

Coalification of Some Coal Basins of Mongolia

Ongi River Coal-Basins

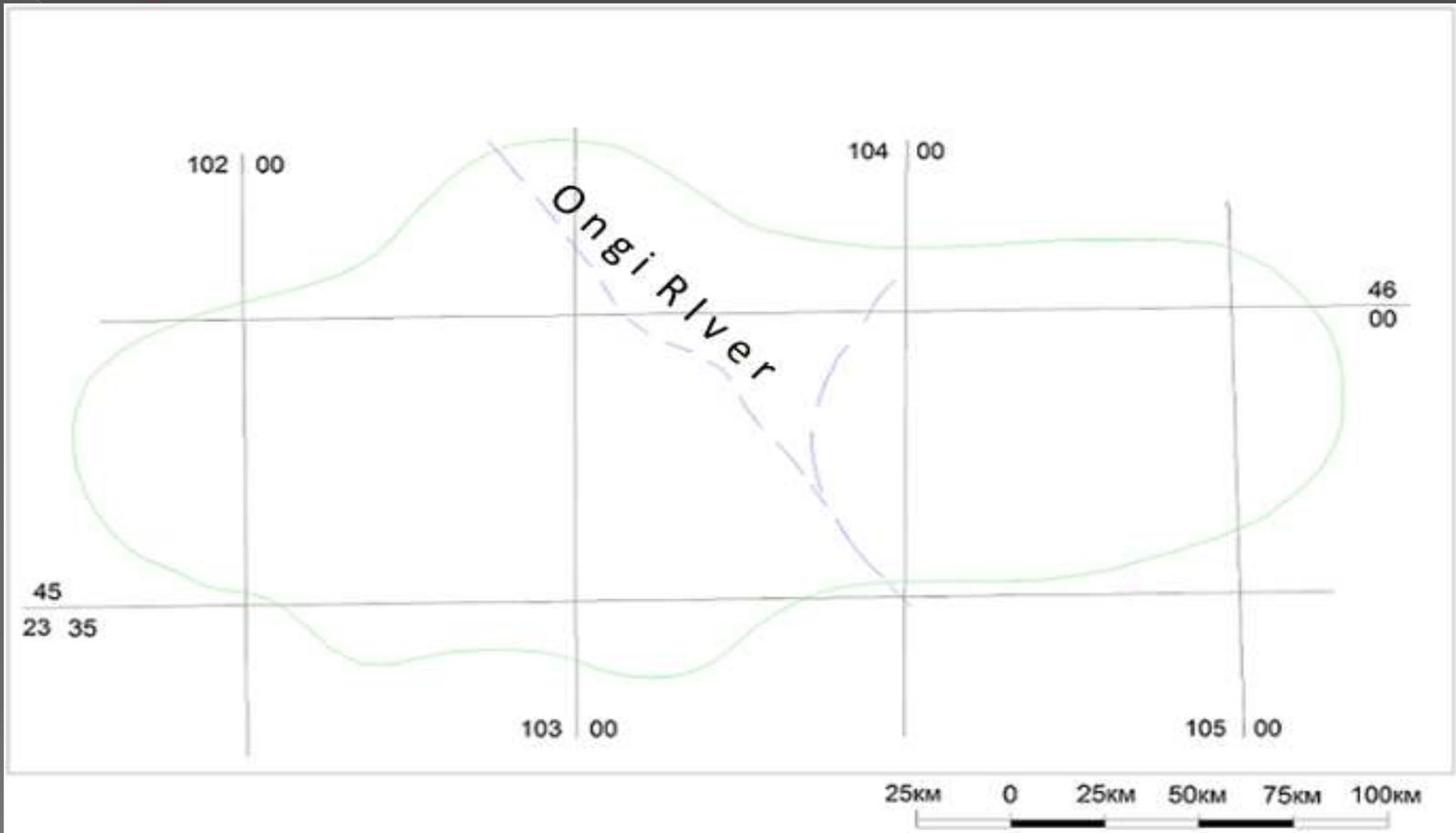
