

The Distributions Aureoles of the Gases Concentrations in the Neighborhood of Some Drillings from Gherăiești

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Abstract

This paper presents the importance of the gases accumulations, how these gases could be accumulated in surface deposits, the concentration of the gases compounds and the goal of these aureoles is to evaluate the size of extension of these gases accumulations.

Several years ago, at Gherăiești, this location being situated in the west part of Bârlad's Depression, took place significant gas manefesatations at the basements and the first floors of some dwelling-houses from that residential quarter.

In 2003 were made studies for knowing the source of these gas emanations and this source is represented by many Sarmațian gas complexes, situated in deep and these gases reached at surface deposits due to poor cimented column of many wells.

Along the time, were made different studies of the affected area by these emanations, the article referring at the study of these gases with geochemical aureoles of disperssion.

For the gases compounds from Gherăiești (methane, ethane, propane, iso-butane and normal-butane) it'll build geochemical aureoles on differet intervals of time. Following these aureoles we'll see which are the zones with higher concentrations of gases and it will indicate the measures which must taken for the diminish the gaze influxes.

Key words: *gases, concentrations, compounds, accumulations, emanations, dwelling-houses*

Introduction

This paper presents the importance of the gases accumulations, what means these gases accumulations, the concentration of the gases compounds and the goal of these aureoles is to evaluate the size of extension of these gases accumulations.

In Romania, some gases can be accumulate in places near the surface, where these gases can be accumulated coming from their sources. Also, it must be completed the accumulation conditions.

The manifestation of gases was very strength at some buildings from Gherăiești, where were affected the basements and the first floors of dwelling-houses.

The Stratigraphy of Bârlad's Depression

The Gherăiești quarter is situated in the west side of Bârlad's Depression.

The stratigraphy is represented through a folded basis, metamorphosed, of the Precambrian age, this age being covered by the Triassic age sedimentary succession, Upper Cretaceous, Badenians, Sarmatians and Meotians.

The Quaternary (Pleistocene și Holocene) having a thickness of 170 m, forms the Bistrița's River terraces, being constituted gravels and sands with lens character (de tip shoestring) in alternation with shales and sandy-shales. These deposits have a arenitic-ruditic structure containing flattened and rounded elements of metamorphic rocks (crystalline shales, menil, other types of shales) and sedimentary rocks (siliceous sandstones, calcareous with calcite diacause, limestones, microconglomerates, sandstone marls).

This Quaternary presents frequent discontinuities of layers, significant local variations of facies noninsurancing the tightness of the screen clay.

The Sarmatian-Pliocene deposits and those from molas are known as being from the zone of Foredeep deposits (which have such distinguish character the alternation of arenites and lutites).

The Tectonic from Gherăiești

For Bârlad's Platform it hasn't known the geosyncline stage, afferent to crystalline base. Is considered as a newest platform than the Moldovan.

Sedimentation was happened in two ways:

- In Jurassic the platform suffers an increasing subsidence in they south part, from neighborhood of the North-Dobrogean Orogen; this subsidence arisis in connection with the Early Orogenesis which affected North Dobrogea and which at north from this orogen a was corresponded with a fos zone;
- In the last cycle from Tertiary, the subsidence was manifested towards west, towards the Carpathian Orogen, the proof is a thickening of formations in this sector.

Distributions Aureoles of Gases Concentrations from Neighborhood of Some Drillings from Gherăiești

For the compounds of gases from Gherăiești (methane, ethane, propane, iso-butane and normal-butane) it could be build the geochemical aureoles presented in Figures 1-10.

Conclusions

In the period of January-February 2005 the compound C1 was concentrated in south-west part of study area, at the buildings from neighborhood of D2,D4,D7 and Fc13 drilling, being a concentration of over 90% methane.

In the period of March-April-May 2005, the compound C1 was concentrated in proportion of over 80%, decreasing very small in comparison with the January-February 2005, now the concentrations from the south-west part, the gases being met on all the area and in the north-west part.

