due to greater depletion of the lighter alkyl naphthalenes in some samples than in others due to variable expulsion efficiency.

Recalculation of MPI1 index to compensate for coeluting sulphur aromatics suggests a trend in these values over the interval from 3200 m to 4800 m from 0.57 - 0.73 %. Based on Radke and Welte, 1983 formula (0.6xMPI1+0.4) this gives a calculated vitrinite reflectance trend from 0.92 % at 3228 m to 0.87 % at 4044 m and 0.87 % at 4385 m. Using an alternative formula used by Boreham et al 1988 (0.7xMPL1+0.22), the trend is:

3200 m	0.59 % Rc
3900 m	0.67 % Rc
4300 m	0.75 % Rc

Based on the general aromatic hydrocarbon fingerprints, the calculated % Ro values using this latter formula are probably more correct at 3200 m, while values from the formula of Radke and Welte appear more correct at 4300 m. The latter formula is strongly affected by co-elution with sulphur compounds in Section 2. Another aromatic maturity ratio known as the Methyl Phenanthrene Distribution Factor (MPDF) developed by Kvaldheim et al 1987 (MPDF= (2MP+3MP)/(2MP+3MP+1MP+9MP), RL= 0.166+2.2424*MPDF) was also used to calculate equivalent vitrinite reflectance according to another formula correlating this ratio to vitrinite reflectance. The vitrinite reflectance trends determined using their formula and the others are shown in Figure 12.

Depth	Ro	Boreham	Kvaldheim	Radke/Welte
3243	0.79 %			
3306		0.60 % Rc	0.69 % Rc	0.91 % Rc
3549	0.21 %			
3600		0.64 % Rc		0.89 % Rc
3766.5		0.65 % Rc	0.76 % Rc	0.84 % Rc
4149	0.33 %			
4177		0.72 % Rc		0.86 % Rc
4272		0.73 % Rc	0.82 % Rc	0.87 % Rc
4274	0.67 %			

The trend based on the Kvaldheim formula is intermediate between the other two. The correct trend is also considered to be that intermediate between the Radke and Boreham trends. Based on GC fingerprints and Rock-Eval data as well as aromatic ratios besides the MPI1, the correct trend is roughly from 0.6 % Ro at 3250 m to 0.85 % Ro at about 4300 m (see Figure 12). The base of the oil window using this trend occurs at approximately 4500 m.

VITRINITE REFLECTANCE

A total of nineteen whole rock samples was analysed for thermal maturity using vitrinite reflectance, two samples being sidewall cores and the rest cuttings samples. The samples were from the depth interval 2900 - 4392 m and covered a stratigraphic range of Lower Cretaceous to Upper Jurassic.

The vitrinite reflectance data is presented in Table 7, while Figure 13 shows a plot of vitrinite reflectance versus depth. The individual sample histograms are included in the Appendix.

In the first four samples (2900 - 3176 m) the overall phyto-clast content is extremely low, with the exception of the 3100 m sample. The lithology is also of a very mixed type, ranging from 2 - 4 types of claystone to silty material. Poor quality and small sized vitrinite is rare. Bitumen staining is almost absent.

The two underlying samples (3201 and 3243 m) are very similar to the above, except for a slight improvement in the vitrinite quality. Bitumen staining is low in the 3201 m sample, but high in the 3243 m sample.

A marked change is observed in the 3294 m sample where the overall phytoclast content is moderate to high and where 40 % of the total content is medium quality and small to large sized vitrinite. Bitumen staining is high, thus significantly depressing the reflectance values.

In the four underlying samples (3450 - 3651 m) however, the overall maceral content is again very low and poor to medium quality vitrinite occurs only in traces. The claystone of these samples is very pyritic, except in the 3620 m sample which mainly consists of siltstone/sandstone. Bitumen staining is low to moderate.

In the five underlying samples (3750 - 4149 m) the overall maceral content is low to very low and poor quality and small sized vitrinite is very rare. The lithology is very mixed, ranging from 2 - 3 types of claystones to siltstone. Bitumen staining is low until 3948 m, but apparently increases downwards.

The next two samples (4251 and 4274 m) contain moderate amounts of phytoclasts, but the vitrinite content is variable. The 4251 m sample has almost 40 % vitrinite, and most of which is of medium quality and medium sized. Bitumen staining is low to moderate. In contrast, the 4274 m sample has vitrinite only in traces and staining is low.

The two deepest samples (4328 and 4392 m) are very similar to the 4274 m sample. Both have low maceral contents and the quality of vitrinite is poor. Staining is moderate to high in the 4328 m sample, but slightly less in the 4392 m sample where no determination was possible due to very limited sample amount.

Based on the data obtained and the microscopic observations, a thermal maturity trend is suggested for the well. Accordingly, the well is estimated to reach oil window maturity (Ro = 0.6 %) around 3900 m and is thought to remain within the oil window until the target depth.

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VISUAL KEROGEN MICROSCOPY

A total of eleven samples were examined, covering the interval 3000 - 4349 m. The detailed kerogen compositions are shown in Table 8, while the gross compositions are plotted in a triangular diagram, Figure 14. Maturity data (Spore Colour Index) is included in Table 7.

Kerogen Typing

The single Section 1 sample is dominantly liptinitic (95 %), but this is overwhelmingly of fine-grained degraded and reworked matter, spore/pollen being subordinate. No fresh algae are identified. The assemblage is possibly bituminous.

According the kerogen assemblage this lithology has little or no inherent source potential. The high hydrogen index considering the poor quality organic matter observed may reflect staining by asphaltenes.

The uppermost Section 2 sample (3243 m) consists practically only of liptinite, this being mainly of yellow-brown fluorescent, good quality (? butiminous) amorphinite. Degraded spore/pollen, algal shreds and bituminite are subordinate.

This anoxic marine sapropelic assemblage has excellent organic matter for generation of oil and gas.

The lower sample (3549 m) surprisingly yielded insufficient organic matter for kerogen typing, but appears to be strongly algal and bituminous similar to the overlying sample.

The eight Section 3 samples examined have broadly similar kerogen compositions to each other, containing strongly dominant liptinitic kerogen (> 80 %). This consists mainly of brown/yellow-brown fluorescent amorphous matter, possibly including reworked material or degraded woody (vitro-humic) matter. There is a variable algal content and variation in preservation and grain-size, while dinoflagellates occur in trace amounts. Cuticle is also present, particularly at 4101 m, which is the most coarse-grained (? near source, more terrestrially affected). Vitrinite and inertinite occur in only trace to accessory (< 10 %) amounts.

These anoxic, dominantly marine assemblages suggest Section 3 to have source rocks similar to those of Section 2, at least in the upper levels. There appears however to be a tendency for decreasing kerogen quality with depth.

Droplets of free hydrocarbons (intense whitish blue fluorescence) are recorded in the samples at 4101, 4323 and 4341 m, these being particularly abundant at 4101 m.

Maturity
(SCI, Spore Fluorescence)

The SCI data for the individual samples suggests the top of the oil window (SCI 6.0) to occur between ~ 3550 m and ~ 3810 m, the uppermost sample (3000 m) being moderately mature. The linear regression line for all SCI data suggests the top to occur at ~ 3650 m, i.e. in Section 3. By extrapolation the base of the oil window (SCI 8.0) is tentatively estimated to occur at ~ 4720 m.

CONCLUSIONS

The following conlusions have been made based on analyses performed on samples from well NOCS 2/8-14:

Source Rock Potential

Section 1 (2800 - 3205 m)

Based on general lithostratigraphic knowledge and information from Amoco and chemical data, this section is considered to consist of the Chalk Group (? - 2895.5 m), Cromer Knoll Gp. (2895.5 - 3195 m) and the strongly weathered/eroded upper part of the Mandal Fm. (3195 - 3205 m). The interval from 3165 m to 3195 m lithologically resembles (based on cuttings samples) more the Mandal Fm. than the Cromer Knoll Gp. However, both the TOC contents and the gamma ray readings are mostly low and not typical for the Mandal Fm. It is suggested that the interval from 3165 m to 3195 m represents partly reworked (thoroughly weathered) material probably derived partly from the Mandal Fm., whereas the interval from 3195 m to 3205 m represents weathered, but not reworked Mandal Fm.

Section 2 (3205 - 3550 m)

This section of the well is, based on geochemical data, thought to represent unweathered Mandal Fm. This section of the well is a very rich source rock for predominantly oil, but also gas.

Section 3 (3550 - 4392 m)

Based on geochemical data and information from Amoco, this section of the well is thought to represent the Farsund Fm., although purely on geochemical grounds. The presence of Haugesund Fm. cannot be ruled out. This section of the well is considered to presently have a rich to fair potential for generation of oil and gas. The potential decreases regularly with depth and much of the apparent decrease in present day source rock potential is due to the maturity of the rock. The original source rock potential is estimated to have been rich at the top, possibly reduced to good at the base. It is however, most likely that the original potential has been rich even at the base, as the lower part of the section has a maturity past peak oil generation.

Generation and Migration

None of the analysed samples in Section 1 are considered to have generated any hydrocarbons. Migrated hydrocarbons are however abundant, especially in limestones. These hydrocarbons have apparently the same maturity as those in Section 2 and are most likely sourced from this section, especially as hydrocarbons can be traced all the way from Section 2. This correlation is however, not supported by GC-MS or isotope analyses, which have not been performed, but it is considered unlikely that such analyses would contradict this interpretation.

The Section 2 samples are as previously noted considered to consist of unweathered Mandal Fm. lithologies. The top of this section is presently above the top of the oil window (0.6 % Ro) and all of it is thought to have a pre-peak oil (0.8 % Ro) maturity. However, the section is full of hydrocarbons which are most likely generated in-situ. These hydrocarbons are early generated and relatively sulphur-rich. See discussion in Extraction chapter. Local migration from Section 3 is possible, especially towards the base. Section 2 appears to be expelling hydrocarbons into the overlying intervals.

Section 3 is also currently generation hydrocarbons. The hydrocarbons in this section are more mature, being within the oil window with a maturity close to, and towards the base probably past peak-oil generation (0.8 % Ro). This indicates that towards TD most of the generative potential of the rock has been realised and hydrocarbons are actively being expelled. The rock is seen to contain more free hydrocarbons than normally found even in currently generating source rocks, and it is speculated that the rock is not yet in equilibrium with respect to generated and expelled hydrocarbons, i.e. that more free hydrocarbons are present in the rock than there would be at equilibrium.

Maturity

Maturity estimates for this well have been very difficult and the various maturity parameters have been contradictive, giving widely variable maturity estimates (cf Figures 4, 12 and 13). The vitrinite reflectance results are considered to be useless in Section 2 and 3 due to the severe staining of the vitrinitic particles and also due to the very low number of particles. Chemical parameters can be used with caution (see Extraction chapter). Spore colour index (derived from visual kerogen microscopy) is probably a fairly reliable maturity parameter. Used with caution the Tmax data is also considered reasonably accurate for Section 2 and 3. Figure 15 shows a combined plot of selected Tmax values and the SCI values. The proposed maturity trend is drawn to compensate for variations in the kerogen composition and staining and suggests that the top of the oil window (0.6 % Ro) occurs close to 3600 m, while the well becomes early mature close to the top of Section 2. The base of the oil window (1.0 % Ro) occurs below TD and extrapolation suggests it to occur close to 4700 m. The maturity gradient for the well changes around the top of Section 2. This is indicated in Figure 15 but can be clearly seen in the bottom hole temperature plot (Figure 16). These changes in the thermal gradient appear to be connected with the change in lithology from marls/limestone in Section 1 to claystones in Sections 2 and 3, the claystones being less conductive. Due to the change in the thermal gradient around the interval where the well becomes early mature (0.5 % Ro), the exact point of onset of early maturity is difficult to estimate, but is suggested to coincide with the top of Section 2, i.e at about 3200 m.

LEGEND FOR FIGURES:

TOC versus Depth

Production Indices versus Depth

Tmax versus Depth

+ Shale/Claystone
X Siltstones
○ Coals
▷ Carbonates
◇ Sandstones
⊠ Anhydrite
◈ Marls
☐ Bulk

Figure 1. Location Map showing block 2/8.

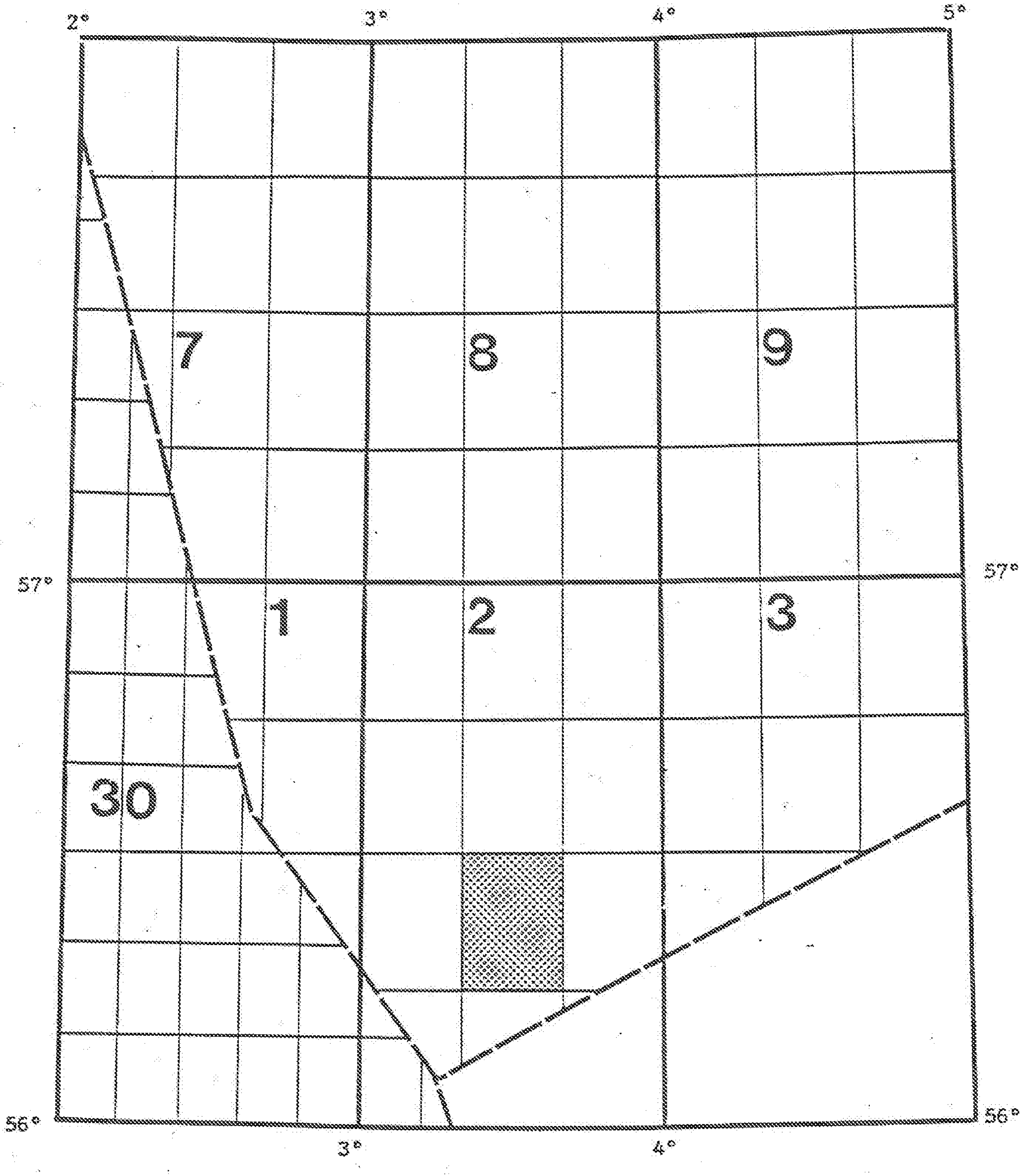


Figure: 2

Client: AMOCO

TOC Data for Well NOCS 2/8-14

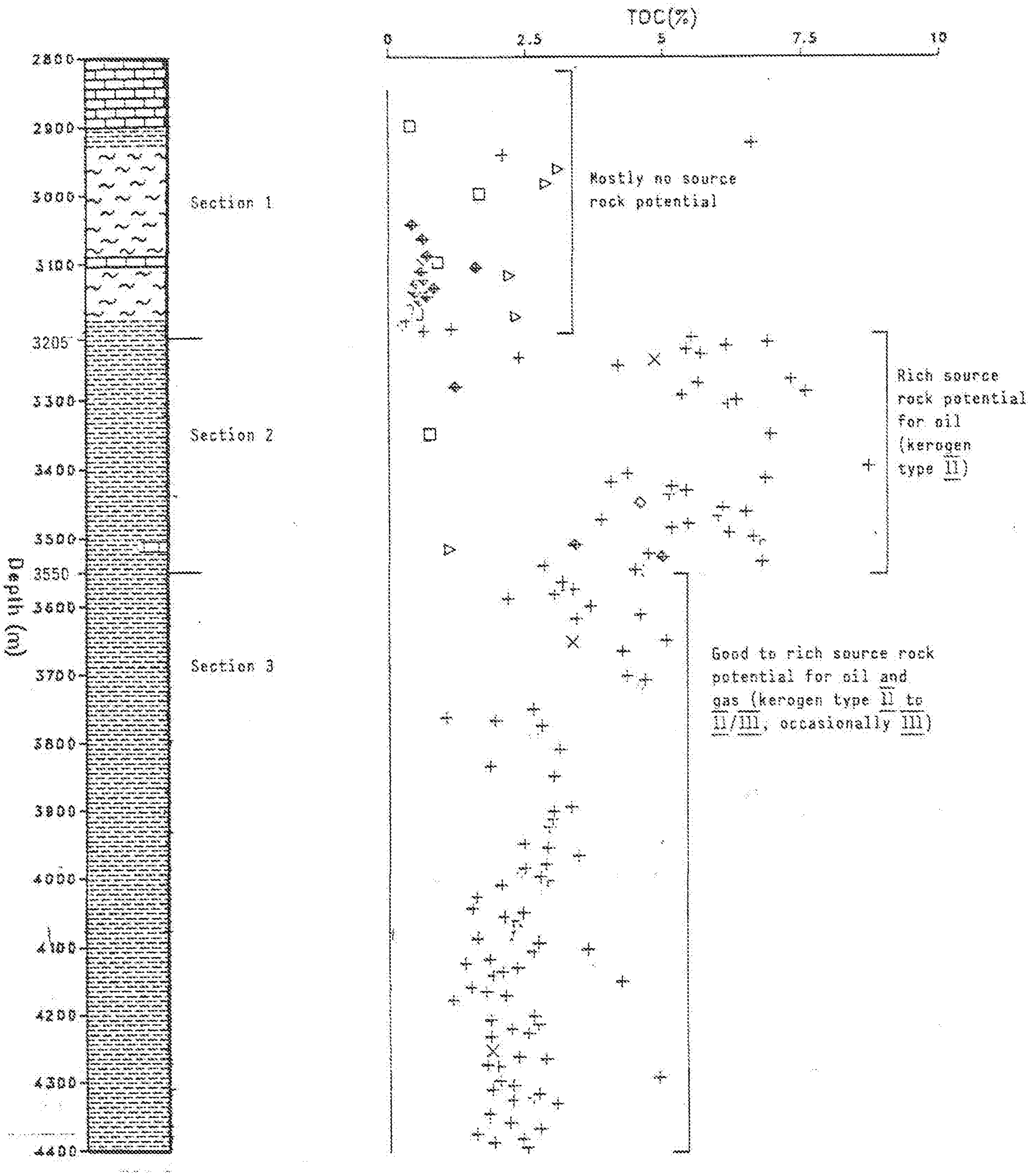


Figure: 3a

Client: AMOCO

GEOLAB NOR

Production Index Data for Well NOCS 2/8-14

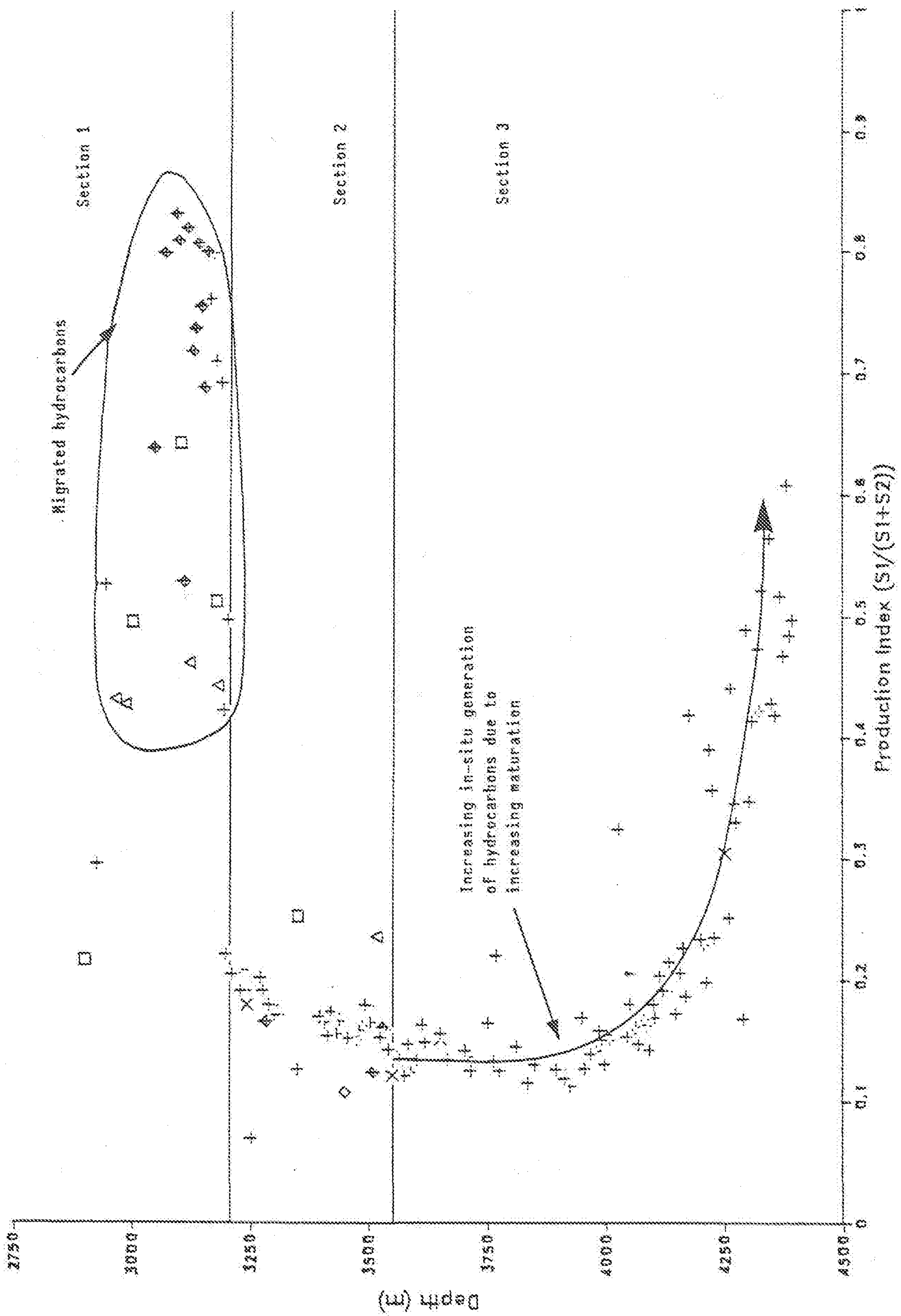
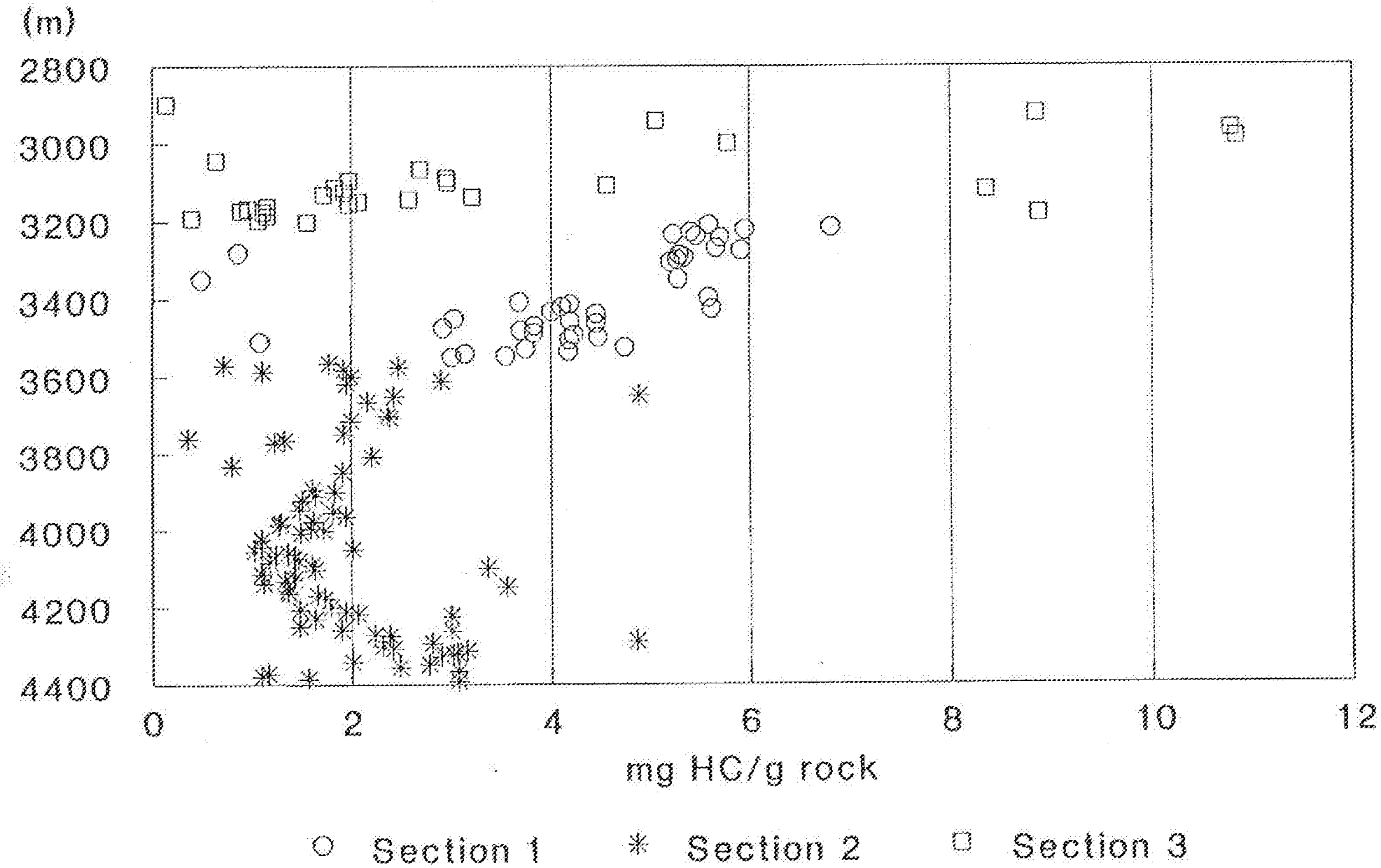
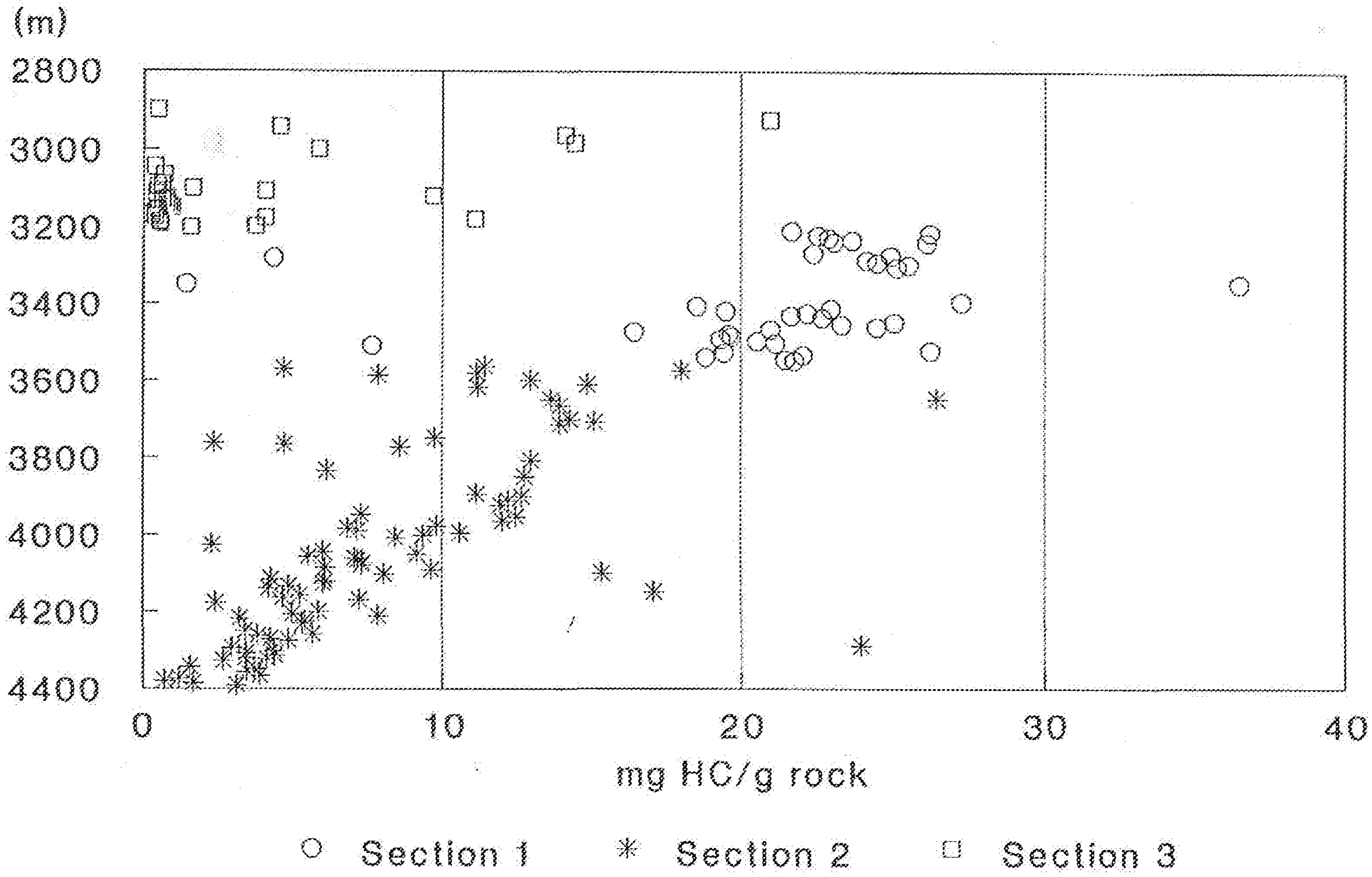


Figure 3b: Well NOCS 2/8-14,
S1 versus depth



GEOLAB NOR

Figure 3c: Well NOCS 2/8-14,
S2 versus depth



GEOLAB NOR

Figure: 4

Client: AMOCO

Tmax Data for Well NOCS 2/8–14

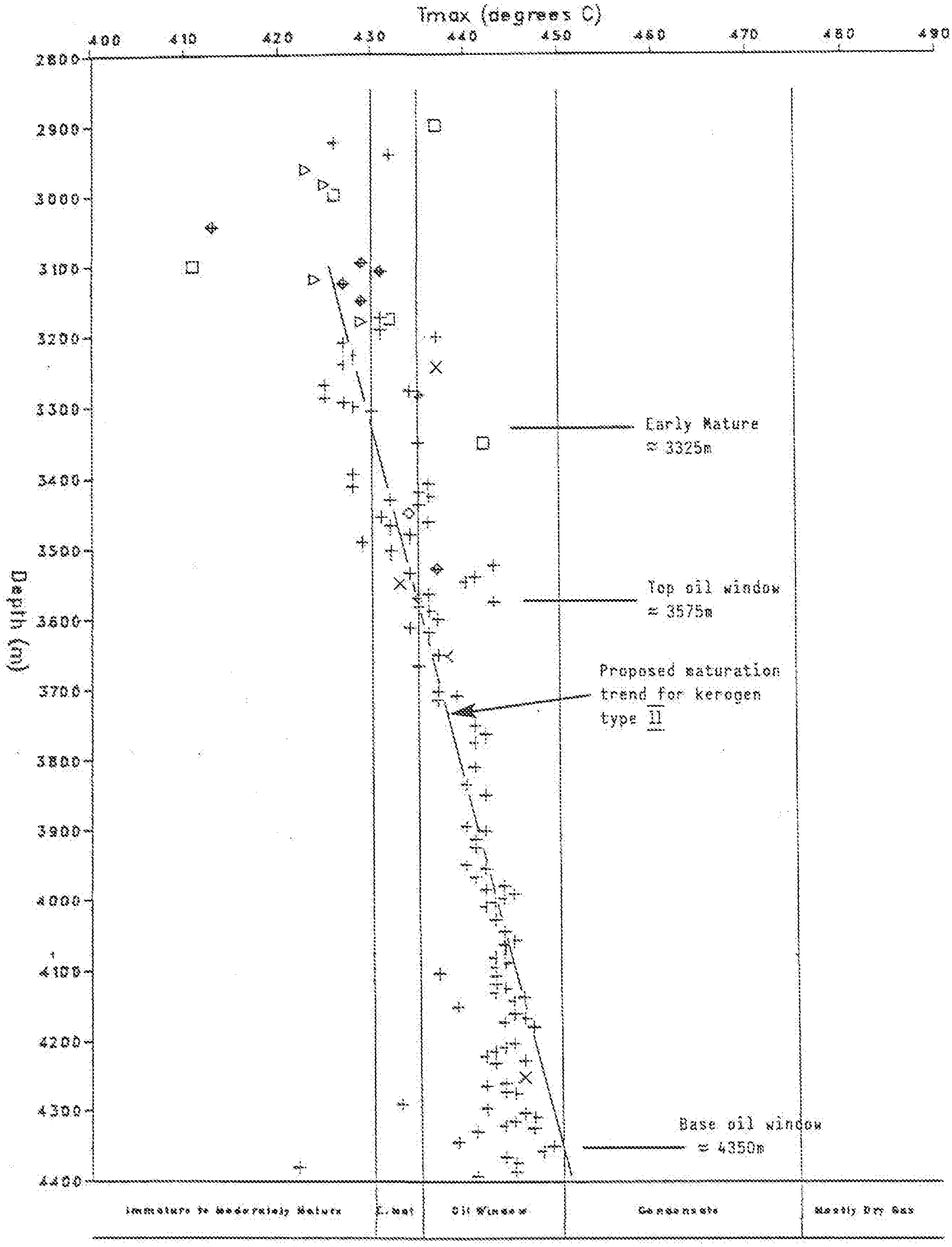


Figure 5a: Hydrogen Index v.s. Tmax values
Well NOCS 2/8–14

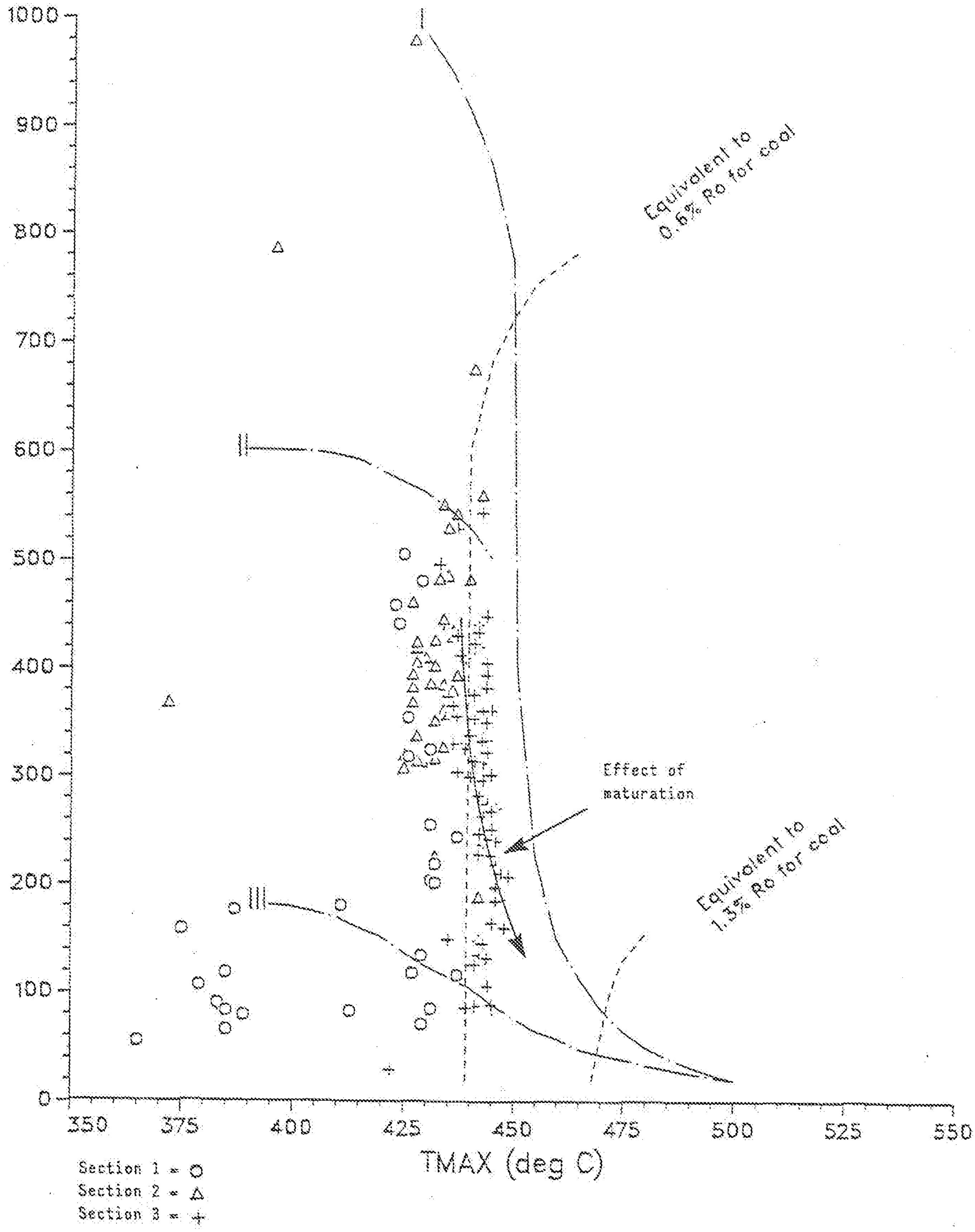
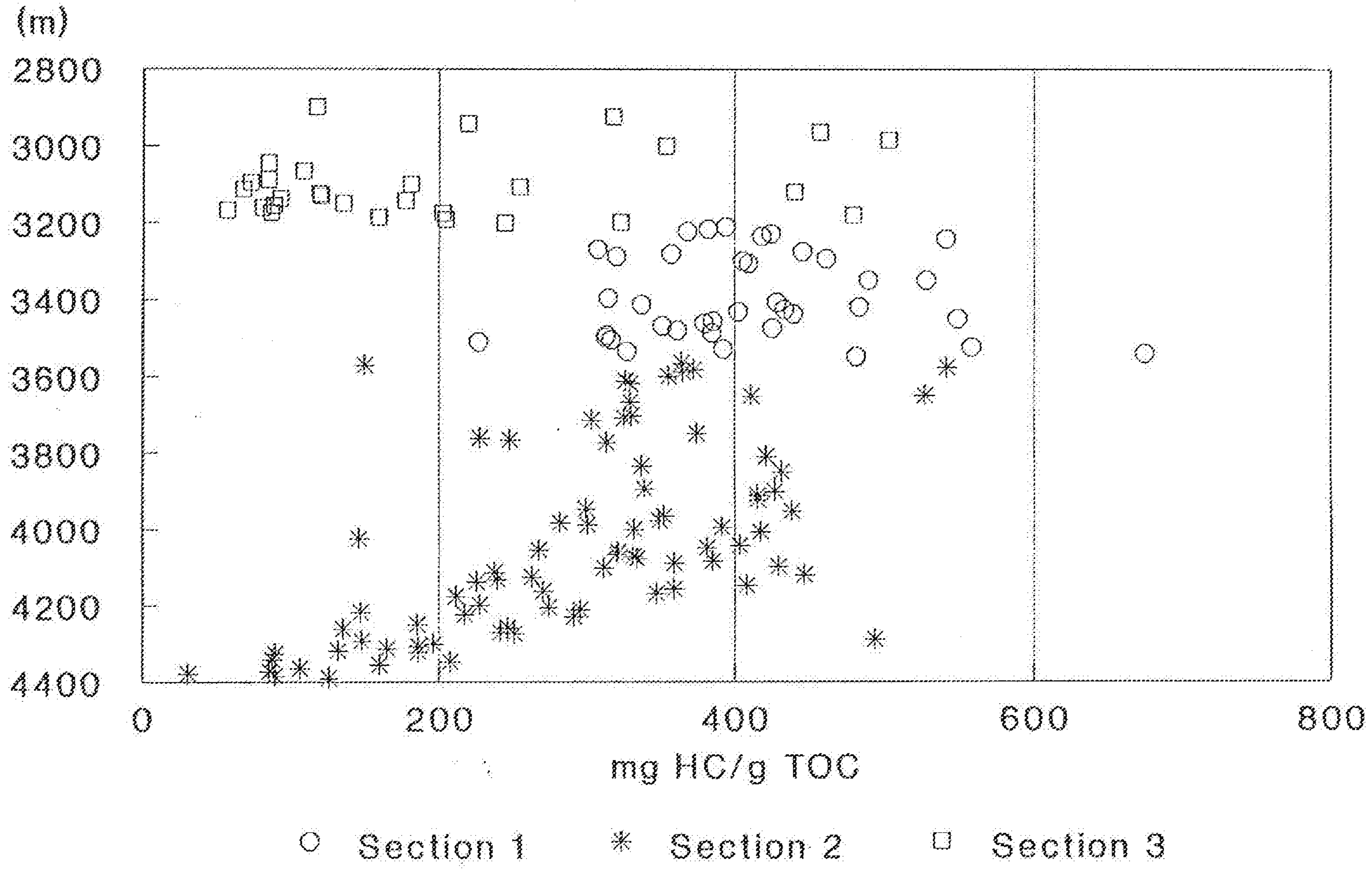
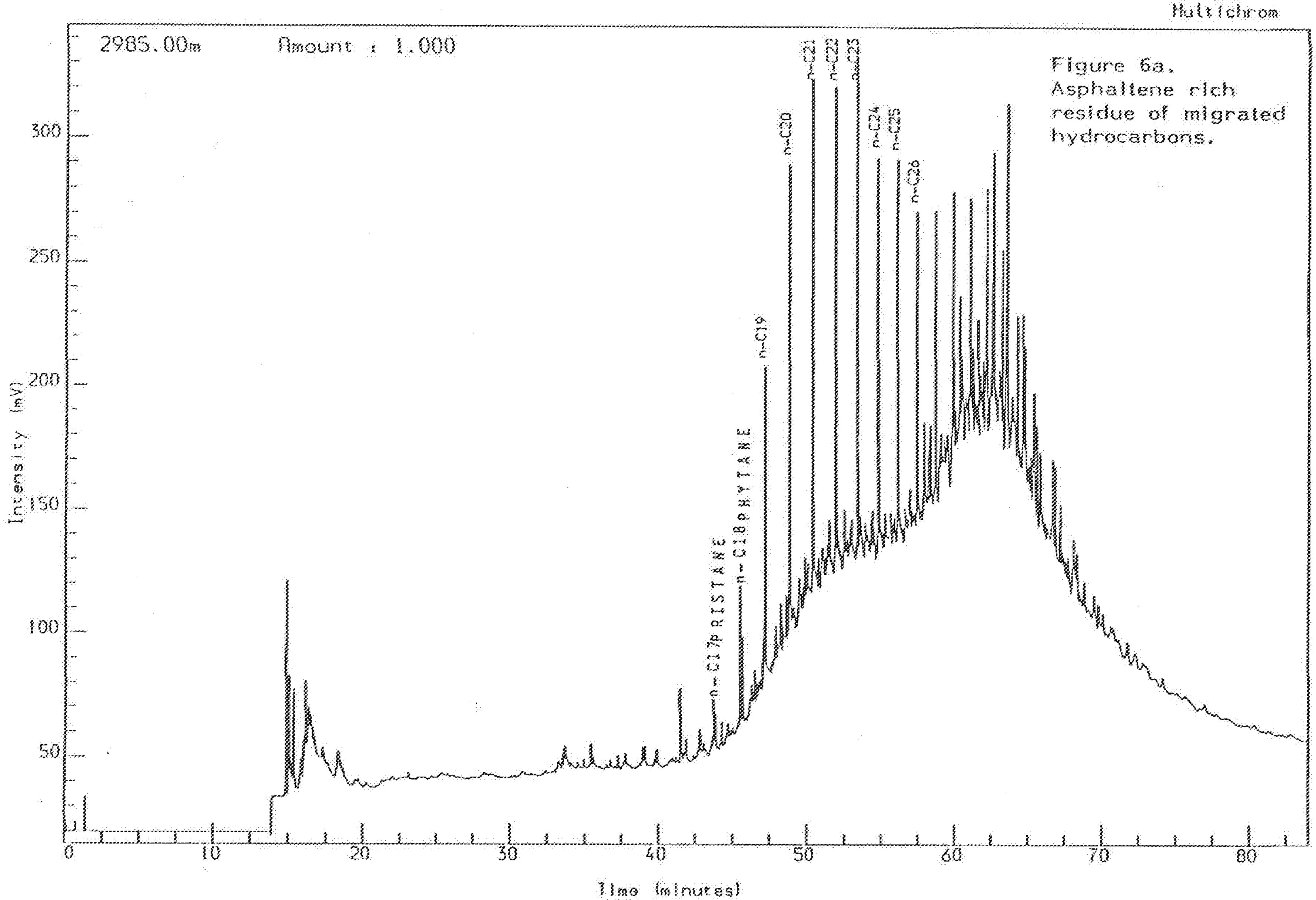


Figure 5b: Well NOCS 2/8-14, hydrogen index versus depth



GEOLAB NOR

Analysis Name : [526097] 26 PE3400391,1,1.

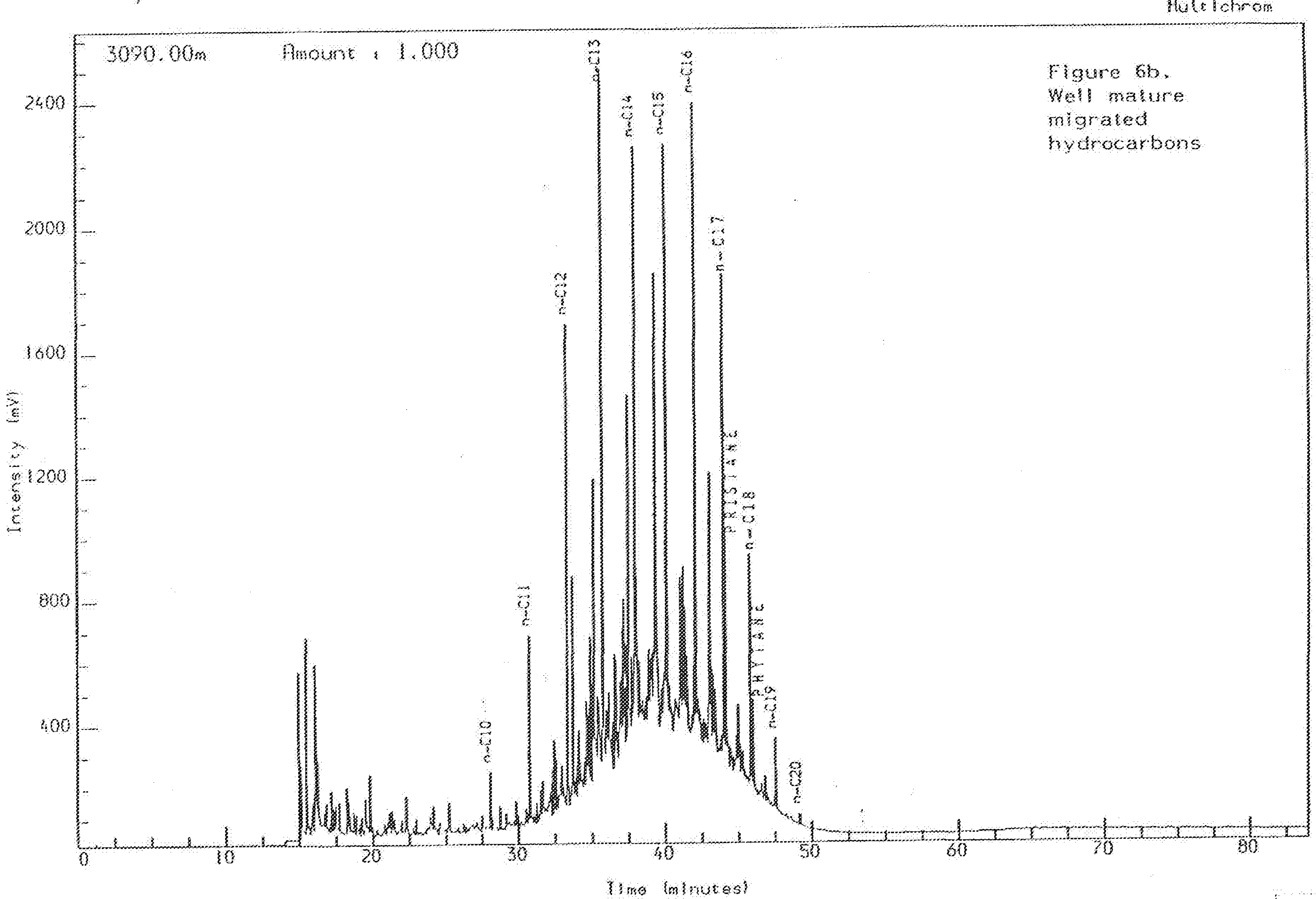


WELL NOCS 2/8-14 2985.00m cut
THERMAL EXTRACTION GC (S1)
Ca: lt or to or gy

Reported on 11-MAR-1991 at 13:14

GEOLAB NOR

Analysis Name : [526097] 26 PE340045I,1,1.

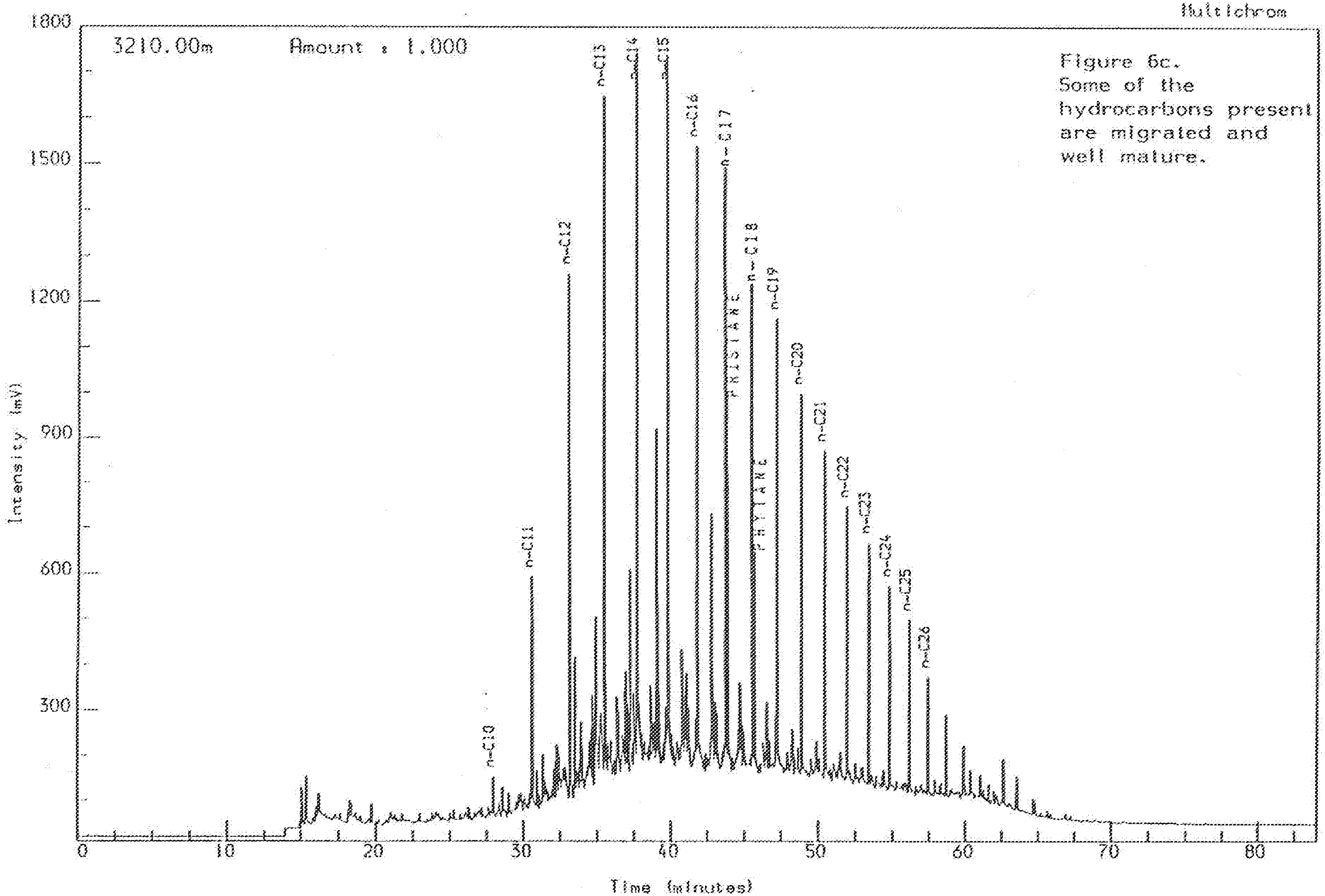


WELL NOCS 2/8-14 3090.00m cut
THERMAL EXTRACTION GC (S1)
Marl: lt gy to m gy

Reported on 11-MAR-1991 at 13:15

GEOLAB NOR

Analysis Name : [526097] 26 PE34B.2.1.

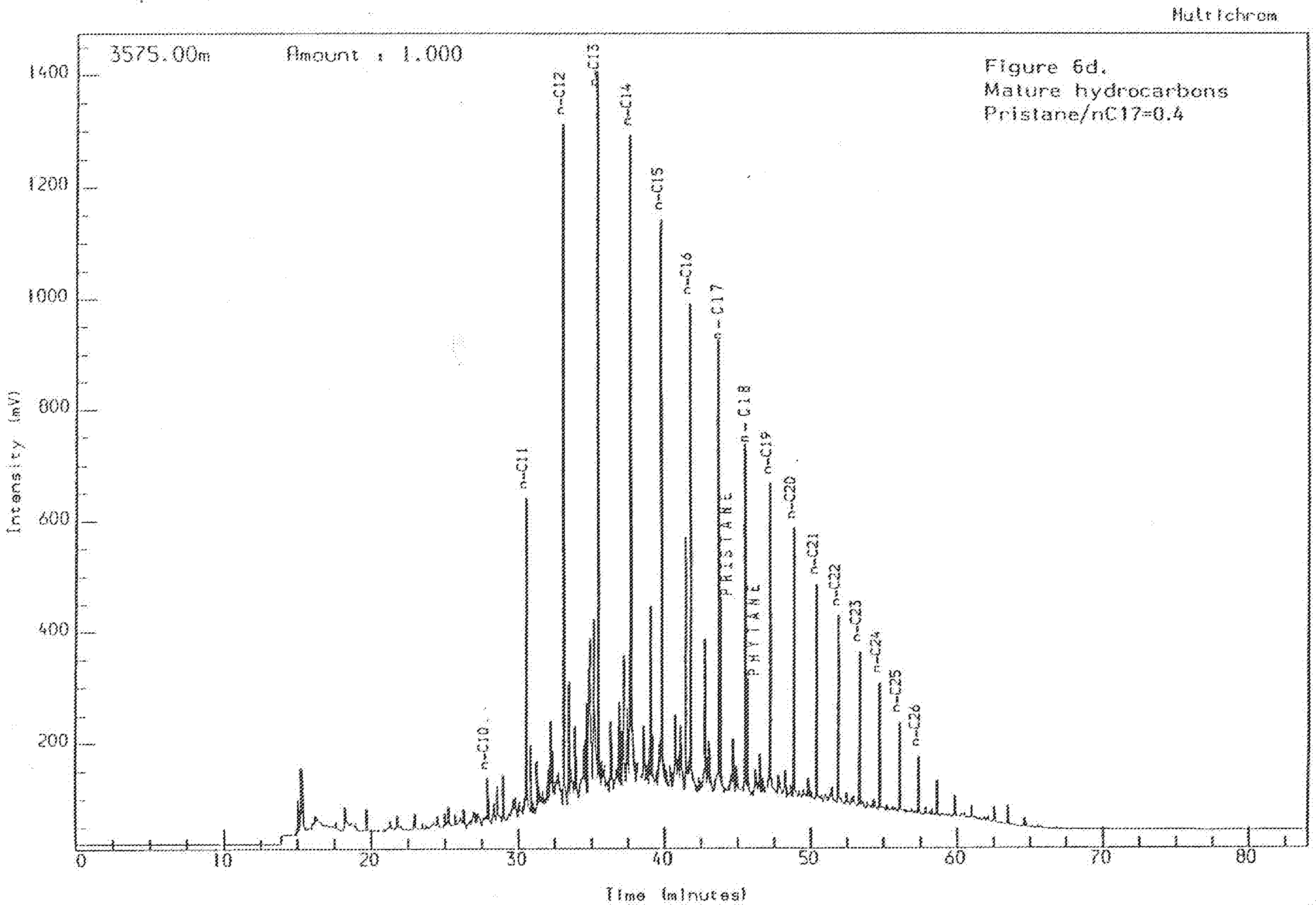


WELL NOCS 2/8-14 3210.00m cut
THERMAL EXTRACTION GC (S1)
Sh/Clst: brn gy to gy brn to drk gy

Reported on 12-MAR-1991 at 09.08

GEOLAB NOR

Analysis Name : [526097] 26 PE34B,10,1.

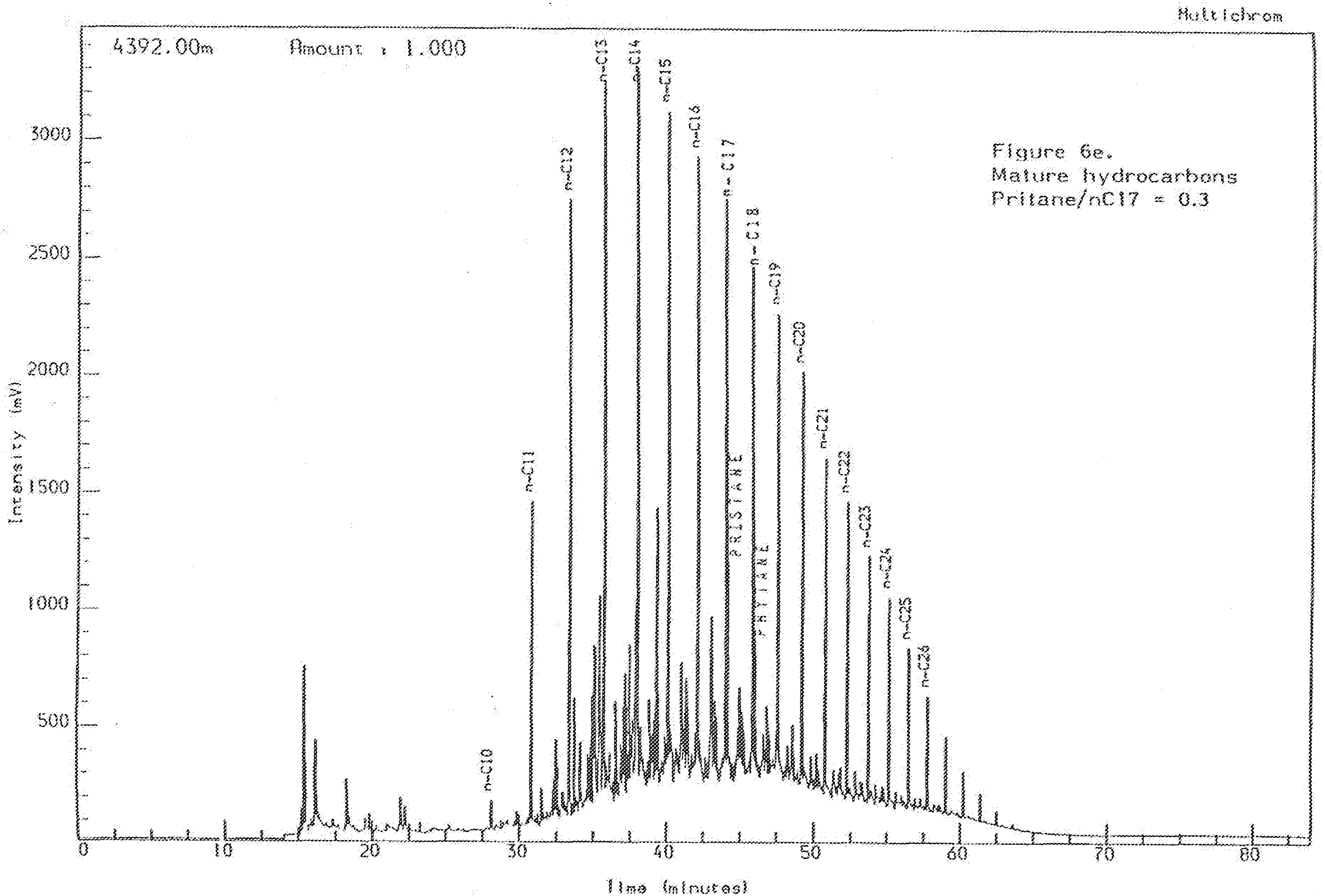


WELL NOCS 2/8-14 3575.00m swc
THERMAL EXTRACTION GC (S1)
Sh/Clst: drk gy to brn blk

Reported on 14-MAR-1991 at 09:39

GEOLAB NOR

Analysis Name : [526097] 26 PE34D.6.1.



WELL NOCS 2/8-14 4392.00m swc
THERMAL EXTRACTION GC (S1)
Sh/Clst: brn blk

Reported on 15-MAR-1991 at 08:56

GEOLAB NOR

Analysis Name : [526097] 25 PE3400391,1,1.

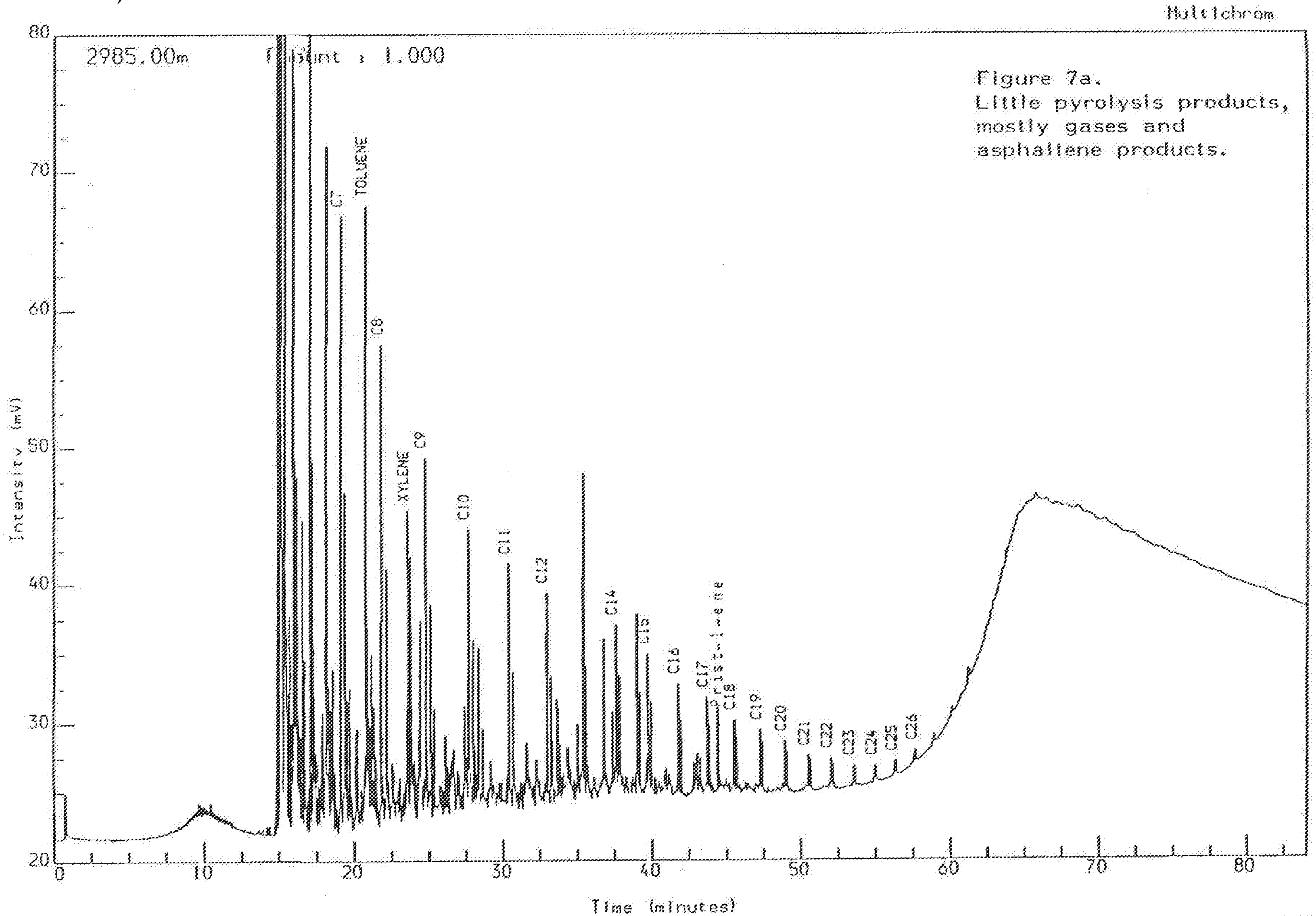


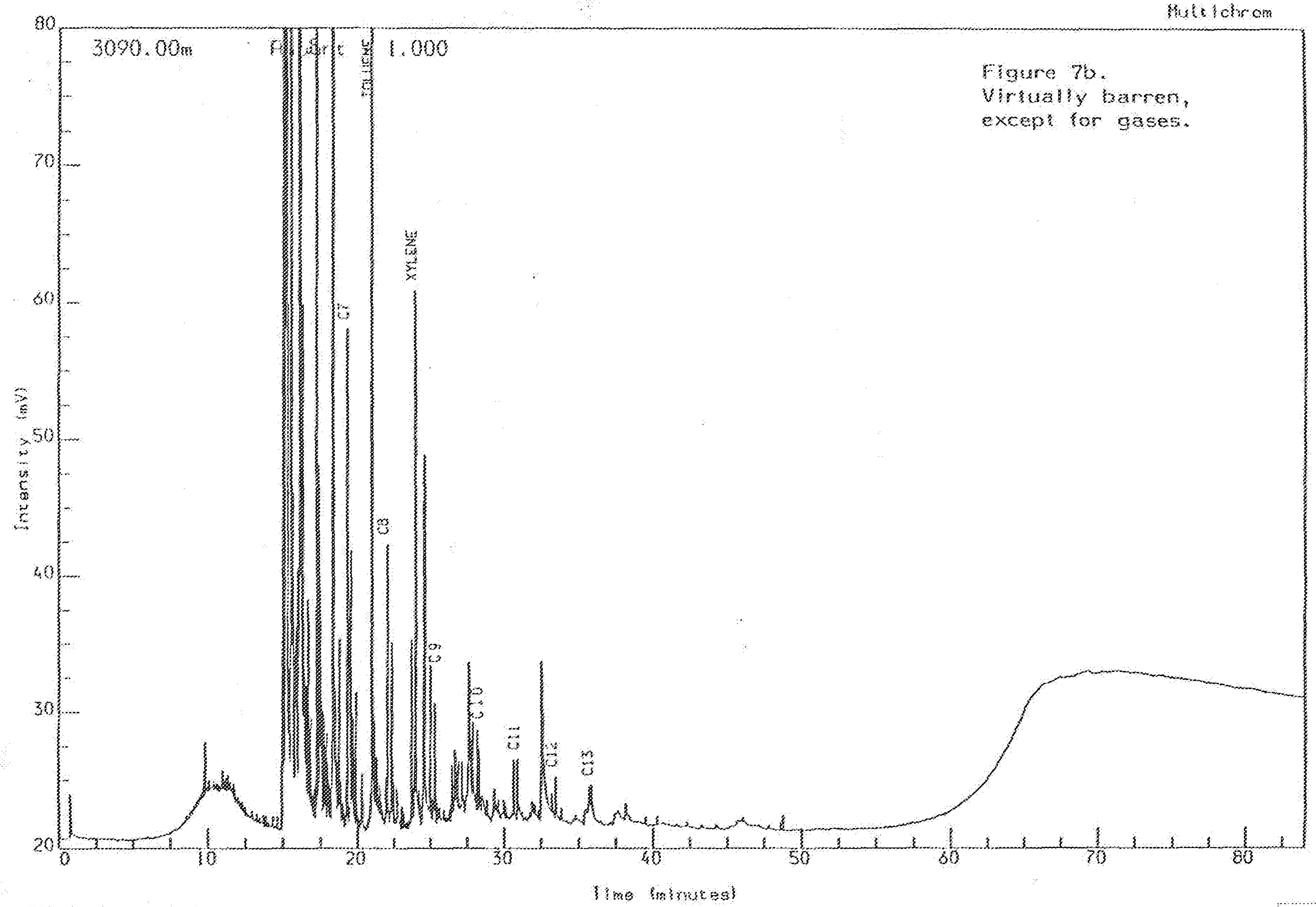
Figure 7a.
Little pyrolysis products,
mostly gases and
asphaltene products.

WELL NOCS 2/8-14 2985.00m cut
PYROLYSIS GC (S2)
Ca: lt or to or gy

Reported on 12-MAR-1991 at 09:19

GEOLAB NOR

Analysis Name : [526097] 25 PE3400451.1.1.



WELL NOCS 2/8-14 3090.00m cut
PYROLYSIS GC (S2)
Marl: lt gy to m gy

Reported on 12-MAR-1991 at 09:20

GEOLAB NOR

Analysis Name : [526097] 25 PE348.2.1.

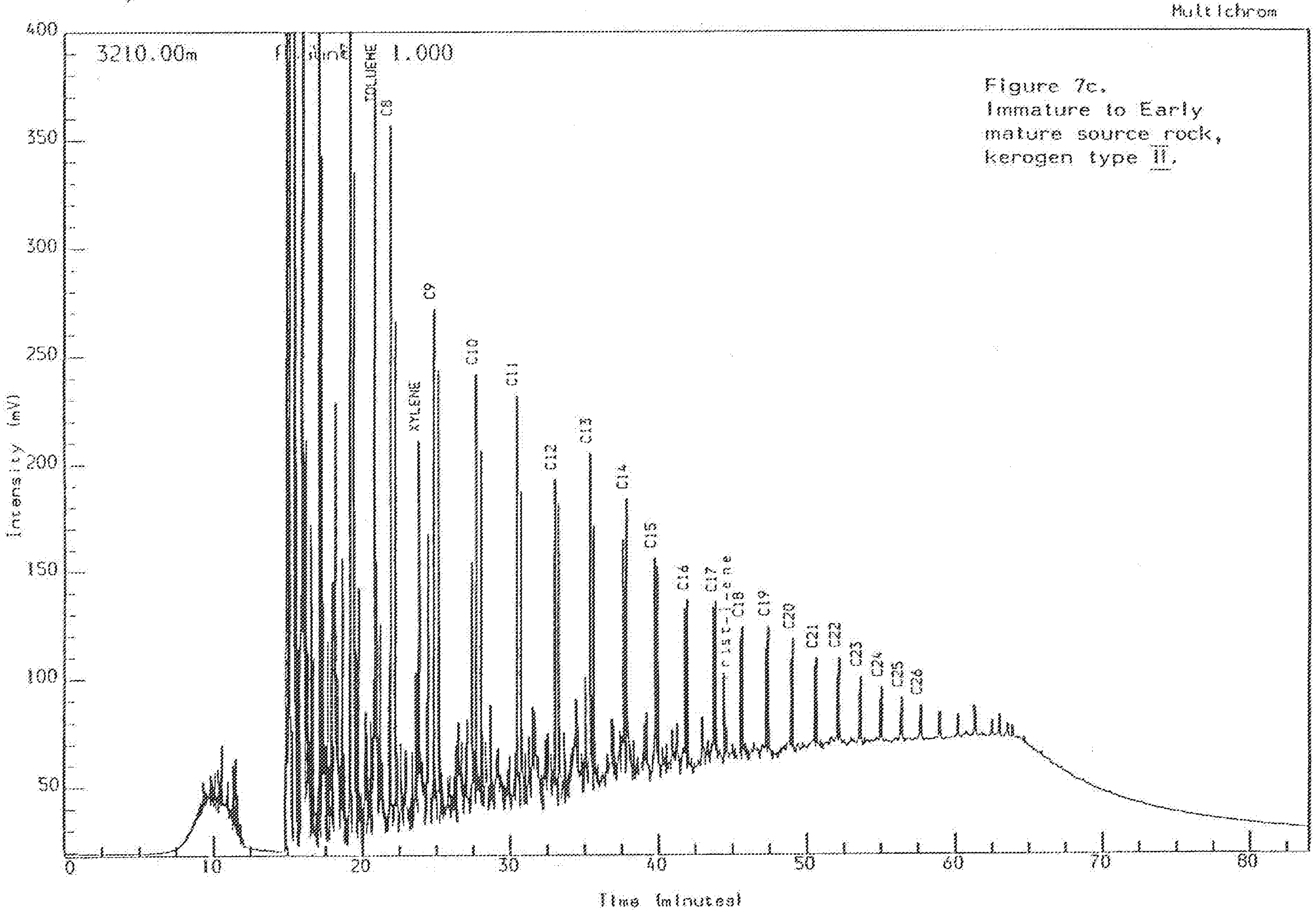


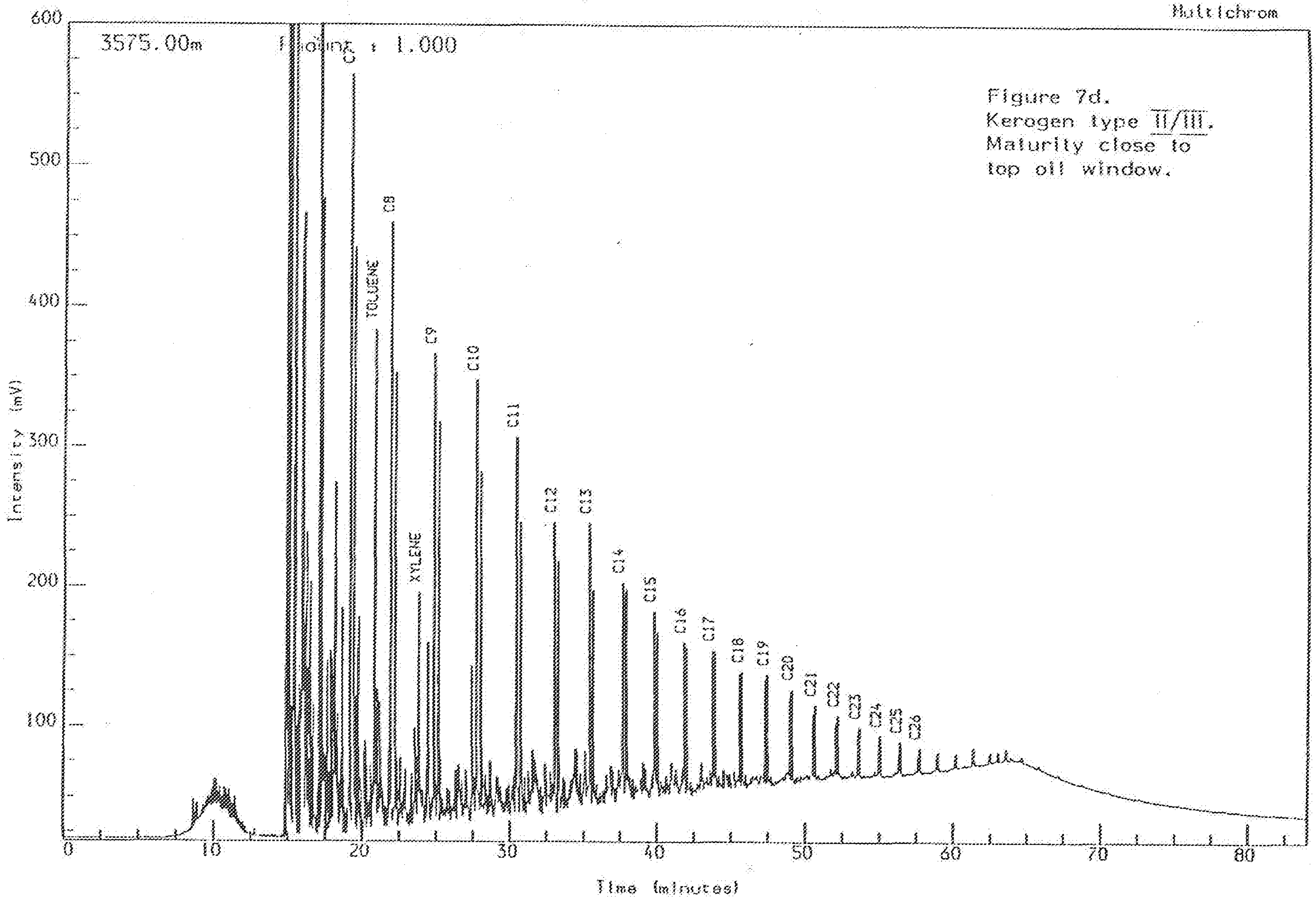
Figure 7c.
Immature to Early mature source rock, kerogen type II.

WELL NOCS 2/8-14 3210.00m cut
PYROLYSIS GC (S2)
Sh/Clst: brn gy to gy brn to drk gy

Reported on 12-MAR-1991 at 09:00

GEOLAB NOR

Analysis Name : [526097] 25 PE348,10,1.



WELL NOCS 2/8-14 3575.00m swc
PYROLYSIS GC (S2)
Sh/Clst: drk gy to brn blk

Reported on 13-MAR-1991 at 12:19

GEOLAB NOR

Analysis Name : [526097] 25 PE34D,6,1.

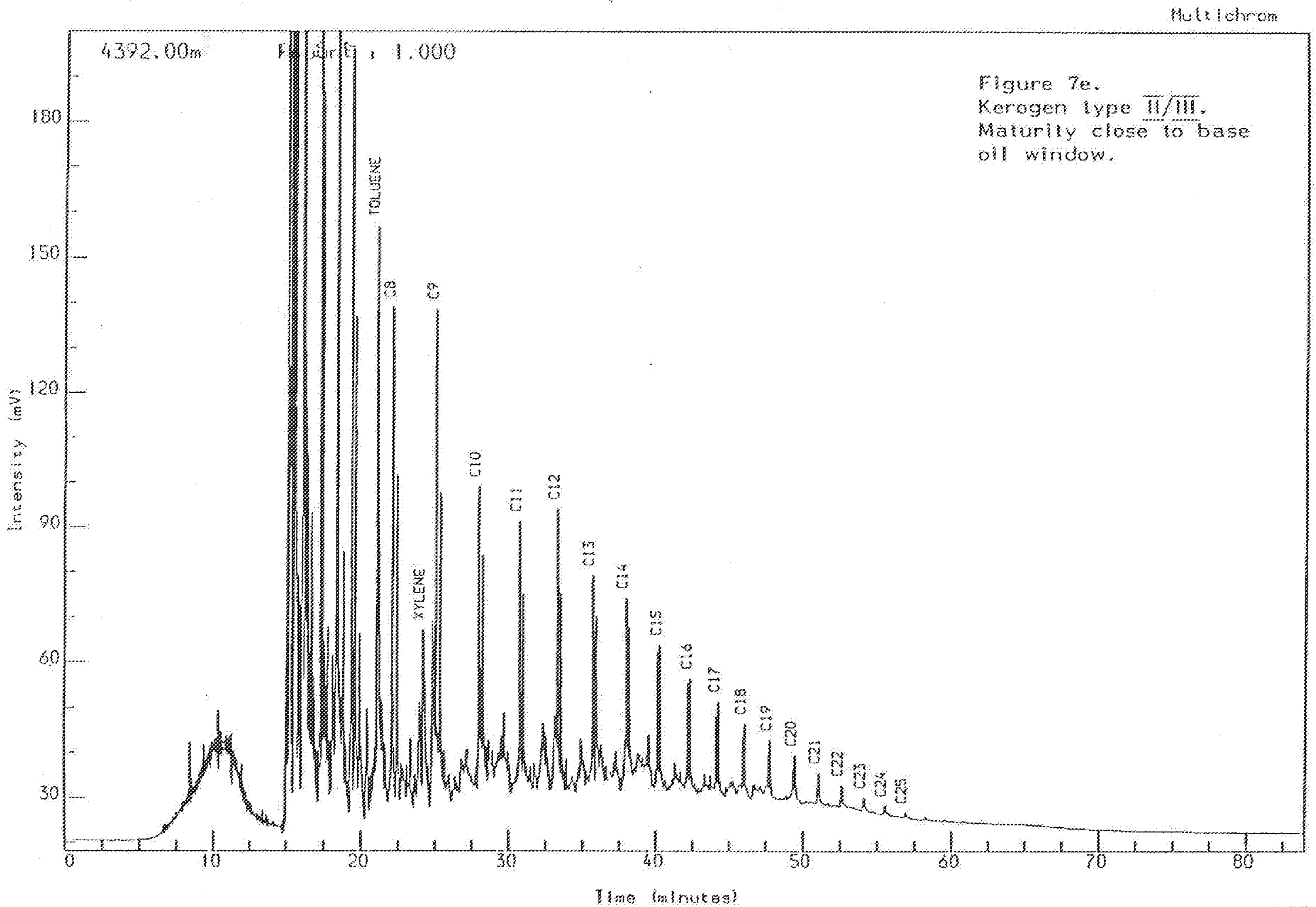


Figure 7e.
Kerogen type II/III.
Maturity close to base oil window.

WELL NOCS 2/8-14 4392.00m swc
PYROLYSIS GC (S2)
Sh/Clst: brn blk

Reported on 15-MAR-1991 at 08:46

GEOLAB NOR

Figure 8 : Pyrolysis GC Composition

Well NOCS 2/8-14

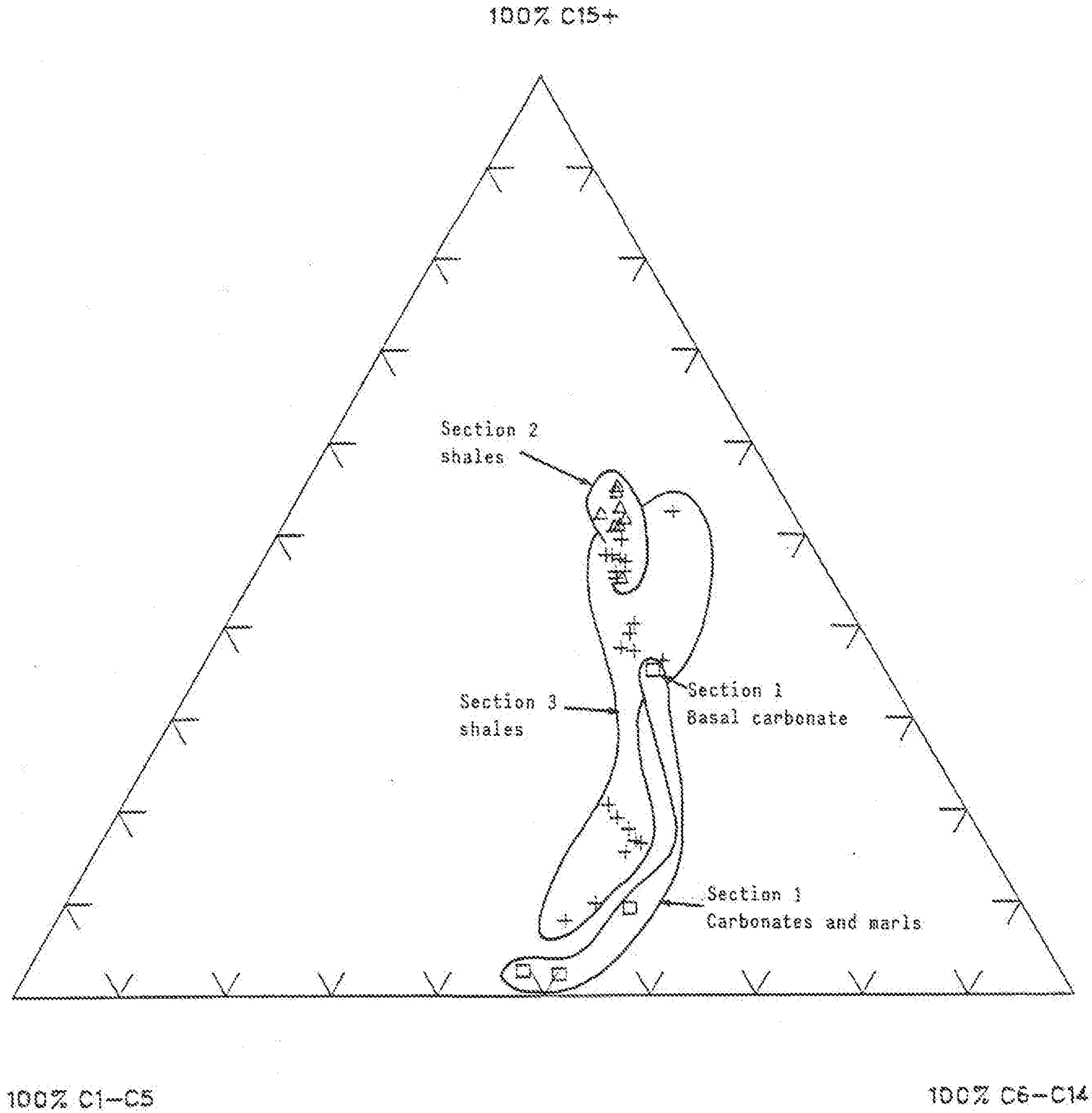
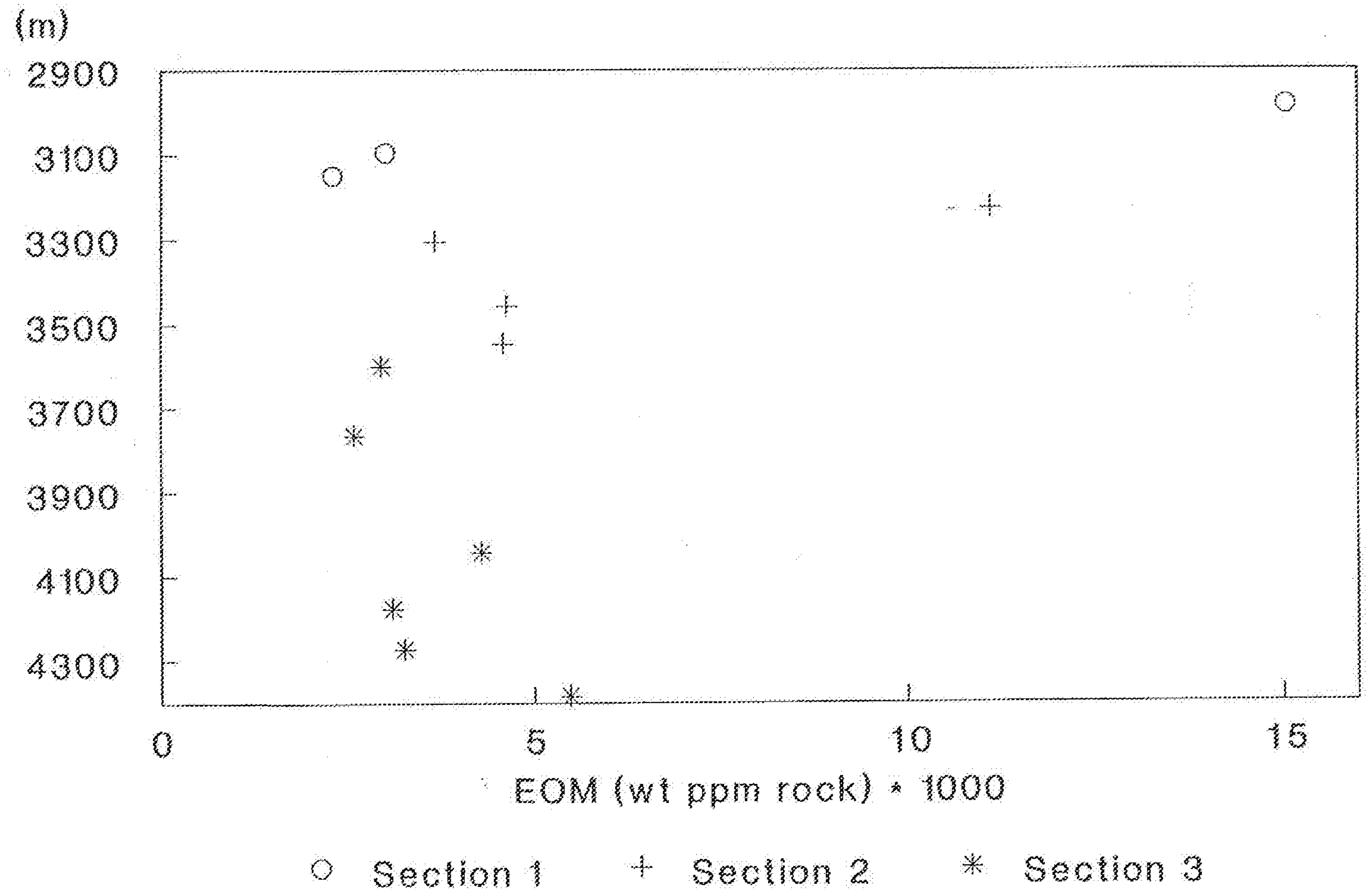
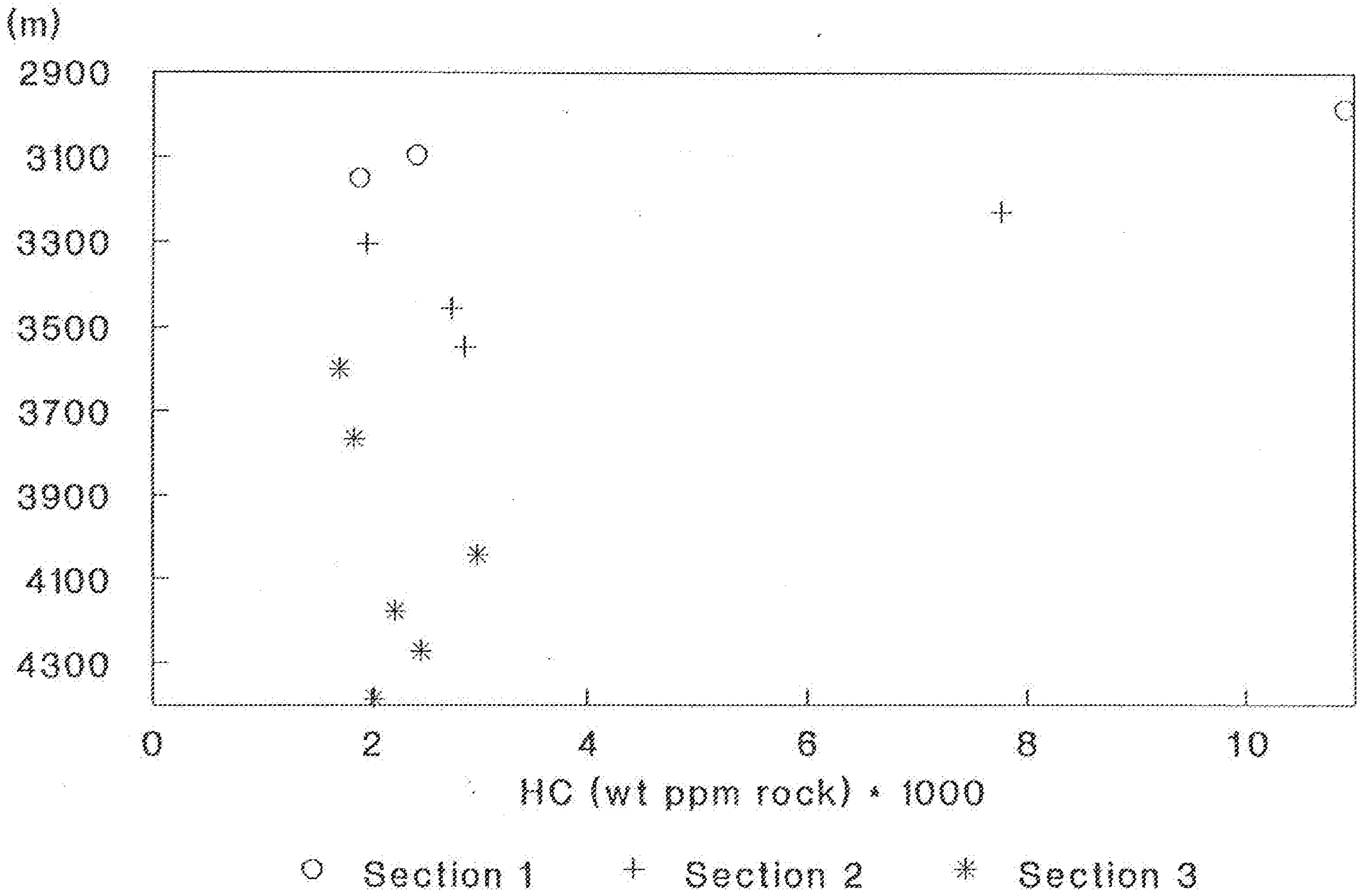


Figure 9a: EOM (wt ppm rock) Content,
Well NOCS 2/8-14



GEOLAB NOR

Figure 9b: HC (wt ppm rock) Content, Well NOCS 2/8-14



GEOLAB NOR

Figure 9c: EOM (mg/g TOC) Content,
Well NOCS 2/8-14

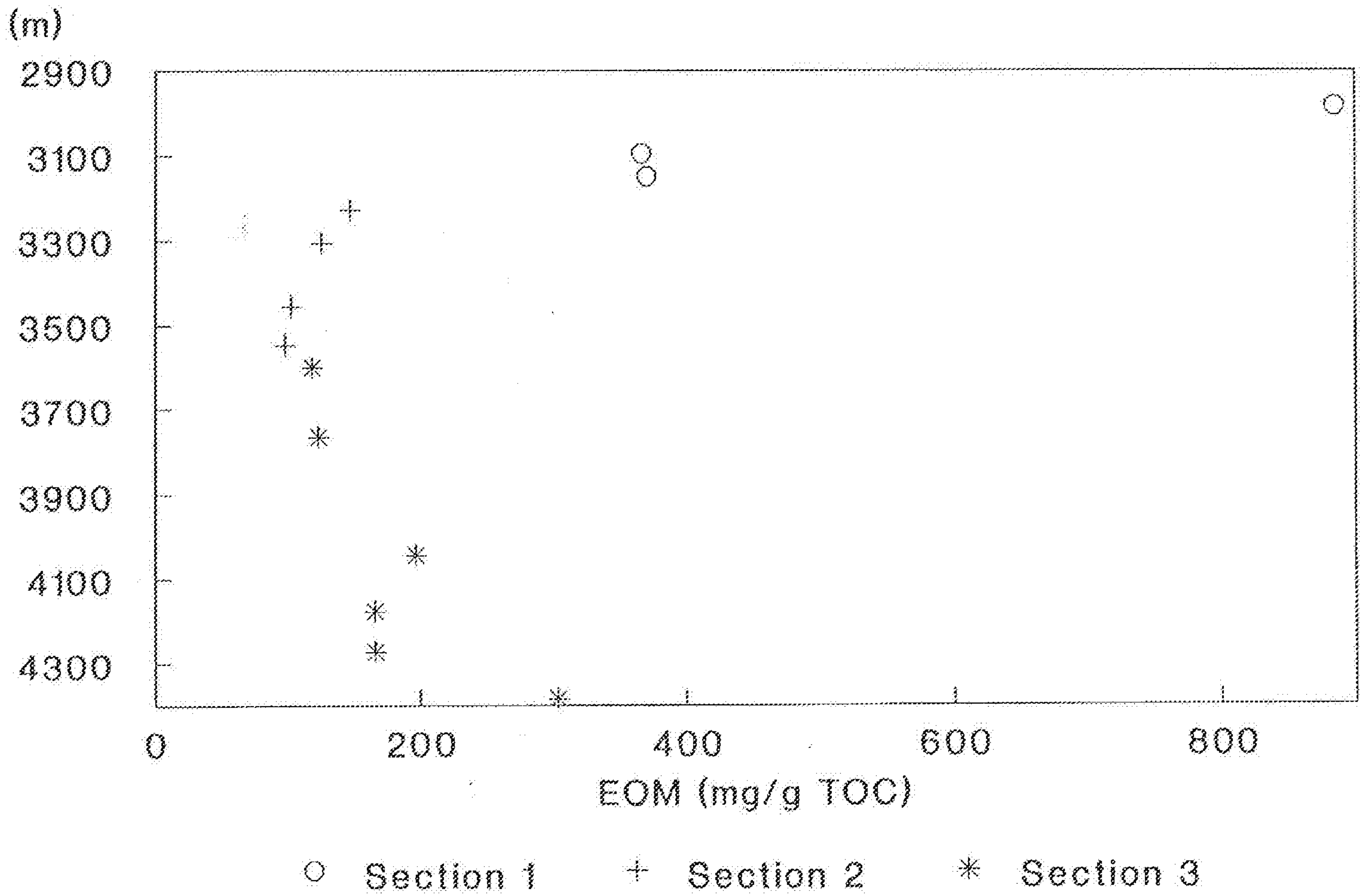
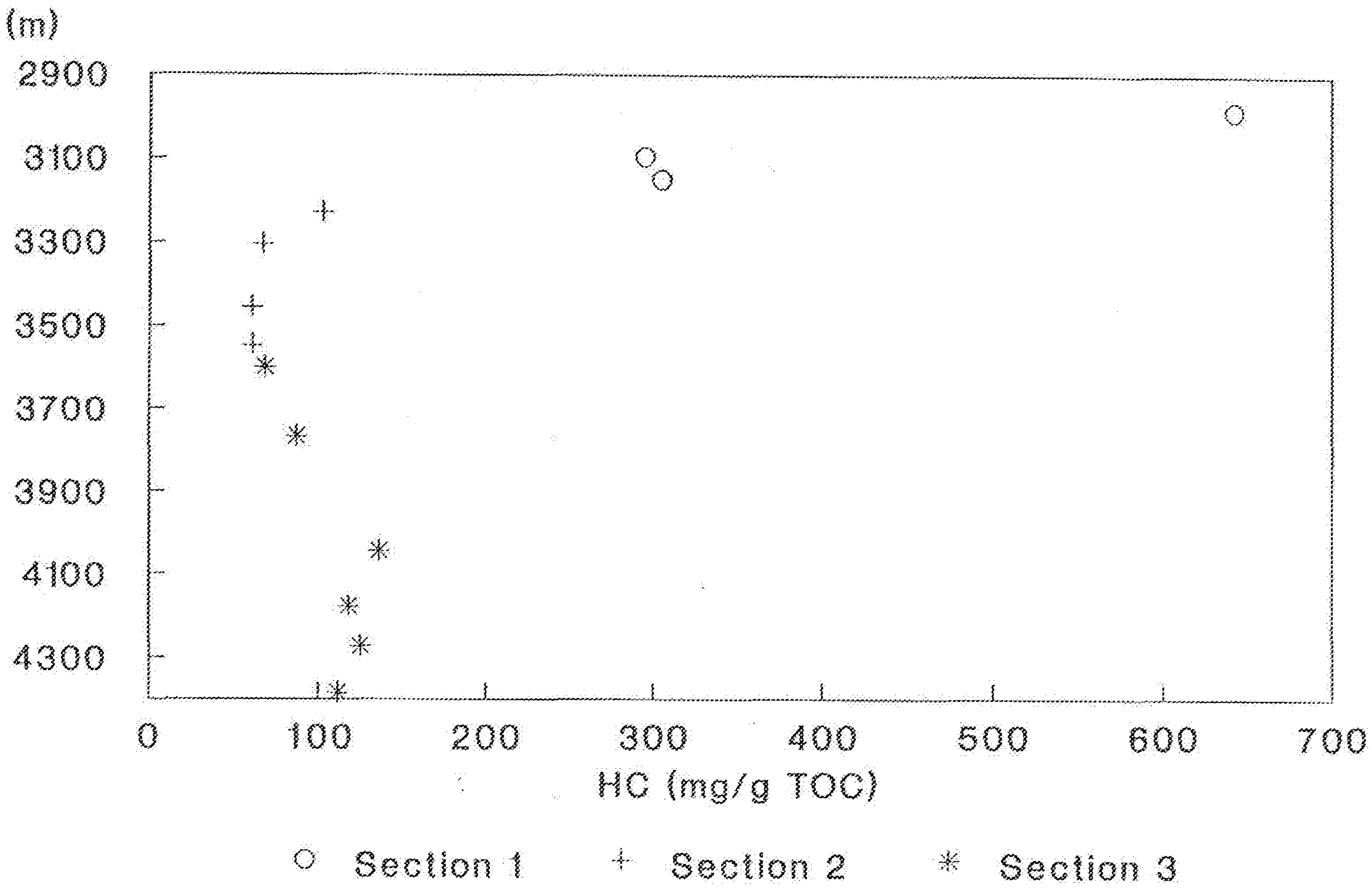
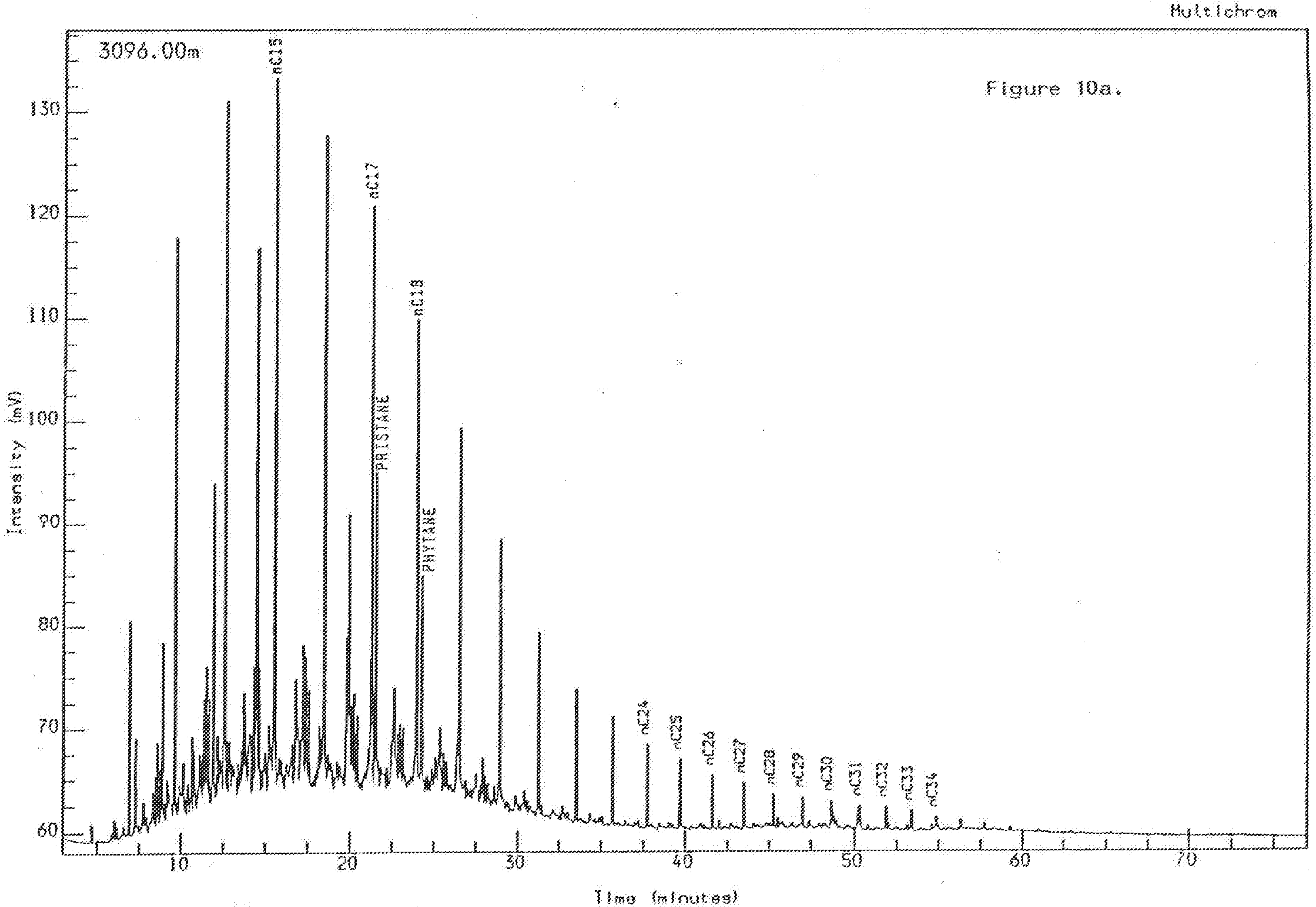


Figure 9d: HC (mg/g TOC) Content, Well NOCS 2/8-14



GEOLAB NOR GECO

Analysis Name : [526097] II SE340046IL.1.1.