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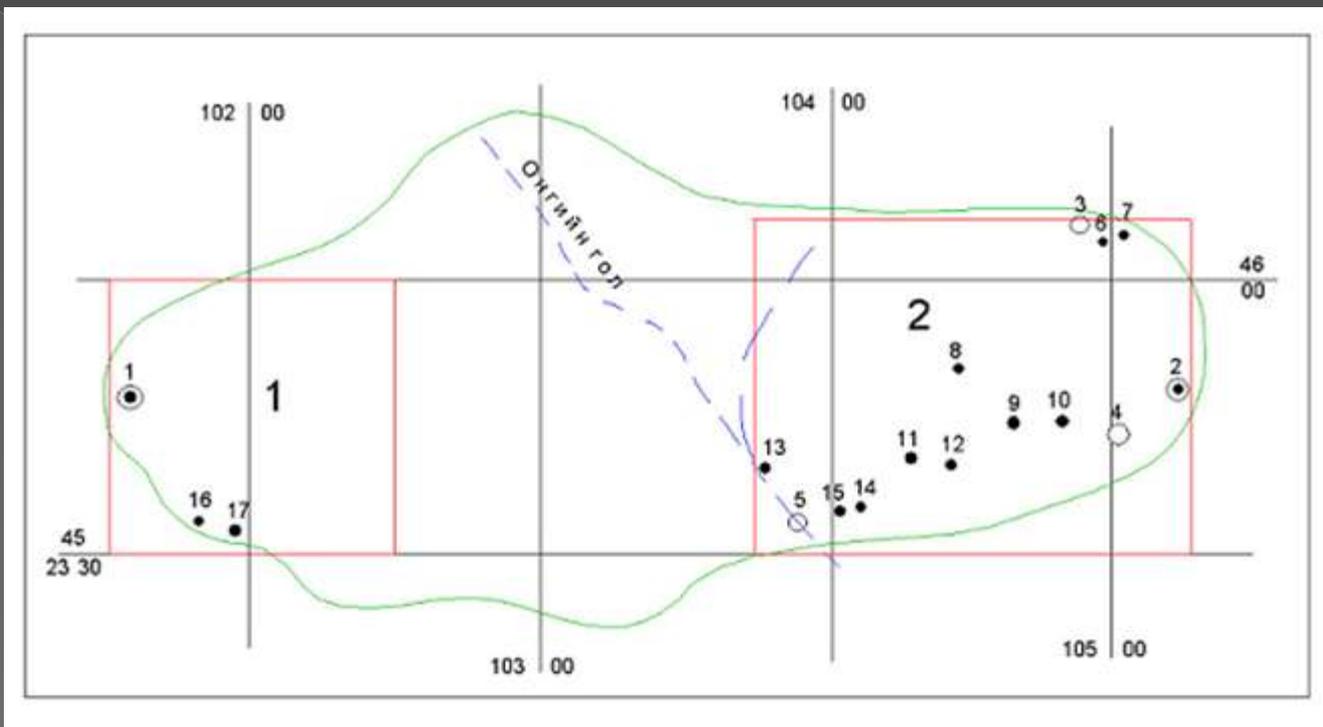
Introduction