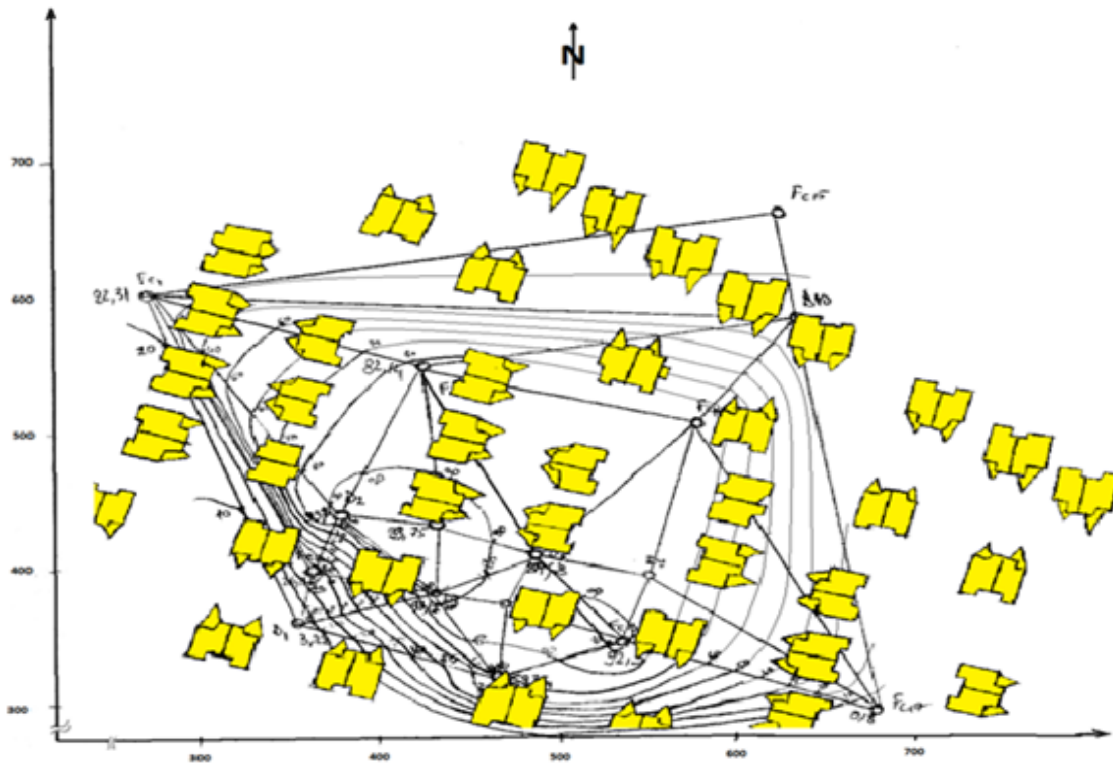


Fig. 1. The geochemical aureola for the C1 compound of the gases from drillings, Gherăiești (Jan. – Feb. 2005)

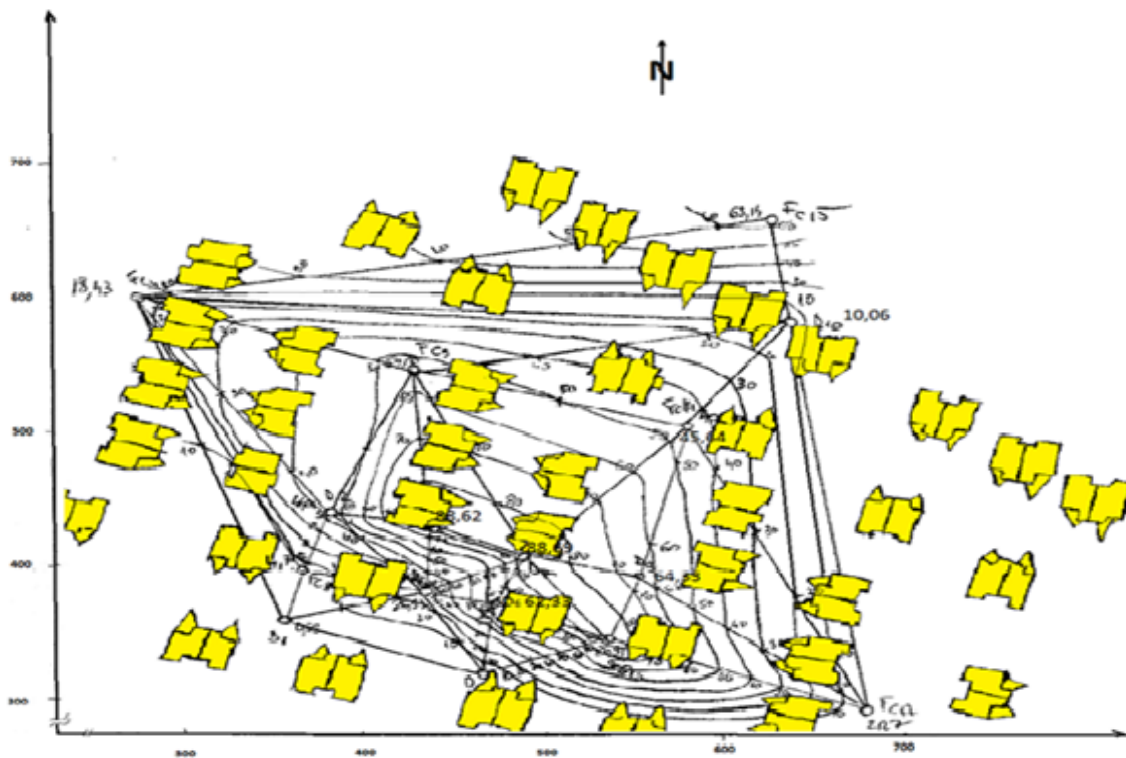


Fig. 2. The geochemical aureola for the C1 compound of the gases from drillings, Gherăiești (March – Apr. – May 2005)