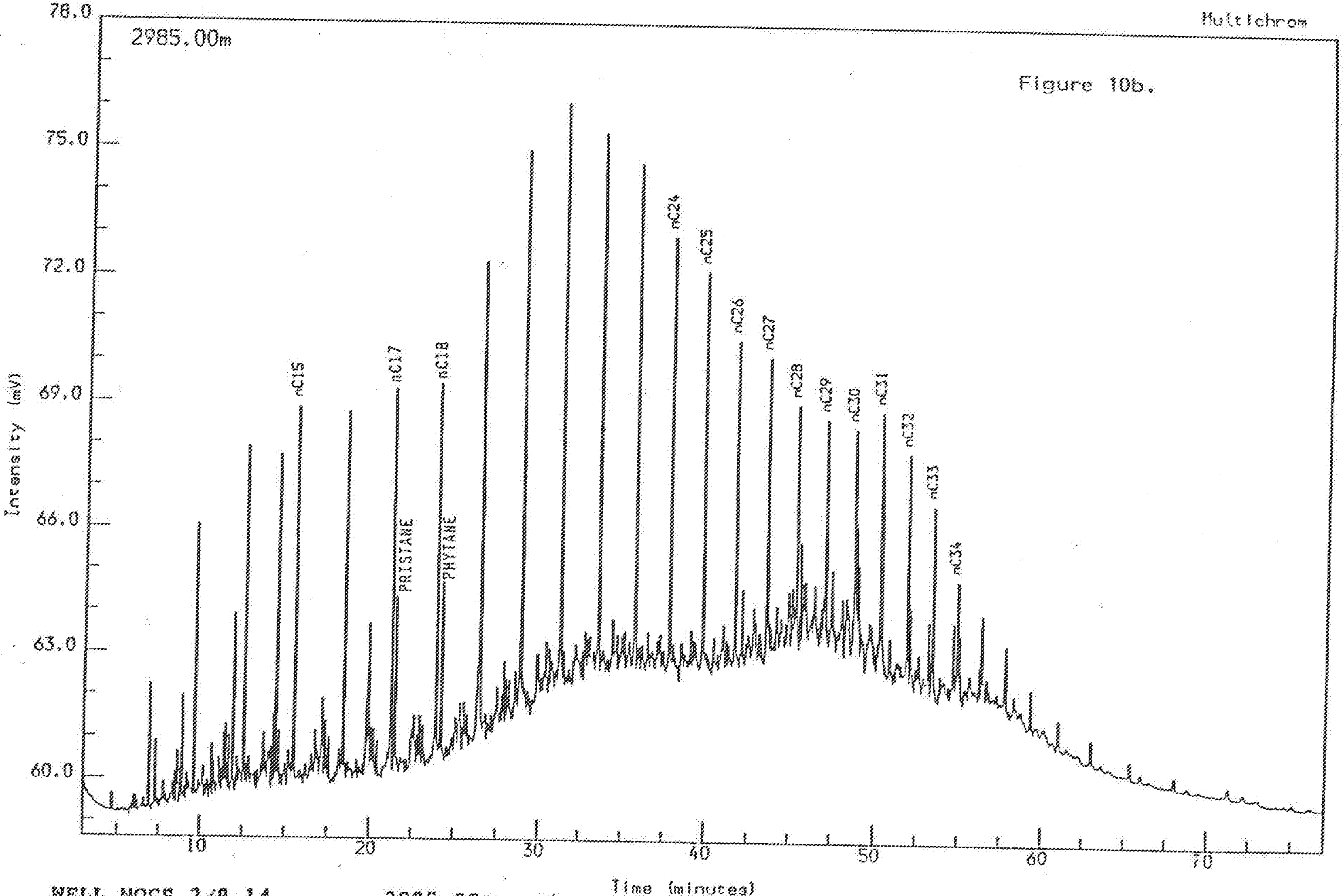


WELL NOCS 2/8-14 3096.00m cut
SATURATED GC
Marl: lt gy to m gy

Reported on 25-MAR-1991 at 13:47

GEOLAB NOR

Analysis Name : [526097] II SE340039IL,1,1.



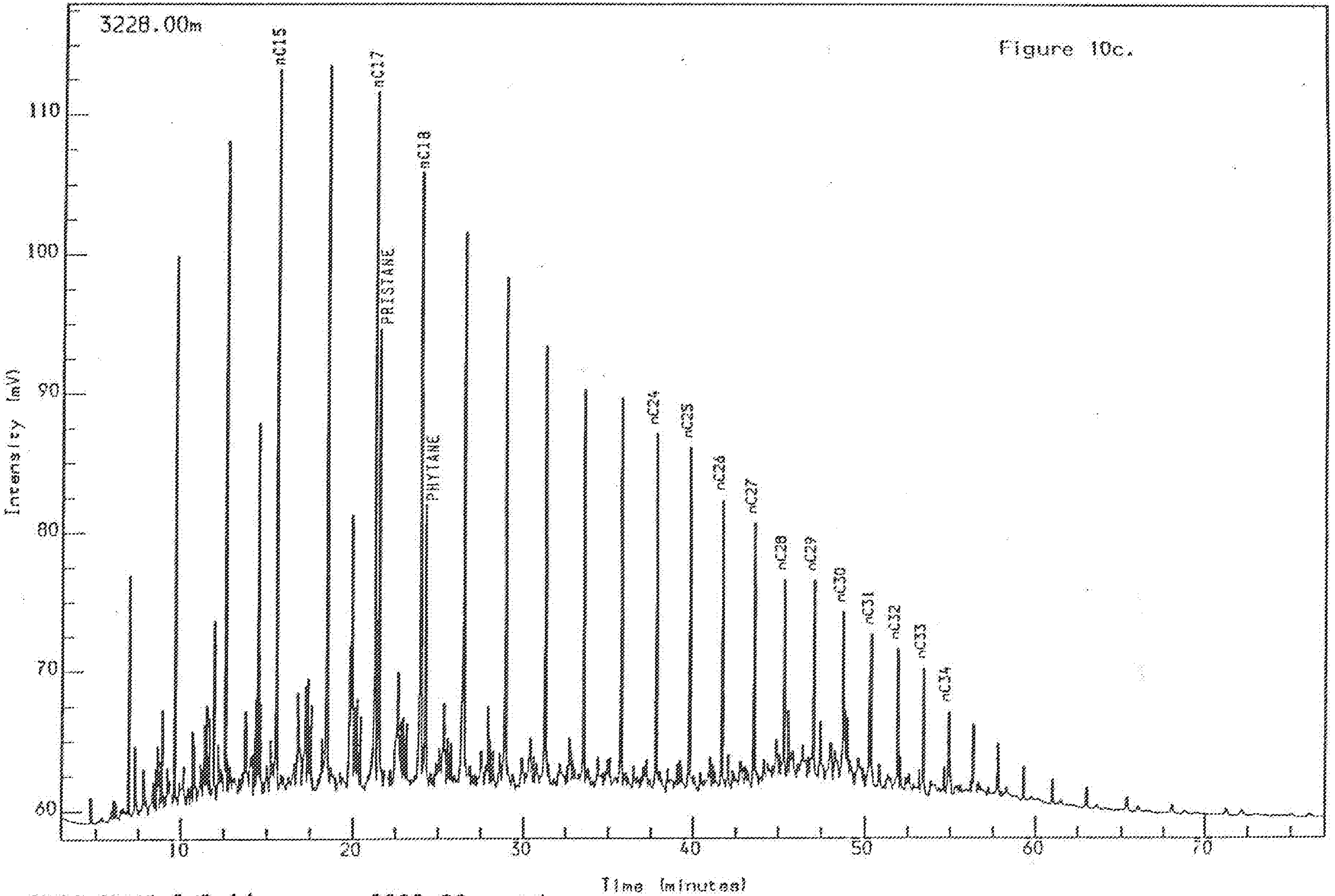
WELL NOCS 2/8-14 2985.00m cut
SATURATED GC
Ca: lt or to or gy

Reported on 25-MAR-1991 at 12:24

GEOLAB NOR

Analysis Name : [526097] 11 SE3400681L,1,1.

Multichrom

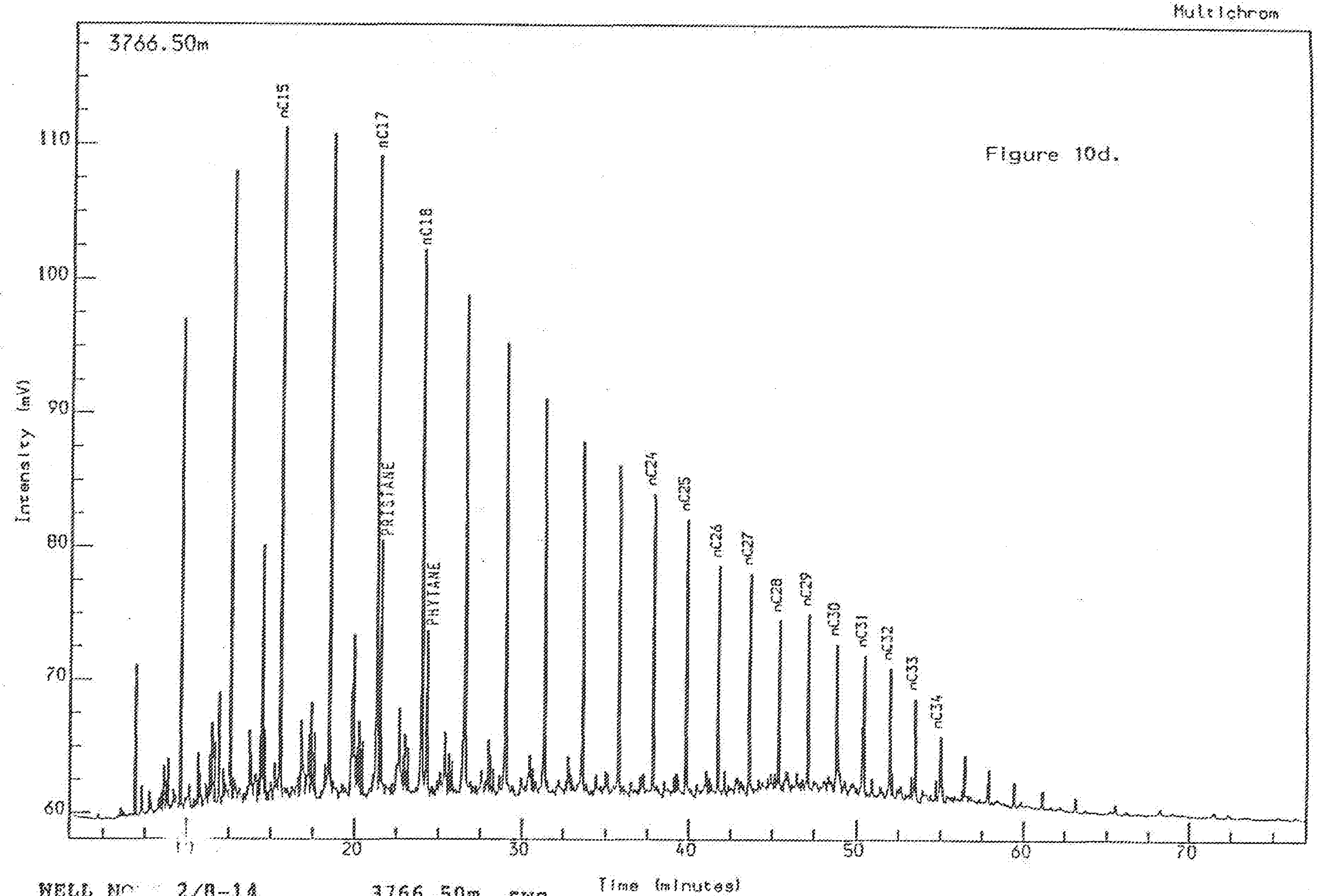


WELL NOCS 2/8-14 3228.00m cut
SATURATED GC
Sh/Clst: brn gy to gy brn to drk gy

Reported on 26-MAR-1991 at 13:41

GEOLAB NOR

Analysis Name : [526097] II SE340029IL,1,1.

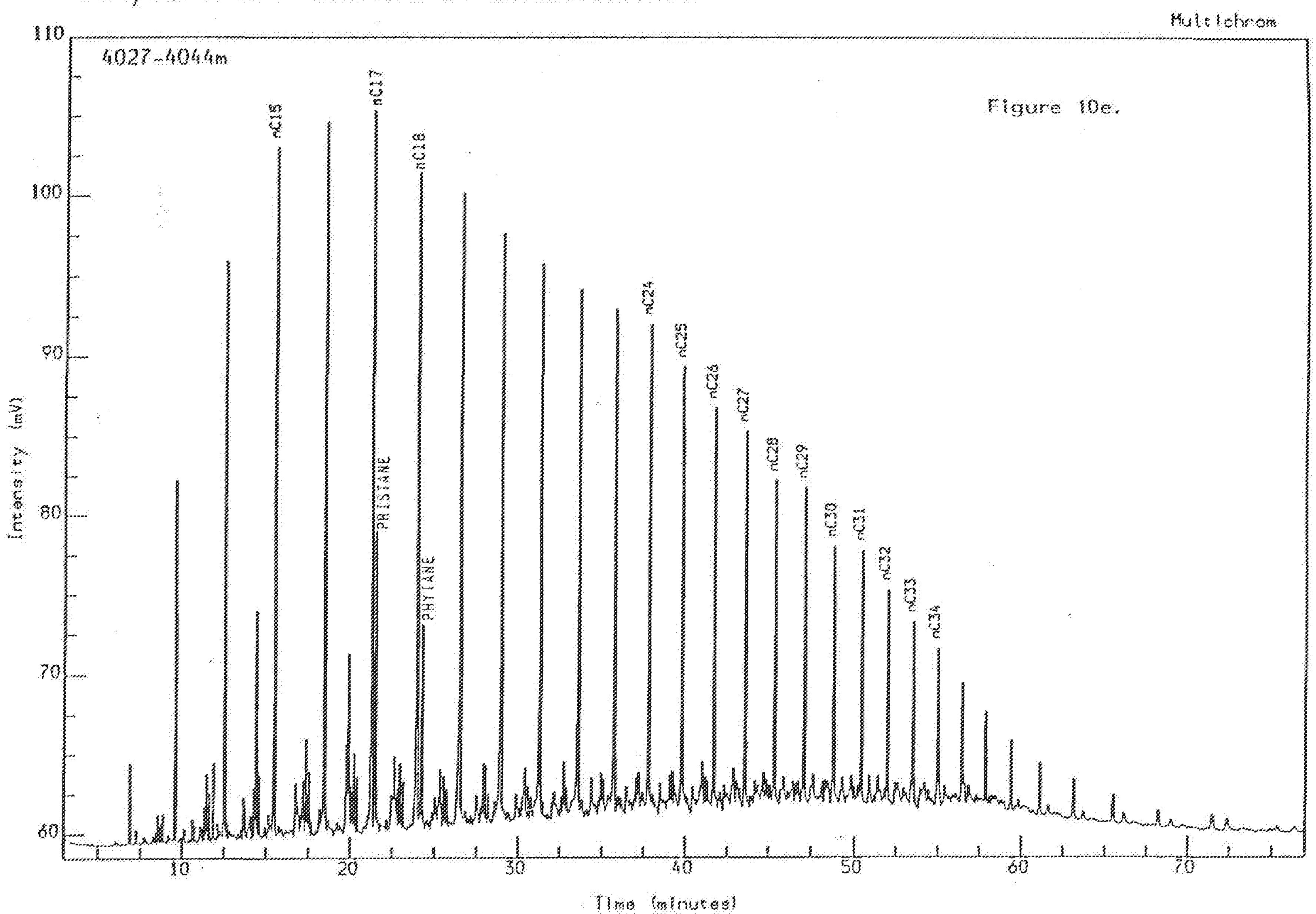


WELL NO: 2/8-14 3766.50m swc
SATURATED GC
Sh/Clst: drk gy to brn blk

Reported on 3-APR-1991 at 10:01

GEOLAB NOR

Analysis Name : [526097] II SE3402780B.1.1.

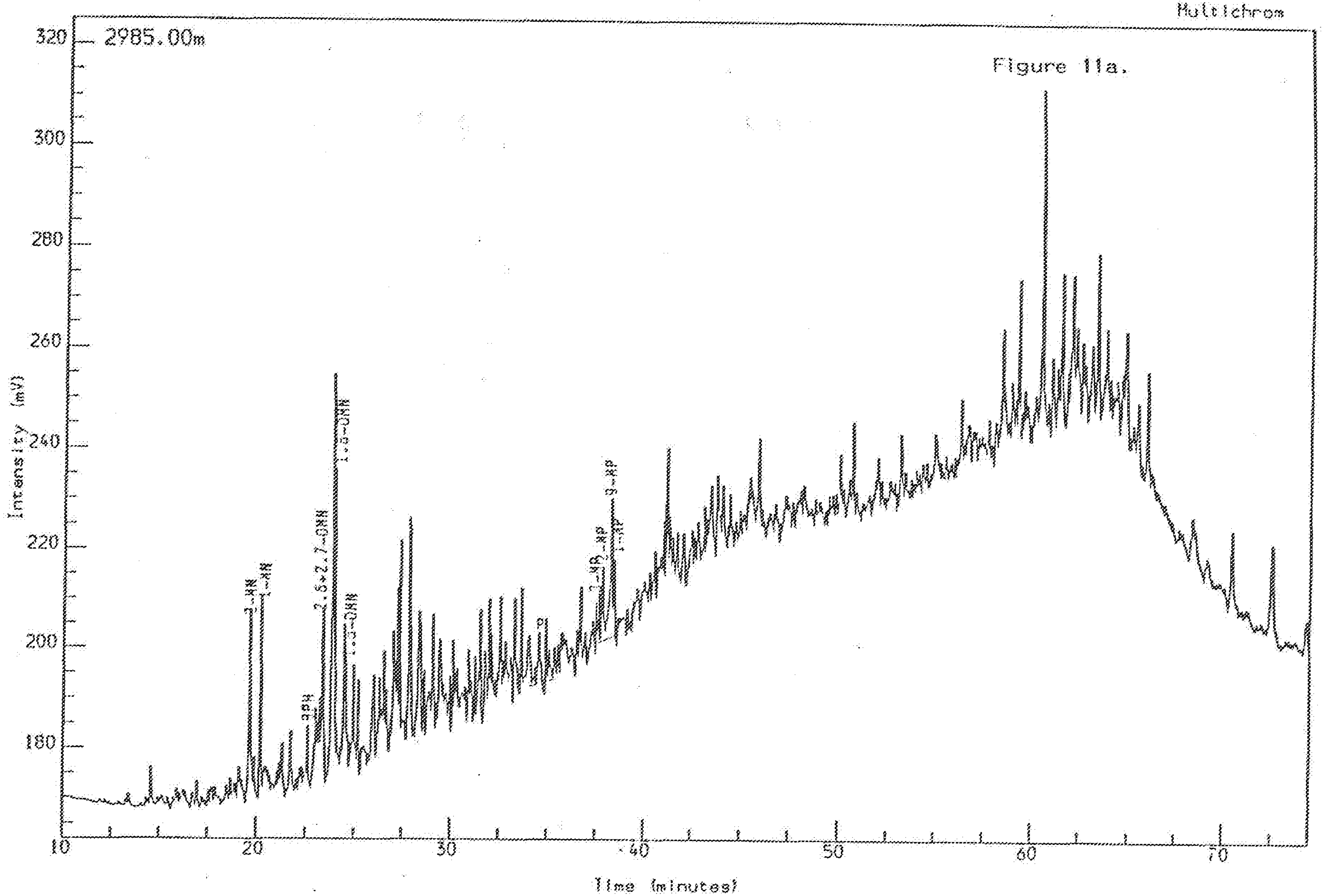


WELL NOCS 2/8-14 4027-4044m com
SATURATED GC :
Sh/clst:drk gy to brn blk

Reported on 8-APR-1991 at 08:55

GEOLAB NOR

Analysis Name : [526097] 29 AE34000391L.1.1.



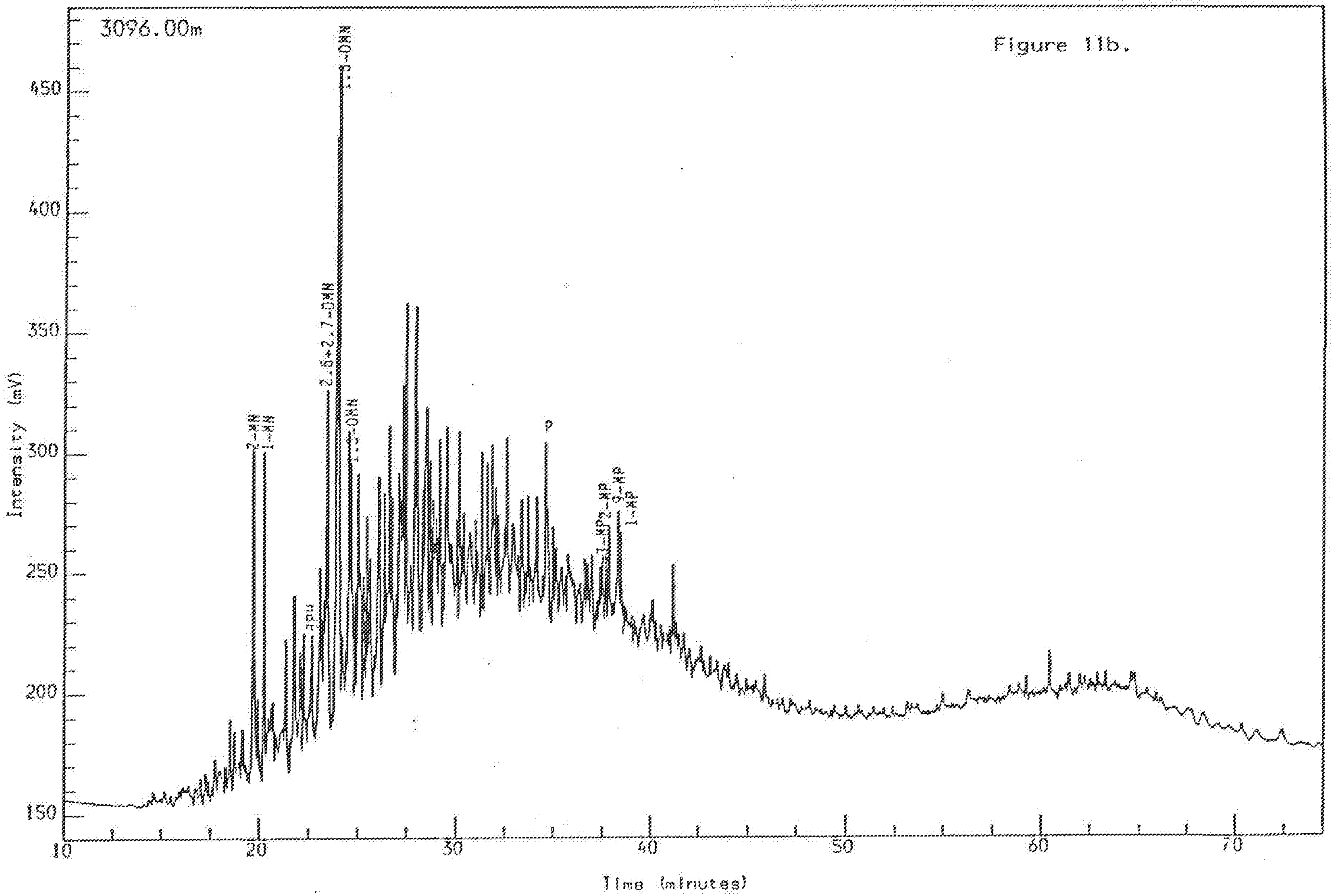
WELL NOCS 2/8-14 2985.00m cut
AROMATIC GC (FID)
Ca: lt or to or gy

Reported on 3-APR-1991 at 13:39

GEOLAB NOR

Analysis Name : [526097] 29 AE34000461L.1.1.

Multichrom

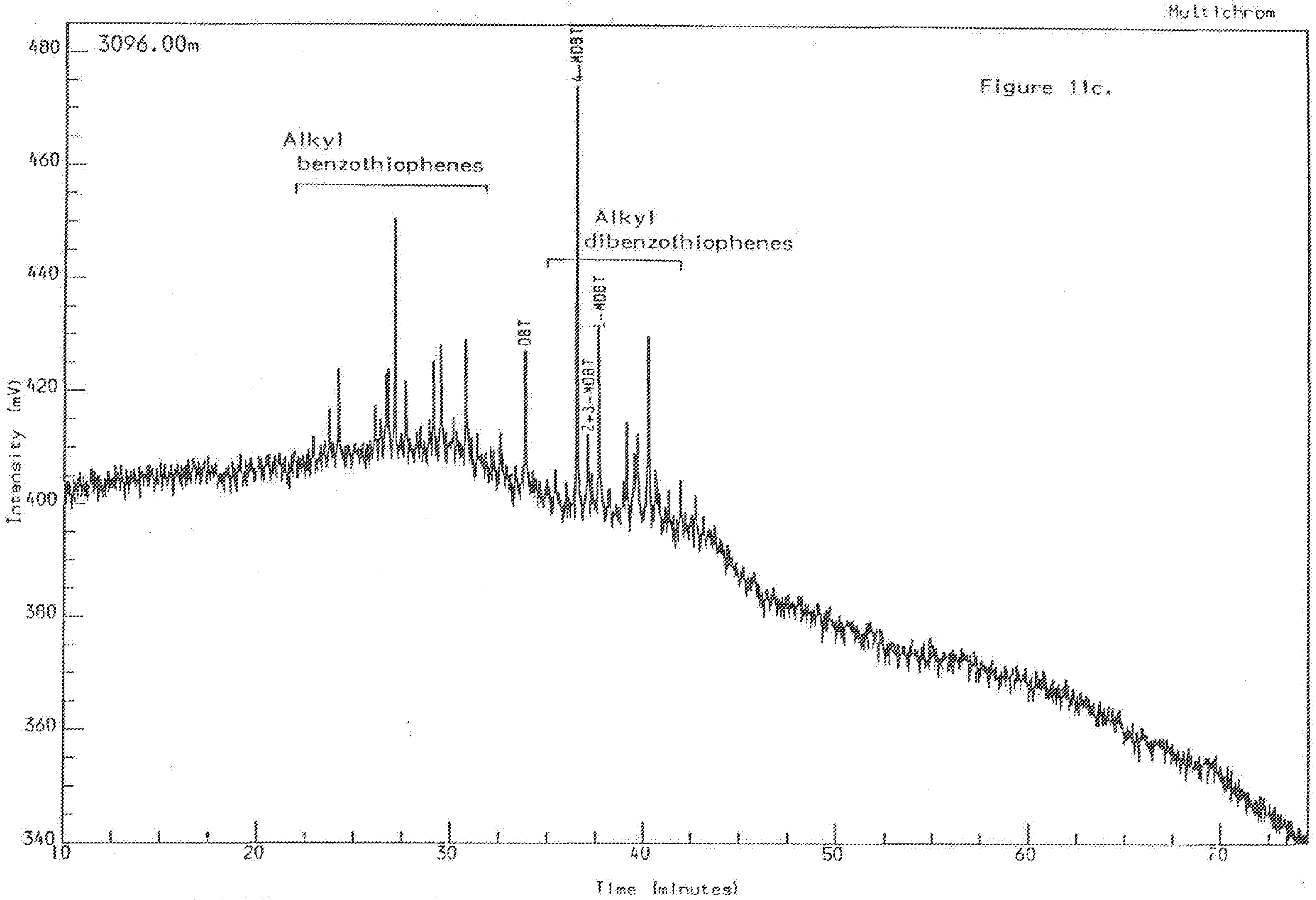


WELL NOCS 2/8-14 3096.00m cut
AROMATIC GC (FID)
Marl: lt gy to m gy

Reported on 3-APR-1991 at 14:33

GEOLAB NOR

Analysis Name : [526097] 30 AE34000461L,1,1.



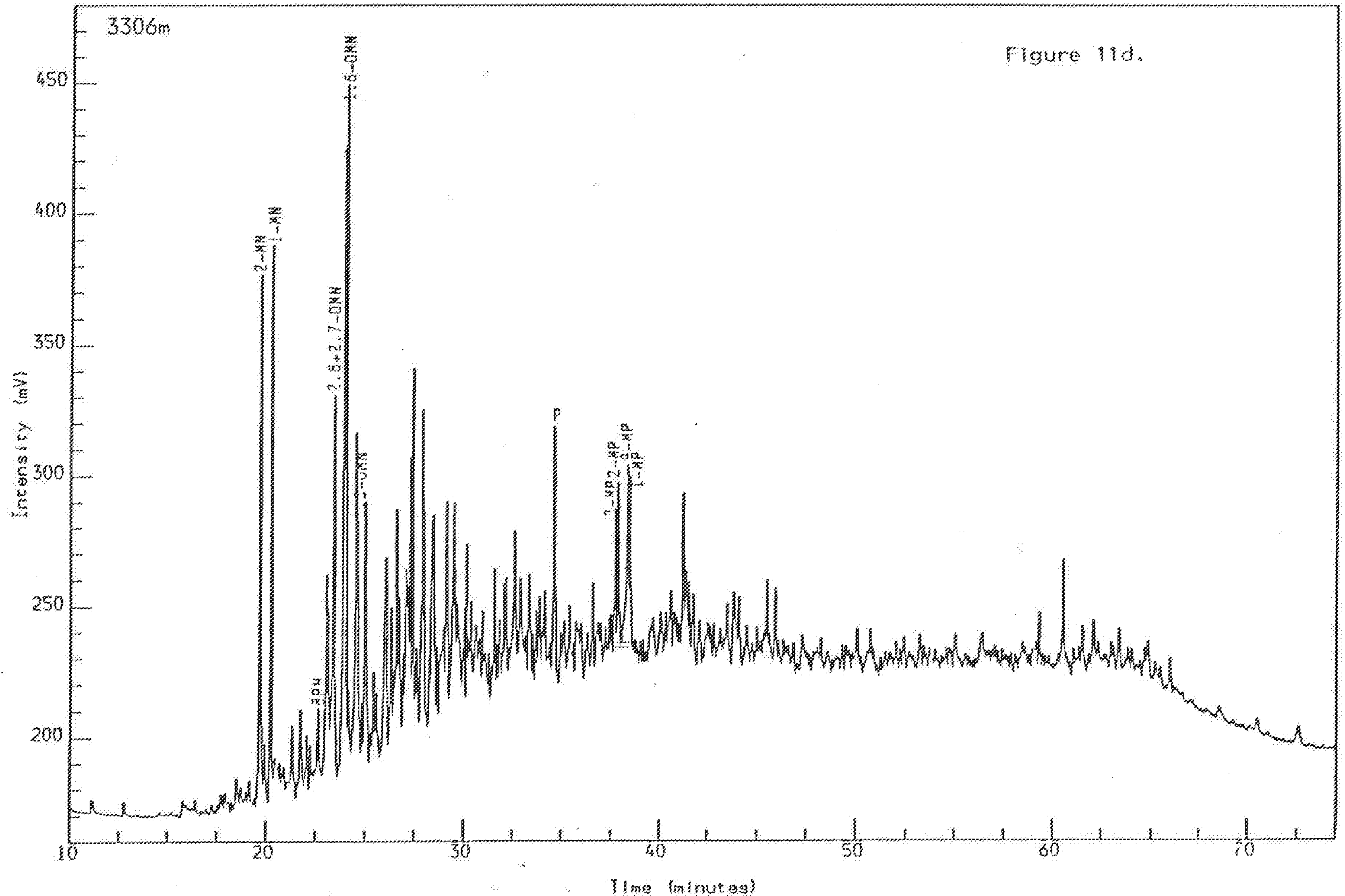
WELL NOCS 2/8-14 3096.00m cut
AROMATIC GC (FPD)
Marl: lt gy to m gy

Reported on 3-APR-1991 at 15:51

GEOLAB NOR

Analysis Name : [526097] 29 AE3400962L,1,1.

Multichrom



WELL NOCS 2/8-14 3306.00m cut

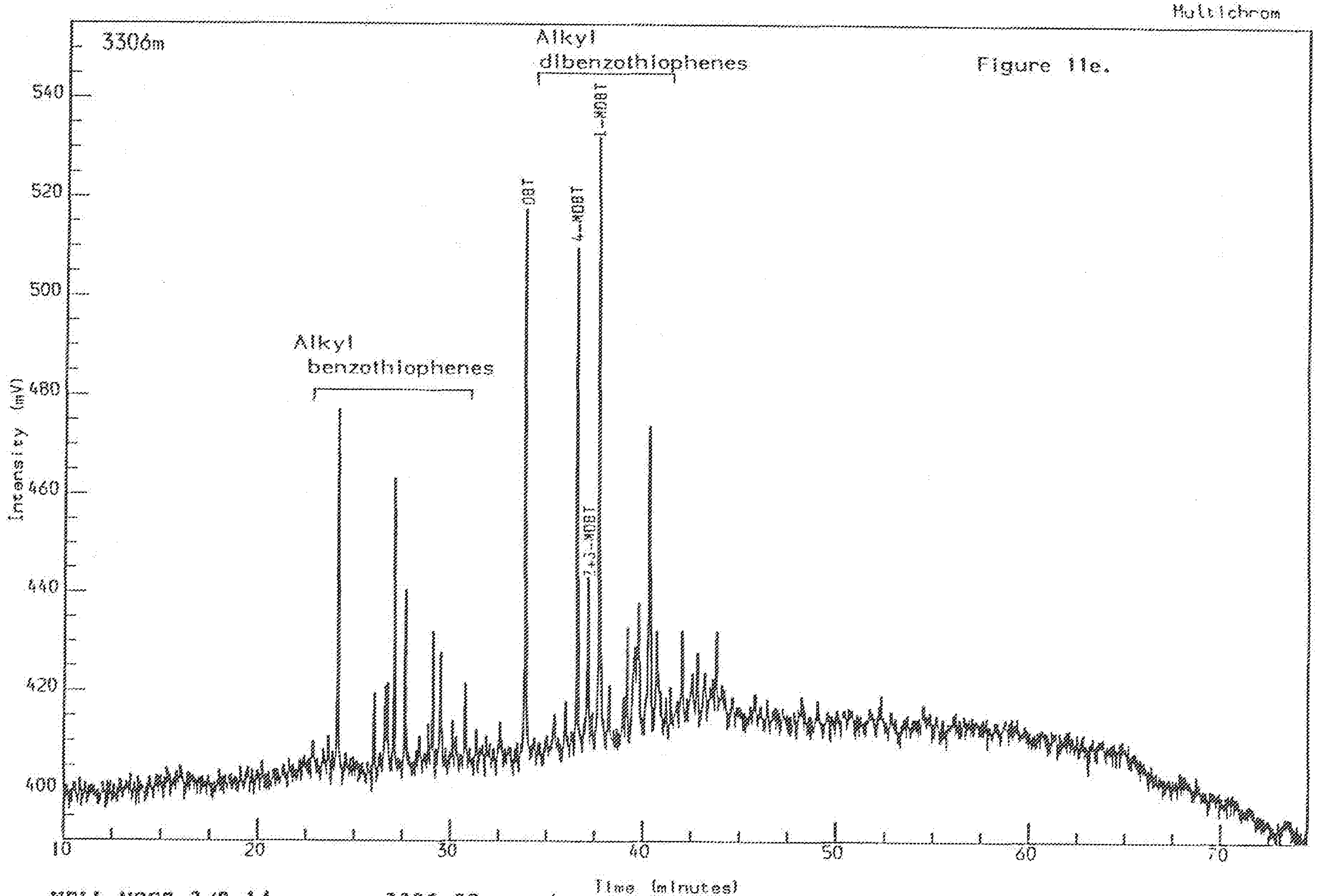
AROMATIC GC (FID)

Sh/Clst: brn gy to drk gy

Reported on 3-APR-1991 at 14:52

GEOLAB NOR

Analysis Name : [526097] 30 AE3400962L,1,1.

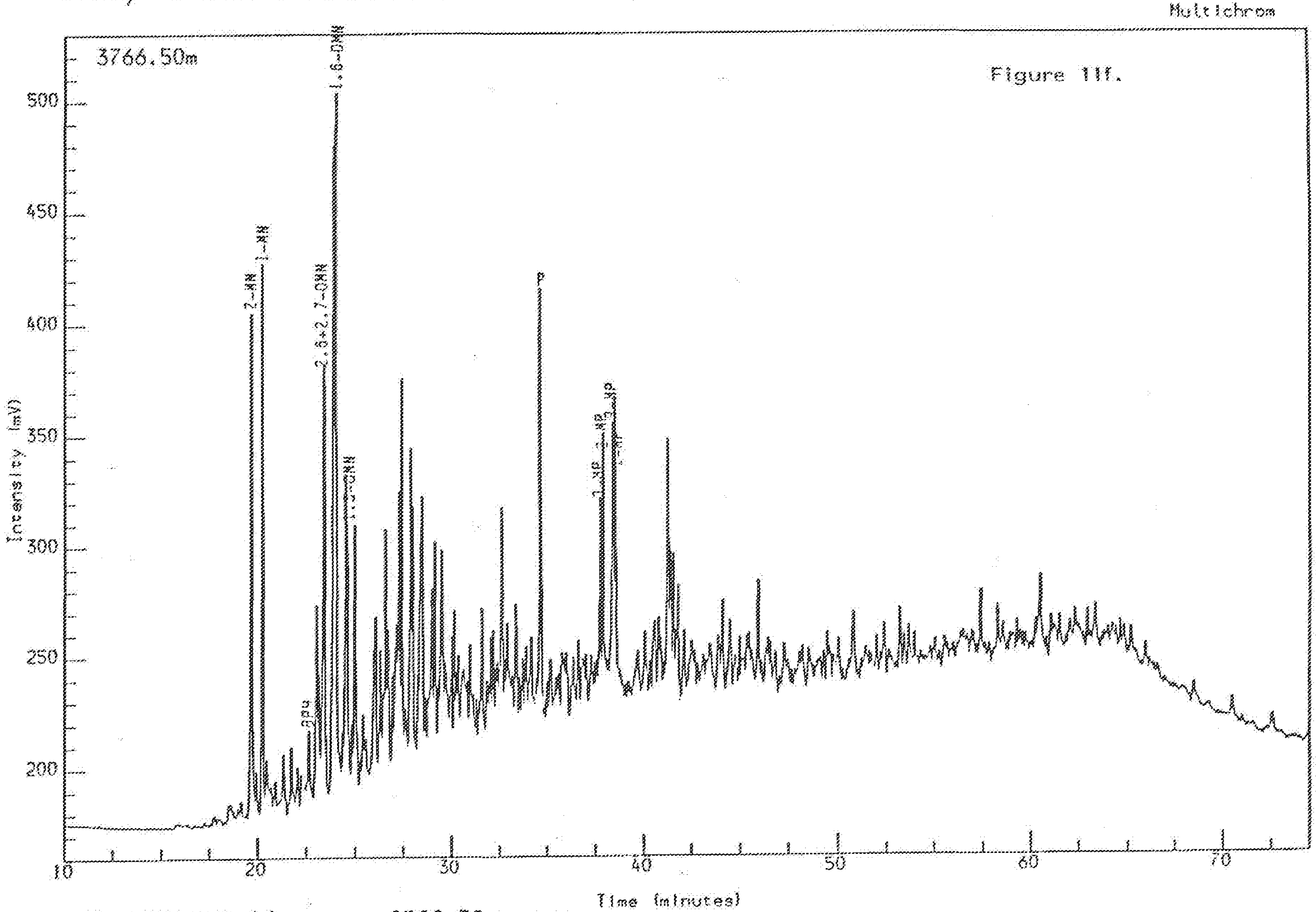


WELL NOCS 2/8-14 3306.00m cut
AROMATIC GC (FPD)
Sh/Clst: brn gy to drk gy

Reported on 3-APR-1991 at 15:59

GEOLAB NOR

Analysis Name : [526097] 29 AE340029IL,1,1.

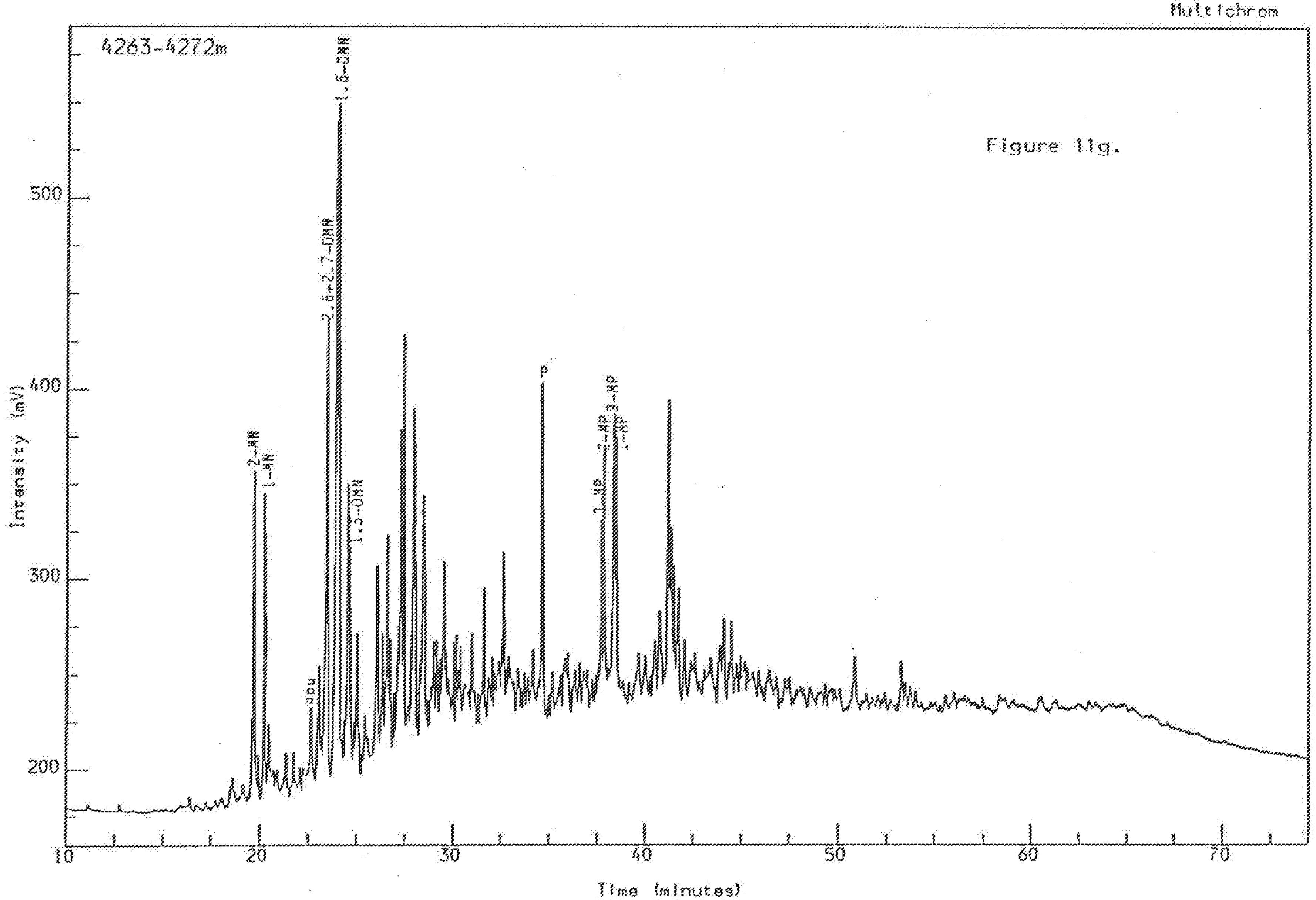


WELL NOCS 2/8-14 3766.50m swc
AROMATIC GC (FID)
Sh/Clst: drk gy to brn blk

Reported on 3-APR-1991 at 15:02

GEOLAB NOR

Analysis Name : [526097] 29 AE34027908,1,1.



WELL NOCS 2/8-14 4263-4272m com
AROMATIC GC (FID)
Sh/clst:brn blk to drk gy

Reported on 3-APR-1991 at 15:06

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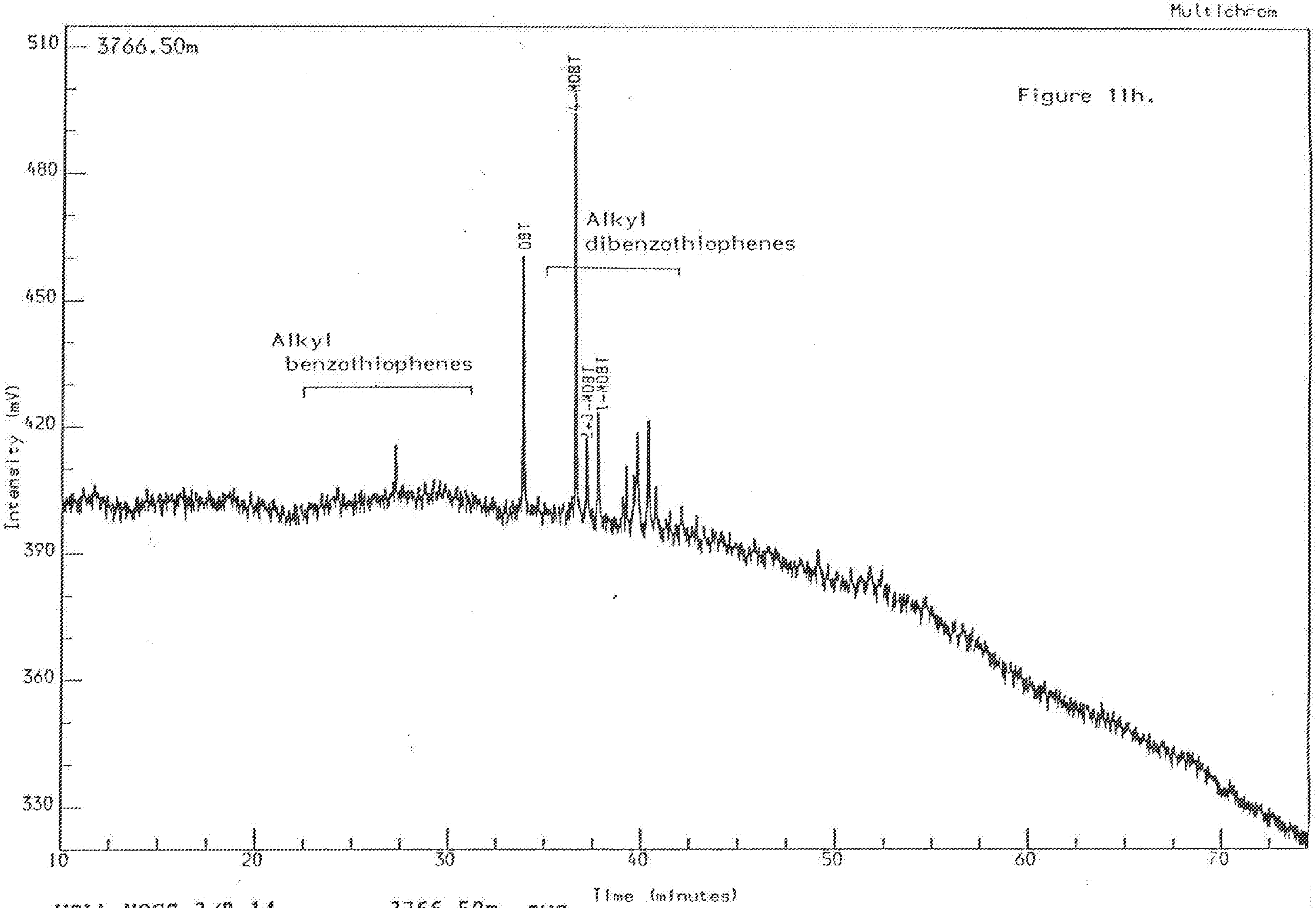
Analysis Name : [5260097] 30 AE3400291L,1,1.



WELL NOCS 2/8-14 3766.50m swc
AROMATIC GC (FPD)
Sh/Clst: drk gy to brn blk

Reported on 3-APR-1991 at 15:40

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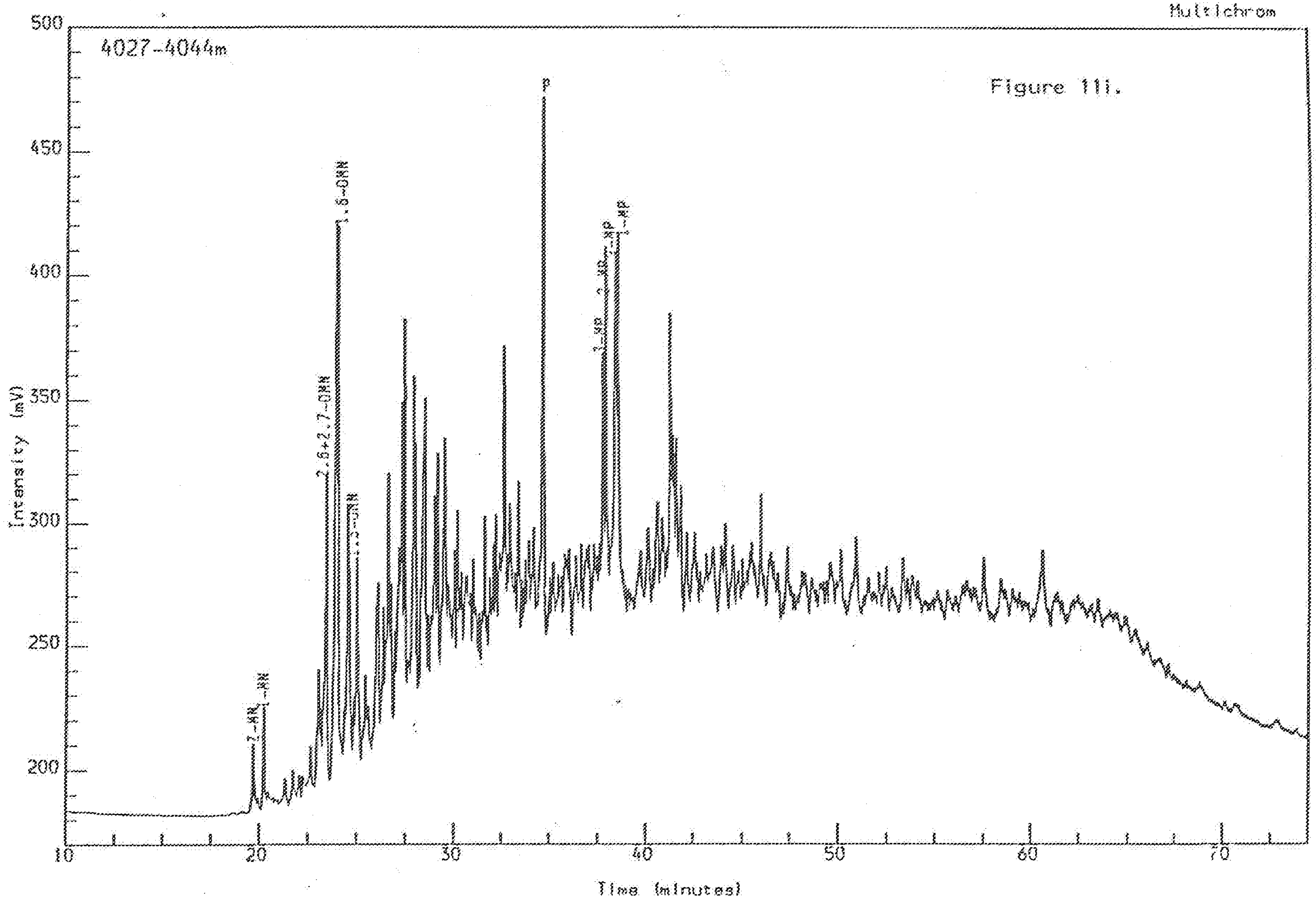
Analysis Name : [526097] 29 AE340278OBL,1,1.



WELL NOCS 2/8-14 4027-4044m com
AROMATIC GC (FID)
Sh/clst:drk gy to brn blk

Reported on 8-APR-1991 at 14:27

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Figure 12: Calculated Vitrinite Reflectance vs depth

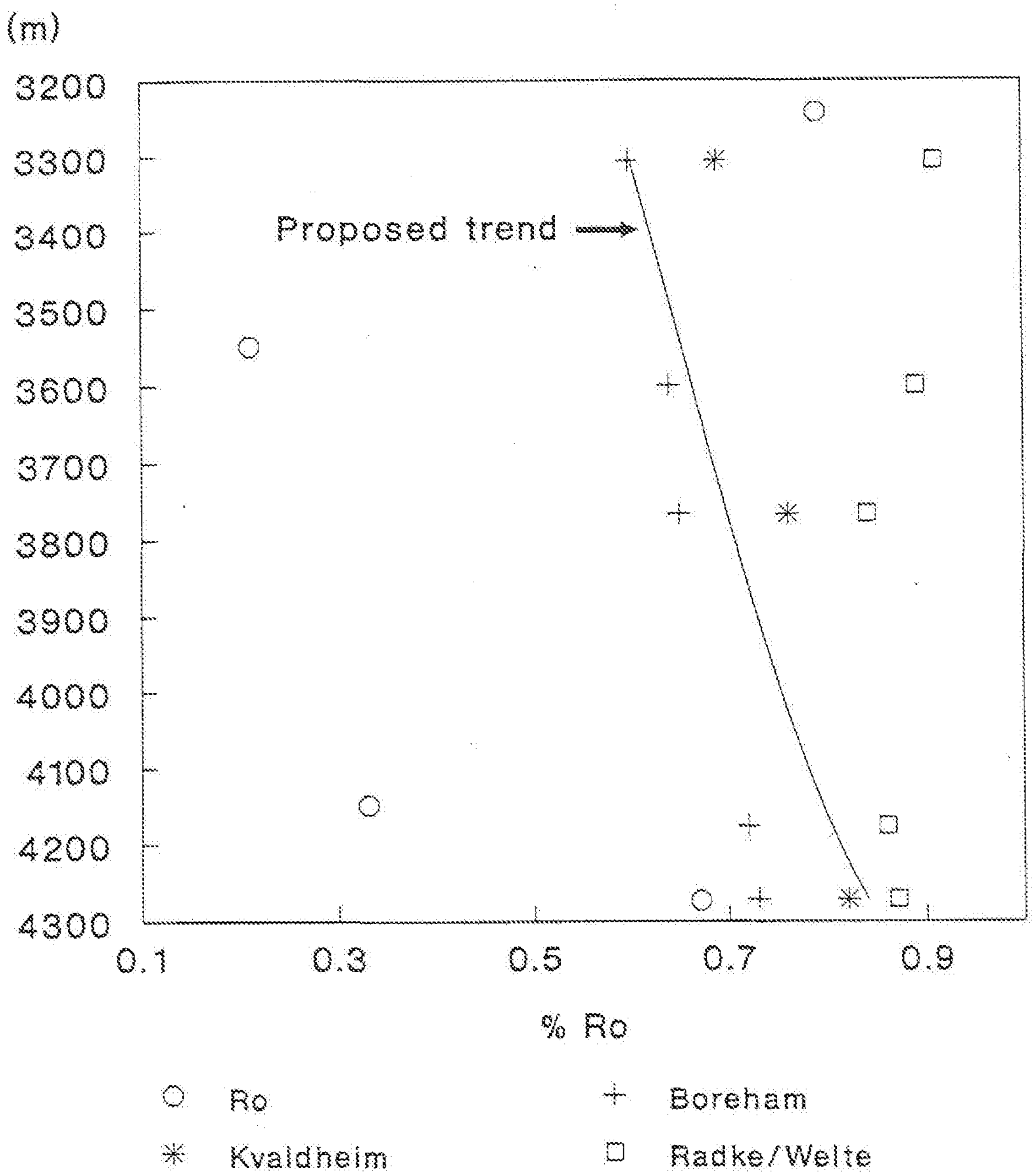

Figure 13: Vitrinite Reflectance versus Depth
Well NOCS 2/8-14

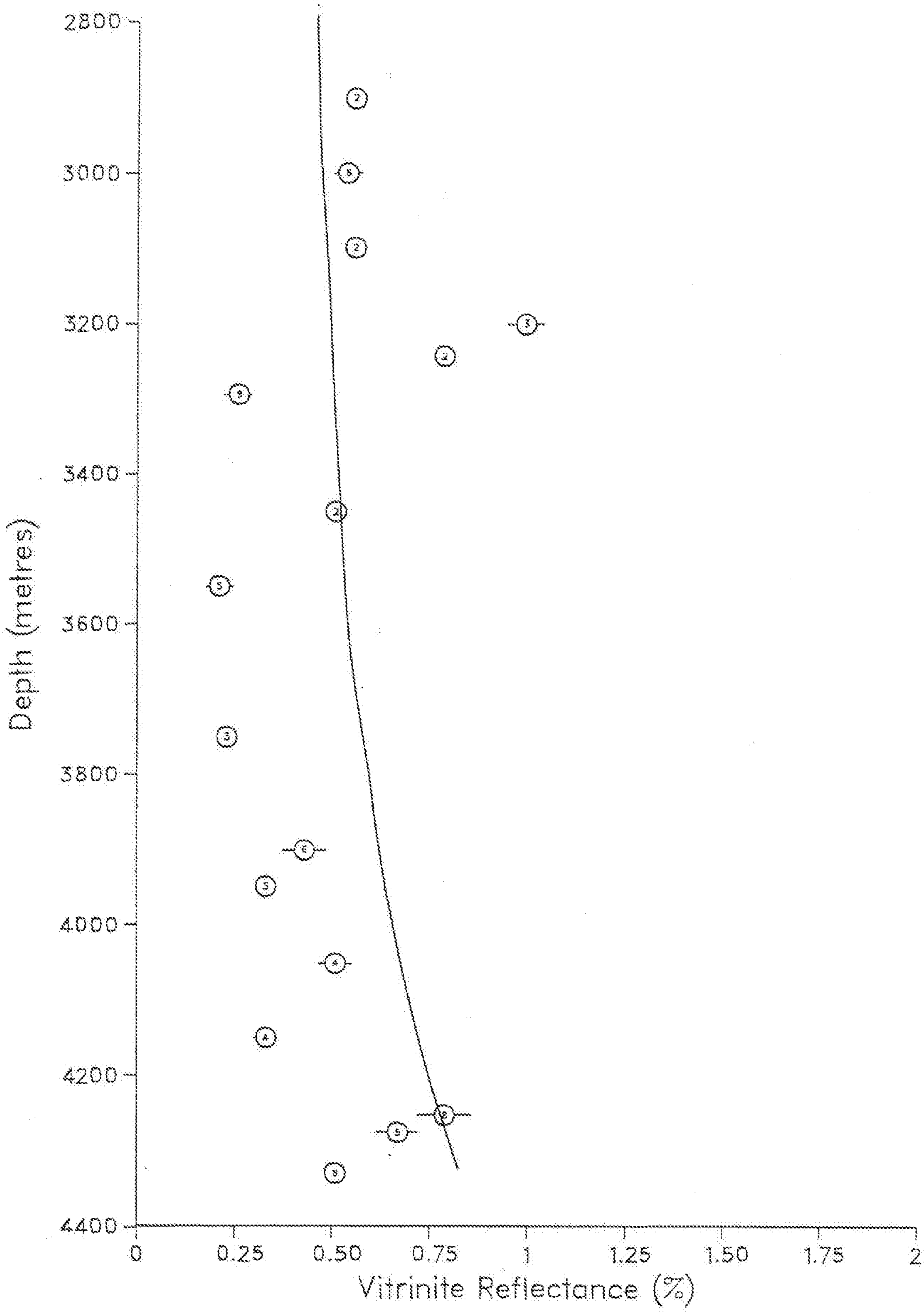

Figure 14: Kerogen Composition and Potential Hydrocarbon Products

Well NOCS 2/8-14

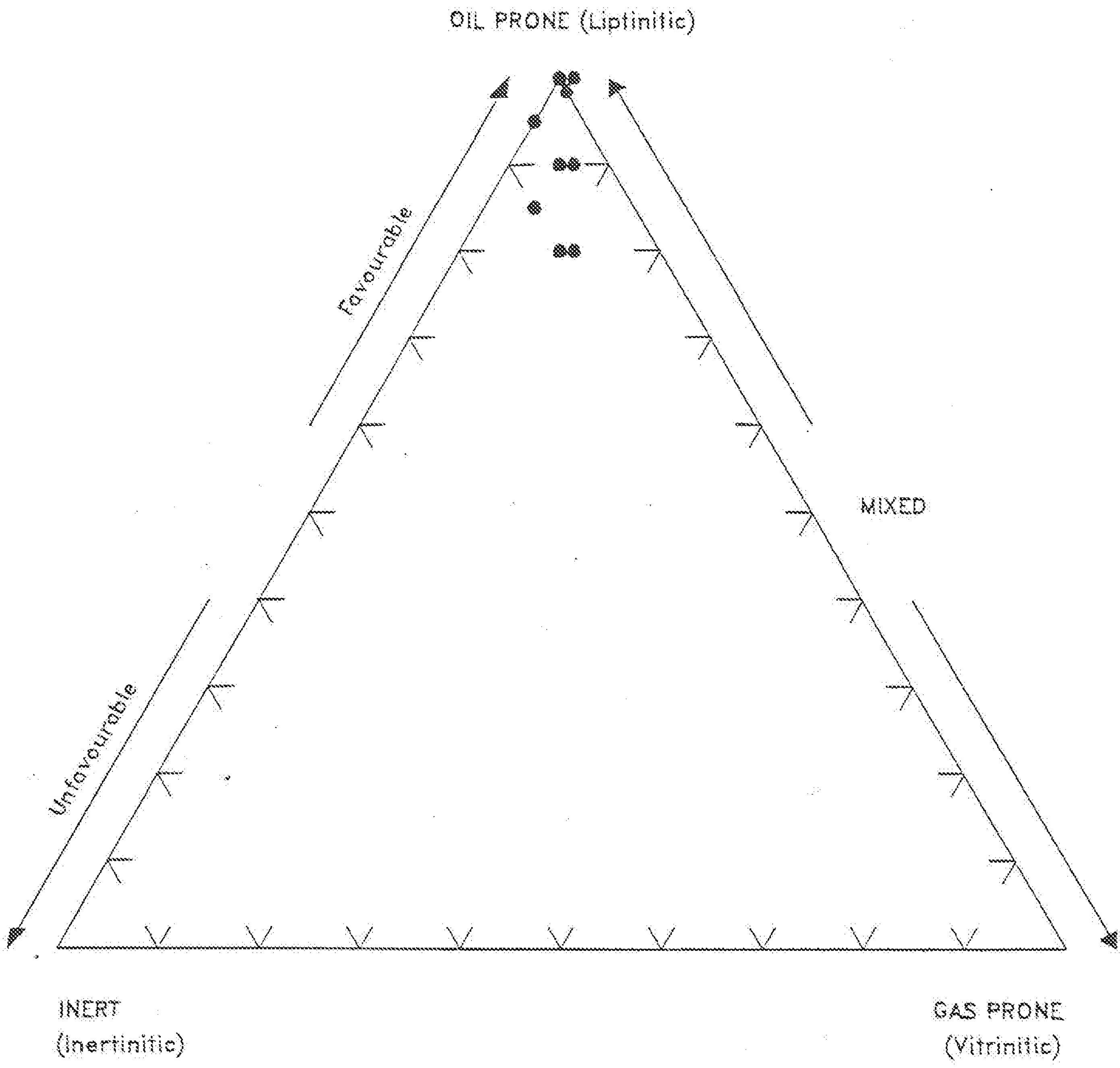

Figure 15: Comparison of SCI and Tmax

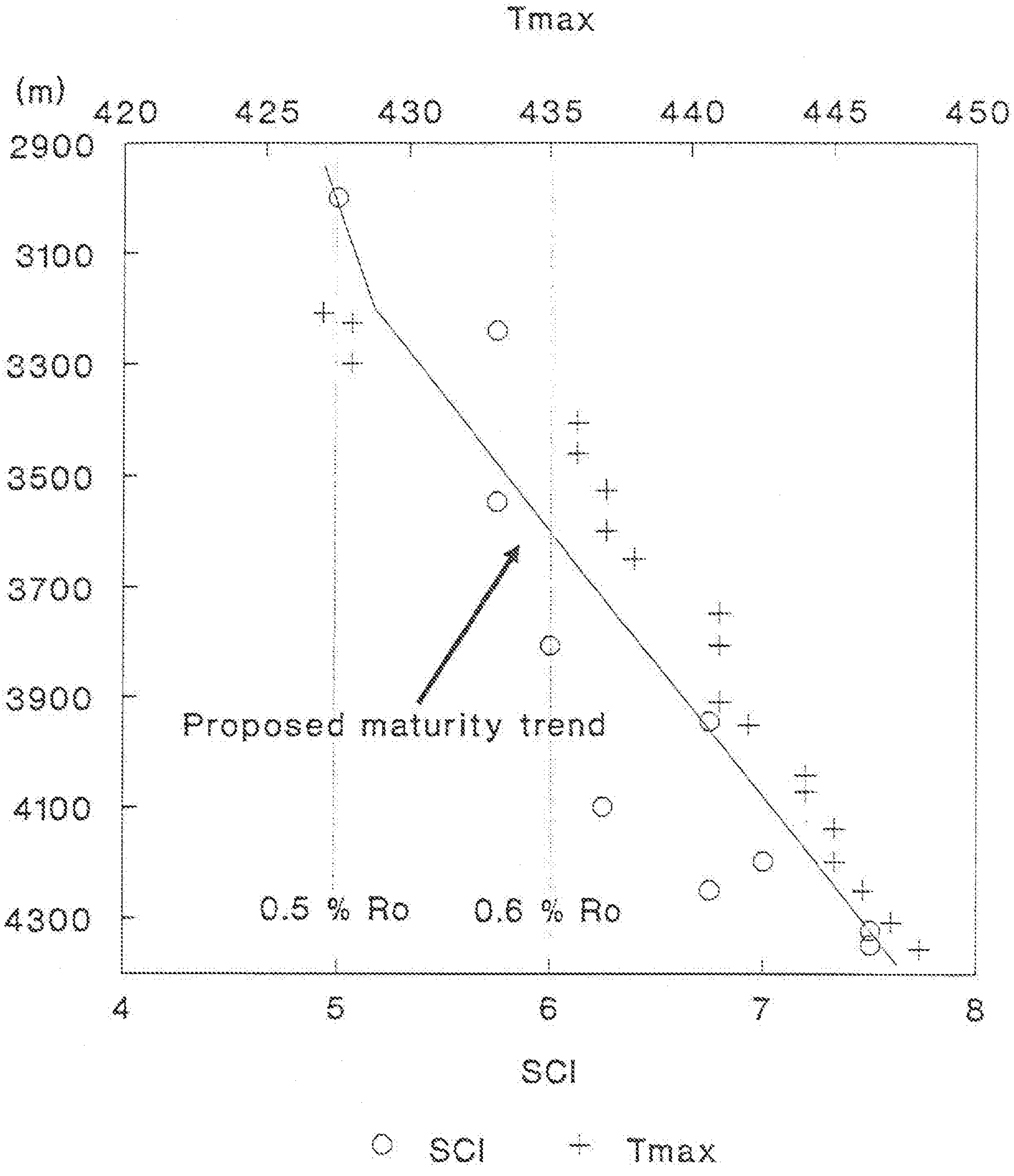

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Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp / Frm / Age / Lithology description	Trb	Sample
2886.00						0034
			90	Ca : w		0034-1L
			10	Sh/Clst: lt gy to lt brn gy to lt bl gy to brn blk, calc		0034-2L
			tr	Sh/Clst: pl pu to pl brn		0034-3L
			tr	Cont : prp		0034-4L
2900.00						0001
			85	Ca : w, st		0001-3L
			15	Sh/Clst: y gy to gy red, lt gy		0001-1L
		0.40		bulk		0001-0B
			tr	Sh/Clst: drk gy		0001-2L
2904.00						0035
			40	Ca : w		0035-1L
			35	Sh/Clst: lt gy to lt brn gy to lt bl gy to brn blk, calc		0035-2L
			25	Sh/Clst: m brn to pl brn, wx		0035-3L
			tr	Cont : Coal-ad		0035-4L
2925.00						0036
		6.59	95	Sh/Clst: lt gy to m gy to drk gy to brn blk, calc		0036-1L
			5	Sh/Clst: m brn to pl brn, wx		0036-2L
			tr	Ca : w		0036-3L
			tr	Cont : dd		0036-4L

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Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp / Frm / Age / Lithology description	Trb	Sample
2943.00						0037
			60	Ca : or gy to lt or to w		0037-1L
		2.06	30	Sh/Clst: lt gy to m gy to drk gy, wx, calc		0037-2L
			10	Sh/Clst: pl brn to pl y brn, wx		0037-3L
2964.00						0038
		3.08	85	Ca : or gy to lt or		0038-1L
			10	Sh/Clst: lt gy to m gy to drk gy, wx, calc		0038-2L
			5	Sh/Clst: pl brn to pl y brn, wx, calc		0038-3L
			tr	Cont : dd, fib		0038-4L
2985.00						0039
		2.86	60	Ca : lt or to or gy, mrl		0039-1L
			40	Marl : lt gy		0039-2L
			tr	Sh/Clst: m gy to drk gy to brn blk, wx, calc		0039-3L
3000.00						0002
			50	Marl : lt gy to m gy		0002-3L
			30	Ca : pl y brn, st		0002-2L
			20	Cont : st, Mica-ad, prp		0002-4L
		1.65		bulk		0002-0B
			tr	Sh/Clst: m gy to drk gy		0002-1L
3006.00						0040
			70	Ca : or gy		0040-1L
			30	Marl : lt gy		0040-2L
			tr	Sh/Clst: m brn to pl brn, calc		0040-3L
			tr	Sh/Clst: brn gy to drk gy to brn blk, wx, calc		0040-4L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3024.00						0041
			50	Cont : Coal-ad, prp, fib		0041-1L
			20	Marl : lt gy		0041-2L
			20	S/Sst : w, f, l		0041-3L
			10	Ca : lt or to or gy		0041-4L
			tr	Sh/Clst: m brn to pl brn, calc		0041-5L
3045.00						0042
		0.43	80	Marl : lt gy		0042-1L
			10	Ca : lt or, mrl		0042-2L
			10	Sh/Clst: m brn to pl brn, wx		0042-3L
			tr	Cont : prp		0042-4L
3066.00						0043
		0.62	60	Marl : lt gy to m gy		0043-1L
			40	Ca : lt or to or gy, mrl		0043-2L
			tr	Sh/Clst: m brn to pl brn, wx		0043-3L
3084.00						0044
			60	Marl : lt gy to m gy		0044-1L
			40	Ca : or gy to lt or		0044-2L
3090.00						0045
		0.70	70	Marl : lt gy to m gy		0045-1L
			30	Ca : lt or to or gy to pl y brn, mrl		0045-2L
			tr	Sh/Clst: pl brn to m brn		0045-3L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp / Frm / Age / Lithology description	Trb	Sample
3096.00						0046
		0.64	85	Marl : lt gy to m gy		0046-1L
			15	Ca : lt or to or gy to pl y brn, mrl		0046-2L
			tr	Sh/Clst: pl brn to m brn		0046-3L
3100.00						0003
			65	Marl : lt gy to m gy		0003-3L
			35	Ca : pl y brn		0003-2L
		0.90		bulk		0003-0B
			tr	Sh/Clst: m gy to drk gy		0003-1L
			tr	Cont : prp		0003-4L
3102.00						0047
			70	Marl : lt gy to m gy		0047-1L
			30	Ca : lt or to or gy to pl y brn, mrl		0047-2L
			tr	Sh/Clst: drk gy to brn blk		0047-3L
			tr	Cont : prp		0047-4L
3108.00						0048
		1.59	80	Marl : lt gy to m gy		0048-1L
			20	Ca : lt or to or gy to pl y brn, mrl		0048-2L
			tr	Sh/Clst: m brn to pl brn		0048-3L
3114.00						0049
		0.60	95	Marl : lt gy to m gy		0049-1L
			5	Ca : lt or to or gy to pl y brn		0049-2L
			tr	Sh/Clst: drk gy to brn blk		0049-3L

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Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3120.00						0050
			75	Marl : lt gy to m gy		0050-1L
		2.20	25	Ca : lt or to or gy to pl y brn		0050-2L
3126.00						0051
		0.63	90	Marl : lt gy to lt brn gy		0051-1L
			10	Ca : lt or to or gy to pl y brn		0051-2L
			tr	Cont : prp		0051-3L
3132.00						0052
		0.51	95	Marl : lt gy to lt brn gy		0052-1L
			5	Ca : lt or to or gy to pl y brn		0052-2L
			tr	Cont : prp		0052-3L
3138.00						0053
		0.83	60	Marl : lt gy to lt brn gy		0053-1L
			35	Ca : lt or to or gy to pl y brn		0053-2L
			5	Sh/Clst: brn gy to dsk brn to drk gy, calc		0053-3L
			tr	Cont : prp		0053-4L
3144.00						0054
		0.47	80	Marl : lt gy to lt brn gy		0054-1L
			20	Ca : lt or to or gy		0054-2L
			tr	Cont : prp		0054-3L
3150.00						0055
		0.69	50	Marl : lt gy to lt brn gy		0055-1L
			30	Ca : lt or to or gy		0055-2L
			20	Sh/Clst: brn gy to m gy to drk gy, wx		0055-3L
			tr	S/Sst : lt gy to lt or, f, hd		0055-4L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3156.00						0056
		0.56	40	Marl : lt gy to lt brn gy		0056-1L
			30	Ca : lt or to or gy		0056-2L
			30	Sh/Clst: brn gy to m gy to drk gy, wx		0056-3L
			tr	S/Sst : lt gy to lt or, f, hd		0056-4L
3162.00						0057
		0.45	70	Sh/Clst: brn gy to m gy, wx		0057-1L
			20	Ca : or gy		0057-2L
			10	Marl : lt gy to lt brn gy		0057-3L
			tr	Cont : prp		0057-4L
3168.00						0058
		0.43	75	Sh/Clst: brn gy to lt brn gy to m gy, wx		0058-1L
			20	Ca : or gy		0058-2L
			5	Marl : lt gy to lt brn gy		0058-3L
			tr	Cont : prp		0058-4L
3174.00						0059
		0.42	85	Sh/Clst: brn gy to lt brn gy to m gy, wx		0059-1L
			10	Ca : or gy to lt or gy		0059-2L
			5	Marl : lt gy to lt brn gy		0059-3L
			tr	Cont : prp		0059-4L
3176.00						0004
			100	Sh/Clst: brn gy to m gy, calc		0004-2L
		0.52		bulk		0004-0B
			tr	Ca : pl y brn		0004-1L
			tr	Cont : prp		0004-3L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp / Frm / Age / Lithology description	Trb	Sample
3180.00						0060
		2.31	75	Ca : or gy to lt or gy		0060-1L
			10	Marl : lt gy to lt brn gy		0060-2L
			10	Sh/Clst: brn gy to m gy, wx		0060-3L
			5	S/Sst : lt brn, f, hd		0060-4L
			tr	Cont : prp		0060-5L
3186.00						0061
		0.32	60	Sh/Clst: brn gy to gy brn, calc		0061-1L
			20	Marl : lt gy		0061-2L
			10	Ca : or gy to lt or		0061-3L
			10	S/Sst : lt brn to or gy, f, hd		0061-4L
3192.00						0062
		0.26	70	Sh/Clst: brn gy to gy brn to drk gy, wx		0062-1L
			15	Marl : lt gy		0062-2L
			10	Ca : or gy to lt or		0062-3L
			5	S/Sst : lt brn to or gy, f, hd		0062-4L
3198.00						0063
		1.15	75	Sh/Clst: brn gy to gy brn to drk gy, wx		0063-1L
			10	Marl : lt gy		0063-2L
			10	Ca : or gy to lt or, mrl		0063-3L
			5	S/Sst : w to lt gy to lt brn to or gy, f, hd, l		0063-4L
3201.00						0005
		0.64	100	Sh/Clst: lt brn gy to pl brn, calc, mrl		0005-1L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3204.00						0064
			80	Cont : w to lt gy, f, l, bar		0064-1L
			20	Sh/Clst: brn gy to gy brn to drk gy, calc		0064-2L
			tr	Marl : lt gy		0064-3L
3210.00						0065
		5.50	80	Sh/Clst: brn gy to gy brn to drk gy, calc		0065-1L
			20	Marl : lt gy to lt ol gy		0065-2L
			tr	Ca : or gy		0065-3L
3216.00						0066
		6.86	95	Sh/Clst: brn gy to gy brn to drk gy, calc		0066-1L
			5	Marl : lt gy to lt ol gy		0066-2L
3222.00						0067
		6.12	60	Sh/Clst: brn gy to gy brn to drk gy, calc		0067-1L
			40	Marl : lt gy to lt ol gy		0067-2L
			tr	Cont : prp		0067-3L
3228.00						0068
		5.40	90	Sh/Clst: brn gy to gy brn to drk gy, calc		0068-1L
			10	Marl : lt gy to lt ol gy		0068-2L
			tr	Cont : prp		0068-3L
3234.00						0069
		5.66	90	Sh/Clst: brn gy to gy brn, calc		0069-1L
			10	Marl : lt gy to lt ol gy		0069-2L
			tr	S/Sst : m gy to lt brn, f, hd		0069-3L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp / Frm / Age / Lithology description	Trb	Sample
3240.00						0070
		2.36	95	Sh/Clst: brn gy to gy brn, calc		0070-1L
			5	Marl : lt gy to lt ol gy		0070-2L
			tr	Ca : lt or to or gy, mrl		0070-3L
3243.00						0006
		4.83	90	Sltst : lt ol gy to dsk y brn, calc, cly		0006-2L
			10	Marl : lt gy to lt brn gy		0006-1L
			tr	Sh/Clst: m gy		0006-3L
3246.00						0086
			60	Sh/Clst: brn gy to gy brn, slt		0086-1L
			40	Marl : lt gy to lt ol gy		0086-2L
			tr	Sh/Clst: m gy, calc		0086-3L
3252.00						0087
		4.17	90	Sh/Clst: brn to m brn, calc		0087-1L
			5	Sh/Clst: brn gy to gy brn, calc		0087-2L
			5	Cont : prp, dd, bar		0087-3L
3258.00						0088
			100	Cont : w, f, l, bar		0088-1L
			tr	Sh/Clst: brn gy to gy brn		0088-2L
			tr	Sh/Clst: brn to m brn, calc		0088-3L
			tr	Cont : prp, dd		0088-4L
3264.00						0089
			90	Cont : w, f, l, bar		0089-1L
			5	Sh/Clst: brn gy to gy brn, calc		0089-2L
			5	Cont : prp, dd		0089-3L

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Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp / Frm / Age / Lithology description	Trb	Sample
3270.00						0090
			85	Cont : w, f, l, bar		0090-1L
		7.28	10	Sh/Clst: brn gy to gy brn, calc		0090-2L
			5	Cont : prp, dd		0090-3L
3276.00						0091
		5.61	70	Sh/Clst: brn gy to drk gy, calc		0091-1L
			20	Cont : prp, dd		0091-2L
			10	Cont : w, f, l, bar		0091-3L
3282.00						0092
		1.21	50	Marl : lt gy to lt ol gy		0092-1L
			30	Cont : w, f, l, bar		0092-2L
			15	Cont : prp, dd		0092-3L
			5	Sh/Clst: brn gy to drk gy		0092-4L
3288.00						0093
			75	Cont : w, f, l, bar		0093-1L
			15	Cont : prp, dd		0093-2L
		7.55	10	Sh/Clst: brn gy to drk gy		0093-3L
3294.00						0094
		5.32	80	Sh/Clst: brn gy to drk gy		0094-1L
			10	Cont : w, f, l, bar		0094-2L
			10	Cont : prp, dd		0094-3L
			tr	Marl : lt gy		0094-4L

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Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3300.00						0095
			45	Cont : w, f, l, bar		0095-1L
		6.30	40	Sh/Clst: brn gy to drk gy, slt		0095-2L
			15	Cont : prp, dd		0095-3L
3306.00						0096
			70	Cont : w, f, l, bar		0096-1L
		6.14	15	Sh/Clst: brn gy to drk gy, slt		0096-2L
			10	Cont : prp, dd		0096-3L
			5	Marl : lt gy to lt ol gy		0096-4L
3312.00						0097
			100	Cont : w, f, l, bar		0097-1L
			tr	Sh/Clst: brn gy to drk gy, slt		0097-2L
			tr	Cont : prp, dd		0097-3L
3318.00						0098
			100	Cont : w, f, l, bar		0098-1L
			tr	Sh/Clst: brn gy to drk gy, slt		0098-2L
			tr	Cont : prp, dd		0098-3L
3324.00						0099
			100	Cont : w, f, l, bar		0099-1L
			tr	Sh/Clst: brn gy to drk gy, slt		0099-2L
			tr	Marl : lt gy to lt ol gy		0099-3L
			tr	Cont : prp, dd		0099-4L

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Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3330.00						0100
			100	Cont : w, f, l, bar		0100-1L
			tr	Sh/Clst: brn gy to drk gy, slt		0100-2L
			tr	Marl : lt gy to lt ol gy		0100-3L
			tr	Cont : prp, dd		0100-4L
3336.00						0101
			100	Cont : w, f, l, bar		0101-1L
			tr	Sh/Clst: brn gy to drk gy, slt		0101-2L
			tr	Cont : prp, dd		0101-3L
3342.00						0102
			95	Cont : w, f, l, bar		0102-1L
			5	Sh/Clst: brn gy to drk gy		0102-2L
			tr	Cont : prp, dd		0102-3L
3348.00						0103
			95	Cont : w, f, l, bar		0103-1L
			5	Sh/Clst: brn gy to drk gy		0103-2L
			tr	Cont : prp, dd		0103-3L
3350.00						0007
			80	S/Sst : lt gy to pl y brn, l		0007-1L
		6.91	20	Sh/Clst: dsk y brn		0007-2L
		0.75		bulk		0007-0B
			tr	Cont : prp		0007-3L

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Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3354.00						0104
			80	Cont : w, f, l, bar		0104-1L
			20	Cont : Coal-ad, fib, prp		0104-2L
			tr	Sh/Clst: brn gy to drk gy		0104-3L
3360.00						0105
			95	Cont : w, f, l, bar		0105-1L
			5	Cont : Coal-ad, fib, prp		0105-2L
			tr	Sh/Clst: brn gy to drk gy		0105-3L
			tr	Ca : lt gy, mrl		0105-4L
3366.00						0106
			95	Cont : w, f, l, bar		0106-1L
			5	Marl : lt gy to lt ol gy		0106-2L
			tr	Sh/Clst: brn gy to drk gy		0106-3L
			tr	Cont : prp, dd		0106-4L
3372.00						0107
			85	Cont : w, f, l, bar		0107-1L
			15	Cont : Coal-ad, prp, fib		0107-2L
			tr	Sh/Clst: brn gy to drk gy		0107-3L
3378.00						0108
			60	Cont : w, f, l, bar		0108-1L
			40	Cont : Coal-ad, prp, fib		0108-2L
			tr	Sh/Clst: brn gy to drk gy		0108-3L

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Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3384.00						0109
			70	Cont : w, f, l, bar		0109-1L
			25	Cont : Coal-ad, prp, fib		0109-2L
			5	Marl : lt gy to ol gy		0109-3L
			tr	Sh/Clst: brn gy to drk gy		0109-4L
3390.00						0110
			75	Cont : Coal-ad, prp, fib		0110-1L
			20	Cont : w, f, l, bar		0110-2L
			5	Sh/Clst: brn gy to drk gy		0110-3L
3396.00						0111
			90	Cont : w, f, l, bar		0111-1L
		8.67	10	Sh/Clst: brn gy to drk gy		0111-2L
			tr	Cont : prp, fib		0111-3L
3402.00						0112
			80	Cont : w, f, l, bar		0112-1L
			20	Cont : prp, fib		0112-2L
			tr	Sh/Clst: brn gy to drk gy		0112-3L
3408.00						0113
		4.33	50	Sh/Clst: brn gy to m gy to drk gy		0113-1L
			45	Cont : w, f, l, bar		0113-2L
			5	Cont : Coal-ad, prp, dd		0113-3L
3414.00						0114
			90	Cont : w, f, l, bar		0114-1L
		6.81	10	Sh/Clst: brn gy to drk gy, sft		0114-2L
			tr	Cont : prp, dd, fib		0114-3L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp / Frm / Age / Lithology description	Trb	Sample
3420.00						0115
		4.03	75	Sh/Clst: m gy to brn gy, sft		0115-1L
			25	Cont : w, f, l, bar		0115-2L
			tr	Cont : prp, Coal-ad		0115-3L
3426.00						0116
		5.12	100	Sh/Clst: m gy to drk gy to brn gy		0116-1L
			tr	Cont : w, f, l, bar		0116-2L
			tr	Cont : prp, fib		0116-3L
3432.00						0117
			80	Cont : w, f, l, bar		0117-1L
		5.39	20	Sh/Clst: m gy to drk gy to brn gy		0117-2L
			tr	Cont : Coal-ad, prp		0117-3L
3438.00						0118
		5.07	90	Sh/Clst: m gy to drk gy to brn gy		0118-1L
			10	Cont : w, f, l, bar		0118-2L
			tr	Cont : Coal-ad, prp		0118-3L
3444.00						0119
			60	Cont : w, f, l, bar		0119-1L
			35	Cont : Coal-ad, prp, fib		0119-2L
			5	Sh/Clst: m gy to brn gy		0119-3L
3450.00						0008
			85	Cont : Coal-ad		0008-2L
		4.56	15	S/Sst : m gy, slt, cem, l		0008-1L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3450.50						0120
			80	Cont : w, f, l, bar		0120-1L
			15	Sh/Clst: m gy to brn gy		0120-2L
			5	Cont : prp		0120-3L
3456.00						0121
			40	Cont : Coal-ad, fib, prp		0121-1L
			30	Marl : lt gy to lt ol gy		0121-2L
		6.05	25	Sh/Clst: m gy to brn gy		0121-3L
			5	Cont : w, f, l, bar		0121-4L
3462.00						0122
			60	Cont : w, f, l, bar		0122-1L
		6.46	40	Sh/Clst: brn gy to drk gy		0122-2L
			tr	Cont : prp		0122-3L
3468.00						0123
			60	Cont : Coal-ad, fib, prp, dd		0123-1L
		5.97	30	Sh/Clst: brn gy to drk gy		0123-2L
			10	Cont : w, f, l, bar		0123-3L
3474.00						0124
			40	Cont : Coal-ad, fib, prp, dd		0124-1L
		3.85	40	Sh/Clst: m gy to drk gy		0124-2L
			20	Cont : w, f, l, bar		0124-3L
3480.00						0125
			90	Cont : w, f, l, bar		0125-1L
		5.42	10	Sh/Clst: m gy to drk gy		0125-2L
			tr	Cont : prp		0125-3L

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Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3486.00						0126
			60	Cont : fib, Coal-ad, prp		0126-1L
		5.12	30	Sh/Clst: m gy to drk gy		0126-2L
			10	Cont : w, f, l, bar		0126-3L
3492.00						0127
			85	Cont : w, f, l, bar		0127-1L
		6.16	15	Sh/Clst: m gy to drk gy		0127-2L
			tr	Cont : prp		0127-3L
3498.00						0128
			60	Cont : w, f, l, bar		0128-1L
			30	Cont : fib, Coal-ad, prp		0128-2L
		6.58	10	Sh/Clst: m gy to drk gy		0128-3L
3504.00						0129
			40	Cont : w, f, l, bar		0129-1L
			30	Cont : fib, Coal-ad, prp		0129-2L
		6.69	30	Sh/Clst: m gy to drk gy		0129-3L
3510.00						0130
			60	Cont : w, f, l, bar		0130-1L
		3.37	25	Marl : lt gy to m gy to lt ol gy		0130-2L
			15	Sh/Clst: m gy to drk gy		0130-3L
			tr	Cont : prp		0130-4L
3516.00						0131
		1.10	50	Ca : lt or to w		0131-1L
			30	Sh/Clst: brn gy to drk gy, calc		0131-2L
			20	Cont : w, f, l, bar		0131-3L
			tr	Cont : prp		0131-4L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type / TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3522.00						0132
			70	Cont : Coal-ad, fib, prp		0132-1L
			25	Cont : w, f, l, bar		0132-2L
			5	Sh/Clst: drk gy to brn gy		0132-3L
3524.00		swc				0033
		4.70	100	Sh/Clst: drk gy to brn gy to brn blk		0033-1L
3528.00						0133
		4.95	50	Marl : lt gy to lt ol gy		0133-1L
			40	Sh/Clst: m gy to drk gy to brn gy		0133-2L
			10	S/Sst : w to m y brn, f, hd		0133-3L
3534.00						0071
			65	Cont : Coal-ad, fib, prp		0071-1L
		6.74	30	Sh/Clst: drk gy to brn gy to brn blk		0071-2L
			5	Ca : lt or		0071-3L
			tr	Cont : w, f, l, bar		0071-4L
3540.00						0072
		2.79	60	Sh/Clst: drk gy to brn gy to brn blk		0072-1L
			40	Cont : w, f, l, bar		0072-2L
			tr	Ca : lt or		0072-3L
			tr	Cont : prp		0072-4L
3546.00						0073
			40	Marl : lt gy to lt brn gy		0073-1L
			30	Cont : w, f, l, bar		0073-2L
			25	Sh/Clst: drk gy to brn gy to brn blk		0073-3L
			5	Cont : prp		0073-4L

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Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Cvd	Type / TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3547.00		swc				0032
		4.46	100	Sh/Clst: drk gy to brn blk		0032-1L
3549.00						0009
			90	Cont : w, Coal-ad, evap		0009-2L
		4.52	10	Sltst : drk gy to dsk y brn, cly		0009-1L
3552.00						0074
			90	Cont : w, f, l, bar		0074-1L
			10	Sh/Clst: drk gy to brn gy to brn blk		0074-2L
			tr	Cont : prp		0074-3L
3558.00						0075
			60	Cont : Coal-ad, prp, fib		0075-1L
			20	Sh/Clst: drk gy to brn blk		0075-2L
			15	Cont : w, f, l, bar		0075-3L
			5	Marl : lt gy		0075-4L
			tr	Coal : w, wx		0075-5L
3564.00						0076
		3.13	45	Sh/Clst: drk gy to brn gy, calc		0076-1L
			40	Marl : lt gy to m gy		0076-2L
			10	S/Sst : w to lt gy, f, hd		0076-3L
			5	Cont : Coal-ad, prp, fib		0076-4L
3570.00						0077
		3.13	70	Marl : lt gy to m gy		0077-1L
			25	Sh/Clst: drk gy to brn blk		0077-2L
			5	Cont : prp, dd, fib		0077-3L
			tr	Cont : w, f, l, bar		0077-4L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp Frm Age Lithology description	Trb	Sample
3575.00		swc				0031
		3.32	100	Sh/Clst: drk gy to brn blk		0031-1L
			tr	S/Sst : pl y brn, f, lam		0031-2L
3576.00						0078
			75	Sh/Clst: drk gy to brn blk		0078-1L
			20	S/Sst : pl y brn to m y brn to lt gy, crs, hd		0078-2L
			5	Cont : prp, fib		0078-3L
			tr	Marl : lt gy to m gy		0078-4L
3582.00						0079
			40	Cont : w, f, l, bar		0079-1L
		2.99	40	Sh/Clst: drk gy to brn gy to brn blk		0079-3L
			10	S/Sst : w to lt gy, f, crs, l		0079-6L
			5	Ca : lt or		0079-4L
			5	Cont : prp, fib		0079-5L
3588.00						0080
			50	Cont : Coal-ad, fib, prp		0080-1L
		2.15	45	Sh/Clst: drk gy to brn gy to brn blk		0080-2L
			5	Cont : w, f, l, bar		0080-3L
			tr	S/Sst : w to lt gy, f, crs, l		0080-4L
3594.00						0081
			45	Cont : w, f, l, bar		0081-1L
			45	Sh/Clst: drk gy to brn gy to brn blk, hd		0081-2L
			5	Cont : prp, fib		0081-3L
			5	S/Sst : lt gy to pl y brn, crs, hd		0081-4L

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Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp / Frm / Age / Lithology description	Trb	Sample
3600.00						0082
			60	Cont : w, f, l, bar		0082-1L
		3.64	25	Sh/Clst: drk gy to brn gy to brn blk, hd		0082-2L
			10	S/Sst : lt gy to pl y brn, crs, hd		0082-4L
			5	Cont : prp, fib		0082-3L
3606.00						0083
			100	Cont : w, f, l, bar		0083-1L
			tr	Sh/Clst: drk gy to brn gy to brn blk, hd		0083-2L
			tr	S/Sst : lt gy to pl y brn, crs, hd		0083-3L
			tr	Cont : prp, fib		0083-4L
3612.00						0084
			65	Cont : w, f, l, bar		0084-1L
		4.54	25	Sh/Clst: drk gy to brn gy to brn blk, hd		0084-2L
			5	Cont : prp, dd		0084-3L
			5	S/Sst : lt gy to pl y brn, crs, l		0084-4L
3618.00						0085
			85	Cont : w, f, l, bar		0085-1L
		3.39	15	Sh/Clst: drk gy to brn gy		0085-2L
			tr	Cont : prp, dd		0085-3L
			tr	S/Sst : lt gy to pl y brn, crs, hd		0085-4L
3624.00						0134
			90	Cont : w, f, l, bar		0134-1L
			5	Sh/Clst: drk gy to brn gy		0134-2L
			5	Cont : prp, fib		0134-3L

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Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3630.00						0135
			95	Cont : w, f, l, bar		0135-1L
			5	Cont : prp		0135-2L
			tr	Sh/Clst: m gy to drk gy		0135-3L
			tr	Marl : lt gy to m gy		0135-4L
3636.00						0136
			95	Cont : w, f, l, bar		0136-1L
			5	Cont : prp		0136-2L
			tr	Sh/Clst: brn gy to drk gy		0136-3L
3642.00						0137
			100	Cont : w, f, l, bar		0137-1L
			tr	Cont : prp		0137-2L
			tr	Sh/Clst: brn gy to drk gy		0137-3L
3648.00						0138
			90	Cont : w, f, l, bar		0138-1L
			10	S/Sst : lt gy, f, crs, l		0138-4L
			tr	Cont : prp		0138-2L
			tr	Sh/Clst: brn gy to drk gy		0138-3L
3650.00		swc				0030
		5.02	100	Sh/Clst: drk gy to brn blk		0030-1L
3651.00						0010
		3.31	75	Sltst : drk gy to brn blk, s		0010-2L
			25	Cont : Coal-ad, prp, fib, evap		0010-1L