- Starting from the end of 1960's, Mongolia has begun the intensive as well as more detailed studies with respect to the geology of sediments, deposits, and basins of mineral fuels. Studies on the coking coals and the petrography started from 1970's and evaluation studies on the reserves of coal and peat started from the end of 1960's. To date, there are 12 coal basins where over 200 coal deposits and occurrences are discovered; in general these deposits and occurrences equally located over the territory of this country and coal reserves are thought to be of over 150 billion tonnes.

Ongi Coal-Basins

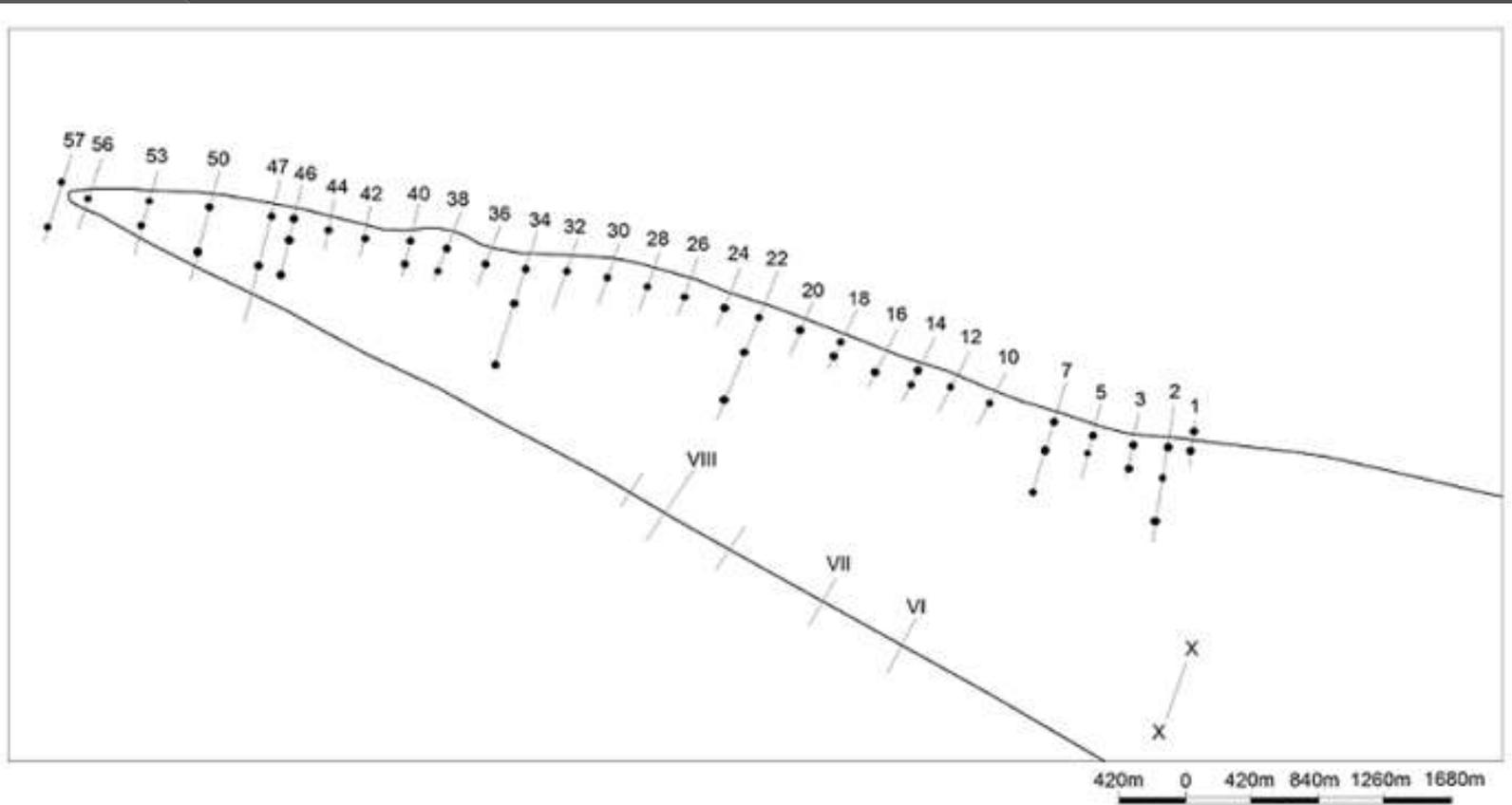


- Border of Coal-Bearing Basin
- - - Border of Coal-Bearing Area



Ongi River of Coalification, Schema of diffusion

Geological image of Coal-Field, Bayanteg

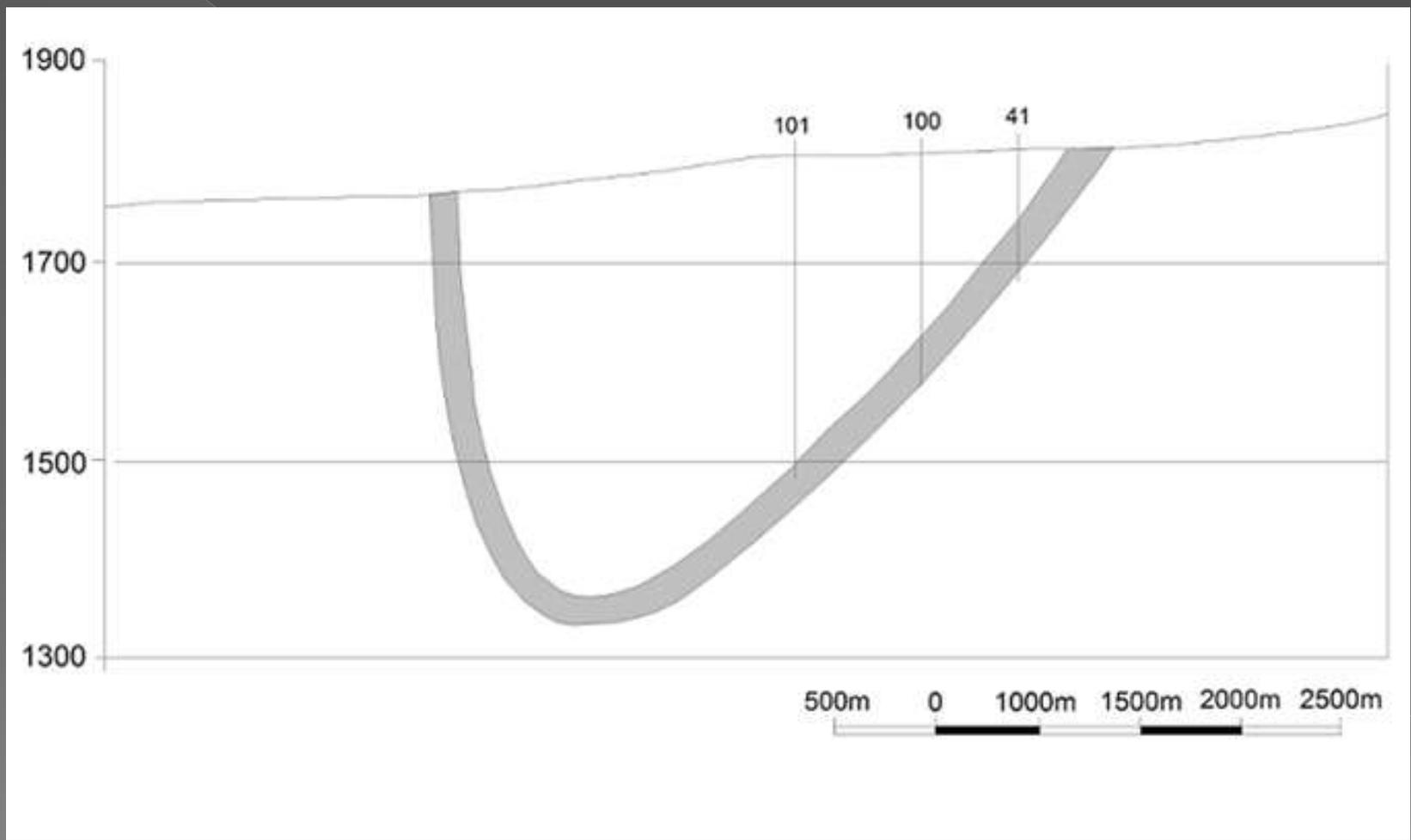


56— Exploratory line

● Borehole

— Coal- Occurrence (coal outcrop)