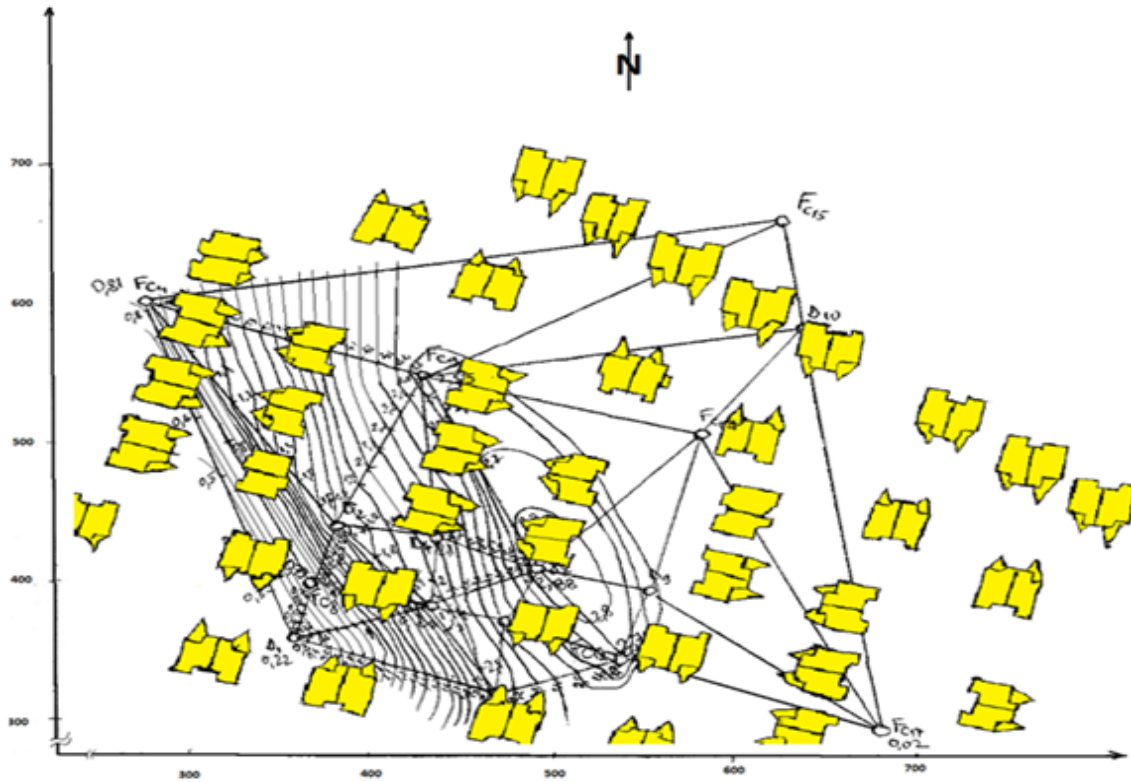


Fig. 3. The geochemical aureola for the C2 compound of the gases from drillings, Gherăiești (Jan. - Feb. 2005)