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Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3654.00						0139
			95	Cont : lt gy, f, l, bar		0139-1L
			5	Sh/Clst: brn gy to drk gy		0139-2L
			tr	Cont : prp		0139-3L
3660.00						0140
			95	Cont : w, f, l, bar		0140-1L
			5	Sh/Clst: brn gy to drk gy		0140-2L
			tr	Cont : prp, fib		0140-3L
3666.00						0141
			95	Cont : w, f, l, bar		0141-1L
		4.22	5	Sh/Clst: brn gy to drk gy		0141-2L
			tr	Cont : prp, fib		0141-3L
3672.00						0142
			95	Cont : w, f, l, bar		0142-1L
			5	Sh/Clst: brn gy to drk gy		0142-2L
			tr	Cont : prp, fib		0142-3L
3678.00						0143
			100	Cont : w, f, l, bar		0143-1L
			tr	Sh/Clst: brn gy to drk gy		0143-2L
			tr	Cont : prp, fib		0143-3L
3684.00						0144
			95	Cont : w, f, l, bar		0144-1L
			5	Sh/Clst: brn gy to drk gy		0144-2L
			tr	Cont : prp, fib		0144-3L

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Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp / Frm / Age / Lithology description	Trb	Sample
3690.00						0145
			90	Cont : w, f, l, bar		0145-1L
			5	Sh/Clst: brn gy to drk gy		0145-2L
			5	Marl : lt gy to m gy		0145-3L
			tr	Cont : prp, fib		0145-4L
3696.00						0146
			95	Cont : w, f, l, bar		0146-1L
			5	Sh/Clst: brn gy to drk gy		0146-2L
			tr	Cont : prp, fib		0146-3L
3702.00						0147
			75	Cont : w, f, l, bar		0147-1L
		4.31	25	Sh/Clst: brn gy to drk gy to brn blk		0147-2L
			tr	Cont : prp		0147-3L
3708.00						0148
			85	Cont : w, f, l, bar		0148-1L
		4.63	15	Sh/Clst: brn gy to drk gy to brn blk		0148-2L
			tr	Cont : prp		0148-3L
3714.00						0149
			90	Cont : w, f, l, bar		0149-1L
		4.58	10	Sh/Clst: brn gy to drk gy to brn blk		0149-2L
			tr	Cont : prp		0149-3L
3720.00						0150
			100	Cont : w, f, l, bar		0150-1L
			tr	Sh/Clst: brn gy to drk gy to brn blk		0150-2L
			tr	Cont : prp		0150-3L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp / Frm / Age / Lithology description	Trb	Sample
3726.00						0151
			100	Cont : w, f, l, bar		0151-1L
			tr	Sh/Clst: brn gy to drk gy to brn blk		0151-2L
			tr	Cont : prp		0151-3L
3732.00						0152
			95	Cont : w, f, l, bar		0152-1L
			5	Marl : lt gy to m gy		0152-2L
			tr	Sh/Clst: drk gy to brn gy to brn blk		0152-3L
			tr	Cont : prp		0152-4L
3738.00						0153
			95	Cont : w, f, l, bar		0153-1L
			5	Sh/Clst: drk gy to brn blk		0153-2L
			tr	Cont : prp		0153-3L
3744.00						0154
			100	Cont : w, f, l, bar		0154-1L
			tr	Sh/Clst: m gy to drk gy, calc		0154-2L
			tr	Ca : lt or		0154-3L
			tr	Cont : prp		0154-4L
3750.00						0011
		2.60	60	Sh/Clst: drk gy, slt		0011-2L
			40	Cont : Coal-ad, prp, fib, evap		0011-1L
			tr	Ca : drk gy		0011-3L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3750.50						0155
			100	Cont : w, f, l, bar		0155-1L
			tr	Sh/Clst: drk gy to brn blk		0155-2L
			tr	Ca : lt or to w		0155-3L
			tr	Cont : prp		0155-4L
3756.00						0156
			90	Cont : w, f, l, bar		0156-1L
			5	Sh/Clst: drk gy to brn blk		0156-2L
			5	S/Sst : lt gy to m y brn, f, crs, l		0156-5L
			tr	Ca : lt or to w		0156-3L
			tr	Cont : prp		0156-4L
3762.00						0157
			60	Cont : w, f, l, bar		0157-1L
		1.03	25	Sh/Clst: drk gy to brn blk		0157-2L
			10	S/Sst : lt gy to pl y brn, f, crs, l		0157-6L
			5	Marl : lt gy to lt ol gy		0157-3L
			tr	Ca : lt or to w		0157-4L
			tr	Cont : prp, dd		0157-5L
3766.50		swc				0029
		1.91	100	Sh/Clst: drk gy to brn blk		0029-1L
3768.00						0158
			95	Cont : w, f, l, bar		0158-1L
			5	Sh/Clst: drk gy to brn blk		0158-2L
			tr	Cont : prp, dd		0158-3L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3774.00						0159
			90	Cont : w, f, l, bar		0159-1L
		2.74	10	Sh/Clst: drk gy to brn blk, calc		0159-2L
			tr	Cont : prp		0159-3L
3780.00						0160
			100	Cont : w, f, l, bar		0160-1L
			tr	Sh/Clst: drk gy to brn blk		0160-2L
			tr	Ca : lt or		0160-3L
			tr	Cont : prp		0160-4L
			tr	S/Sst : lt gy to pl y brn, f, slt, l		0160-5L
3786.00						0161
			100	Cont : w, f, l, bar		0161-1L
			tr	Sh/Clst: drk gy to brn blk		0161-2L
			tr	Cont : prp		0161-3L
3792.00						0162
			95	Cont : w, f, l, bar		0162-1L
			5	Sh/Clst: drk gy to brn blk		0162-2L
			tr	Cont : prp		0162-3L
3798.00						0163
			95	Cont : w, f, l, bar		0163-1L
			5	Sh/Clst: drk gy to brn blk		0163-2L
			tr	Ca : lt or		0163-3L
			tr	Cont : prp		0163-4L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type / TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3804.00						0164
			100	Cont : w, f, l, bar		0164-1L
			tr	Sh/Clst: drk gy to brn blk		0164-2L
			tr	Cont : prp		0164-3L
3809.00						0019
			60	Sltst : gy red, cly		0019-1L
		3.07	40	Sh/Clst: drk gy to brn blk, slt		0019-2L
			tr	Cont : prp, fib		0019-3L
3810.00						0165
			100	Cont : w to lt gy, f, l, bar		0165-1L
			tr	Cont : prp		0165-2L
3816.00						0179
			95	Cont : w, f, l, bar		0179-1L
			5	Sh/Clst: drk gy to dsk brn to brn blk		0179-2L
			tr	Cont : prp, fib, Coal-ad		0179-3L
3822.00						0180
			100	Cont : w, f, l, bar		0180-1L
			tr	Cont : fib		0180-2L
3828.00						0181
			85	Cont : w, f, l, bar		0181-1L
			15	Cont : fib, prp		0181-2L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3834.00						0182
			85	Cont : w, f, l, bar		0182-1L
		1.82	10	Sh/Clst: drk gy to brn blk		0182-2L
			5	Cont : prp, fib		0182-3L
3840.00						0183
			100	Cont : w, f, l, bar		0183-1L
			tr	Sh/Clst: drk gy to brn blk		0183-2L
			tr	Cont : prp, fib		0183-3L
3846.00						0184
			100	Cont : w, f, l, bar		0184-1L
			tr	Sh/Clst: drk gy to brn blk		0184-2L
			tr	Cont : prp		0184-3L
3849.00						0012
			50	Cont : Coal-ad, prp, fib, evap		0012-1L
		2.95	50	Sh/Clst: drk gy		0012-2L
			tr	Ca : drk gy		0012-3L
3852.00						0185
			95	Cont : w, f, l, bar		0185-1L
			5	Sh/Clst: drk gy		0185-2L
			tr	Marl : m gy		0185-3L
			tr	Cont : prp		0185-4L
3858.00						0186
			90	Cont : w, f, l, bar		0186-1L
			5	Sh/Clst: drk gy, wx		0186-2L
			5	Cont : prp, fib		0186-3L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3864.00						0187
			100	Cont : w, f, l, bar		0187-1L
			tr	Sh/Clst: drk gy, wx		0187-2L
			tr	Cont : prp, fib		0187-3L
3870.00						0188
			100	Cont : w, f, l, bar		0188-1L
			tr	Sh/Clst: drk gy to brn blk, wx		0188-2L
			tr	Cont : prp, fib		0188-3L
3875.00						0189
			100	Cont : w, f, l, bar		0189-1L
			tr	Sh/Clst: drk gy to brn blk, wx		0189-2L
			tr	Cont : prp, fib		0189-3L
3882.00						0190
			100	Cont : w, f, l, bar		0190-1L
			tr	Sh/Clst: drk gy to brn blk		0190-2L
			tr	Cont : prp, fib, Coal-ad		0190-3L
3888.00						0191
			95	Cont : w, f, l, bar		0191-1L
			5	Sh/Clst: drk gy to brn blk		0191-2L
			tr	Cont : prp, fib, Coal-ad		0191-3L
3894.00						0192
			85	Cont : w, f, l, bar		0192-1L
		3.28	15	Sh/Clst: drk gy		0192-2L
			tr	Cont : prp		0192-3L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3900.00						0020
			100	Cont : Coal-ad, evap		0020-1L
			tr	Sh/Clst: drk gy		0020-2L
3900.50						0193
		2.96	80	Sh/Clst: drk gy		0193-1L
			15	Cont : w, f, l, bar		0193-2L
			5	Cont : prp, dd		0193-3L
3906.00						0194
			100	Cont : w, f, l, bar		0194-1L
			tr	Sh/Clst: drk gy		0194-2L
			tr	Cont : prp		0194-3L
3912.00						0195
		2.93	100	Sh/Clst: drk gy to brn blk, hd, wx		0195-1L
			tr	S/Sst : w, hd		0195-2L
			tr	Cont : prp		0195-3L
3918.00						0196
			90	Cont : w, f, l, bar		0196-1L
			10	Sh/Clst: drk gy to brn blk		0196-2L
			tr	Cont : prp		0196-3L
3924.00						0197
		2.87	80	Sh/Clst: drk gy to dsk brn to brn blk, hd		0197-1L
			20	Cont : w, f, l, bar		0197-2L
			tr	Cont : prp, dd		0197-3L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3930.00						0198
			95	Cont : w, f, l, bar		0198-1L
			5	Sh/Clst: drk gy, calc		0198-2L
			tr	Cont : prp		0198-3L
3936.00						0199
			90	Cont : w, f, l, bar		0199-1L
			10	Sh/Clst: drk gy to brn blk, calc, hd		0199-2L
			tr	Cont : prp		0199-3L
3942.00						0200
			100	Cont : w, f, l, bar		0200-1L
			tr	Sh/Clst: drk gy, hd		0200-2L
			tr	Cont : prp		0200-3L
3948.00						0014
		2.43	100	Sh/Clst: drk gy, slt		0014-1L
			tr	Cont : Coal-ad, prp, fib		0014-2L
		2.43	tr	Sh/Clst: lt gy to m gy		0014-3L
3948.50						0201
			80	Cont : w, f, l, bar		0201-1L
			20	Sh/Clst: drk gy, hd, wx		0201-2L
			tr	Cont : prp		0201-3L
3954.00						0202
			70	Cont : w, f, l, bar		0202-1L
		2.84	30	Sh/Clst: drk gy, hd, wx, calc		0202-2L
			tr	Cont : prp		0202-3L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3960.00						0203
			95	Cont : w, f, l, bar		0203-1L
			5	Sh/Clst: drk gy, hd		0203-2L
			tr	Cont : prp		0203-3L
3966.00						0204
			90	Cont : w, f, l, bar		0204-1L
		3.40	10	Sh/Clst: drk gy, hd, wx, calc		0204-2L
			tr	Cont : prp		0204-3L
3972.00						0205
			100	Cont : w, f, l, bar		0205-1L
			tr	Sh/Clst: drk gy, hd, wx, calc		0205-2L
			tr	Cont : prp		0205-3L
3978.00						0206
		2.81	65	Sh/Clst: drk gy to brn blk, hd, calc		0206-1L
			35	Cont : w, f, l, bar		0206-2L
			tr	Cont : prp		0206-3L
3984.00						0207
			75	Cont : w, f, l, bar		0207-1L
		2.43	25	Sh/Clst: drk gy to brn blk, hd, calc		0207-2L
3990.00						0208
		2.38	80	Sh/Clst: drk gy, hd, slt		0208-1L
			20	Cont : w, f, l, bar		0208-2L
			tr	Cont : prp		0208-3L

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Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3996.00						0209
		2.70	60	Sh/Clst: drk gy, hd, slt, calc		0209-1L
			40	Cont : w, f, l, bar		0209-2L
			tr	Cont : prp		0209-3L
4002.00						0021
			80	Cont : Coal-ad, bar		0021-1L
		2.82	20	Sh/Clst: drk gy, slt		0021-2L
4002.50						0210
			95	Cont : w, f, l, bar		0210-1L
			5	Sh/Clst: drk gy, calc, slt		0210-2L
			tr	Cont : prp		0210-3L
4008.00						0211
			90	Cont : w, f, l, bar		0211-1L
		2.02	10	Sh/Clst: drk gy, calc, slt		0211-2L
			tr	Cont : prp		0211-3L
4014.00						0212
			100	Cont : w, f, l, bar		0212-1L
			tr	Sh/Clst: drk gy		0212-2L
			tr	Cont : prp		0212-3L
4020.00						0213
			95	Cont : w, f, l, bar		0213-1L
			5	Sh/Clst: drk gy		0213-2L
			tr	Cont : prp		0213-3L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
4026.00						0214
			100	Cont : w, f, l, bar		0214-1L
			tr	Sh/Clst: m gy to drk gy		0214-2L
			tr	Cont : prp		0214-3L
4027.00		swc				0028
		1.57	95	Sh/Clst: drk gy to brn blk, slt, carb		0028-1L
			5	Sh/Clst: m y brn to pl brn, carb		0028-2L
4032.00						0215
			100	Cont : w, f, l, bar		0215-1L
			tr	Sh/Clst: drk gy		0215-2L
			tr	Cont : prp		0215-3L
4038.00						0216
			95	Cont : w, f, l, bar		0216-1L
			5	Sh/Clst: drk gy		0216-2L
			tr	Cont : prp		0216-3L
4044.00						0217
			50	Cont : w, f, l, bar		0217-1L
		1.49	50	Sh/Clst: drk gy to brn blk, calc, slt		0217-2L
			tr	Cont : prp		0217-3L
4050.00						0015
		2.40	85	Sh/Clst: drk gy to brn blk, slt		0015-2L
			15	Cont : Coal-ad, prp, dd, fib		0015-1L

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Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp / Frm / Age / Lithology description	Trb	Sample
4050.50						0218
			90	Cont : w, f, l, bar		0218-1L
			10	Sh/Clst: drk gy to brn blk, calc, slt		0218-2L
			tr	Cont : prp		0218-3L
4056.00						0219
		2.06	60	Sh/Clst: drk gy to brn blk, calc, slt		0219-1L
			40	Cont : w, f, l, bar		0219-2L
			tr	Cont : prp		0219-3L
4062.00						0220
		2.20	80	Sh/Clst: drk gy, calc, slt		0220-1L
			20	Cont : w, f, l, bar		0220-2L
			tr	Cont : prp		0220-3L
4068.00						0221
		2.24	65	Sh/Clst: drk gy to brn blk, calc, slt		0221-1L
			35	Cont : w, f, l, bar		0221-2L
			tr	Cont : prp		0221-3L
4074.00						0222
		2.21	80	Sh/Clst: drk gy to dsk brn to brn blk, calc, slt, wx		0222-1L
			20	Cont : w, f, l, bar		0222-2L
			tr	Cont : prp		0222-3L
4080.00						0223
		2.18	80	Sh/Clst: drk gy to dsk brn to brn blk, calc, slt, wx		0223-1L
			20	Cont : w, f, l, bar		0223-2L
			tr	Cont : prp, dd		0223-3L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp / Frm / Age / Lithology description	Trb	Sample
4086.00						0224
		1.58	75	Sh/Clst: drk gy to dsk brn to brn blk, calc, slt, wx		0224-1L
			25	Cont : w, f, l, bar		0224-2L
			tr	Marl : m gy		0224-3L
			tr	Cont : prp		0224-4L
4092.00						0225
		2.68	70	Sh/Clst: drk gy to dsk brn to brn blk, calc, slt, wx		0225-1L
			30	S/Sst : lt gy to w, f, slt, l		0225-2L
			tr	Marl : m gy		0225-3L
			tr	Cont : prp		0225-4L
4098.00						0226
			95	Cont : w, f, l, bar		0226-1L
			5	Sh/Clst: drk gy to brn blk		0226-2L
			tr	Cont : prp		0226-3L
4101.00						0022
		3.57	75	Sh/Clst: drk gy, slt		0022-2L
			15	Sltst : brn gy to gy brn		0022-3L
			10	Cont : Coal-ad, prp, fib		0022-1L
4104.00						0227
			50	Cont : w, f, l, bar		0227-1L
		2.58	50	Sh/Clst: m gy to drk gy to brn blk, calc		0227-2L
			tr	Cont : prp		0227-3L

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Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
4110.00						0228
			95	Cont : w, f, l, bar		0228-1L
			5	Sh/Clst: drk gy, calc		0228-2L
			tr	Cont : prp		0228-3L
4116.00						0229
		1.80	100	Sh/Clst: drk gy to drk gy, calc, slt		0229-1L
4122.00						0230
		1.36	50	Sh/Clst: drk gy to drk gy, calc, slt		0230-1L
			50	Cont : w, f, l, bar		0230-2L
			tr	Cont : prp		0230-3L
4128.00						0231
			85	Cont : w, f, l, bar		0231-1L
		2.29	15	Sh/Clst: drk gy to brn blk, slt		0231-2L
			tr	Cont : prp		0231-3L
4134.00						0232
		2.03	100	Sh/Clst: drk gy to brn blk		0232-1L
			tr	Cont : prp, dd		0232-2L
4140.00						0233
			60	Cont : w, f, l, bar		0233-1L
		1.86	40	Sh/Clst: drk gy to brn blk		0233-2L
			tr	Cont : prp		0233-3L

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Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
4146.00						0234
			60	Cont : w, f, l, bar		0234-1L
			40	Sh/Clst: pl y brn to drk gy, hd		0234-2L
			tr	Cont : prp		0234-3L
4149.00						0016
		4.18	75	Sh/Clst: drk gy to brn blk, slt		0016-2L
			25	Cont : st, Coal-ad, prp, dd, fib		0016-1L
4152.00						0235
			50	Cont : w, f, l, bar		0235-1L
			50	Sh/Clst: drk gy to brn blk, calc, slt		0235-2L
			tr	Cont : prp		0235-3L
4158.00						0236
		1.46	75	Sh/Clst: drk gy to brn blk, slt, calc		0236-1L
			25	Cont : w, f, l, bar		0236-2L
			tr	Cont : prp		0236-3L
4164.00						0237
		1.73	100	Sh/Clst: drk gy to brn blk, slt, calc		0237-1L
			tr	S/Sst : lt gy, crs		0237-2L
			tr	Cont : prp		0237-3L
4170.00						0238
		2.08	60	Sh/Clst: drk gy to brn blk, slt, calc		0238-1L
			35	Cont : w, f, l, bar		0238-2L
			5	Cont : prp		0238-3L

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Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type / TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
4176.00						0239
			75	Sh/Clst: drk gy to brn blk, slt, calc		0239-1L
			20	Cont : w, f, l, bar		0239-2L
			5	Cont : prp		0239-3L
4177.00		swc				0027
		1.14	100	Sh/Clst: drk gy to brn blk, slt, carb		0027-1L
4182.00						0240
			60	Cont : w, f, l, bar		0240-1L
			35	Sh/Clst: drk gy to brn blk, slt		0240-2L
			5	Cont : prp		0240-3L
4188.00						0241
			100	Cont : w, f, l, bar		0241-1L
			tr	Sh/Clst: drk gy to brn blk, slt, hd		0241-2L
			tr	Cont : prp		0241-3L
4194.00						0242
			95	Cont : w, f, l, bar		0242-1L
			5	Sh/Clst: drk gy to brn blk, slt, hd		0242-2L
			tr	Cont : prp		0242-3L
4200.00						0024
		2.59	80	Sh/Clst: drk gy to brn blk, calc		0024-1L
			20	Cont : w, f, l, bar		0024-2L
			tr	Cont : Coal-ad, prp, dd		0024-3L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
4200.50						0243
			100	Sh/Clst: drk gy to brn blk, calc, slt		0243-1L
			tr	Cont : prp		0243-2L
4206.00						0244
		1.82	100	Sh/Clst: drk gy to brn blk, calc, slt		0244-1L
			tr	Cont : prp		0244-2L
4212.00						0245
			75	Cont : w, f, l, bar		0245-1L
		2.66	25	Sh/Clst: drk gy to brn blk, calc, slt		0245-2L
			tr	Cont : prp		0245-3L
4218.00						0246
			100	Cont : w, f, l, bar		0246-1L
			tr	Sh/Clst: drk gy to brn blk		0246-2L
			tr	Cont : prp		0246-3L
4219.00	swc					0178
		2.19	100	Sh/Clst: brn blk, calc		0178-1L
			tr	Cont : dd		0178-2L
4224.00						0247
			100	Cont : w, f, l, bar		0247-1L
			tr	Sh/Clst: drk gy to brn blk		0247-2L
			tr	Cont : prp		0247-3L

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Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Cvd	Type / TOC%	%	Grp / Frm / Age / Lithology description	Trb	Sample
4225.00		swc				0177
		2.48	100	Sh/Clst: drk gy		0177-1L
			tr	Cont : dd		0177-2L
4230.00						0248
		1.82	90	Sh/Clst: drk gy to brn blk, calc, slt		0248-1L
			10	S/Sst : w, f, l, bar		0248-2L
			tr	Cont : prp		0248-3L
4236.00						0249
			90	Cont : w, f, l, bar		0249-1L
			5	Sh/Clst: drk gy to brn blk, calc, slt		0249-2L
			5	Cont : prp		0249-3L
4242.00						0250
			85	Cont : w, f, l, bar		0250-1L
			10	Sh/Clst: drk gy to brn blk, calc, slt		0250-2L
			5	Cont : prp		0250-3L
			tr	S/Sst : lt gy, f, crs, l		0250-4L
4248.00						0251
			95	Cont : lt gy to lt brn gy, f, l, st		0251-1L
			5	Sh/Clst: drk gy to brn blk, calc, slt		0251-2L
			tr	Cont : prp		0251-3L
4251.00						0017
		1.83	100	Sltst : gy brn to dsk y brn, cly		0017-1L
			tr	Cont : Coal-ad, prp, evap		0017-2L

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Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
4254.00						0252
			50	Sh/Clst: drk gy to brn blk, calc, slt		0252-1L
			50	Cont : w, f, l, bar		0252-2L
			tr	Cont : prp		0252-3L
			tr	S/Sst : lt gy to lt brn gy, f, crs, l		0252-4L
4260.00						0253
		2.30	60	Sh/Clst: drk gy to brn blk, calc, slt		0253-1L
			40	Cont : w, f, l, bar		0253-2L
			tr	Cont : prp		0253-3L
			tr	S/Sst : lt gy to pl y brn, f, crs, l		0253-4L
4263.00	swc					0176
		2.80	100	Sh/Clst: brn blk to drk gy, s		0176-1L
			tr	Cont : dd		0176-2L
4266.00						0254
			50	Sh/Clst: drk gy to brn blk, calc, slt		0254-1L
			50	Cont : w, f, l, bar		0254-2L
			tr	Cont : prp		0254-3L
			tr	S/Sst : lt gy, crs, l		0254-4L
4272.00	swc					0175
		1.75	100	Sh/Clst: brn blk, calc, s		0175-1L
			tr	Cont : dd		0175-2L
4272.00						0255
			100	Sh/Clst: drk gy to brn blk, wx, slt		0255-1L
			tr	Cont : w, f, l, bar		0255-2L
			tr	Cont : prp, dd		0255-3L

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Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp / Frm / Age / Lithology description	Trb	Sample
4274.00						0018
		1.93	100	Sh/Clst: drk gy to brn blk, gy brn, slt		0018-1L
			tr	Cont : Coal-ad, prp		0018-2L
4278.00						0256
			90	Sh/Clst: drk gy to brn blk, calc, slt		0256-1L
			10	Cont : w, f, l, bar		0256-2L
			tr	Cont : prp, fib		0256-3L
			tr	S/Sst : lt gy, crs, l		0256-4L
4284.00						0257
			100	Cont : w, f, l, bar		0257-1L
			tr	Sh/Clst: drk gy to brn blk		0257-2L
			tr	Cont : prp		0257-3L
			tr	S/Sst : lt gy, crs, l		0257-4L
4290.00						0258
			50	Cont : w, f, l, bar		0258-1L
		4.85	40	Sh/Clst: drk gy to brn blk, calc, slt		0258-2L
			10	Cont : prp, dd		0258-3L
4295.00	swc					0174
		1.97	100	Sh/Clst: brn blk, calc, slt		0174-1L
			tr	Cont : dd		0174-2L
4296.00						0259
			90	Cont : w, f, l, bar		0259-1L
			5	Sh/Clst: drk gy to brn blk, calc, slt		0259-2L
			5	Cont : prp		0259-3L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
4302.00						0260
			50	Cont : w, f, l, bar		0260-1L
		2.21	40	Sh/Clst: drk gy to brn blk, calc, slt		0260-2L
			10	Cont : prp		0260-3L
			tr	S/Sst : lt gy, crs, f, l		0260-4L
4308.00						0261
		1.83	50	Sh/Clst: drk gy to brn blk, calc		0261-1L
			35	Cont : prp, fib		0261-2L
			10	Cont : w, f, l, bar		0261-3L
			5	S/Sst : lt gy, f, crs, l		0261-6L
			tr	Ca : lt or to gy pi		0261-4L
			tr	Sh/Clst: m brn, mrl		0261-5L
4314.00						0262
		2.66	40	Sh/Clst: drk gy to brn blk, calc		0262-1L
			30	Cont : prp, fib, dd		0262-2L
			25	Cont : w, f, l, bar		0262-3L
			5	S/Sst : lt gy, crs, l		0262-5L
			tr	Sh/Clst: m brn, mrl		0262-4L
4320.00		swc				0173
		2.57	100	Sh/Clst: brn blk, calc, slt		0173-1L
			tr	Cont : dd		0173-2L
4320.00						0263
			100	Cont : w, f, l, bar		0263-1L
			tr	Sh/Clst: drk gy to brn blk, calc		0263-2L
			tr	Cont : prp		0263-3L
			tr	S/Sst : lt gy to w, crs, l		0263-4L

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Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
4323.00						0025
		2.21	90	Sh/Clst: drk gy to brn blk, carb		0025-1L
			10	Cont : prp, fib, bar		0025-2L
			tr	Ca : gy pi to or gy		0025-4L
4326.00						0264
			85	Sh/Clst: drk gy to brn blk, calc		0264-1L
			10	Cont : w, f, l, bar		0264-2L
			5	Cont : prp		0264-3L
			tr	S/Sst : lt gy, crs, l		0264-4L
4328.00	swc					0172
		2.99	100	Sh/Clst: brn blk, calc, slt		0172-1L
			tr	Cont : dd		0172-2L
4332.00						0265
			50	Sh/Clst: drk gy to brn gy to brn blk, calc		0265-1L
			35	Cont : w, f, l, bar		0265-2L
			10	S/Sst : lt gy to pl brn, crs		0265-4L
			5	Cont : prp, dd		0265-3L
4338.00						0266
			85	Cont : Coal-ad, fib		0266-1L
			10	Cont : w, f, l, bar		0266-2L
			5	Sh/Clst: drk gy to brn blk, calc		0266-3L
			tr	S/Sst : lt gy, crs		0266-4L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type / TOC%	%	Grp / Frm / Age / Lithology description	Trb	Sample
4343.50		swc				0171
		1.79	100	Sh/Clst: brn blk, calc		0171-1L
			tr	Cont : dd		0171-2L
4344.00						0267
			70	Cont : w, f, l, bar		0267-1L
			25	Sh/Clst: drk gy to brn blk, calc		0267-2L
			5	S/Sst : lt gy, crs, l		0267-4L
			tr	Cont : prp		0267-3L
4349.00						0026
		1.78	60	Sh/Clst: drk gy to brn blk, carb		0026-1L
			35	Cont : bar		0026-2L
			5	Cont : prp, fib		0026-3L
4349.50						0268
			90	Cont : bar, prp		0268-1L
			10	Sh/Clst: drk gy to brn blk, calc		0268-2L
4356.00						0269
		2.15	75	Sh/Clst: drk gy to brn blk, calc		0269-1L
			25	Cont : bar, prp, dd, fib		0269-2L
4362.00						0270
			75	Sh/Clst: drk gy to brn blk, calc		0270-1L
			25	Cont : bar, prp, dd, fib		0270-2L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth (Int Cvd)	Type (TOC%)	%	Grp Frm Age / Lithology description	Trb	Sample
4365.00	swc				0170
	2.69	100	Sh/Clst: brn blk, calc, slt		0170-1L
		tr	Cont : dd		0170-2L
4368.00					0271
		100	Cont : bar, prp		0271-1L
		tr	Sh/Clst: drk gy to brn blk		0271-2L
4373.00	swc				0169
	1.56	100	Sh/Clst: brn blk, calc		0169-1L
		tr	Cont : dd		0169-2L
4374.00					0272
		95	Cont : bar, prp		0272-1L
		5	Sh/Clst: drk gy to brn blk		0272-2L
4379.50	swc				0168
	2.38	95	Sh/Clst: brn blk to drk gy, calc, slt		0168-1L
		5	Cont : dd		0168-2L
4380.00					0273
		50	Cont : bar, prp		0273-1L
		50	Sh/Clst: drk gy to brn blk		0273-2L
4385.00	swc				0167
	1.87	95	Sh/Clst: brn blk, calc, slt		0167-1L
		5	Cont : dd		0167-2L

Table 1 : Lithology description for well NOCS 2/8-14

Depth unit of measure: m

Depth Int	Depth Cvd	Type / TOC%	%	Grp / Frm / Age / Lithology description	Trb	Sample
4386.00						0274
			85	Cont : bar, prp		0274-1L
			15	Sh/Clst: drk gy to brn blk		0274-2L
4392.00		swc				0166
		2.45	75	Sh/Clst: brn blk, calc		0166-1L
			25	Cont : dd		0166-2L
4392.00						0275
			100	Cont : bar, prp		0275-1L
			tr	Sh/Clst: drk gy to brn blk		0275-2L

Table 2 : Rock-Eval table for well NOCS 2/8-14

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
2900.00	cut	bulk	0.13	0.47	0.35	1.34	0.40	117	88	0.6	0.22	437	0001-0B
2925.00	cut	Sh/Clst: lt gy to m gy to drk gy to brn blk	8.84	20.98	0.98	21.41	6.59	318	15	29.8	0.30	426	0036-1L
2943.00	cut	Sh/Clst: lt gy to m gy to drk gy	5.06	4.52	0.55	8.22	2.06	219	27	9.6	0.53	432	0037-2L
2964.00	cut	Ca : or gy to lt or	10.78	14.07	0.87	16.17	3.08	457	28	24.9	0.43	423	0038-1L
2985.00	cut	Ca : lt or to or gy	10.83	14.40	0.80	18.00	2.86	503	28	25.2	0.43	425	0039-1L
3000.00	cut	bulk	5.78	5.84	0.72	8.11	1.65	354	44	11.6	0.50	426	0002-0B
3045.00	cut	Marl : lt gy	0.64	0.36	0.38	0.95	0.43	84	88	1.0	0.64	413	0042-1L
3066.00	cut	Marl : lt gy to m gy	2.68	0.67	0.42	1.60	0.62	108	68	3.4	0.80	379	0043-1L
3090.00	cut	Marl : lt gy to m gy	2.94	0.59	0.31	1.90	0.70	84	44	3.5	0.83	385	0045-1L
3096.00	cut	Marl : lt gy to m gy	1.97	0.46	0.29	1.59	0.64	72	45	2.4	0.81	429	0046-1L
3100.00	cut	bulk	2.95	1.63	0.37	4.41	0.90	181	41	4.6	0.64	411	0003-0B
3108.00	cut	Marl : lt gy to m gy	4.56	4.04	0.38	10.63	1.59	254	24	8.6	0.53	431	0048-1L
3114.00	cut	Marl : lt gy to m gy	1.83	0.40	0.26	1.54	0.60	67	43	2.2	0.82	385	0049-1L
3120.00	cut	Ca : lt or to or gy to pl y brn	8.35	9.68	0.61	15.87	2.20	440	28	18.0	0.46	424	0050-2L

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Table 2 : Rock-Eval table for well NOCS 2/8-14

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
3126.00	cut	Marl : lt gy to lt brn gy	1.92	0.75	0.28	2.68	0.63	119	44	2.7	0.72	427	0051-1L
3132.00	cut	Marl : lt gy to lt brn gy	1.72	0.61	0.20	3.05	0.51	120	39	2.3	0.74	385	0052-1L
3138.00	cut	Marl : lt gy to lt brn gy	3.20	0.76	0.24	3.17	0.83	92	29	4.0	0.81	383	0053-1L
3144.00	cut	Marl : lt gy to lt brn gy	2.57	0.83	0.23	3.61	0.47	177	49	3.4	0.76	387	0054-1L
3150.00	cut	Marl : lt gy to lt brn gy	2.07	0.93	0.18	5.17	0.69	135	26	3.0	0.69	429	0055-1L
3156.00	cut	Marl : lt gy to lt brn gy	1.97	0.49	0.20	2.45	0.56	88	36	2.5	0.80	384	0056-1L
3162.00	cut	Sh/Clst: brn gy to m gy	1.15	0.36	0.18	2.00	0.45	80	40	1.5	0.76	389	0057-1L
3168.00	cut	Sh/Clst: brn gy to lt brn gy to m gy	0.96	0.24	0.16	1.50	0.43	56	37	1.2	0.80	365	0058-1L
3174.00	cut	Sh/Clst: brn gy to lt brn gy to m gy	0.89	0.36	0.13	2.77	0.42	86	31	1.3	0.71	431	0059-1L
3176.00	cut	bulk	1.11	1.05	0.25	4.20	0.52	202	48	2.2	0.51	432	0004-0B
3180.00	cut	Ca : or gy to lt or gy	8.86	11.07	0.45	24.60	2.31	479	19	19.9	0.44	429	0060-1L
3186.00	cut	Sh/Clst: brn gy to gy brn	1.15	0.51	0.17	3.00	0.32	159	53	1.7	0.69	375	0061-1L
3192.00	cut	Sh/Clst: brn gy to gy brn to drk gy	0.39	0.53	0.11	4.82	0.26	204	42	0.9	0.42	431	0062-1L

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Table 2 : Rock-Eval table for well NOCS 2/8-14

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
3198.00	cut	Sh/Clst: brn gy to gy brn to drk gy	1.06	3.72	0.18	20.67	1.15	323	16	4.8	0.22	431	0063-1L
3201.00	cut	Sh/Clst: lt brn gy to pl brn	1.55	1.56	0.28	5.57	0.64	244	44	3.1	0.50	437	0005-1L
3210.00	cut	Sh/Clst: brn gy to gy brn to drk gy	5.59	21.67	0.47	46.11	5.50	394	9	27.3	0.21	427	0065-1L
3216.00	cut	Sh/Clst: brn gy to gy brn to drk gy	6.81	26.22	0.77	34.05	6.86	382	11	33.0	0.21	427	0066-1L
3222.00	cut	Sh/Clst: brn gy to gy brn to drk gy	5.95	22.55	0.64	35.23	6.12	368	10	28.5	0.21	427	0067-1L
3228.00	cut	Sh/Clst: brn gy to gy brn to drk gy	5.41	22.88	0.61	37.51	5.40	424	11	28.3	0.19	428	0068-1L
3234.00	cut	Sh/Clst: brn gy to gy brn	6.23	23.67	0.55	43.04	5.66	418	10	29.9	0.21	428	0069-1L
3240.00	cut	Sh/Clst: brn gy to gy brn	5.46	23.06	0.74	31.16	2.36	977	31	28.5	0.19	427	0070-1L
3243.00	cut	Sltst : lt ol gy to dsk y brn	5.70	26.13	0.33	79.18	4.83	541	7	31.8	0.18	437	0006-2L
3252.00	cut	Sh/Clst: brn to m brn	2.45	32.74	2.19	14.95	4.17	785	53	35.2	0.07	396	0087-1L
3270.00	cut	Sh/Clst: brn gy to gy brn	5.66	22.38	0.80	27.97	7.28	307	11	28.0	0.20	425	0090-2L
3276.00	cut	Sh/Clst: brn gy to drk gy	5.91	24.95	0.64	38.98	5.61	445	11	30.9	0.19	434	0091-1L

Table 2 : Rock-Eval table for well NOCS 2/8-14

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
3282.00	cut	Marl : lt gy to lt ol gy	0.86	4.32	0.87	4.97	1.21	357	72	5.2	0.17	435	0092-1L
3288.00	cut	Sh/Clst: brn gy to drk gy	5.29	24.14	0.85	28.40	7.55	320	11	29.4	0.18	425	0093-3L
3294.00	cut	Sh/Clst: brn gy to drk gy	5.34	24.50	0.85	28.82	5.32	461	16	29.8	0.18	427	0094-1L
3300.00	cut	Sh/Clst: brn gy to drk gy	5.27	25.52	0.56	45.57	6.30	405	9	30.8	0.17	428	0095-2L
3306.00	cut	Sh/Clst: brn gy to drk gy	5.20	25.13	0.56	44.88	6.14	409	9	30.3	0.17	430	0096-2L
3350.00	cut	bulk	0.48	1.42	0.65	2.18	0.75	189	87	1.9	0.25	442	0007-0B
3350.00	cut	Sh/Clst: dsk y brn	5.28	36.49	0.44	82.93	6.91	528	6	41.8	0.13	435	0007-2L
3396.00	cut	Sh/Clst: brn gy to drk gy	5.58	27.24	0.59	46.17	8.67	314	7	32.8	0.17	428	0111-2L
3408.00	cut	Sh/Clst: brn gy to m gy to drk gy	3.67	18.52	0.44	42.09	4.33	428	10	22.2	0.17	436	0113-1L
3414.00	cut	Sh/Clst: brn gy to drk gy	4.18	22.97	0.57	40.30	6.81	337	8	27.1	0.15	428	0114-2L
3420.00	cut	Sh/Clst: m gy to brn gy	4.10	19.48	0.78	24.97	4.03	483	19	23.6	0.17	435	0115-1L
3426.00	cut	Sh/Clst: m gy to drk gy to brn gy	4.62	22.18	0.54	41.07	5.12	433	11	26.8	0.17	436	0116-1L
3432.00	cut	Sh/Clst: m gy to drk gy to brn gy	4.00	21.65	0.54	40.09	5.39	402	10	25.6	0.16	432	0117-2L
3438.00	cut	Sh/Clst: m gy to drk gy to brn gy	4.45	22.27	0.48	46.40	5.07	439	9	26.7	0.17	435	0118-1L
3450.00	cut	S/Sst : m gy	3.02	25.05	0.33	75.91	4.56	549	7	28.1	0.11	434	0008-1L

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Table 2 : Rock-Eval table for well NOCS 2/8-14

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
3456.00	cut	Sh/Clst: m gy to brn gy	4.19	23.32	0.55	42.40	6.05	385	9	27.5	0.15	431	0121-3L
3462.00	cut	Sh/Clst: brn gy to drk gy	4.45	24.47	0.65	37.65	6.46	379	10	28.9	0.15	436	0122-2L
3468.00	cut	Sh/Clst: brn gy to drk gy	3.83	20.98	0.70	29.97	5.97	351	12	24.8	0.15	432	0123-2L
3474.00	cut	Sh/Clst: m gy to drk gy	2.91	16.38	0.55	29.78	3.85	425	14	19.3	0.15	432	0124-2L
3480.00	cut	Sh/Clst: m gy to drk gy	3.69	19.58	0.46	42.57	5.42	361	8	23.3	0.16	434	0125-2L
3486.00	cut	Sh/Clst: m gy to drk gy	3.82	19.68	0.56	35.14	5.12	384	11	23.5	0.16	434	0126-2L
3492.00	cut	Sh/Clst: m gy to drk gy	4.23	19.30	0.61	31.64	6.16	313	10	23.5	0.18	429	0127-2L
3498.00	cut	Sh/Clst: m gy to drk gy	4.47	20.53	0.52	39.48	6.58	312	8	25.0	0.18	429	0128-3L
3504.00	cut	Sh/Clst: m gy to drk gy	4.18	21.12	0.62	34.06	6.69	316	9	25.3	0.17	432	0129-3L
3510.00	cut	Marl : lt gy to m gy to lt ol gy	1.08	7.63	1.67	4.57	3.37	226	50	8.7	0.12	432	0130-2L
3516.00	cut	Ca : lt or to w	1.25	4.05	1.37	2.96	1.10	368	125	5.3	0.24	372	0131-1L
3524.00	swc	Sh/Clst: drk gy to brn gy to brn blk	4.74	26.24	0.76	34.53	4.70	558	16	31.0	0.15	443	0033-1L
3528.00	cut	Marl : lt gy to lt ol gy	3.74	19.42	0.65	29.88	4.95	392	13	23.2	0.16	437	0133-1L
3534.00	cut	Sh/Clst: drk gy to brn gy to brn blk	4.17	22.03	0.71	31.03	6.74	327	11	26.2	0.16	434	0071-2L

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
3540.00	cut	Sh/Clst: drk gy to brn gy to brn blk	3.13	18.80	0.59	31.86	2.79	674	21	21.9	0.14	441	0072-1L
3547.00	swc	Sh/Clst: drk gy to brn blk	3.54	21.46	0.05	429.20	4.46	481	1	25.0	0.14	440	0032-1L
3549.00	cut	Sltst : drk gy to dsk y brn	3.00	21.76	0.33	65.94	4.52	481	7	24.8	0.12	433	0009-1L
3564.00	cut	Sh/Clst: drk gy to brn gy	1.78	11.40	0.69	16.52	3.13	364	22	13.2	0.14	436	0076-1L
3570.00	cut	Marl : lt gy to m gy	0.72	4.69	1.67	2.81	3.13	150	53	5.4	0.13	435	0077-1L
3575.00	swc	Sh/Clst: drk gy to brn blk	2.47	17.98	0.52	34.58	3.32	542	16	20.4	0.12	443	0031-1L
3582.00	cut	Sh/Clst: drk gy to brn gy to brn blk	1.92	11.13	0.58	19.19	2.99	372	19	13.1	0.15	435	0079-3L
3588.00	cut	Sh/Clst: drk gy to brn gy to brn blk	1.11	7.85	0.55	14.27	2.15	365	26	9.0	0.12	436	0080-2L
3600.00	cut	Sh/Clst: drk gy to brn gy to brn blk	2.00	12.91	0.80	16.14	3.64	355	22	14.9	0.13	437	0082-2L
3612.00	cut	Sh/Clst: drk gy to brn gy to brn blk	2.89	14.82	0.68	21.79	4.54	326	15	17.7	0.16	434	0084-2L
3618.00	cut	Sh/Clst: drk gy to brn gy	1.95	11.17	0.63	17.73	3.39	329	19	13.1	0.15	436	0085-2L
3650.00	swc	Sh/Clst: drk gy to brn blk	4.89	26.45	0.61	43.36	5.02	527	12	31.3	0.16	437	0030-1L

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Table 2 : Rock-Eval table for well NOCS 2/8-14

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
3651.00	cut	Sltst : drk gy to brn blk	2.42	13.60	0.40	34.00	3.31	411	12	16.0	0.15	438	0010-2L
3666.00	cut	Sh/Clst: brn gy to drk gy	2.16	13.89	1.01	13.75	4.22	329	24	16.1	0.13	435	0141-2L
3702.00	cut	Sh/Clst: brn gy to drk gy to brn blk	2.36	14.24	0.86	16.56	4.31	330	20	16.6	0.14	437	0147-2L
3708.00	cut	Sh/Clst: brn gy to drk gy to brn blk	2.38	15.04	1.01	14.89	4.63	325	22	17.4	0.14	439	0148-2L
3714.00	cut	Sh/Clst: brn gy to drk gy to brn blk	1.99	13.89	0.98	14.17	4.58	303	21	15.9	0.13	437	0149-2L
3750.00	cut	Sh/Clst: drk gy	1.92	9.73	0.44	22.11	2.60	374	17	11.6	0.16	441	0011-2L
3762.00	cut	Sh/Clst: drk gy to brn blk	0.36	2.34	0.24	9.75	1.03	227	23	2.7	0.13	442	0157-2L
3766.50	swc	Sh/Clst: drk gy to brn blk	1.33	4.71	0.56	8.41	1.91	247	29	6.0	0.22	442	0029-1L
3774.00	cut	Sh/Clst: drk gy to brn blk	1.23	8.57	0.86	9.97	2.74	313	31	9.8	0.13	441	0159-2L
3809.00	cut	Sh/Clst: drk gy to brn blk	2.20	12.93	0.68	19.01	3.07	421	22	15.1	0.15	441	0019-2L
3834.00	cut	Sh/Clst: drk gy to brn blk	0.80	6.13	0.49	12.51	1.82	337	27	6.9	0.12	440	0182-2L
3849.00	cut	Sh/Clst: drk gy	1.91	12.72	0.32	39.75	2.95	431	11	14.6	0.13	442	0012-2L
3894.00	cut	Sh/Clst: drk gy	1.61	11.12	0.55	20.22	3.28	339	17	12.7	0.13	440	0192-2L

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
3900.50	cut	Sh/Clst: drk gy	1.83	12.63	0.77	16.40	2.96	427	26	14.5	0.13	442	0193-1L
3912.00	cut	Sh/Clst: drk gy to brn blk	1.64	12.17	0.75	16.23	2.93	415	26	13.8	0.12	441	0195-1L
3924.00	cut	Sh/Clst: drk gy to dsk brn to brn blk	1.51	11.90	0.76	15.66	2.87	415	26	13.4	0.11	441	0197-1L
3948.00	cut	Sh/Clst: drk gy	1.48	7.27	0.29	25.07	2.43	299	12	8.8	0.17	440	0014-1L
3954.00	cut	Sh/Clst: drk gy	1.81	12.44	0.55	22.62	2.84	438	19	14.3	0.13	442	0202-2L
3966.00	cut	Sh/Clst: drk gy	1.94	11.98	0.34	35.24	3.40	352	10	13.9	0.14	441	0204-2L
3978.00	cut	Sh/Clst: drk gy to brn blk	1.62	9.80	0.77	12.73	2.81	349	27	11.4	0.14	444	0206-1L
3984.00	cut	Sh/Clst: drk gy to brn blk	1.29	6.84	0.52	13.15	2.43	281	21	8.1	0.16	442	0207-2L
3990.00	cut	Sh/Clst: drk gy	1.27	7.15	0.77	9.29	2.38	300	32	8.4	0.15	445	0208-1L
3996.00	cut	Sh/Clst: drk gy	1.59	10.57	0.79	13.38	2.70	391	29	12.2	0.13	444	0209-1L
4002.00	cut	Sh/Clst: drk gy	1.72	9.35	0.54	17.31	2.82	332	19	11.1	0.16	443	0021-2L
4008.00	cut	Sh/Clst: drk gy	1.49	8.43	0.44	19.16	2.02	417	22	9.9	0.15	442	0211-2L
4027.00	swc	Sh/Clst: drk gy to brn blk	1.10	2.29	0.97	2.36	1.57	146	62	3.4	0.32	443	0028-1L
4044.00	cut	Sh/Clst: drk gy to brn blk	1.09	6.01	0.91	6.60	1.49	403	61	7.1	0.15	444	0217-2L

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Table 2 : Rock-Eval table for well NOCS 2/8-14

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
4050.00	cut	Sh/Clst: drk gy to brn blk	2.01	9.14	0.37	24.70	2.40	381	15	11.2	0.18	444	0015-2L
4056.00	cut	Sh/Clst: drk gy to brn blk	1.02	5.51	0.70	7.87	2.06	267	34	6.5	0.16	445	0219-1L
4062.00	cut	Sh/Clst: drk gy	1.36	7.06	0.70	10.09	2.20	321	32	8.4	0.16	444	0220-1L
4068.00	cut	Sh/Clst: drk gy to brn blk	1.24	7.17	0.80	8.96	2.24	320	36	8.4	0.15	444	0221-1L
4074.00	cut	Sh/Clst: drk gy to dsk brn to brn blk	1.43	7.32	0.80	9.15	2.21	331	36	8.8	0.16	444	0222-1L
4080.00	cut	Sh/Clst: drk gy to dsk brn to brn blk	1.47	7.29	0.88	8.28	2.18	334	40	8.8	0.17	443	0223-1L
4086.00	cut	Sh/Clst: drk gy to dsk brn to brn blk	1.18	6.08	0.94	6.47	1.58	385	59	7.3	0.16	444	0224-1L
4092.00	cut	Sh/Clst: drk gy to dsk brn to brn blk	1.60	9.63	0.96	10.03	2.68	359	36	11.2	0.14	443	0225-1L
4101.00	cut	Sh/Clst: drk gy	3.36	15.30	0.44	34.77	3.57	429	12	18.7	0.18	437	0022-2L
4104.00	cut	Sh/Clst: m gy to drk gy to brn blk	1.63	8.03	0.61	13.16	2.58	311	24	9.7	0.17	443	0227-2L
4116.00	cut	Sh/Clst: drk gy to drk gy	1.09	4.26	0.69	6.17	1.80	237	38	5.4	0.20	443	0229-1L
4122.00	cut	Sh/Clst: drk gy to drk gy	1.44	6.07	0.69	8.80	1.36	446	51	7.5	0.19	444	0230-1L
4128.00	cut	Sh/Clst: drk gy to brn blk	1.42	6.01	0.60	10.02	2.29	262	26	7.4	0.19	443	0231-2L

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
4134.00	cut	Sh/Clst: drk gy to brn blk	1.33	4.86	0.68	7.15	2.03	239	33	6.2	0.21	446	0232-1L
4140.00	cut	Sh/Clst: drk gy to brn blk	1.12	4.18	0.69	6.06	1.86	225	37	5.3	0.21	445	0233-2L
4149.00	cut	Sh/Clst: drk gy to brn blk	3.55	17.04	0.58	29.38	4.18	408	14	20.6	0.17	439	0016-2L
4158.00	cut	Sh/Clst: drk gy to brn blk	1.36	5.24	0.74	7.08	1.46	359	51	6.6	0.21	445	0236-1L
4164.00	cut	Sh/Clst: drk gy to brn blk	1.37	4.67	0.60	7.78	1.73	270	35	6.0	0.23	446	0237-1L
4170.00	cut	Sh/Clst: drk gy to brn blk	1.66	7.22	0.73	9.89	2.08	347	35	8.9	0.19	444	0238-1L
4177.00	swc	Sh/Clst: drk gy to brn blk	1.73	2.40	0.56	4.29	1.14	211	49	4.1	0.42	447	0027-1L
4200.00	cut	Sh/Clst: drk gy to brn blk	1.79	5.87	0.10	58.70	2.59	227	4	7.7	0.23	445	0024-1L
4206.00	cut	Sh/Clst: drk gy to brn blk	1.48	4.98	0.18	27.67	1.82	274	10	6.5	0.23	444	0244-1L
4212.00	cut	Sh/Clst: drk gy to brn blk	1.94	7.85	0.57	13.77	2.66	295	21	9.8	0.20	443	0245-2L
4219.00	swc	Sh/Clst: brn blk	2.06	3.22	0.65	4.95	2.19	147	30	5.3	0.39	442	0178-1L
4225.00	swc	Sh/Clst: drk gy	2.99	5.39	0.49	11.00	2.48	217	20	8.4	0.36	446	0177-1L
4230.00	cut	Sh/Clst: drk gy to brn blk	1.63	5.30	0.48	11.04	1.82	291	26	6.9	0.24	443	0248-1L
4251.00	cut	Sltst : gy brn to dsk y brn	1.48	3.38	0.47	7.19	1.83	185	26	4.9	0.30	446	0017-1L
4260.00	cut	Sh/Clst: drk gy to brn blk	1.90	5.65	0.30	18.83	2.30	246	13	7.6	0.25	444	0253-1L

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Table 2 : Rock-Eval table for well NOCS 2/8-14

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
4263.00	swc	Sh/Clst: brn blk to drk gy	2.99	3.79	0.93	4.08	2.80	135	33	6.8	0.44	442	0176-1L
4272.00	swc	Sh/Clst: brn blk	2.23	4.22	0.59	7.15	1.75	241	34	6.4	0.35	444	0175-1L
4274.00	cut	Sh/Clst: drk gy to brn blk, gy brn	2.38	4.83	0.33	14.64	1.93	250	17	7.2	0.33	445	0018-1L
4290.00	cut	Sh/Clst: drk gy to brn blk	4.86	23.96	0.59	40.61	4.85	494	12	28.8	0.17	433	0258-2L
4295.00	swc	Sh/Clst: brn blk	2.80	2.92	0.74	3.95	1.97	148	38	5.7	0.49	442	0174-1L
4302.00	cut	Sh/Clst: drk gy to brn blk	2.31	4.34	0.50	8.68	2.21	196	23	6.7	0.35	446	0260-2L
4308.00	cut	Sh/Clst: drk gy to brn blk	2.41	3.41	0.56	6.09	1.83	186	31	5.8	0.41	447	0261-1L
4314.00	cut	Sh/Clst: drk gy to brn blk	3.15	4.38	0.55	7.96	2.66	165	21	7.5	0.42	445	0262-1L
4320.00	swc	Sh/Clst: brn blk	3.05	3.39	0.79	4.29	2.57	132	31	6.4	0.47	444	0173-1L
4323.00	cut	Sh/Clst: drk gy to brn blk	3.01	4.11	0.45	9.13	2.21	186	20	7.1	0.42	447	0025-1L
4328.00	swc	Sh/Clst: brn blk	2.89	2.65	0.81	3.27	2.99	89	27	5.5	0.52	441	0172-1L
4343.50	swc	Sh/Clst: brn blk	2.01	1.55	0.50	3.10	1.79	87	28	3.6	0.56	439	0171-1L
4349.00	cut	Sh/Clst: drk gy to brn blk	2.77	3.69	0.30	12.30	1.78	207	17	6.5	0.43	449	0026-1L
4356.00	cut	Sh/Clst: drk gy to brn blk	2.48	3.44	0.31	11.10	2.15	160	14	5.9	0.42	448	0269-1L
4365.00	swc	Sh/Clst: brn blk	3.06	2.86	0.74	3.86	2.69	106	28	5.9	0.52	444	0170-1L

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Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
4373.00	swc	Sh/Clst: brn blk	1.16	1.32	0.50	2.64	1.56	85	32	2.5	0.47	445	0169-1L
4379.50	swc	Sh/Clst: brn blk to drk gy	1.10	0.71	1.63	0.44	2.38	30	68	1.8	0.61	422	0168-1L
4385.00	swc	Sh/Clst: brn blk	1.57	1.67	0.53	3.15	1.87	89	28	3.2	0.48	445	0167-1L
4392.00	swc	Sh/Clst: brn blk	3.06	3.09	0.80	3.86	2.45	126	33	6.2	0.50	441	0166-1L

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Table 3 : Pyrolysis GC Data (S2 peak) as Percentage of Total Area for Well NOCS 2/8-14

Depth unit of measure: m

Depth	Typ	Lithology	C1	C2-C5	C6-C14	C15+	S2 from Rock-Eval	Sample
2985.00	cut	Ca : lt or to or gy	4.24	32.94	53.43	9.40	14.40	0039-1L
3090.00	cut	Marl : lt gy to m gy	10.96	39.75	46.67	2.63	0.59	0045-1L
3138.00	cut	Marl : lt gy to lt brn gy	9.11	38.35	50.30	2.25	0.76	0053-1L
3180.00	cut	Ca : or gy to lt or gy	3.21	18.67	42.78	35.34	11.07	0060-1L
3210.00	cut	Sh/Clst: brn gy to gy brn to drk gy	2.88	13.22	31.89	52.00	21.67	0065-1L
3234.00	cut	Sh/Clst: brn gy to gy brn	3.17	13.86	31.65	51.32	23.67	0069-1L
3276.00	cut	Sh/Clst: brn gy to drk gy	2.66	12.49	29.34	55.52	24.95	0091-1L
3300.00	cut	Sh/Clst: brn gy to drk gy	2.70	12.81	29.65	54.84	25.52	0095-2L
3408.00	cut	Sh/Clst: brn gy to m gy to drk gy	2.86	13.15	30.80	53.19	18.52	0113-1L
3432.00	cut	Sh/Clst: m gy to drk gy to brn gy	3.43	14.74	29.31	52.52	21.65	0117-2L
3480.00	cut	Sh/Clst: m gy to drk gy	3.34	16.38	34.78	45.50	19.58	0125-2L
3534.00	cut	Sh/Clst: drk gy to brn gy to brn blk	2.90	14.17	31.70	51.22	22.03	0071-2L
3547.00	swc	Sh/Clst: drk gy to brn blk	2.89	14.69	31.27	51.15	21.46	0032-1L

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Table 3 : Pyrolysis GC Data (S2 peak) as Percentage of Total Area for Well NOCS 2/8-14

Depth unit of measure: m

Depth	Typ	Lithology	C1	C2-C5	C6-C14	C15+	S2 from Rock-Eval	Sample
3575.00	swc	Sh/Clst: drk gy to brn blk	2.94	14.72	32.76	49.58	17.98	0031-1L
3650.00	swc	Sh/Clst: drk gy to brn blk	3.31	16.11	32.63	47.94	26.45	0030-1L
3702.00	cut	Sh/Clst: brn gy to drk gy to brn blk	3.44	15.61	34.82	46.13	14.24	0147-2L
3714.00	cut	Sh/Clst: brn gy to drk gy to brn blk	3.89	16.10	33.90	46.11	13.89	0149-2L
3766.50	swc	Sh/Clst: drk gy to brn blk	6.06	26.55	50.97	16.42	4.71	0029-1L
3809.00	cut	Sh/Clst: drk gy to brn blk	4.11	16.21	34.32	45.36	12.93	0019-2L
3849.00	cut	Sh/Clst: drk gy	3.79	16.23	32.09	47.89	12.72	0012-2L
3900.50	cut	Sh/Clst: drk gy	3.68	15.24	33.65	47.44	12.63	0193-1L
3948.00	cut	Sh/Clst: drk gy	1.77	9.46	36.19	52.58	7.27	0014-1L
3984.00	cut	Sh/Clst: drk gy to brn blk	4.56	17.46	38.66	39.32	6.84	0207-2L
4027.00	swc	Sh/Clst: drk gy to brn blk	3.23	17.20	43.19	36.38	2.29	0028-1L
4050.00	cut	Sh/Clst: drk gy to brn blk	4.03	17.06	38.49	40.42	9.14	0015-2L
4092.00	cut	Sh/Clst: drk gy to dsk brn to brn blk	3.93	14.56	34.33	47.18	9.63	0225-1L

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Table 3 : Pyrolysis GC Data (S2 peak) as Percentage of Total Area for Well NOCS 2/8-14

Depth unit of measure: m

Depth	Typ	Lithology	C1	C2-C5	C6-C14	C15+	S2 from Rock-Eval	Sample
4134.00	cut	Sh/Clst: drk gy to brn blk	4.71	17.89	40.01	37.39	4.86	0232-1L
4177.00	swc	Sh/Clst: drk gy to brn blk	8.86	31.23	49.95	9.96	2.40	0027-1L
4219.00	swc	Sh/Clst: brn blk	6.67	26.25	50.33	16.75	3.22	0178-1L
4263.00	swc	Sh/Clst: brn blk to drk gy	4.13	19.59	38.54	37.75	3.79	0176-1L
4295.00	swc	Sh/Clst: brn blk	6.79	27.75	50.00	15.46	2.92	0174-1L
4328.00	swc	Sh/Clst: brn blk	5.75	27.18	49.08	17.99	2.65	0172-1L
4365.00	swc	Sh/Clst: brn blk	6.48	26.95	47.34	19.23	2.86	0170-1L
4379.50	swc	Sh/Clst: brn blk to drk gy	7.80	36.15	47.99	8.06	0.71	0168-1L
4392.00	swc	Sh/Clst: brn blk	8.36	25.14	45.85	20.64	3.09	0166-1L

Table 4 a: Weight of EOM and Chromatographic Fraction for well NOCS 2/8-14

Depth unit of measure: m

Depth	Typ	Lithology	Rock Extracted (g)	EOM (mg)	Sat (mg)	Aro (mg)	Asph (mg)	NSO (mg)	HC (mg)	Non-HC (mg)	TOC(e) (%)	Sample
2985.00	cut	Ca : lt or to or gy	8.8	132.3	76.3	19.7	2.6	33.7	96.0	36.3	1.70	0039-1L
3096.00	cut	Marl : lt gy to m gy	6.4	19.1	10.5	4.9	0.7	3.0	15.4	3.7	0.82	0046-1L
3150.00	cut	Marl : lt gy to lt brn gy	6.5	14.8	8.5	3.7	0.4	2.2	12.2	2.6	0.62	0055-1L
3228.00	cut	Sh/Clst: brn gy to gy brn to drk gy	3.3	37.1	15.8	10.2	1.9	9.2	26.0	11.1	7.58	0068-1L
3306.00	cut	Sh/Clst: brn gy to drk gy	3.6	13.3	3.7	3.4	1.9	4.3	7.1	6.2	2.93	0096-2L
3456.00	com	Composite sample - see table 4 e	5.5	25.5	8.5	6.6	2.1	8.3	15.1	10.4	4.54	0276-0B
3547.00	swc	Sh/Clst: drk gy to brn blk	4.4	20.2	7.1	5.5	1.2	6.4	12.6	7.6	4.72	0032-1L
3600.00	com	Composite sample - see table 4 e	2.6	7.8	2.9	1.6	0.9	2.4	4.5	3.3	2.51	0277-0B
3766.50	swc	Sh/Clst: drk gy to brn blk	6.9	17.9	7.9	4.8	1.2	4.0	12.7	5.2	2.11	0029-1L
4044.00	com	Composite sample - see table 4 e	5.3	22.9	13.3	2.6	1.3	5.7	15.9	7.0	2.18	0278-0B
4177.00	swc	Sh/Clst: drk gy to brn blk	3.4	10.5	5.1	2.4	0.6	2.4	7.5	3.0	1.87	0027-1L
4272.00	com	Composite sample - see table 4 e	4.6	15.1	7.6	3.8	1.2	2.5	11.4	3.7	1.96	0279-0B
4385.00	swc	Sh/Clst: brn blk	0.8	4.6	1.4	0.3	0.2	2.7	1.7	2.9	1.81	0167-1L

Table 4 b: Concentration of EOM and Chromatographic Fraction (wt ppm rock) for well NOCS 2/8-14

Depth unit of measure: m

Depth	Typ	Lithology	EOM	Sat	Aro	Asph	NSO	HC	Non-HC	Sample
2985.00	cut	Ca : lt or to or gy	15034	8670	2238	295	3829	10909	4124	0039-1L
3096.00	cut	Marl : lt gy to m gy	2998	1648	769	109	470	2417	580	0046-1L
3150.00	cut	Marl : lt gy to lt brn gy	2291	1315	572	61	340	1888	402	0055-1L
3228.00	cut	Sh/Clst: brn gy to gy brn to drk gy	11107	4730	3053	568	2754	7784	3323	0068-1L
3306.00	cut	Sh/Clst: brn gy to drk gy	3663	1019	936	523	1184	1955	1707	0096-2L
3456.00	com	Composite sample - see table 4 e	4619	1539	1195	380	1503	2735	1884	0276-0B
3547.00	swc	Sh/Clst: drk gy to brn blk	4580	1609	1247	272	1451	2857	1723	0032-1L
3600.00	com	Composite sample - see table 4 e	2954	1098	606	340	909	1704	1250	0277-0B
3766.50	swc	Sh/Clst: drk gy to brn blk	2586	1141	693	173	578	1835	751	0029-1L
4044.00	com	Composite sample - see table 4 e	4280	2485	485	242	1065	2971	1308	0278-0B
4177.00	swc	Sh/Clst: drk gy to brn blk	3097	1504	707	176	707	2212	884	0027-1L
4272.00	com	Composite sample - see table 4 e	3254	1637	818	258	538	2456	797	0279-0B
4385.00	swc	Sh/Clst: brn blk	5476	1666	357	238	3214	2023	3452	0167-1L

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Table 4 c: Concentration of EOM and Chromatographic Fraction (mg/g TOC(e)) for well NOCS 2/8-14

Depth unit of measure: m

Depth	Typ	Lithology	EOM	Sat	Aro	Asph	NSO	HC	Non-HC	Sample
2985.00	cut	Ca : lt or to or gy	884.36	510.03	131.68	17.38	225.27	641.71	242.65	0039-1L
3096.00	cut	Marl : lt gy to m gy	365.66	201.02	93.81	13.40	57.43	294.83	70.84	0046-1L
3150.00	cut	Marl : lt gy to lt brn gy	369.52	212.22	92.38	9.99	54.93	304.60	64.92	0055-1L
3228.00	cut	Sh/Clst: brn gy to gy brn to drk gy	146.54	62.41	40.29	7.50	36.34	102.70	43.84	0068-1L
3306.00	cut	Sh/Clst: brn gy to drk gy	125.05	34.79	31.97	17.86	40.43	66.76	58.29	0096-2L
3456.00	com	Composite sample - see table 4 e	101.75	33.92	26.34	8.38	33.12	60.25	41.50	0276-0B
3547.00	swc	Sh/Clst: drk gy to brn blk	97.04	34.11	26.42	5.77	30.75	60.53	36.51	0032-1L
3600.00	com	Composite sample - see table 4 e	117.71	43.76	24.15	13.58	36.22	67.91	49.80	0277-0B
3766.50	swc	Sh/Clst: drk gy to brn blk	122.59	54.11	32.87	8.22	27.40	86.98	35.61	0029-1L
4044.00	com	Composite sample - see table 4 e	196.35	114.04	22.29	11.15	48.87	136.33	60.02	0278-0B
4177.00	swc	Sh/Clst: drk gy to brn blk	165.63	80.45	37.86	9.46	37.86	118.31	47.32	0027-1L
4272.00	com	Composite sample - see table 4 e	166.04	83.57	41.78	13.19	27.49	125.35	40.68	0279-0B
4385.00	swc	Sh/Clst: brn blk	302.55	92.08	19.73	13.15	177.58	111.81	190.74	0167-1L

Table 4 d: Composition of material extracted from the rock (%) for well NOCS 2/8-14

Depth unit of measure: m

Depth	Typ	Lithology	Sat / EOM	Aro / EOM	Asph / EOM	NSO / EOM	HC / EOM	Non-HC / EOM	Sat / Aro	HC / Non-HC	Sample
2985.00	cut	Ca : lt or to or gy	57.67	14.89	1.97	25.47	72.56	27.44	387.31	264.46	0039-1L
3096.00	cut	Marl : lt gy to m gy	54.97	25.65	3.66	15.71	80.63	19.37	214.29	416.22	0046-1L
3150.00	cut	Marl : lt gy to lt brn gy	57.43	25.00	2.70	14.86	82.43	17.57	229.73	469.23	0055-1L
3228.00	cut	Sh/Clst: brn gy to gy brn to drk gy	42.59	27.49	5.12	24.80	70.08	29.92	154.90	234.23	0068-1L
3306.00	cut	Sh/Clst: brn gy to drk gy	27.82	25.56	14.29	32.33	53.38	46.62	108.82	114.52	0096-2L
3456.00	com	Composite sample - see table 4 e	33.33	25.88	8.24	32.55	59.22	40.78	128.79	145.19	0276-0B
3547.00	swc	Sh/Clst: drk gy to brn blk	35.15	27.23	5.94	31.68	62.38	37.62	129.09	165.79	0032-1L
3600.00	com	Composite sample - see table 4 e	37.18	20.51	11.54	30.77	57.69	42.31	181.25	136.36	0277-0B
3766.50	swc	Sh/Clst: drk gy to brn blk	44.13	26.82	6.70	22.35	70.95	29.05	164.58	244.23	0029-1L
4044.00	com	Composite sample - see table 4 e	58.08	11.35	5.68	24.89	69.43	30.57	511.54	227.14	0278-0B
4177.00	swc	Sh/Clst: drk gy to brn blk	48.57	22.86	5.71	22.86	71.43	28.57	212.50	250.00	0027-1L
4272.00	com	Composite sample - see table 4 e	50.33	25.17	7.95	16.56	75.50	24.50	200.00	308.11	0279-0B
4385.00	swc	Sh/Clst: brn blk	30.43	6.52	4.35	58.70	36.96	63.04	466.67	58.62	0167-1L

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Table 4 e: List of composite samples appearing in the extraction tables for well NOCS 2/8-14

Depth unit of measure: m

NOTE: Depths shown in tables 4 a to d correspond to the composite samples' lower depth.

Upper depth	Lower depth	Typ	Sample	Depth	Typ	Lithology	Sample
3450.00	3456.00	com	0276-0B is composed of:	3450.00	cut	Sh/Clst: m gy to brn gy	0120-2L
				3456.00	cut	Sh/Clst: m gy to brn gy	0121-3L
3582.00	3600.00	com	0277-0B is composed of:	3582.00	cut	Sh/Clst: drk gy to brn gy to brn blk	0079-3L
				3588.00	cut	Sh/Clst: drk gy to brn gy to brn blk	0080-2L
				3600.00	cut	Sh/Clst: drk gy to brn gy to brn blk, hd	0082-2L
4027.00	4044.00	com	0278-0B is composed of:	4027.00	swc	Sh/Clst: drk gy to brn blk, slt, carb	0028-1L
				4044.00	cut	Sh/Clst: drk gy to brn blk, calc, slt	0217-2L
4263.00	4272.00	com	0279-0B is composed of:	4263.00	swc	Sh/Clst: brn blk to drk gy, s	0176-1L
				4272.00	swc	Sh/Clst: brn blk, calc, s	0175-1L

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Table 5 : Saturated Hydrocarbon Ratios for well NOCS 2/8-14

Depth unit of measure: m

Depth	Typ	Lithology	Pristane / nC17	Pristane / Phytane	Pristane + Phytane / nC17 + nC18	Phytane / nC18	CPI	Sample
2985.00	cut	Ca : lt or to or gy	0.45	0.98	0.46	0.47	1.10	0039-1L
3096.00	cut	Marl : lt gy to m gy	0.55	1.44	0.52	0.47	1.11	0046-1L
3150.00	cut	Marl : lt gy to lt brn gy	0.56	1.48	0.50	0.44	1.11	0055-1L
3228.00	cut	Sh/Clst: brn gy to gy brn to drk gy	0.66	1.63	0.57	0.46	1.11	0068-1L
3306.00	cut	Sh/Clst: brn gy to drk gy	0.58	1.68	0.50	0.41	1.09	0096-2L
3456.00	com	bulk	0.65	1.64	0.56	0.46	1.15	0276-0B
3547.00	swc	Sh/Clst: drk gy to brn blk	0.64	1.54	0.58	0.50	1.12	0032-1L
3600.00	com	bulk	0.60	1.62	0.52	0.43	1.11	0277-0B
3766.50	swc	Sh/Clst: drk gy to brn blk	0.40	1.55	0.35	0.30	1.11	0029-1L
4044.00	com	bulk	0.42	1.47	0.37	0.31	1.09	0278-0B
4177.00	swc	Sh/Clst: drk gy to brn blk	0.34	1.62	0.30	0.25	1.08	0027-1L
4272.00	com	bulk	0.31	1.47	0.28	0.24	1.04	0279-0B
4385.00	swc	Sh/Clst: brn blk	0.37	1.41	0.32	0.27	1.09	0167-1L

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Table 6 : Aromatic Hydrocarbon Ratios for well NOCS 2/8-14

Depth unit of measure: m

Depth	Typ	Lithology	MNR	DMNR	BPhR	2/1MP	MPI1	MPI2	Rc	DBT/P	4/1MDBT	(3+2) /1MDBT	Sample
2985.00	cut	Ca : lt or to or gy	0.96	1.46	0.20	1.00	0.78	0.90	0.87	-	1.07	-	0039-1L
3096.00	cut	Marl : lt gy to m gy	1.01	1.24	0.21	1.04	0.82	0.88	0.89	0.57	2.27	0.45	0046-1L
3150.00	cut	Marl : lt gy to lt brn gy	1.03	1.30	0.21	1.10	0.87	0.97	0.92	0.59	2.01	0.49	0055-1L
3228.00	cut	Sh/Clst: brn gy to gy brn to drk gy	0.98	1.50	0.14	1.07	0.86	0.93	0.92	0.53	0.62	0.24	0068-1L
3306.00	cut	Sh/Clst: brn gy to drk gy	0.95	1.49	0.12	0.98	0.85	0.89	0.91	0.48	0.83	0.29	0096-2L
3456.00	com	bulk	0.96	1.45	0.14	0.94	0.81	0.85	0.89	0.42	1.06	0.34	0276-0B
3547.00	swc	Sh/Clst: drk gy to brn blk	0.87	1.64	0.11	0.95	0.79	0.83	0.87	0.36	0.97	0.36	0032-1L
3600.00	com	bulk	0.48	1.30	0.09	0.95	0.82	0.87	0.89	0.43	1.04	0.38	0277-0B
3766.50	swc	Sh/Clst: drk gy to brn blk	0.91	1.60	0.11	0.90	0.73	0.82	0.84	0.24	3.58	0.77	0029-1L
4044.00	com	bulk	0.66	1.47	0.09	0.98	0.79	0.89	0.87	0.30	3.30	0.64	0278-0B
4177.00	swc	Sh/Clst: drk gy to brn blk	0.84	1.83	0.10	0.92	0.77	0.86	0.86	0.20	7.00	1.33	0027-1L
4272.00	com	bulk	1.08	1.94	0.13	0.98	0.79	0.90	0.87	-	-	-	0279-0B
4385.00	swc	Sh/Clst: brn blk	0.88	1.65	0.09	1.04	0.79	0.91	0.87	-	-	-	0167-1L

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Table 7 : Thermal Maturity Data for well NOCS 2/8-14

Depth unit of measure: m

Depth	Typ	Lithology	Vitrinite Reflectance (%)	Number of Readings	Standard Deviation	Spore Fluorescence Colour	SCI	Tmax (°C)	Sample
2900.00	cut	bulk	0.56	2	0.01	-	-	437	0001-0B
3000.00	cut	bulk	0.54	5	0.04	-	5.0	426	0002-0B
3100.00	cut	bulk	0.56	2	0.00	-	-	411	0003-0B
3176.00	cut	bulk	NDP	-	-	-	-	432	0004-0B
3201.00	cut	bulk	1.00	3	0.05	-	-	-	0005-0B
3243.00	cut	bulk	0.79	2	0.01	-	-	-	0006-0B
3243.00	cut	Sltst : lt ol gy to dsk y brn	-	-	-	-	5.5-6.0	437	0006-2L
3294.00	cut	bulk	0.26	9	0.03	-	-	-	0094-0B
3450.00	cut	bulk	0.51	2	0.02	-	-	-	0008-0B
3549.00	cut	bulk	0.21	5	0.03	-	-	-	0009-0B
3549.00	cut	Sltst : drk gy to dsk y brn	-	-	-	-	5.5-6.0(??)	433	0009-1L
3651.00	cut	bulk	NDP	-	-	-	-	-	0010-0B
3750.00	cut	bulk	0.23	3	0.00	-	-	-	0011-0B
3750.00	cut	Sh/Clst: drk gy	-	-	-	-	NDP	441	0011-2L

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Table 7 : Thermal Maturity Data for well NOCS 2/8-14

Depth unit of measure: m

Depth	Typ	Lithology	Vitrinite Reflectance (%)	Number of Readings	Standard Deviation	Spore Fluorescence Colour	SCI	Tmax (°C)	Sample
3809.00	cut	Sh/Clst: drk gy to brn blk	-	-	-	-	6.0	441	0019-2L
3900.50	cut	bulk	0.43	6	0.06	-	-	-	0193-0B
3948.00	cut	bulk	0.33	5	0.01	-	-	-	0014-0B
3948.00	cut	Sh/Clst: drk gy	-	-	-	-	6.5-7.0	440	0014-1L
4050.00	cut	bulk	0.51	4	0.04	-	-	-	0015-0B
4101.00	cut	Sh/Clst: drk gy	-	-	-	-	6.0-6.5	437	0022-2L
4149.00	cut	bulk	0.33	4	0.03	-	-	-	0016-0B
4200.00	cut	Sh/Clst: drk gy to brn blk	-	-	-	-	7.0(?)	445	0024-1L
4251.00	cut	bulk	0.79	8	0.07	-	-	-	0017-0B
4251.00	cut	Sltst : gy brn to dsk y brn	-	-	-	-	6.5-7.0	446	0017-1L
4274.00	cut	bulk	0.67	5	0.05	-	-	-	0018-0B
4323.00	cut	Sh/Clst: drk gy to brn blk	-	-	-	-	7.5	447	0025-1L
4328.00	swc	bulk	0.51	9	0.02	-	-	-	0172-0B
4349.00	cut	Sh/Clst: drk gy to brn blk	-	-	-	-	7.5	449	0026-1L

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Table 7 : Thermal Maturity Data for well NOCS 2/8-14

Depth unit of measure: m

Depth	Typ	Lithology	Vitrinite Reflectance (%)	Number of Readings	Standard Deviation	Spore Fluorescence Colour	SCI	Tmax (°C)	Sample
4392.00	swc	bulk	NDP	-	-	-	-	-	0166-0B

Table 8 : Visual Kerogen Composition Data for well NOCS 2/8-14

Depth unit of measure: m

Depth	Typ	Lithology	LIPT %	Amor L	Lip Det	Sp/Pol	Cuticl	Resin	Algae	Dinofl	Acrit	Bit L	INERT %	Fusin	SemFus	IntDet	Micrin	Sclero	Bit I	VITR %	Telin	Collin	VitDet	Amor V	Bit V	Sample
3000.00	cut	bulk	95	**	**	*						?	5			*				TR			*			0002-0B
3243.00	cut	Sltst : lt ol gy to dsk y brn	100	**		*			*			*	TR			*				TR			*			0006-2L
3549.00	cut	Sltst : drk gy to dsk y brn	NDP						*			*	NDP							NDP						0009-1L
3750.00	cut	Sh/Clst: drk gy	100	**	**	*			*				TR			*				TR			*			0011-2L
3809.00	cut	Sh/Clst: drk gy to brn blk	80	**	*	*	*		*	*			10		**	*				10	**		*			0019-2L
3948.00	cut	Sh/Clst: drk gy	NDP										NDP							NDP						0014-1L
4101.00	cut	Sh/Clst: drk gy	90	**	*	*	**		*	*		*	5	*	*					5	*	*				0022-2L
4200.00	cut	Sh/Clst: drk gy to brn blk	100	**		*	?		*	*			TR			*				TR			*			0024-1L
4251.00	cut	Sltst : gy brn to dsk y brn	90	**	**	*	*		*	*			5			*				5			*			0017-1L
4323.00	cut	Sh/Clst: drk gy to brn blk	80	**	*	*	?		**	?			10	*	*	*				10	*		*			0025-1L
4349.00	cut	Sh/Clst: drk gy to brn blk	85	**	*	*	*		**	?		?	10	*	*	*				5	*		*			0026-1L

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APPENDIX 2

VITRINITE REFLECTANCE HISTOGRAMS

Vitrinite Reflectance Histogram

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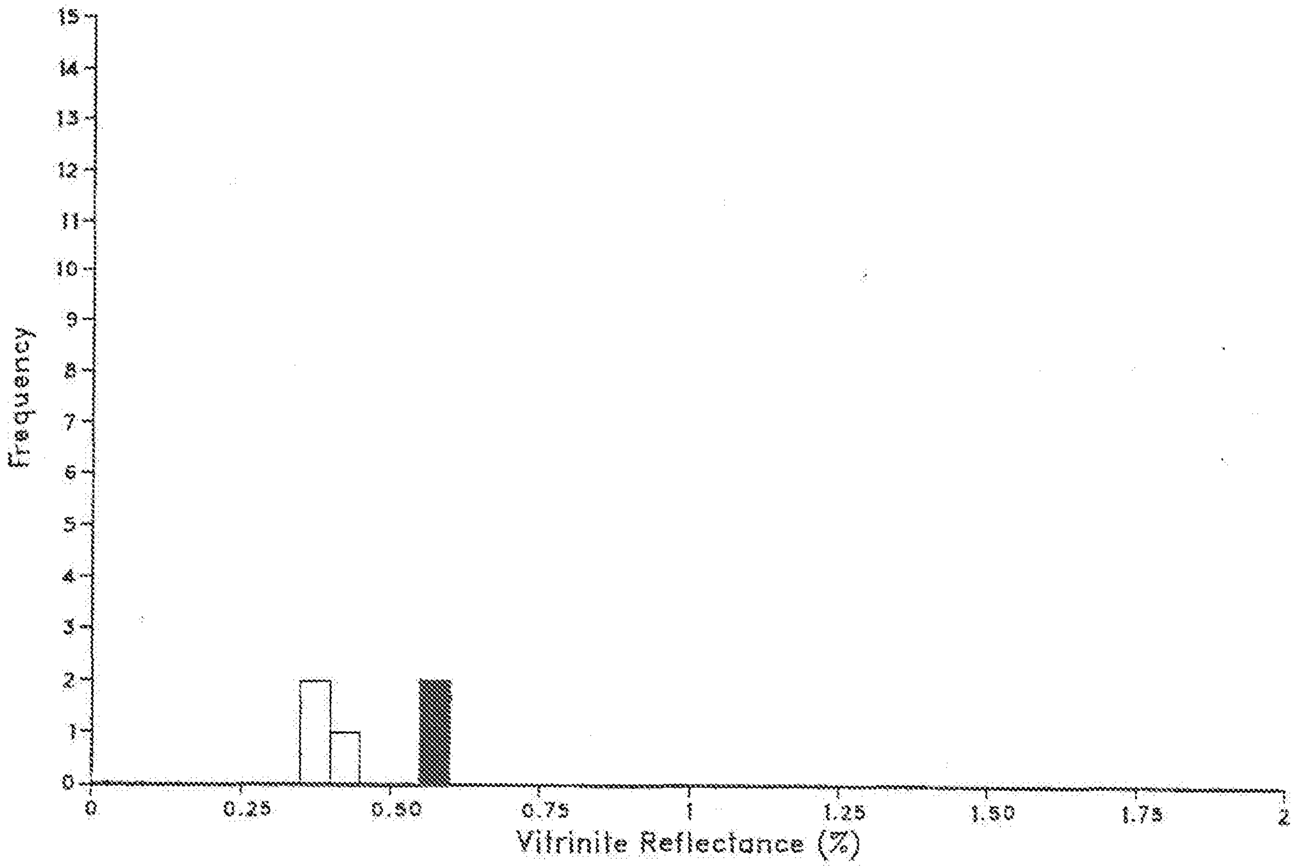
Well: NOCS 2/8-14
Depth: 2900.00(m)



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.550 to 0.600):	0.56	0.01	2
Population Two (from 0.350 to 0.450):	0.39	0.04	3

Readings:

0.361 0.365 0.435 0.553 0.562

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Vitrinite Reflectance Histogram

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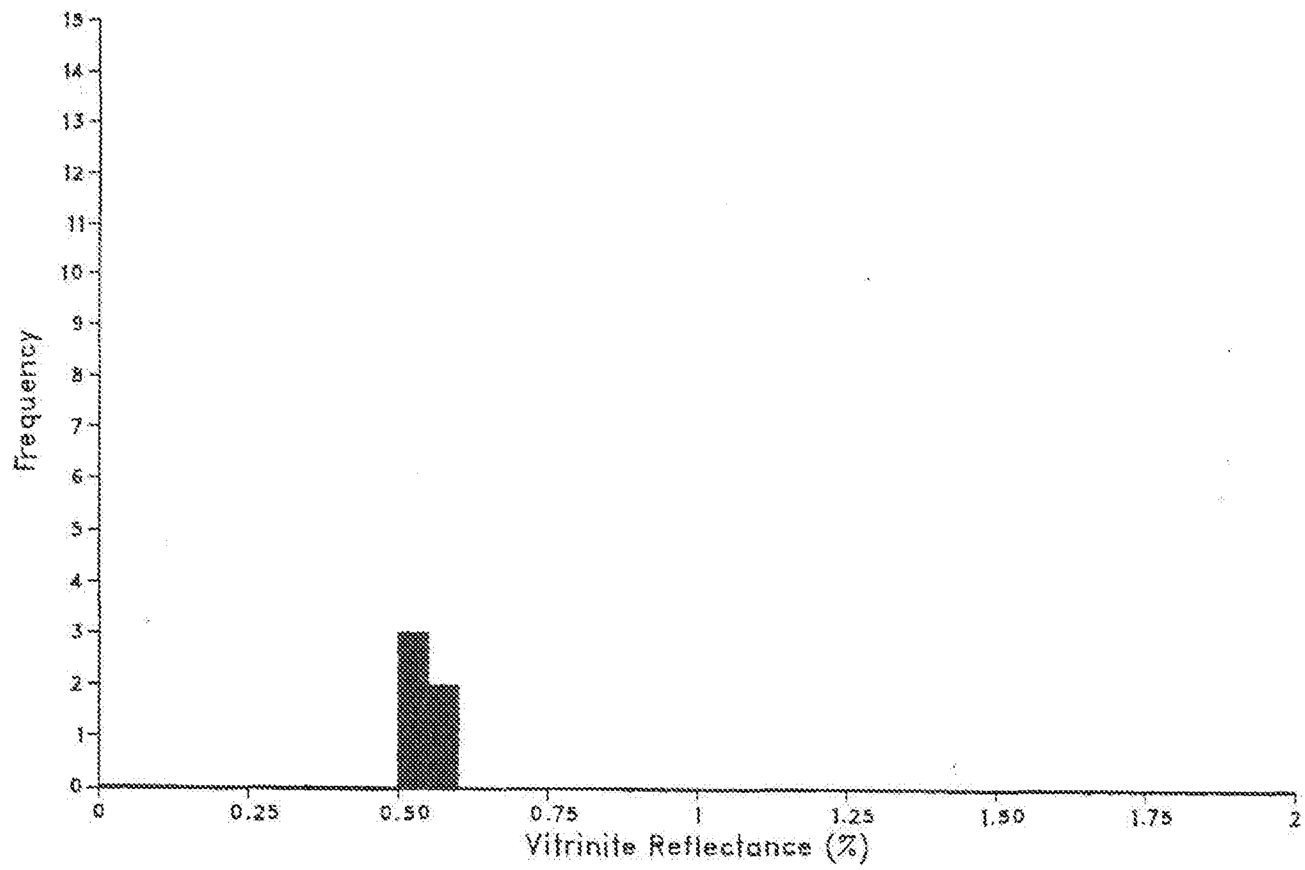
Well: NOCS 2/8-14
Depth: 3000.00(m)



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.500 to 0.600):	0.54	0.04	5

Readings:

0.504 0.520 0.531 0.579 0.587 0.916

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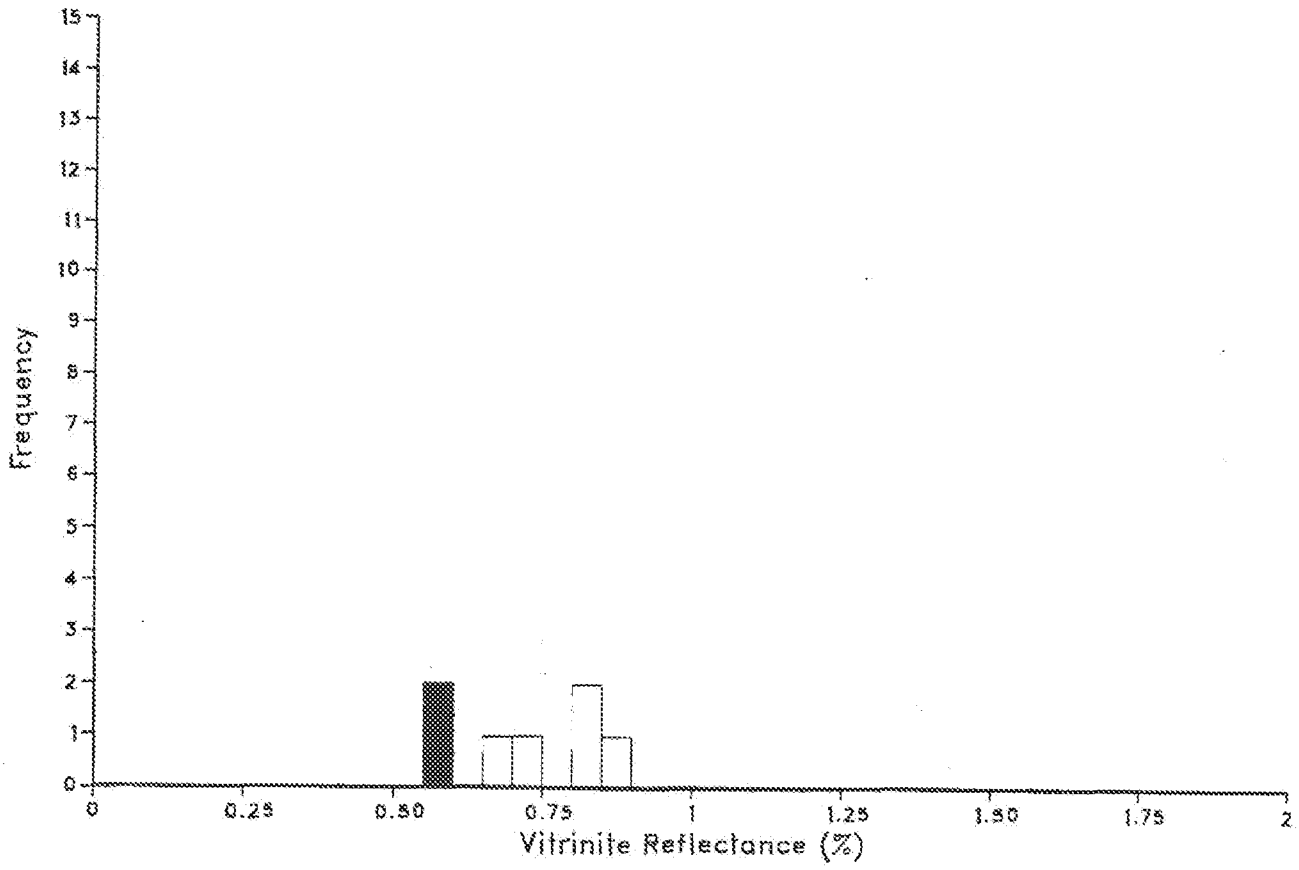
Vitrinite Reflectance Histogram

GEOLAB NOR

Well: NOCS 2/8-14
Depth: 3100.00(m)



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.550 to 0.600):	0.56	0.00	2
Population Two (from 0.650 to 0.750):	0.69	0.01	2
Population Three (from 0.800 to 0.900):	0.84	0.03	3

Readings:

0.554 0.561 0.685 0.703 0.801 0.849 0.856

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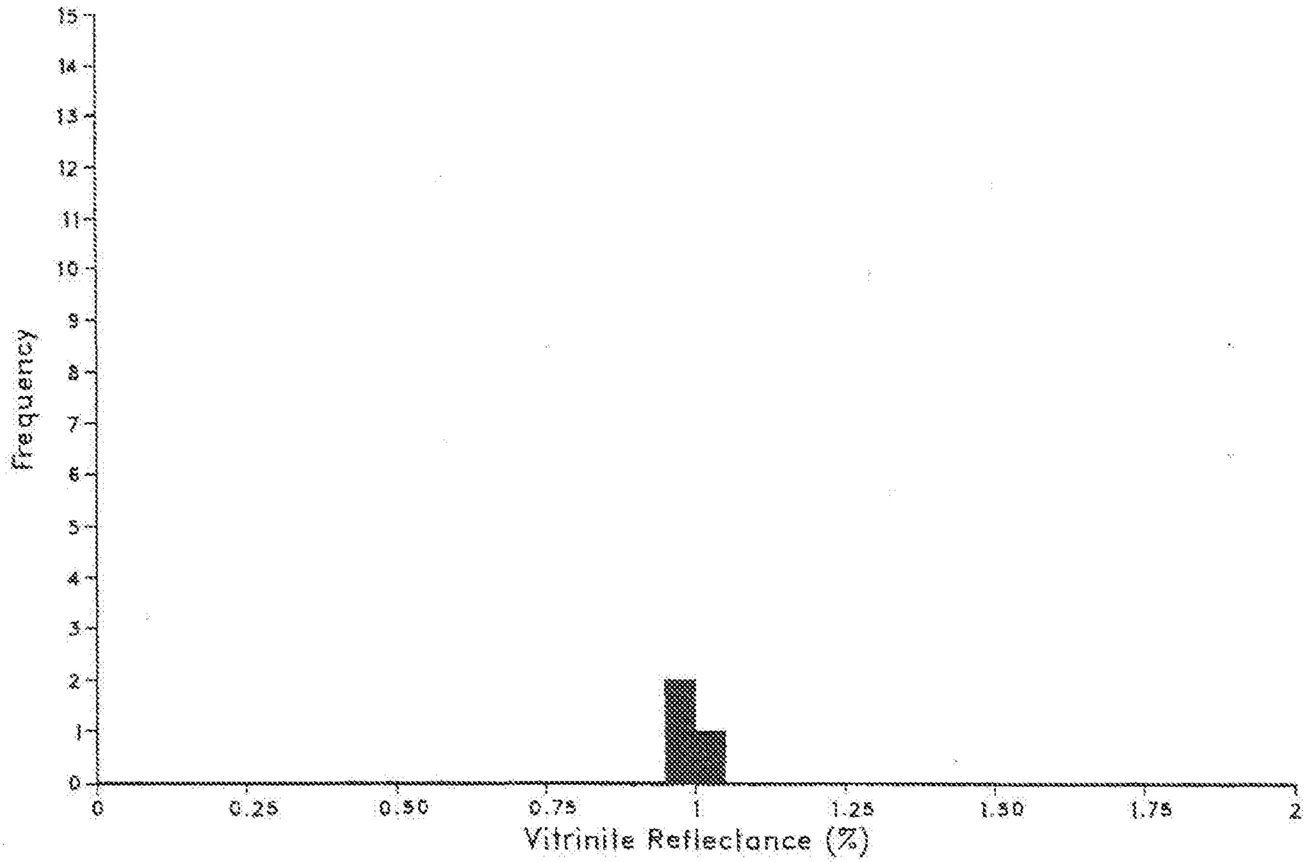
Vitrinite Reflectance Histogram

GEOLAB NOR

Well: NOCS 2/8-14
Depth: 3201.00(m)



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.950 to 1.050):	1.00	0.05	3

Readings:

0.508 0.952 0.996 1.045 1.343

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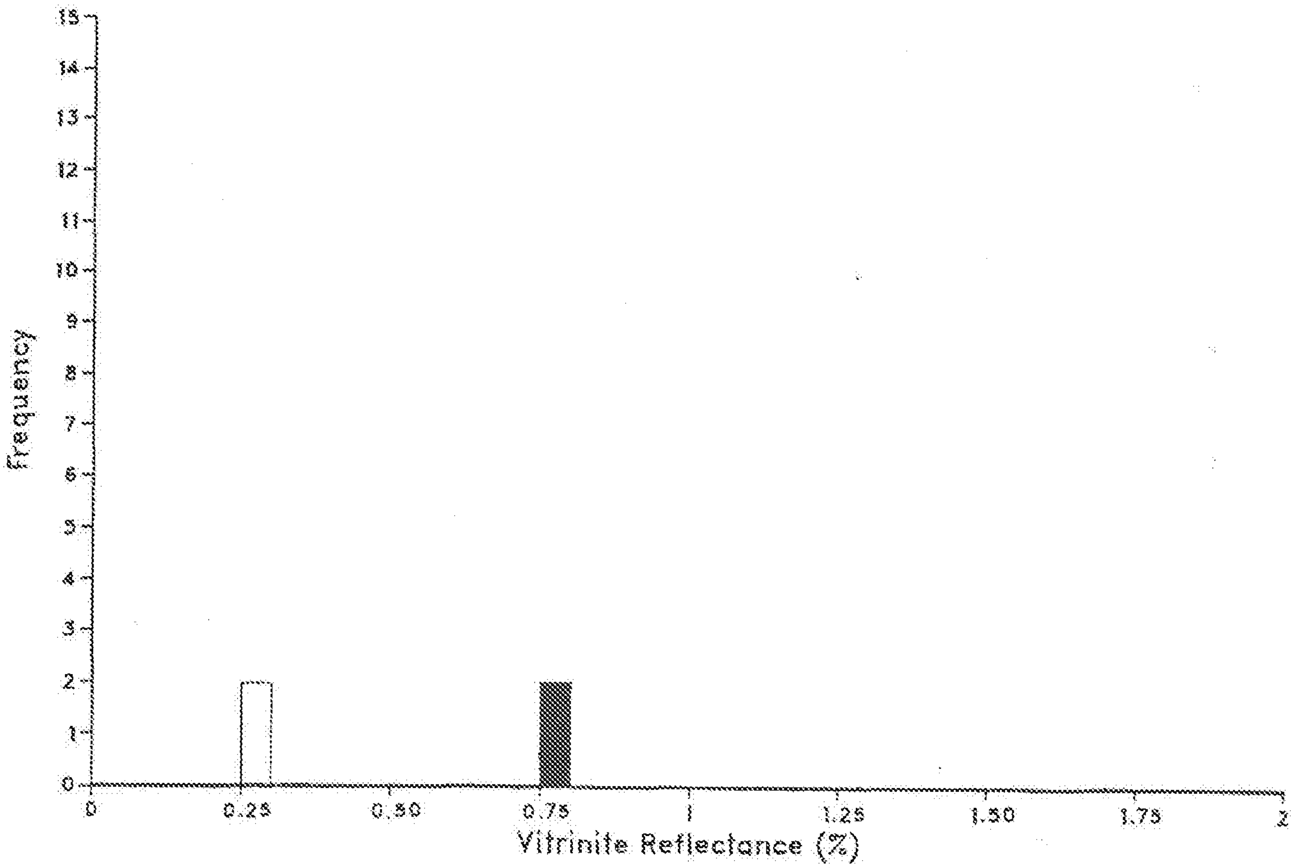
Vitrinite Reflectance Histogram

GEOLAB NOR GECO

Well: NOCS 2/8-14
Depth: 3243.00(m)



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.750 to 0.800):	0.79	0.01	2
Population Two (from 0.250 to 0.300):	0.25	0.00	2

Readings:

0.253 0.254 0.545 0.777 0.794

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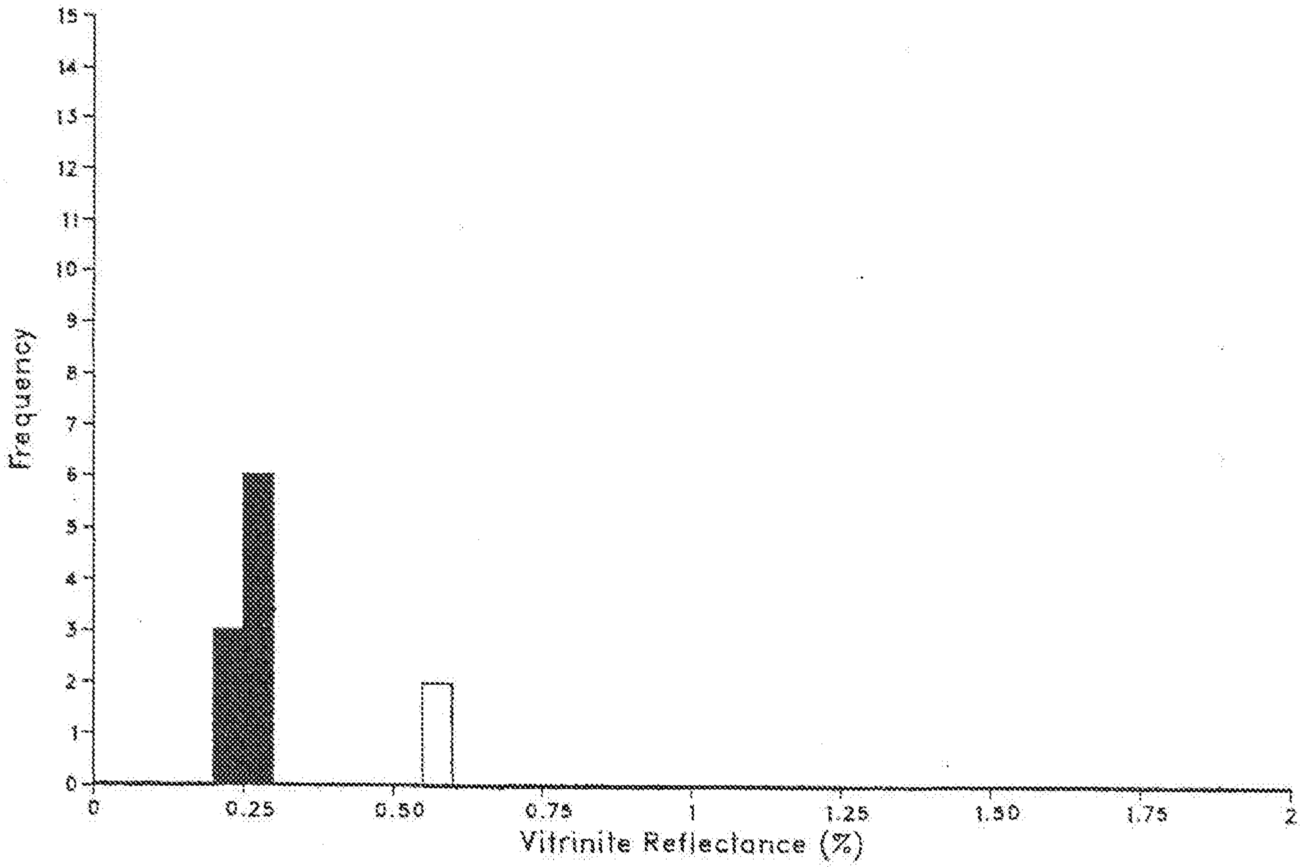
Vitrinite Reflectance Histogram