Image5. 22th line of cross cut



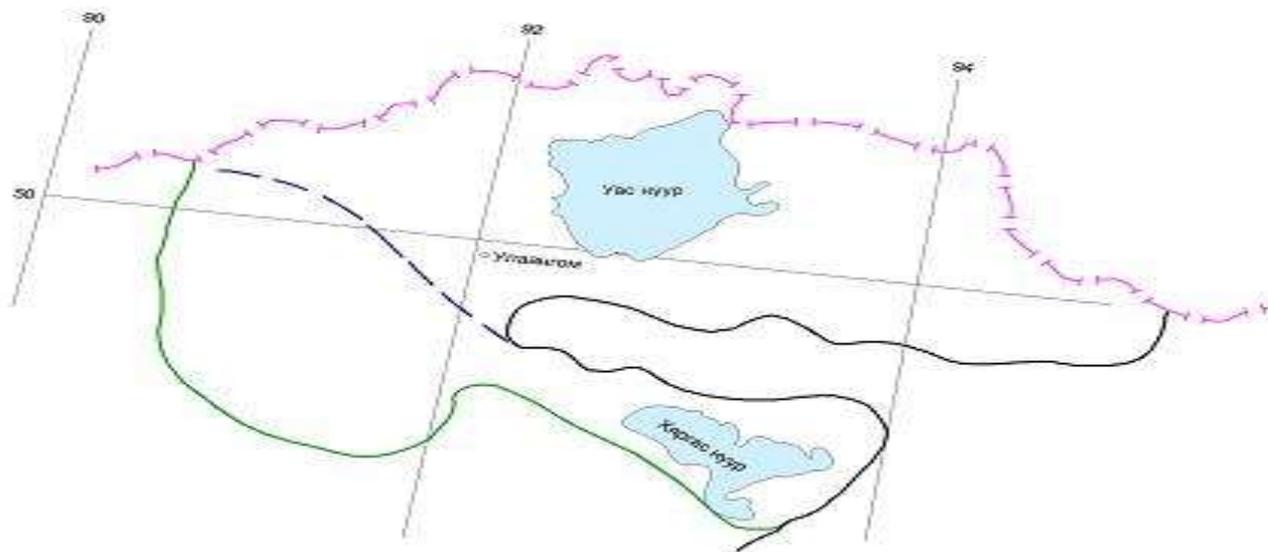
Result of Laboratory analysis

Gauge	Value
Regular Damp (W^a)%	<u>0,7-12,5</u> 510-2,2
Culm (A^d)%	<u>63,4-5,0</u> 510-22,6
Flammable Gas (V^{dat})%	<u>39.1</u> 212
Sulphuric Contents (S^d_t)%	<u>0,27-3,5</u> 163-1,01
Calorie (Q^{daf}) kcal / kg	<u>4900-9010</u> 192-7230
Working Damp (W^r)%	<u>3,33-8,5</u> 11-5, 17
Volume Balance (δ) g/cm ²	<u>1,28-1,5</u> 11-1,3
Rate (γ) g/cm ³	<u>1,3-1,8</u> 306-1,57

Coalification of Kharkhira Coal-Basins

◎ **The *Kharkhira* Coal-Bearing Basin**

The province of the western Mongolia occupies an area of 280 thousand square kilometers spanning over the ranges of *Altai* and *Kharkhira* Mountains Range while bordering via the state borderline with Russian Federation on the north and the People's Republic of China on the west and via land area with the *Khangai* Mountaineous Range on the east. The northern part of this province constitutes of a total of 60 thousand square kilometers area. It borders with the western part of *Uvs Aimag*, the *Kharkhira* Mountains, the northwestern part of the Great Lakes Depression, the *Khar Nuur* Lake and the *Baga Khar Nuur* Lake on the south, the *Achit Nuur* Lake on the right, and *Khan Khukhii* Mountaineous Range on its southeast. This basin has carboniferous sections of *Kharkhira-Turgen*, *Termes Uul-Khuden*, and *Khyargas Nuur* Lake regions.