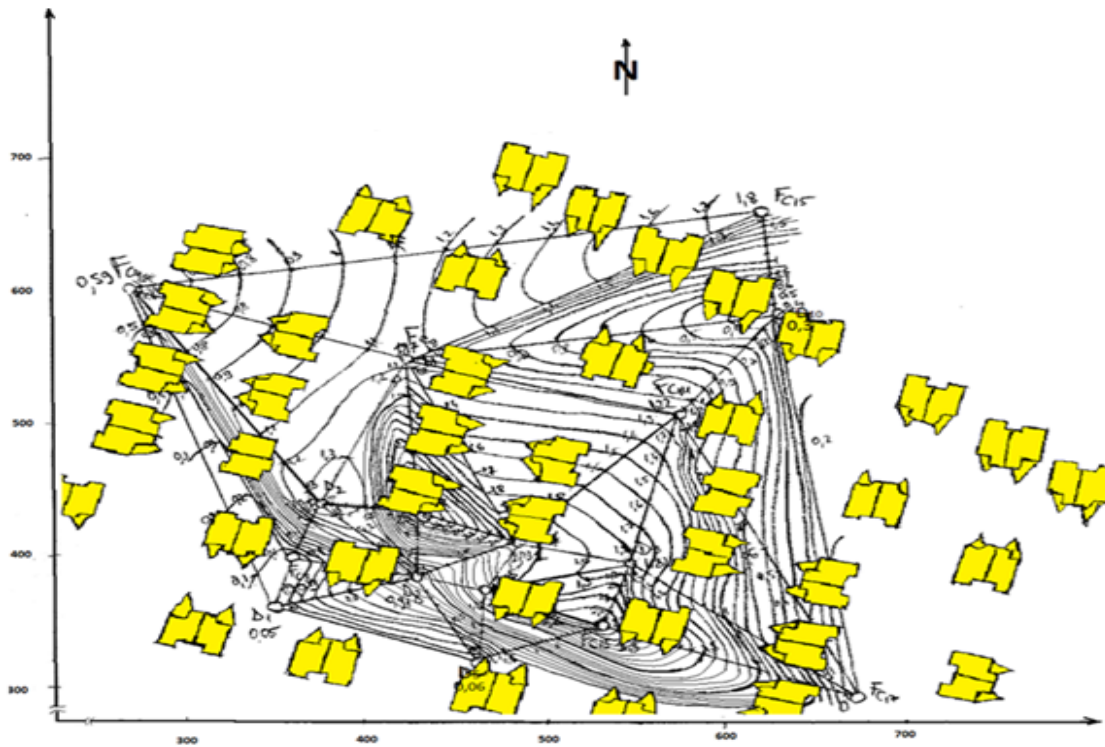


Fig. 4. The geochemical aureola for the C2 compound of the gases from drillings, Gherăiești (March - Apr. - May 2005)

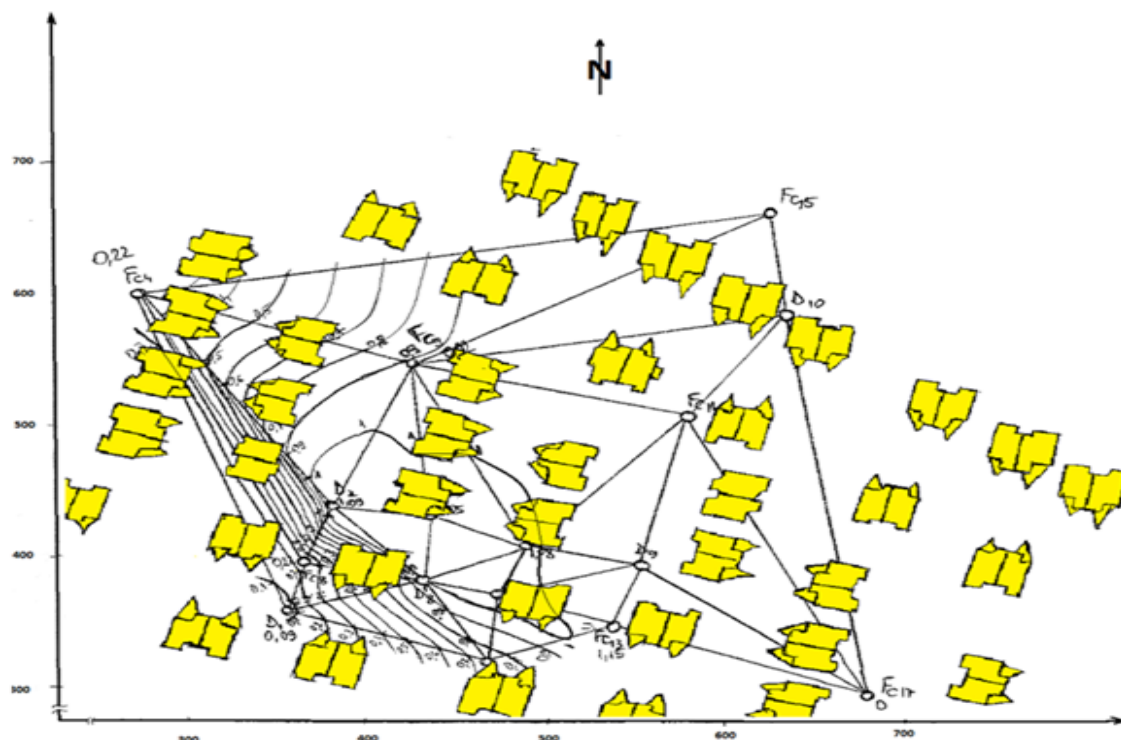


Fig. 5. The geochemical aureola for the C3 compound of the gases from drillings, Gherăiești (Jan. – Feb. 2005)