GEOLAB NOR

Well: NOCS 2/8-14
Depth: 3294.00(m)



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.200 to 0.300):	0.26	0.03	9
Population Two (from 0.550 to 0.600):	0.59	0.01	2

Readings:

0.192 0.206 0.213 0.249 0.254 0.283 0.284 0.288 0.289 0.297
0.577 0.595

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Vitrinite Reflectance Histogram

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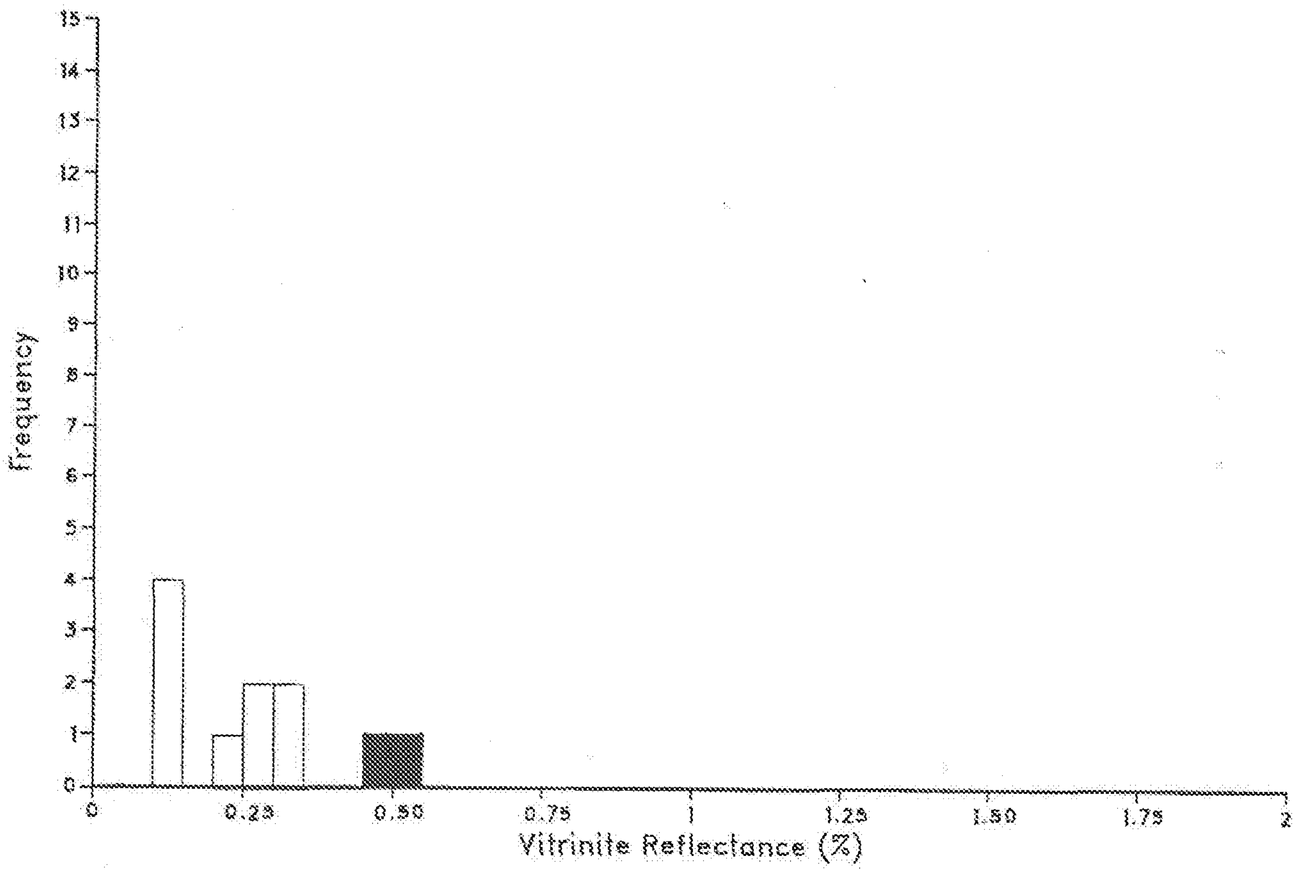
Well: NOCS 2/8-14
Depth: 3450.00(m)



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.450 to 0.550):	0.51	0.02	2
Population Two (from 0.100 to 0.150):	0.12	0.01	4
Population Three (from 0.200 to 0.350):	0.28	0.04	5

Readings:

0.105 0.124 0.126 0.133 0.235 0.252 0.272 0.329 0.330 0.493
0.521

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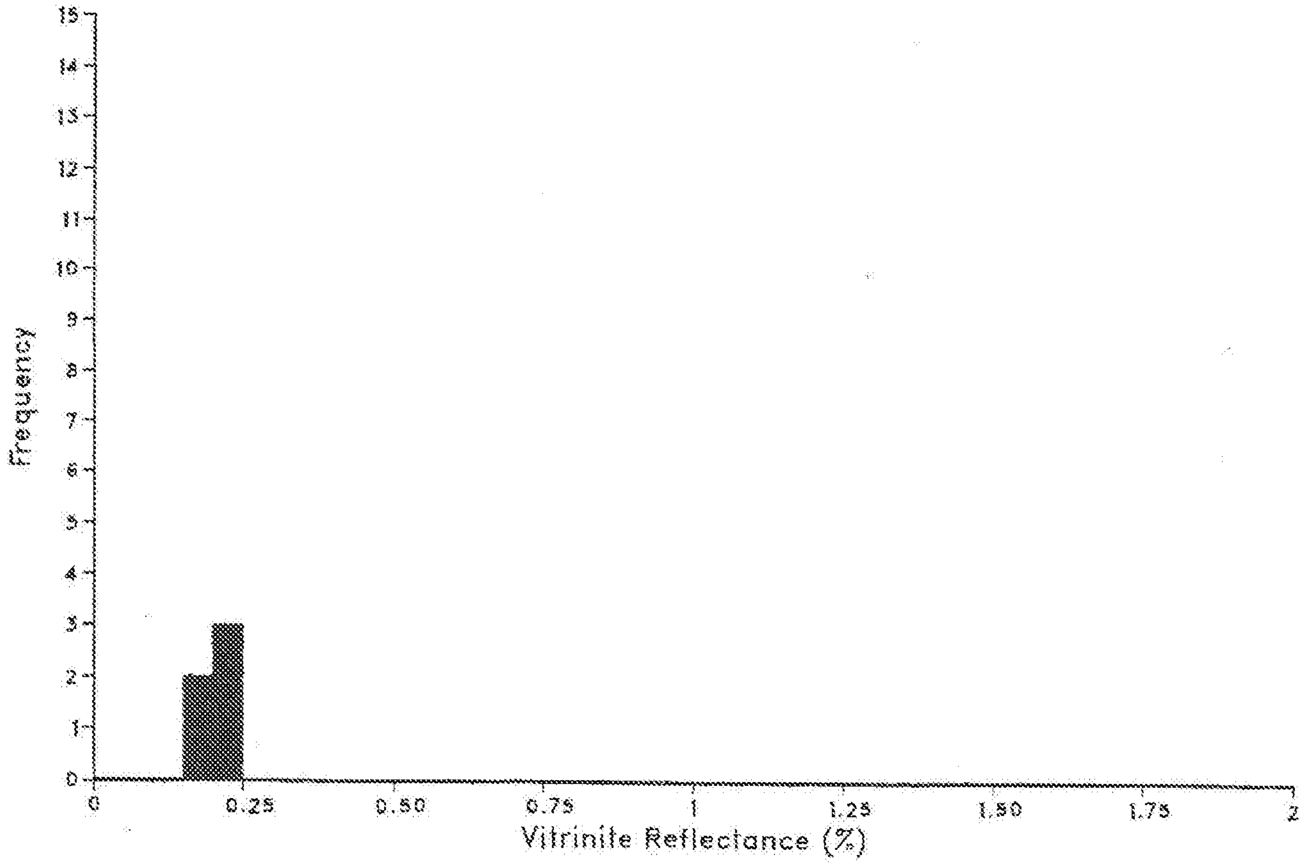
Vitrinite Reflectance Histogram

GEOLAB NOR

Well: NOCS 2/8-14
Depth: 3549.00(m)



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.150 to 0.250):	0.21	0.03	5

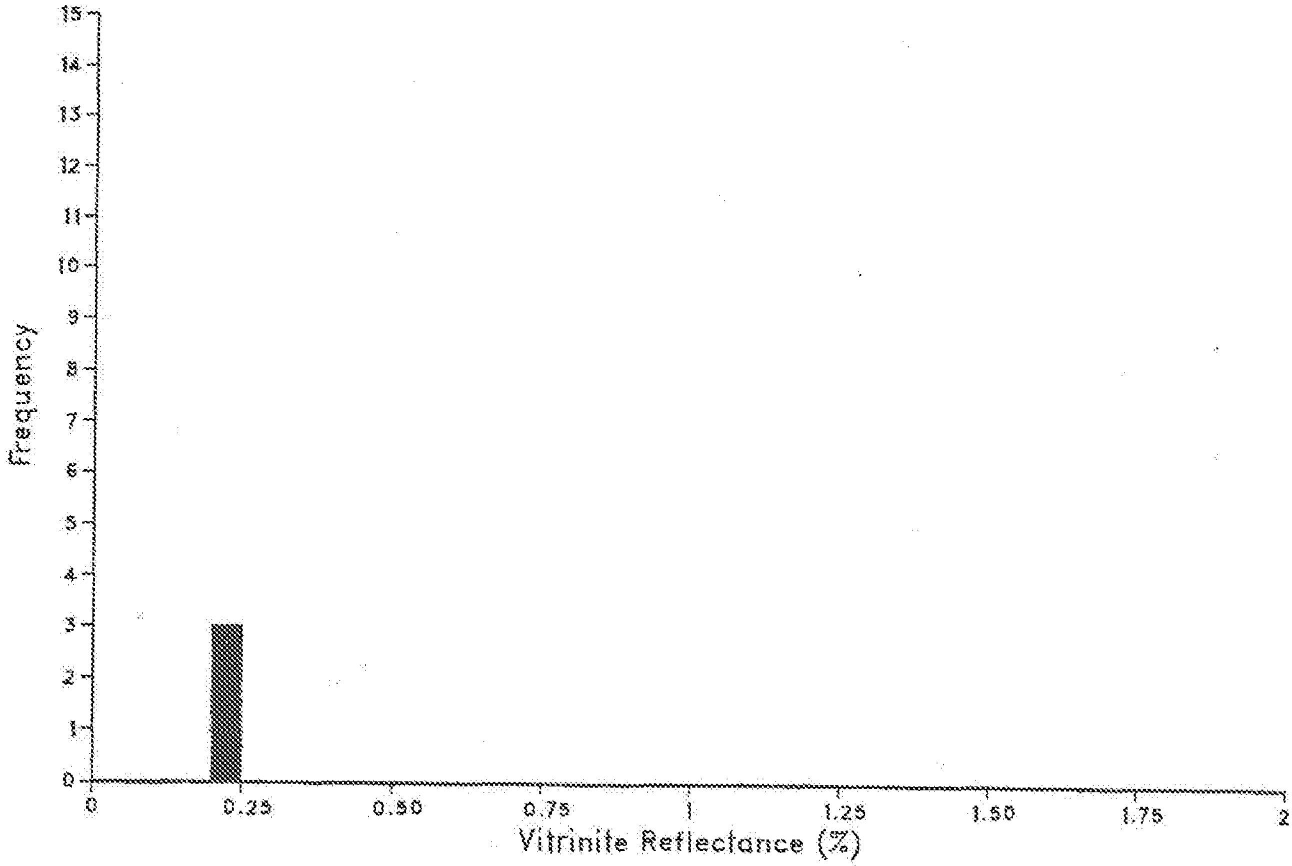
Readings:

0.165 0.190 0.212 0.241 0.243

Vitrinite Reflectance Histogram

GEOLAB NOR

Well: NOCS 2/8-14
Depth: 3750.00(m)



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.200 to 0.250):	0.23	0.00	3

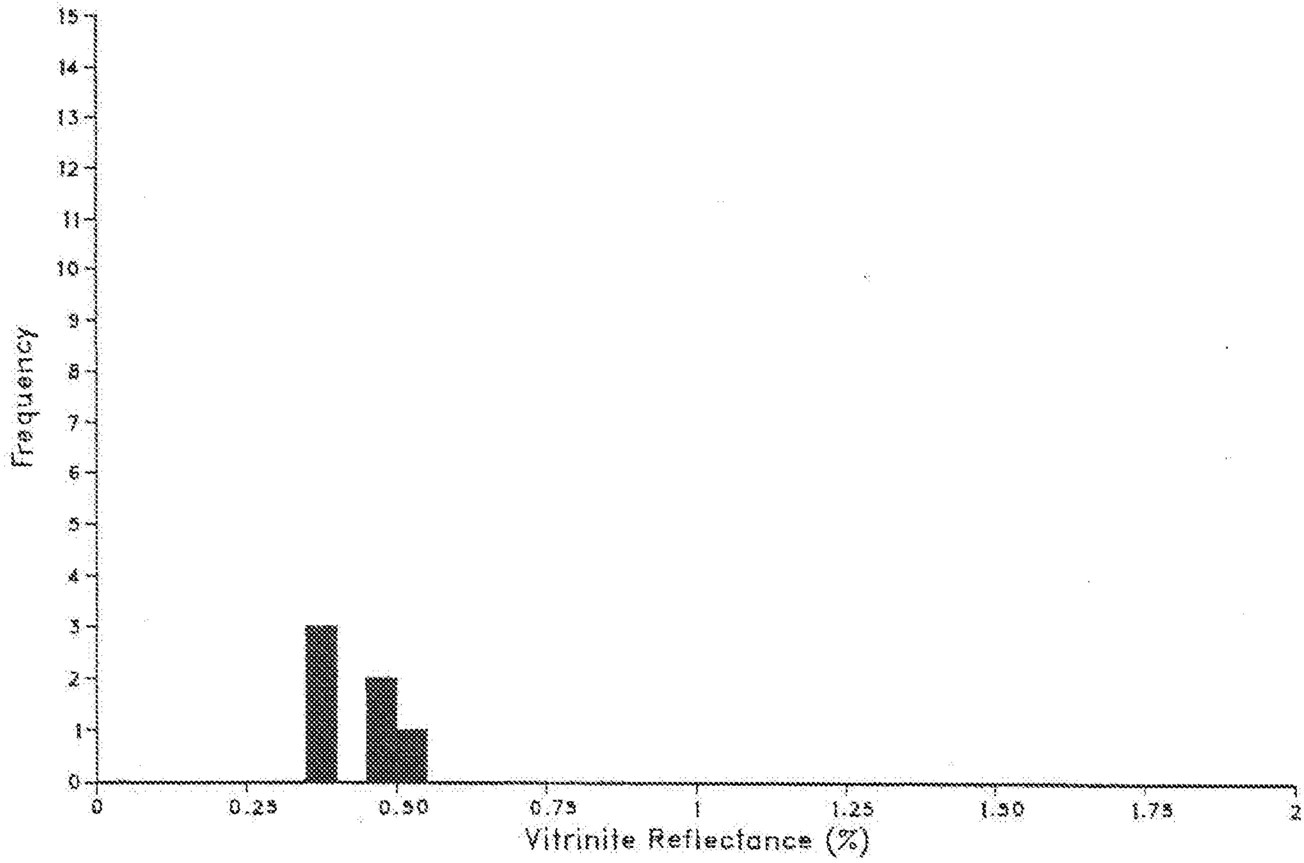
Readings:

0.225 0.225 0.231

Vitrinite Reflectance Histogram

GEOLAB NOR

Well: NOCS 2/8-14
Depth: 3900.00(m)



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.350 to 0.550):	0.43	0.06	6

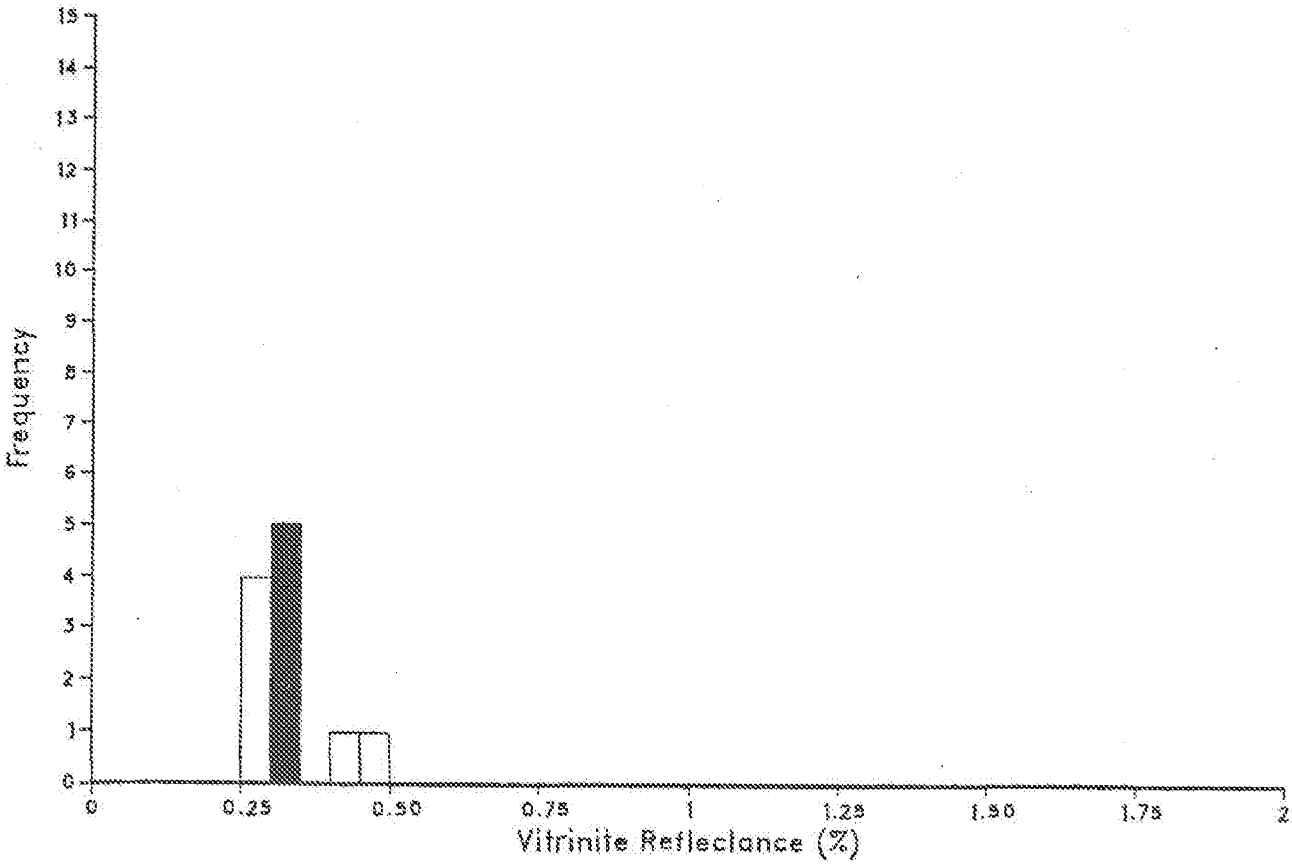
Readings:

0.330 0.374 0.391 0.392 0.462 0.485 0.503 0.707

Vitrinite Reflectance Histogram

GEOLAB NOR GECO

Well: NOCS 2/8-14
Depth: 3948.00(m)



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.300 to 0.350):	0.33	0.01	5
Population Two (from 0.250 to 0.300):	0.28	0.02	4
Population Three (from 0.400 to 0.500):	0.46	0.03	2

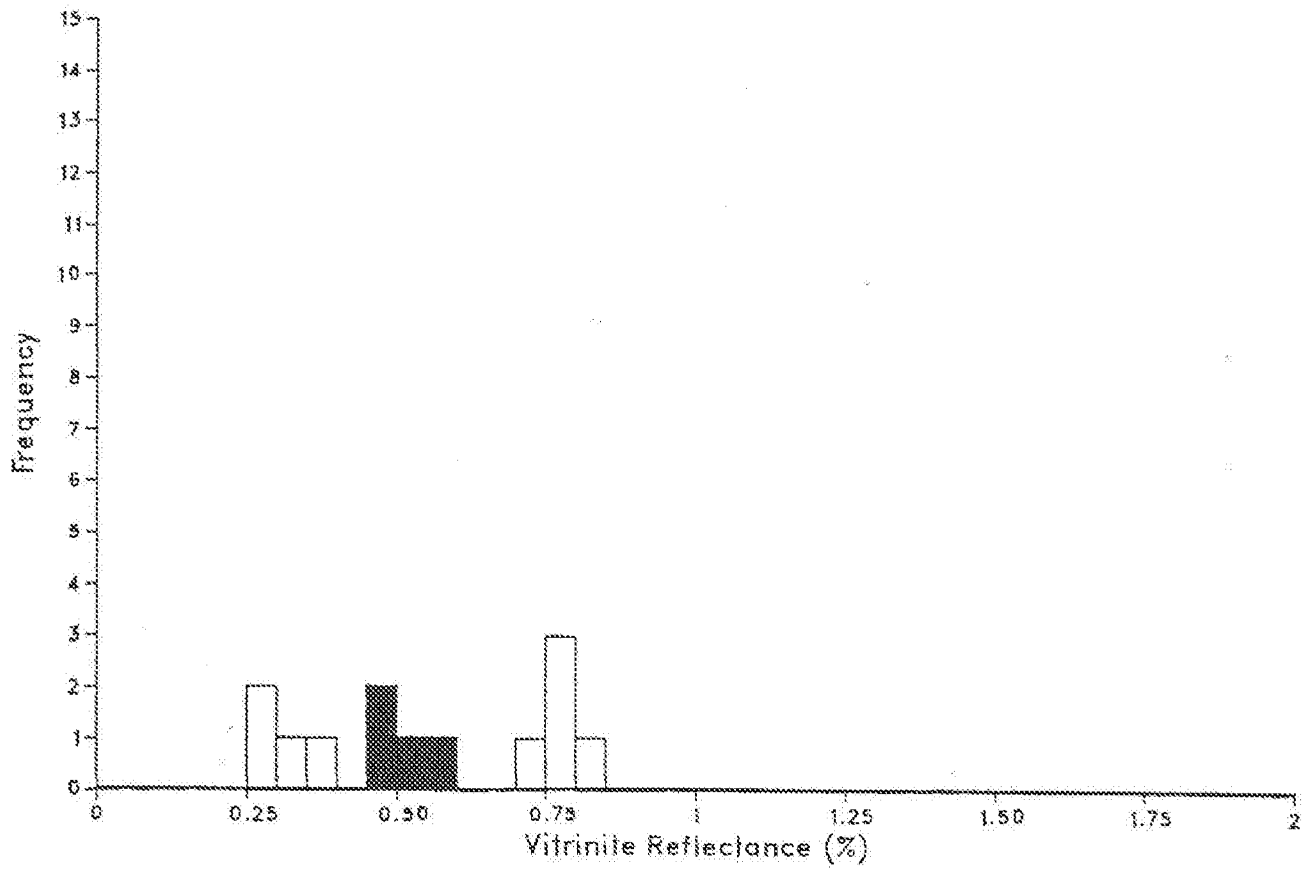
Readings:

0.236 0.258 0.268 0.281 0.298 0.320 0.323 0.325 0.331 0.341
0.436 0.485

Vitrinite Reflectance Histogram

GEOLAB NOR

Well: NOCS 2/8-14
Depth: 4050.00(m)



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.450 to 0.600):	0.51	0.04	4
Population Two (from 0.250 to 0.400):	0.33	0.04	4
Population Three (from 0.700 to 0.850):	0.77	0.02	5

Readings:

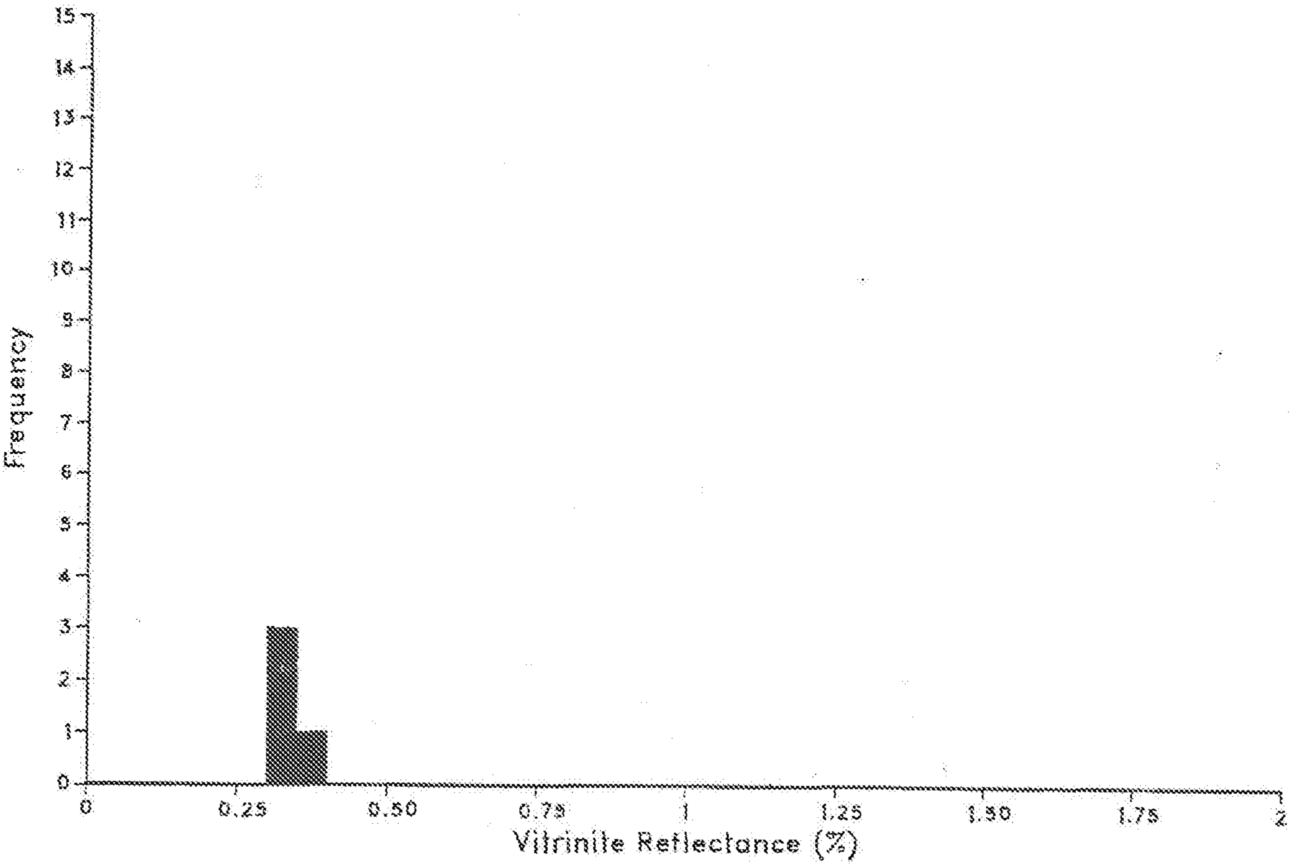
0.293 0.297 0.324 0.387 0.472 0.475 0.518 0.556 0.748 0.758
0.760 0.762 0.809 0.868

GEOLAB NOR a/s — Geochemical Laboratories of Norway

Vitrinite Reflectance Histogram

GEOLAB NOR

Well: NOCS 2/8-14
Depth: 4149.00(m)



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.300 to 0.400):	0.33	0.03	4

Readings:

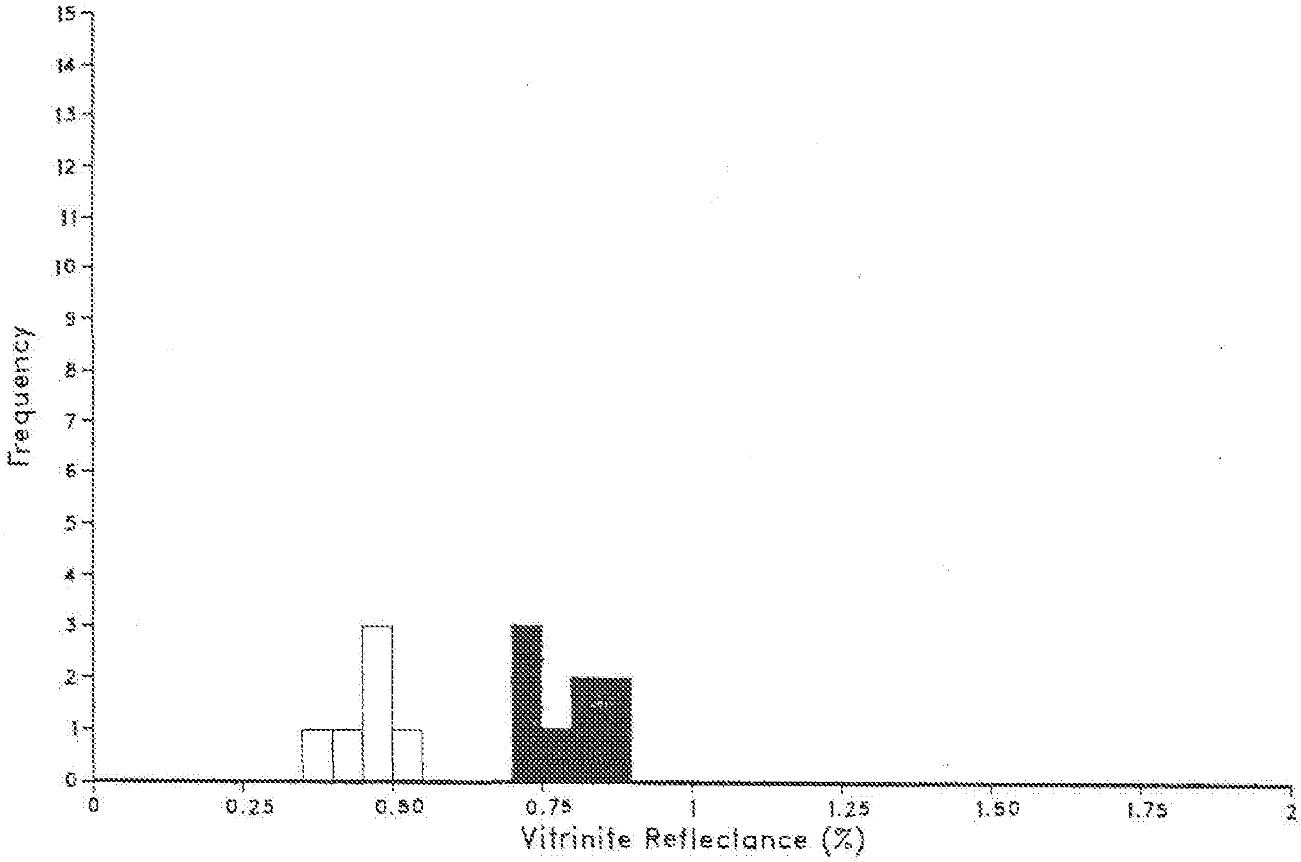
0.313 0.317 0.323 0.379

GEOLAB NOR a/s — Geochemical Laboratories of Norway

Vitrinite Reflectance Histogram

GEOLAB NOR

Well: NOCS 2/8-14
Depth: 4251.00(m)



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.700 to 0.900):	0.79	0.07	8
Population Two (from 0.350 to 0.550):	0.45	0.06	6

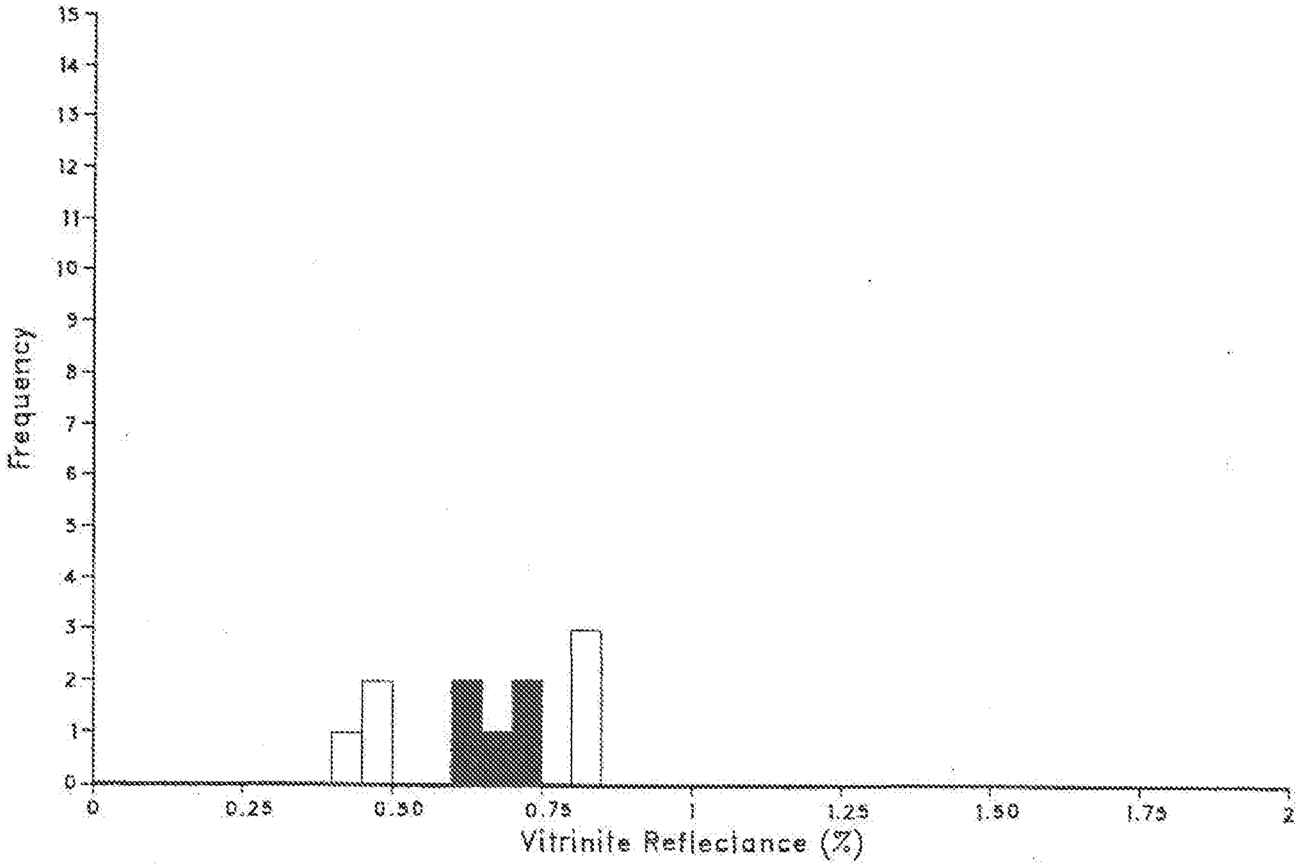
Readings:

0.373 0.410 0.451 0.455 0.488 0.531 0.704 0.708 0.735 0.774
0.829 0.850 0.856 0.867

Vitrinite Reflectance Histogram

GEOLAB NOR

Well: NOCS 2/8-14
Depth: 4274.00(m)



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.600 to 0.750):	0.67	0.05	5
Population Two (from 0.400 to 0.500):	0.46	0.01	3
Population Three (from 0.800 to 0.850):	0.83	0.01	3

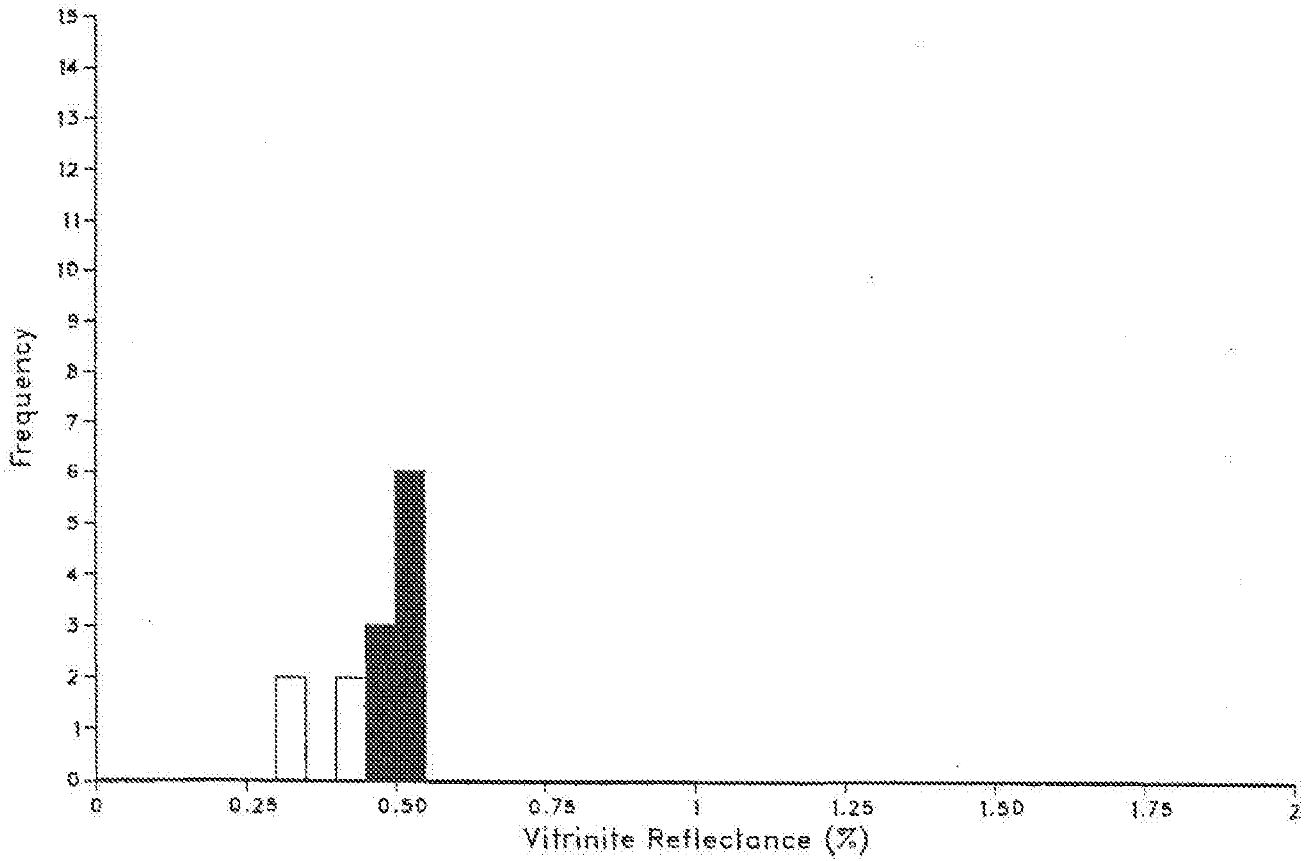
Readings:

0.447 0.459 0.463 0.610 0.618 0.694 0.712 0.722 0.818 0.825
0.842 0.977

Vitrinite Reflectance Histogram

GEOLAB NOR

Well: NOCS 2/8-14
Depth: 4328.00(m)



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.450 to 0.550):	0.51	0.02	9
Population Two (from 0.300 to 0.450):	0.37	0.06	4

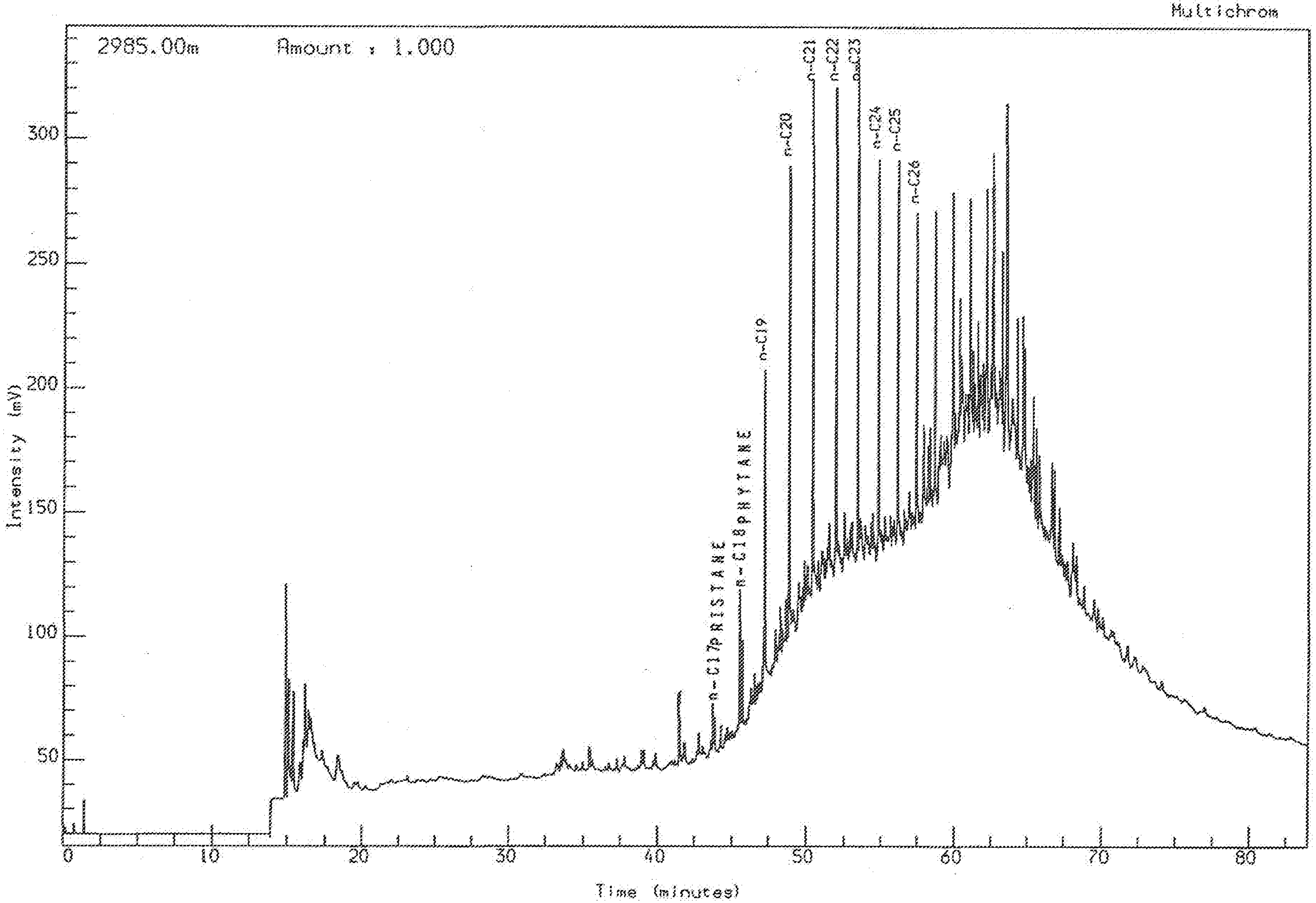
Readings:

0.301	0.335	0.409	0.432	0.470	0.488	0.499	0.508	0.509	0.513
0.527	0.538	0.550	0.712						

APPENDIX 3

THERMAL EXTRACTION
AND
PYROLYSIS GAS CHROMATOGRAMS

Analysis Name : [526097] 26 PE3400391.1.1.



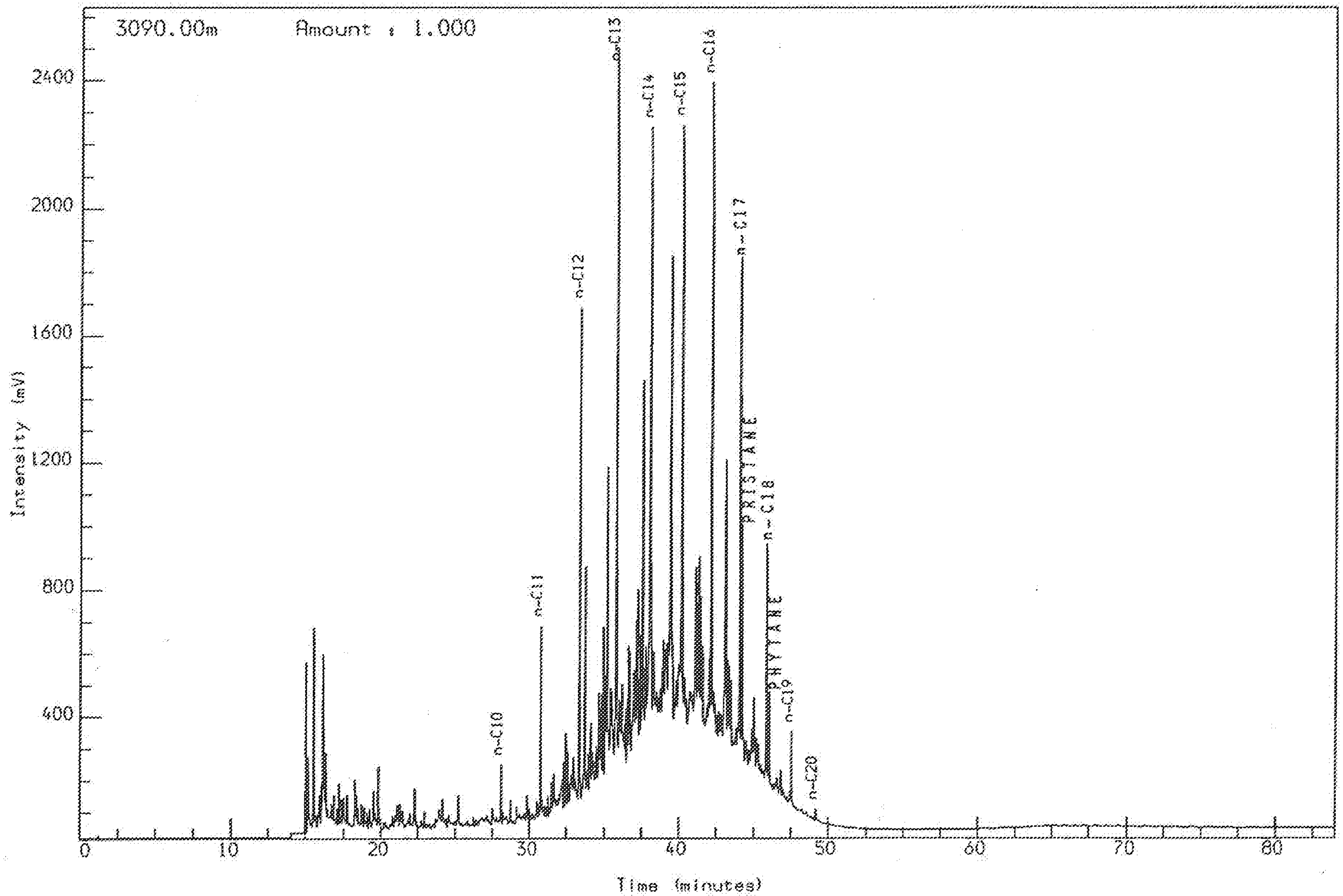
WELL NOCS 2/8-14 2985.00m cut
THERMAL EXTRACTION GC (S1)
Ca: lt or to or gy

Reported on 11-MAR-1991 at 13:14

GEOLAB NOR GECO

Analysis Name : [526097] 26 PE3400451,1,1.

Multichrom

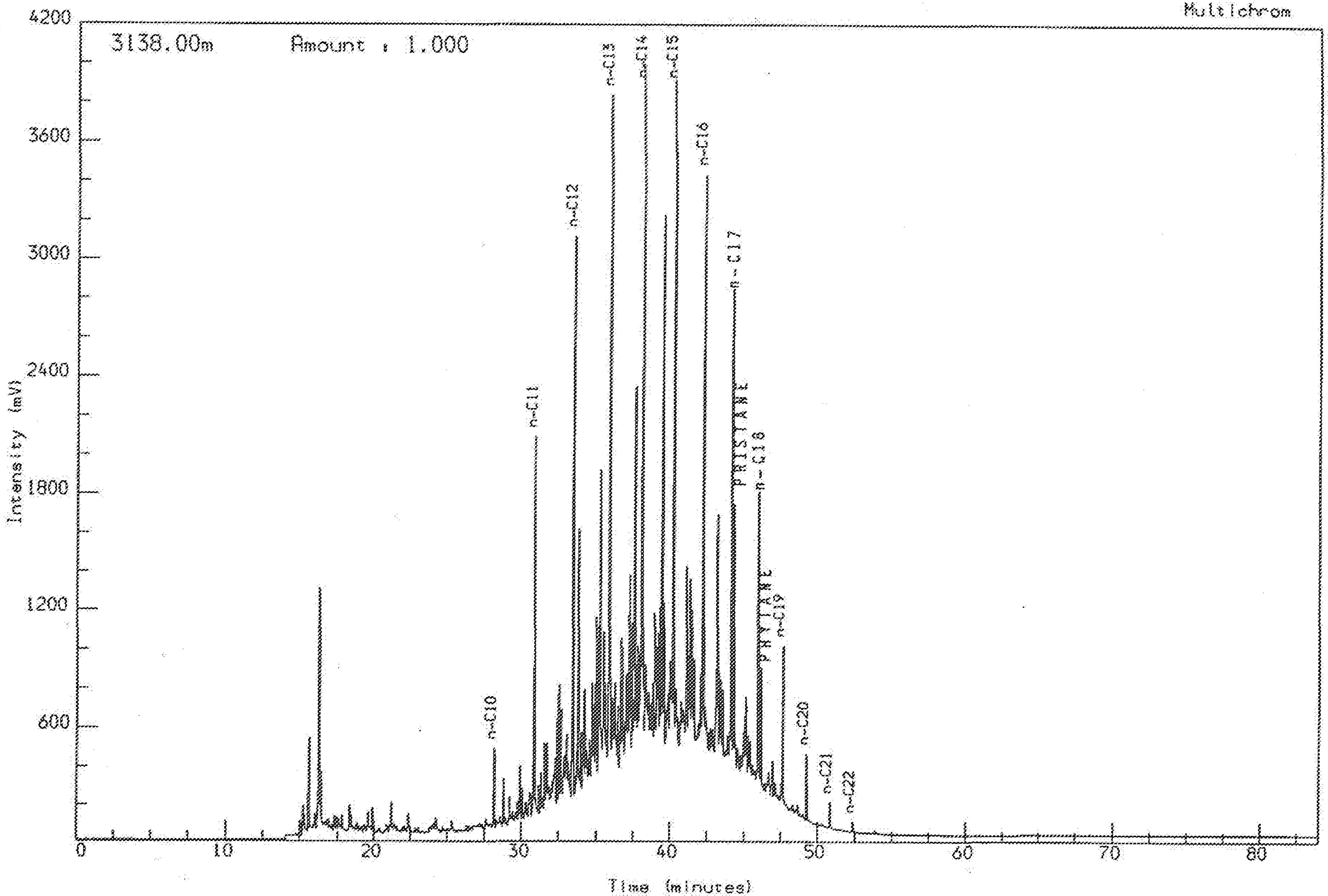


WELL NOCS 2/8-14 3090.00m cut
THERMAL EXTRACTION GC (S1)
Marl: lt gy to m gy

Reported on 11-MAR-1991 at 13:15

GEOLAB NOR

Analysis Name : [526097] 26 PE3400531,1,1.

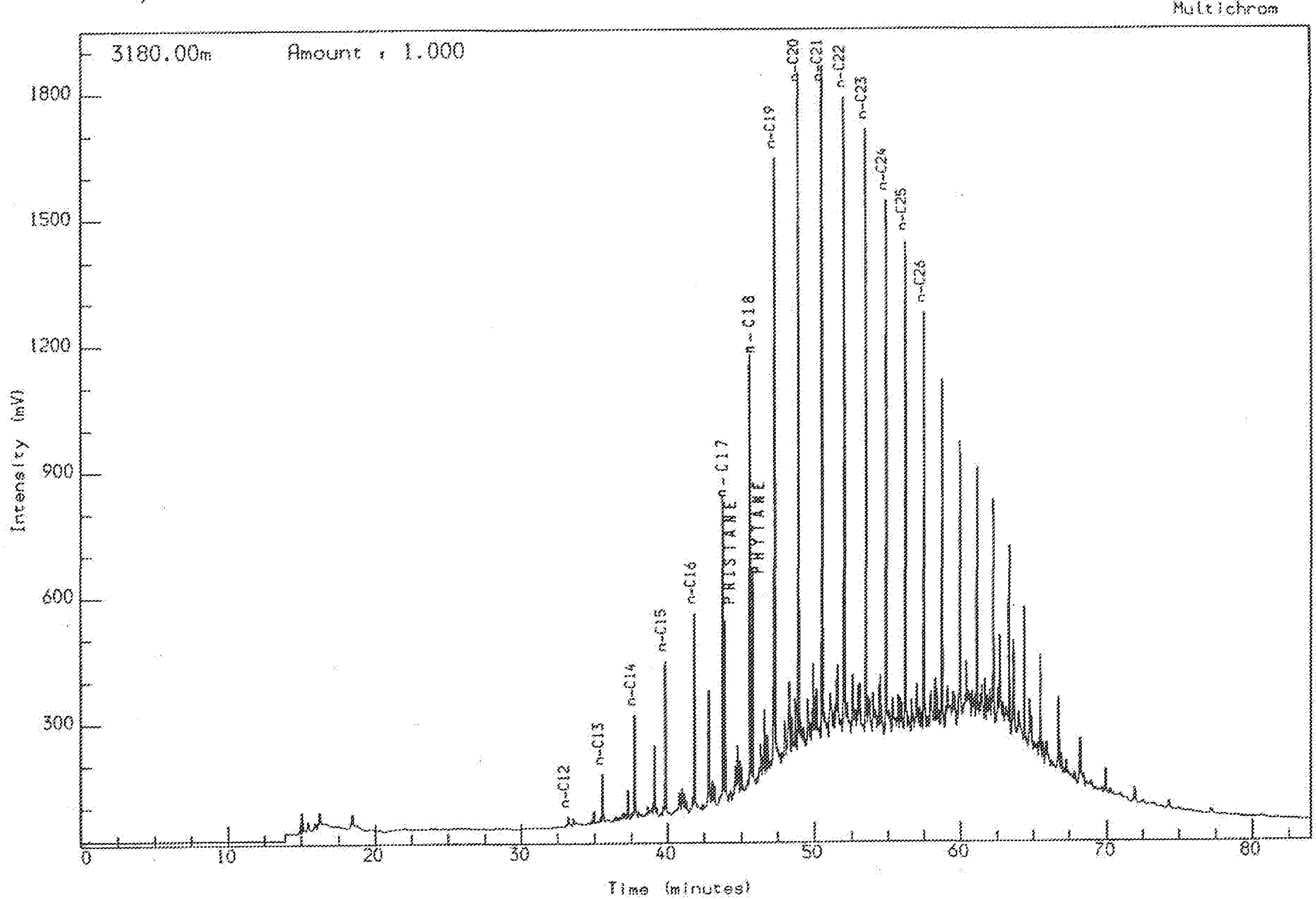


WELL NOCS 2/8-14 3138.00m cut
THERMAL EXTRACTION GC (S1)
Marl: lt gy to lt brn gy

Reported on 12-MAR-1991 at 09:15

GEOLAB NOR

Analysis Name : [526097] 26 PE348.1.1.

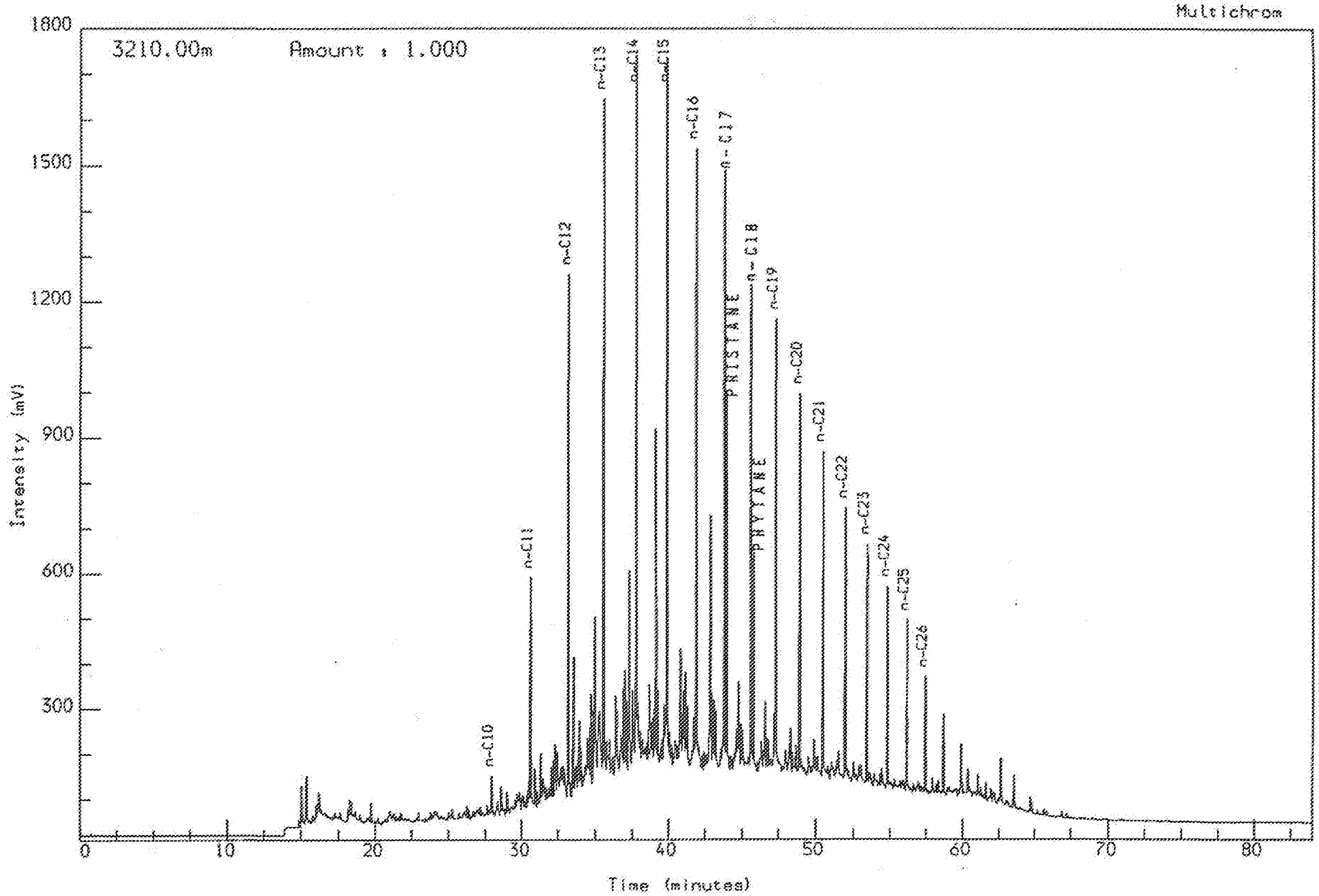


WELL NOCS 2/8-14 3180.00m cut
THERMAL EXTRACTION GC (S1)
Ca: or gy to lt or gy

Reported on 12-MAR-1991 at 09:06

GEOLAB NOR

Analysis Name : [526097] 26 PE34B,2,1.

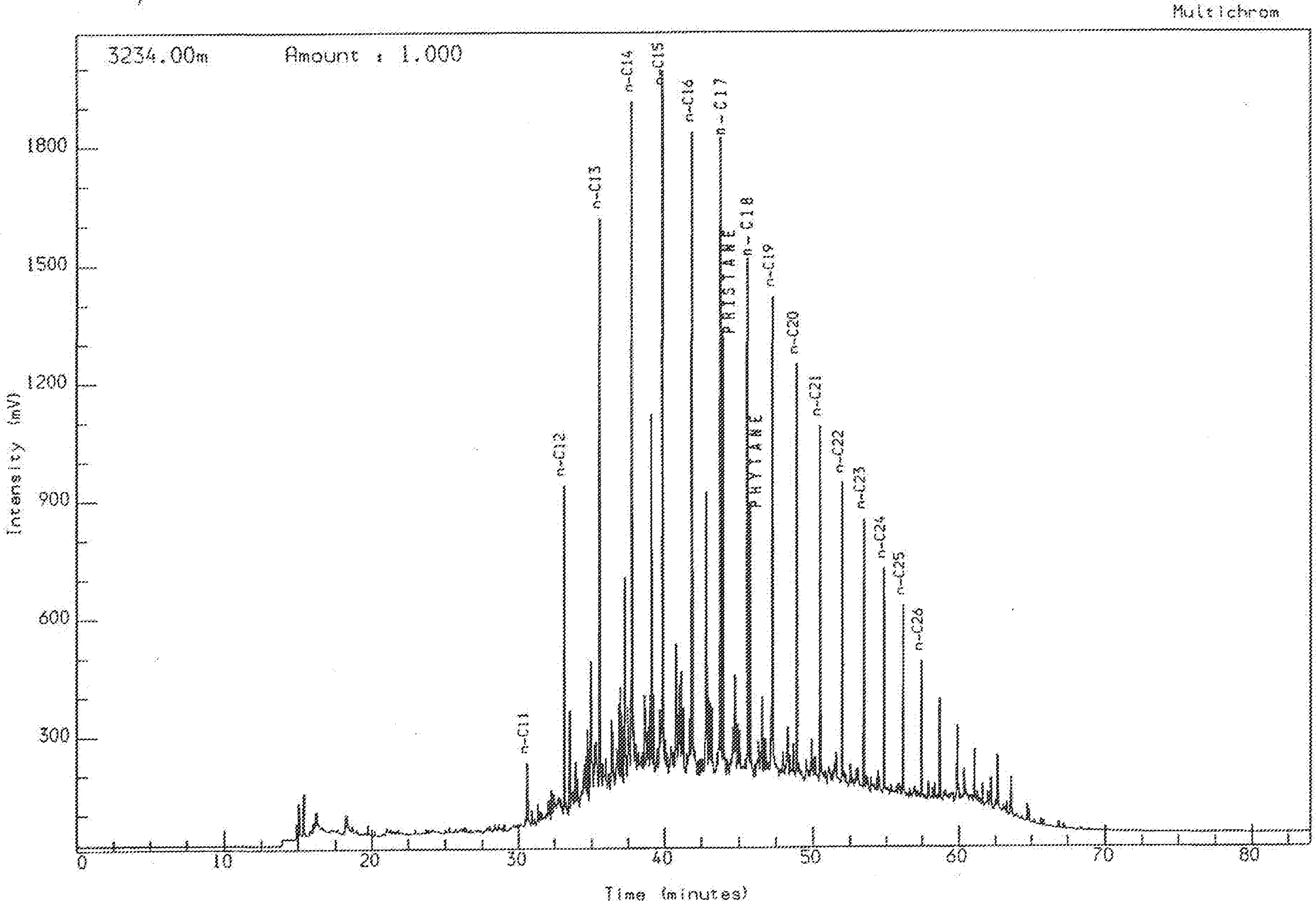


WELL NOCS 2/8-14 3210.00m cut
THERMAL EXTRACTION GC (S1)
Sh/Clst: brn gy to gy brn to drk gy

Reported on 12-MAR-1991 at 09:08

GEOLAB NOR

Analysis Name : [526097] 26 PE34B.3.1.

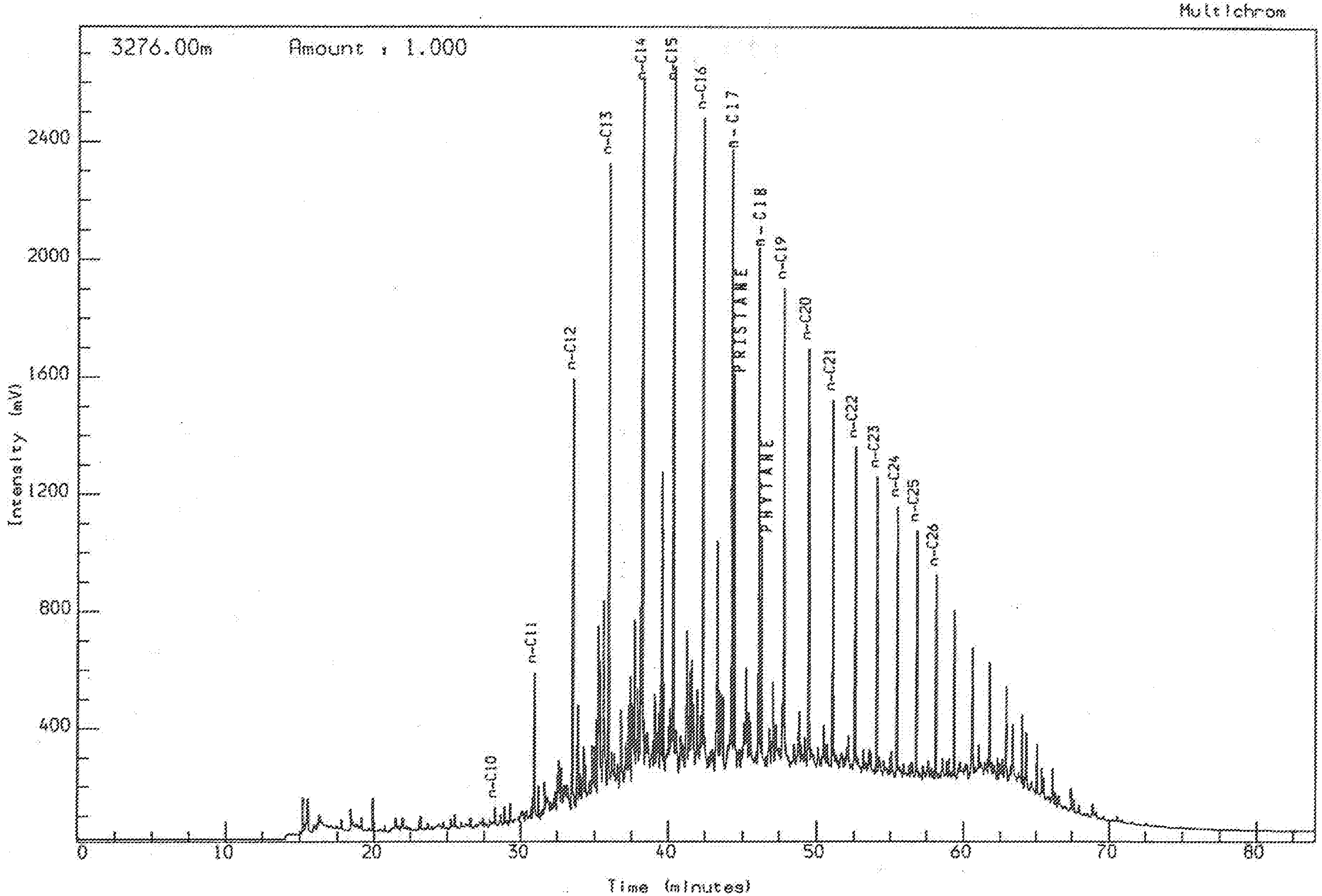


WELL NOCS 2/8-14 3234.00m cut
THERMAL EXTRACTION GC (S1)
Sh/Clst: brn gy to gy brn

Reported on 12-MAR-1991 at 09:09

GEOLAB NOR

Analysis Name : [526097] 26 PE34B.4.1.

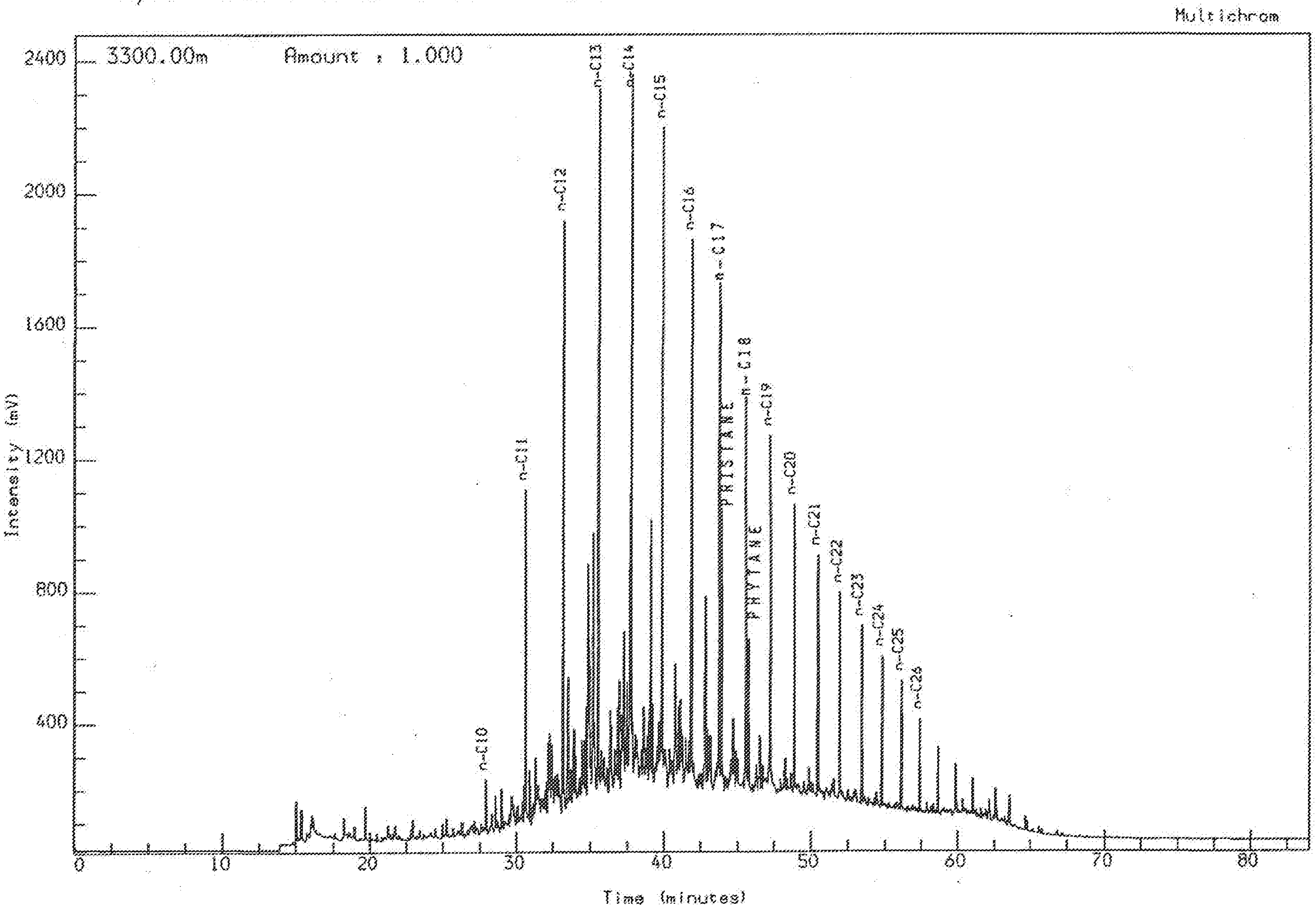


WELL NOCS 2/8-14 3276.00m cut
THERMAL EXTRACTION GC (S1)
Sh/Clst: brn gy to drk gy

Reported on 12-MAR-1991 at 09:10

GEOLAB NOR

Analysis Name : [526097] 26 PE34B,5,1.

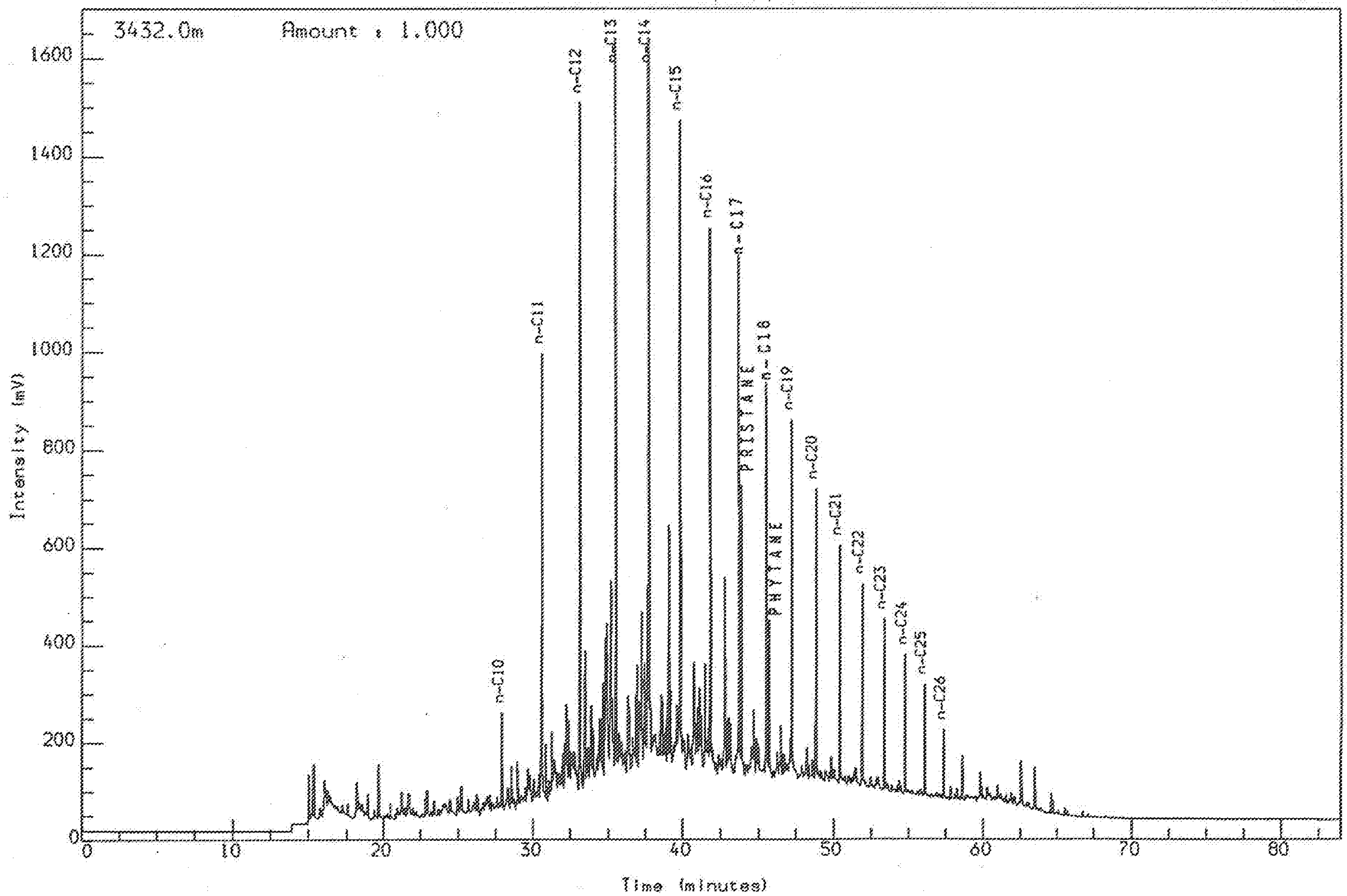


WELL NOCS 2/8-14 3300.00m cut
THERMAL EXTRACTION GC (S1)
Sh/Clst: brn gy to drk gy

Reported on 12-MAR-1991 at 09:11

GEOLAB NOR

Analysis Name : [526097] 26 PE34A.10.1.

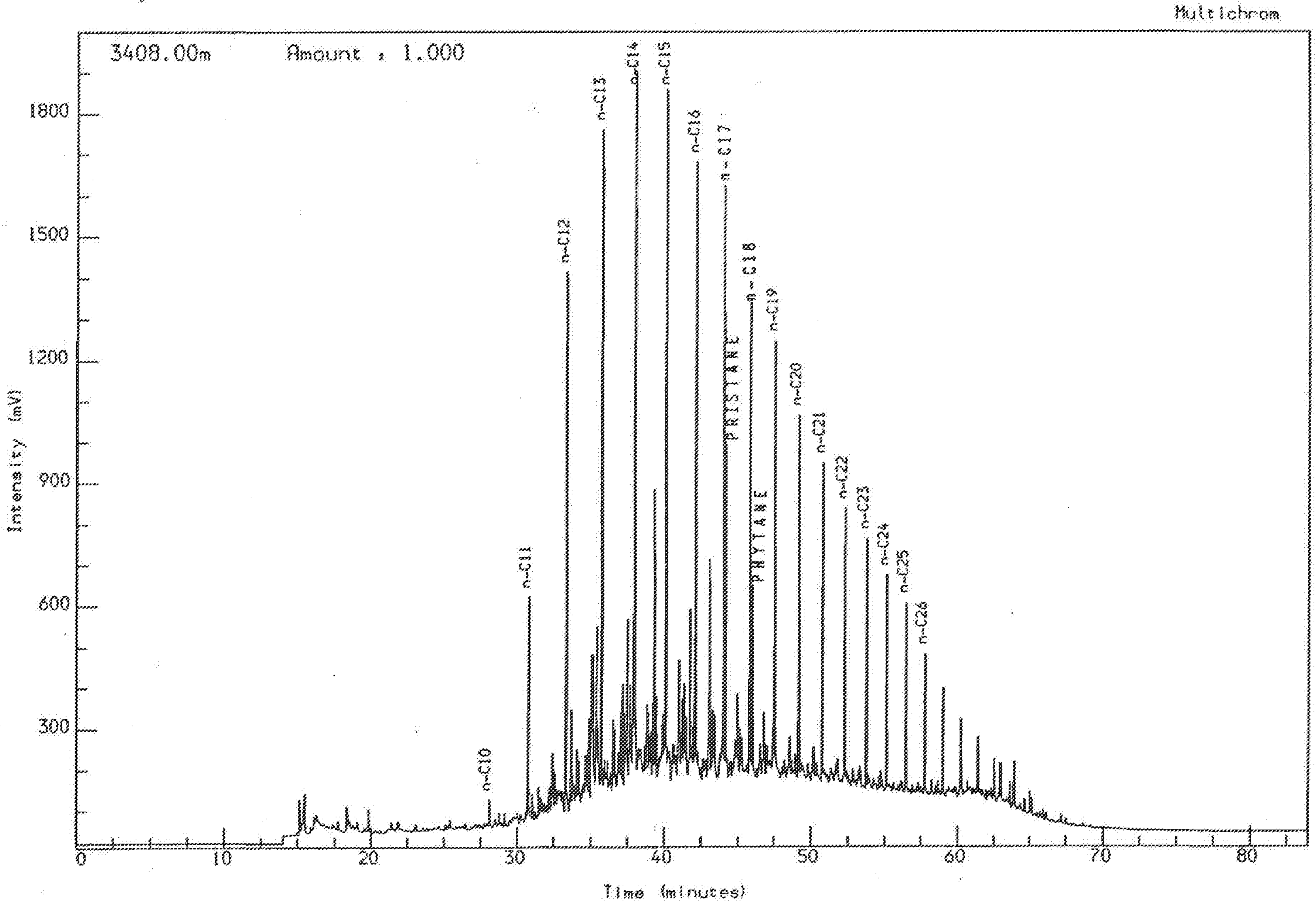


WELL NOCS 2/8-14 3408.00m cut
THERMAL EXTRACTION GC (S1)
Sh/Clst: brn gy to m gy to drk gy

Reported on 11-MAR-1991 at 13:17

GEOLAB NOR

Analysis Name : [526097] 26 PE34C,10,1.



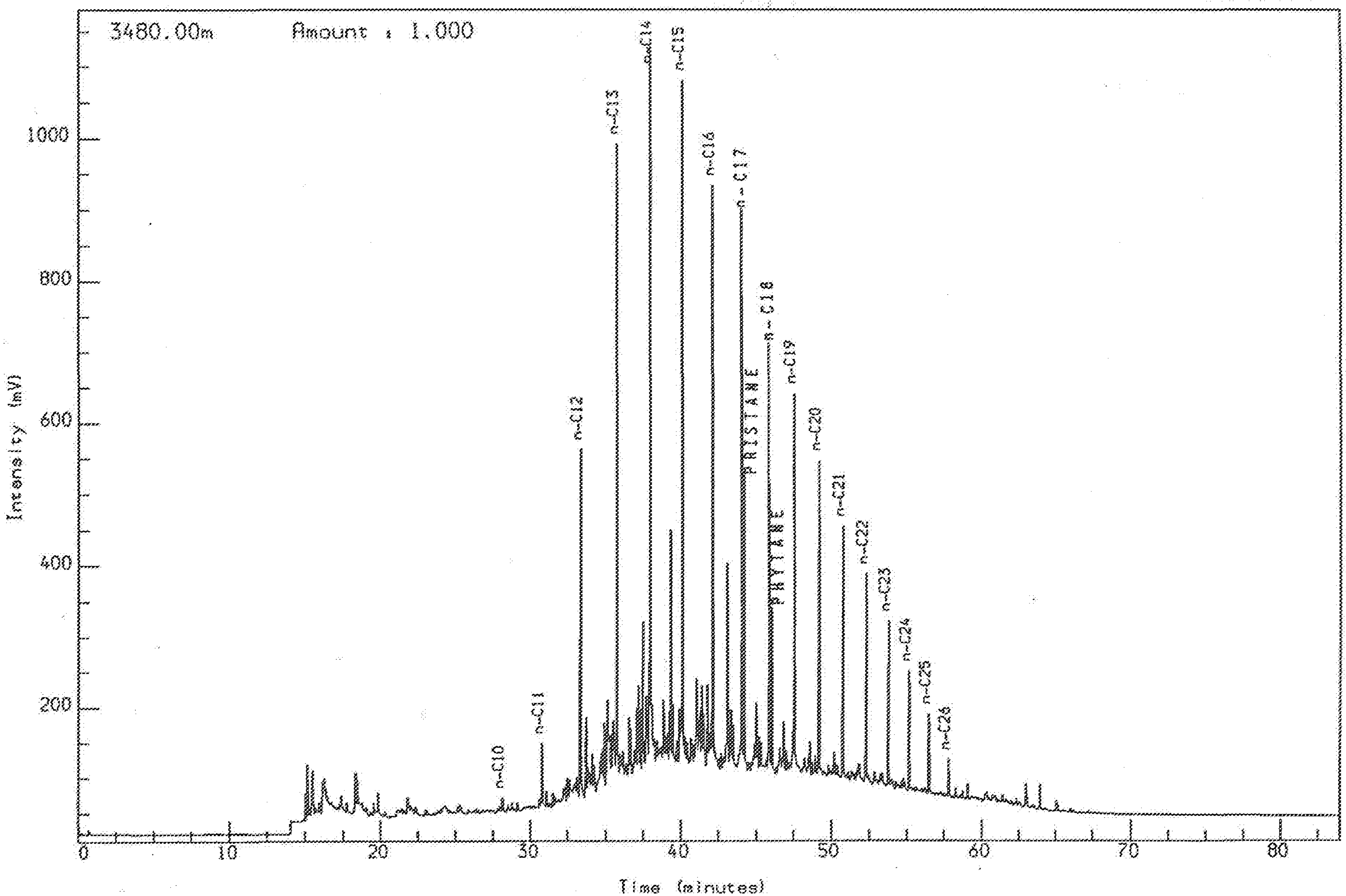
WELL NOCS 2/8-14 3432.00m cut
THERMAL EXTRACTION GC (S1)
Sh/Clst: m gy to drk gy to brn gy

Reported on 14-MAR-1991 at 09:34

GEOLAB NOR GECO

Analysis Name : [526097] 26 PE34B,7,1.

Multichrom

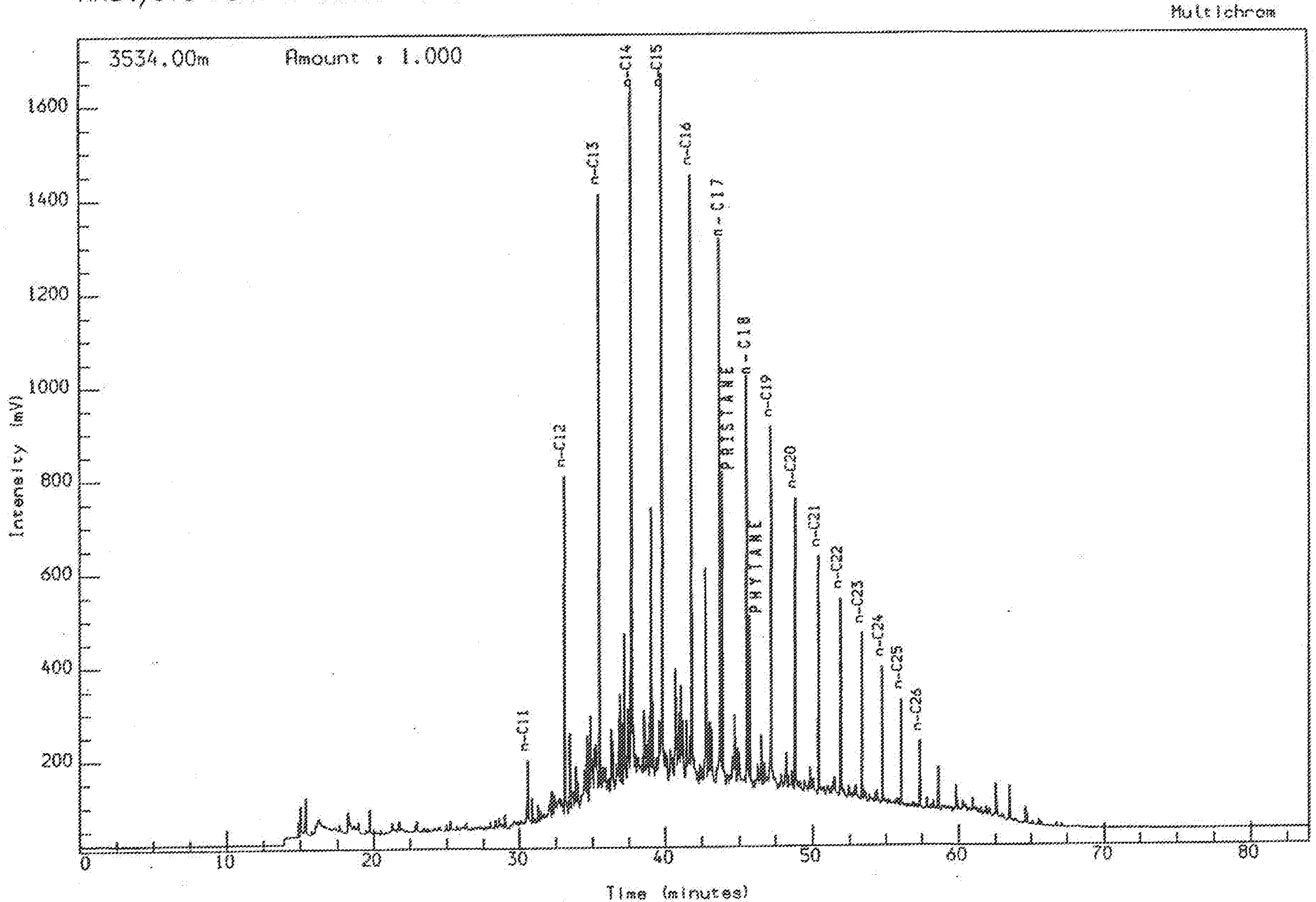


WELL NOCS 2/8-14 3480.00m cut
THERMAL EXTRACTION GC (S1)
Sh/Clst: m gy to drk gy

Reported on 14-MAR-1991 at 09:36

GEOLAB NOR

Analysis Name : [526097] 26 PE34B.8.1.

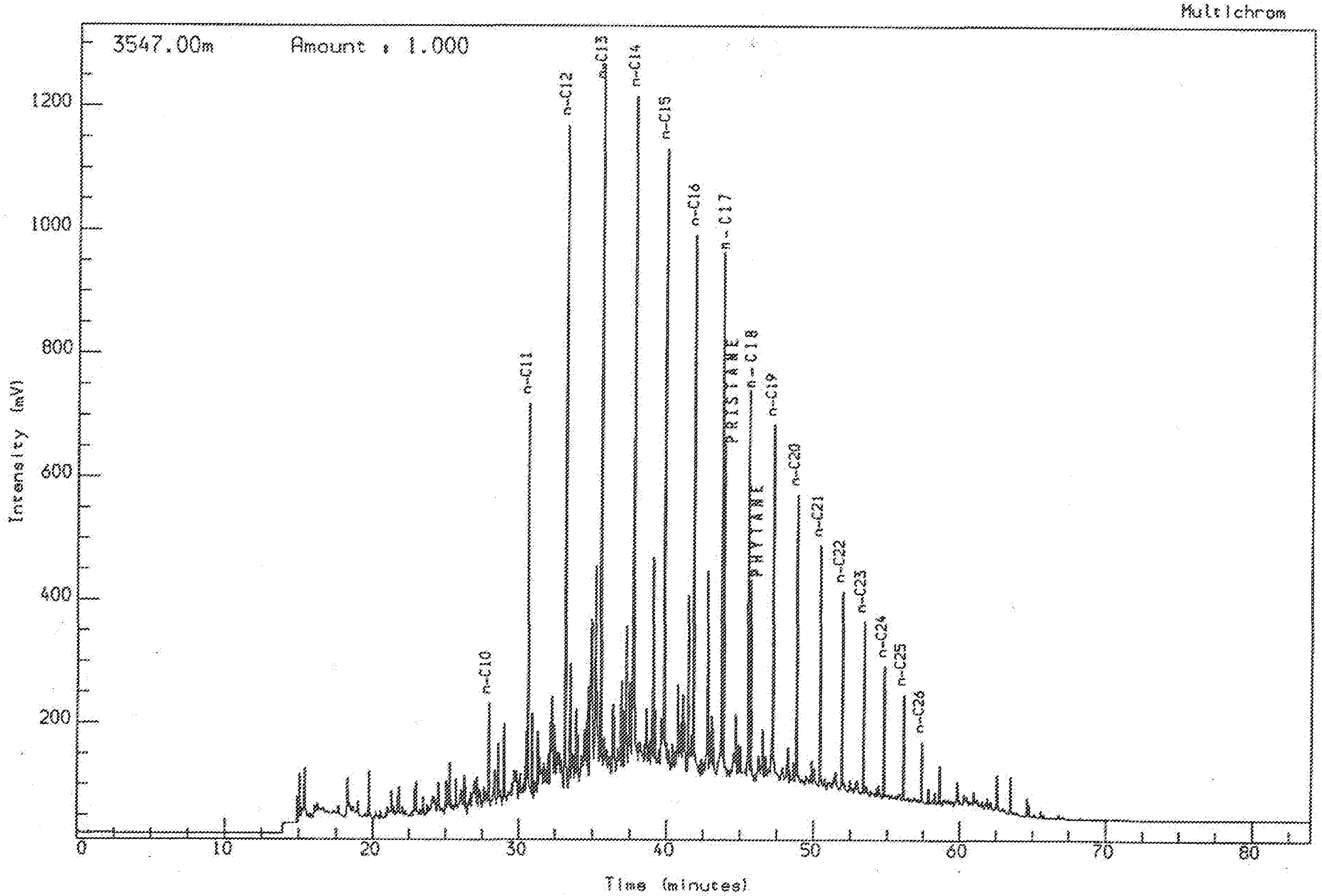


WELL NOCS 2/8-14 3534.00m cut
THERMAL EXTRACTION GC (S1)
Sh/Clst: drk gy to brn gy to brn blk

Reported on 14-MAR-1991 at 09:37

GEOLAB NOR

Analysis Name : [526097] 26 PE34B,9,1.

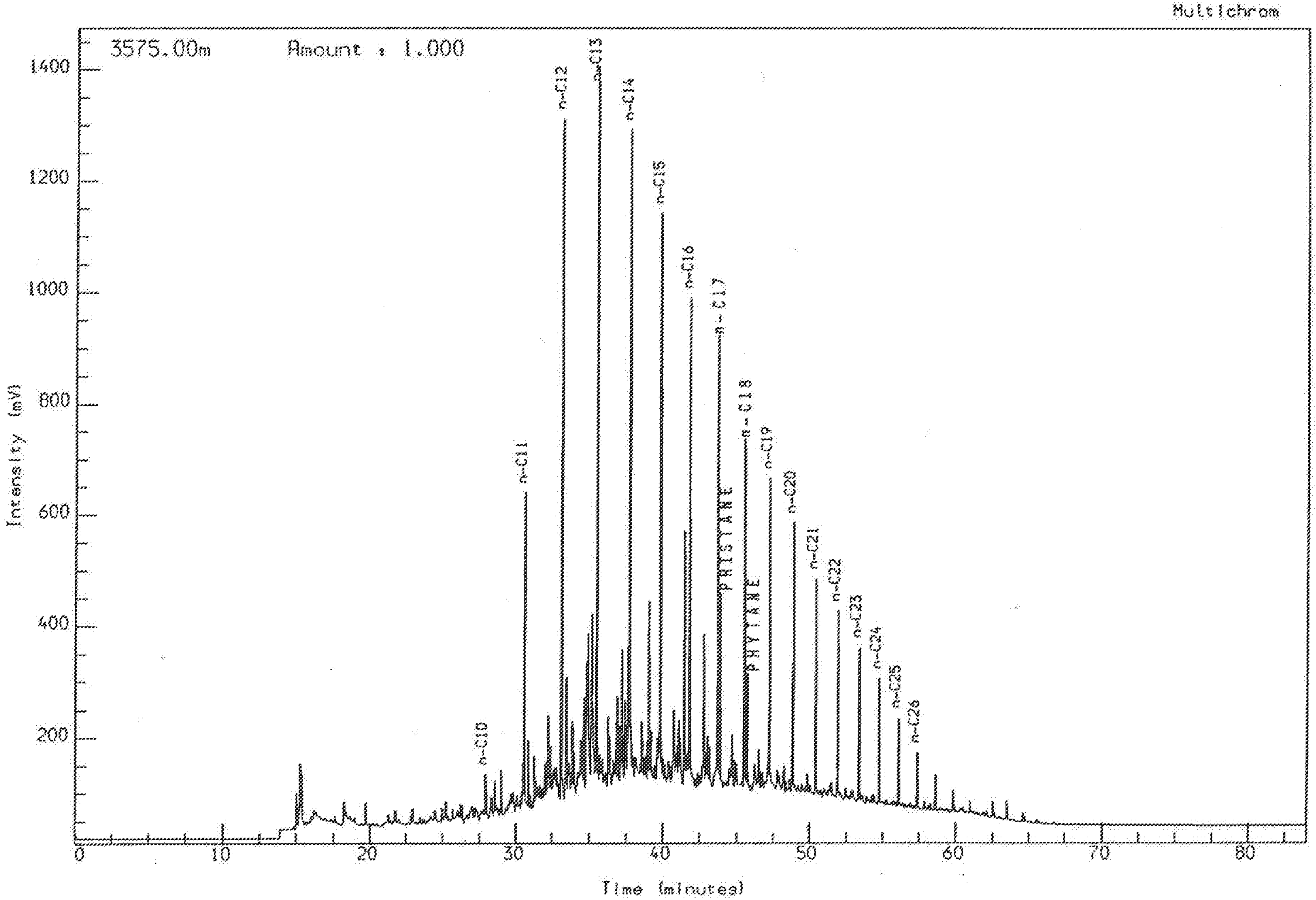


WELL NOCS 2/8-14 3547.00m swc
THERMAL EXTRACTION GC (S1)
Sh/Clst: drk gy to brn blk

Reported on 14-MAR-1991 at 09:38

GEOLAB NOR

Analysis Name : [526097] 26 PE34B,10,1.

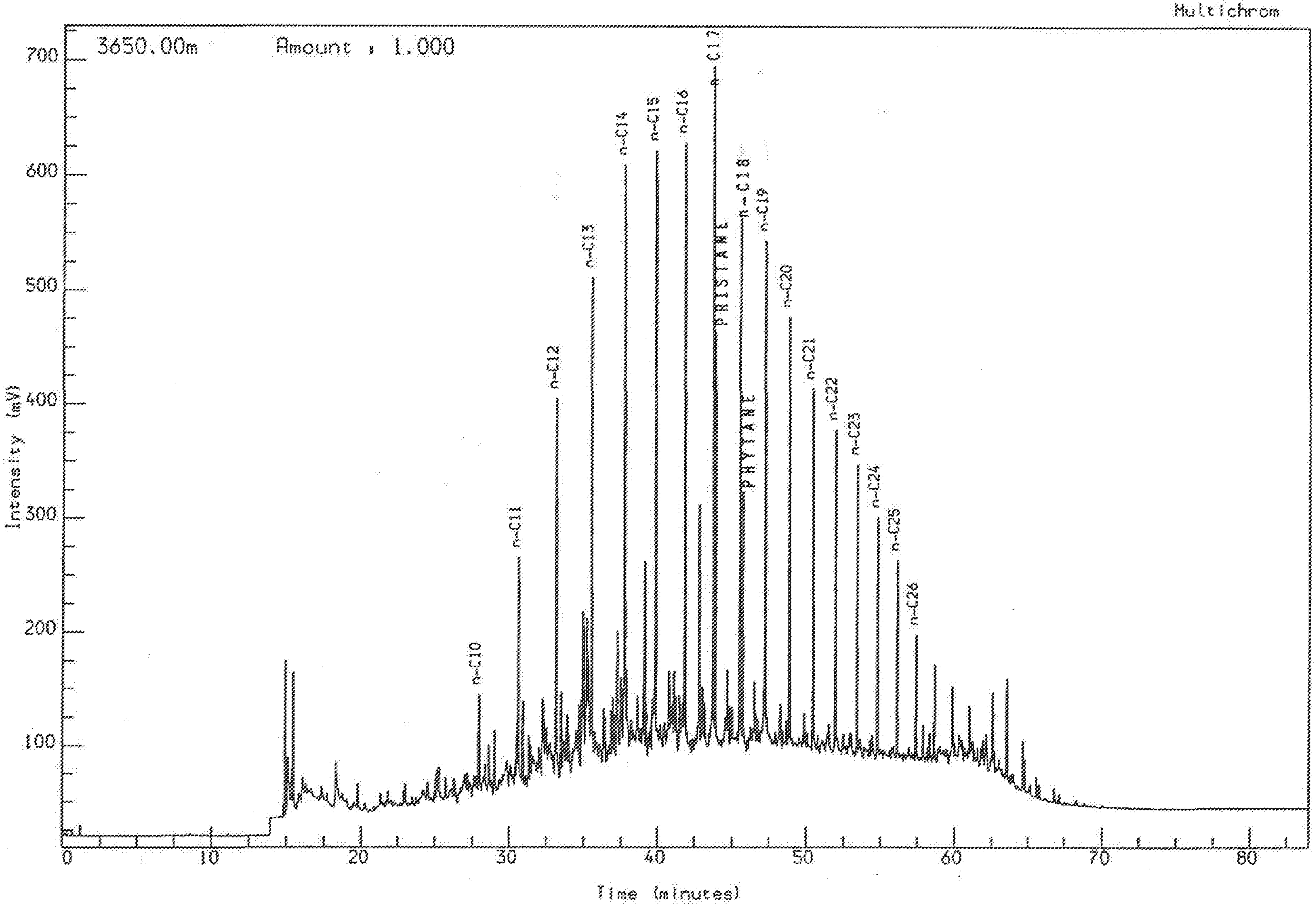


WELL NOCS 2/8-14 3575.00m swc
THERMAL EXTRACTION GC (S1)
Sh/Clst: drk gy to brn blk

Reported on 14-MAR-1991 at 09:39

GEOLAB NOR

Analysis Name : [526097] 26 PE34C,1,1.