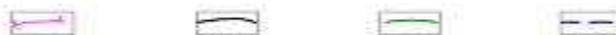


Зураг 1

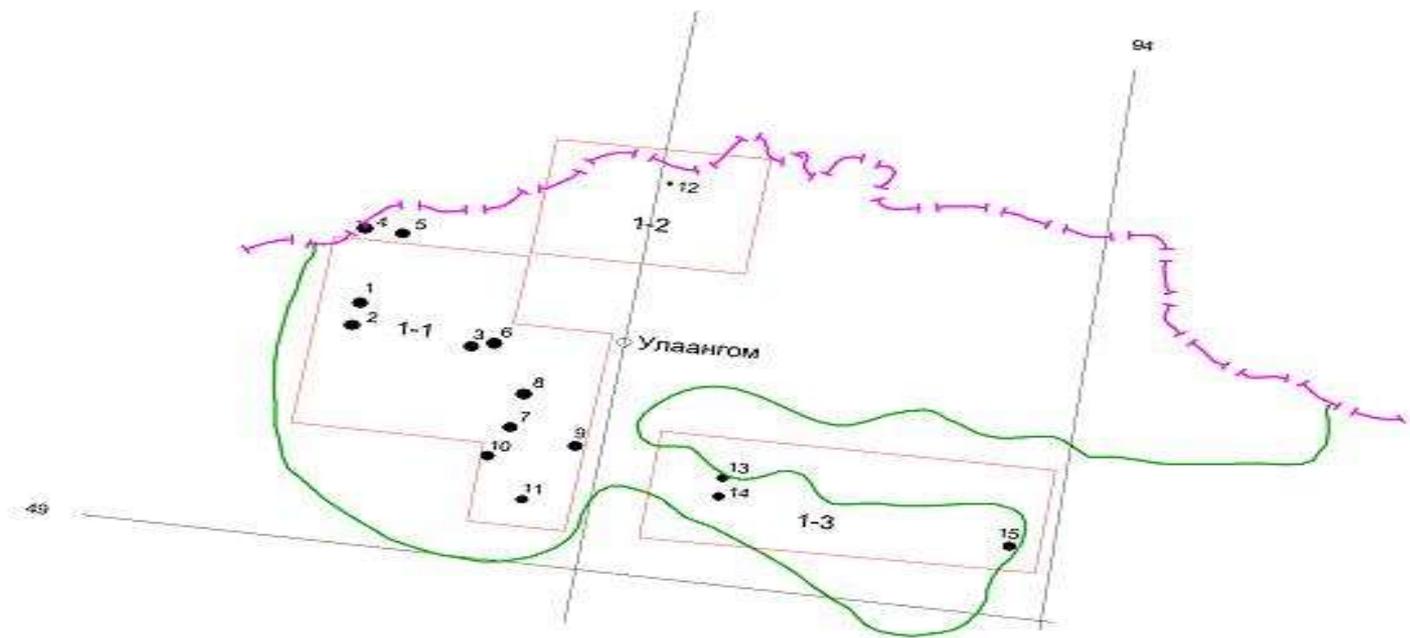
Нүүрс хуримтлалын хархираагийн сав газар

масштаб 1:2,500000

Таних тэмдэг



1. Монгол улсын хил
2. Нүүрс хуримтлалын их мужийн хил
3. Нүүрс хуримтлалын сав газрын хил
4. Нүүрс хуримтлалын талбайн хил