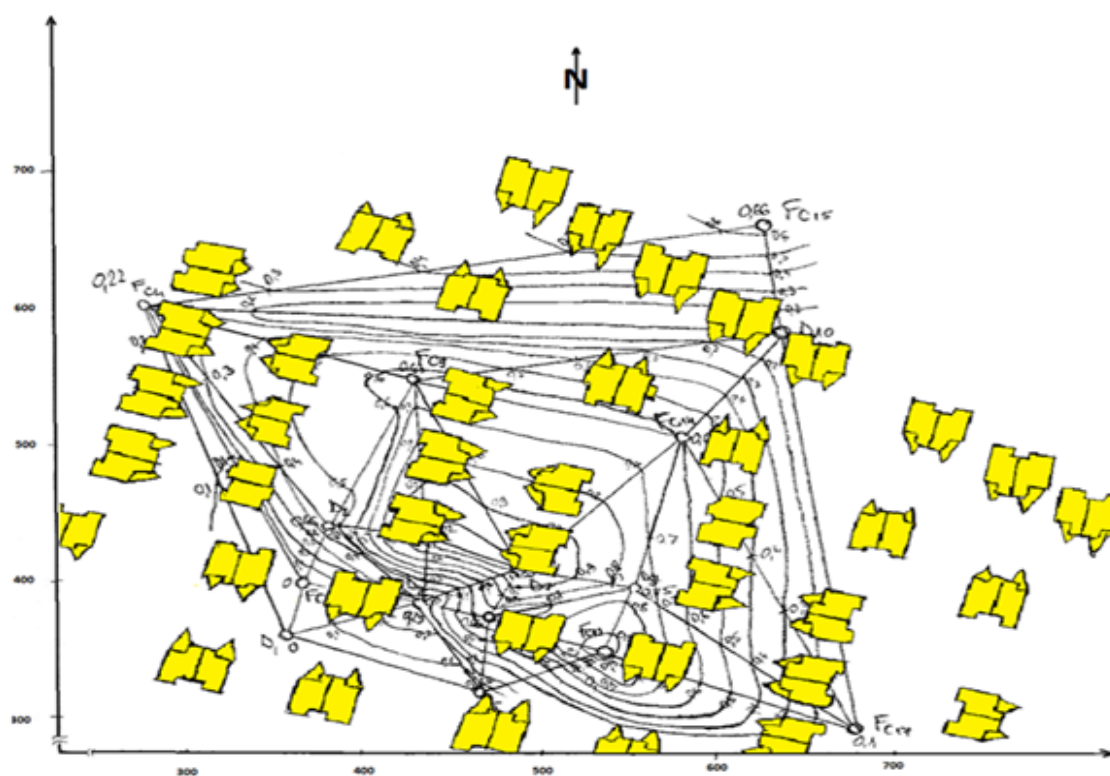


Fig. 6. The geochemical aureola for the C3 compound of the gases from drillings, Gherăiești (March – Apr. – May 2005)