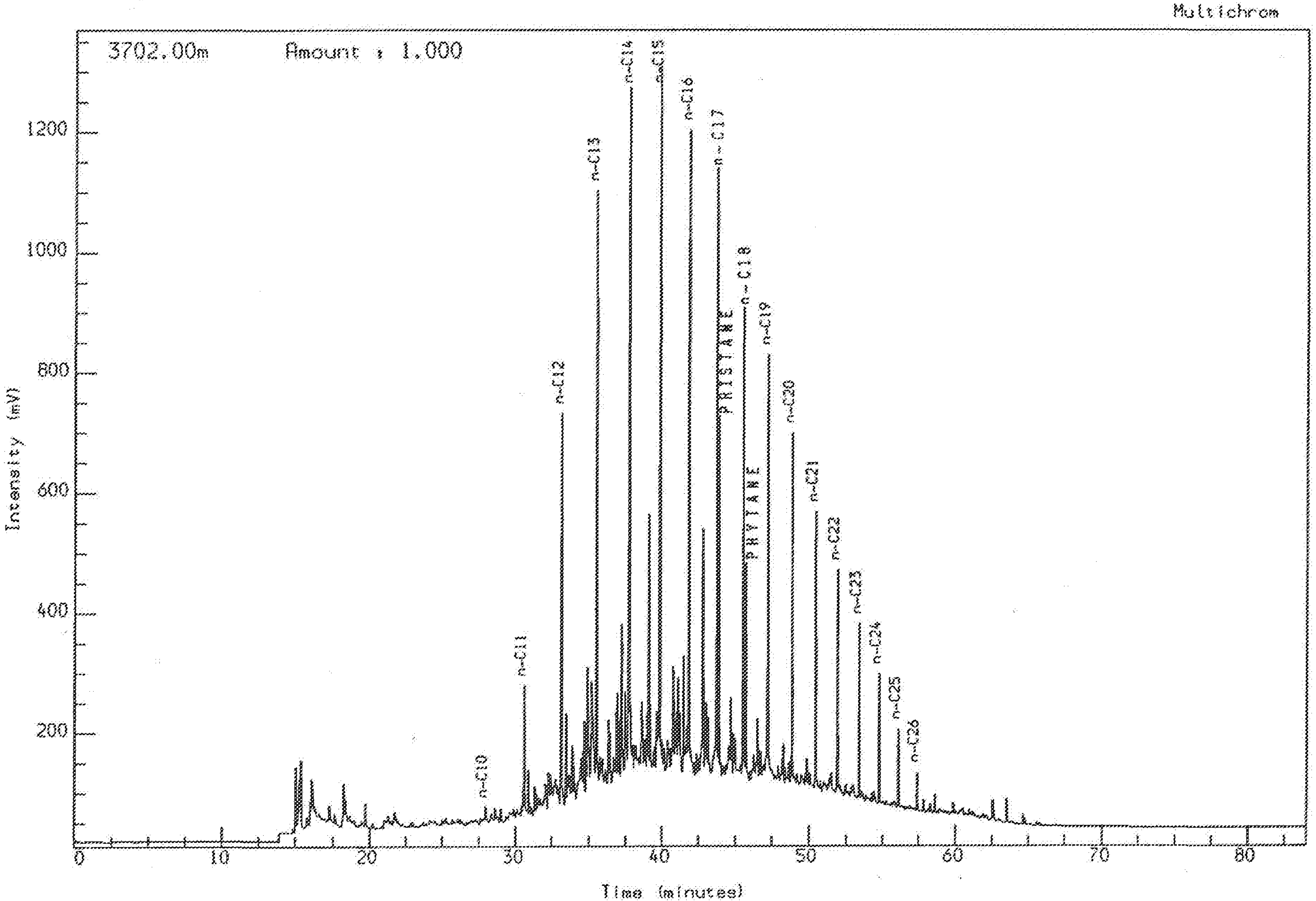


WELL NOCS 2/8-14 3650.00m swc
THERMAL EXTRACTION GC (S1)
Sh/Clst: drk gy to brn blk

Reported on 14-MAR-1991 at 09:43

GEOLAB NOR GECO

Analysis Name : [526097] 26 PE34C,2,1.

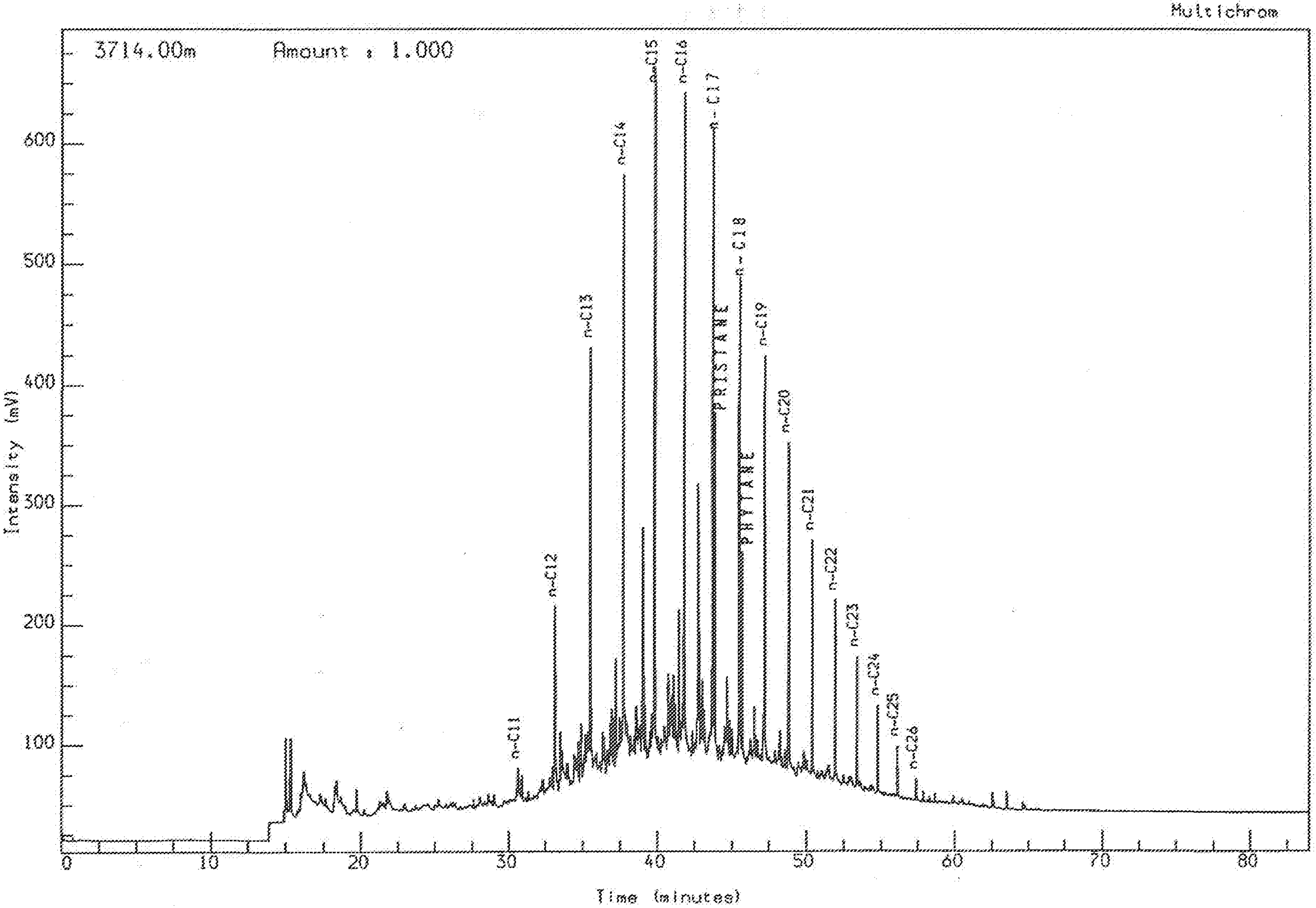


WELL NOCS 2/8-14 3702.00m cut
THERMAL EXTRACTION GC (S1)
Sh/Clst: brn gy to drk gy to brn blk

Reported on 14-MAR-1991 at 09:44

GEOLAB NOR

Analysis Name : [526097] 26 PE34C,3,1.



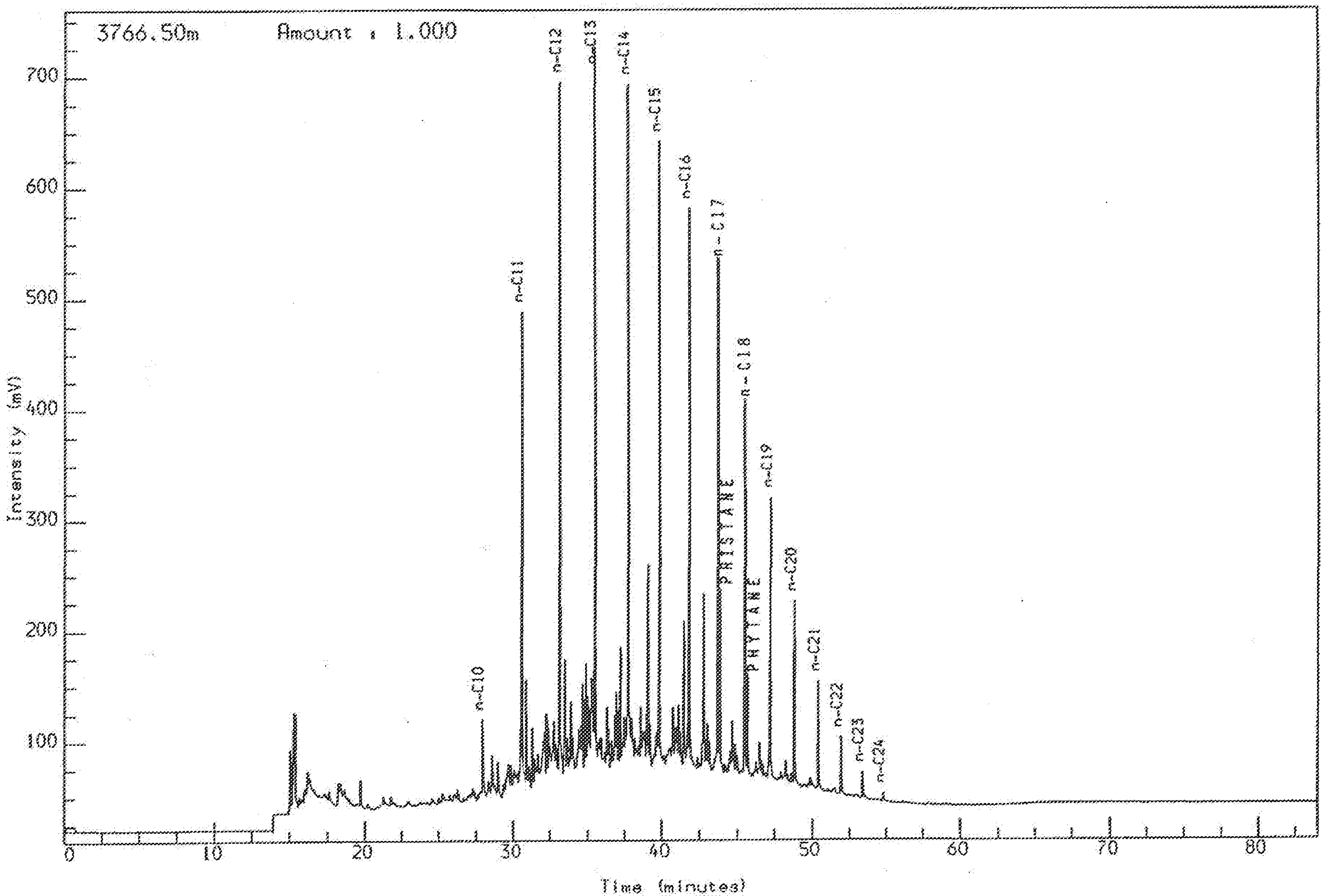
WELL NOCS 2/8-14 3714.00m cut
THERMAL EXTRACTION GC (S1)
Sh/Clst: brn gy to drk gy to brn blk

Reported on 14-MAR-1991 at 09:45

GEOLAB NOR GECO

Analysis Name : [526097] 26 PE34C.4.1.

Multichrom



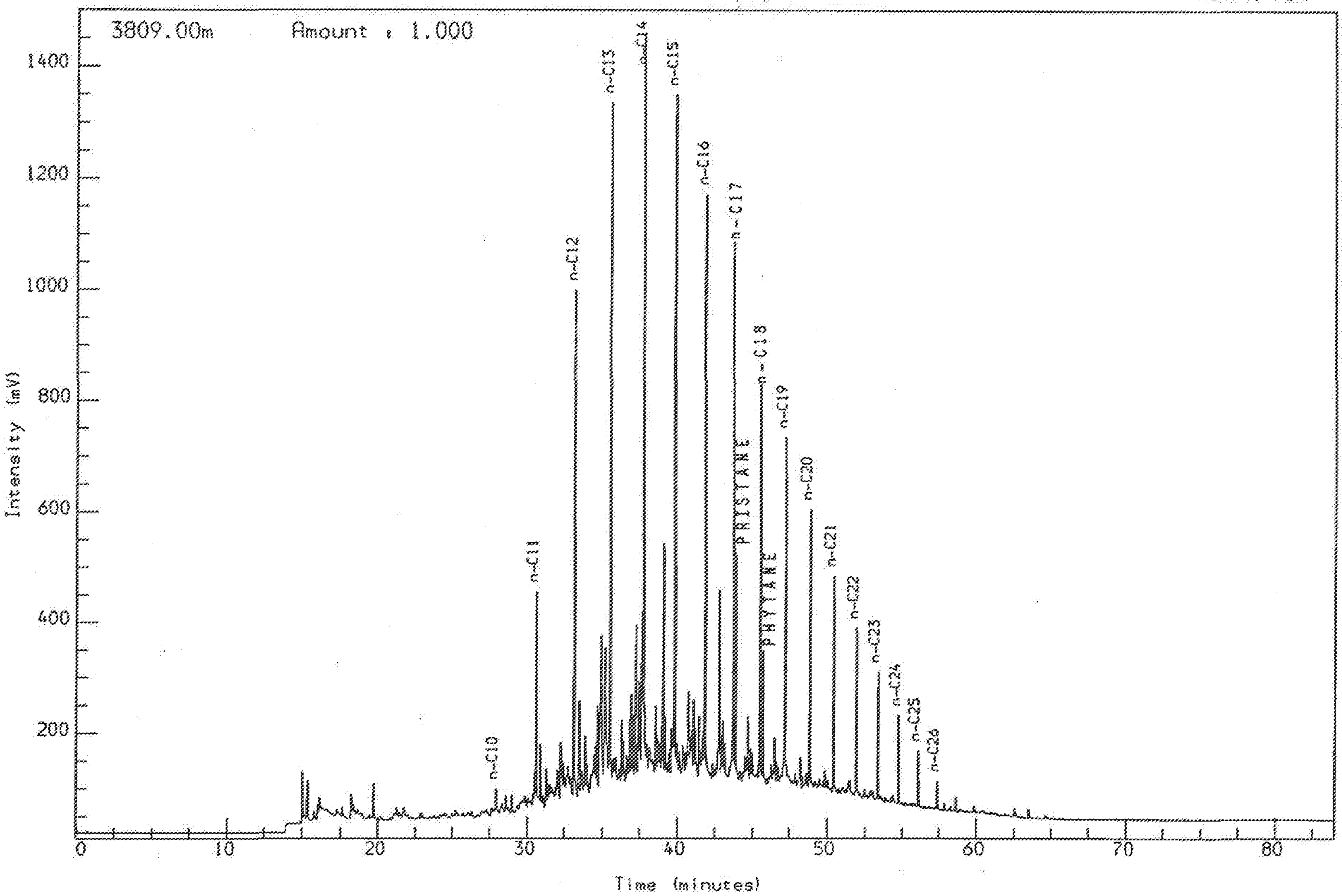
WELL NOCS 2/8-14 3766.50m swc
THERMAL EXTRACTION GC (S1)
Sh/Clst: drk gy to brn blk

Reported on 14-MAR-1991 at 09:46

GEOLAB NOR

Analysis Name : [526097] 26 PE34C,5,1.

Multichrom

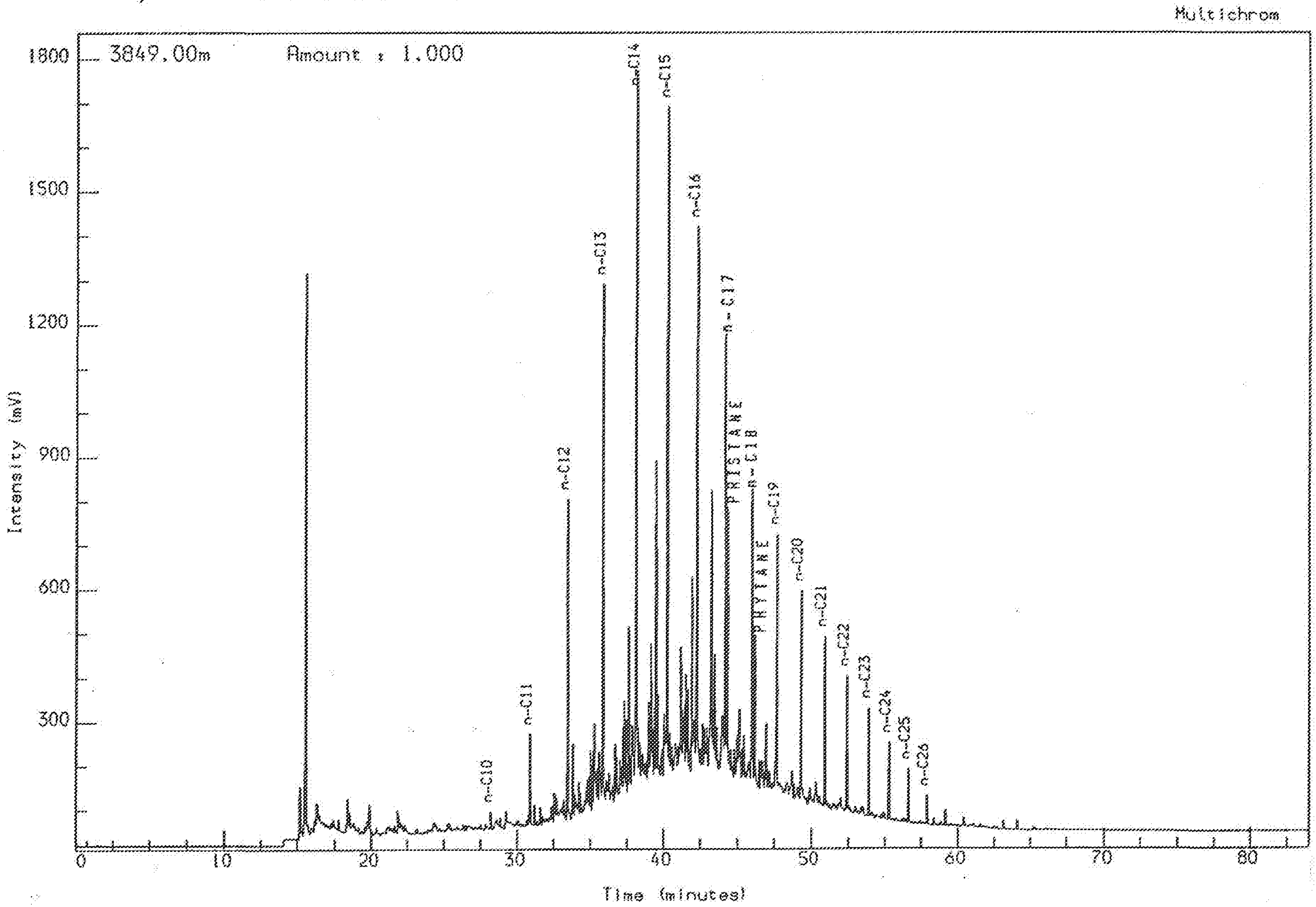


WELL NOCS 2/8-14 3809.00m cut
THERMAL EXTRACTION GC (S1)
Sh/Clst: drk gy to brn blk

Reported on 14-MAR-1991 at 09:47

GEOLAB NOR

Analysis Name : [526097] 26 PE34E,3,1.

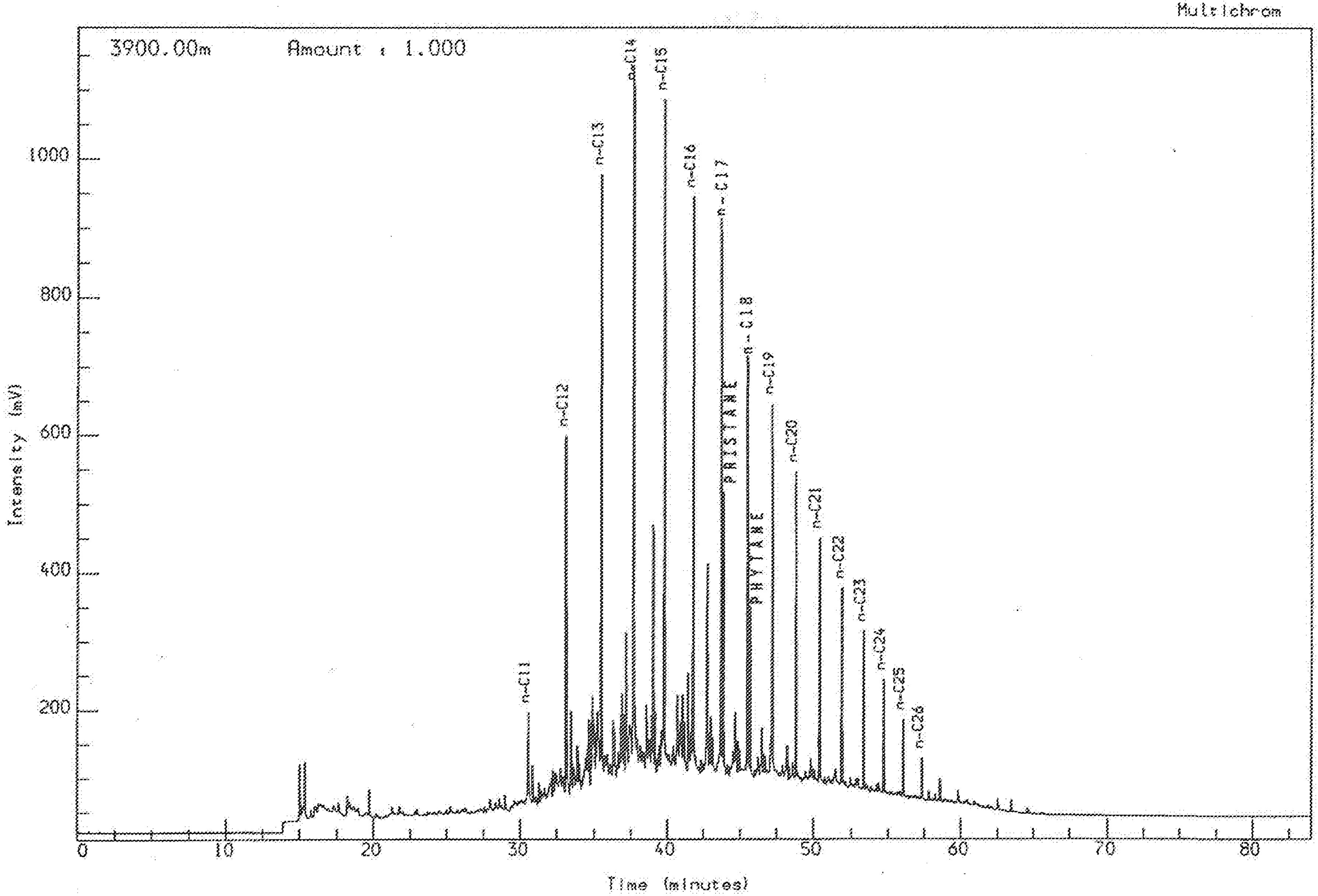


WELL NOCS 2/8-14 3849m cut
THERMAL EXTRACTION GC (S1)
SH/CLST:drk gy

Reported on 19-MAR-1991 at 09:37

GEOLAB NOR

Analysis Name : [526097] 26 PE34C.6.1.

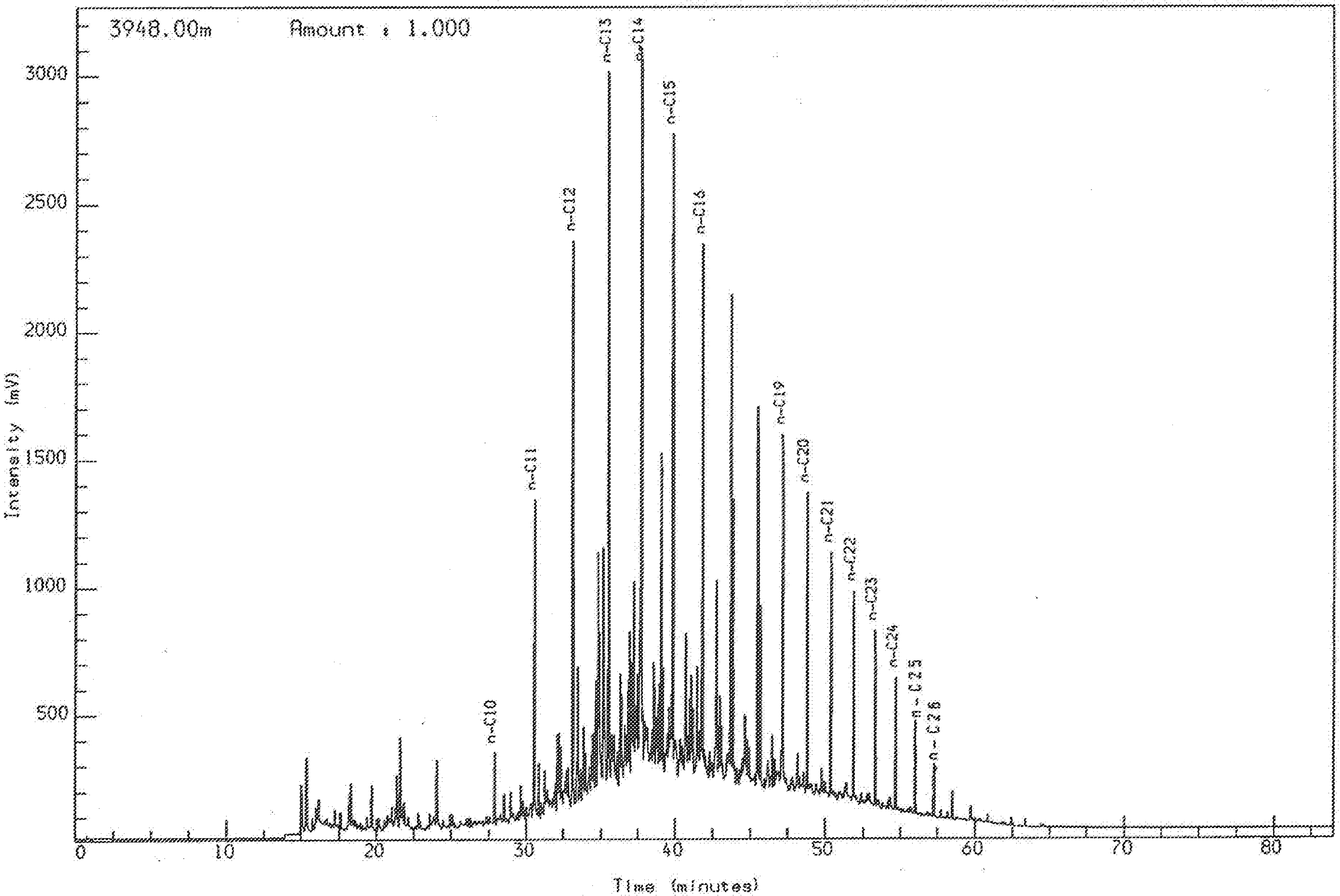


WELL NOCS 2/8-14 3900.00m cut
THERMAL EXTRACTION GC (S1)
Sh/Clst: drk gy

Reported on 14-MAR-1991 at 09:48

GEOLAB NOR

Analysis Name : [526097] 26 PE34E.4,1.

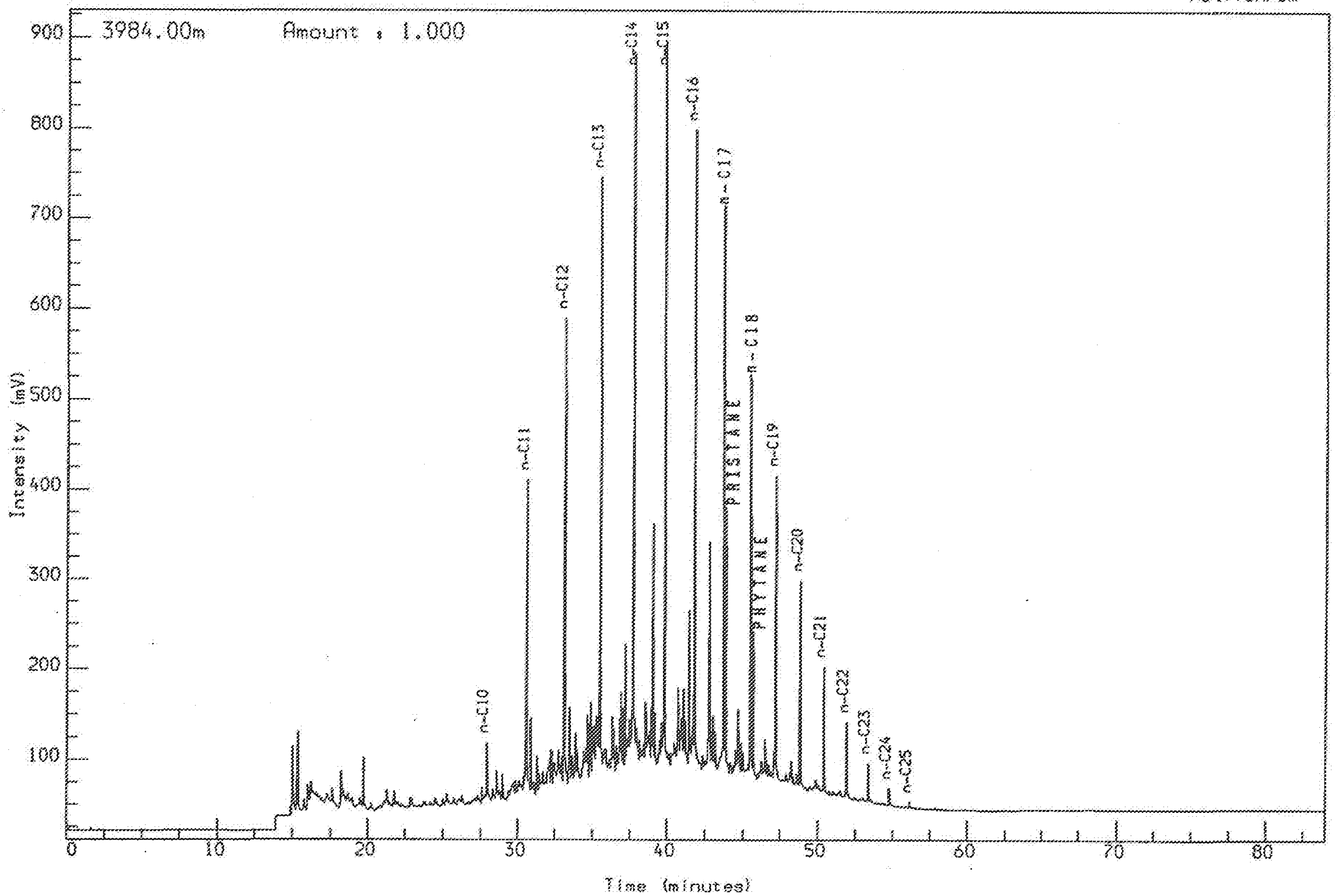


WELL NOCS 2/8-14 3948.00m cut
THERMAL EXTRACTION GC (S1)
Sh/Clst: drk gy

Reported on 19-MAR-1991 at 09:38

GEOLAB NOR

Analysis Name : [526097] 26 PE34C.7.1.

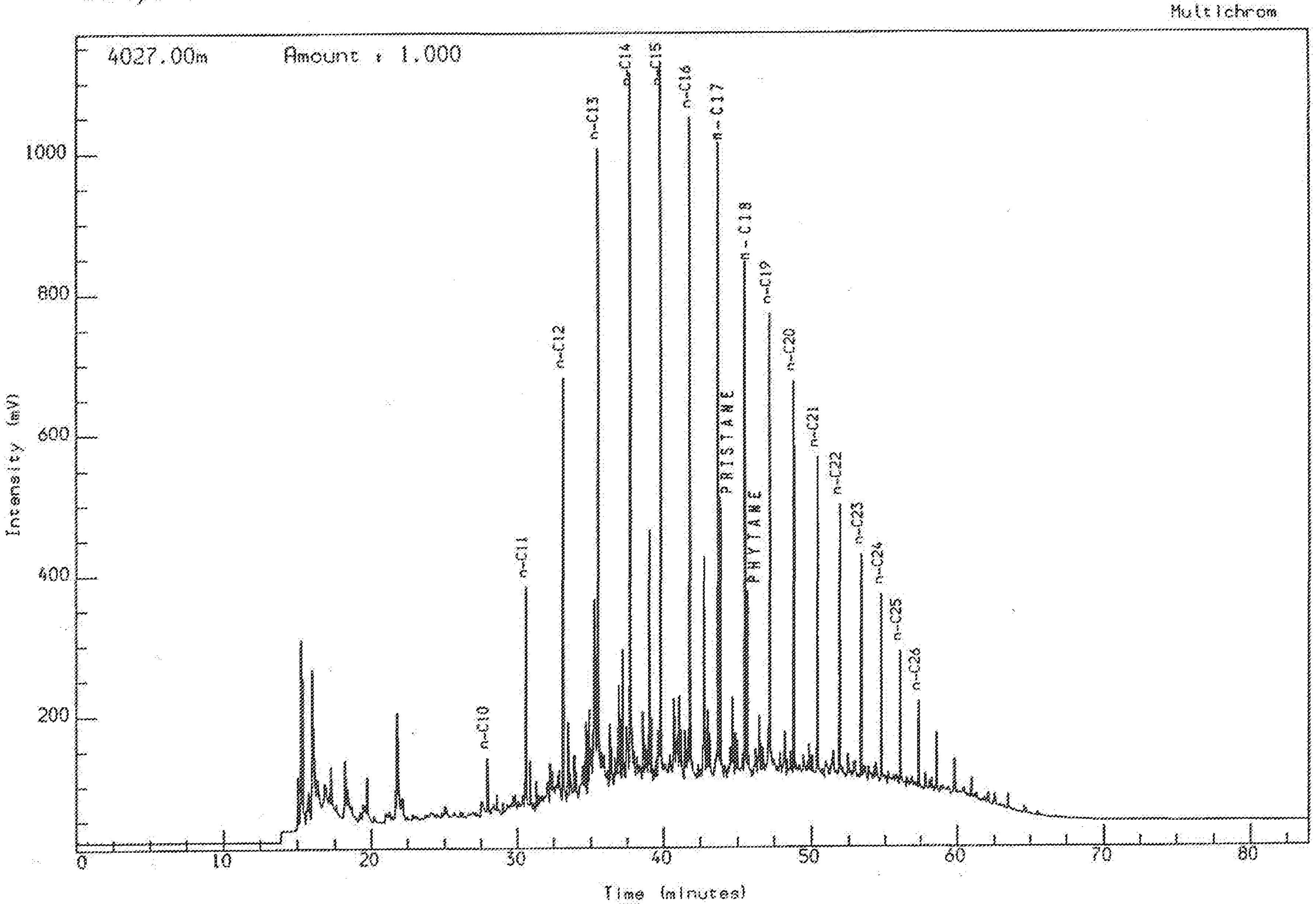


WELL NOCS 2/8-14 3984.00m cut
THERMAL EXTRACTION GC (S1)
Sh/Clst: drk gy to brn blk

Reported on 14-MAR-1991 at 09:49

GEOLAB NOR

Analysis Name : [526097] 26 PE34C,8,1.

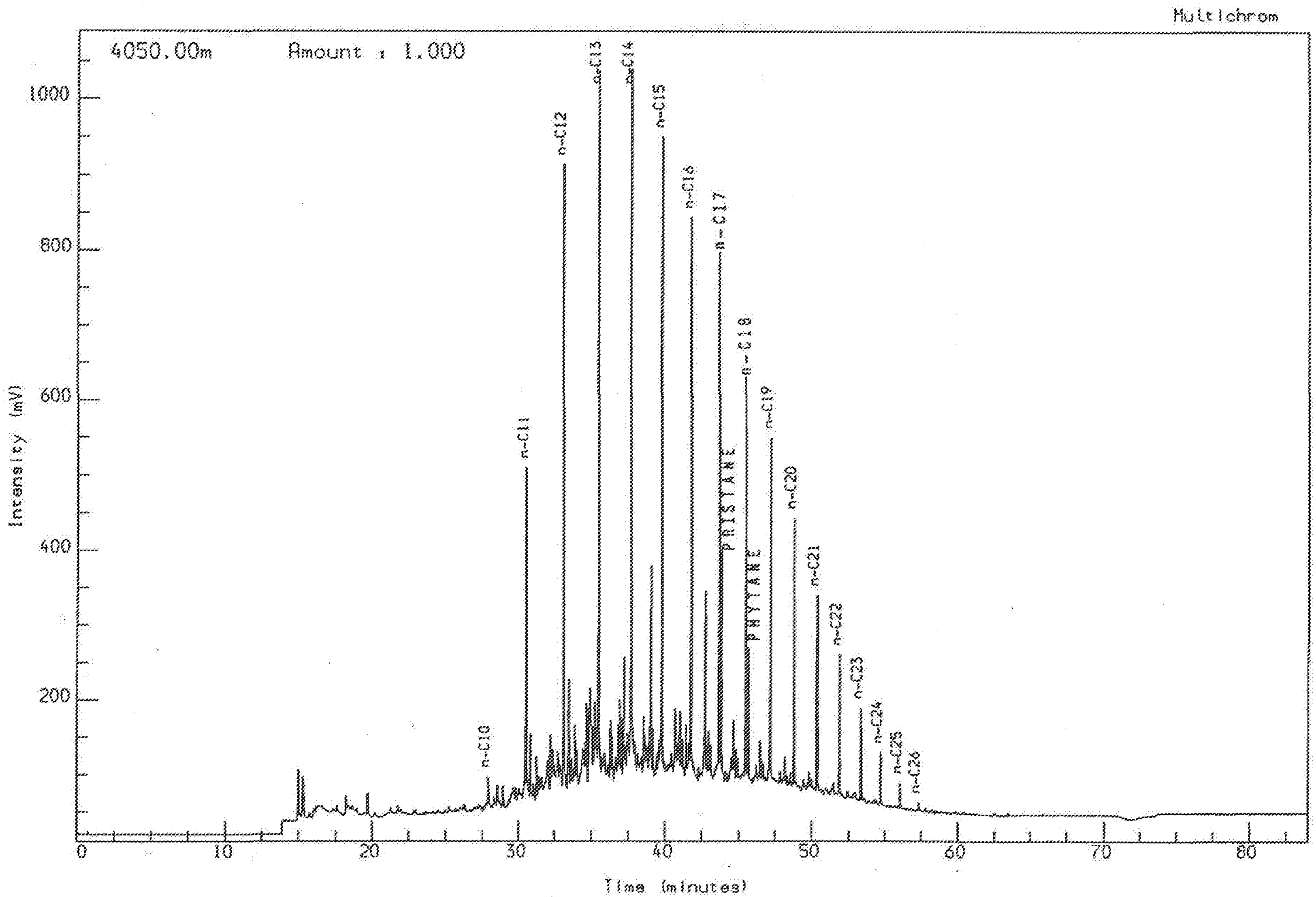


WELL NOCS 2/8-14 4027.00m swc
THERMAL EXTRACTION GC (S1)
Sh/Clst: drk gy to brn blk

Reported on 14-MAR-1991 at 09:50

GEOLAB NOR

Analysis Name : [526097] 26 PE34C,9,1.

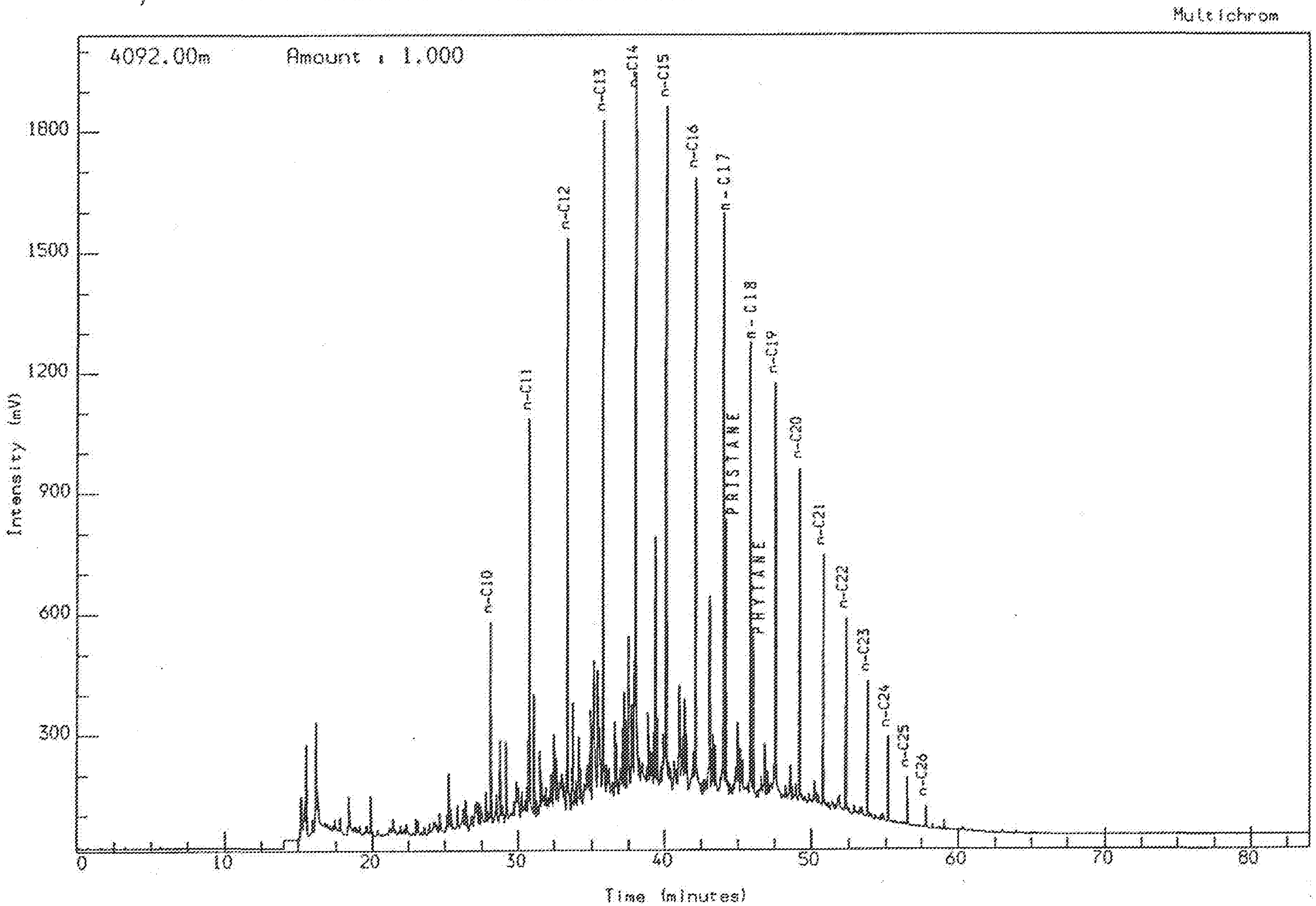


WELL NOCS 2/8-14 4050.00m cut
THERMAL EXTRACTION GC (S1)
Sh/Clst: drk gy to brn blk

Reported on 14-MAR-1991 at 09:51

GEOLAB NOR

Analysis Name : [526097] 26 PE3402251.1.1.

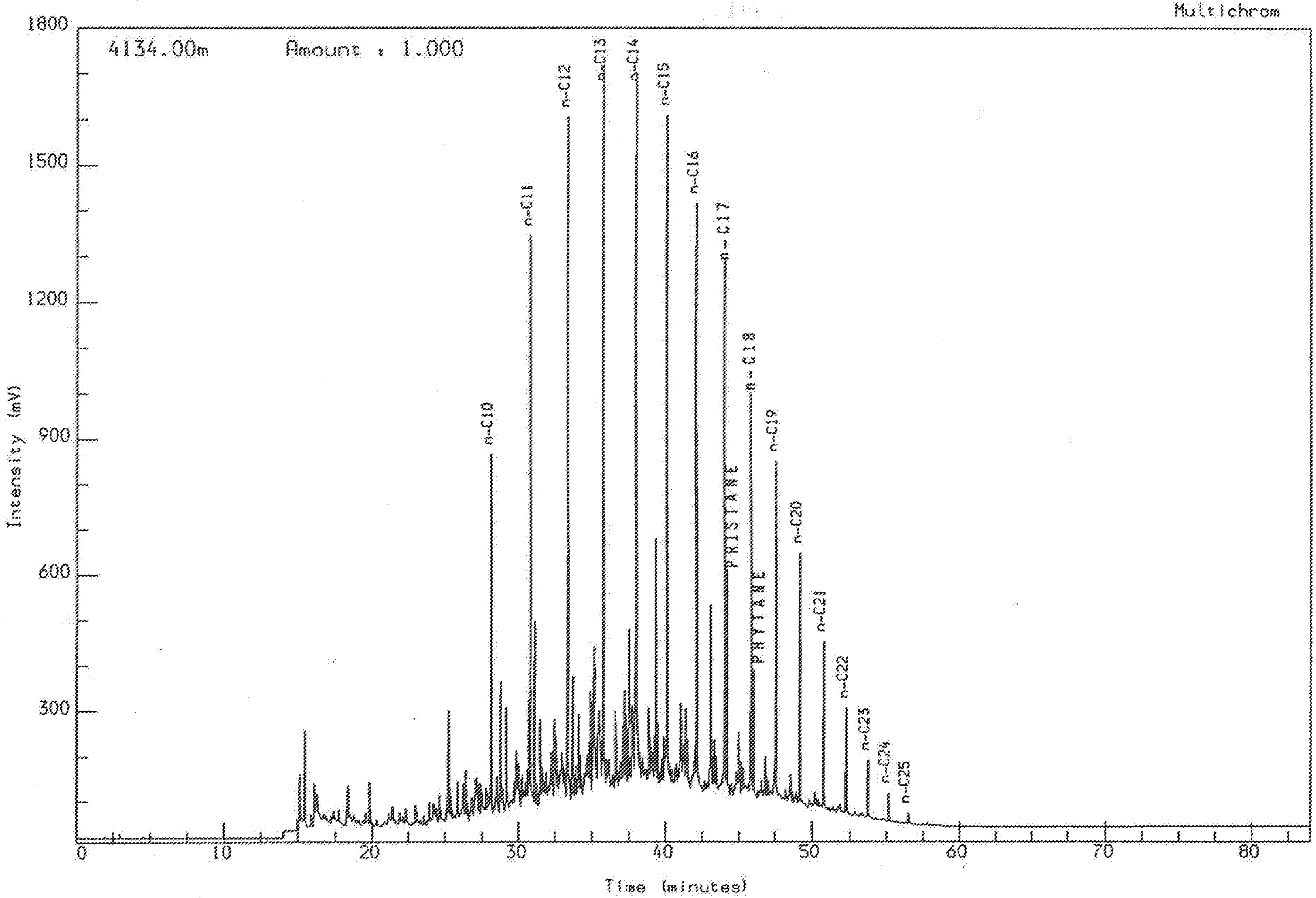


WELL NOCS 2/8-14 4092.00m cut
THERMAL EXTRACTION GC (S1)
Sh/Clst: drk gy to dsk brn to brn bl

Reported on 14-MAR-1991 at 13:12

GEOLAB NOR

Analysis Name : [526097] 26 PE3402321,1,1.

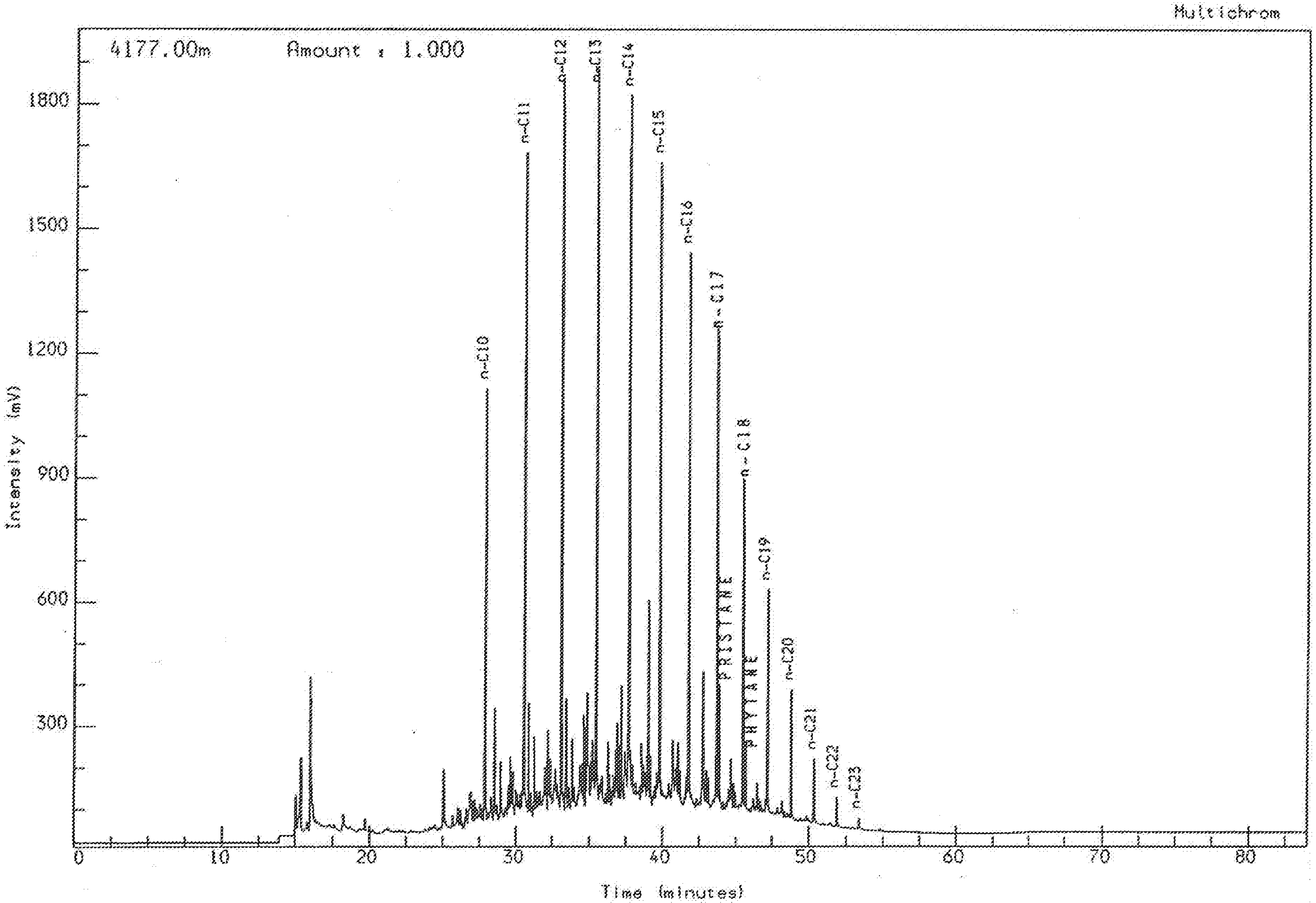


WELL NOCS 2/8-14 4134.00m cut
THERMAL EXTRACTION GC (S1)
Sh/Clst: drk gy to brn blk

Reported on 13-MAR-1991 at 13:20

GEOLAB NOR

Analysis Name : [526097] 26 PE3400271.1.1.

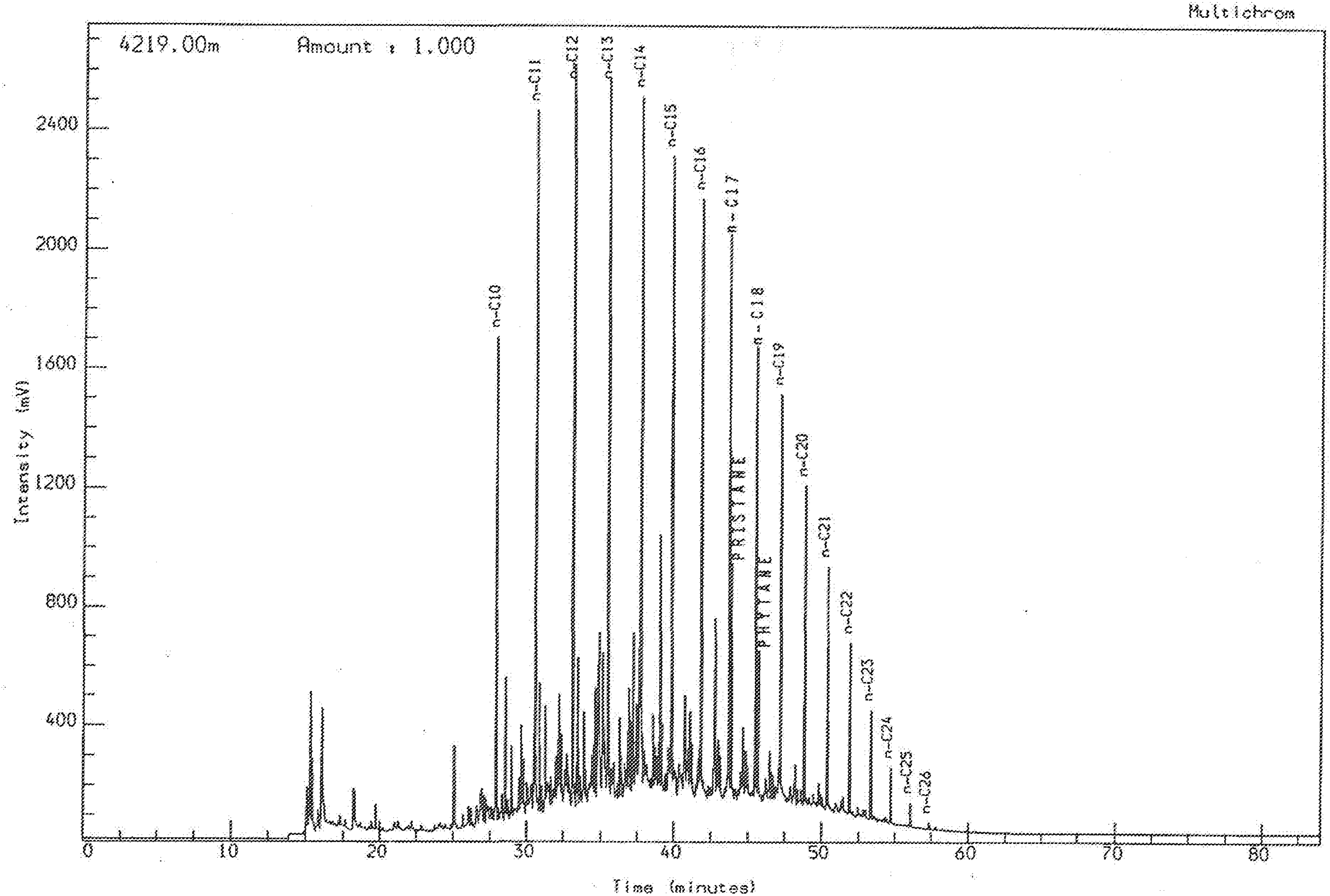


WELL NOCS 2/8-14 4177.00m swc
THERMAL EXTRACTION GC (S1)
Sh/Clst: drk gy to brn blk

Reported on 14-MAR-1991 at 10:03

GEOLAB NOR

Analysis Name : [526097] 26 PE3401781.1.1.

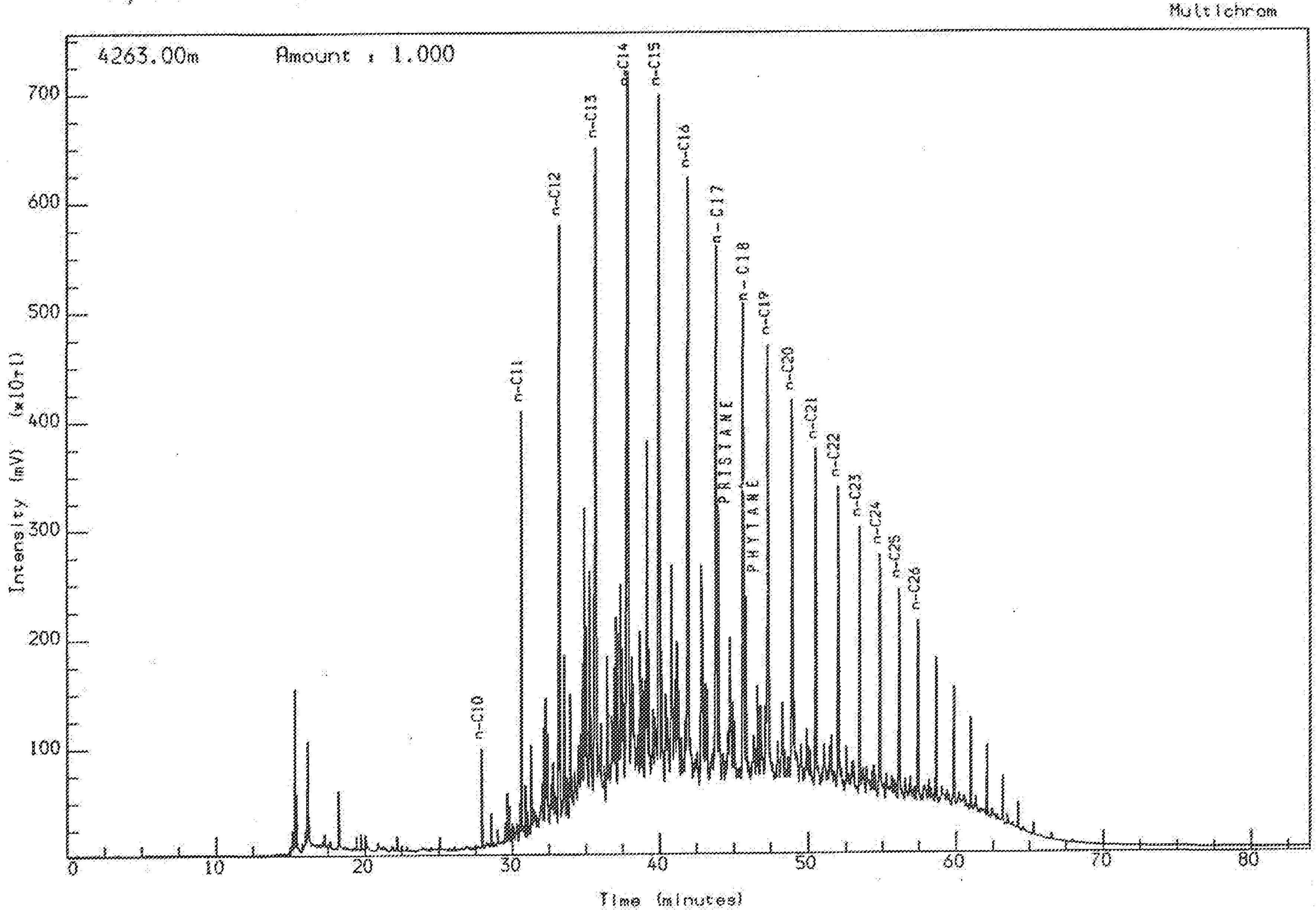


WELL NOCS 2/8-14 4219.00m swc
THERMAL EXTRACTION GC (S1)
Sh/Clst: brn blk

Reported on 14-MAR-1991 at 10:06

GEOLAB NOR

Analysis Name : [526097] 26 PE340176lB,1,1.

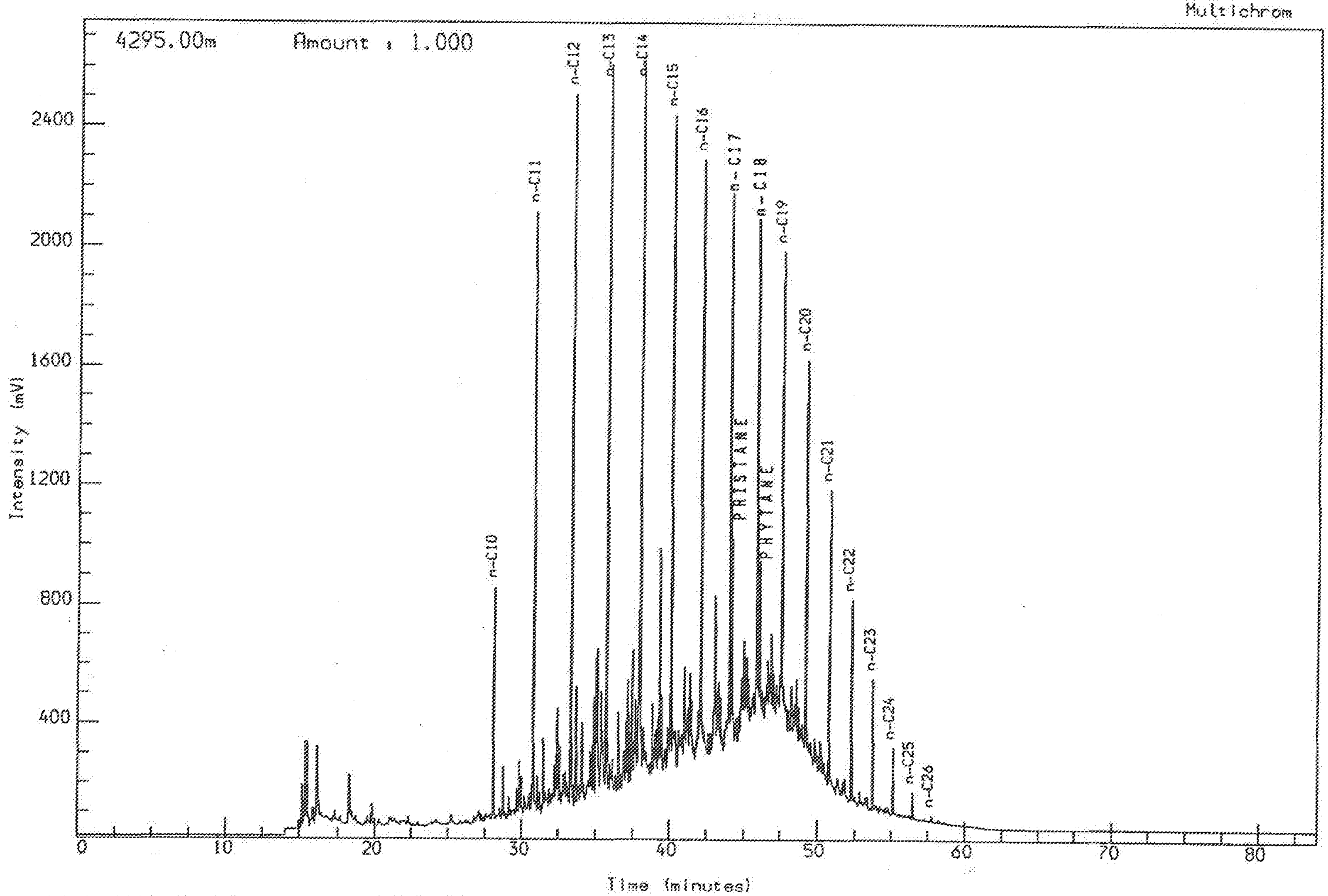


WELL NOCS 2/8-14 4263.00m swc
THERMAL EXTRACTION GC (S1)
Sh/Clst: brn blk to drk gy

Reported on 19-MAR-1991 at 13:12

GEOLAB NOR

Analysis Name : [526097] 26 PE340,2,1.

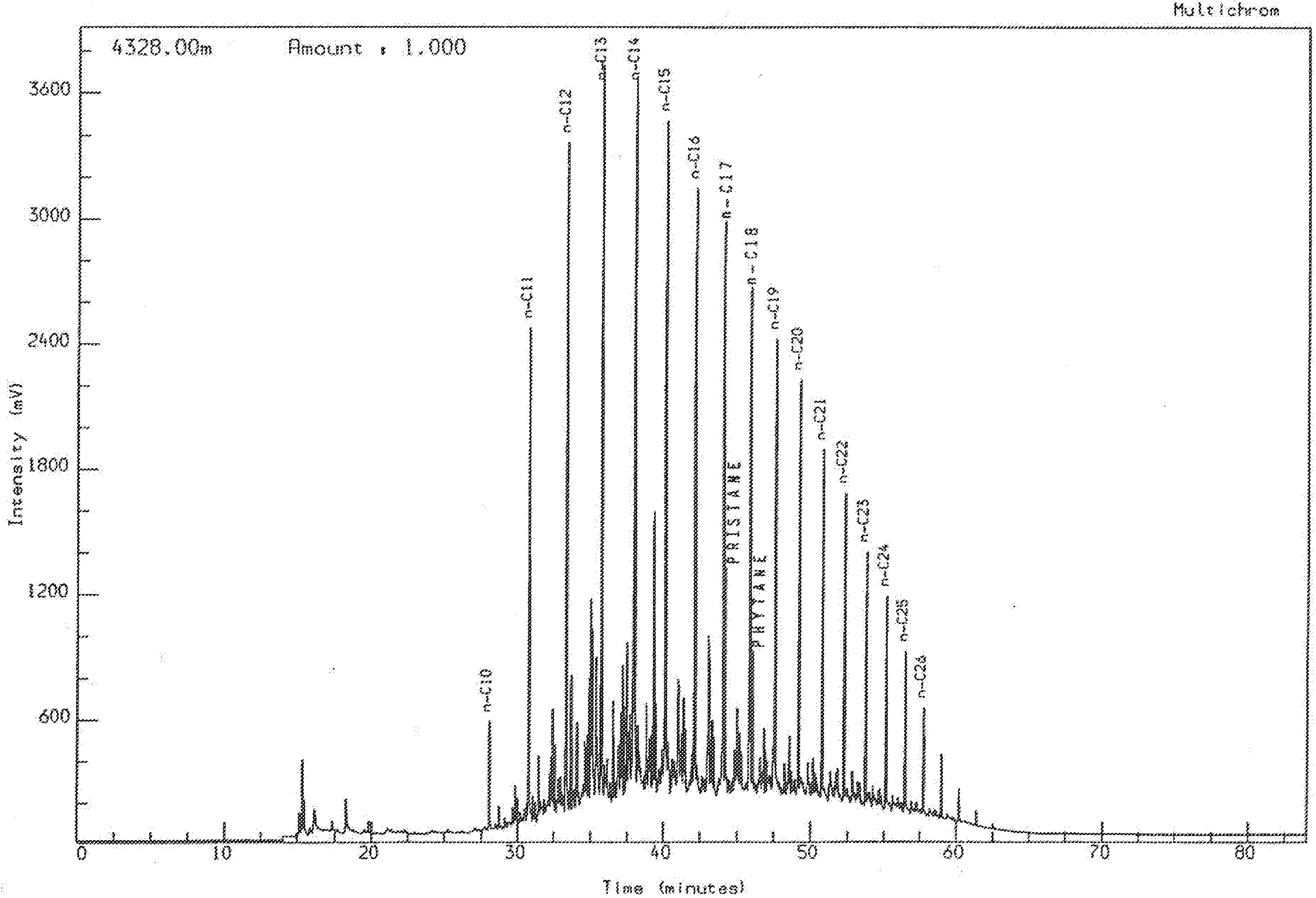


WELL NOCS 2/8-14 4295.00m swc
THERMAL EXTRACTION GC (S1)
Sh/Clst: brn blk

Reported on 15-MAR-1991 at 08:48

GEOLAB NOR

Analysis Name : [526097] 26 PE34D,3,1.



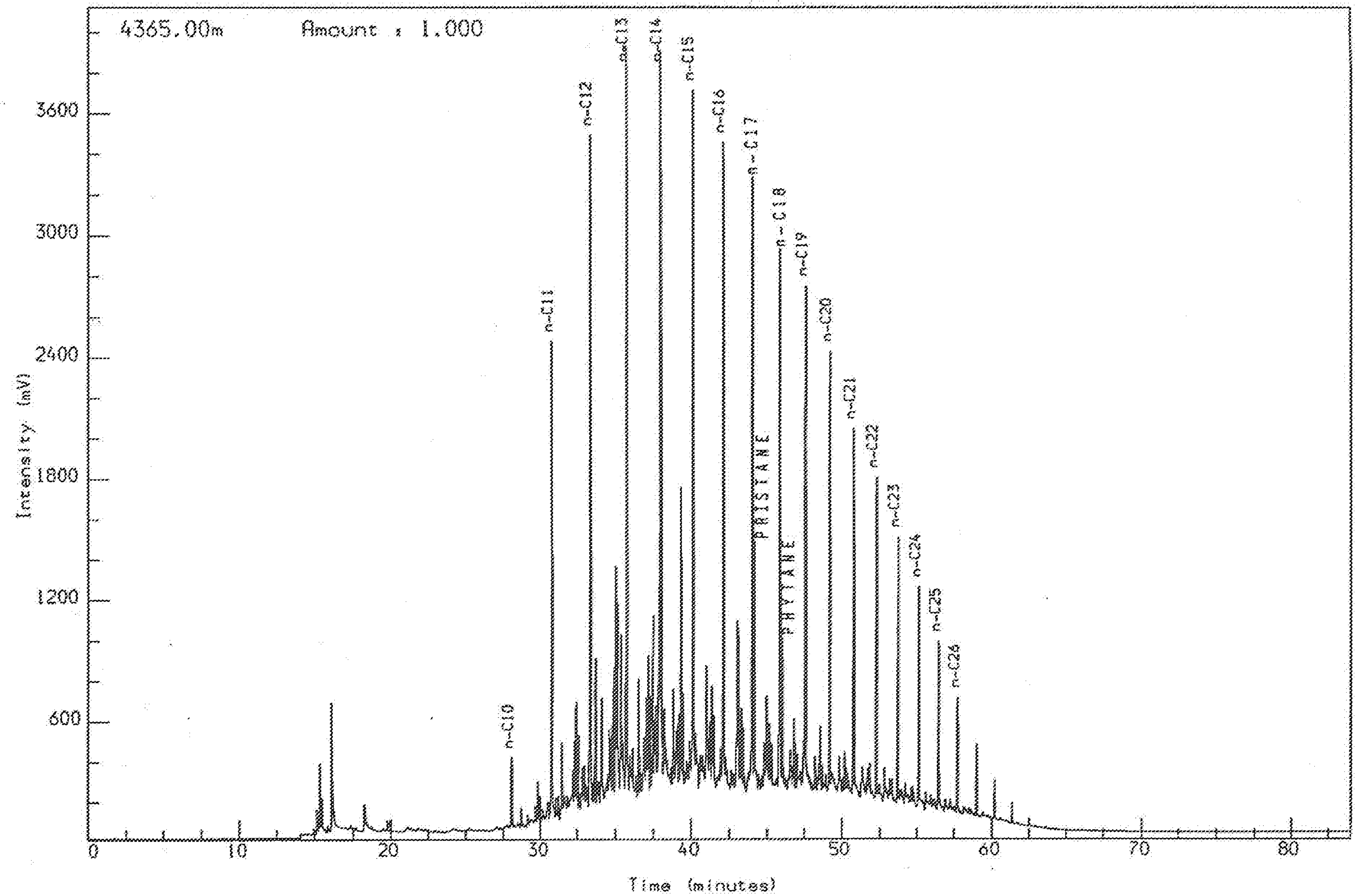
WELL NOCS 2/8-14 4328.00m swc
THERMAL EXTRACTION GC (S1)
Sh/Clst: brn blk

Reported on 15-MAR-1991 at 08:52

GEOLAB NOR

Analysis Name : [526097] 26 PE34D.4.1.

Multichrom

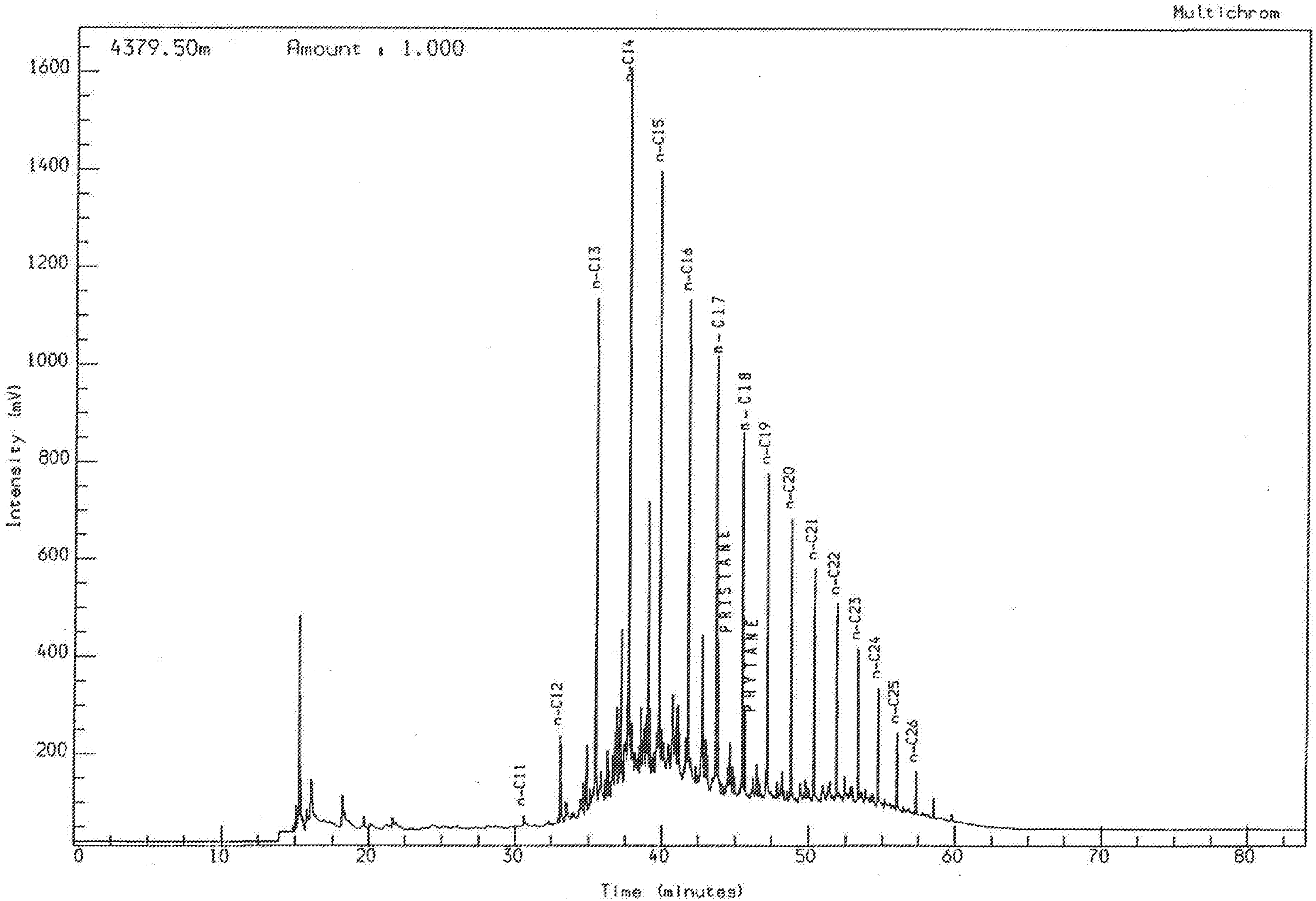


WELL NOCS 2/8-14 4365.00m swc
THERMAL EXTRACTION GC (S1)
Sh/Clst: brn blk

Reported on 15-MAR-1991 at 08:54

GEOLAB NOR

Analysis Name : [526097] 26 PE34D.5.1.

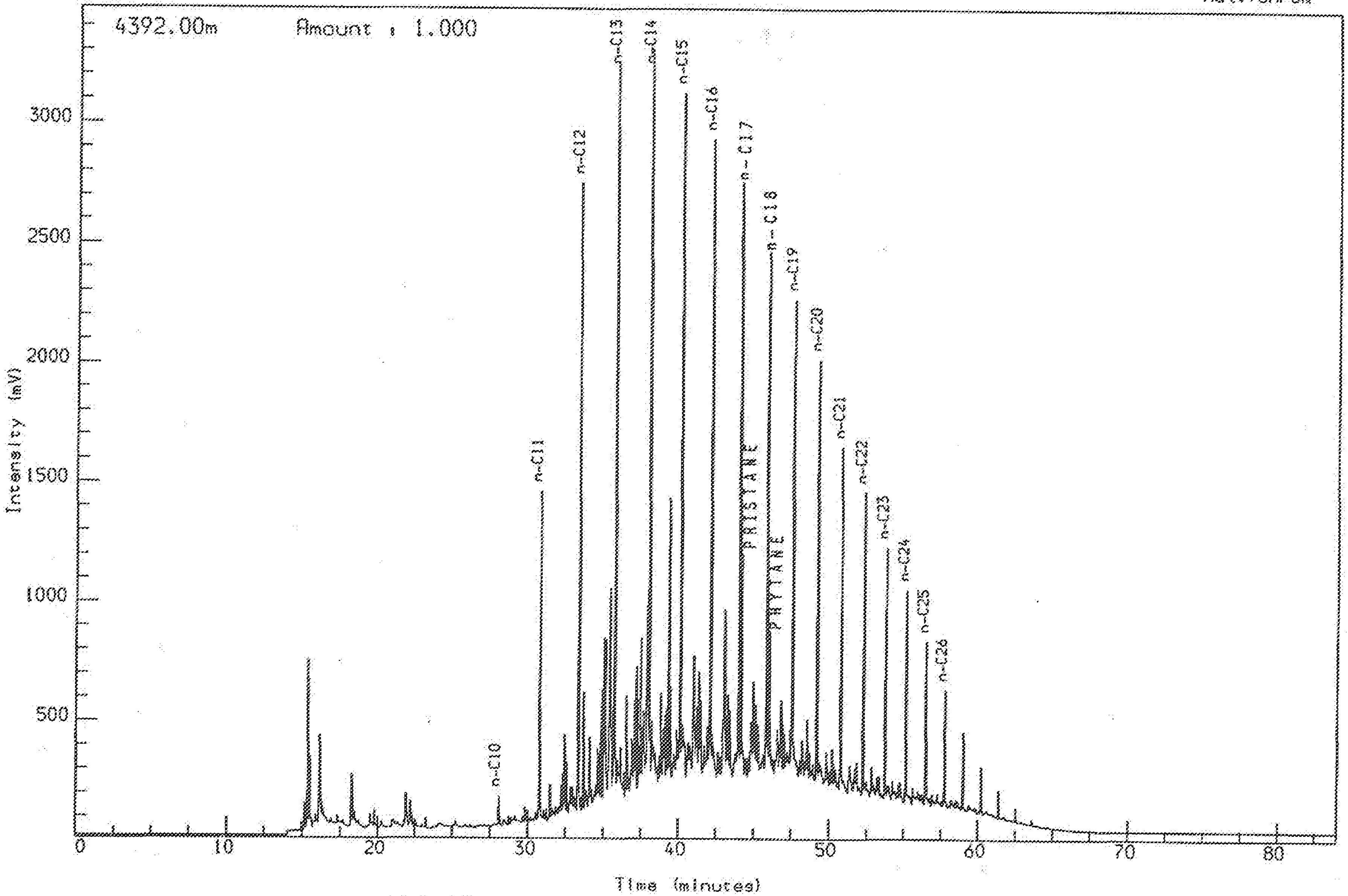


WELL NOCS 2/8-14 4379.50m swc
THERMAL EXTRACTION GC (S1)
Sh/Clst: brn blk to drk gy

Reported on 15-MAR-1991 at 08:55

GEOLAB NOR

Analysis Name : [526097] 26 PE34D,6,1.

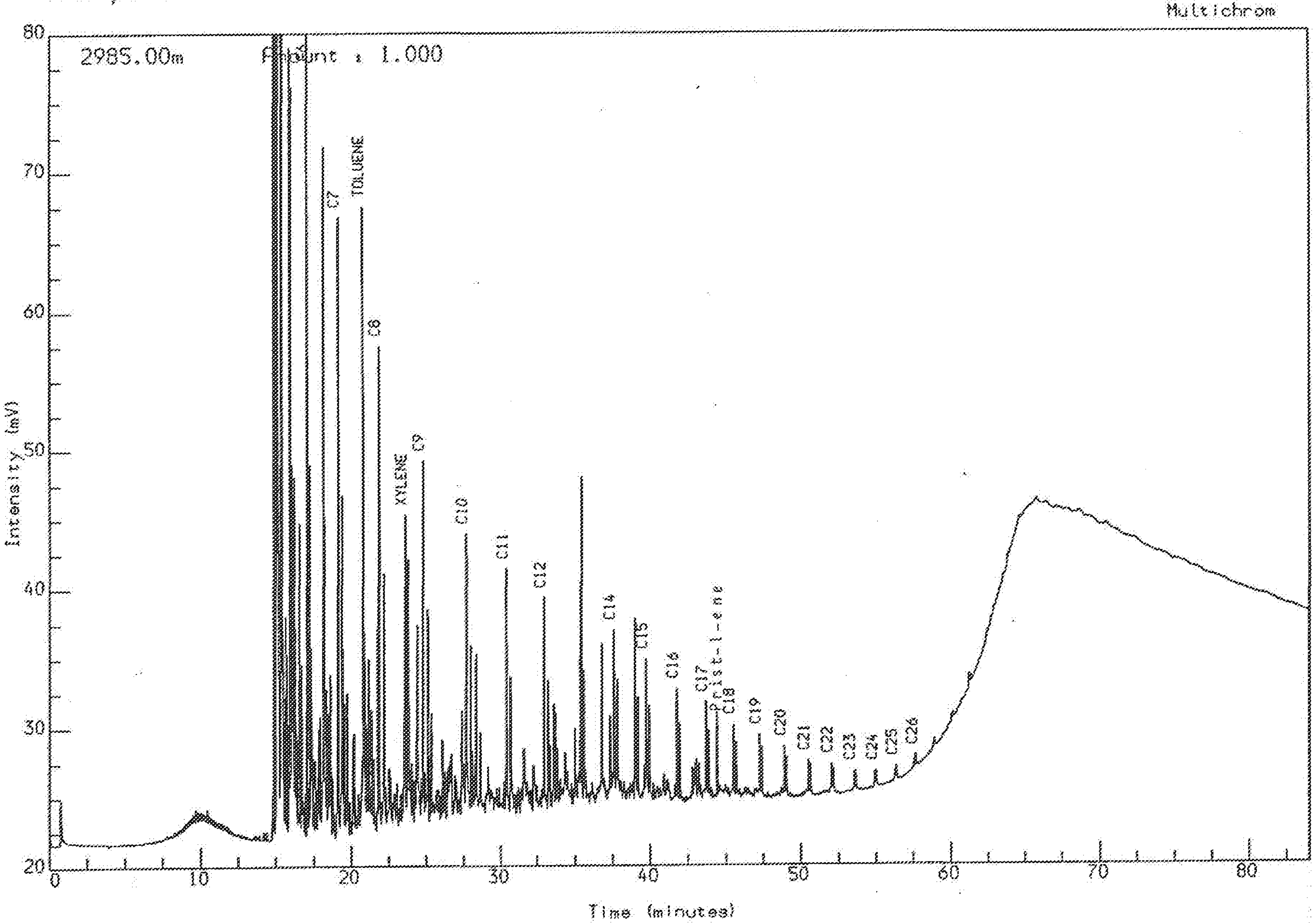


WELL NOCS 2/8-14 4392.00m swc
THERMAL EXTRACTION GC (S1)
Sh/Clst: brn blk

Reported on 15-MAR-1991 at 08:56

GEOLAB NOR

Analysis Name : [526097] 25 PE3400391,1,1.

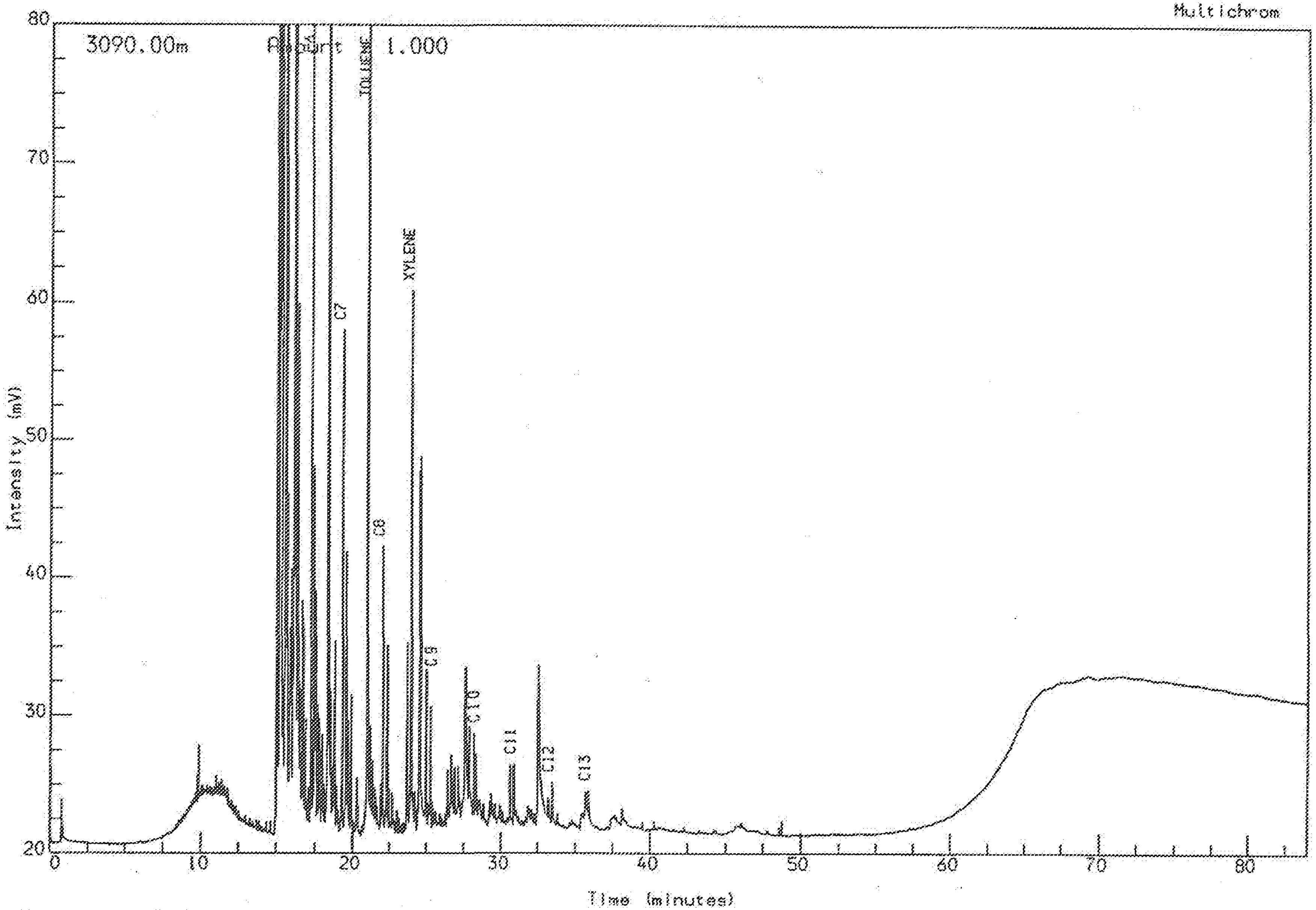


WELL NOCS 2/8-14 2985.00m cut
PYROLYSIS GC (S2)
Ca: lt or to or gy

Reported on 12-MAR-1991 at 09:19

GEOLAB NOR

Analysis Name : [526097] 25 PE3400451.1.1.

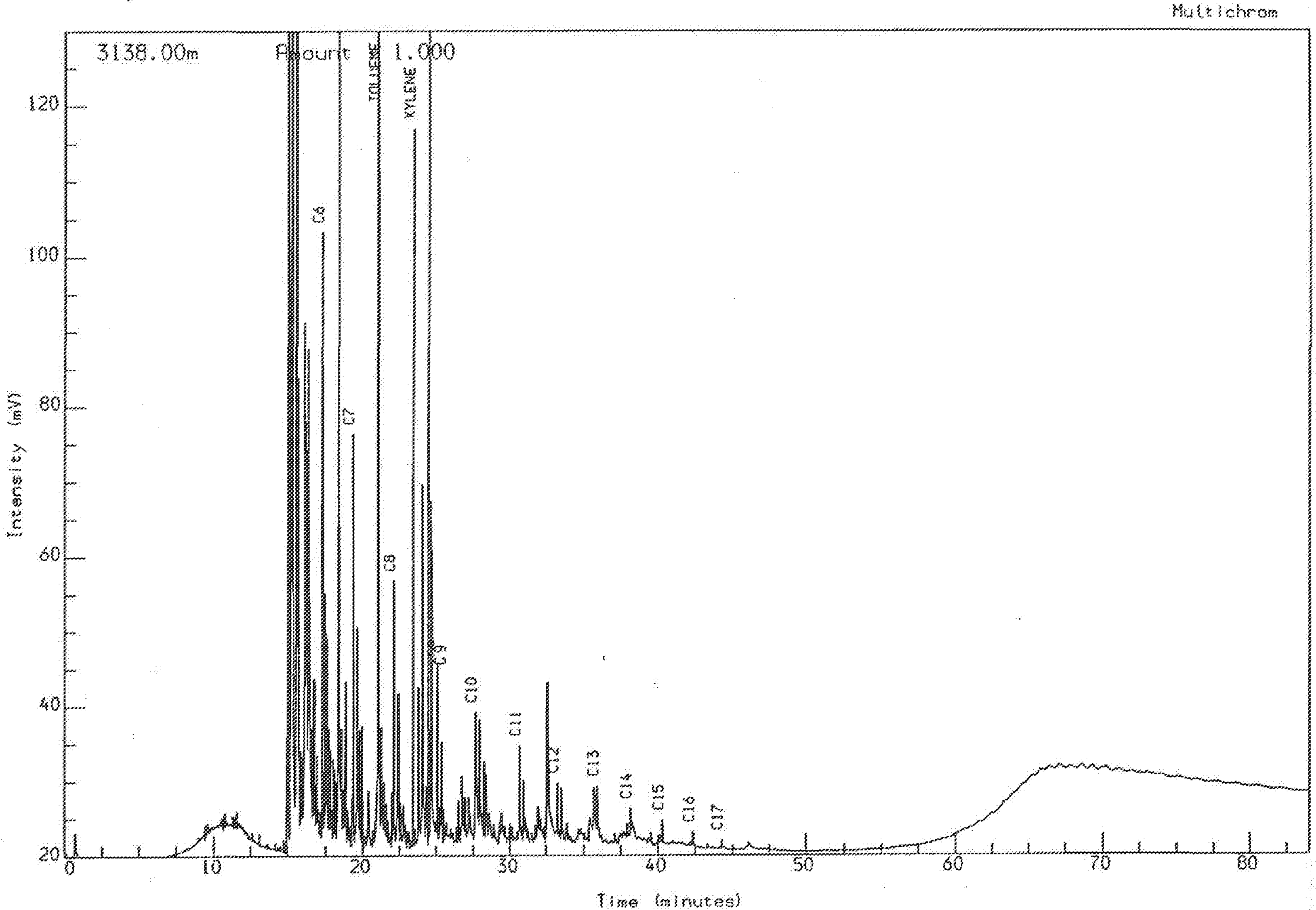


WELL NOCS 2/8-14 3090.00m cut
PYROLYSIS GC (S2)
Marl: lt gy to m gy

Reported on 12-MAR-1991 at 09:20

GEOLAB NOR

Analysis Name : [526097] 25 PE3400531,1,1.



WELL NOCS 2/8-14 3138.00m cut

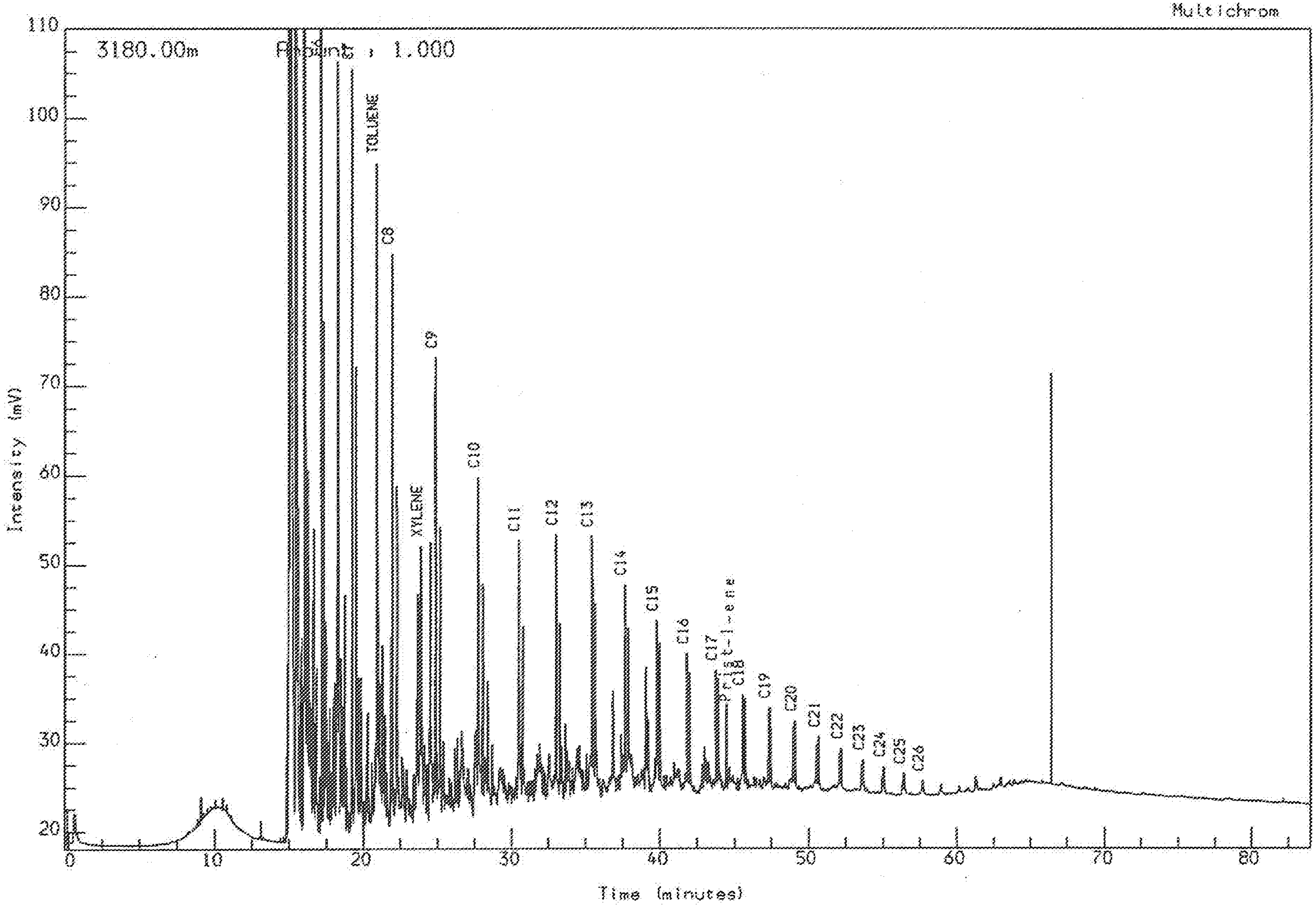
PYROLYSIS GC (S2)

Marl: lt gy to lt brn gy

Reported on 12-MAR-1991 at 09:37

GEOLAB NOR

Analysis Name : [526097] 25 PE34B.1.1.

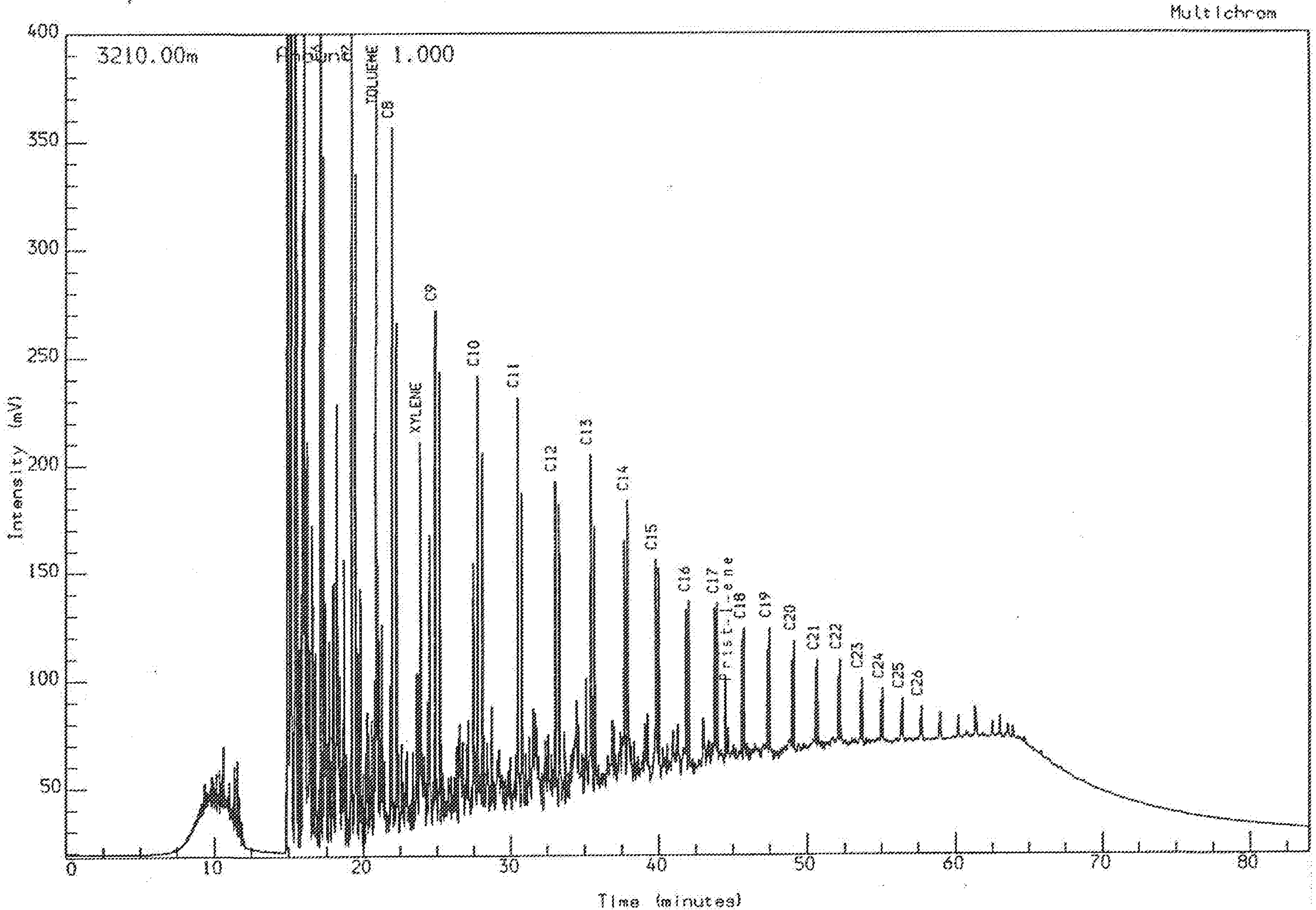


WELL NOCS 2/8-14 3180.00m cut
PYROLYSIS GC (S2)
Ca: or gy to lt or gy

Reported on 12-MAR-1991 at 08:58

GEOLAB NOR

Analysis Name : [526097] 25 PE34B.2.1.