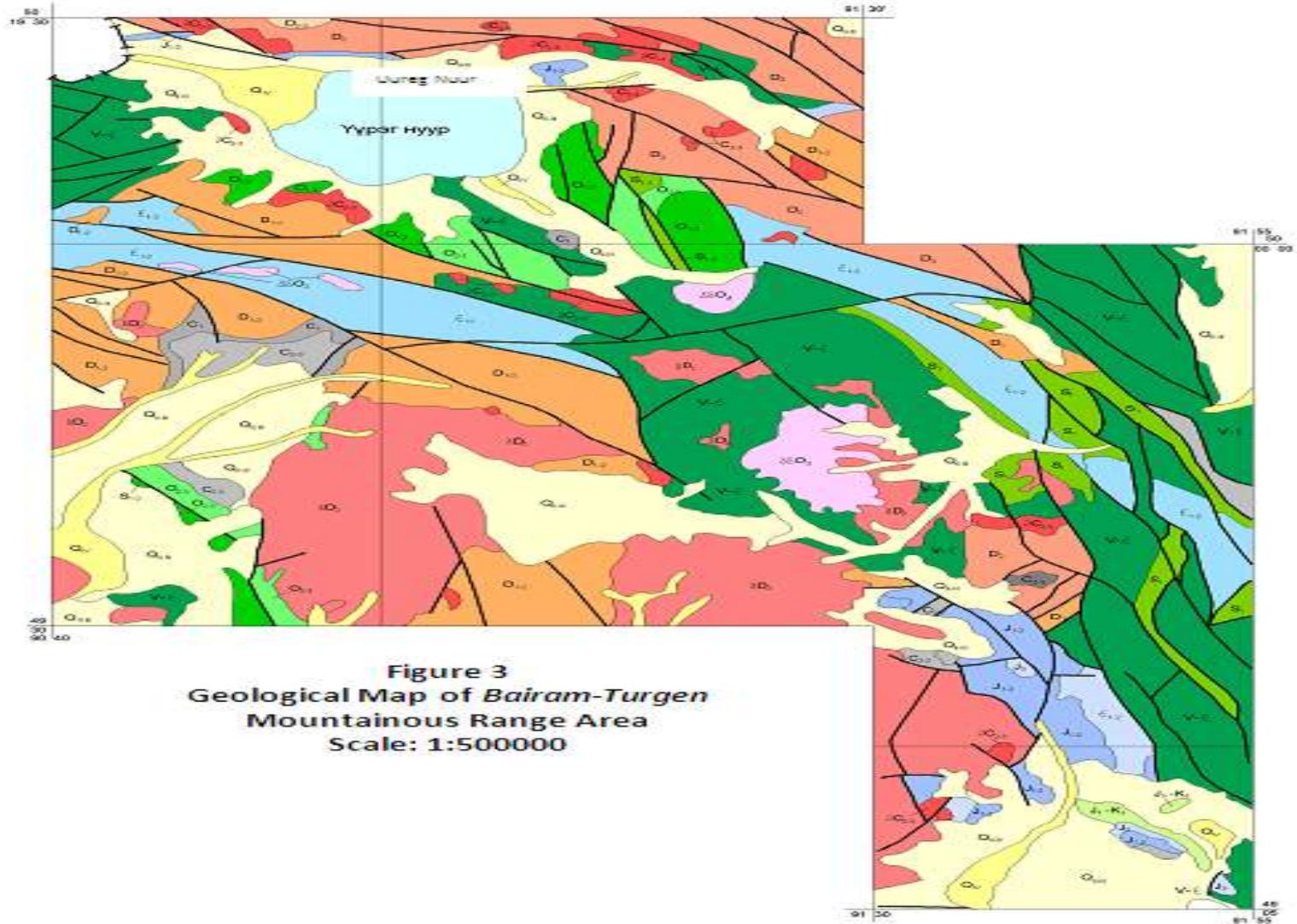
Зураг 2

1. Хархираагийн сав газрын нүүрсжилт бүхий хурдасны тархалтын райончлолын схем

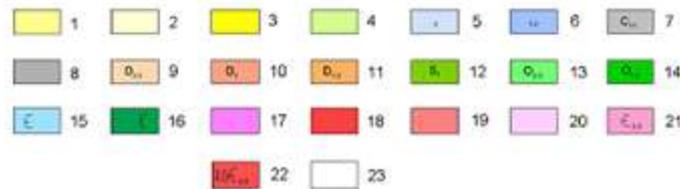
- 1-1. Байрим-Түргэний район
- 1-2. Тэрмис уул-Хүдэнгийн район
- 1-3. Хяргас нуурын район

Coal Deposits and Occurrences

- 1. *Nuurst Khotgor*
- 2. *Indert*
- 3. *Khetiin Khutul*
- 4. *Khargiin Gol*
- 5. *Bayanmat*
- 6. *Ijigen Gol*
- 7. *Khartarvagatai*
- 8. *Myangan*
- 9. *Burgastain Gol*
- 10. *Khargait*
- 11. *Yavar*
- 12. *Khuden*
- 13. *Maikhan Uul*
- 14. *Occurrences 1-3*
- 15. *Baitsatyn Gol*