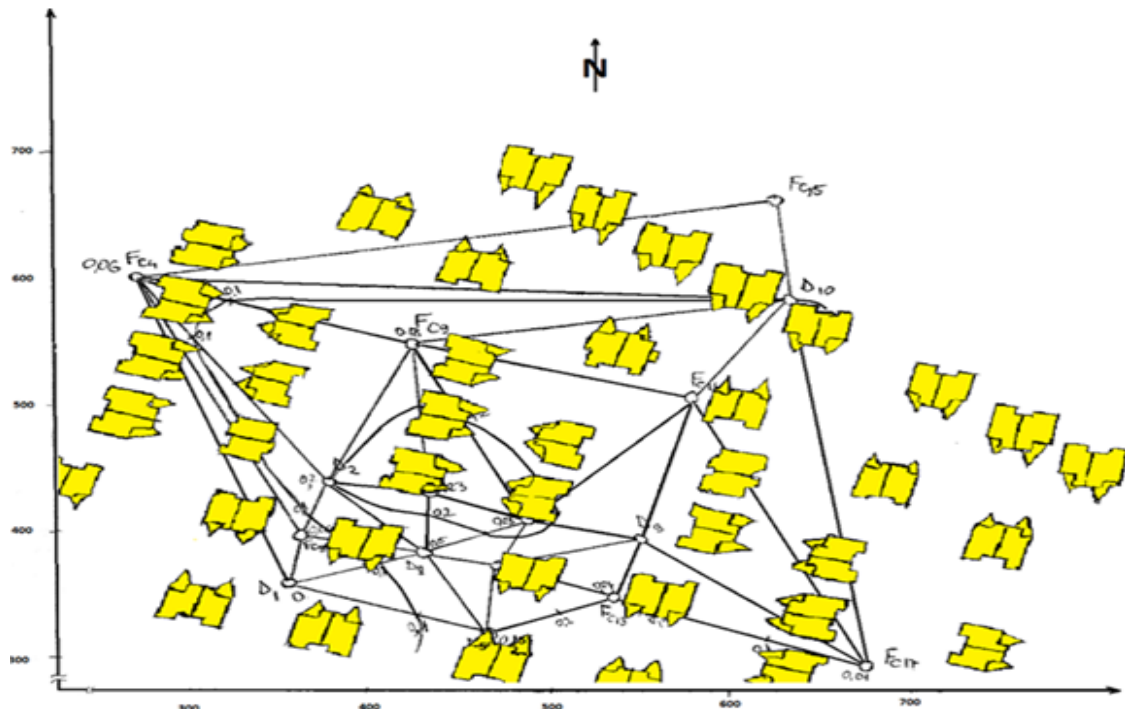


Fig. 7. The geochemical aureola for the i - C4 compound of the gases from drillings, Gherăiești (Jan. – Feb. 2005)

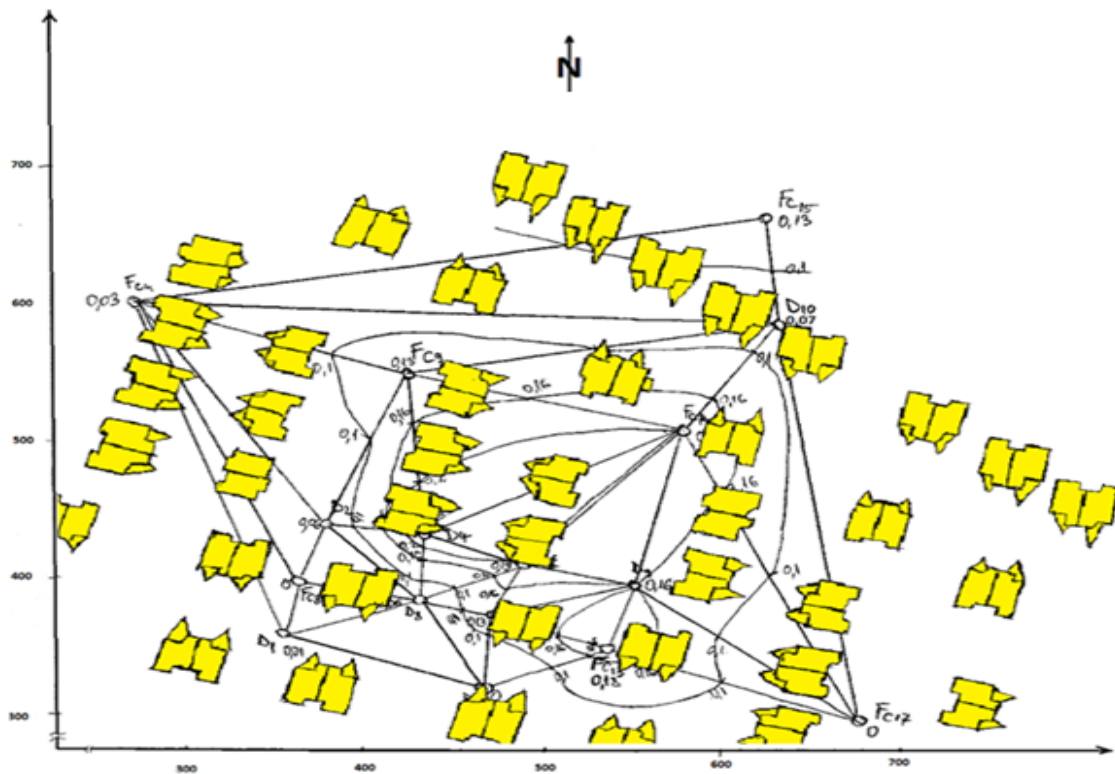


Fig. 8. The geochemical aureola for the i – C4 compound of the gases from drillings, Gherăiești (March – Apr. – May 2005)