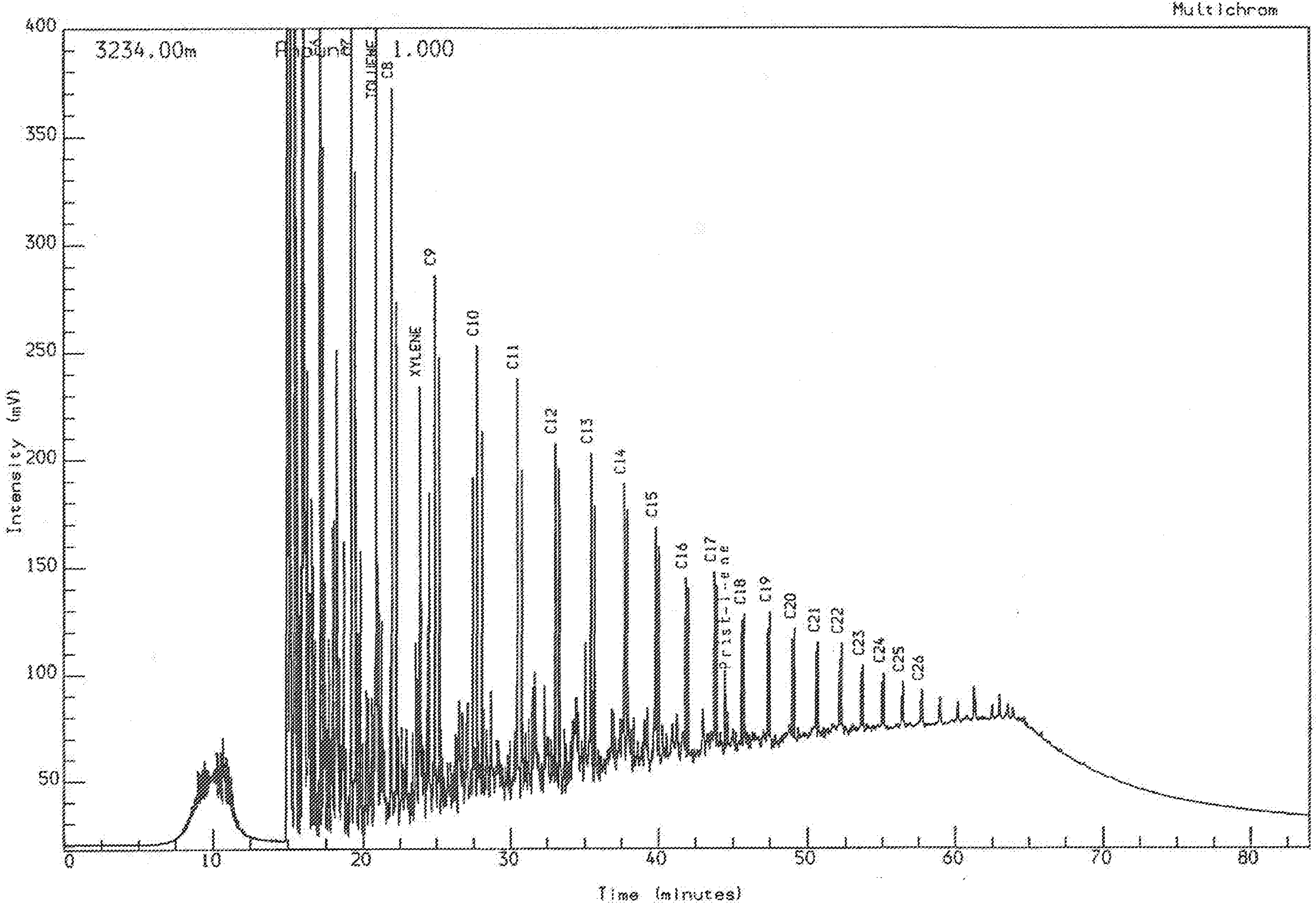


WELL NOCS 2/8-14 3210.00m cut
PYROLYSIS GC (S2)
Sh/Clst: brn gy to gy brn to drk gy

Reported on 12-MAR-1991 at 09:00

GEOLAB NOR

Analysis Name : [526097] 25 PE34B.3.1.

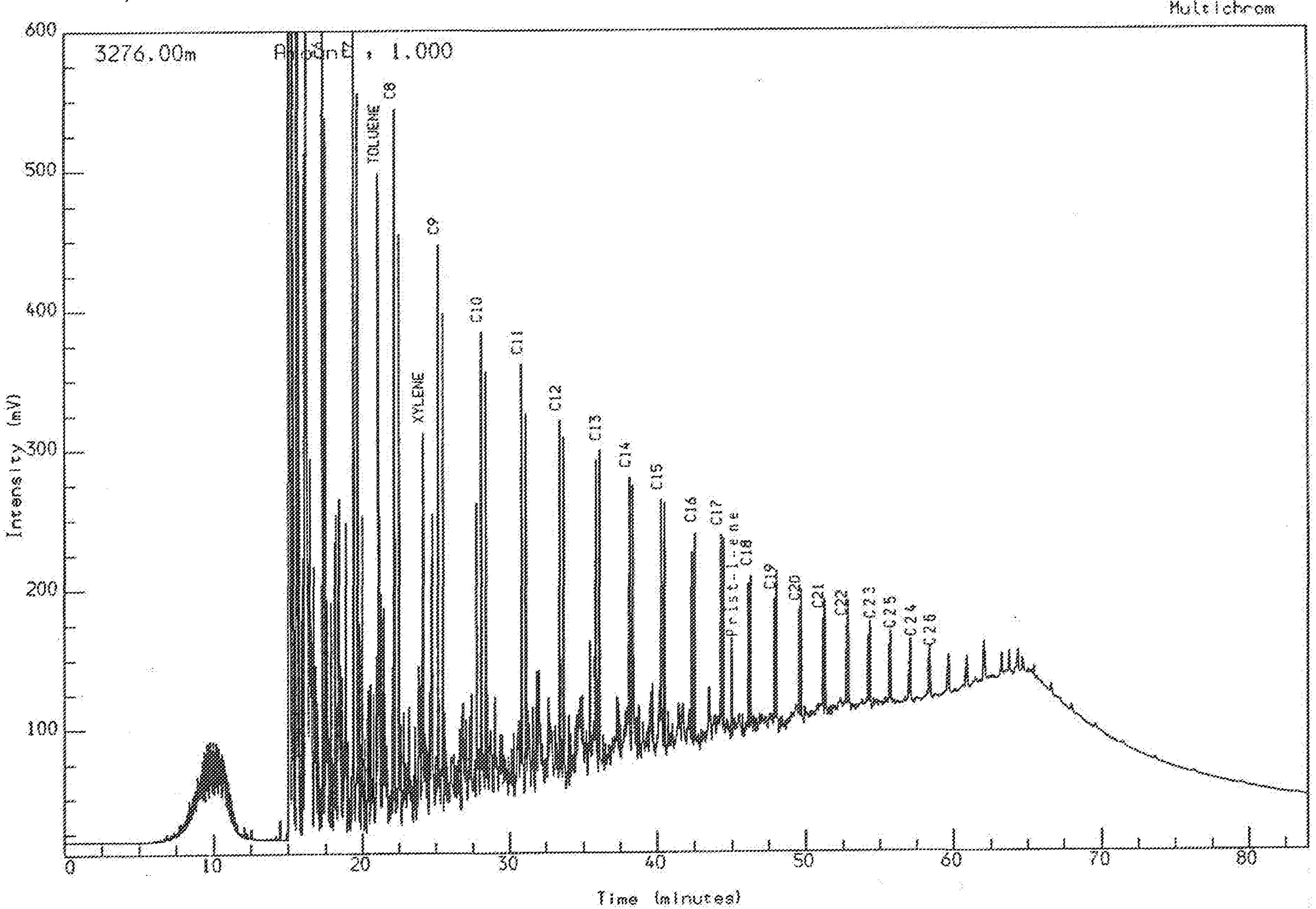


WELL NOCS 2/8-14 3234.00m cut
PYROLYSIS GC (S2)
Sh/Clst: brn gy to gy brn

Reported on 12-MAR-1991 at 09:01

GEOLAB NOR

Analysis Name : [526097] 25 PE34B.4.1.

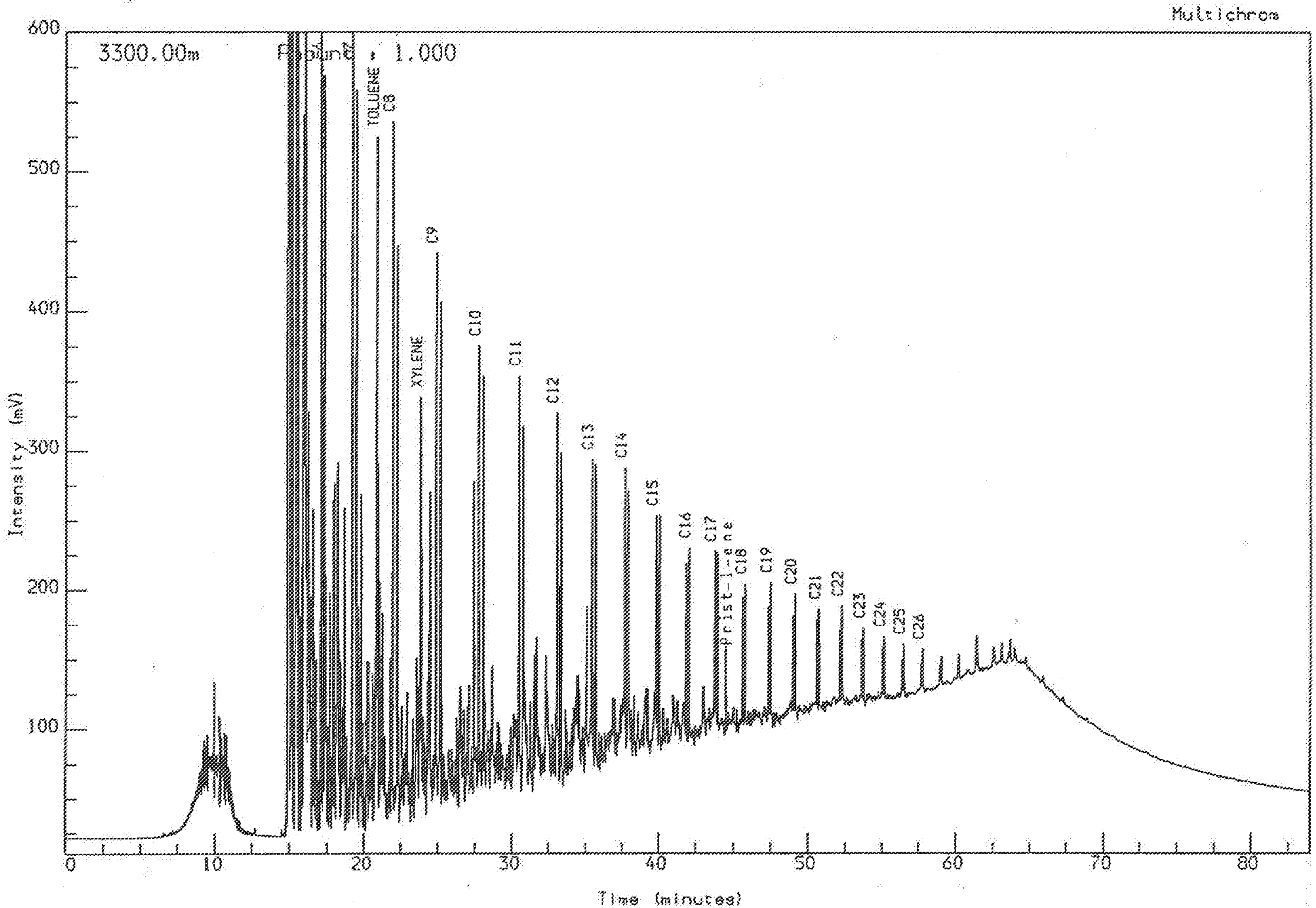


WELL NOCS 2/8-14 3276.00m cut
PYROLYSIS GC (S2)
Sh/Clst: brn gy to drk gy

Reported on 12-MAR-1991 at 10:00

GEOLAB NOR

Analysis Name : [526097] 25 PE34B.5.1.

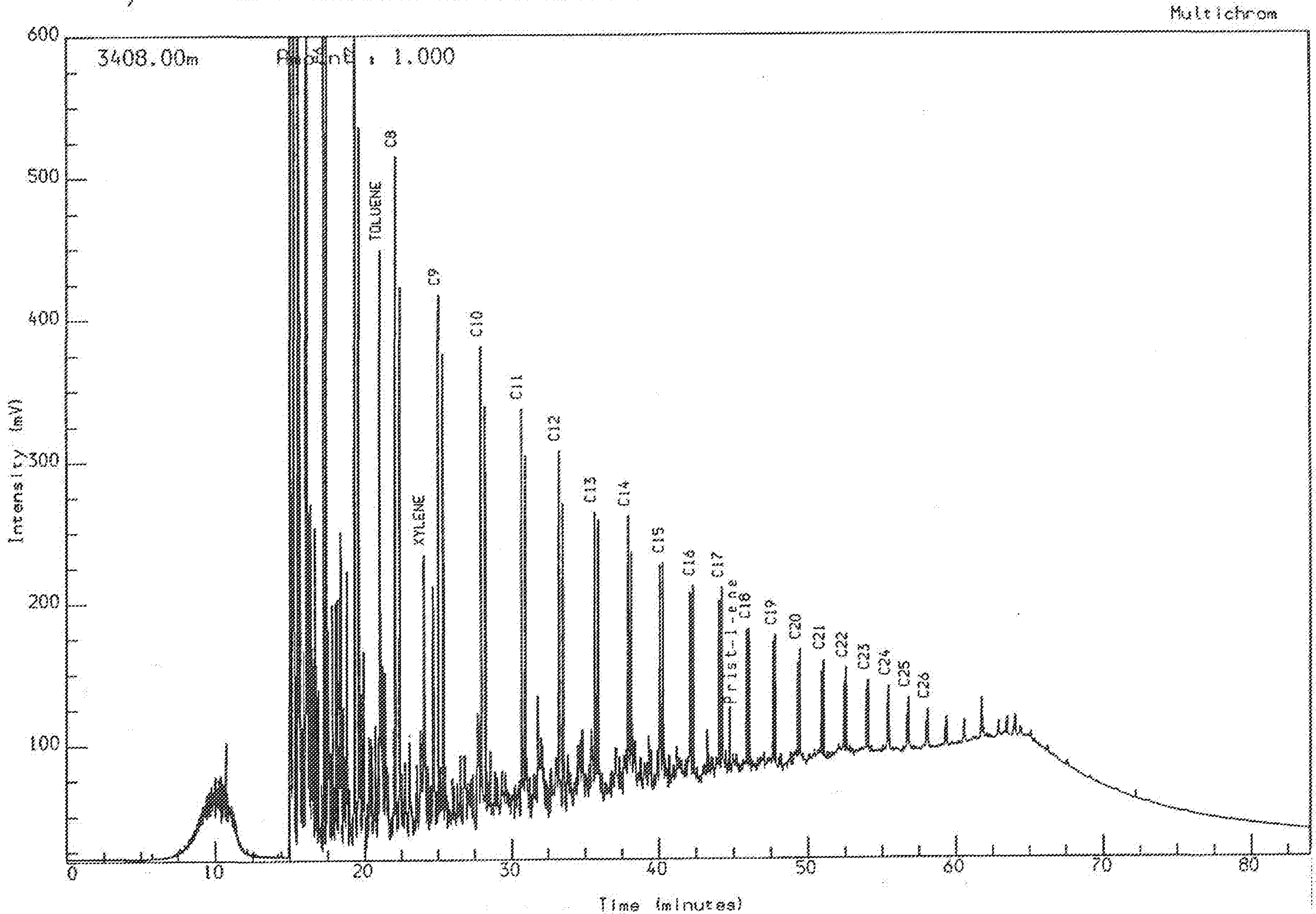


WELL NOCS 2/8-14 3300.00m cut
PYROLYSIS GC (S2)
Sh/Clst: brn gy to drk gy

Reported on 12-MAR-1991 at 10:01

GEOLAB NOR

Analysis Name : [526097] 25 PE34C,10,1.

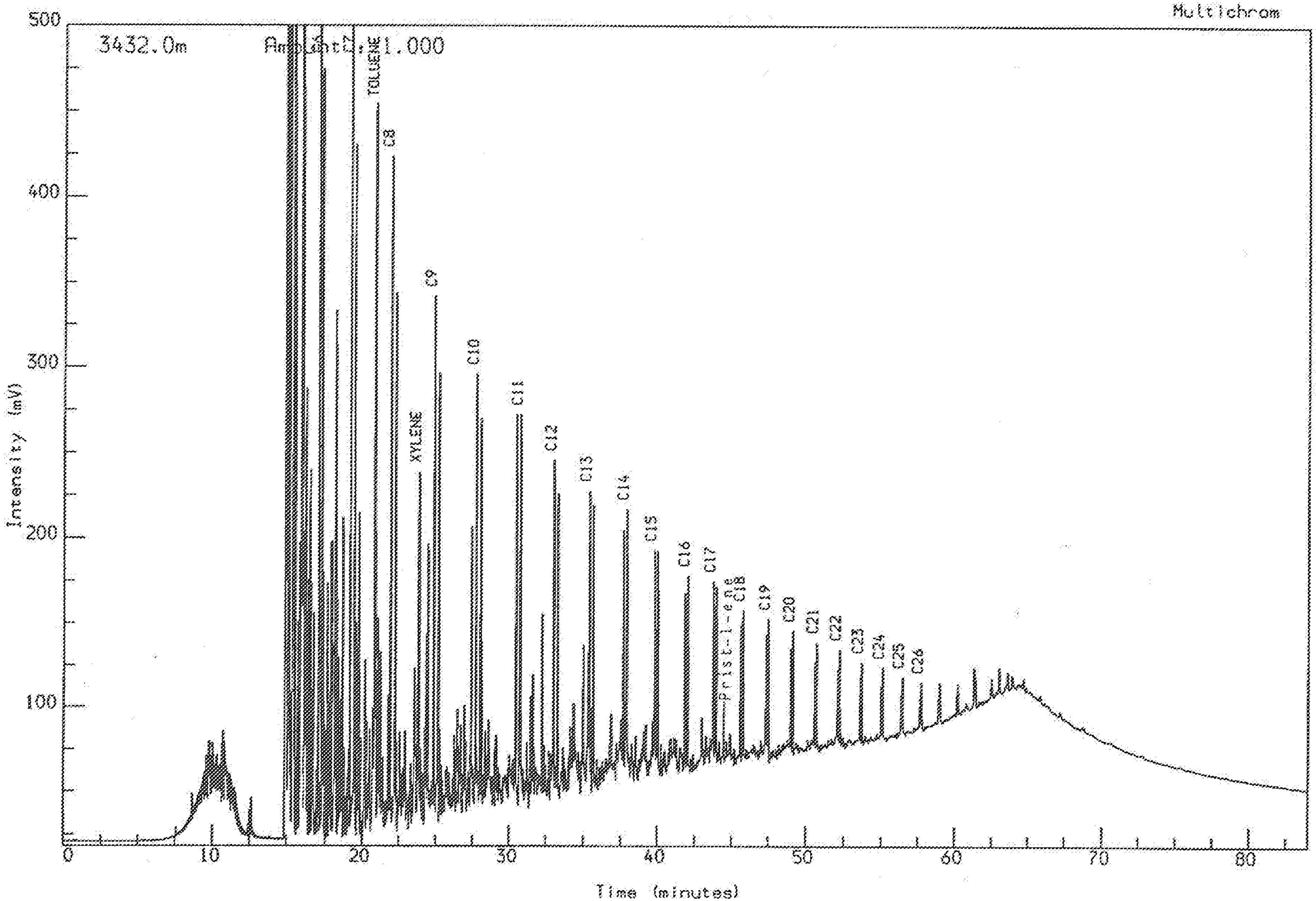


WELL NOCS 2/8-14 3408.00m cut
PYROLYSIS GC (S2)
Sh/Clst: brn gy to m gy to drk gy

Reported on 13-MAR-1991 at 12:11

GEOLAB NOR

Analysis Name : [526097] 25 PE34A.10.1.

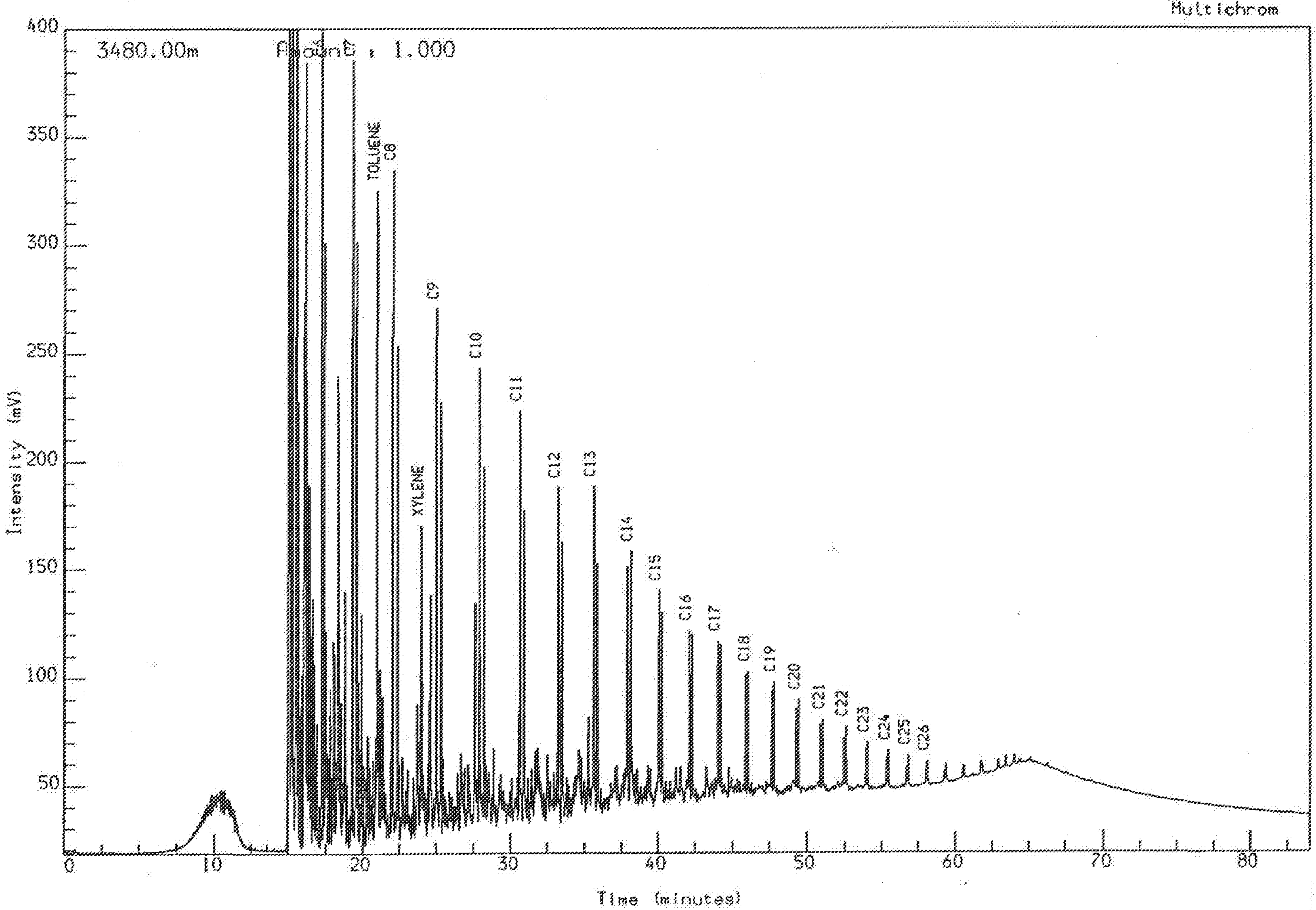


WELL NOCS 2/8-14 3432.00m cut
PYROLYSIS GC (S2)
Sh/Clst: m gy to drk gy to brn gy

Reported on 12-MAR-1991 at 09:17

GEOLAB NOR

Analysis Name : [526097] 25 PE34B,7,1.

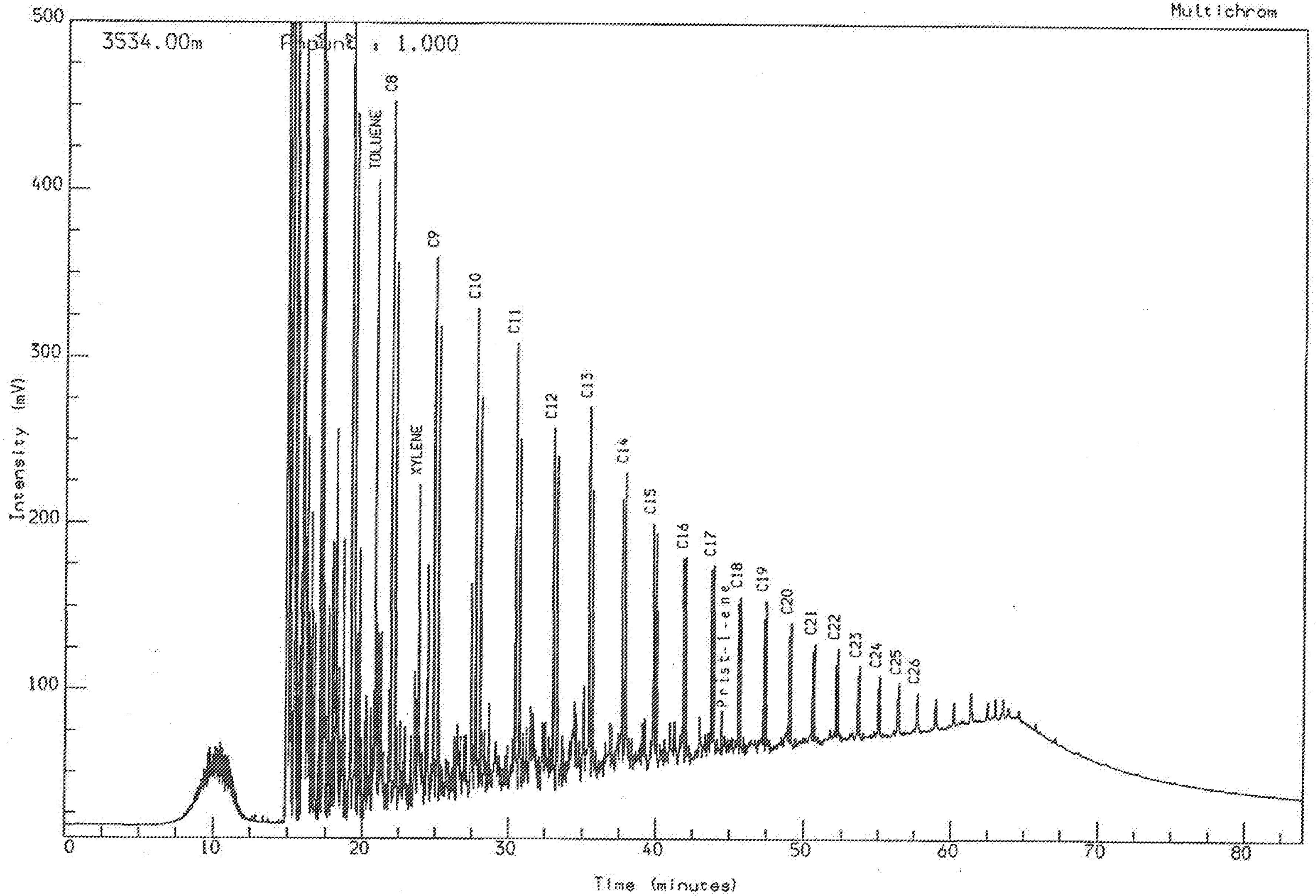


WELL NOCS 2/8-14 3480.00m cut
PYROLYSIS GC (S2)
Sh/Clst: m gy to drk gy

Reported on 13-MAR-1991 at 12:13

GEOLAB NOR

Analysis Name : [526097] 25 PE34B,8,1.

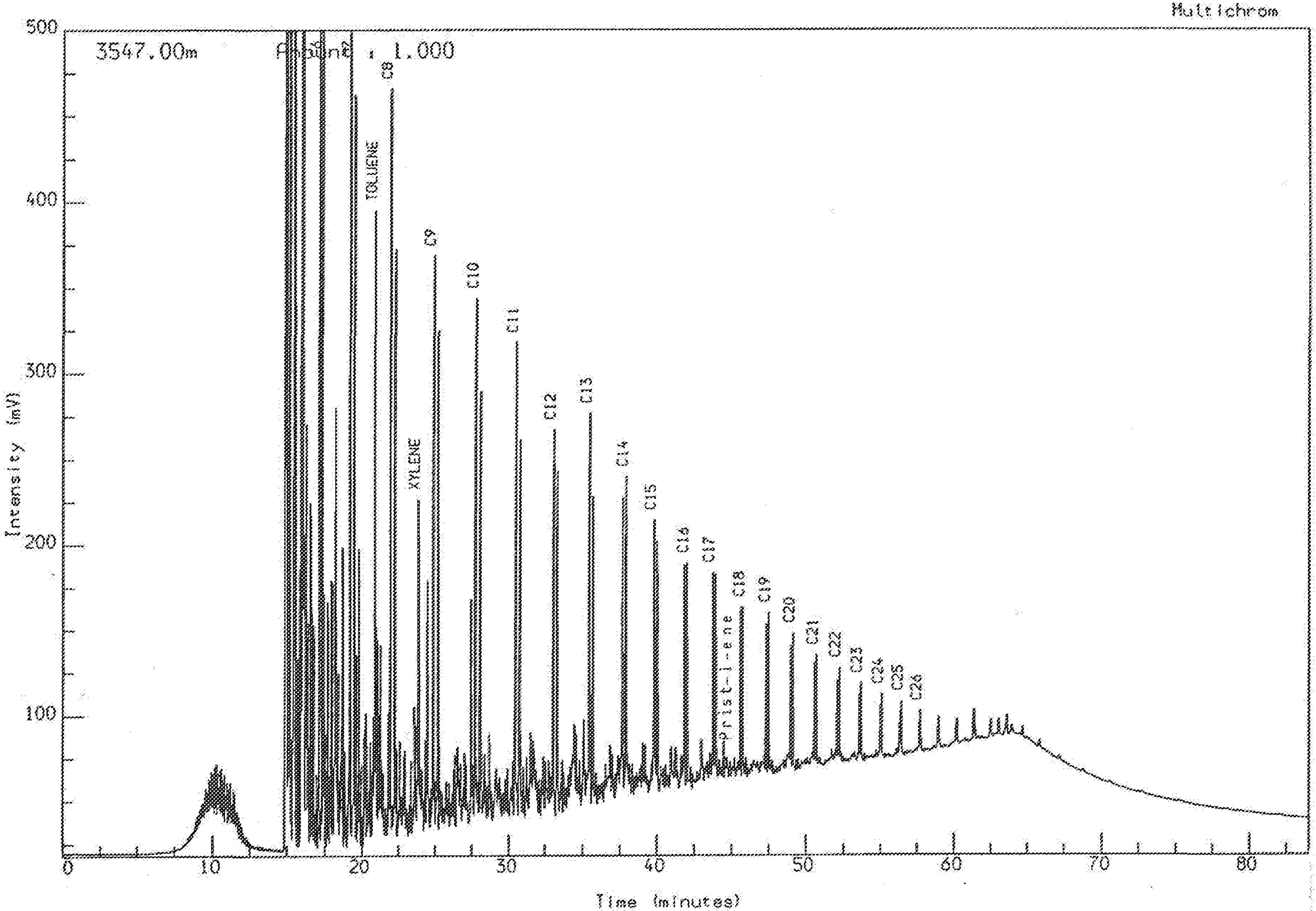


WELL NOCS 2/8-14 3534.00m cut
PYROLYSIS GC (S2)
Sh/Clst: drk gy to brn gy to brn blk

Reported on 13-MAR-1991 at 12:16

GEOLAB NOR

Analysis Name : [526097] 25 PE34B.9.1.

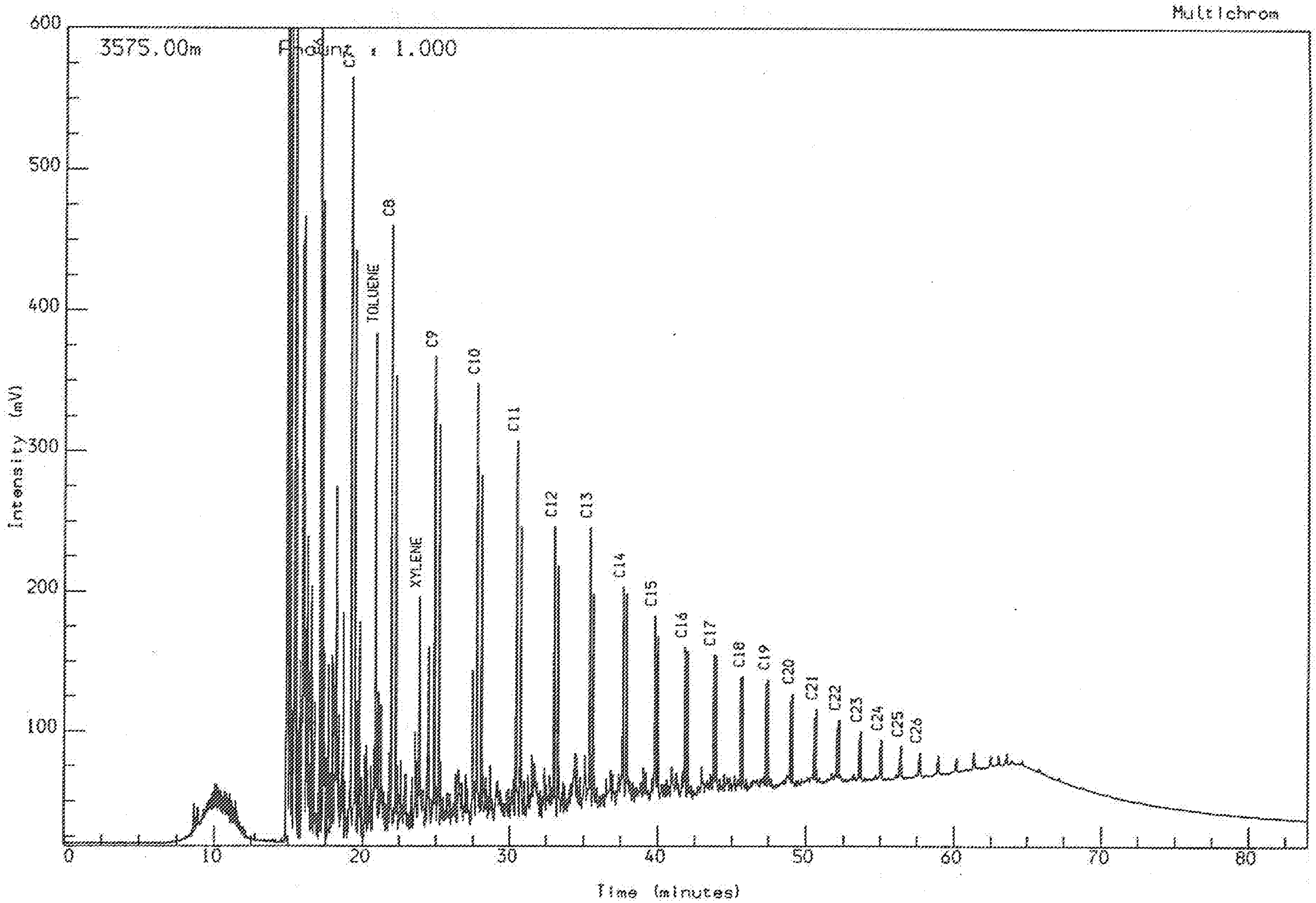


WELL NOCS 2/8-14 3547.00m swc
PYROLYSIS GC (S2)
Sh/Clst: drk gy to brn blk

Reported on 13-MAR-1991 at 12:17

GEOLAB NOR

Analysis Name : [526097] 25 PE34B,10,1.



WELL NOCS 2/8-14 3575.00m swc

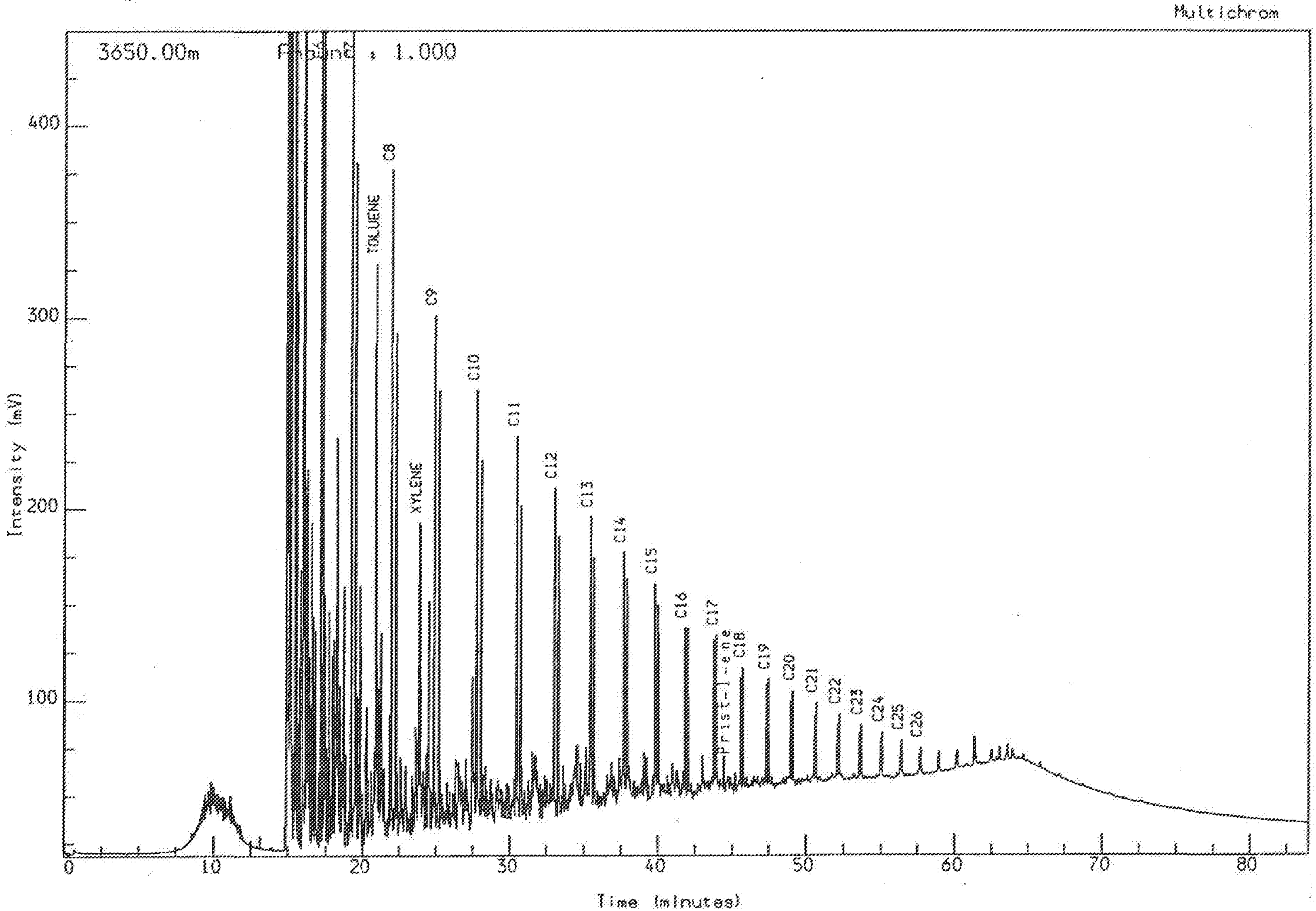
PYROLYSIS GC (S2)

Sh/Clst: drk gy to brn blk

Reported on 13-MAR-1991 at 12:19

GEOLAB NOR

Analysis Name : [526097] 25 PE34C,1,1.

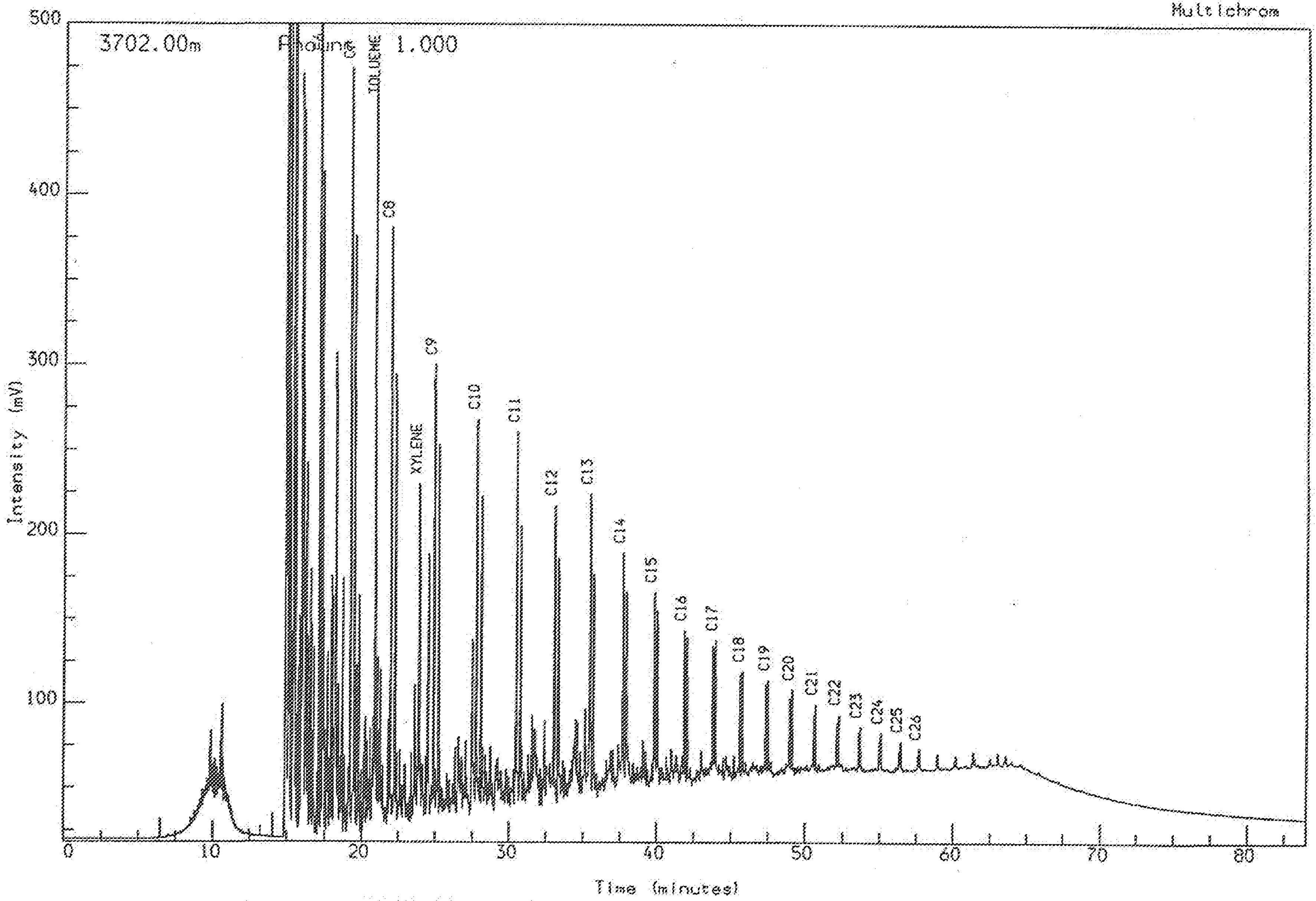


WELL NOCS 2/8-14 3650.00m swc
PYROLYSIS GC (S2)
Sh/Clst: drk gy to brn blk

Reported on 13-MAR-1991 at 12:20

GEOLAB NOR

Analysis Name : [526097] 25 PE34C.2.1.

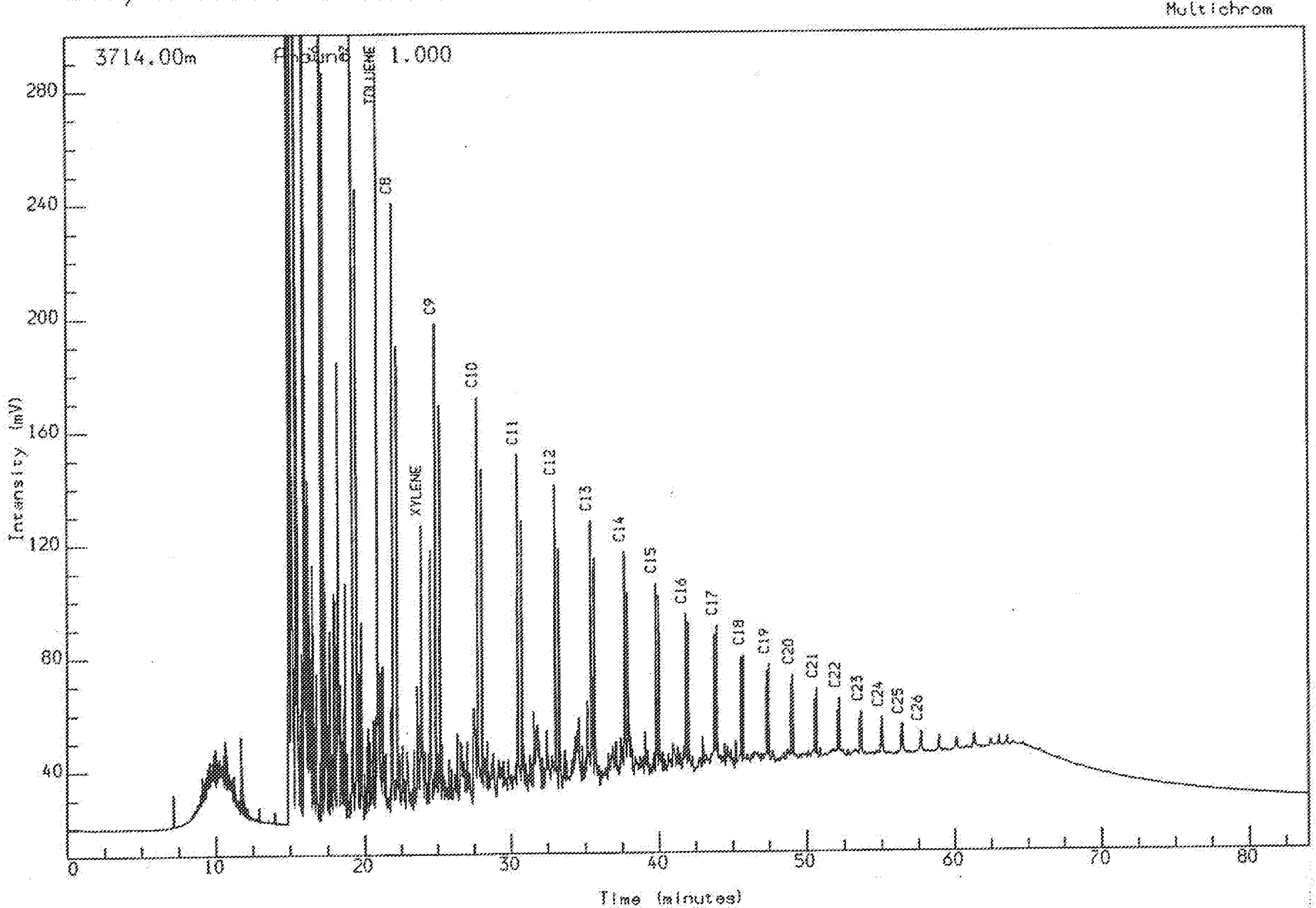


WELL NOCS 2/8-14 3702.00m cut
PYROLYSIS GC (S2)
Sh/Clst: brn gy to drk gy to brn blk

Reported on 13-MAR-1991 at 12:22

GEOLAB NOR

Analysis Name : [526097] 25 PE34C,3,1.

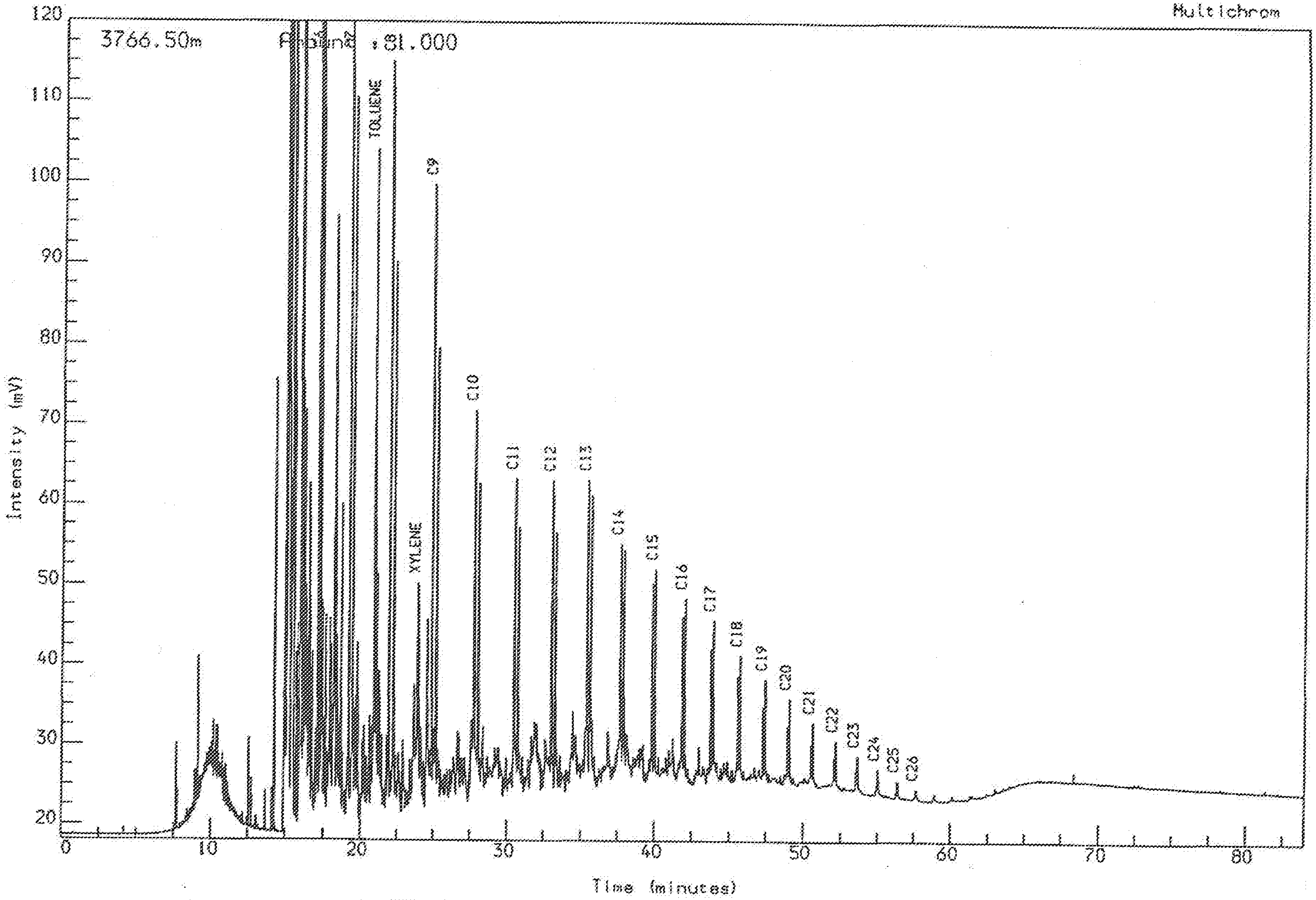


WELL NOCS 2/8-14 3714.00m cut
PYROLYSIS GC (S2)
Sh/Clst: brn gy to drk gy to brn blk

Reported on 13-MAR-1991 at 12:23

GEOLAB NOR

Analysis Name : [526097] 25 PE34C.4.1.

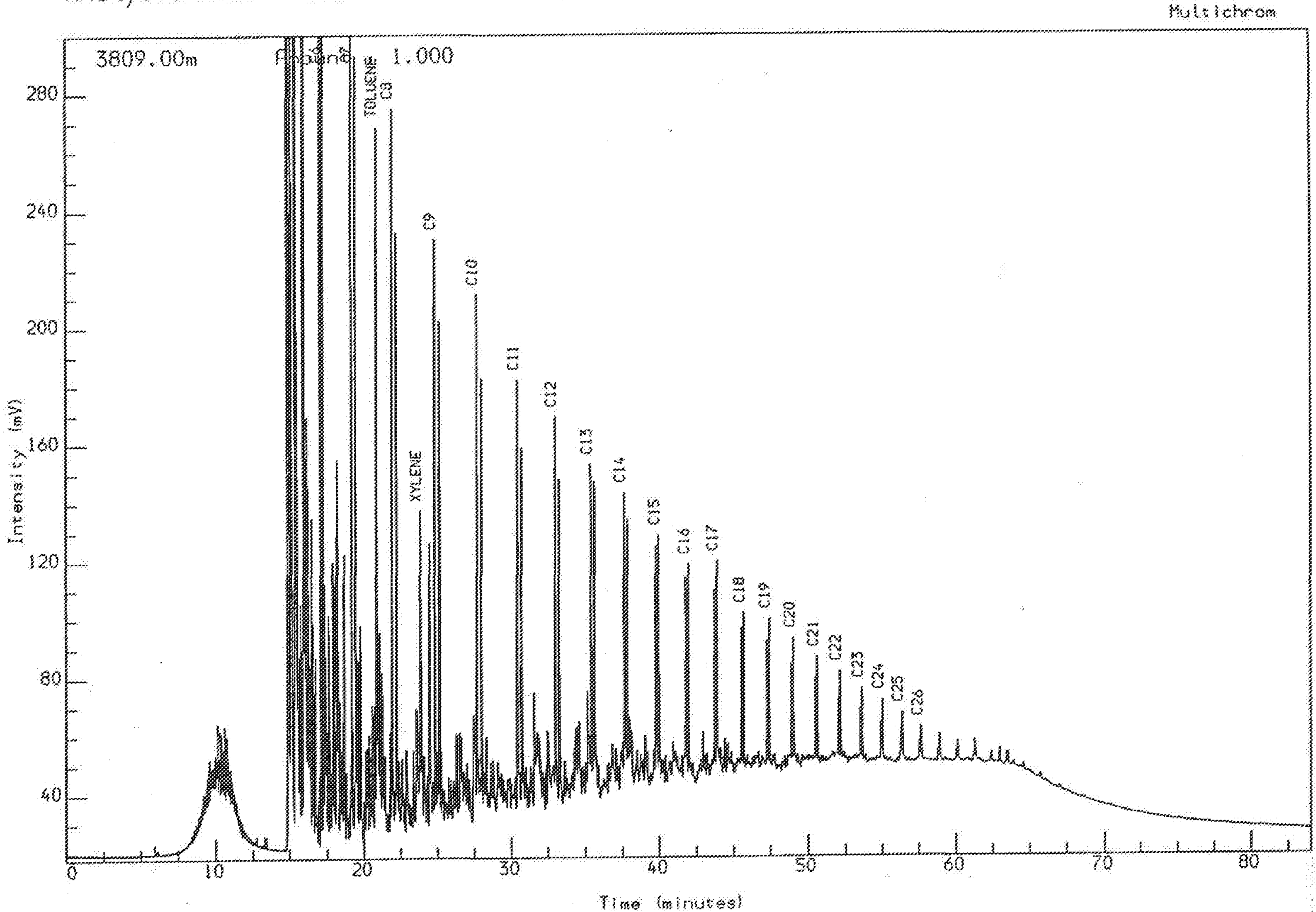


WELL NOCS 2/8-14 3766.50m swc
PYROLYSIS GC (S2)
Sh/Clst: drk gy to brn blk

Reported on 13-MAR-1991 at 12:24

GEOLAB NOR

Analysis Name : [526097] 25 PE34C.5.1.

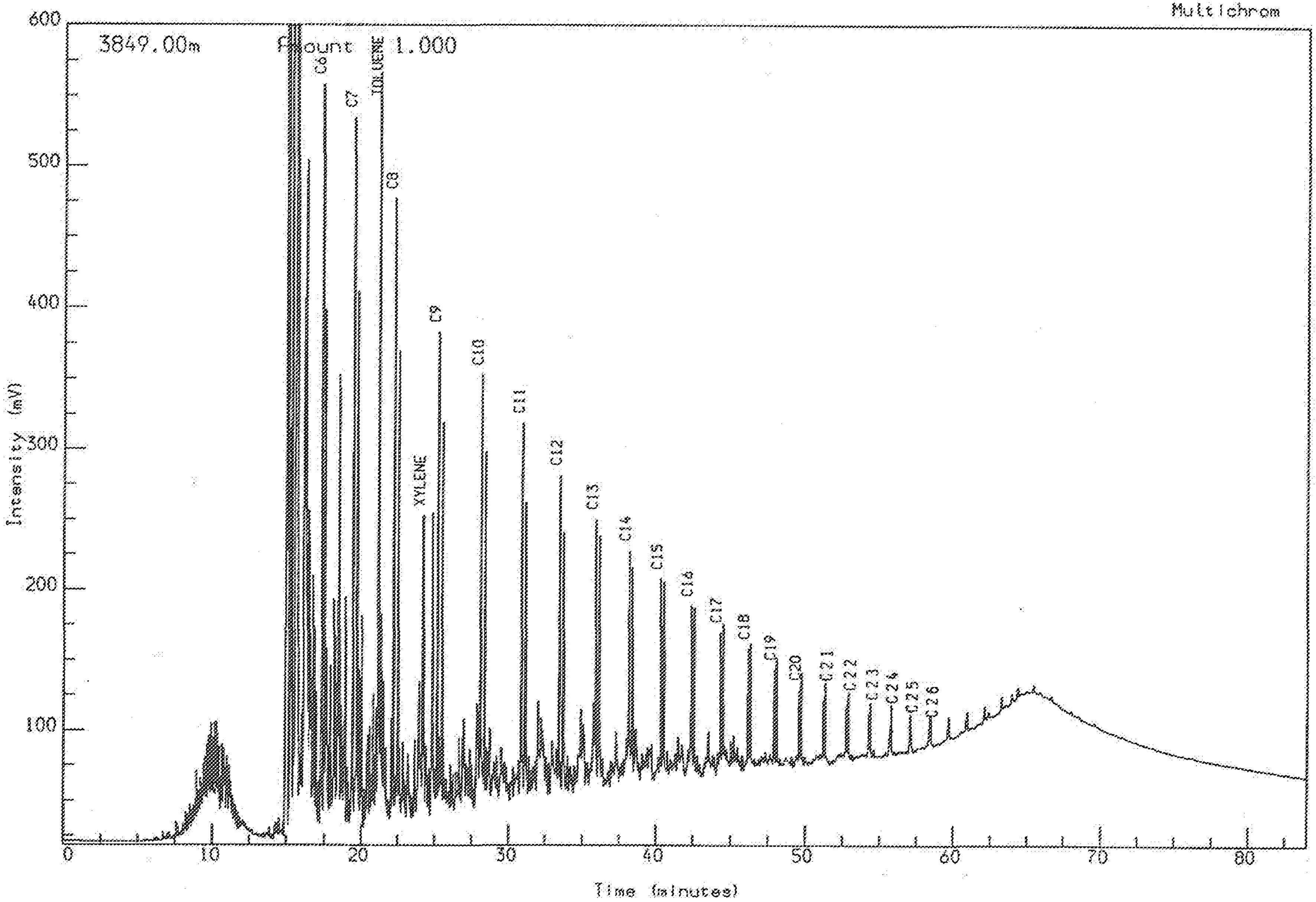


WELL NOCS 2/8-14 3809.00m cut
PYROLYSIS GC (S2)
Sh/Clst: drk gy to brn blk

Reported on 13-MAR-1991 at 12:25

GEOLAB NOR

Analysis Name : [526097] 25 PE34E.3.1.

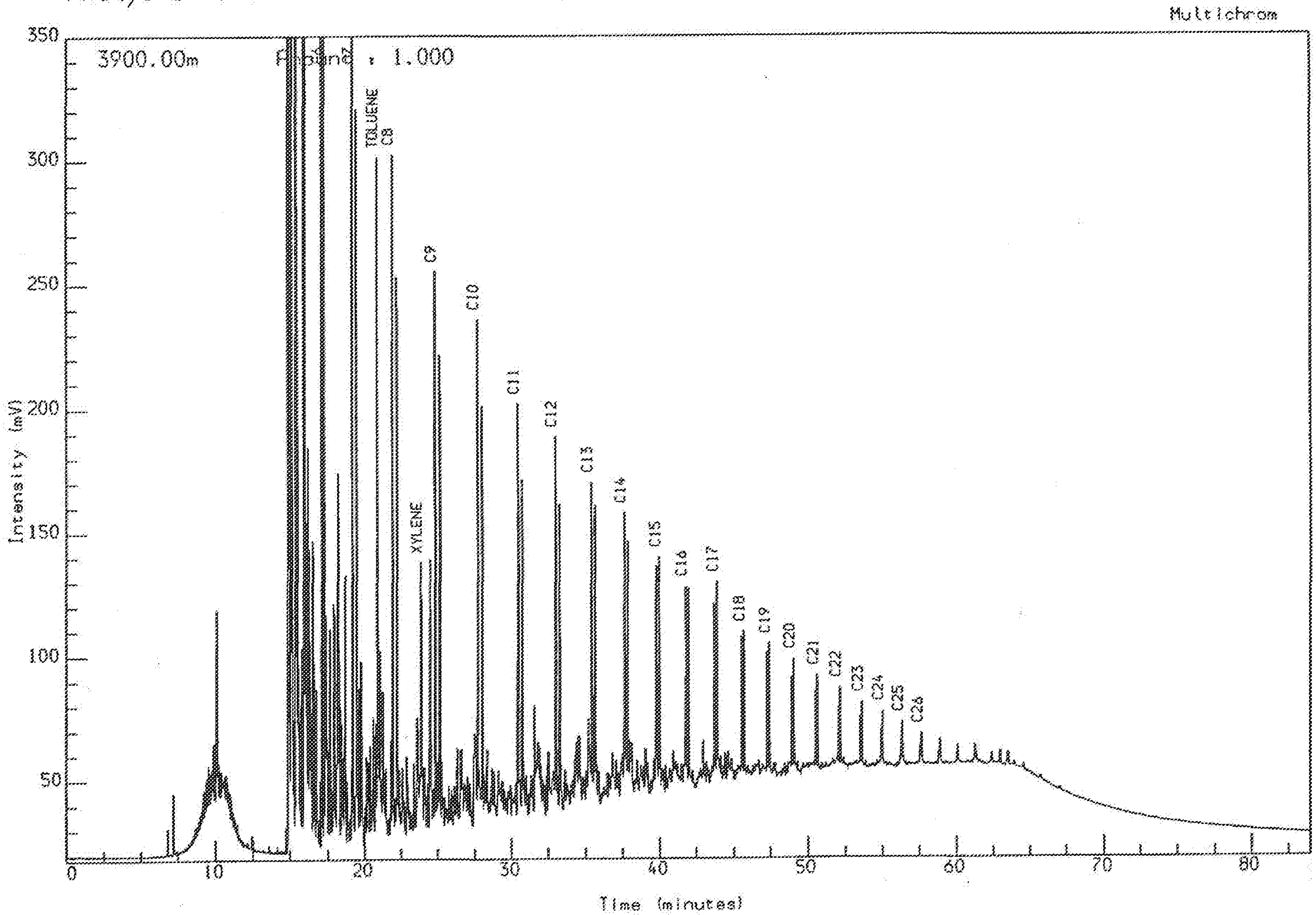


WELL NOCS 2/8-14 3849.00m cut
PYROLYSIS GC (S2)
Sh/Clst: drk gy

Reported on 19-MAR-1991 at 09:35

GEOLAB NOR

Analysis Name : [526097] 25 PE34C,6,1.

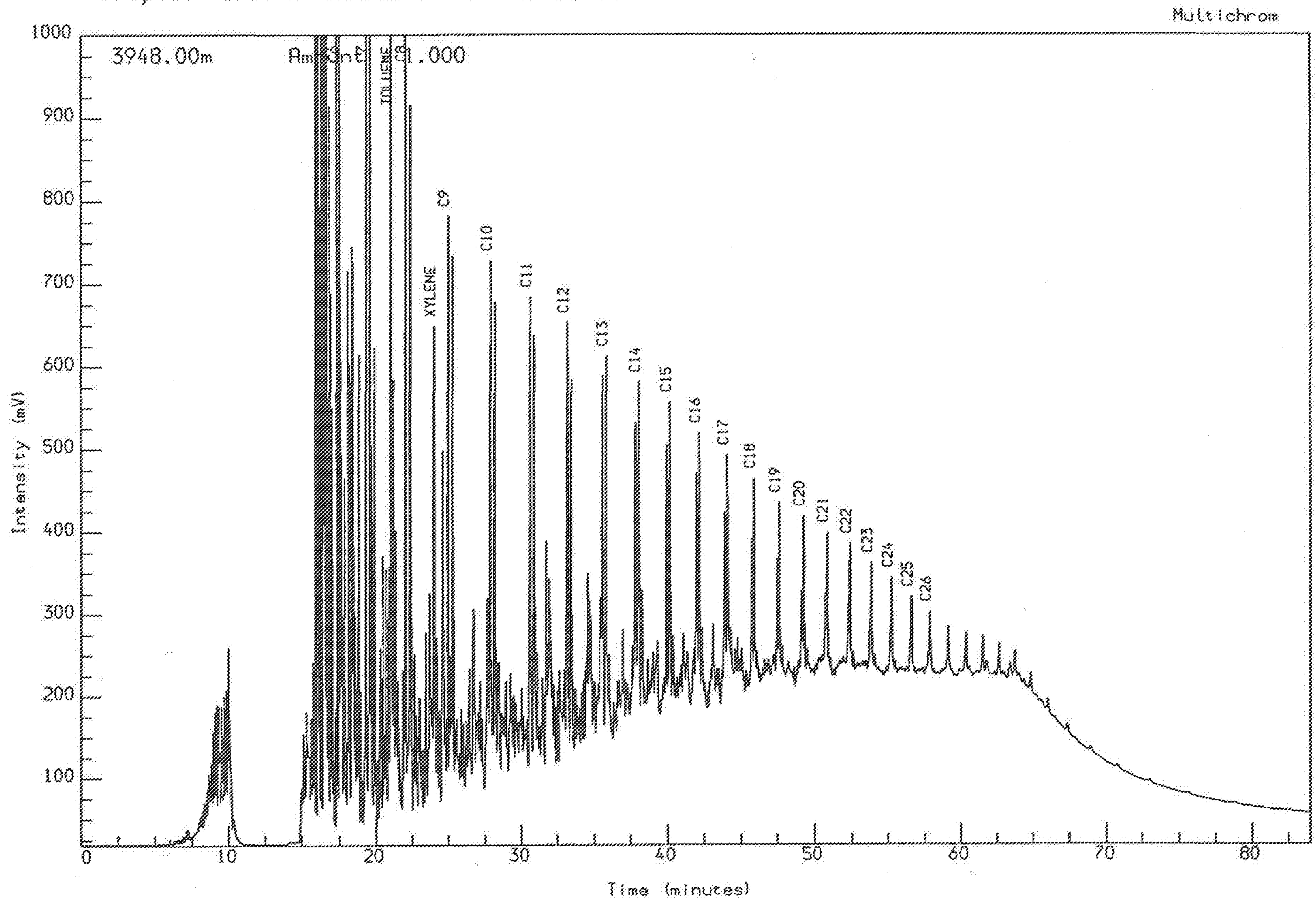


WELL NOCS 2/8-14 3900.00m cut
PYROLYSIS GC (S2)
Sh/Clst: drk gy

Reported on 13-MAR-1991 at 12:26

GEOLAB NOR

Analysis Name : [526097] 25 PE34E,4,1.

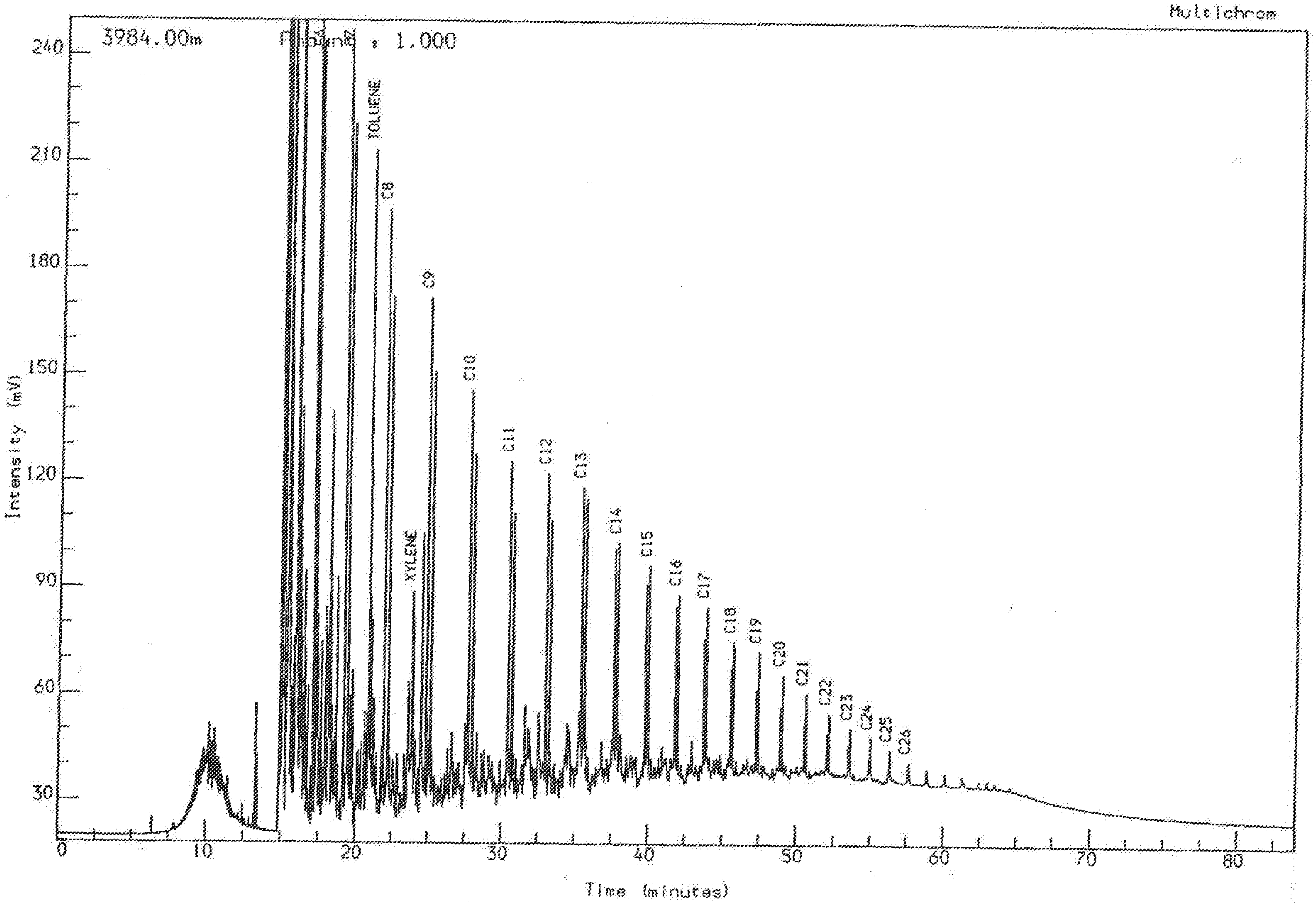


WELL NOCS 2/8-14 3948.00m cut
PYROLYSIS GC (S2)
Sh/Clst: drk gy

Reported on 19-MAR-1991 at 09:36

GEOLAB NOR

Analysis Name : [526097] 25 PE34C,7,1.

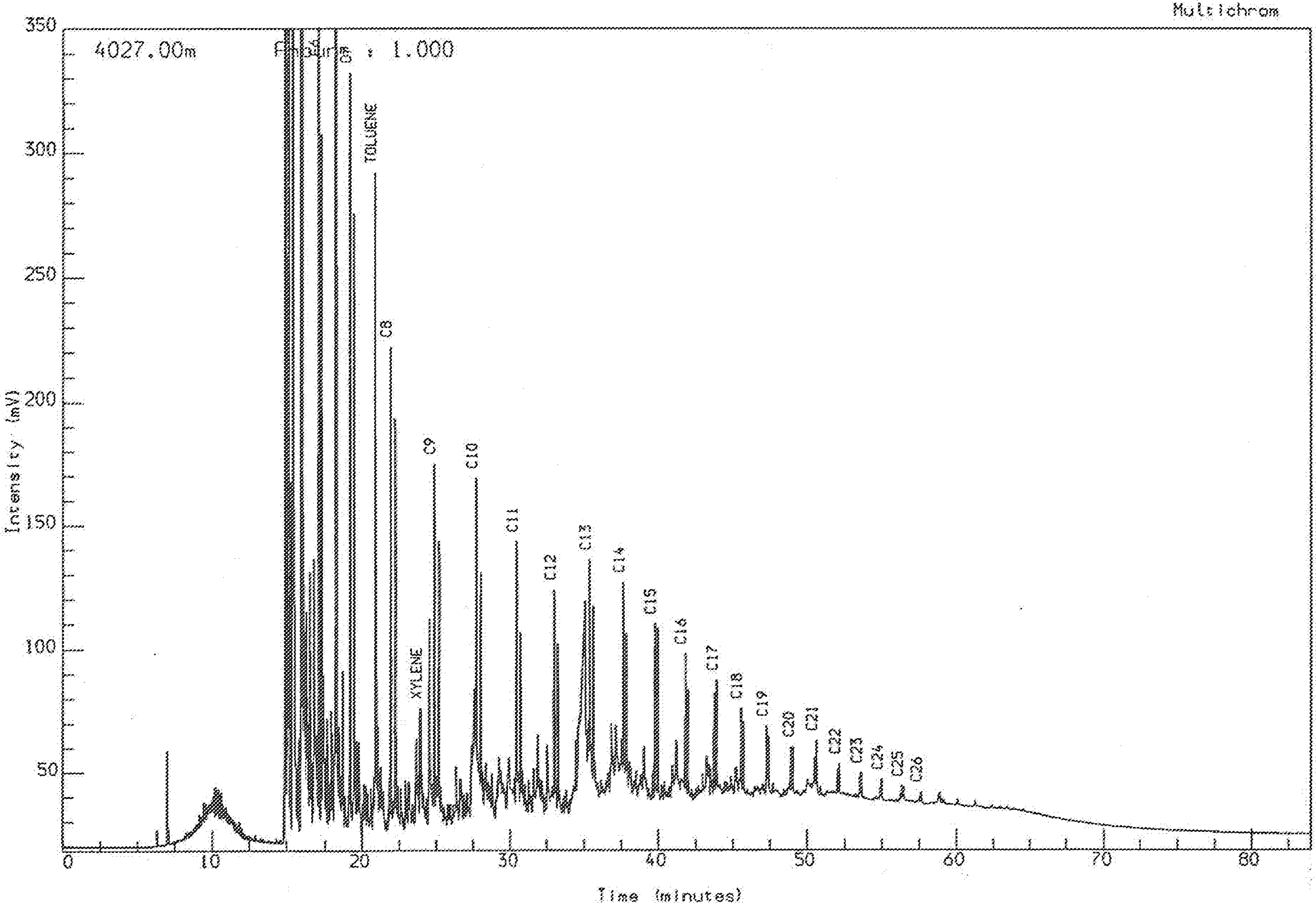


WELL NOCS 2/8-14 3984.00m cut
PYROLYSIS GC (S2)
Sh/Clst: drk gy to brn blk

Reported on 13-MAR-1991 at 12:27

GEOLAB NOR

Analysis Name : [526097] 25 PE34C,8,1.

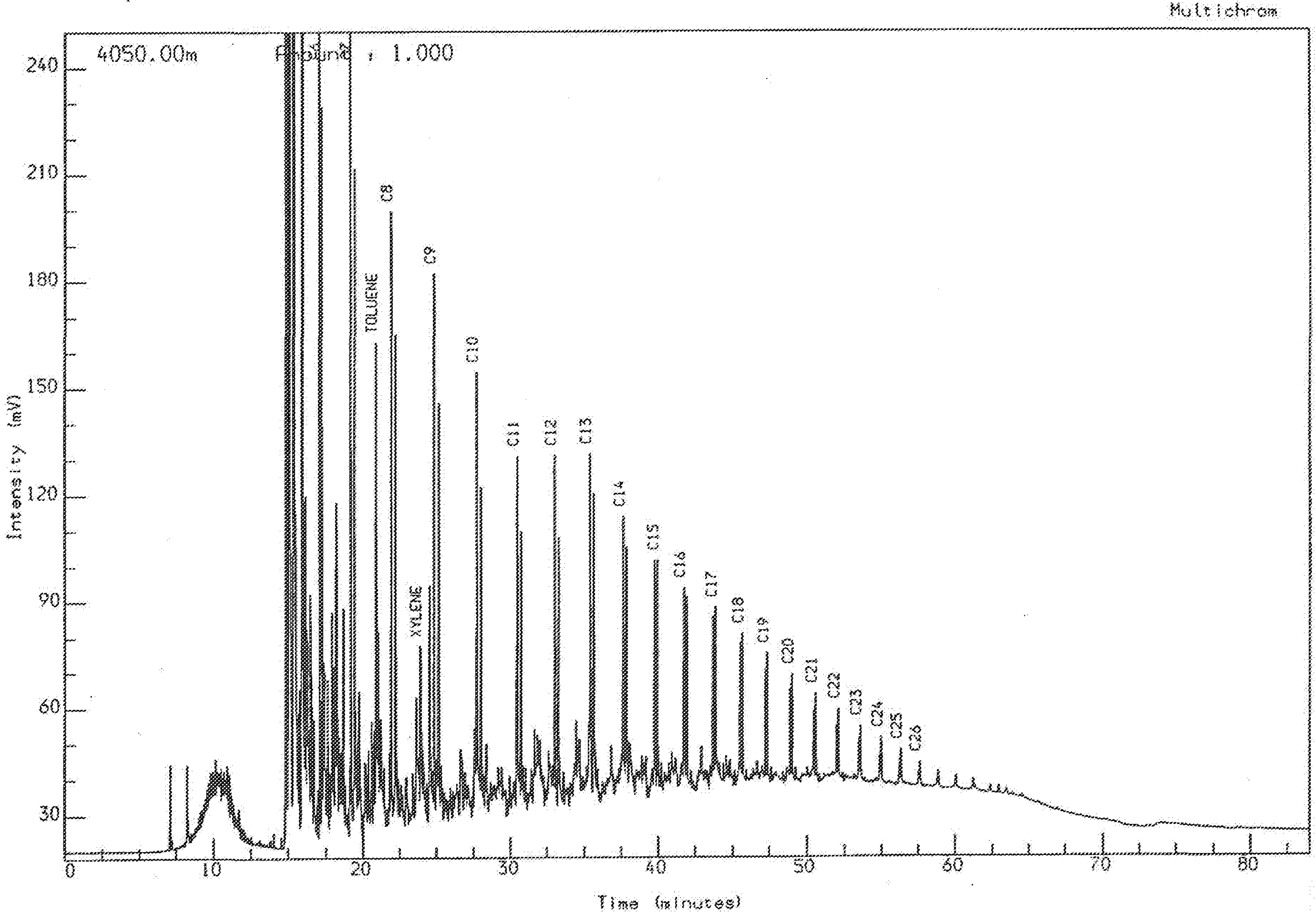


WELL NOCS 2/8-14 4027.00m swc
PYROLYSIS GC (S2)
Sh/Clst: drk gy to brn blk

Reported on 13-MAR-1991 at 12:28

GEOLAB NOR

Analysis Name : [526097] 25 PE34C,9,1.

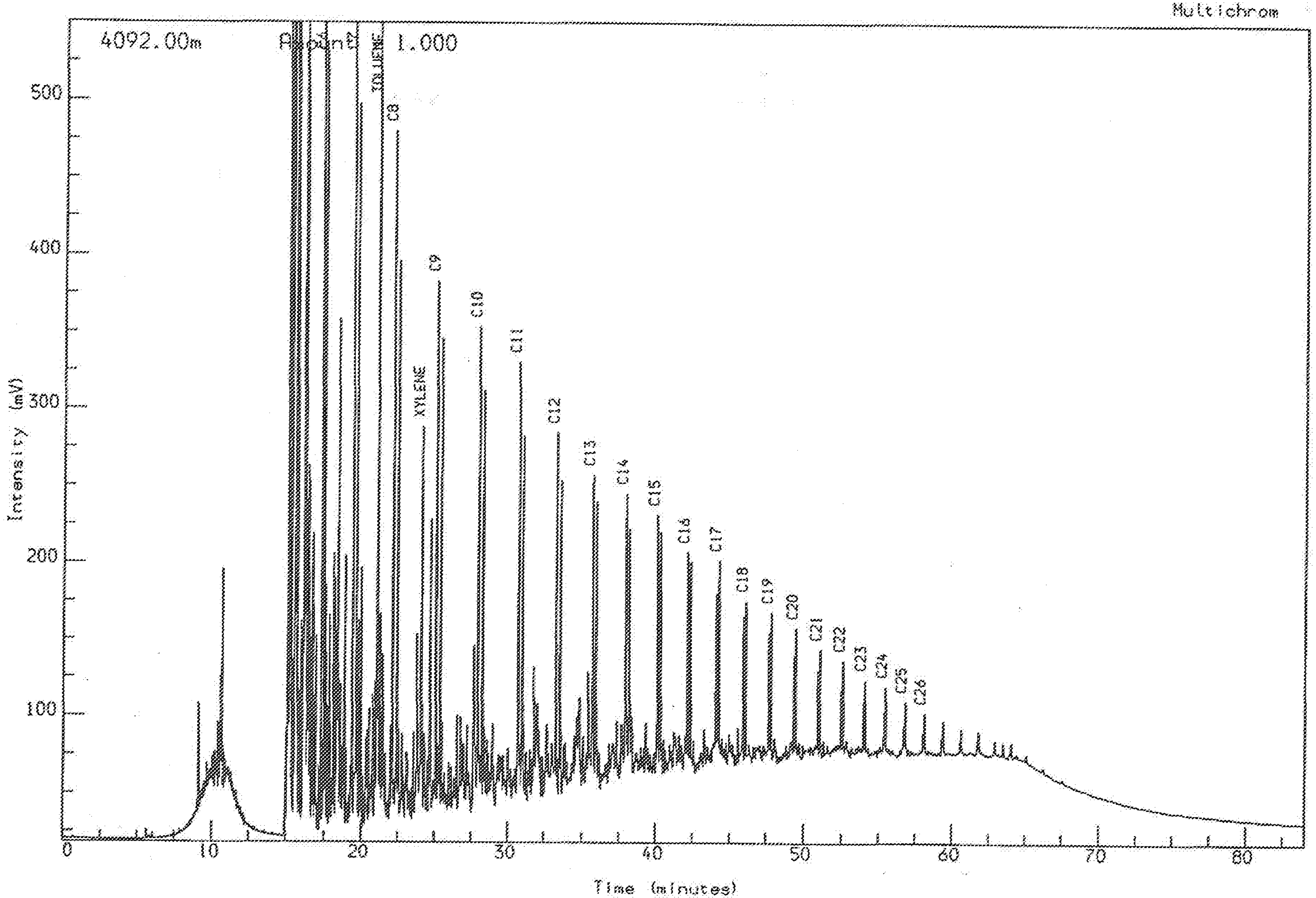


WELL NOCS 2/8-14 4050.00m cut
PYROLYSIS GC (S2)
Sh/Clst: drk gy to brn blk

Reported on 13-MAR-1991 at 13:00

GEOLAB NOR

Analysis Name : [526097] 25 PE3402251,1,1.

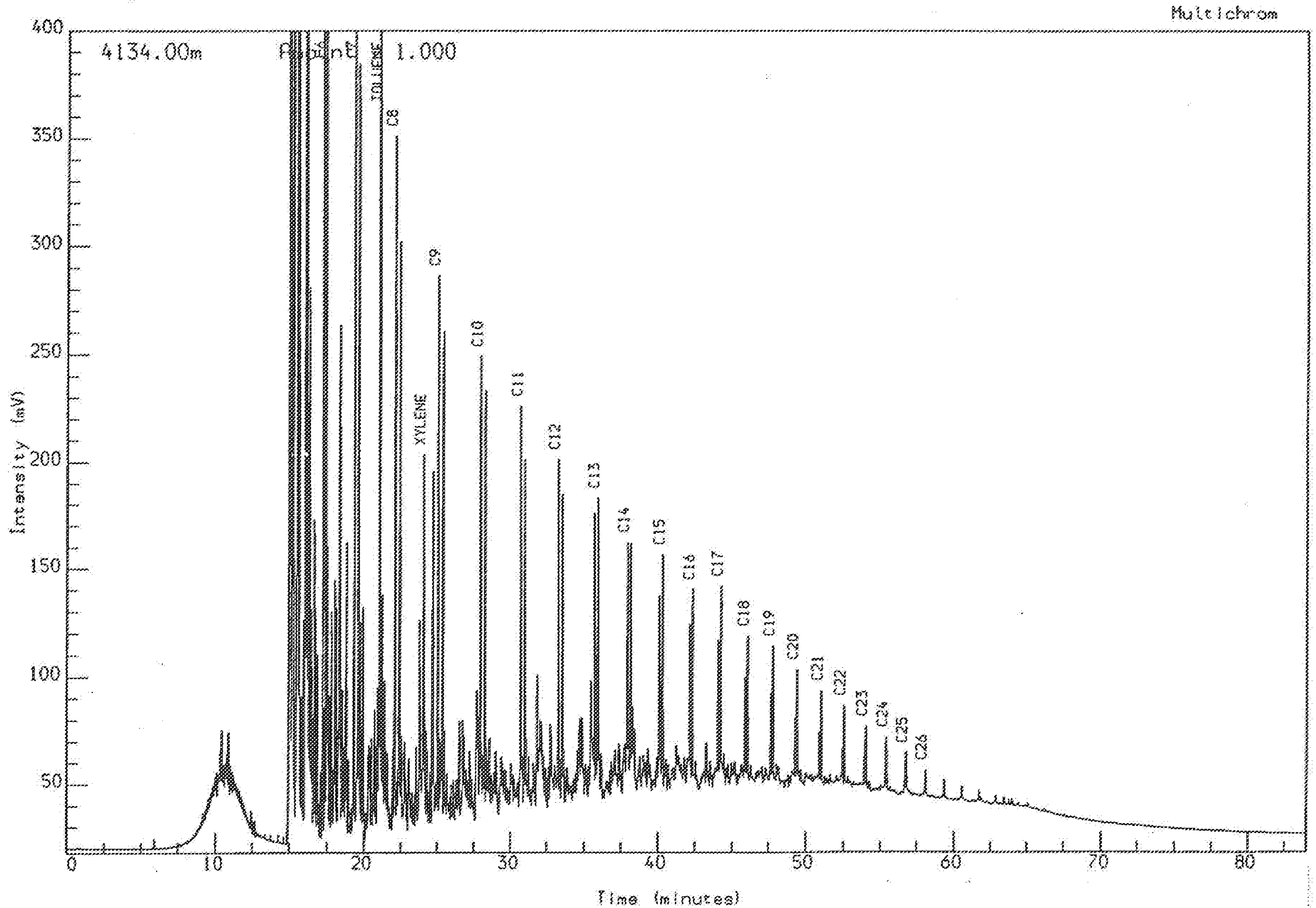


WELL NOCS 2/8-14 4092.00m cut
PYROLYSIS GC (S2)
Sh/Clst: drk gy to dsk brn to brn bl

Reported on 13-MAR-1991 at 13:02

GEOLAB NOR

Analysis Name : [S26097] 25 PE3402321,1,1.

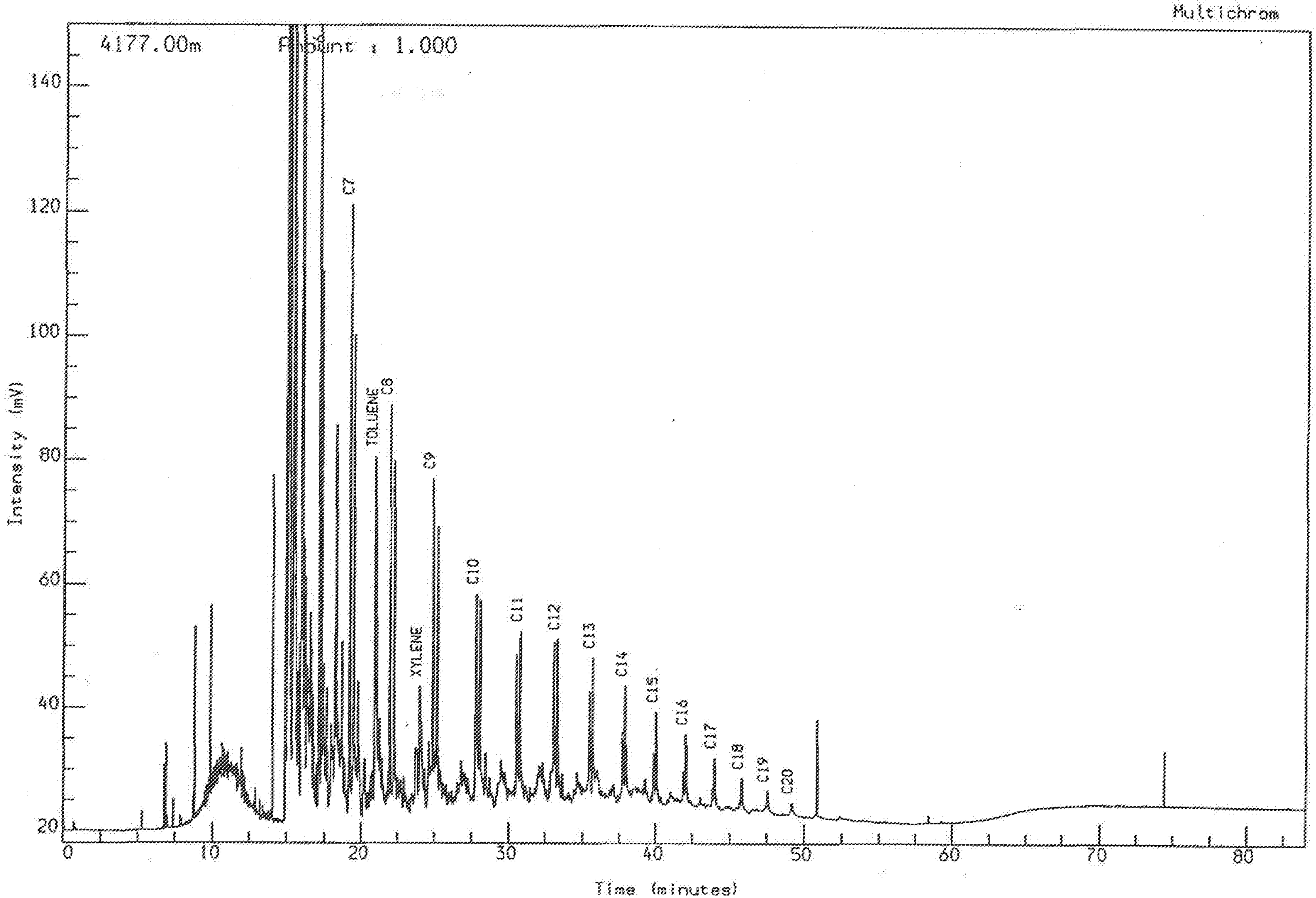


WELL NOCS 2/8-14 4134.00m cut
PYROLYSIS GC (S2)
Sh/Clst: drk gy to brn blk

Reported on 13-MAR-1991 at 13:17

GEOLAB NOR

Analysis Name : [526097] 25 PE3400271,1,1.

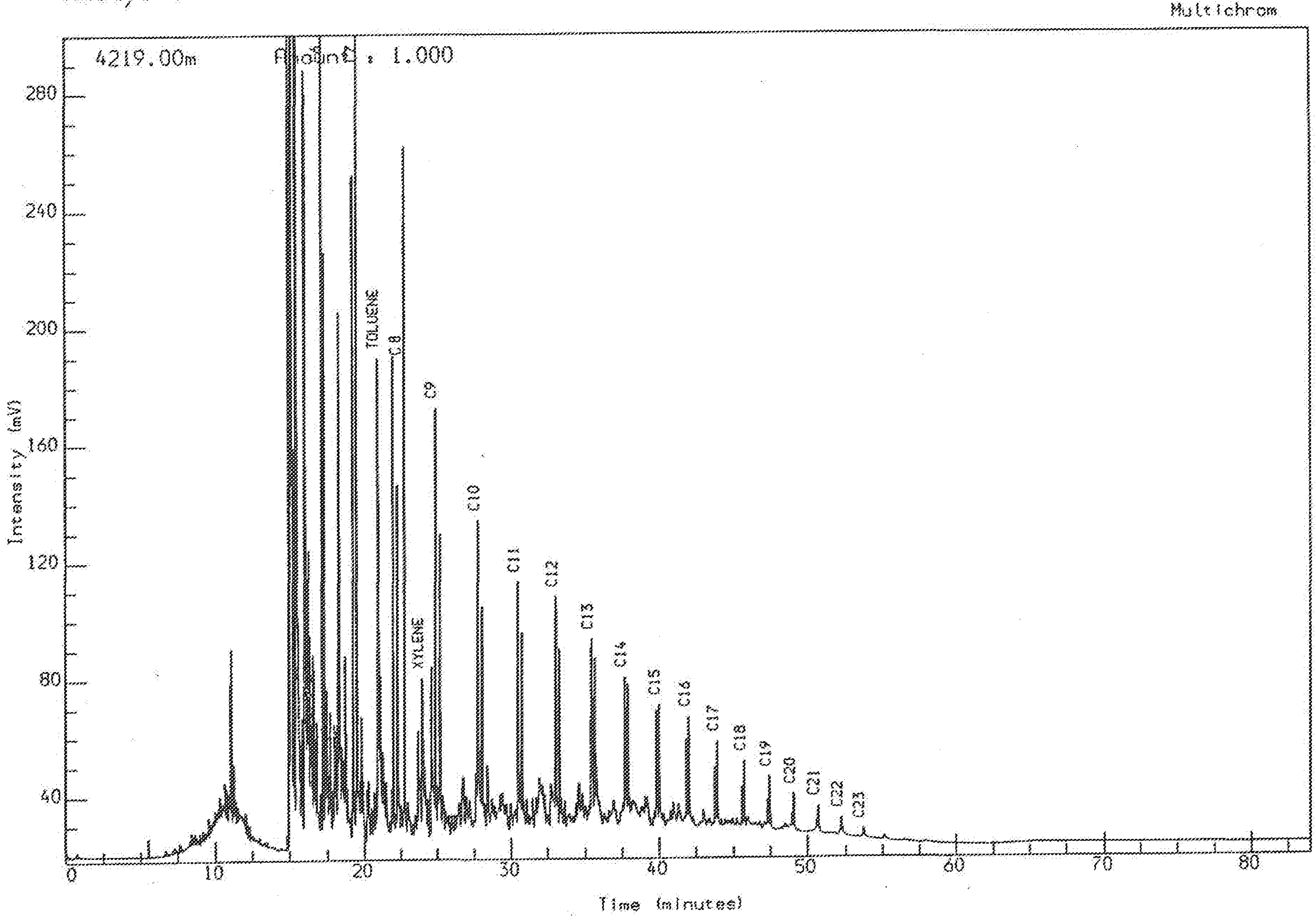


WELL NOCS 2/8-14 4177.00m swc
PYROLYSIS GC (S2)
Sh/Clst: drk gy to brn blk

Reported on 14-MAR-1991 at 09:59

GEOLAB NOR

Analysis Name : [526097] 25 PE3401781.1.1.



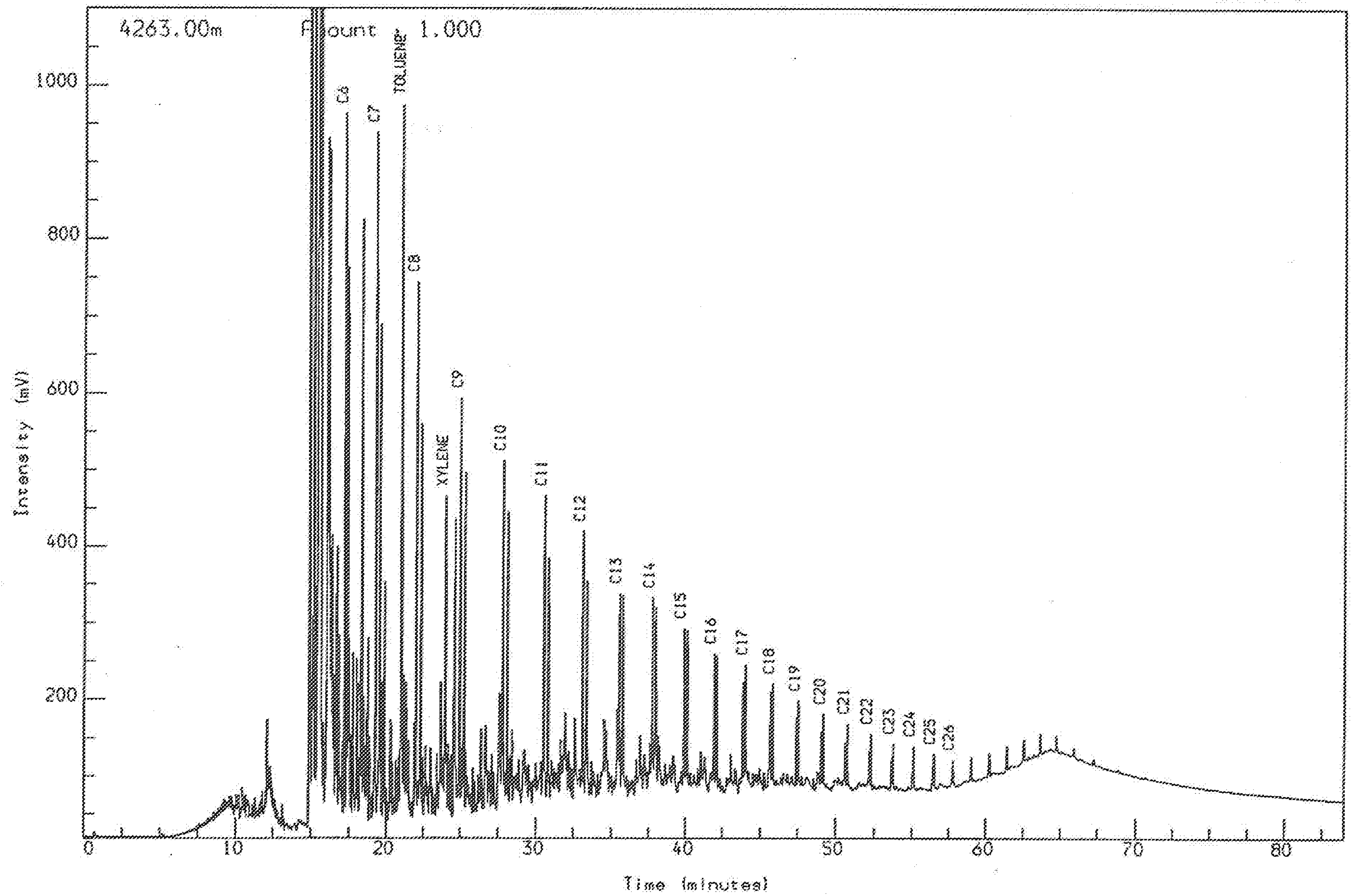
WELL NOCS 2/8-14 4219.00m swc
PYROLYSIS GC (S2)
Sh/Clst: brn blk

Reported on 14-MAR-1991 at 10:00

GEOLAB NOR

Analysis Name : [526097] 25 PE340176IB.1.1.