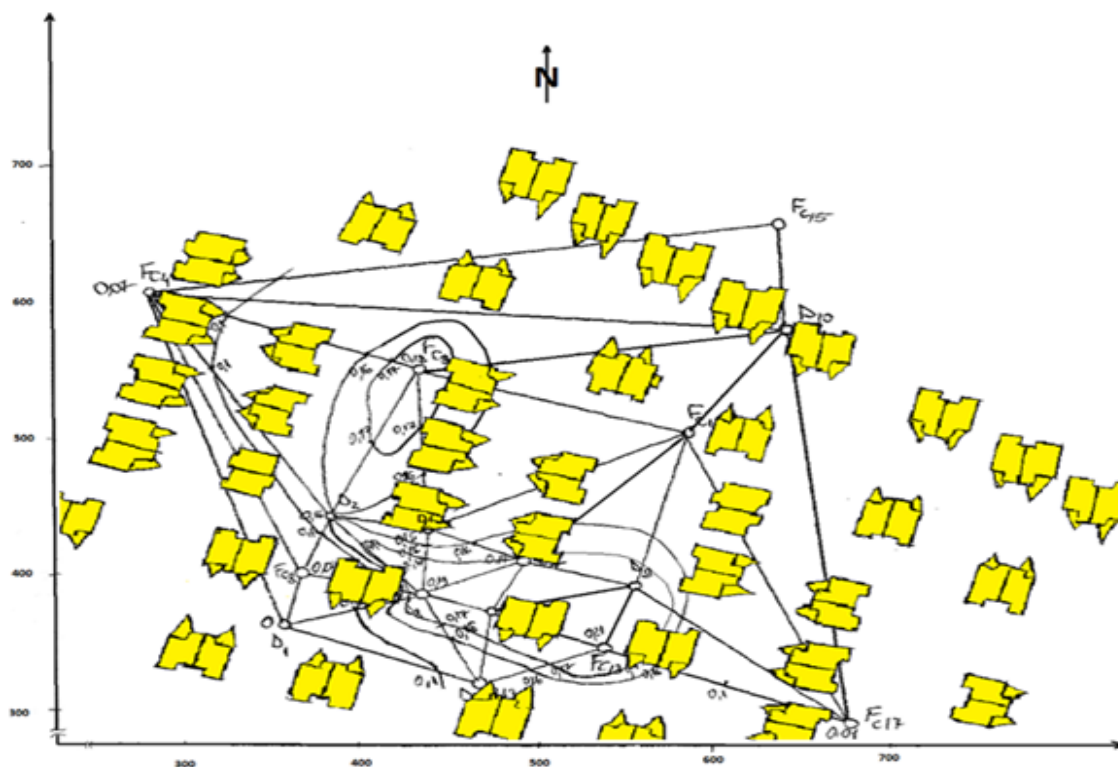


Fig. 9. The geochemical aureola for the n - C₄ compound of the gases from drillings, Gherăiești (Jan. – Feb. 2005)

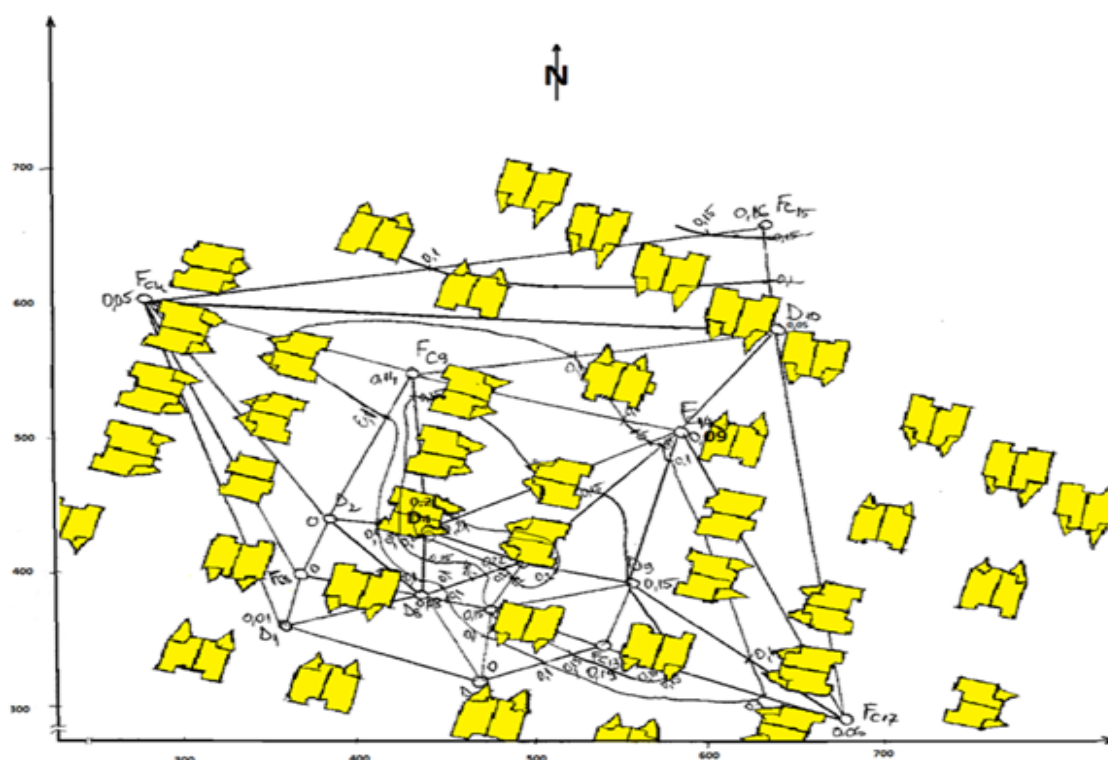


Fig. 10. The geochemical aureola for the n - C₄ compound of the gases from drillings, Gherăiești (March – Apr. – May 2005)

Such concentrations determined through the geochemical explorations argued the idea that on such basement it couldn't built dwelling-houses, due to the respective methane without wells where are positioned burners.