Multichrom

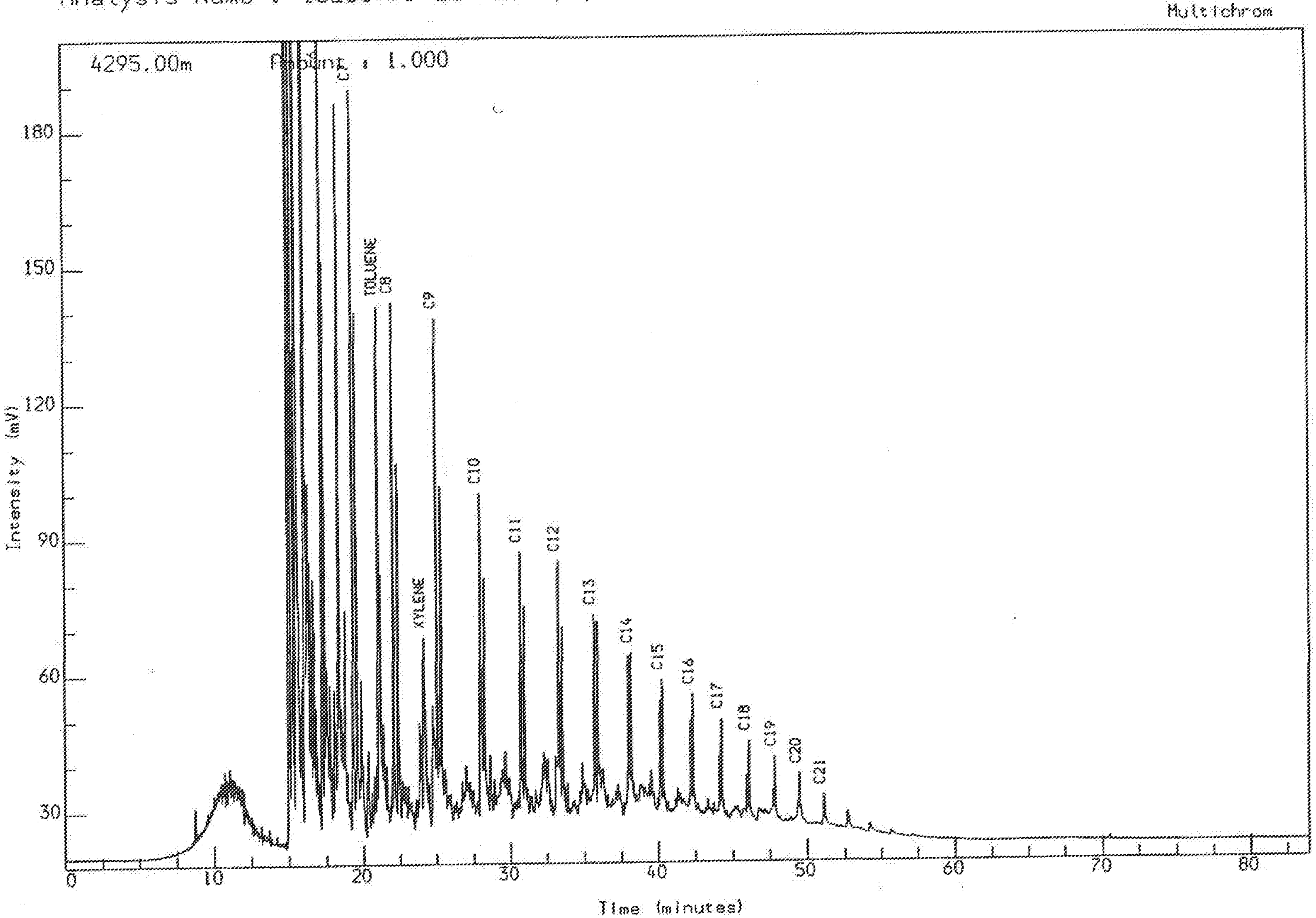


WELL NOCS 2/8-14 4263.00m swc
PYROLYSIS GC (S2)
Sh/Clst: brn blk to drk gy

Reported on 19-MAR-1991 at 09:41

GEOLAB NOR

Analysis Name : [526097] 25 PE34D,2,1.

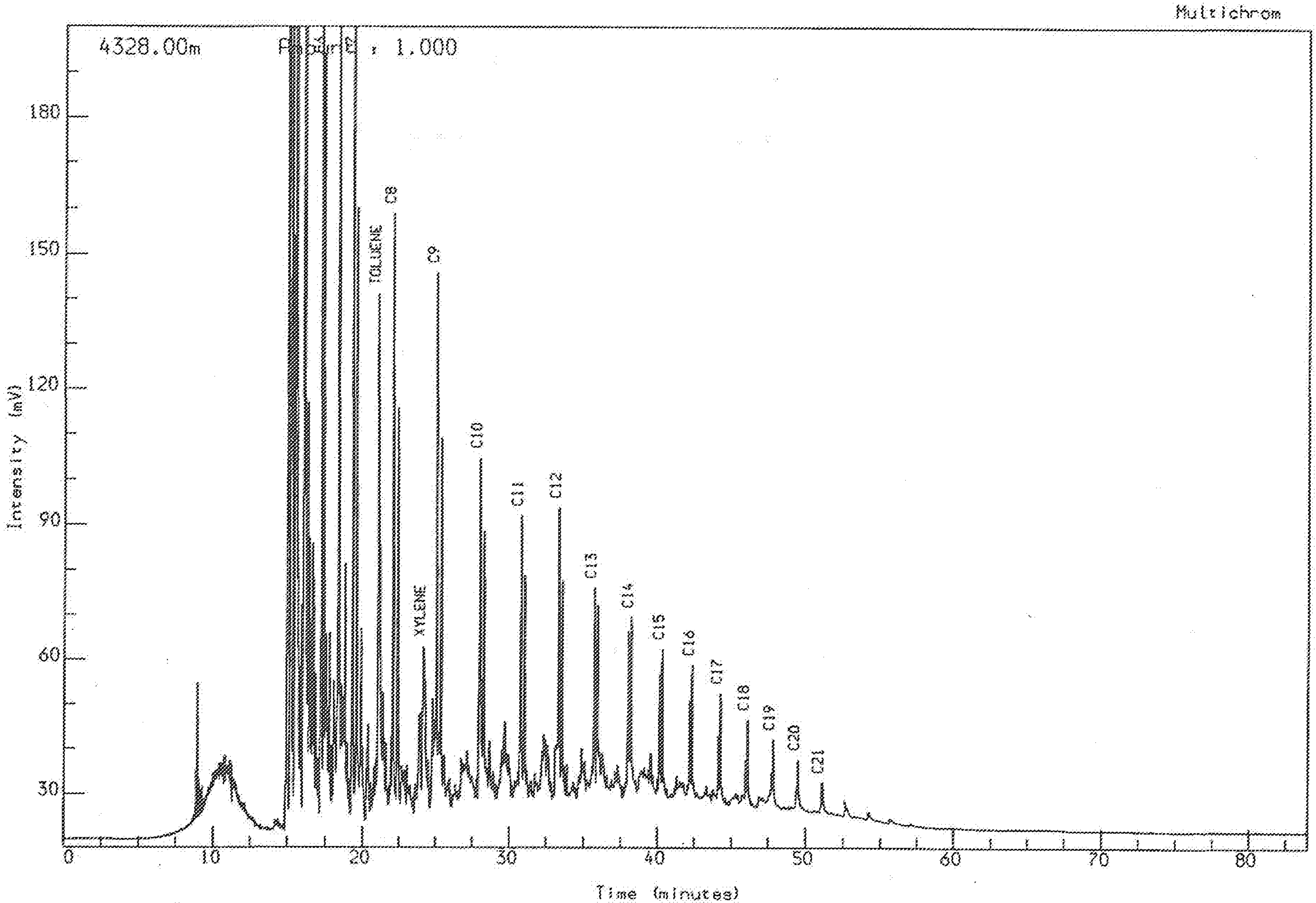


WELL NOCS 2/8-14 4295.00m swc
PYROLYSIS GC (S2)
Sh/Clst: brn blk

Reported on 15-MAR-1991 at 08:34

GEOLAB NOR

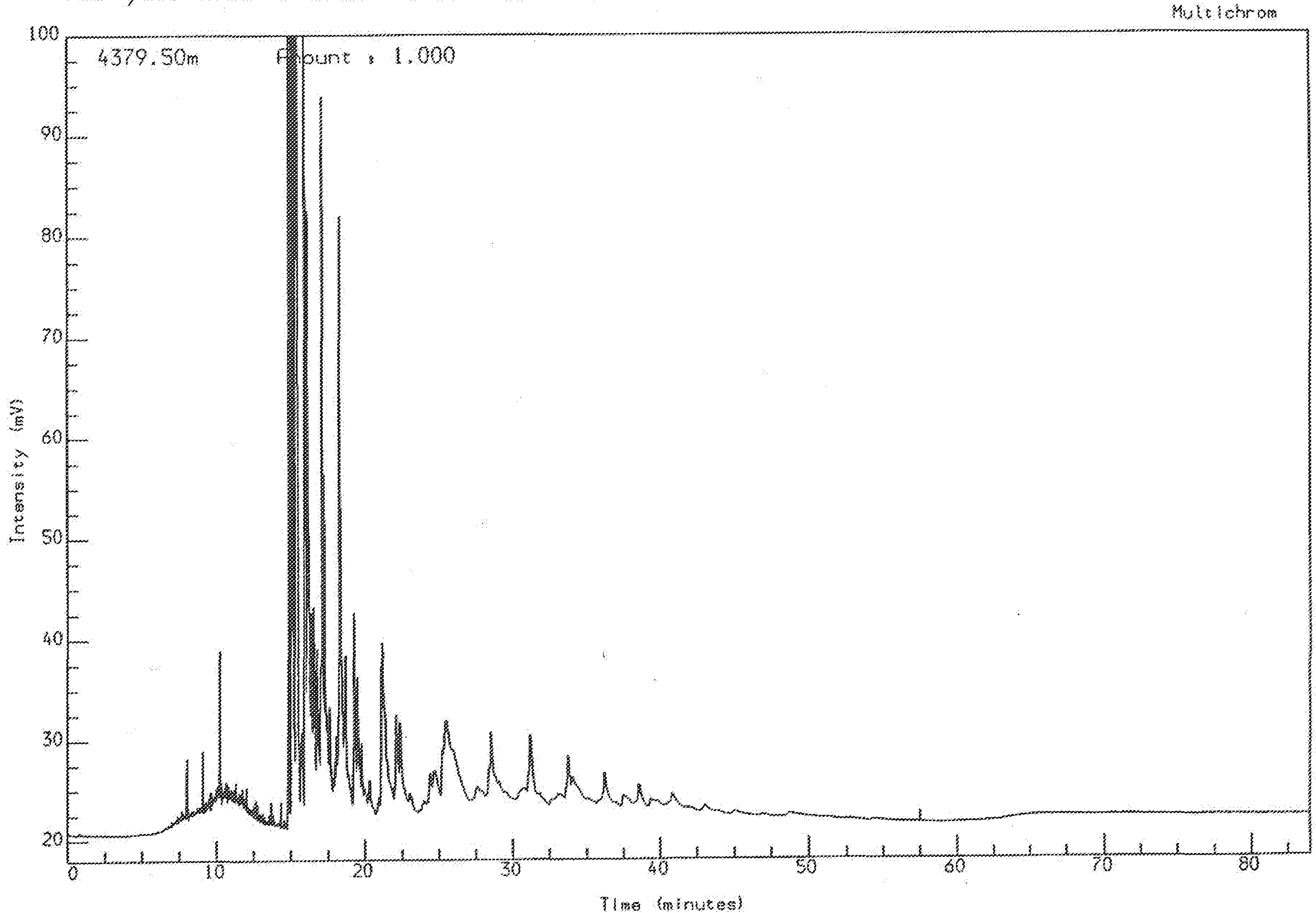
Analysis Name : [526097] 25 PE34D,3,1.



WELL NOCS 2/8-14 4328.00m swc
PYROLYSIS GC (S2)
Sh/Clst: brn blk

Reported on 15-MAR-1991 at 08:37

Analysis Name : [526097] 25 PE34D,5,1.

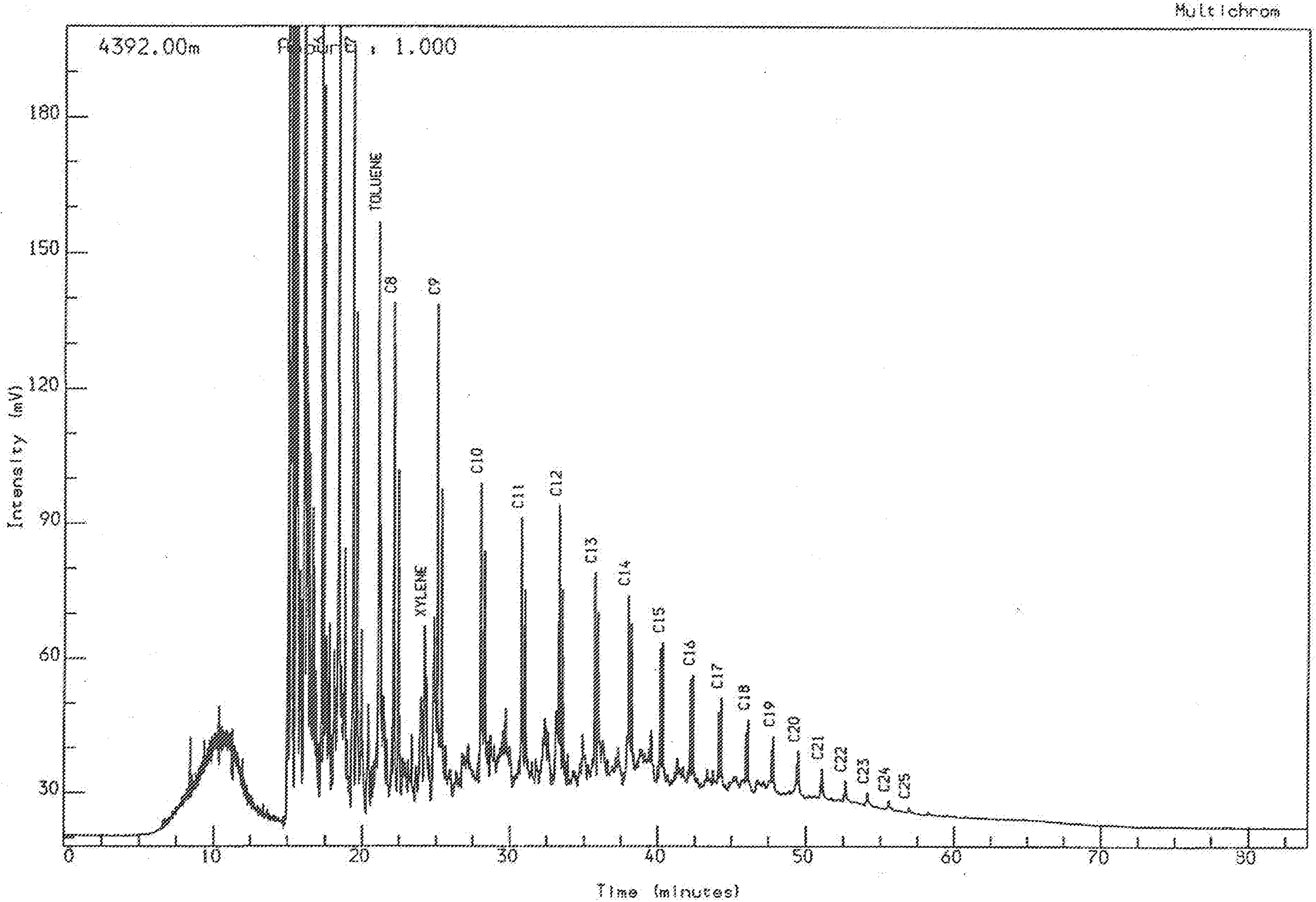


WELL NOCS 2/8-14 4379.50m swc
PYROLYSIS GC (S2)
Sh/Clst: brn blk to drk gy

Reported on 15-MAR-1991 at 08:45

GEOLAB NOR

Analysis Name : [526097] 25 PE34D.6.1.



WELL NOCS 2/8-14 4392.00m swc
PYROLYSIS GC (S2)
Sh/Clst: brn blk

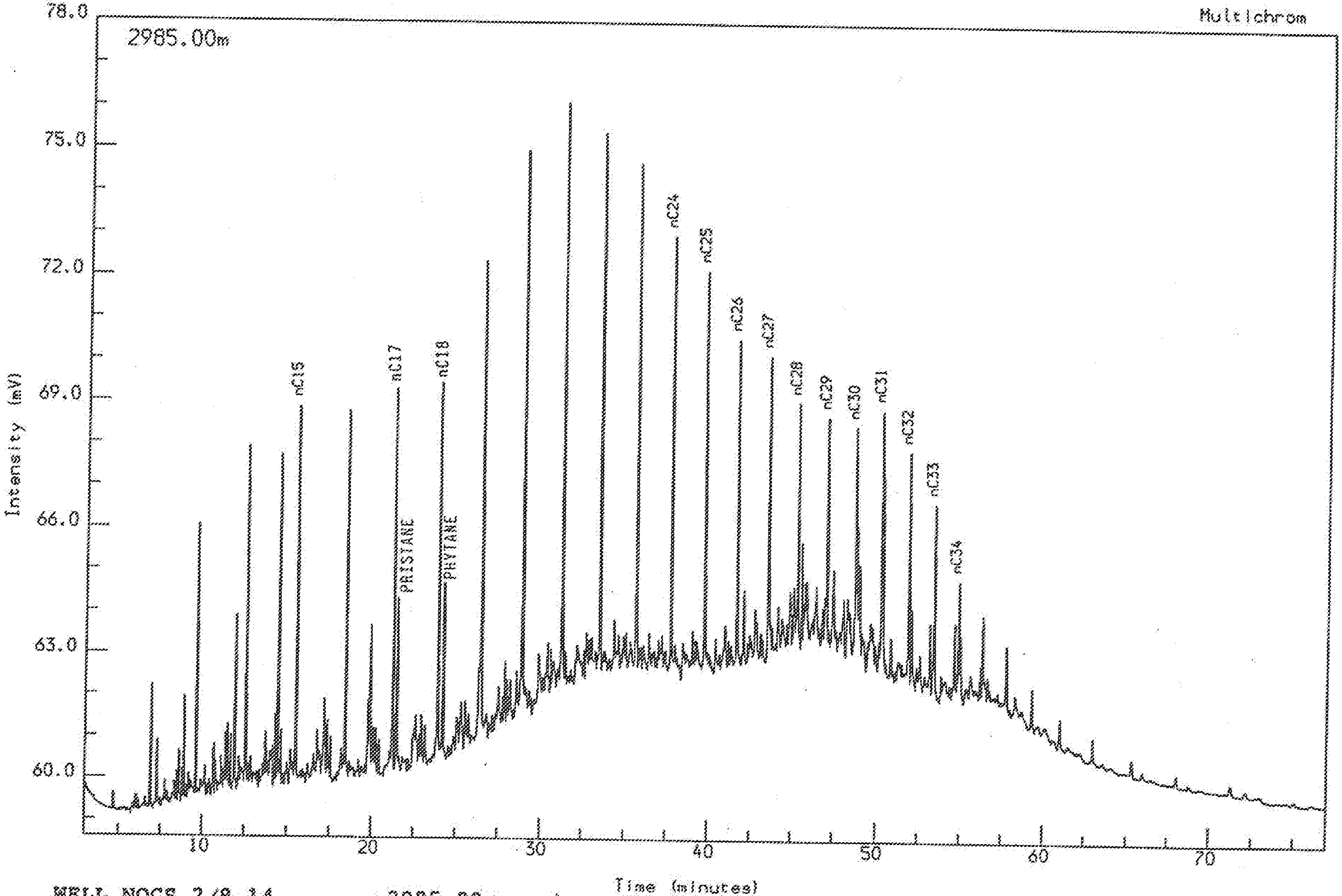
Reported on 15-MAR-1991 at 08:46

GEOLAB NOR

APPENDIX 4

GAS CHROMATOGRAMS

Analysis Name : [526097] 11 SE3400391L.1.1.

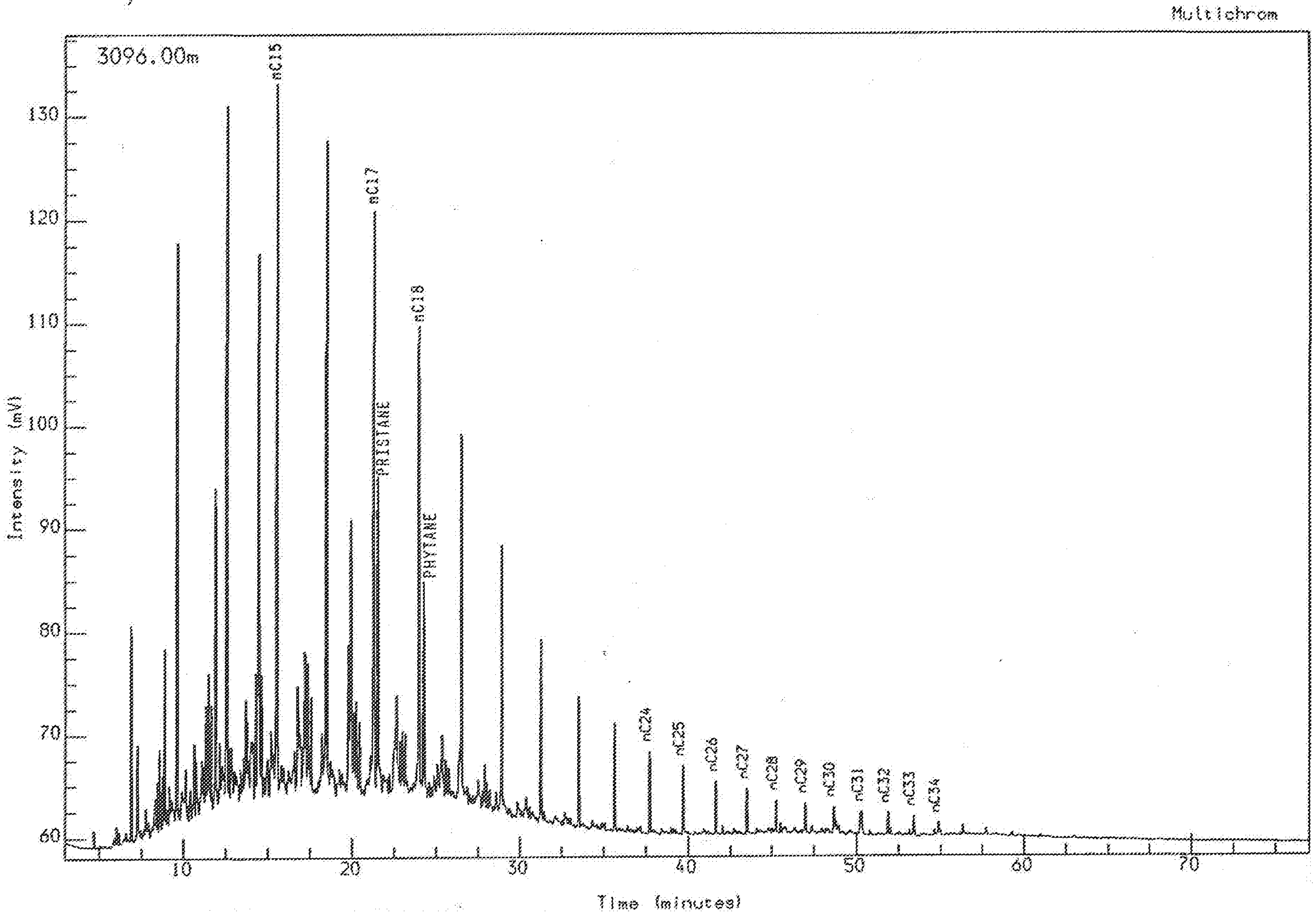


WELL NOCS 2/8-14 2985.00m cut
SATURATED GC
Ca: lt or to or gy

Reported on 25-MAR-1991 at 12:24

GEOLAB NOR

Analysis Name : [526097] 11 SE3400461L.1.1.

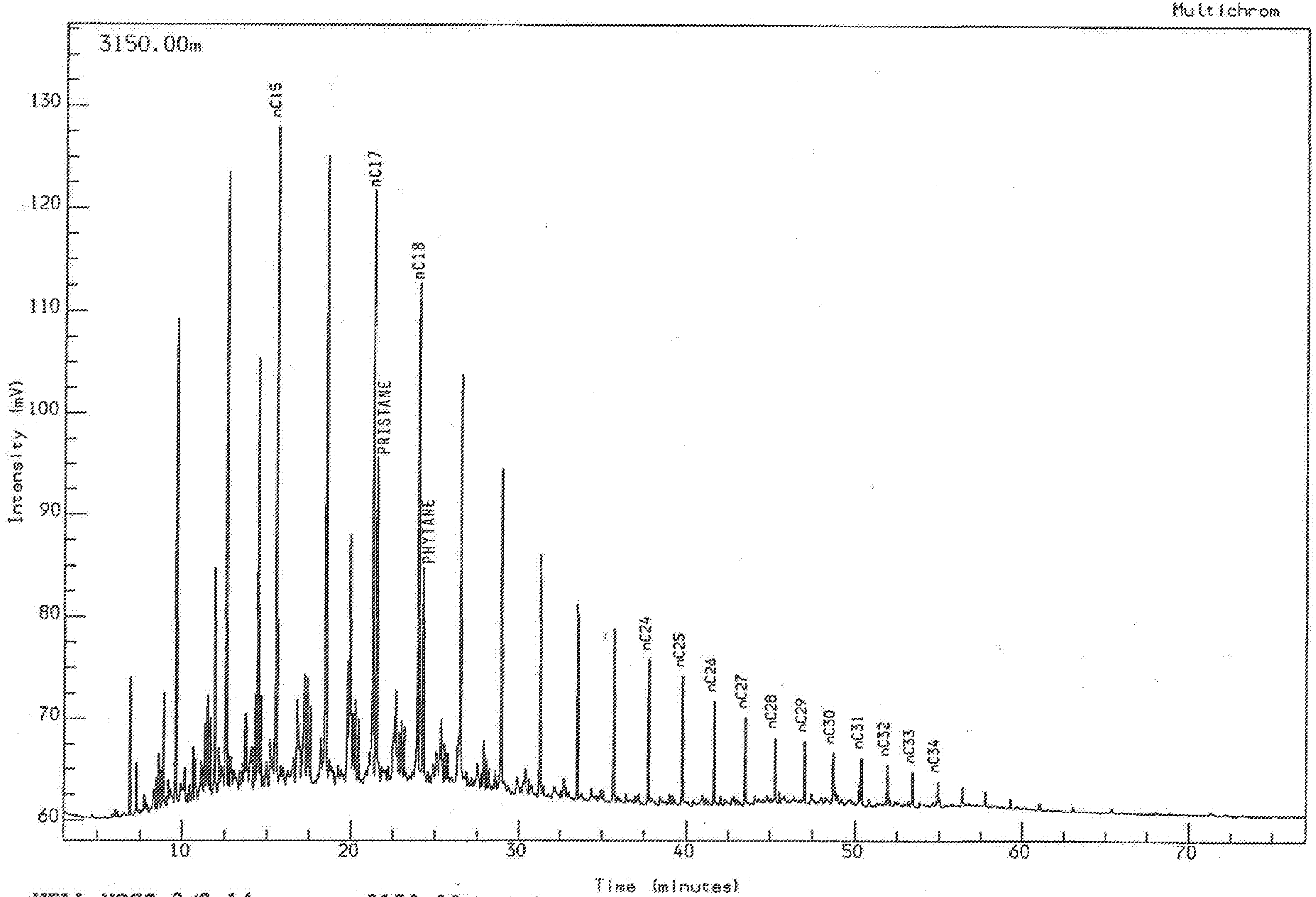


WELL NOCS 2/8-14 3096.00m cut
SATURATED GC
Marl: lt gy to m gy

Reported on 25-MAR-1991 at 13:47

GEOLAB NOR

Analysis Name : [526097] 11 SE3400551L.1.1.

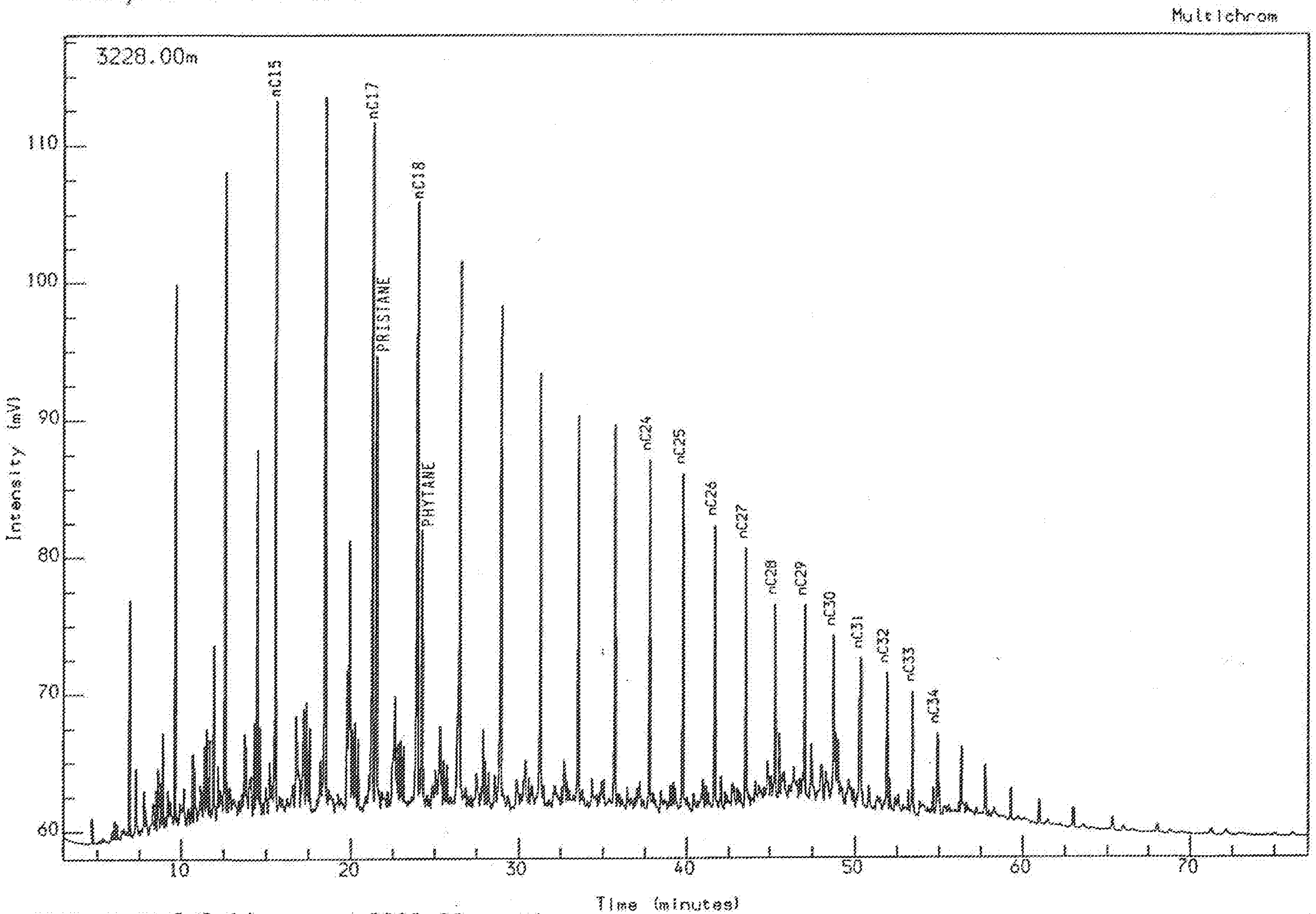


WELL NOCS 2/8-14 3150.00m cut
SATURATED GC
Marl: lt gy to lt brn gy

Reported on 25-MAR-1991 at 15:18

GEOLAB NOR

Analysis Name : [526097] 11 SE3400681L,1,1.

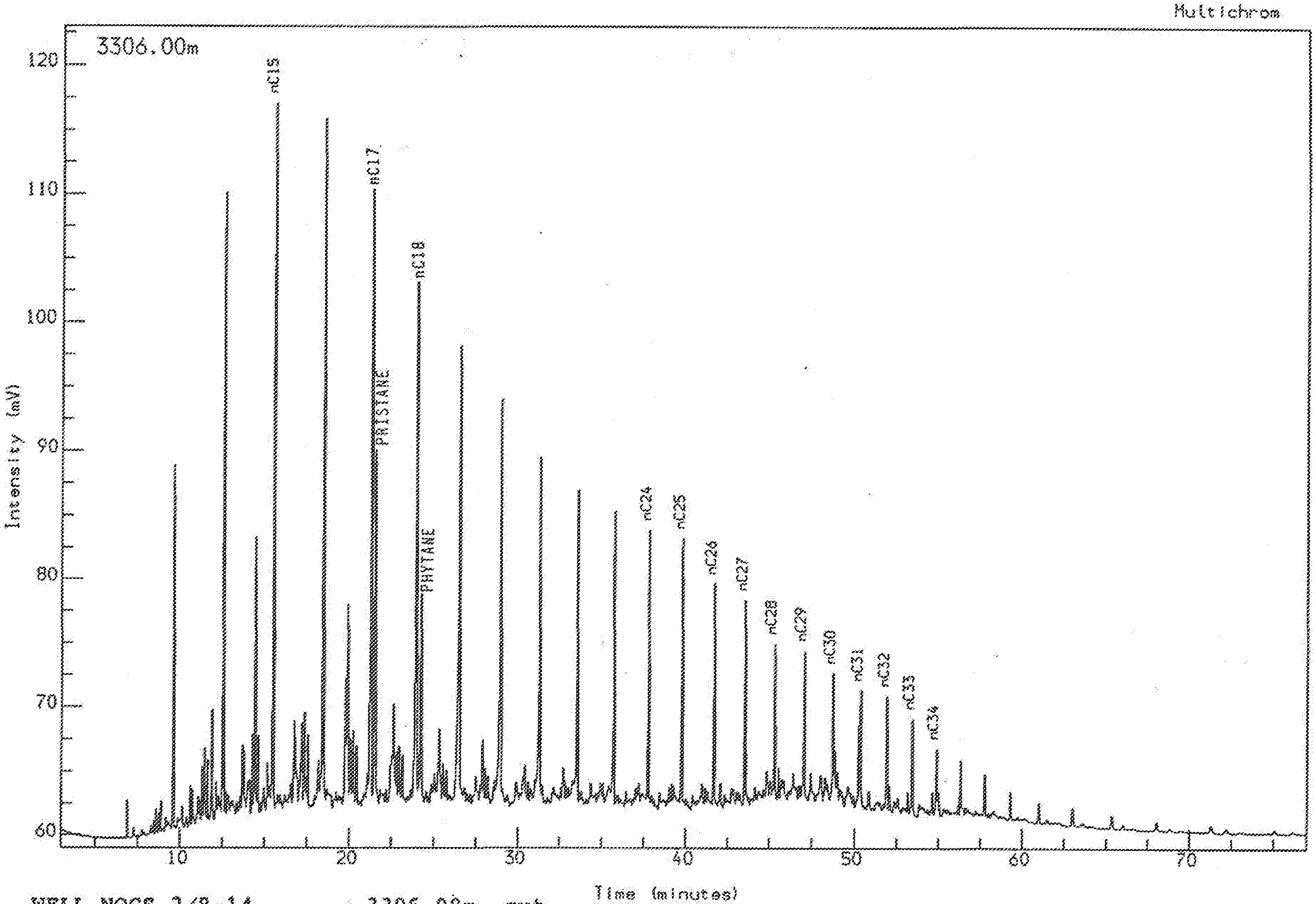


WELL NOCS 2/8-14 3228.00m cut
SATURATED GC
Sh/Clst: brn gy to gy brn to drk gy

Reported on 26-MAR-1991 at 13:41

GEOLAB NOR

Analysis Name : [526097] 11 SE3400962L.1.1.

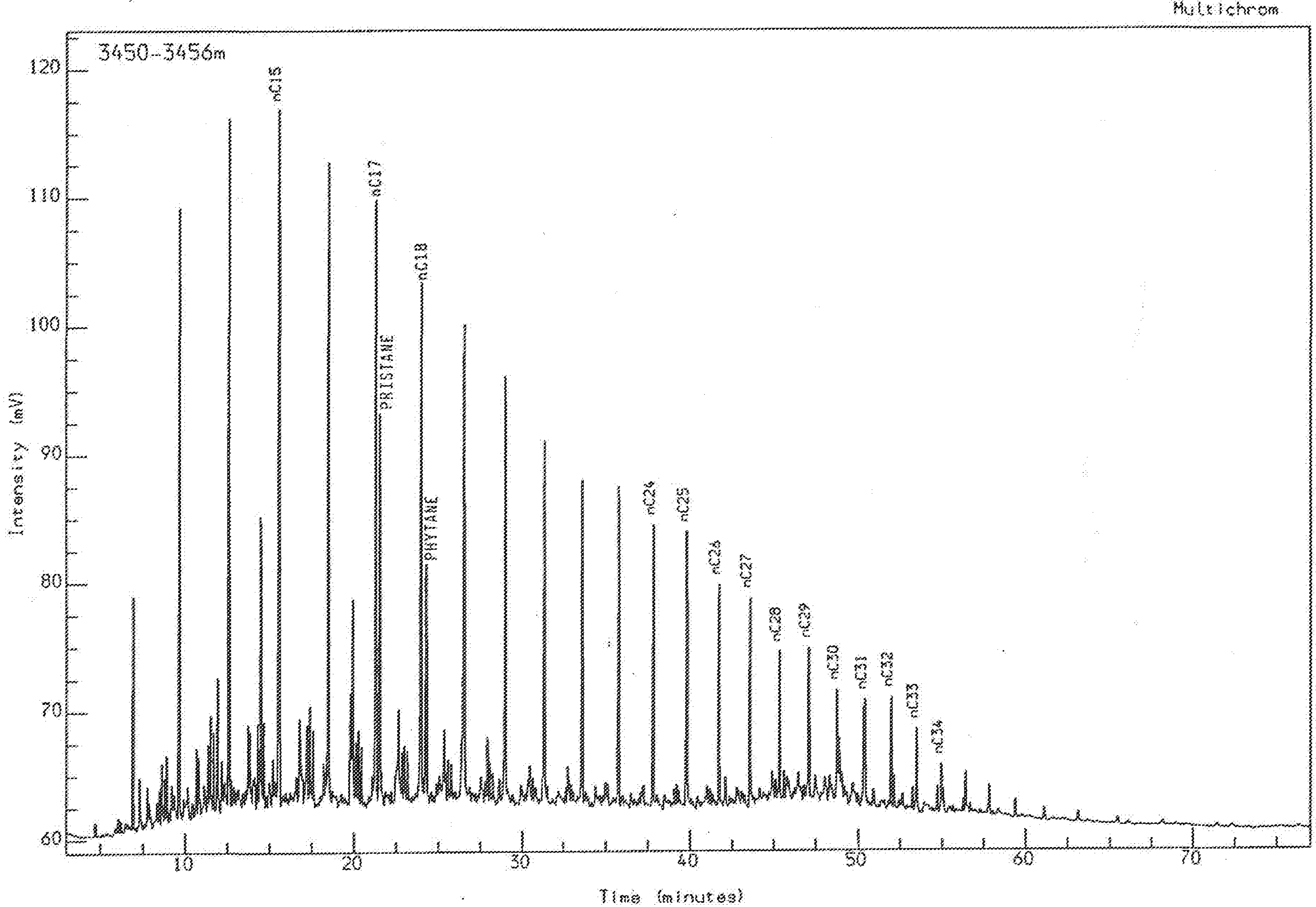


WELL NOCS 2/8-14 3306.00m cut
SATURATED GC
Sh/Clst: brn gy to drk gy

Reported on 27-MAR-1991 at 14:59

GEOLAB NOR

Analysis Name : [526097] 11 SE3402760B,1,1.

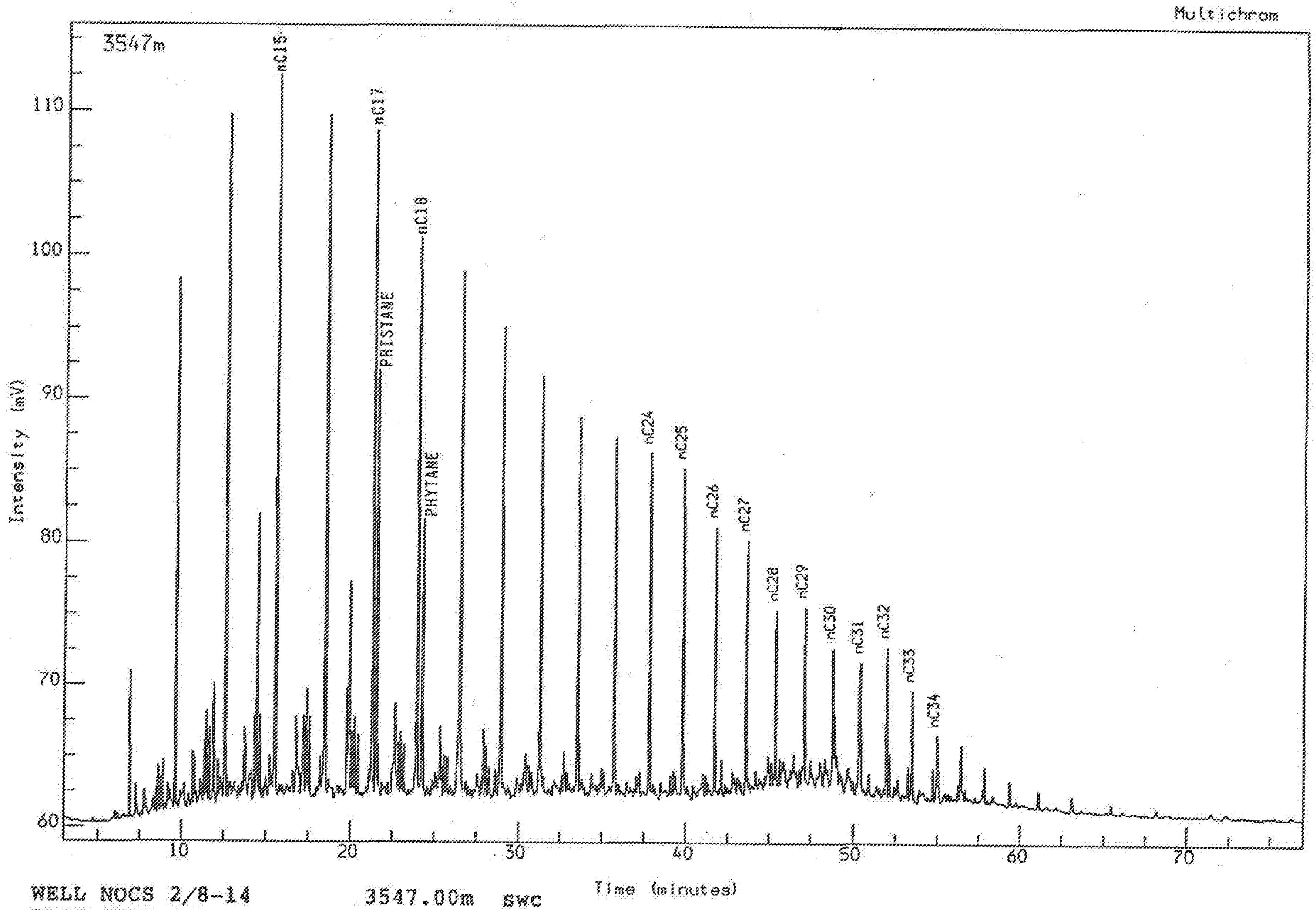


WELL NOCS 2/8-14 3450-3456m com
SATURATED GC
Sh/clst:m gy to brn gy

Reported on 2-APR-1991 at 14:24

GEOLAB NOR

Analysis Name : [526097] 11 SE3400321L,1,1.

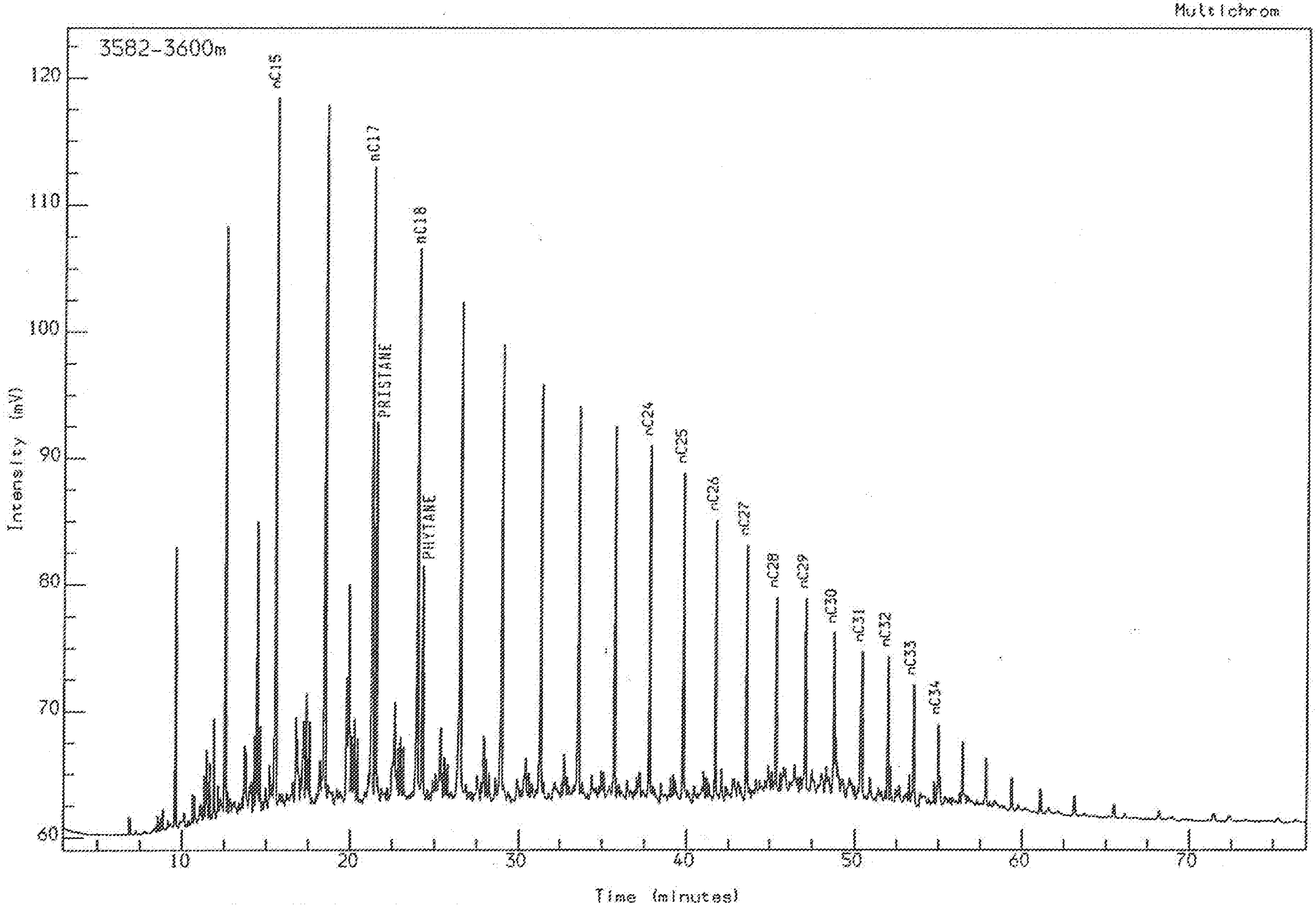


WELL NOCS 2/8-14 3547.00m swc
SATURATED GC
Sh/Clst: drk gy to brn blk

Reported on 2-APR-1991 at 14:27

GEOLAB NOR

Analysis Name : [526097] 11 SE3402770B.1,1.

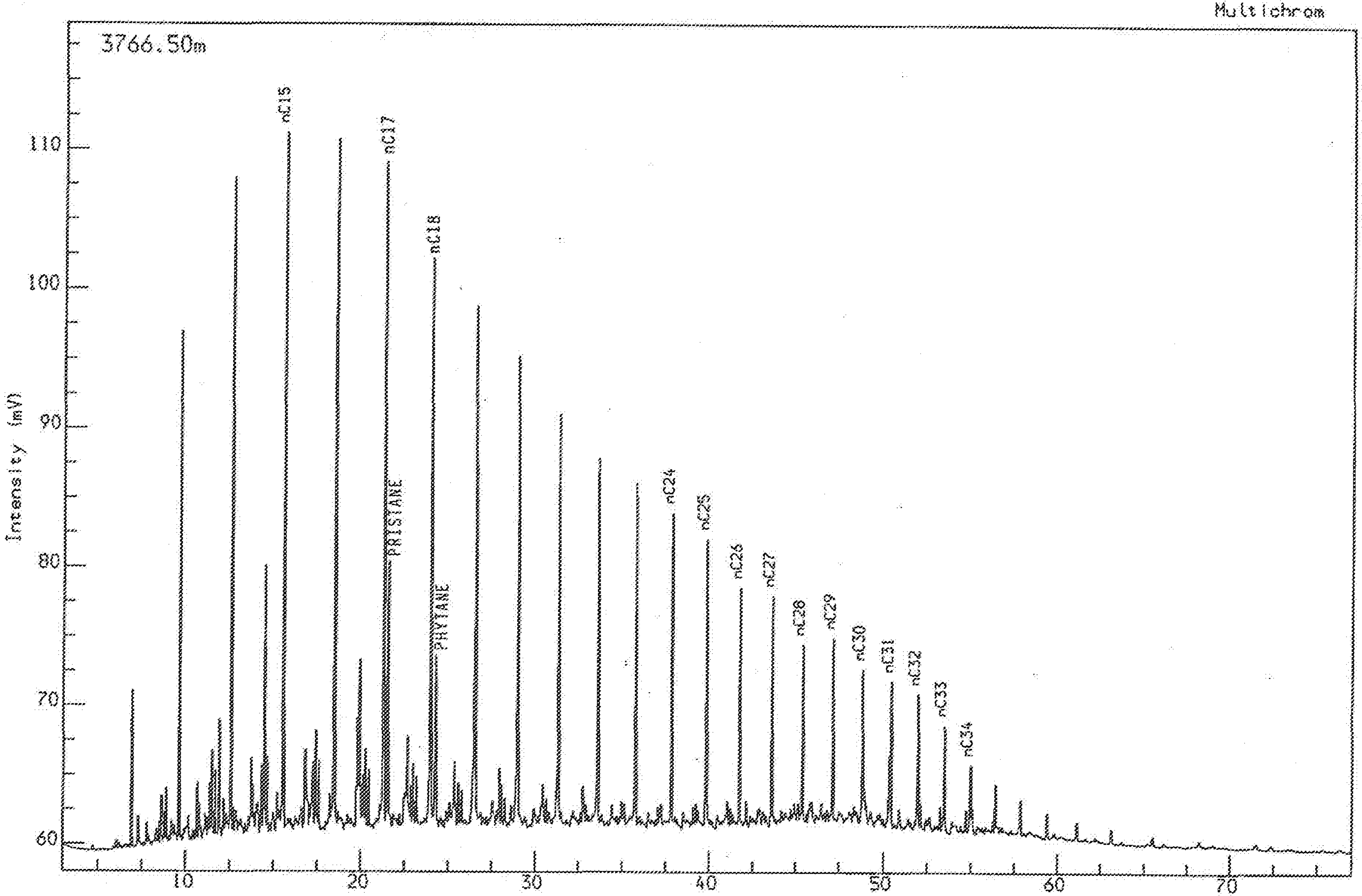


WELL NOCS 2/8-14 3582-3600m com
SATURATED GC
Sh/clst:drk gy to brn blk

Reported on 3-APR-1991 at 07:18

GEOLAB NOR

Analysis Name : [526097] 11 SE3400291L.1.1.

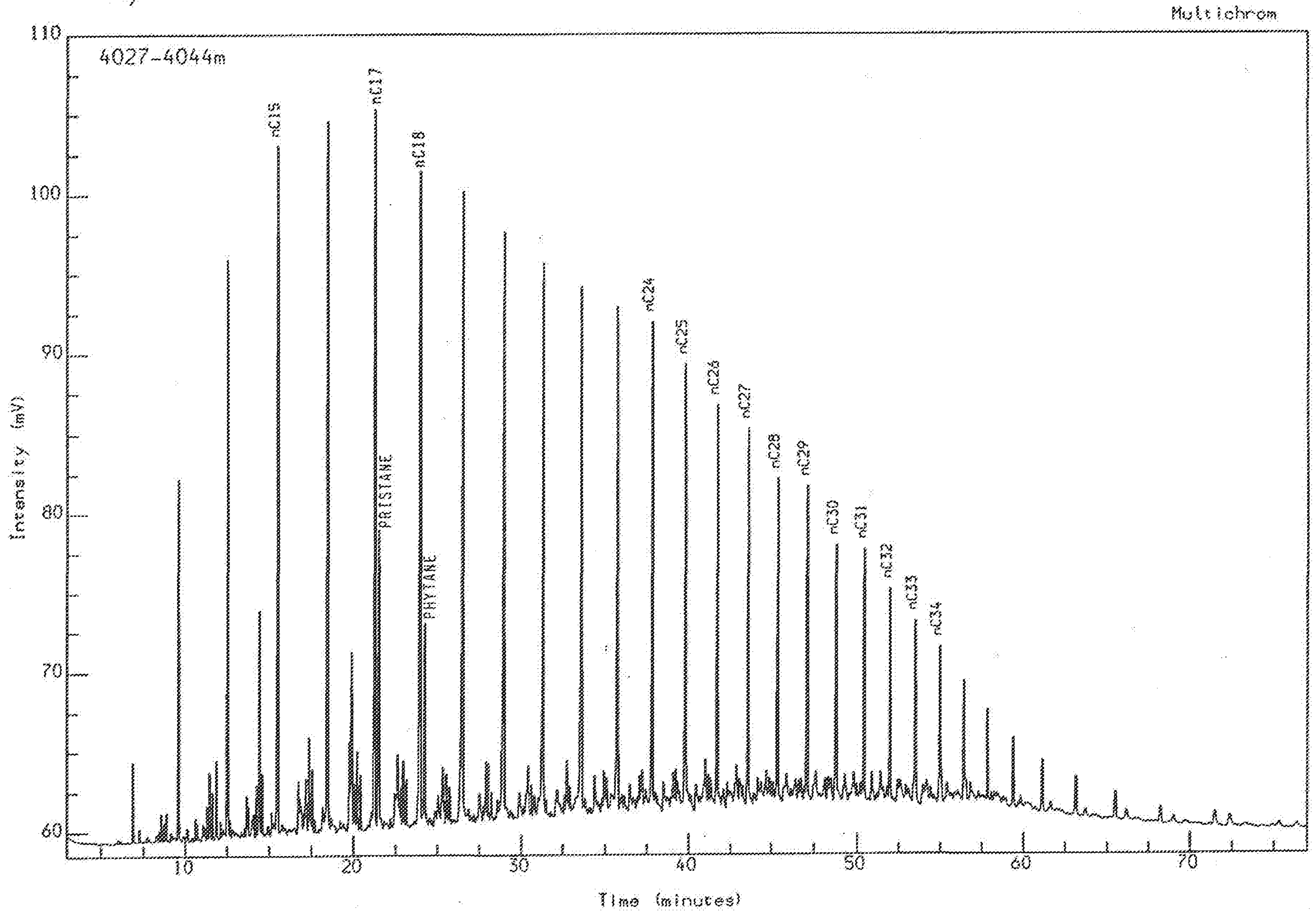


WELL NOCS 2/8-14 3766.50m swc
SATURATED GC
Sh/Clst: drk gy to brn blk

Reported on 3-APR-1991 at 10:01

GEOLAB NOR

Analysis Name : [526097] 11 SE3402780B.1.1.

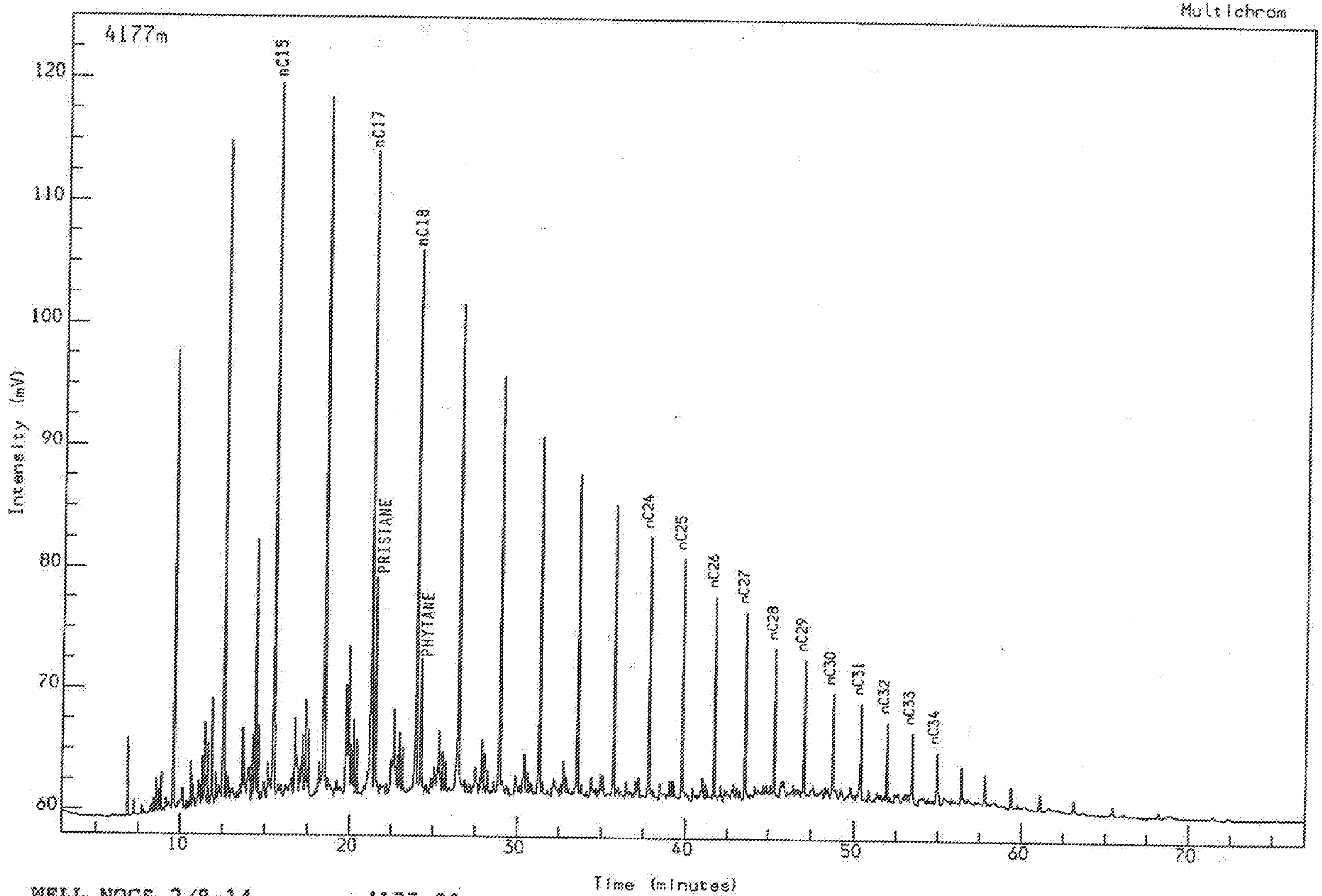


WELL NOCS 2/8-14 4027-4044m com
SATURATED GC
Sh/clst:drk gy to brn blk

Reported on 8-APR-1991 at 08:55

GEOLAB NOR

Analysis Name : [526097] 11 SE340027IL,1,1.

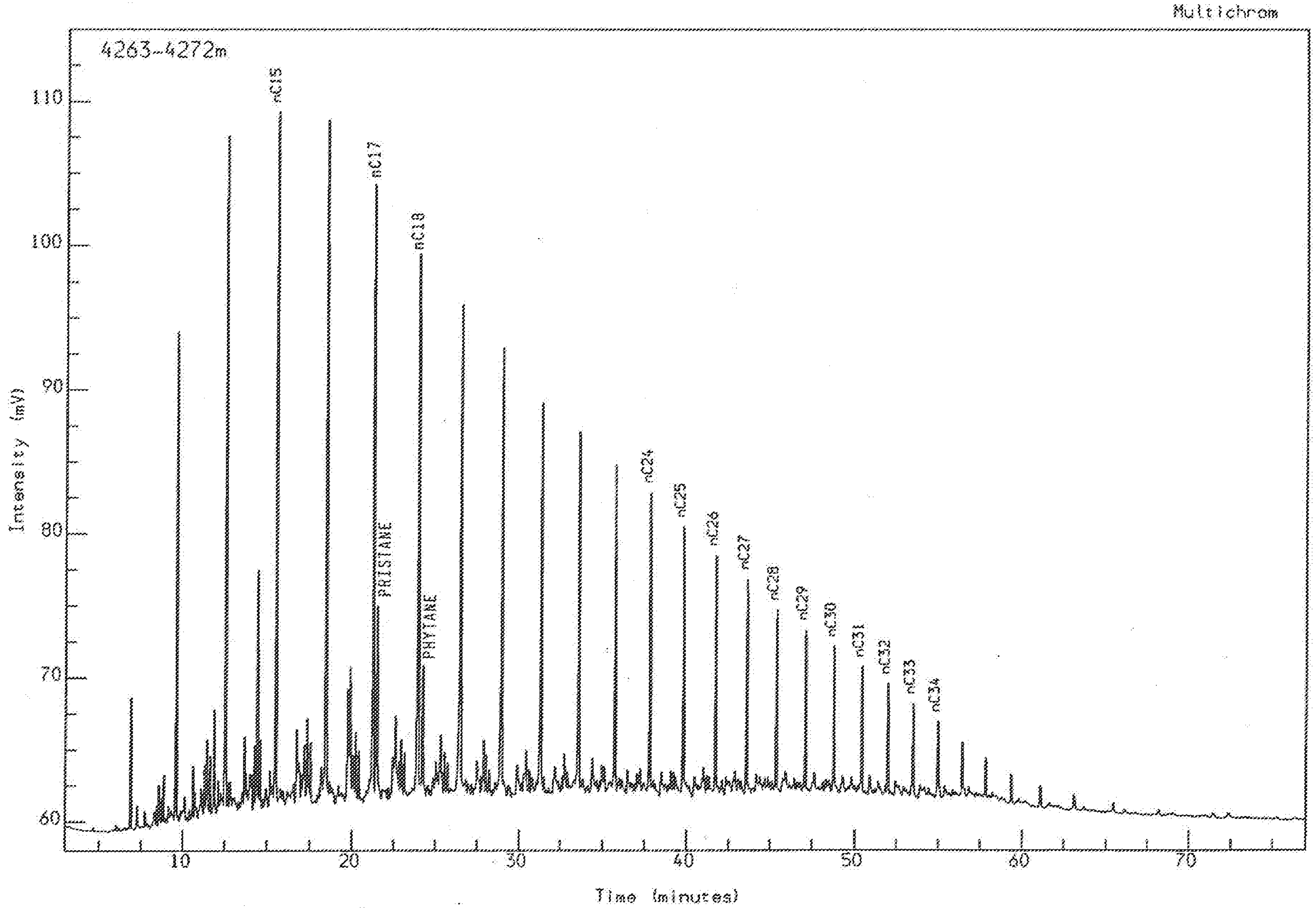


WELL NOCS 2/8-14 4177.00m swc
SATURATED GC
Sh/Clst: drk gy to brn blk

Reported on 3-APR-1991 at 12:46

GEOLAB NOR

Analysis Name : [526097] 11 SE34027908,1,1.

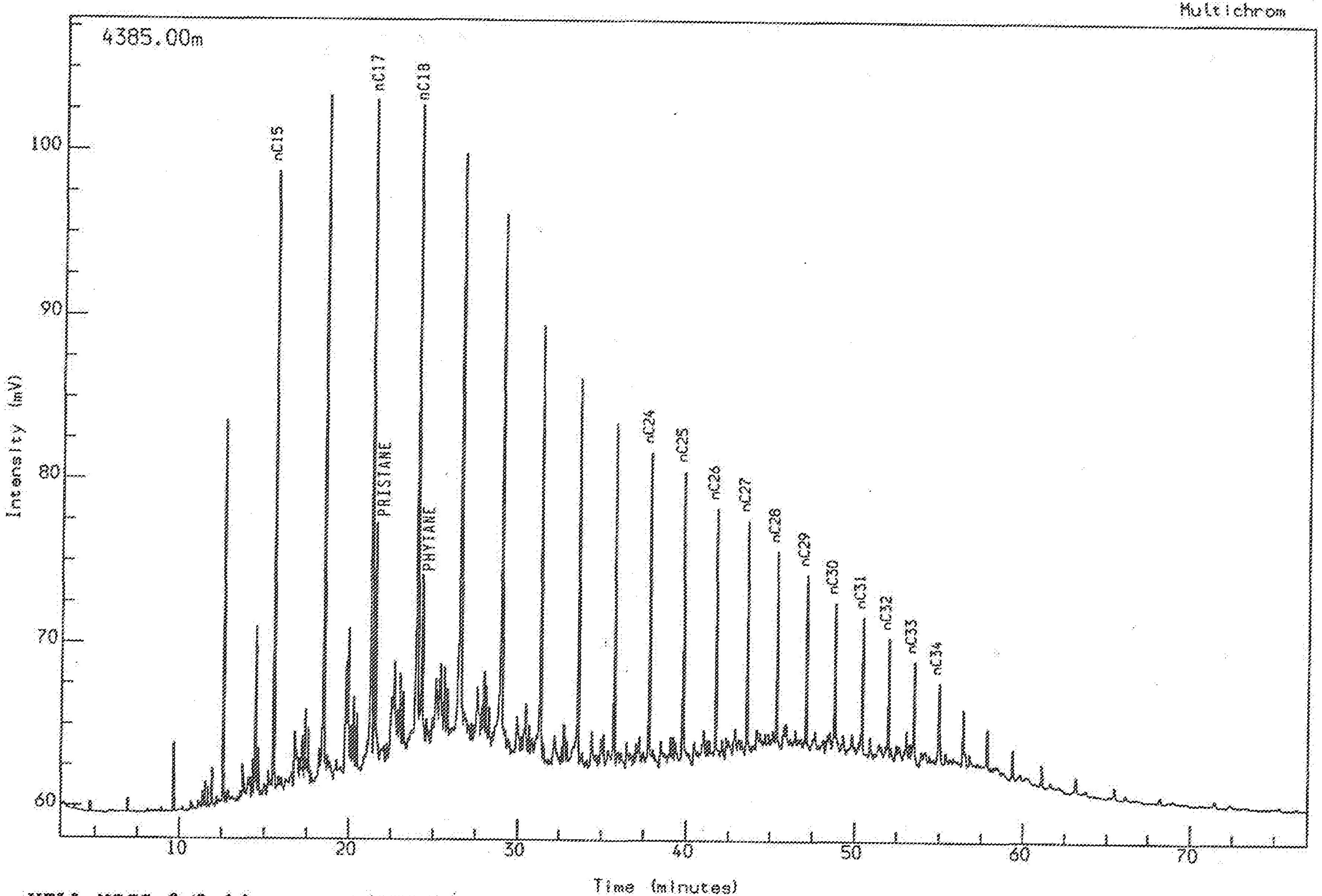


WELL NOCS 2/8-14 4263-4272m com
SATURATED GC
Sh/clst:brn blk to drk gy

Reported on 3-APR-1991 at 14:24

GEOLAB NOR

Analysis Name : [526097] 11 SE340167IL,1,1.

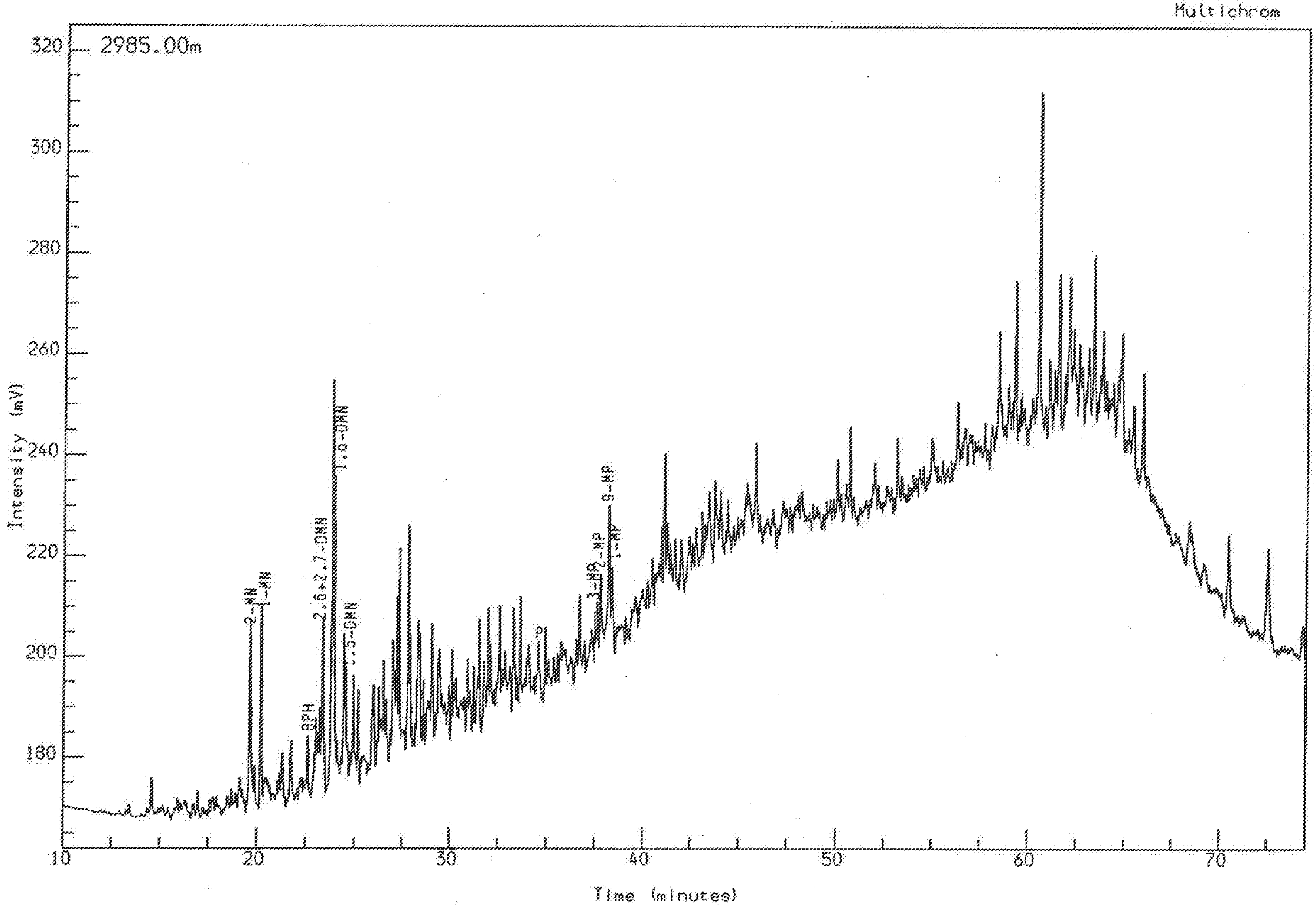


WELL NOCS 2/8-14 4385.00m swc
SATURATED GC
Sh/Clst: brn blk

Reported on 3-APR-1991 at 15:45

GEOLAB NOR GECO

Analysis Name : [526097] 29 AE34000391L,1,1.

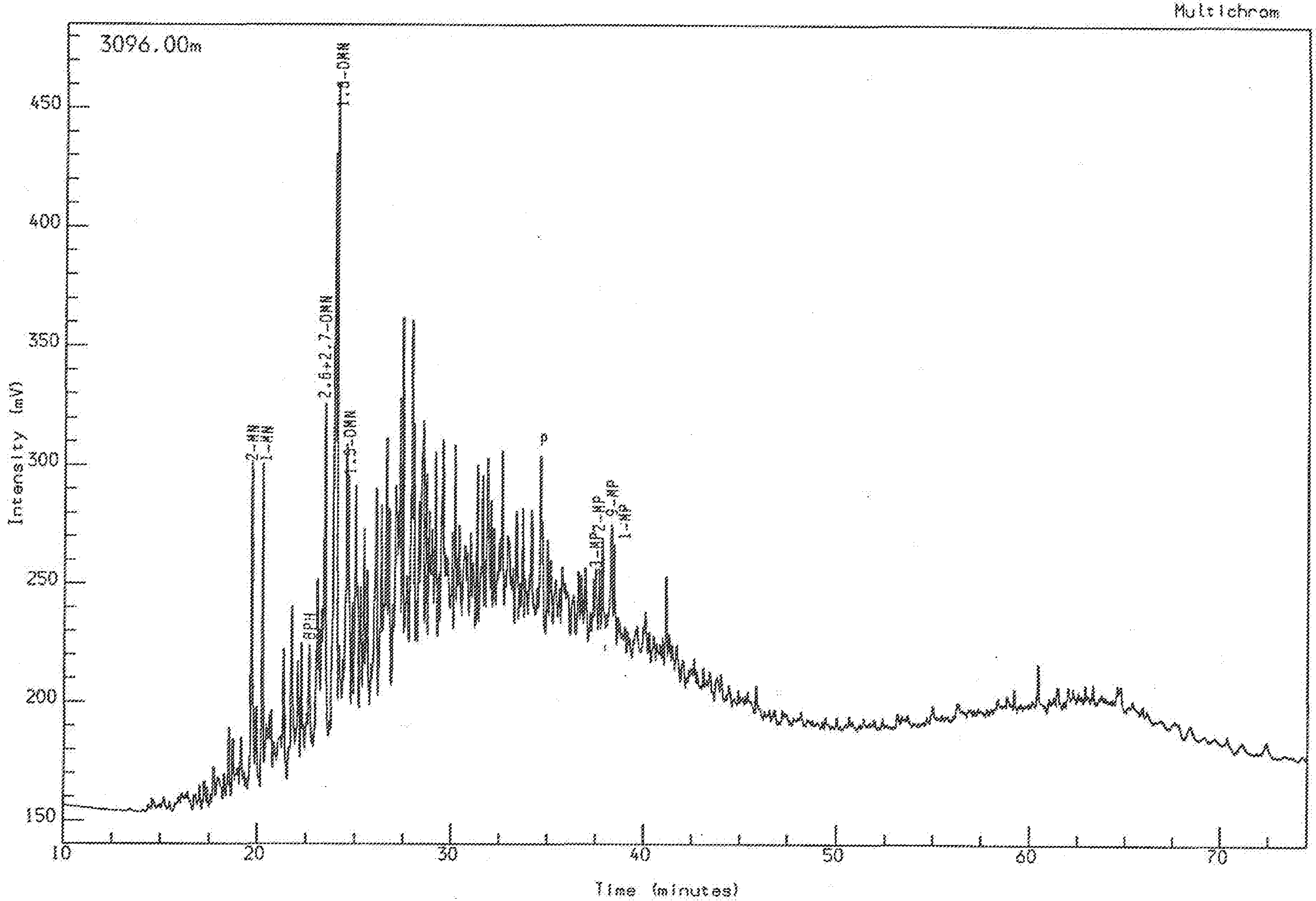


WELL NOCS 2/8-14 2985.00m cut
AROMATIC GC (FID)
Ca: lt or to or gy

Reported on 3-APR-1991 at 13:39

GEOLAB NOR

Analysis Name : [526097] 29 AE34000461L.1.1.

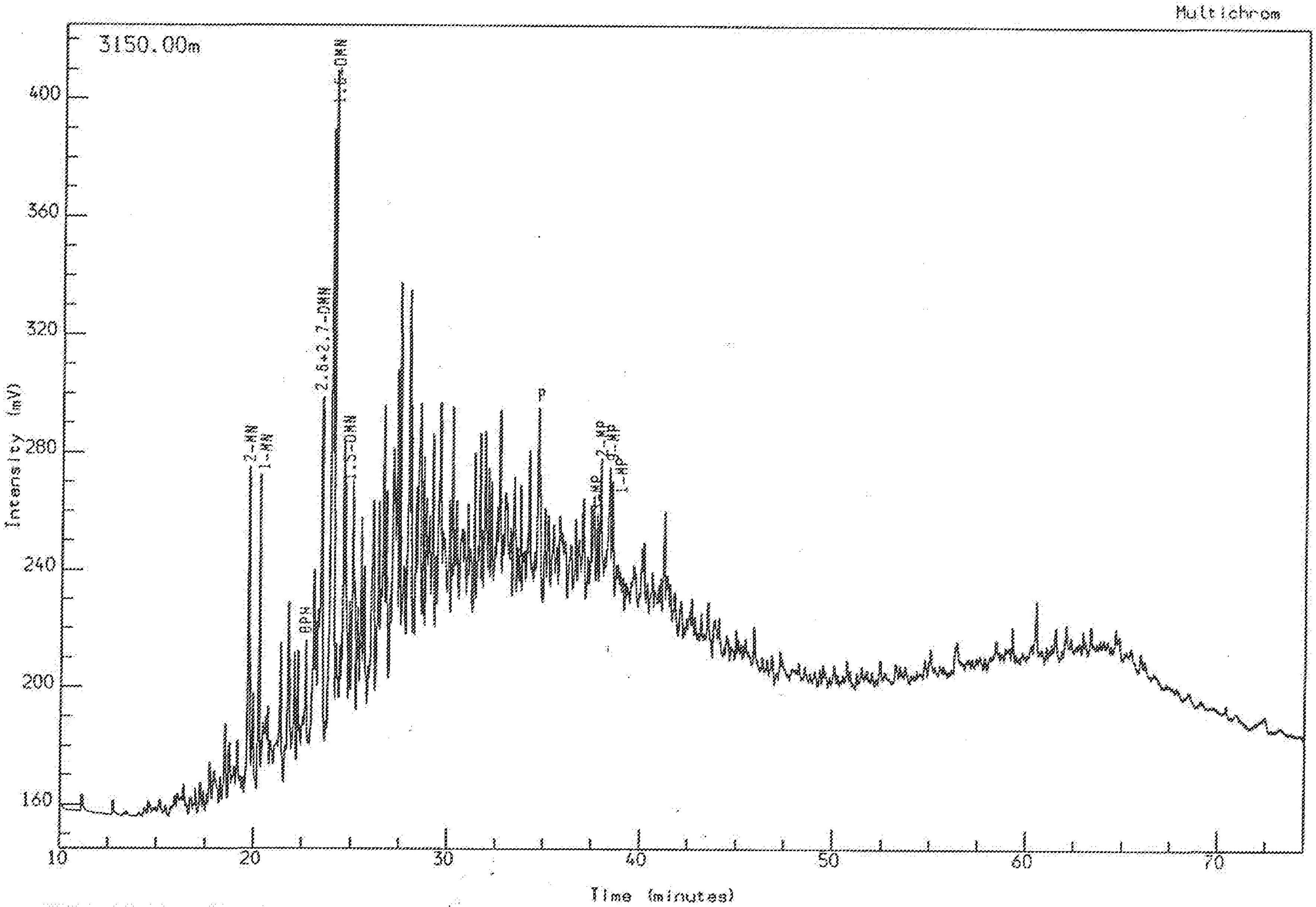


WELL NOCS 2/8-14 3096.00m cut
AROMATIC GC (FID)
Marl: lt gy to m gy

Reported on 3-APR-1991 at 14:33

GEOLAB NOR

Analysis Name : [526097] 29 AE3400551L,1,1.

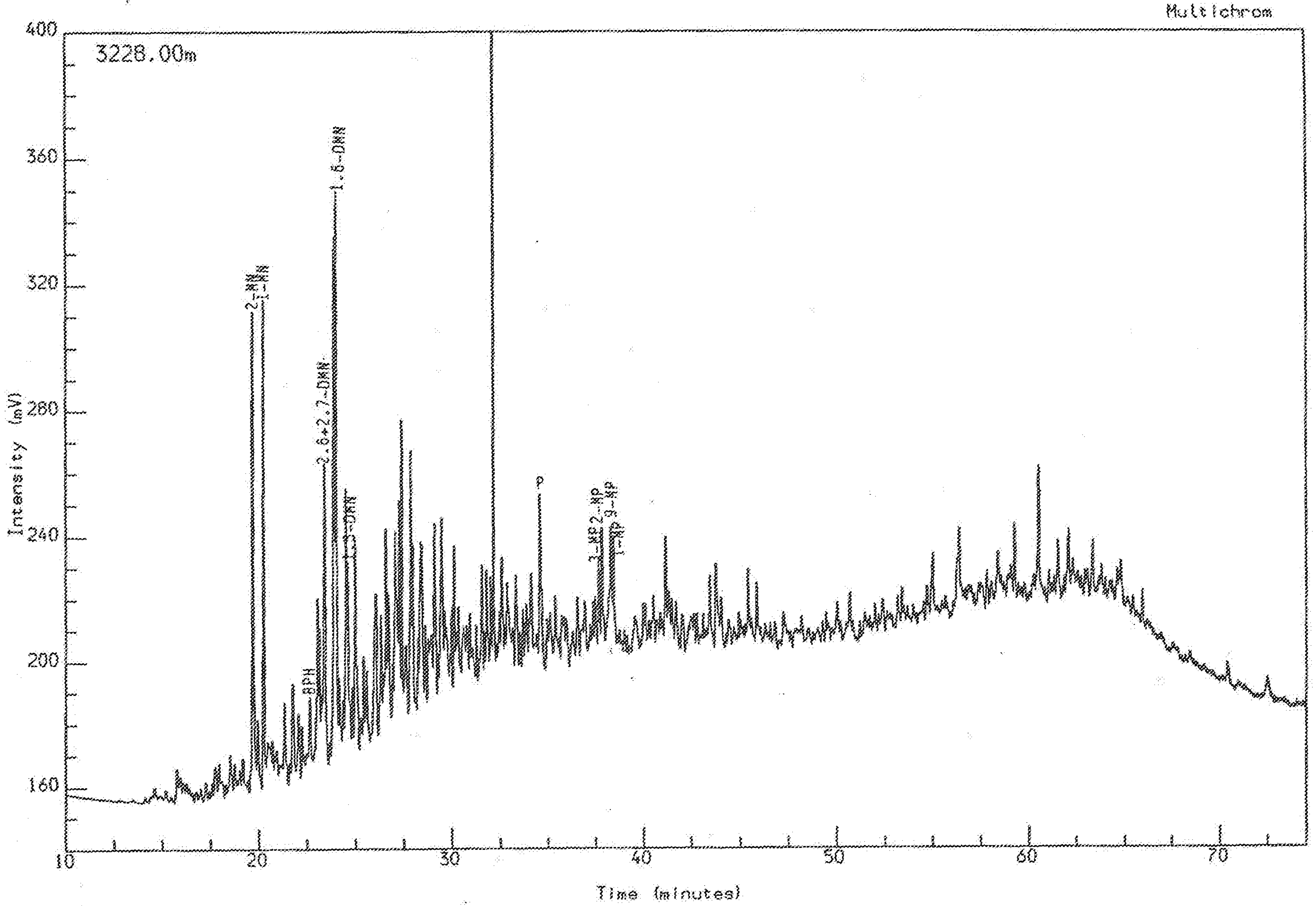


WELL NOCS 2/8-14 3150.00m cut
AROMATIC GC (FID)
Marl: lt gy to lt brn gy

Reported on 3-APR-1991 at 14:48

GEOLAB NOR

Analysis Name : [526097] 29 AE3400681L.1,1.

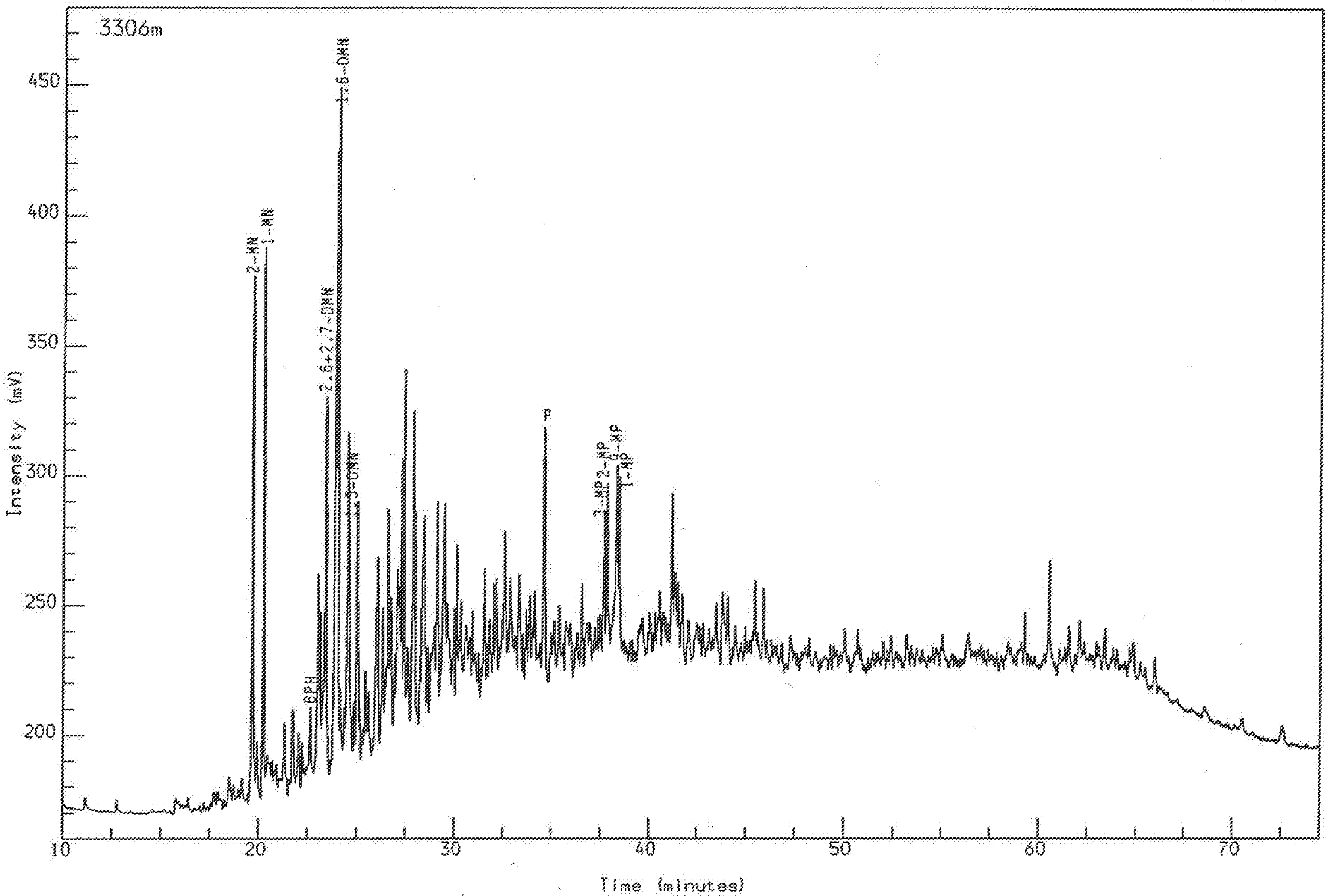


WELL NOCS 2/8-14 3228.00m cut
AROMATIC GC (FID)
Sh/Clst: brn gy to gy brn to drk gy

Reported on 3-APR-1991 at 14:50

GEOLAB NOR

Analysis Name : [526097] 29 AE3400962L.1.1.

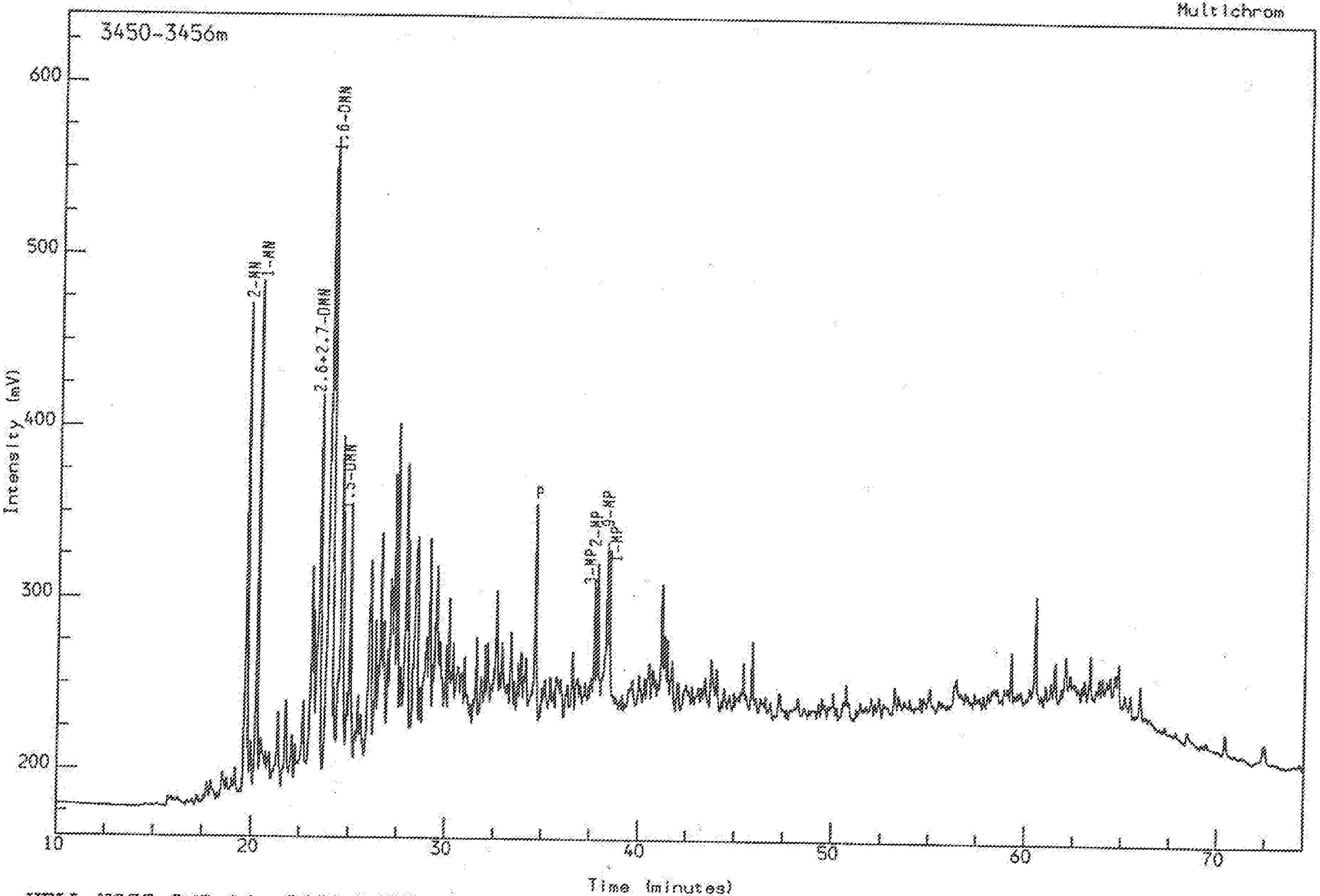


WELL NOCS 2/8-14 3306.00m cut
AROMATIC GC (FID)
Sh/Clst: brn gy to drk gy

Reported on 3-APR-1991 at 14:52

GEOLAB NOR GECO

Analysis Name : [526097] 29 AE3402760B.1.1.

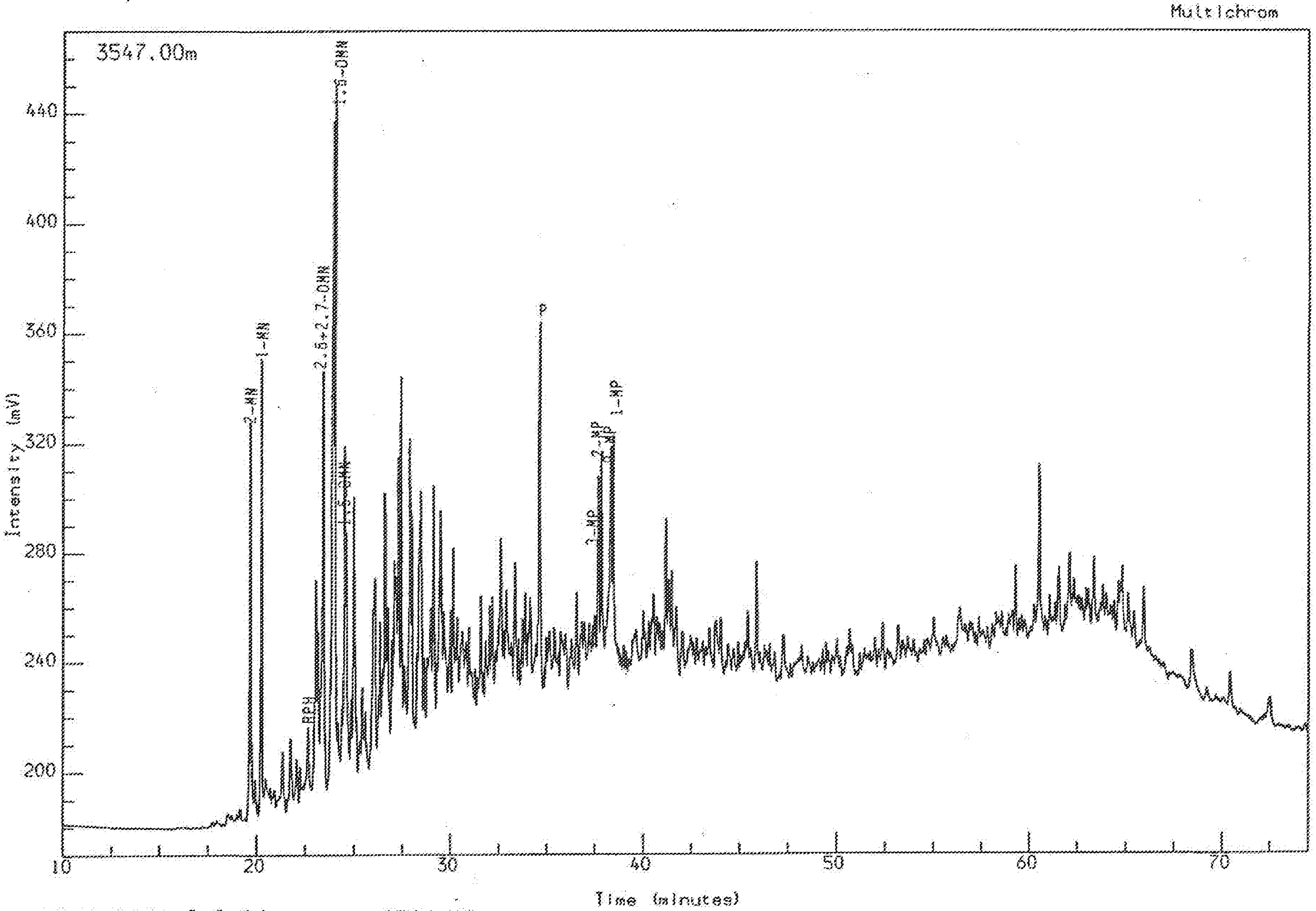


WELL NOCS 2/8-14 3450-3456m com
AROMATIC GC (FID)
Sh/clst:m gy to brn gy

Reported on 3-APR-1991 at 14:56

GEOLAB NOR

Analysis Name : [526097] 29 AE340032IL.1.1.

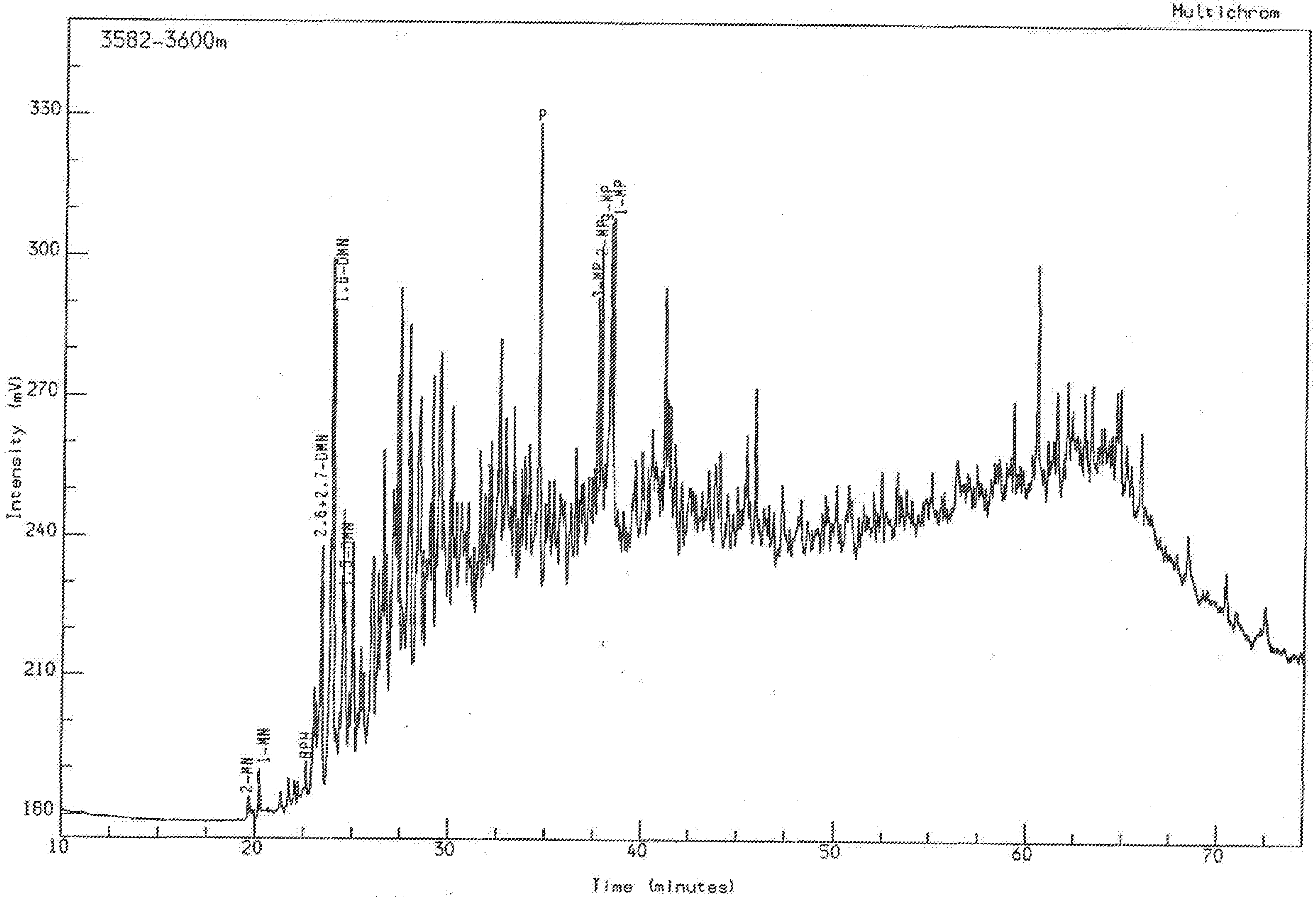


WELL NOCS 2/8-14 3547.00m swc
AROMATIC GC (FID)
Sh/Clst: drk gy to brn blk

Reported on 3-APR-1991 at 14:58

GEOLAB NOR

Analysis Name : [526097] 29 AE3402770B.1.1.