The supply with gases for this zone it could make from a source of deep, and these gases reached in the deposits from neighborhood of surface.

In the period of January-February 2005 the compound C2 (ethane) was concentrated in an insignificant proportion in comparison with C1, the maximum manifestation of this ethane was in the central zone of the studied area.

The gas which migrated through the rocks pores, containing this ethane influenced the location of some dwelling-houses.

The lines of equal concentration are remarked in special in the west part of the area, the concentrations of C2 compound from January-February 2005 were supplied from the Sarmatian reservoir to the depth or from the reservoirs near the surface adjacent with the studied zone.

The distribution of the compound C2 (ethane) in March-April-May 2005 was in a proportion like in January-February 2005 and this ethane was present in the eastern part.

The concentrations of ethane from this period in comparison with previous period appear forming more distribution zones, the gases from central part migrating on many ways.

As well at methane such at ethane it could be remarked that in the spring period takes place a migration of these gases to east.

The compound C3 (propane) in the period of January-February 2005 was concentrated in the west part of the studied area, the maximum percentage being 1,09%, in the drilling of FD2.

Due to the propane such as due to the other compounds it wasn't allowed the location of dwelling-houses on a base saturated in gases, without taking any measures of drainage of these gases followed by burning of them at baskets.

The distribution of the C3 (propane) compound in March-April-May 2005 was stretched on all area, this compound being present in steady concentrations.

The compound C3 (propane) forms some zones with bigger concentrations which affects many buildings. The concentrations of C3 are comparative with those of C3 from the previous period (Jan-Feb), being on all area.

The lines from the north-east part that are progressive increasing suggest that in the outside of studied area there is a zone with the greatest concentration.

The compound iC4 (iso-butane) in the period of January-February 2005 was concentrated in the central-west part of the studied area, the maximum percentage being 0,23%.

The presence of these iC4, being insignificant, it couldn't had an impact over the dwelling-houses location, if it was single, but in this period it was associated with the other compounds.

The existence of these iC4 it is remarked on all the region where the maximum percentage remained 0,23%. Being associated with the other compounds arise troubles for the location of respective buildings. The lines from the north-east part that are progressive increasing suggest that in the outside of studied area there is another zone with such concentration.

The compound nC4 (normal-butane) in the period of January-February 2005 was concentrated in the south-west part of the studied area, the maximum percentage being 0,21%. In the period of January-February 2005, nC4 appear in two zones with bigger concentrations.

The presence of these iC4 from both points of bigger concentrations is insignificant, and it is burned together with the other compounds.

The distribution of the nC4 (normal-butane) compound in March-April-May 2005 was in the same proportion like in January-February 2005, forming one zone with bigger concentration and this nC4 appearing also in the north-east part.

The presence of these iC4 from the point of big concentration is insignificant, it is increasing in the outside of the studied area, but also the value of concentration is too small and the compounds are burned together at basket.

References

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Aureole de distribuție a concentrațiilor degaze în jurul unor sonde de la Gherăiești

Rezumat

Acest articol prezintă importanța acumulărilor de gaze, cum s-au acumulat aceste gaze în depozite de suprafață, concentrația componenților gazelor, iar scopul este ca prin aureole geochimice să se evalueze extinderea acestor acumulări de gaze.

Acum câțiva ani la Gherăiești, localitate aflată în partea de vest a Depresiunii Bârladului, au avut loc importante manifestări de gaze asupra beciurilor și la parterul mai multor imobile din respectivul cartier rezidențial.

În 2003 s-au efectuat cercetări pentru a cunoaște sursa acestor emanații de gaze și se poate preciza că aceasta este reprezentată de mai multe complexe cu gaze din Sarmașian, aflate la adâncime și aceste gaze au ajuns în depozitele de la suprafață datorită coloanelor cimentate defectuos ale mai multor sonde.

De-a lungul anilor s-au efectuat diferite studii ale ariei afectate de aceste emanații, prezentul articol referindu-se la studiul extinderii gazelor cu aureole geochimice de dispersie.

Pentru componenții gazelor de la Gherăiești (metan, etan, propan, iso-butan și normal-butan) se construiesc aureole geochimice pe diferite intervale de timp. Urmărind aceste aureole se constată care sunt zonele unde concentrațiile de gaze sunt ridicate și se indică măsurile ce trebuie luate pentru diminuarea afluxului de gaze.