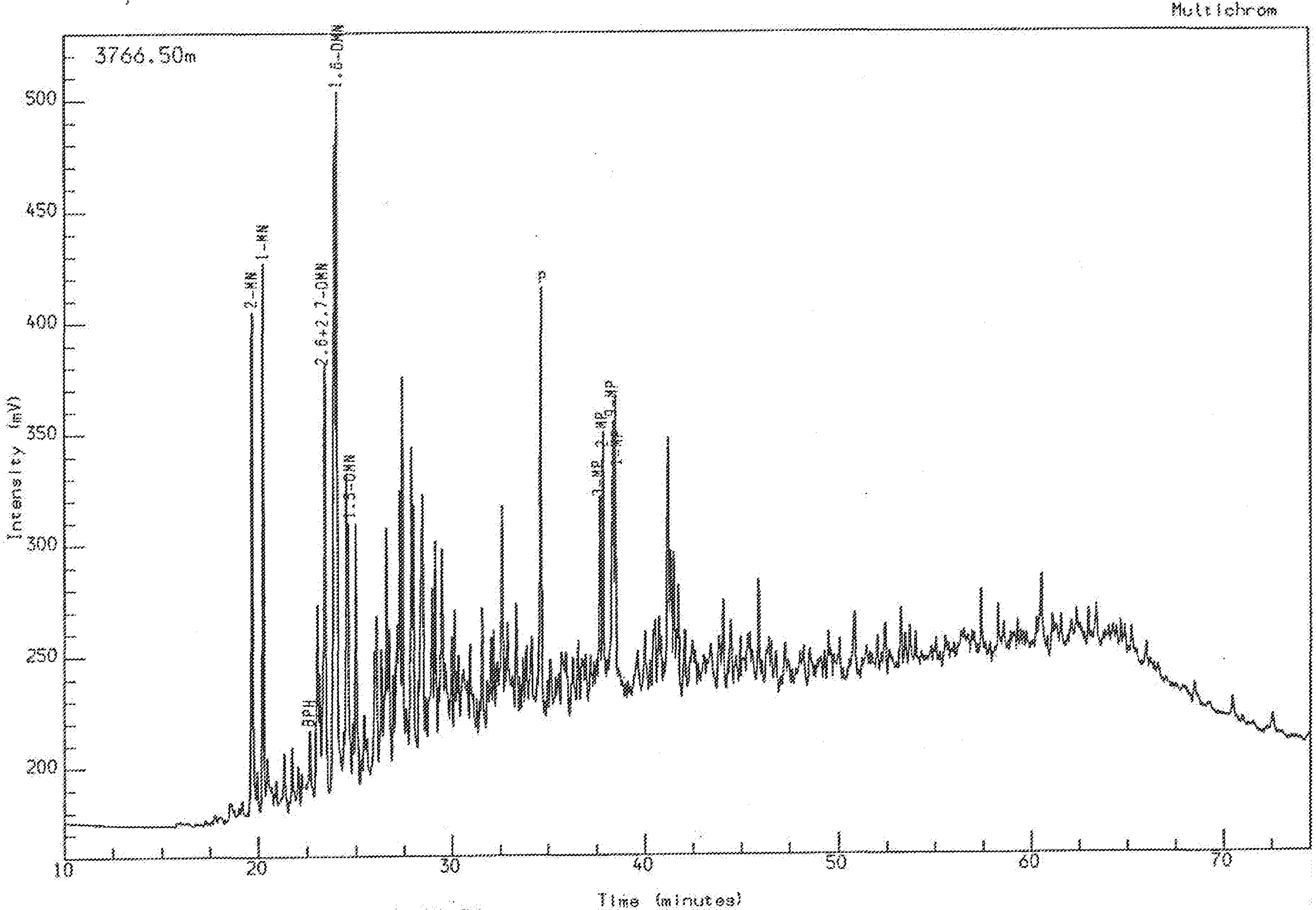


WELL NOCS 2/8-14 3582-3600m com
AROMATIC GC (FID)
Sh/clst:drk gy to brn blk

Reported on 3-APR-1991 at 15:00

GEOLAB NOR

Analysis Name : [526097] 29 AE3400291L,1,1.

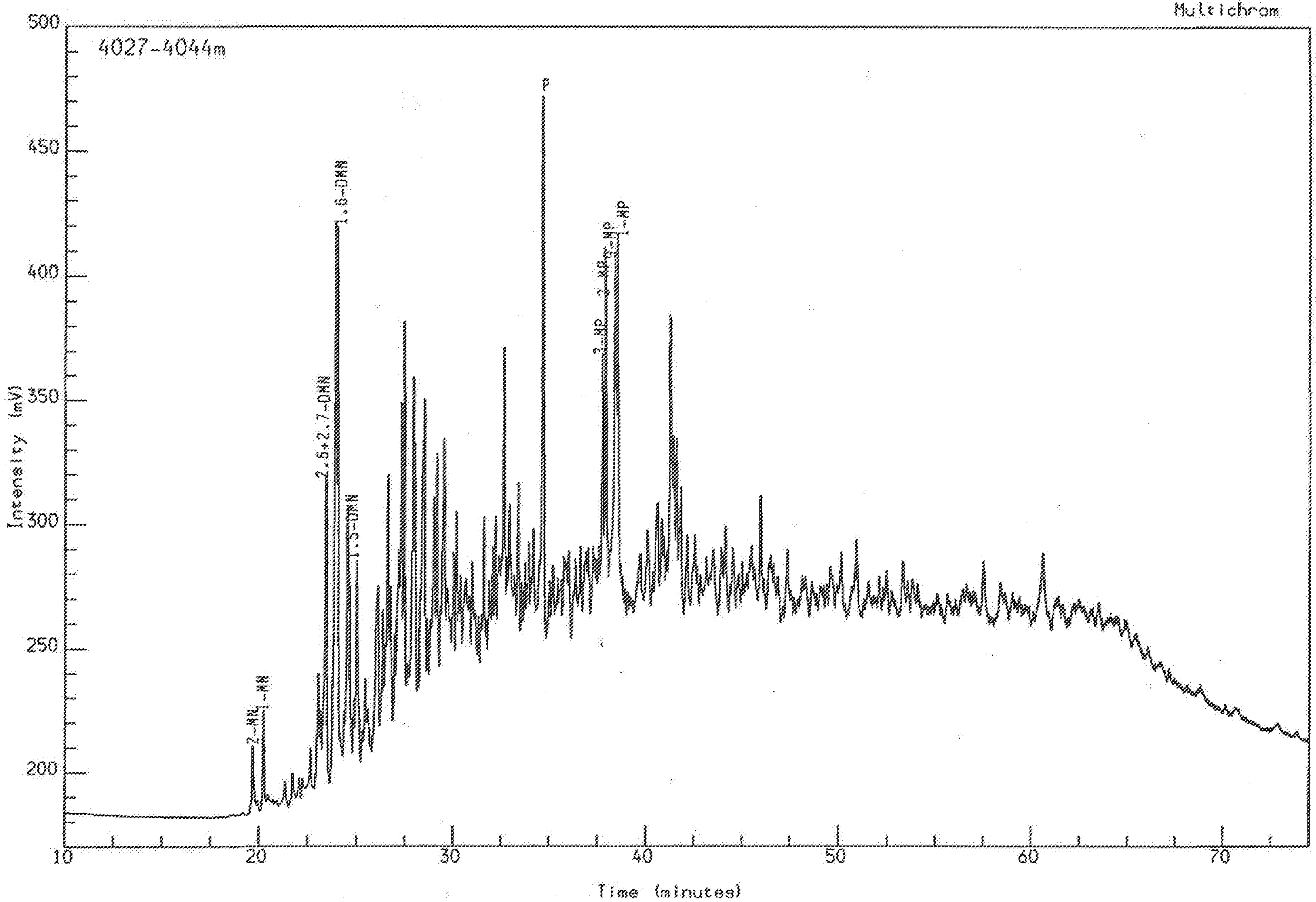


WELL NOCS 2/8-14 3766.50m swc
AROMATIC GC (FID)
Sh/Clst: drk gy to brn blk

Reported on 3-APR-1991 at 15:02

GEOLAB NOR

Analysis Name : [526097] 29 AE3402780BL,1,1.

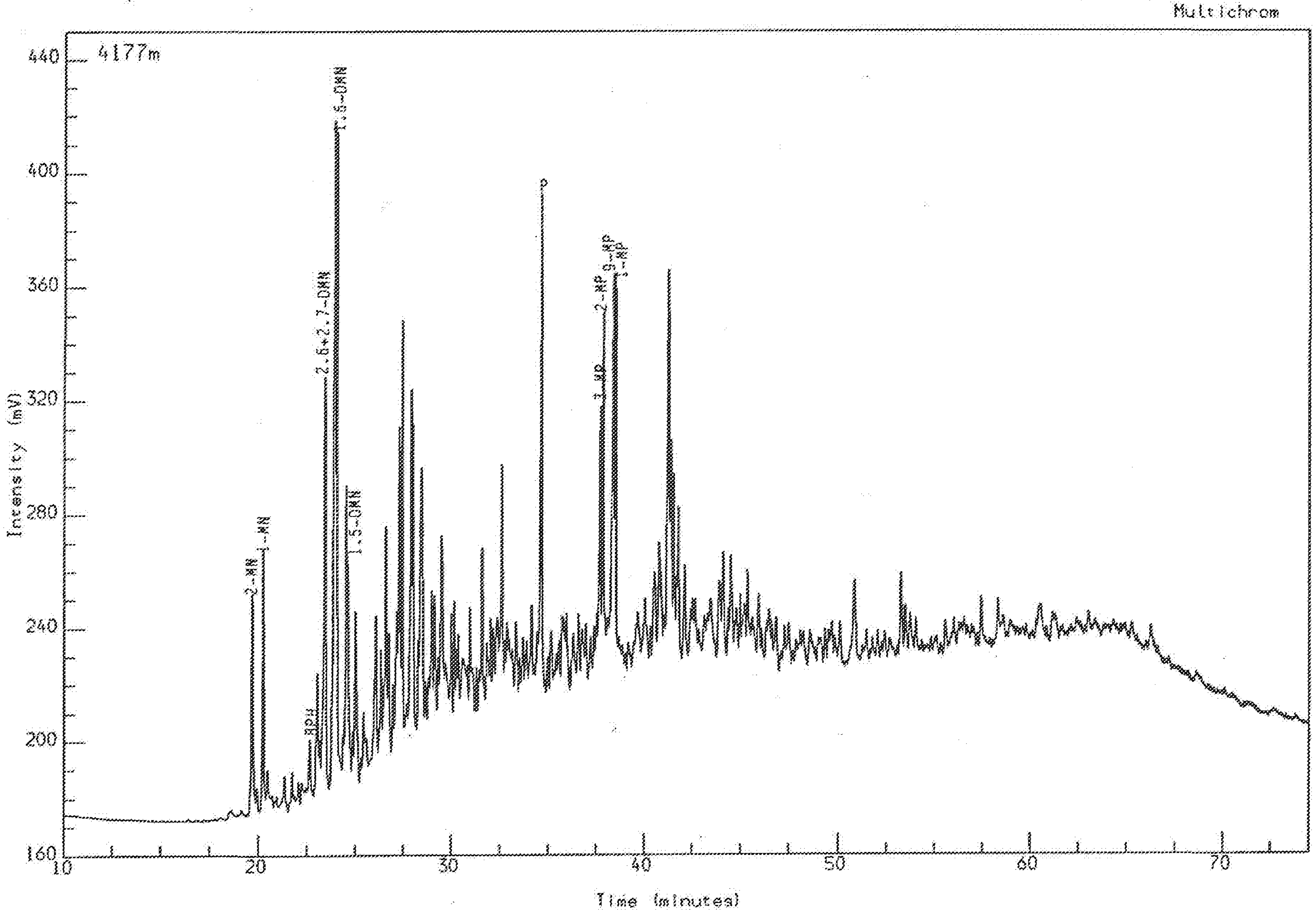


WELL NOCS 2/8-14 4027-4044m com
AROMATIC GC (FID)
Sh/clst:drk gy to brn blk

Reported on 8-APR-1991 at 14:27

GEOLAB NOR

Analysis Name : [526097] 29 AE340027ILB.1.1.

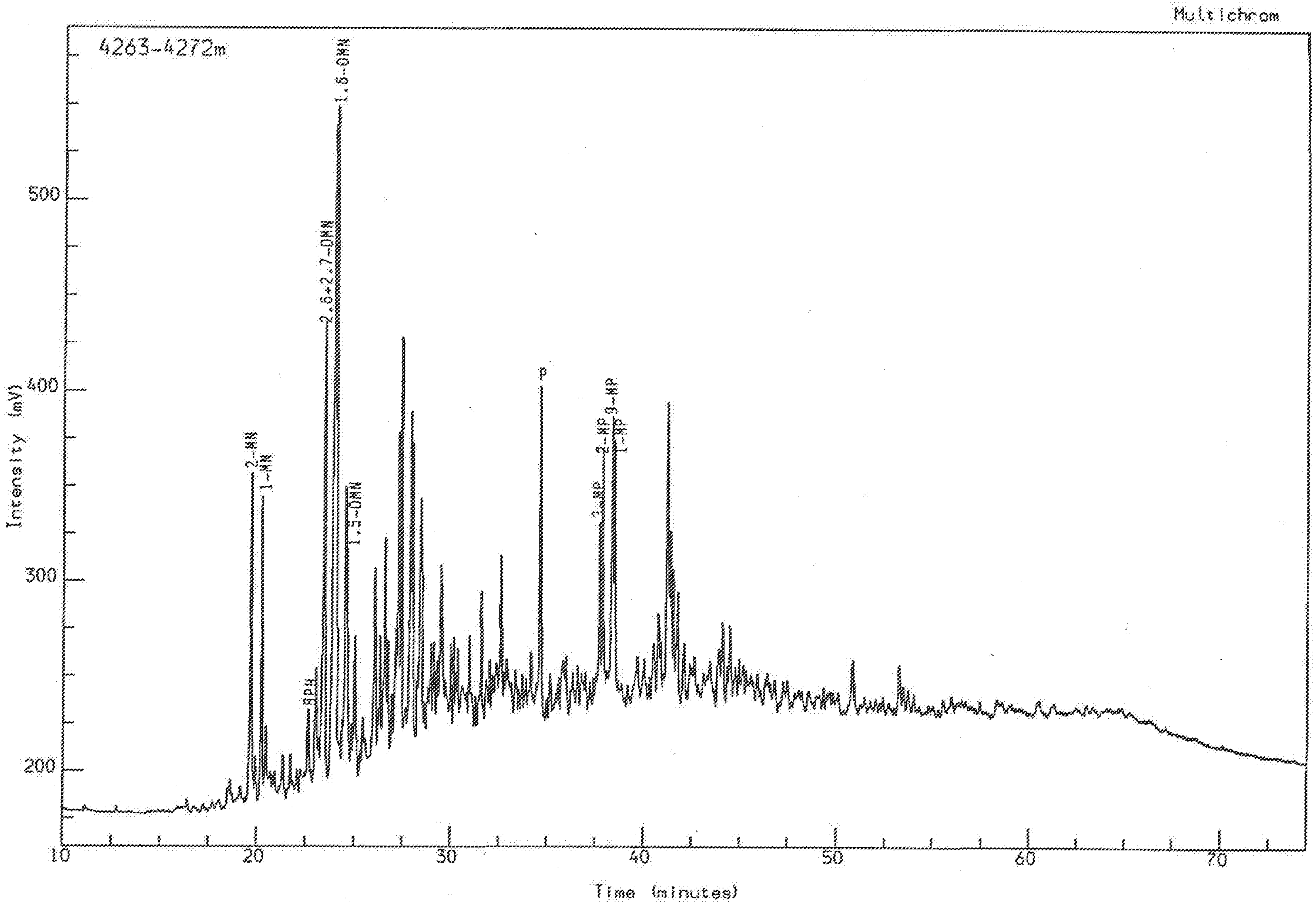


WELL NOCS 2/8-14 4177.00m swc
AROMATIC GC (FID)
Sh/Clst: drk gy to brn blk

Reported on 3-APR-1991 at 15:04

GEOLAB NOR

Analysis Name : [526097] 29 AE3402790B.1.1.

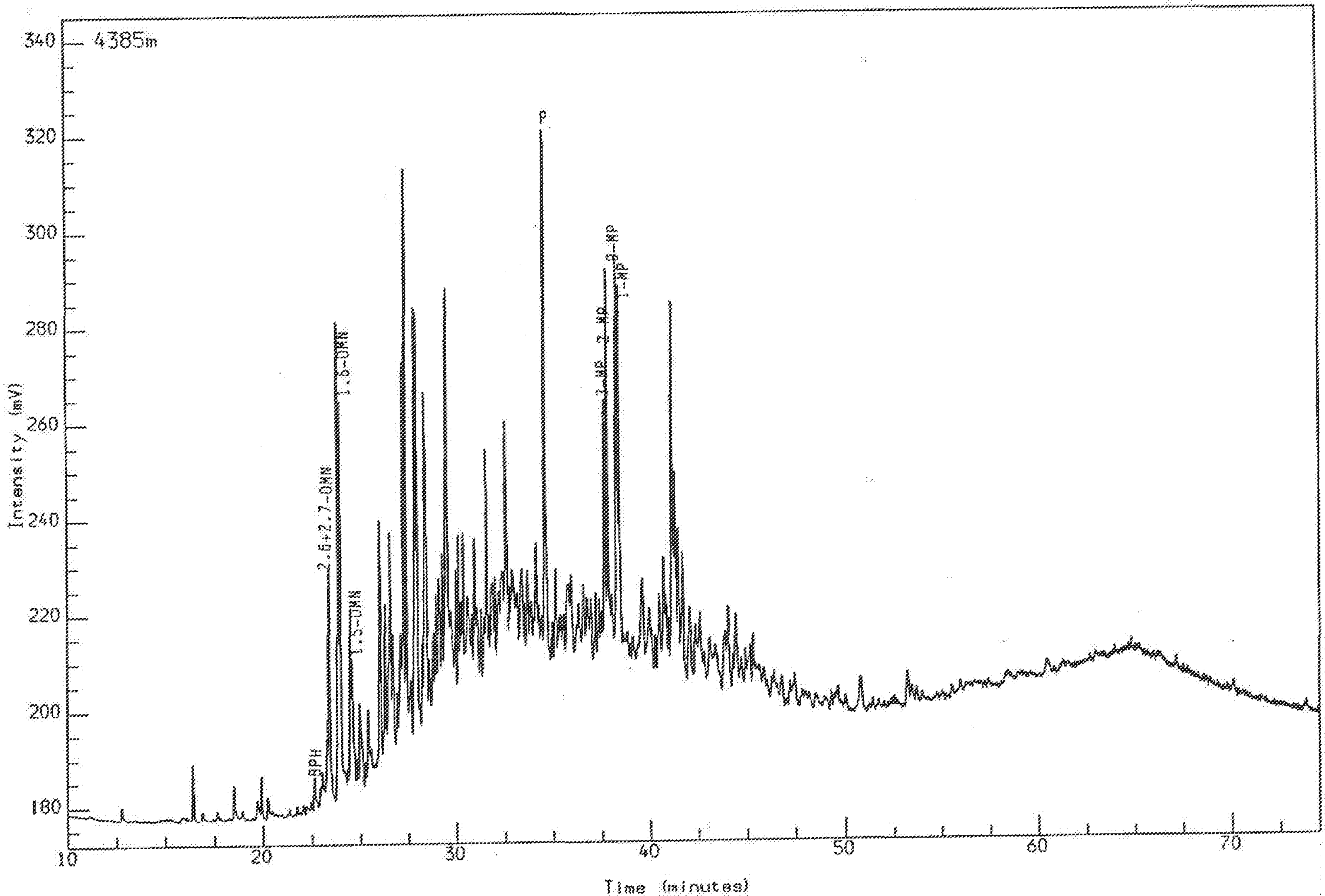


WELL NOCS 2/8-14 4263-4272m com
AROMATIC GC (FID)
Sh/clst:brn blk to drk gy

Reported on 3-APR-1991 at 15:06

GEOLAB NOR

Analysis Name : [526097] 29 AE3401671L.1.1.

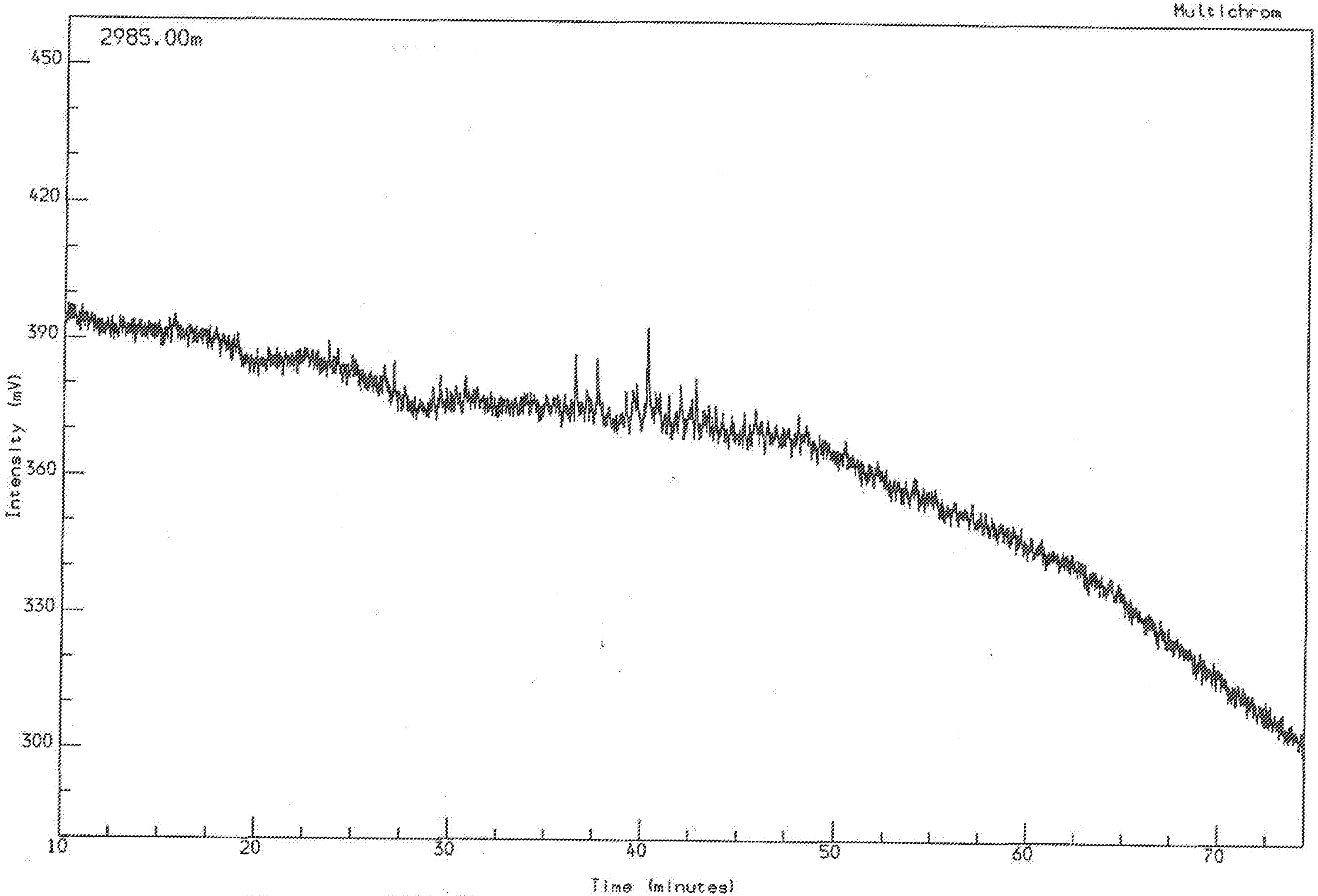


WELL NOCS 2/8-14 4385.00m swc
AROMATIC GC (FID)
Sh/Clst: brn blk

Reported on 3-APR-1991 at 15:08

GEOLAB NOR

Analysis Name : [526097] 30 AE34000391L.1.1.

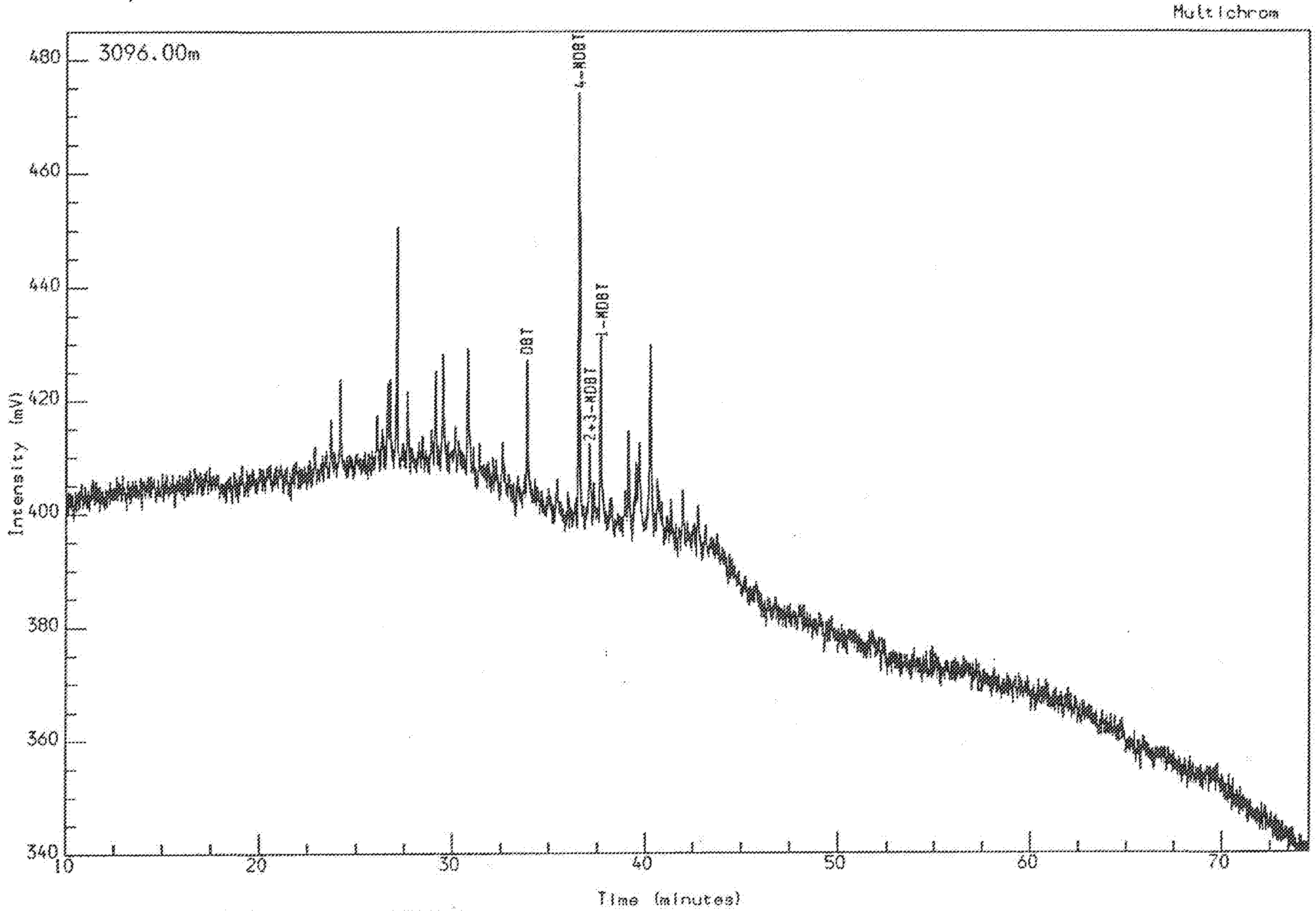


WELL NOCS 2/8-14 2985.00m cut
AROMATIC GC (FPD)
Ca: lt or to or gy

Reported on 3-APR-1991 at 15:48

GEOLAB NOR

Analysis Name : [526097] 30 AE34000461L.1.1.

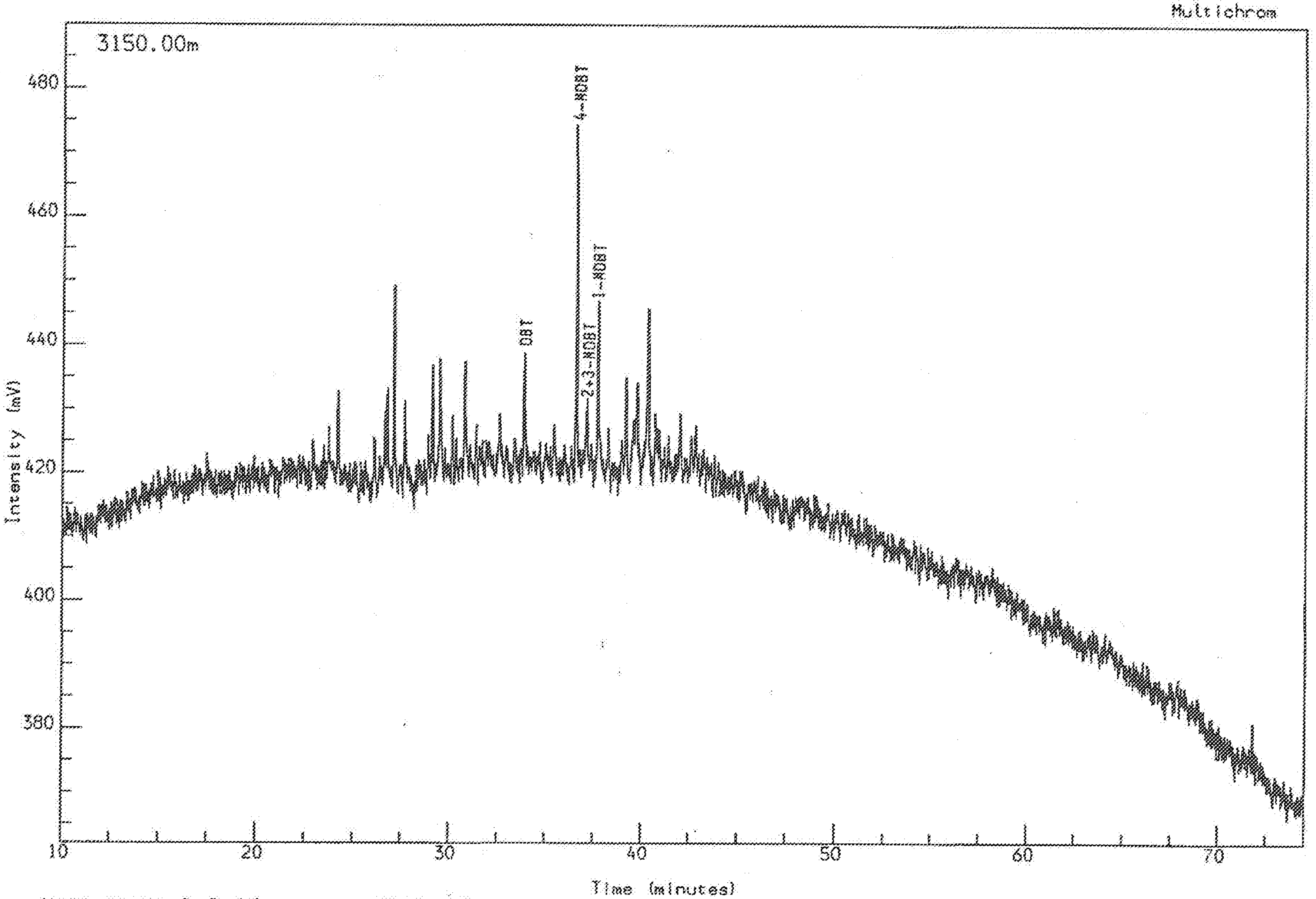


WELL NOCS 2/8-14 3096.00m cut
AROMATIC GC (FPD)
Marl: lt gy to m gy

Reported on 3-APR-1991 at 15:51

GEOLAB NOR

Analysis Name : [526097] 30 AE3400551L.1.1.

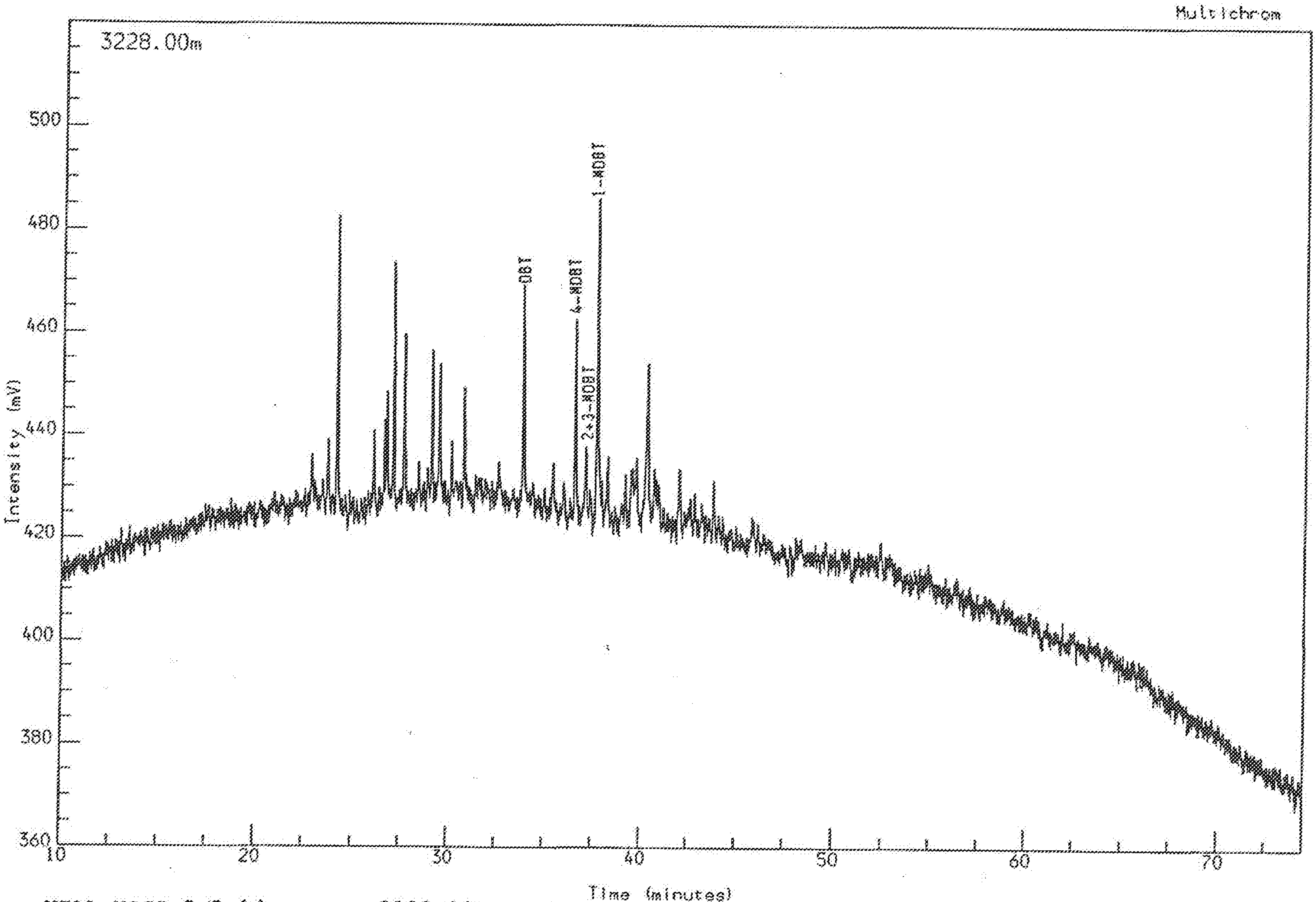


WELL NOCS 2/8-14 3150.00m cut
AROMATIC GC (FPD)
Marl: lt gy to lt brn gy

Reported on 3-APR-1991 at 15:54

GEOLAB NOR

Analysis Name : [526097] 30 AE3400681L,1,1.

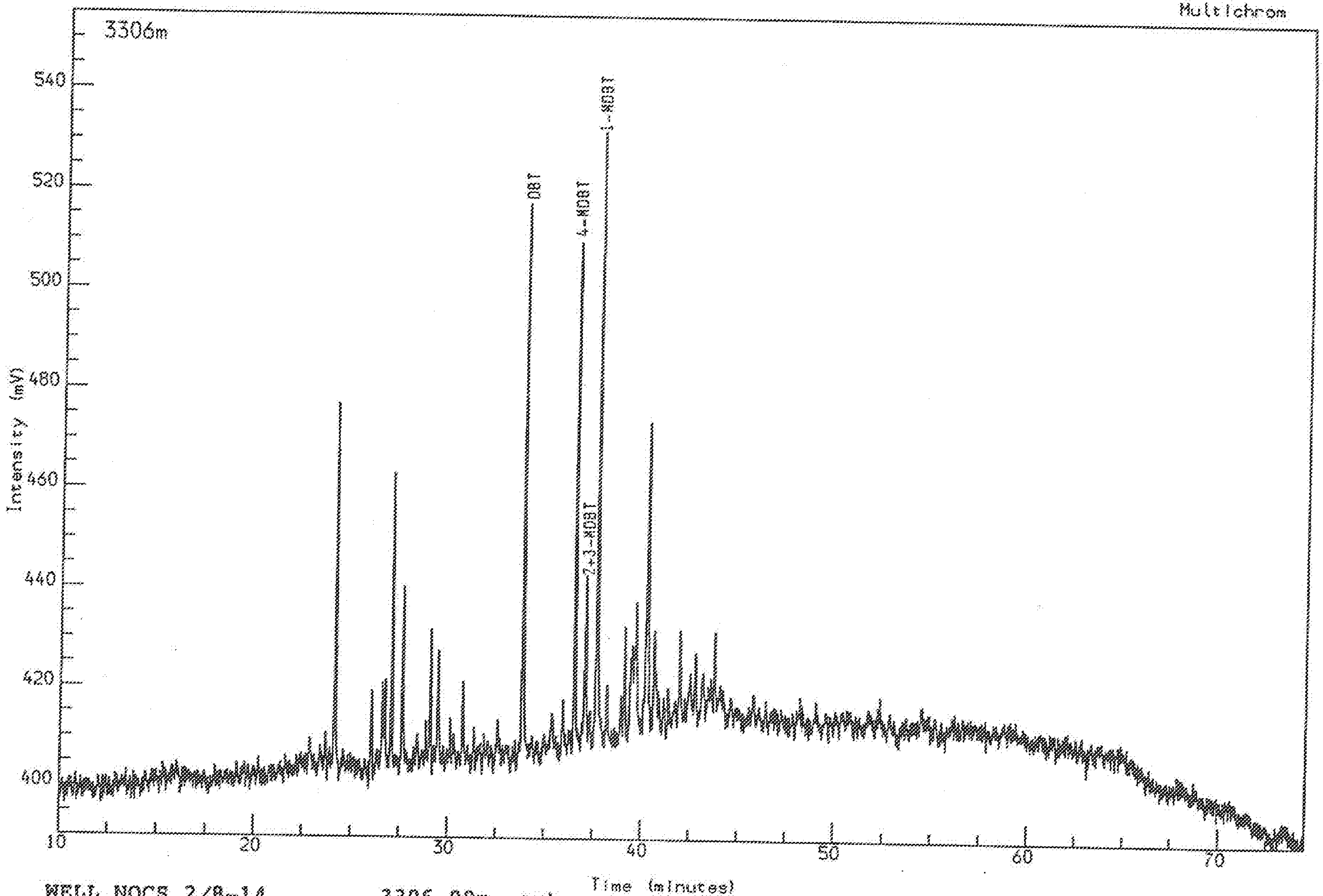


WELL NOCS 2/8-14 3228.00m cut
AROMATIC GC (FPD)
Sh/Clst: brn gy to gy brn to drk gy

Reported on 3-APR-1991 at 15:56

GEOLAB NOR

Analysis Name : [526097] 30 AE3400962L.1.1.

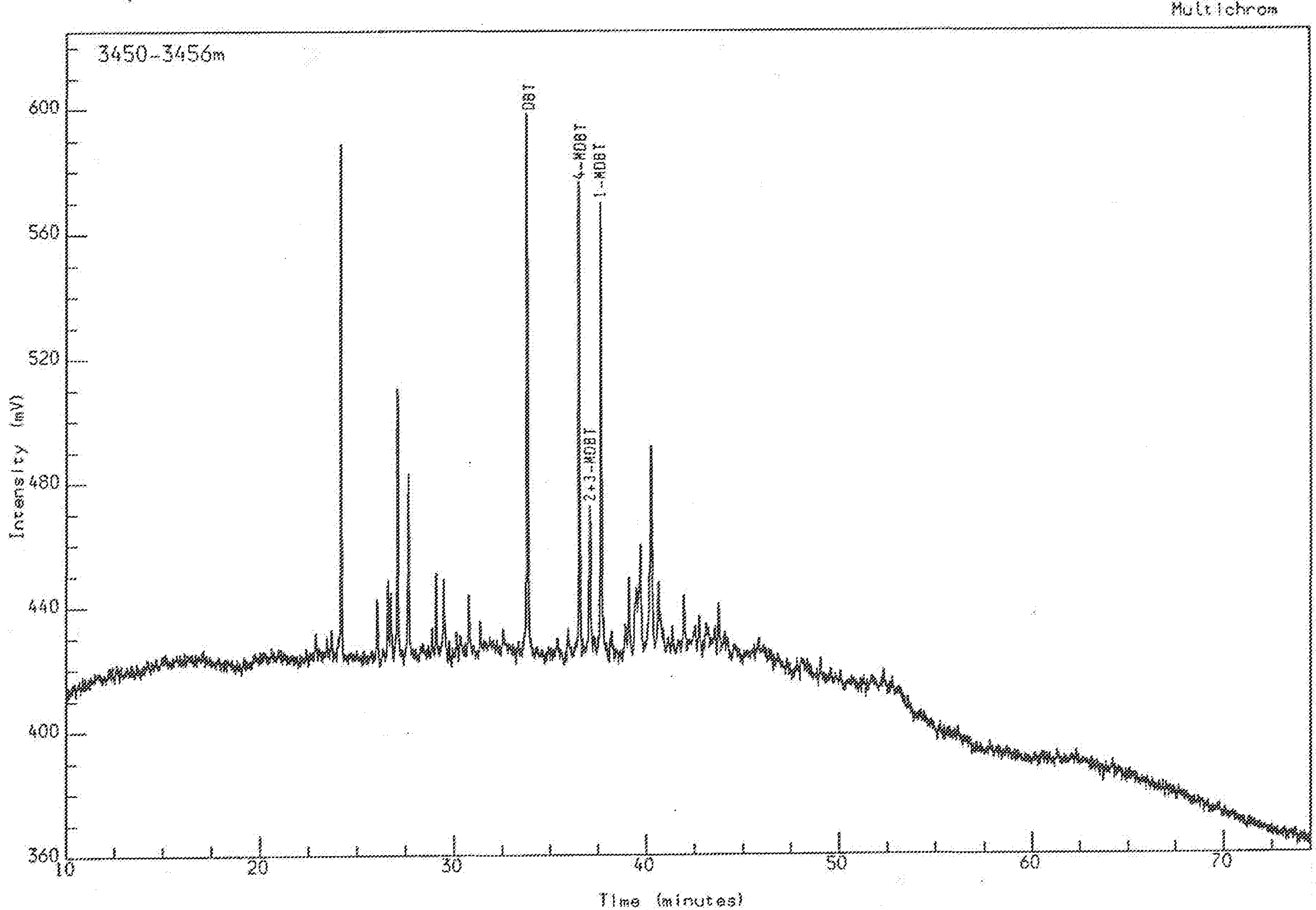


WELL NOCS 2/8-14 3306.00m cut
AROMATIC GC (FPD)
Sh/Clst: brn gy to drk gy

Reported on 3-APR-1991 at 15:59

GEOLAB NOR

Analysis Name : [526097] 30 AE3402760B.1.1.

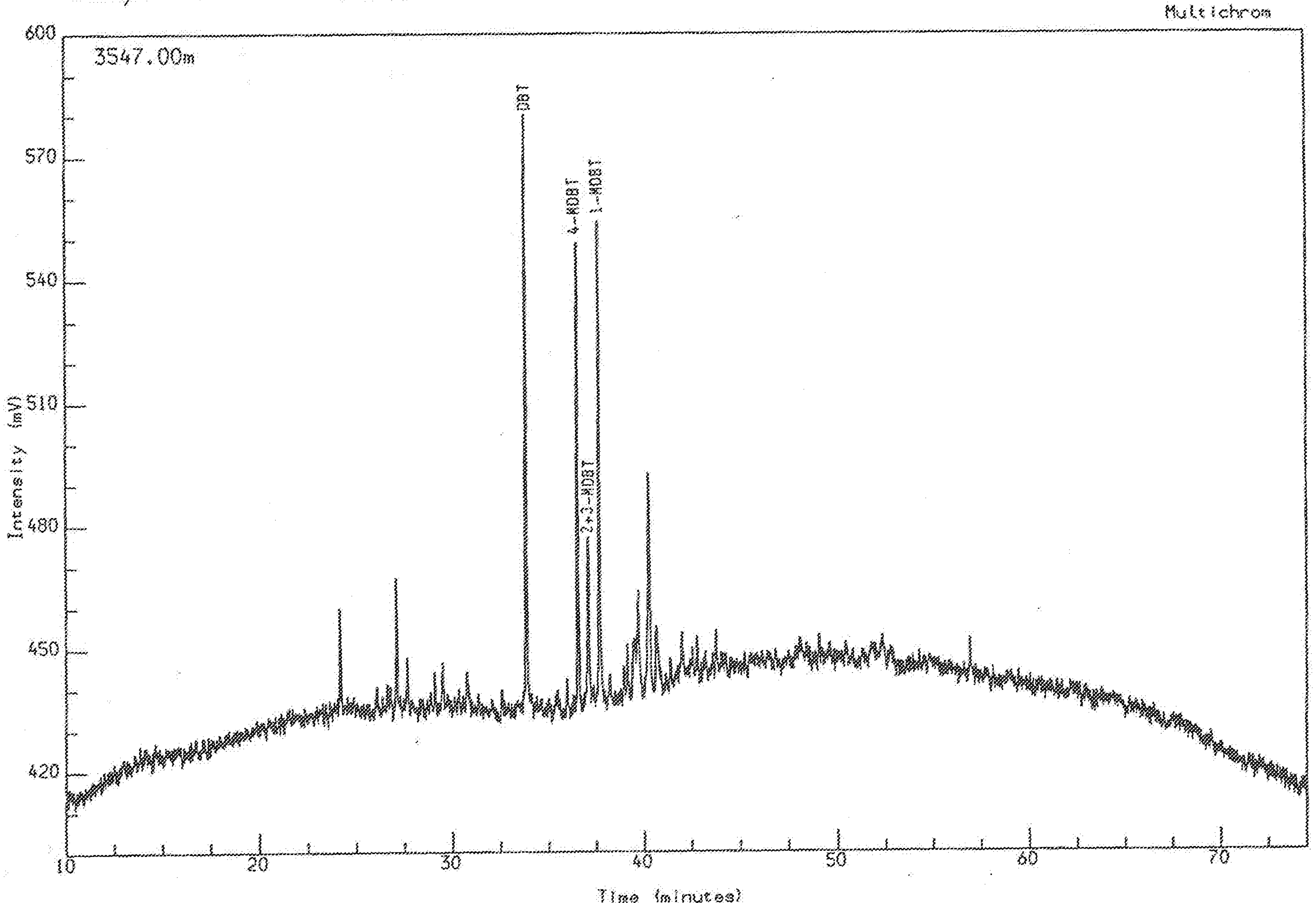


WELL NOCS 2/8-14 3450-3456m com
AROMATIC GC (FPD)
Sh/Clst:m gy to brn gy

Reported on 8-APR-1991 at 14:47

GEOLAB NOR

Analysis Name : [526097] 30 AE3400321L,1,1.

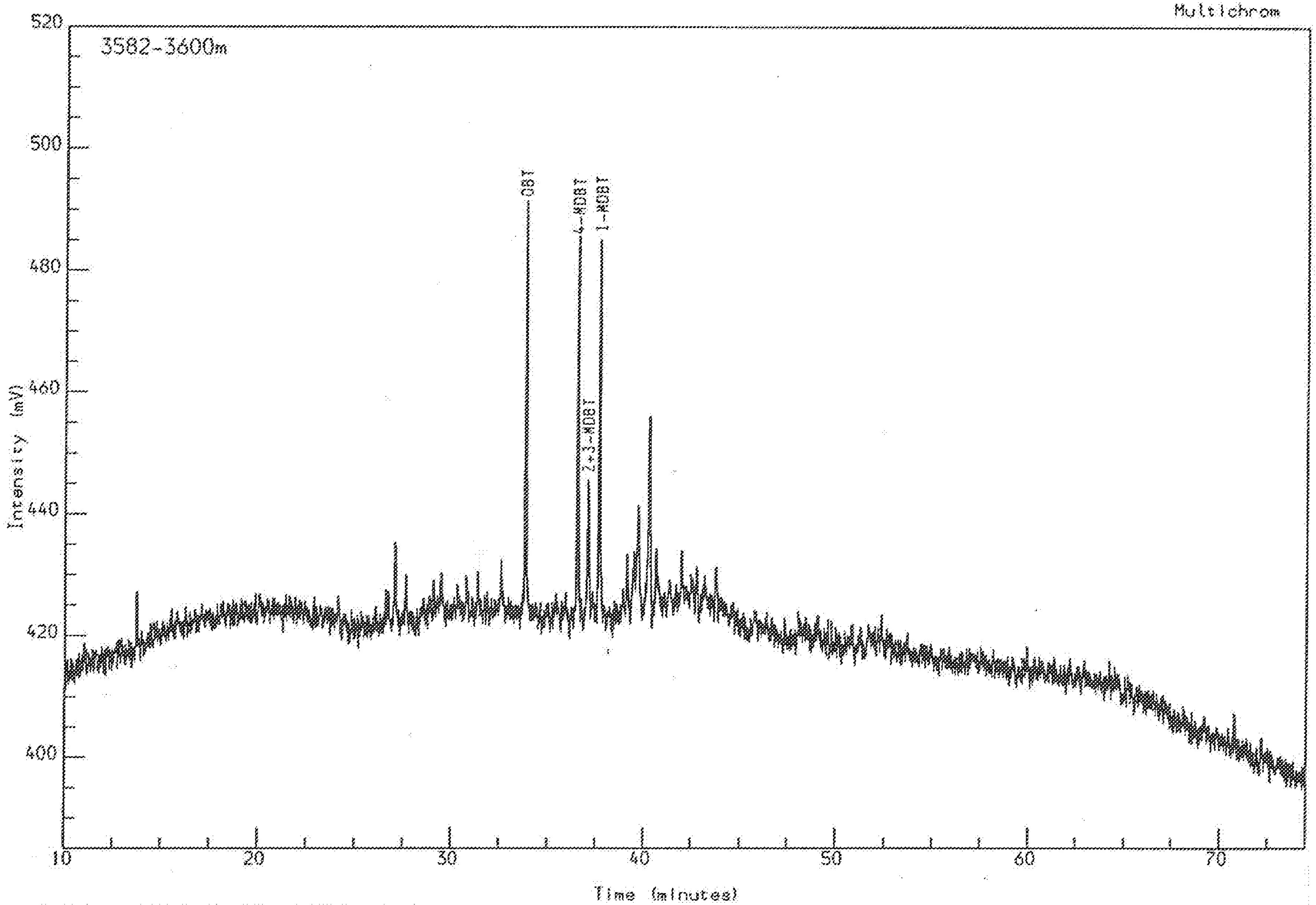


WELL NOCS 2/8-14 3547.00m swc
AROMATIC GC (FPD)
Sh/Clst: drk gy to brn blk

Reported on 3-APR-1991 at 15:34

GEOLAB NOR

Analysis Name : [526097] 30 AE34027708,1,1.

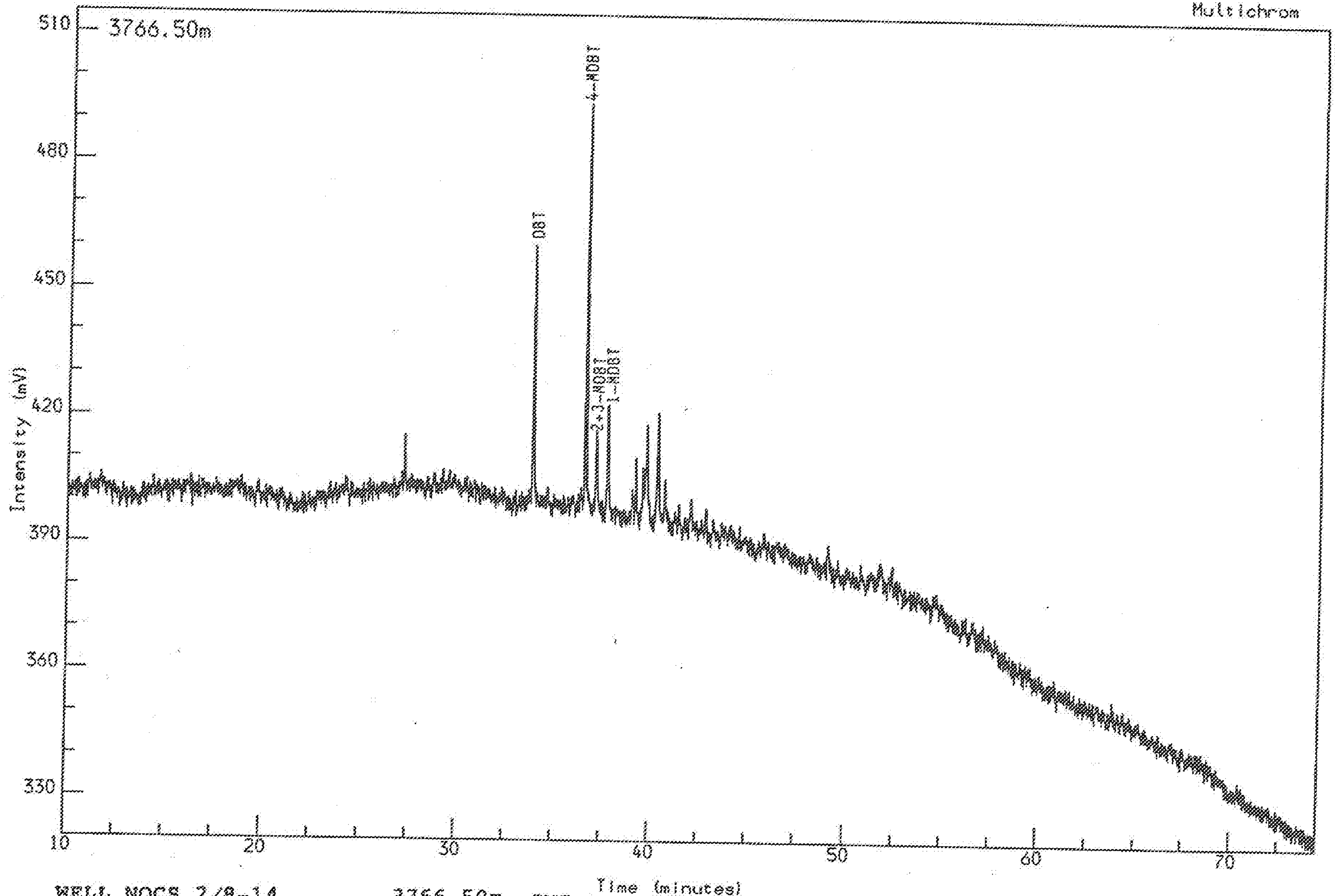


WELL NOCS 2/8-14 3582-3600m com
AROMATIC GC (FPD)
Sh/clst:drk gy to brn blk

Reported on 3-APR-1991 at 15:38

GEOLAB NOR

Analysis Name : [526097] 30 AE3400291L.1.1.

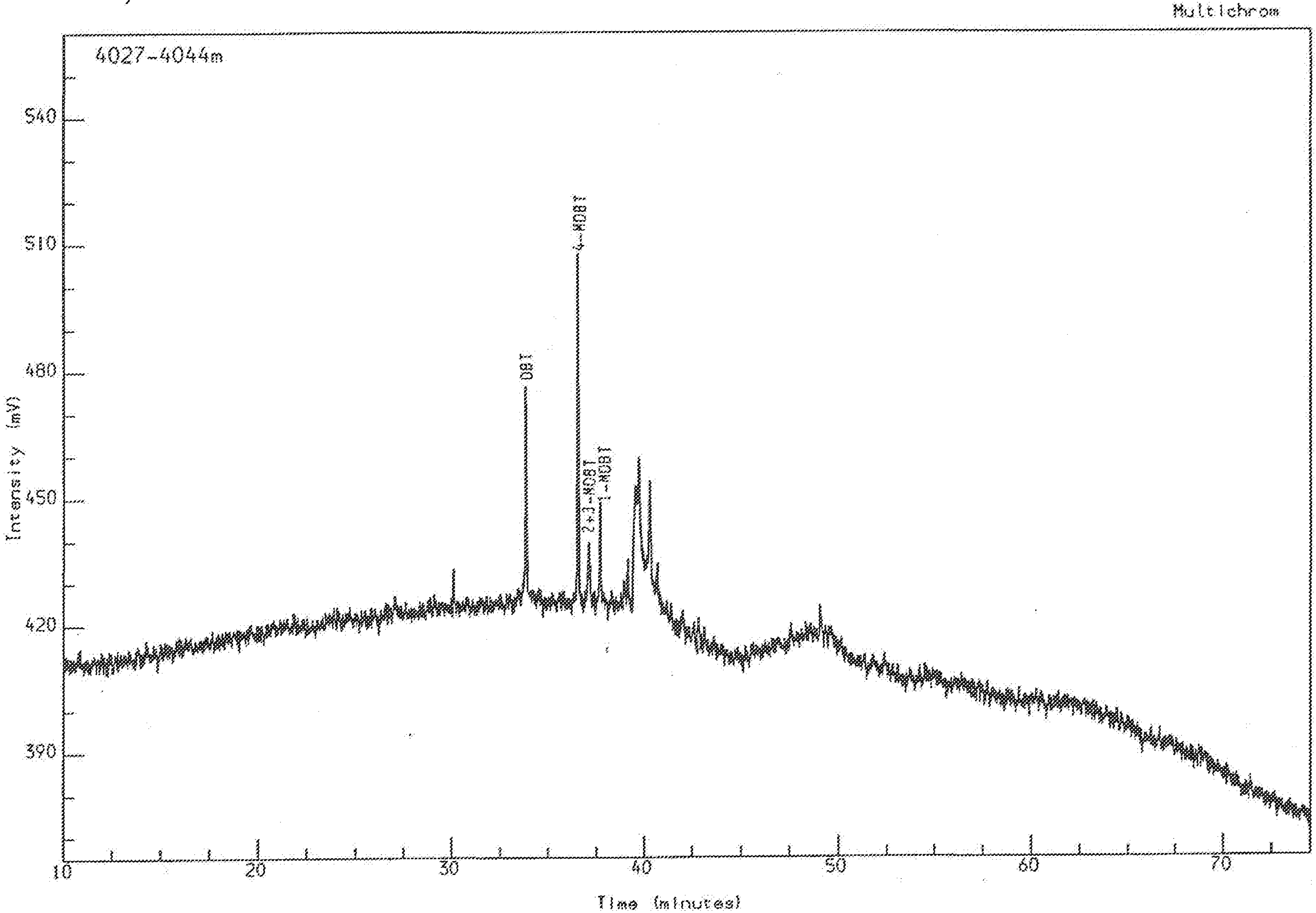


WELL NOCS 2/8-14 3766.50m swc
AROMATIC GC (FPD)
Sh/Clst: drk gy to brn blk

Reported on 3-APR-1991 at 15:40

GEOLAB NOR

Analysis Name : [526097] 30 AE3402780BL.1.1.

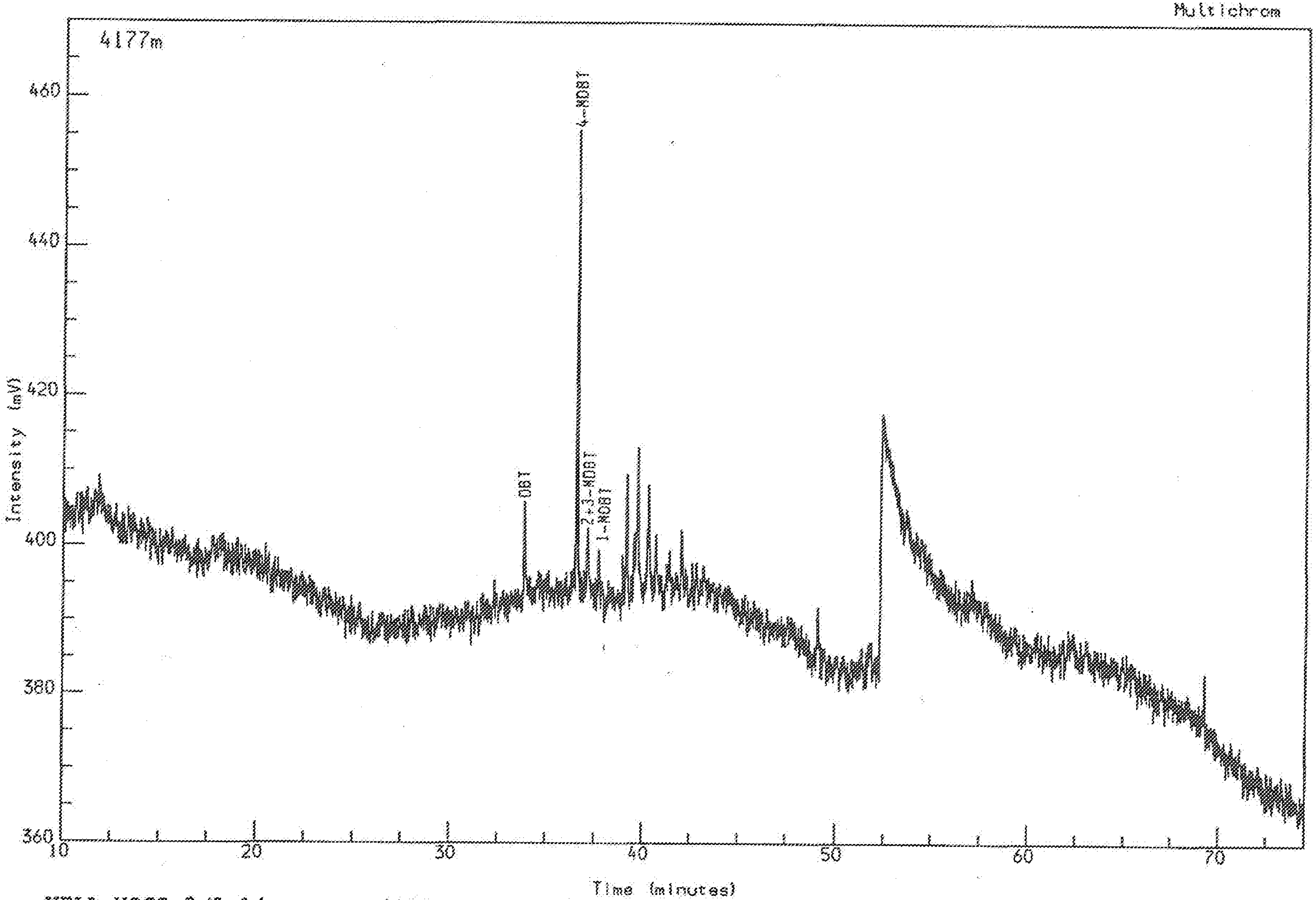


WELL NOCS 2/8-14 4027-4044m com
AROMATIC GC (FPD)
Sh/clst:drk gy to brn blk

Reported on 8-APR-1991 at 14:14

GEOLAB NOR

Analysis Name : [526097] 30 AE340027ILB.1.1.

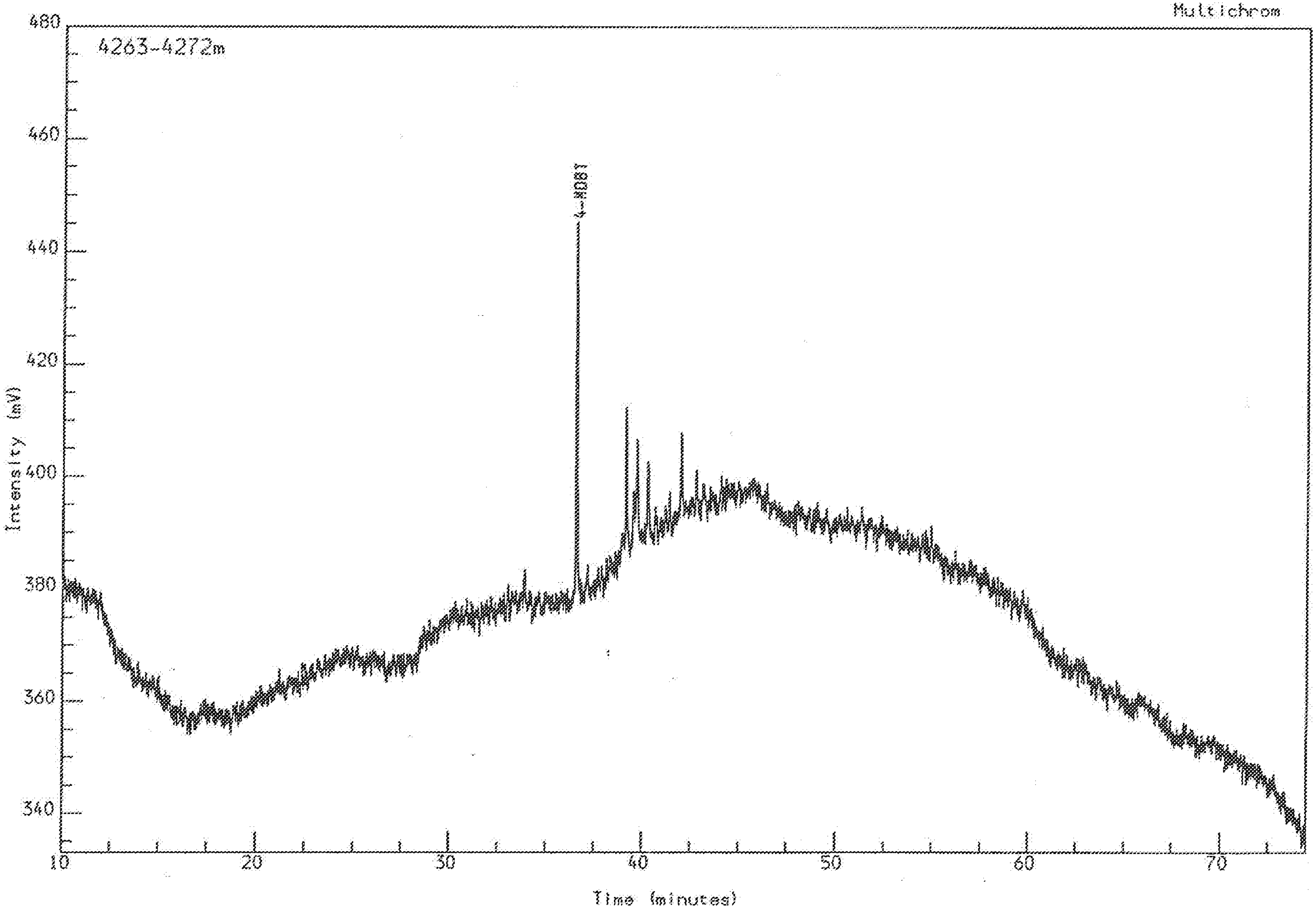


WELL NOCS 2/8-14 4177.00m swc
AROMATIC GC (FPD)
Sh/Clst: drk gy to brn blk

Reported on 3-APR-1991 at 15:43

GEOLAB NOR

Analysis Name : [526097] 30 AE34027908,1,1.

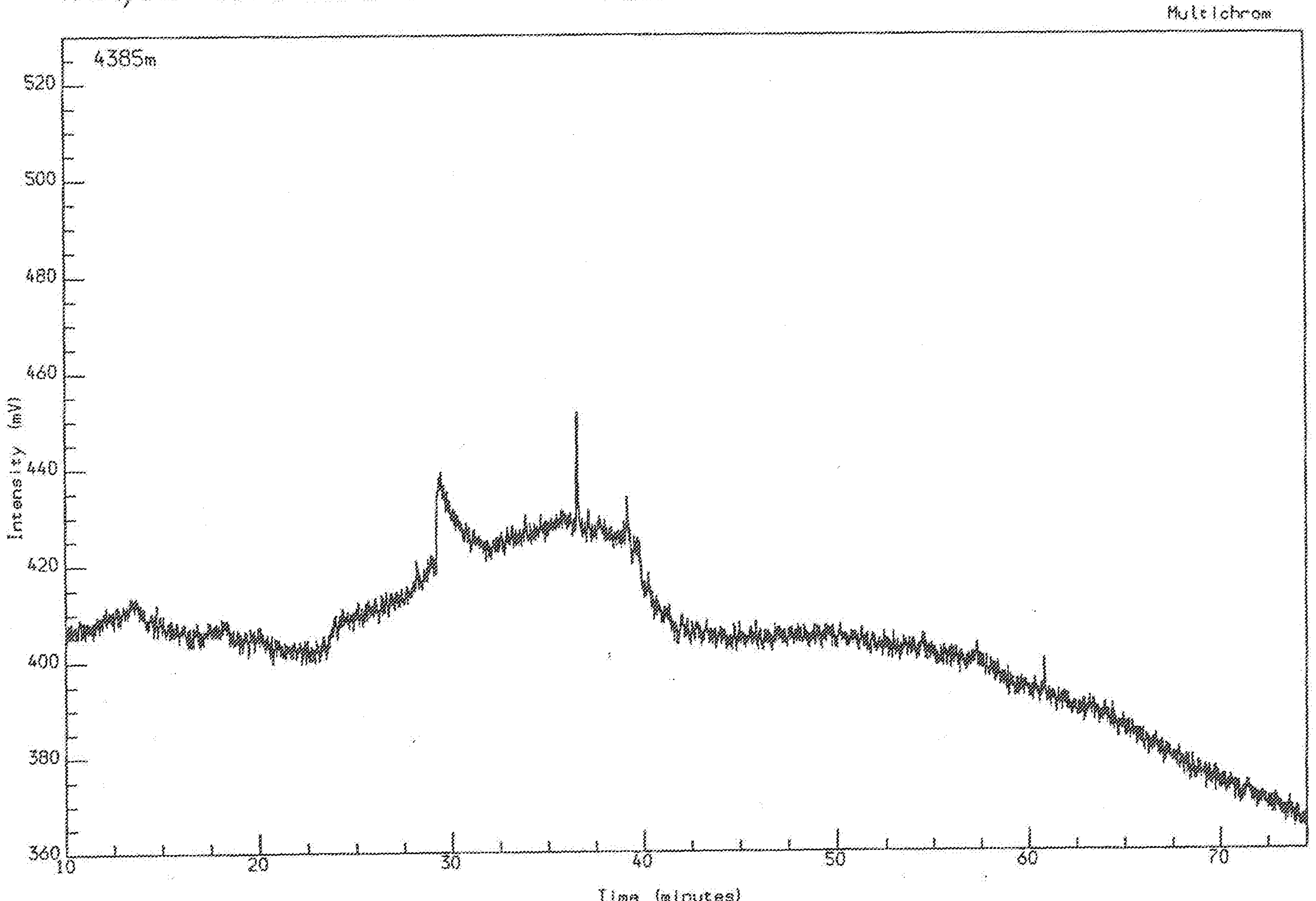


WELL NOCS 2/8-14 4263-4272m com
AROMATIC GC (FPD)
Sh/clst:brn blk to drk gy

Reported on 3-APR-1991 at 15:14

GEOLAB NOR

Analysis Name : [526097] 30 AE3401671L,1,1.



WELL NOCS 2/8-14 4385.00m swc
AROMATIC GC (FPD)
Sh/Clst: brn blk

Reported on 3-APR-1991 at 15:45

GEOLAB NOR

INTERPRETATION LIMITS

ANALYSIS PROCEDURES

ABBREVIATIONS

Experimental Methods

EXPERIMENTAL PROCEDURES

Headspace gas analysis

The analysis is performed using a gas chromatograph with a 50 m capillary column, loop injector and flame ionisation detector. Helium is used as carrier gas.

Two cm^3 of headspace gas are removed from each sample can for chromatographic analysis of the C_1 to C_7 range of hydrocarbons.

Occluded gas analysis

The analysis is performed using a gas chromatograph with a 50 m capillary column, loop injector and flame ionisation detector. Helium is used as carrier gas.

The canned samples are washed in thermostatted water to remove drilling contaminants and sieved on a 2 mm mesh sieve to remove large, caved rock fragments. An aliquot (ca 25 mg) of sieved sample is crushed with 25 cm^3 water in an airtight ball mill. After crushing, 2 cm^3 of the released gas are removed from the ball mill for gas chromatographic analysis.

Total organic carbon (TOC) and total carbon analysis

This analysis is performed using a LECO CS244 Carbon Analyser.

Hand-picked lithologies from cutting samples are crushed with a mortar and pestle and approximately 200 mg (50 mg for coals) are accurately weighed into LECO crucibles. The samples are then treated three times with dilute hydrochloric acid, to remove oxidised (carbonate) carbon, and

The sample of saturated fraction is diluted by 1:20 with hexane and a 1 microlitre aliquot of this is injected into the instrument.

Aromatic fraction

The instrument used is a gas chromatograph with a 25 m SE-54 capillary column, split injector and effluent splitter leading to FID and FPD detectors, allowing simultaneous analysis of hydrocarbons and sulphur compounds. The carrier gas is helium and the temperature program runs from 60°C to 300°C at a rate of 4°C/min.

The sample of aromatic fraction is diluted by 1:20 with hexane and a 1 microlitre aliquot of this is injected into the instrument.

Whole Oil

Whole oil chromatograms are determined on a gas chromatograph fitted with a split injector, 25m SE54 capillary column and effluent splitter connected to FID and sulphur mode FPD detectors allowing simultaneous determination of hydrocarbons and sulphur compounds. Approximately 0.1 microlitres of whole oil are injected and the temperature program on the chromatograph runs from -10°C to 300°C at 4°C/min.

Rock Eval pyrolysis

This analysis is performed using a ROCK EVAL II Pyrolyser into which approximately 100 mg of crushed whole rock is loaded. Analysis involves heating the sample, from 300°C to 600°C, in an inert atmosphere (helium) to release naturally generated hydrocarbons (S1 peak) and then pyrolytically washed four times with distilled water. The samples are dried on a hotplate at 60-70°C before analysis of total organic carbon. Total carbon is analysed on the same instrument using approximately 200 mg of untreated crushed whole rock. Oxidised (carbonate) carbon is calculated by difference.

Total organic carbon can also be determined on the ROCK EVAL II Pyrolyser.

Extractable Organic Matter (EOM) Analysis

Samples are selected for extraction on the basis of screening analysis. Approximately 10 - 20 g of whole rock are accurately weighed.

Extraction is carried out in a Tecator Soxtec HT system, using dichloromethane as extraction solvent and in the presence of activated copper. A 1 hr. boiling period followed by 2 hrs. rinsing is used. The extract is filtered into a tared flask and the solvent is removed by rotary evaporation at 35°C and 200 mB. The dry residue is weighed in the flask to determine the amount of EOM.

Separation of asphaltenes

Asphaltenes are removed from the EOM by precipitation in n-pentane. The amount of n-pentane to be used is prescribed by the formula:

$$\frac{\text{wt of EOM(g)} \times 40}{\text{density of n-pentane } (g/cm^{-3}) \times 1000} = \text{Volume of n-pentane}(cm^3)$$

The n-hexane and EOM are poured into a pre-weighed plastic column containing a small amount of activated silica. The column is allowed to run and then dried and weighed. The amount of asphaltenes recovered is calculated by weight difference.

After the removal of asphaltenes the solvent is evaporated from the remaining EOM by rotary evaporation, at 35°C. If the dried sample is not to be processed immediately, it is stored in a freezer.

Liquid chromatographic separation

Chromatographic separation is performed using an MPLC system developed by the company. The EOM (after removal of asphaltenes) is injected into the MPLC and chromatographed using hexane as eluent. This effects a separation into saturated and aromatic fractions which are collected and concentrated on a rotary evaporator, at 35°C and 200 mB, to remove the bulk of the hexane. The fractions are then transferred to small tared vials and evaporated to dryness in a stream of nitrogen. The vials are re-weighed to obtain the weights of both fractions. The weight of the NSO fraction, which is retained on the chromatography column, is obtained by difference.

Gas chromatographic analyses

Saturated fraction

The instrument used for this analysis is a gas chromatograph with a 25 m OV1 column, split injector and FID detector. The carrier gas is helium and the temperature program runs isothermally at 60°C, for 2 minutes and then rises to 290°C at a rate of 4°C/min.

generated hydrocarbons (S2 peak), both of which are detected by an FID. In the temperature interval between 300°C and 390°C, the released gases are split and a proportion passed through a carbon dioxide trap, which is connected to a thermal conductivity detector (TCD). The value obtained from the TCD corresponds to the amount of oxygen contained in the kerogen of the sample and is reported as the S3 peak. The temperature corresponding to the maximum of the S_2 peak, T_{max}, is also recorded.

The ROCK EVAL II Pyrolyser also determines the TOC of each sample subsequent to pyrolysis.

Thermal extraction/pyrolysis gas chromatography

The instrument used for this analysis is a gas chromatograph connected to a pyrolysis oven. A very small amount (2 mg) of whole rock sample is loaded into the oven and heated isothermally, at 300°C, for 3 minutes, during which time thermal extraction of the generated hydrocarbons occurs (equivalent to the S1 peak of Rock Eval). The released gases pass to a 15 m OV1 column with a nitrogen-cooled trap.

After 3 minutes the pyrolysis oven heats up to 510°C, at a rate of 40°C per minute, causing bound hydrocarbons to be released from the kerogen of the sample (equivalent to the S2 peak of Rock Eval). These gases are passed through a 25m DB1 capillary column with a nitrogen-cooled trap.

The temperature program for the chromatographic oven, in which both columns are situated, rises from 0°C to 290°C at a rate of 4°C/min. Both columns are linked to FID detectors.

Vitrinite reflectance analysis

Samples, in the form of small granules, are mounted in a fast setting resin. The resin blocks are ground on coarse corundum paper to expose the rock granule surfaces and then on three finer grades of corundum paper to improve these surfaces and reduce scratches. The resin blocks are finally polished on a rotating Selvyt-covered lap using two grades of polishing alumina. Isopropyl alcohol is used to lubricate the entire grinding and polishing process except in the case of coal samples, when water is used.

Reflectance measurements are taken under oil immersion (n =1.518) using a ZEISS MPM03 microscope photometer with a 546nm interference filter. The polished blocks are mounted on the microscope stage and scanned manually in order to locate and measure particles of vitrinite. An attempt is made to obtain readings from 20 individual particles per sample but this is not always possible in samples with low amounts of phytoclasts.

Preparation of Kerogen Concentrates

Samples are stirred for 16 h with 25 cm^3 concentrated hydrocloric acid at 35 - 40^oC. The acid is decanted and the residue washed by stirring for 3 hrs. with 25 cm^3 distilled water. The washing is repeated twice more.

If the concentrate is not being prepared for slides the residue is washed, rapidly, at this point, with 25 cm^3 dichloromethane.

25 cm^3 hydrofluoric acid are then added to the residue and the mixture stirred for 16 hrs. at room temperature. The acid is decanted and the residue washed by stirring for 3 hrs. with distilled water. The water washing is repeated three times with fresh aliquots of distilled water each time. The water is then decanted and the residue either dried in an oven at 40 - 50^oC to constant weight, or, if slides are to be made, it is transferred to a microscope cover slip and dried on a hot bench at 40 -50^oC.

Preparation of Slides

The dry kerogen concentrate is mounted on a slide in glycerine/gelatine and left to dry at room temperature overnight.

Spore fluorescence colour

Samples are also analysed microscopically in U.V. light, using an exciter filter with a band pass of 400 - 440 nm and a barrier filter with a long pass of 470 nm, and the colour of the spore fluorescence is determined. This is used as an alternative maturity parameter to verify the result obtained from vitrinite reflectance and is reported on a numerical scale from 1 to 9:

Fluorescence Colour	Colour Index	Corresp. Vitrinite Reflectance
Green	1	0.2%
Green/Yellow	2	0.2/0.3%
Yellow	3	0.3%
Yellow/Orange	4	0.4%
Light Orange	5	0.5%
Mid-Orange	6	0.6%
Dark Orange	7	0.8%
Orange/Red	8	1.0%
Red	9	1.1%

NB. This table only provides a rough correlation as vitrinite reflectance and spore fluorescence colour are both independently affected by factors such as depositional environment and catagenic history.

EXPERIMENTAL

Isotope Ratio Mass Spectrometry

The isotope analysis were performed on a dual inlet VG SIRA 10 instrument. The combustion of the samples were done by a Carlo Erba EA 1108 element analyser directly connected to the inlet system of the mass spectrometer.

The combustion temperature was 1020°C and the carries gas used was Helium. After the combustion H_2O and CO_2 were trapped in different cool traps. The CO_2 gas was then heated up before it was admitted to the mass spectrometer. The whole operation was controlled by a IBM PC50 computer system.

δ-values

The isotope ratios are given as δ-values in °/₀₀ versus the PDB-standard:

$$\delta^{13}C = (R\ sample - R\ standard\ /\ R\ standard) * 1000$$

$$R = {}^{13}C\ /\ {}^{12}C$$

The PDB standard (a marine chalk of the Pee Dee-formation, USA) was created by Craig 1957. All results of ^{13}C / ^{12}C - analysis of organic matter today are calculated (Craig correction) against this international standard.

Reproducebility

The presision of the combustion system and the mass spectrometer is controlled by determinations of an international calibrated standard, NBS22 oil and a house standard of carbon.

Double analysis on samples are also done.

Experimental, combined gas chromatography - mass spectrometry (GC-MS)

The GC-MS analyses were performed on a VG TS250 system interfaced to a Hewlett Packard 5890 gas chromatograph. The GC was fitted with a fused silica SE 54 capillary column (50 m x 0.22 mm i.d.) directly into the ion source. Helium (12psi) was used as carrier gas and the injections were performed in splitless mode. The GC oven was programmed from 45°C to 150°C at 35°C/min at which point the programme rate was 2°C/min. up to 310°C where the column was held isothermally for 15 min. For the aromatic hydrocarbons, the GC oven was programmed from 50°C to 310°C at 5°C/min and held isothermally at 310°C for 15 min. The mass spectrometer was operated in electron impact (EI) mode at 70 eV electron energy, a trap current of 500 uA and a source temperature of 220°C. The instrument resolution used was 1500 (10% valley).

The data system used was a VG PDP11/73 system. The samples were analysed in multiple ion detection mode (MID) at a scan cycle time of approximately 1,1 sec.

Calculation of peak ratios was done from peak heights in the appropriate mass fragmentograms.

In the discussion of the GC-MS data, the results will be discussed by area. The wells within an area will be discussed separately. In the discussion, samples within one formation are discussed together. The discussion is further divided into types of compounds as follows:

Saturated Fractions:

Terpanes

The most commonly used fragment ions for detection of terpanes are M/Z 163 for detection of 25, 28, 30 trisnormoretane or 25, 28, 30 trisnorhopane, M/Z 177 for detection of demethylated hopanes or moretanes, M/Z 191 for detection of tricyclic, tetracyclic- and pentacyclic terpanes and M/Z 205 for methylated hopanes or moretanes.The molecular ions M/Z 370 and 384 are also recorded for identification of C_{27} and C_{28} triterpanes respectively.

Steranes

The most commonly used fragment ions for detection of steranes are M/Z 149 to distinguish betweem 5 α and 5 β steranes, M/Z 189 and 259 for detection of rearranged steranes, M/Z 217 for detection of rearranged and normal steranes and M/Z 218 for detection of 14β (H), 17β (H) steranes.

The M/Z 231 fragment ion is used to detect possible aromatic contamination of the saturated fraction. It is also used for detection of methyl steranes.

Aromatic Fractions:

Alkyl-substituted Benzenes

The M/Z 106 fragment ion is often used to detect the alkyl-substituted benzenes. It is especially useful for the detection of di-substituted benzenes. M/Z 134 can also be used for the detection of C_4-alkylbenzenes, but benzothiophene will also give a signal with this fragment ion.

Naphthalenes

Methylnaphthalenes are normally detected by the M/Z 142 fragment ion while C_2-naphthalenes are detected by M/Z 156 and C_3-naphthalenes by M/Z 170.

Benzothiophenes and Dibenzothiophenes

Benzothiophene can be detected, as mentioned above, by M/Z 134. The M/Z 198 and M/Z 212 fragment ions are used for methylsubstituted dibenzothiophenes and dimethylsubstituted dibenzothiophenes respectively.

Phenanthrenes

Phenanthrene is detected using the M/Z 178 fragment ion. Anthracene will, if present also give a signal in the M/Z 178 fragmention. Methyl-substituted phenanthrenes give signals in the M/Z 192 fragment ion while the M/Z 206 fragment ion shows the dimethyl-substituted phenanthrenes and the M/Z 220 fragmentation shows the C_3 substituted phenanthrenes.

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Aromatic Steranes

Monoaromatic steranes are detected using the M/Z 253 fragment ion while the triaromatic steranes are detected using the M/Z 231 fragmention.

2a. Mass Fragmentograms representing Terpanes
(M/Z 163, 177, 191, 205, 370 and 384)

Peak identification. (α and β refer to hydrogen atoms at C-17 and C-21 respectively unless indicated otherwise).

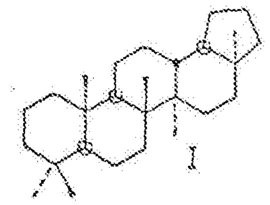
A.	18α-trisnorneohopane (Ts)	$C_{27}H_{44}$	(I)
B.	17α-trisnorhopane (Tm)	$C_{27}H_{46}$	(II, R=H)
Z.	Bisnorhopane	$C_{28}H_{48}$	(IV)
C.	αβ-norhopane	$C_{29}H_{50}$	(II, $R=C_2H_5$)
D.	βα-norhopane	$C_{29}H_{50}$	(III, $R=C_2H_5$)
E.	αβ-hopane	$C_{30}H_{52}$	(II, $R=i-C_3H_7$)
F.	βα-hopane	$C_{30}H_{52}$	(III, $R=i-C_3H_7$)
G.	22S-αβ homohopane	$C_{31}H_{54}$	(II, $R=i-C_4H_9$)
H.	22R-αβ homohopane	$C_{31}H_{54}$	(II, $R=i-C_4H_9$)
I.	βα-homomoretane	$C_{31}H_{54}$	(III, $R=i-C_4H_9$)
J.	22S-αβ bishomohopane	$C_{32}H_{56}$	(II, $R=i-C_5H_{11}$)
	22R-αβ bishomohopane	$C_{32}H_{56}$	(II, $R=i-C_5H_{11}$)
K.	22S-αβ trishomohopane	$C_{33}H_{58}$	(II, $R=i-C_6H_{13}$)
	22R-αβ trishomohopane	$C_{33}H_{58}$	(II, $R=i-C_6H_{13}$)
L.	22S-αβ tetrakishomohopane	$C_{34}H_{60}$	(II, $R=i-C_7H_{15}$)
	22R-αβ tetrakishomohopane	$C_{34}H_{60}$	(II, $R=i-C_7H_{15}$)
M.	22S-αβ pentakishomohopane	$C_{35}H_{62}$	(II, $R=i-C_8H_{17}$)
	22R-αβ pentakishomohopane	$C_{35}H_{62}$	(II, $R=i-C_8H_{17}$)
P.	Tricyclic terpane	$C_{23}H_{42}$	(V, $R=i-C_4H_9$)
Q.	Tricyclic terpane	$C_{24}H_{44}$	(V, $R=i-C_5H_{11}$)
R.	Tricyclic terpane (17R, 17S)	$C_{25}H_{66}$	(V, $R=i-C_6H_{13}$)
S.	Tetracyclic terpane	$C_{24}H_{42}$	(VI)
T.	Tricyclic terpane (17R, 17S)	$C_{26}H_{48}$	(V, $R=i-C_7H_{15}$)
N.	Tricyclic terpane	$C_{21}H_{38}$	(V, $R=C_2H_5$)
O.	Tricyclic terpane	$C_{22}H_{40}$	(V, $R=C_3H_7$)
Y.	25,28,30-trisnorhopane/moretane	$C_{27}H_{46}$	(VII)
X.	Unknown triterpane	$C_{30}H_{52}$	

2b. Mass Fragmentograms representing Steranes
(M/Z 149, 189, 217, 218 and 259)

Peak identifications. (α and β refer to hydrogen atoms at C-5, C-14 and C-17 in regular steranes and at C-13 and C-17 in diasteranes).

a.	20S-βα-diacholestane	$C_{27}H_{48}$	(I, R=H)
b.	20R-βα-diacholestane	$C_{27}H_{48}$	(I, R=H)
c.	20S-αβ-diacholestane	$C_{27}H_{48}$	(II, R=H)
d.	20R-αβ-diacholestane	$C_{27}H_{48}$	(II, R=H)
e.	20S-βα-24-methyl-diacholestane	$C_{28}H_{50}$	(I, $R=CH_3$)
f.	20R-βα-24-methyl-diacholestane	$C_{28}H_{50}$	(I, $R=CH_3$)
g.	20S-αβ-24-methyl-diacholestane	$C_{28}H_{50}$	(II, $R=CH_3$)
	+ 20S-ααα-cholestane	$C_{27}H_{48}$	(III, R=H)
h.	20S-βα-24-ethyl-diacholestane	$C_{29}H_{52}$	(II, $R=C_2H_5$)
	+20R-αββ-cholestane	$C_{27}H_{48}$	(IV, R=H)
i.	20S-αββ-cholestane	$C_{27}H_{48}$	(IV, R=H)
	+20R-αβ-24-methyl-diacholestane	$C_{28}H_{50}$	(II, $R=CH_3$)
j.	20R-ααα-cholestane	$C_{27}H_{48}$	(III, R=H)
k.	20R-βα-24-ethyl-diacholestane	$C_{29}H_{52}$	(I, $R=C_2H_5$)
l.	20S-αβ-24-ethyl-diacholestane	$C_{29}H_{52}$	(II, $R=C_2H_5$)
m.	20S-ααα-24-methyl-cholestane	$C_{28}H_{50}$	(III, $R=CH_3$)
n.	20R-αββ-24-methyl-cholestane	$C_{28}H_{50}$	(IV, $R=CH_3$)
	+ 20R-αβ-24 ethyl-diacholestane	$C_{29}H_{52}$	(II, $R=C_2H_5$)
o.	20S-αββ-24- methyl-cholestane	$C_{28}H_{50}$	(IV, $R=CH_3$)
p.	20R-ααα-24- methyl-cholestane	$C_{28}H_{50}$	(III, $R=CH_3$)
q.	20S-ααα-24-ethyl-cholestane	$C_{29}H_{52}$	(III, $R=C_2H_5$)
r.	20R-αββ-24-ethyl-cholestane	$C_{29}H_{52}$	(IV, $R=C_2H_5$)
s.	20S-αββ-24-ethyl-cholestane	$C_{29}H_{52}$	(IV, $R=C_2H_5$)
t.	20R-ααα-24 ethyl-cholestane	$C_{29}H_{52}$	(III, $R=C_2H_5$)
u.	5α-sterane	$C_{21}H_{36}$	(VI, $R=C_2H_5$)
V.	5α-sterane	$C_{22}H_{38}$	(VI, $R=C_3H_7$)

STRUCTURES REPRESENTING TERPANES



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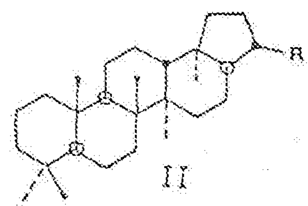

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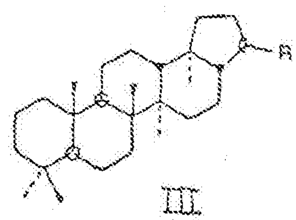

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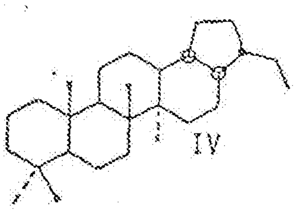

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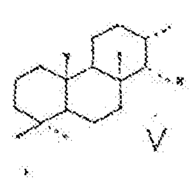

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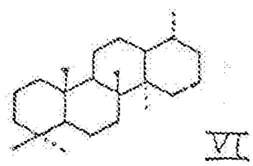

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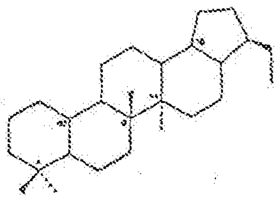
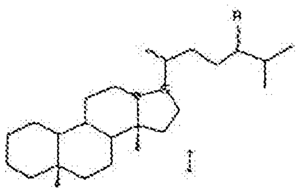


VII

STRUCTURES REFRESENTING STERANES



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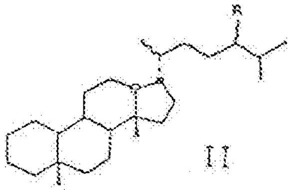

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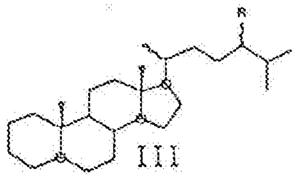

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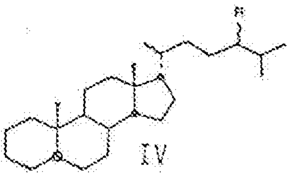

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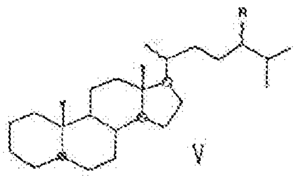

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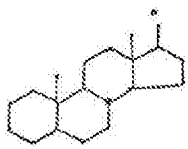


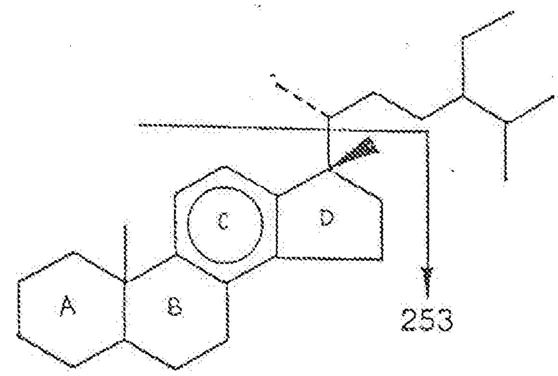
VI

Mass Fragmentograms representing Monoaromatic Steranes (M/Z 253)

Description of C-ring monoaromatic steroid hydrocarbons

Peak	Substituents R_1	R_2	R_3	R_4	Abbreviation of Compound
A1					$C_{21}MA$
B1					$C_{22}MA$
C1	β(H)	CH_3	$S(CH_3)$	H	$\beta SC_{27}MA$
	CH_3	H	$S(CH_3)$	H	$SC_{27}DMA$
	β(H)	CH_3	$R(CH_3)$	H	$\beta RC_{27}MA$
D1	CH_3	H	$R(CH_3)$	H	$RC_{27}DMA$
	α(H)	CH_3	$S(CH_3)$	H	$\alpha SC_{27}MA$
E1	β(H)	CH_3	$S(CH_3)$	CH_3	$\beta SC_{28}MA$
	CH_3	H	$S(CH_3)$	CH_3	$SC_{28}DMA$
F1	α(H)	CH_3	$R(CH_3)$	H	$\alpha RC_{27}MA$
	α(H)	CH_3	$S(CH_3)$	CH_3	$\alpha SC_{28}MA$
	β(H)	CH_3	$R(CH_3)$	CH_3	$\beta RC_{28}MA$
G1	CH_3	H	$R(CH_3)$	CH_3	$RC_{28}DMA$
	β(H)	CH_3	$S(CH_3)$	C_2H_5	$\beta SC_{29}MA$
	CH_3	H	$S(CH_3)$	C_2H_5	$SC_{29}DMA$
	α(H)	CH_3	$R(CH_3)$	CH_3	$\alpha RC_{28}MA$
H1	β(H)	CH_3	$R(CH_3)$	C_2H_5	$\beta RC_{29}MA$
	CH_3	H	$R(CH_3)$	C_2H_5	$RC_{29}DMA$
I1	α(H)	CH_3	$R(CH_3)$	C_2H_5	$\alpha RC_{29}MA$

STRUCTURES REPRESENTING MONOAROMATIC STERANES:



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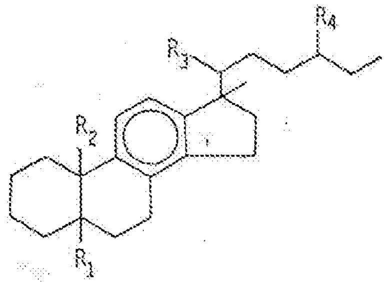
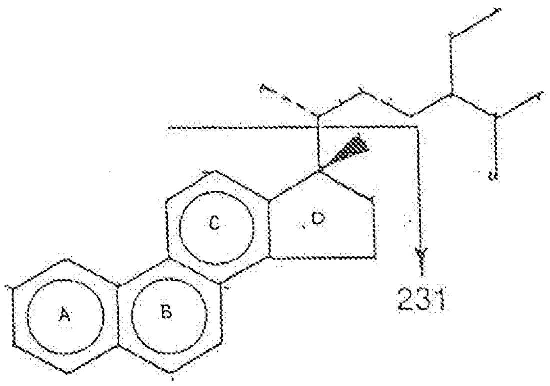


Mass Fragmentograms representing Triaromatic Steranes (M/Z 231)

Description of ABC-ring triaromatic steroid hydrocarbons

Peak	Substituents R_1	R_2	Abbreviation of Compound
a1	CH_3	H	$C_{20}TA$
b1	CH_3	CH_3	$C_{21}TA$
c1	$S(CH_3)$	C_6H_{13}	$SC_{26}TA$
d1	$R(CH_3)$	C_6H_{13}	$RC_{26}TA$
	$S(CH_3)$	C_7H_{15}	$SC_{27}TA$
e1	$S(CH_3)$	C_8H_{17}	$SC_{28}TA$
f1	$S(CH_3)$	C_7H_{15}	$RC_{27}TA$
g1	$R(CH_3)$	C_8H_{17}	$RC_{28}TA$

STRUCTURES REPRESENTING TRIAROMATIC STERANES:



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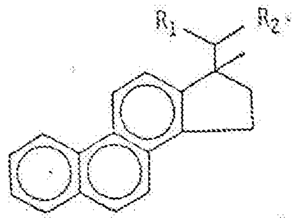

Alphabetic list of Abbreviations and Terms used by GEOLAB NOR in this report

List of abbreviations used for lithology description
(sorted alphabetically).

and	=	angular
bar	=	Baryte (mud additive)
bl	=	blue/blueish
blk	=	black
br	=	brittle
brn	=	brown/brownish
Ca	=	Carbonate (Limestone/Chalc/Dolomite/Siderite)
calc	=	calcareous
carb	=	carbonaceous
cem	=	cement used as additive (under "Cont") or to describe cemented S/Sst
Chert	=	Chert
chk	=	Chalk/chalky
cly	=	clayey/shaley
cngl	=	conglomeratic
Coal	=	Coal
Coal-ad	=	Coal-like additive (eg chromlignosulfonate)
Congl	=	Conglomerate
Cont	=	Contamination(s)
crs	=	coarse grained
dd	=	dried drilling mud
dol	=	Dolomite/dolomitic
drk	=	dark (colour)
dsk	=	dusk/dusky (colour)
evap	=	Salt/Gypsum/Halite (natural "Other" or as additive "Cont")
f	=	fine grained
fib	=	fibres (mud additive / contamination)
fis	=	fissile
fos	=	fossiliferous
glauc	=	Glauconite/glauconitic
gn	=	green/greenish
gy	=	grey/greyish
hd	=	hard
ign	=	Igneous (material derived from igneous source)
Kaolin	=	Kaolin(ite)
kln	=	kaolinitic
l	=	loose
lam	=	laminated/laminae
lt	=	light (colour)
m	=	medium (colour or grain size)

List of abbreviations used for lithology description
(sorted alphabetically).

```
Marl     = Marl ( calcareous claystone/mudstone)
mic      = micaceous
Mica-ad  = Mica used as mud additive
mrl      = marly
No Mat.  = No material left over after washing
ns       = nutshells ( mud additive )
ol       = olive
ool      = Oolite/oolitic
or       = orange
Other    = Other lithology/mineral, specified after this word
pi       = pink/pinkish
pl       = pale ( colour )
prp      = paint/rust/plastic contaminations/additives
pu       = purple
pyr      = Pyrite/pyritic
red      = red/reddish
rnd      = round/rounded
s        = sandy
S/Sst    = Sand and/or sandstone
Sh/Clst  = Shale and/or claystone
sid      = Siderite/sideritic
sil      = siliceous/cherty
slt      = silty
Sltst    = Siltstone
st       = stained ( with natural oil or oil-like additive )
tar-ad   = Tar-like additive ( eg "Black Magic" )
Tuff     = Tuff
tuff     = tuffaceous
v col    = Various colours
w        = white
wx       = waxy
y        = yellow/yellowish
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