Legends to the Geological



- 1 Contemporary alluvial and proluvial deposit
- 2 Contemporary unsorted alluvial, proluvial, lacustrine, and river deposit
- 3 Lower Pliocene, *Altanteel* formation, sand, aleurolite, clay, and marl
- 4 The Upper Jurassic-Lower Cretaceous. *Gurvan Ereen* formation, argillaceous schist, sandstone, gravellite, and conglomerate
- 5 The Upper Jurassic. *Ikhes nuur* formation, conglobreccia, gravellite, sandstone, aleurolite, clay, and coal
- 6 The Lower-Middle Jurassic. *Jargalant* formation. Conglomerate, sandstone, aleurolite, argillite, and coal
- 7 The Middle-Upper Carbon. *Uliastai* formation. Conglomerate gravellite, coalstratal sandstone, and gravellite sandstone
- 8 The Lower Carbon. *Shanaga bulag* formation. Sandstone, aleurolite, limestone, conglomerate, and coal
- 9 The Middle-Upper Devonian. *Khatuu gol* formation. Argillaceous schist, sandstone, and aleurolite
- 10 The Middle Devonian. *Aduunchuluun* formation. Conglomerate, sandstone, and aleurolite
- 11 The Lower-Middle Devonian. *Yamaat gol* formation. Sandstone, aleurolite, argillaceous schist, and limestone
- 12 The Lower Silurian. Unsorted sediment. Sandstone, conglomerate, gravellite, aleurolite, and limestone
- 13 The Middle-Upper Ordovician. Unsorted sediment. Sandstone, aleurolite, siliceous tuffite, limestone, middle to basic tuffite
- 14 The Lower-Middle Ordovician. Unsorted sediment. Andesitebasalt, andesite, rhyolite, their tuffs, tuffconglomerate, tuff sandstone, gravellite, siliceous tuffite, and aleurolite
- 15 The Lower-Middle Cambrian. Unsorted sediment. Tuffite and grey wacky sandstone, andesite, andesite-basalt, their tuffs, siliceous schist, tuff gravellite, and aleurolite
- 16 The Vendian- Lower Cambrian. *Jivert Gol* formation. Metasandstone, gravellite, aleurolite, fillite, chlorite-sericite, carboniferous and siliceous schist, jaspoid quartzite, limestone, basic and alkaline meta-effusive
- 17 The Upper Riff. Granite-biotite, biotite, biotite-amphibolite, carboniferous and sericite schist, meta-sandstone, meta gravellite, and meta conglomerate.
- 18 The Middle-Upper Carbon. Gabbro, gabbro diabase, gabbrodiorite, and diorite intrusive complex.
- 19 The Upper Devonian. *Kharkhiraagiin* granite, and leucogranite intrusive complex
- 20 The Middle Ordovician. Granodiorite, granite, diorite intrusive complex
- 21 The Middle-Upper Cambrian. *Togtokhyn Shil*. Gabbrodiorite, granite-diorite, intrusive complex.
- 22 The Middle-Upper Cambrian. Plagiogranite intrusive complex.
- 23 The tectonic fracture

The Coal Quality

The coals are black, with pleated structure, coal surfaces range from bright to semi-bright to dull. Table below shows indicators of coal quality

Sampling wells and trenches	Sample Number	Indicators				
		W ^a	V ^r	γ ^e	Q _г ^б	S ^e _{общ}
1	2	3	4	5	6	7
1. Trench No.25	11	7,95	32,95	1,76	6283	0,59
2. Trench No.28	4	7,27	41,00	1,84	5892	0,26
3. Trench No.29	2	7,36	41,45	1,80	5712	0,15
4. Trench No.32	4	7,50	40,25	1,80	5853	0,25
5. Trench No.36	2	8,24	38,83	1,71	6287	0,33
6. Trench No.30	2	8,06	41,17	1,76	6036	0,28
7. Trench No.31	2	7,53	34,13	1,79	5193	0,20
8. Trench No.40	4	7,96	35,50	1,75	6132	0,30
9. Trench No.41	3	7,38	39,82	1,70	6365	0,20
10. Trench No.42	2	8,37	36,14	1,78	5599	0,36
11. Trench No.43	2	9,53	36,81	1,75	5634	0,43
12. Trench No.44	2	8,14	35,50	1,73	5321	0,25

The Nuurstkhotgor coal deposit

The Economics and Geographic Location of the Deposit

The Nuurstkhotgor coal deposit is located in 70 kilometers northeast of Bukhmurun Soum Center of Uvs Aimag, 180 kilometers west of Ulaangom town, and 140 kilometers northeast of Ulgii town. The geographic coordinates of this locality are $90^{\circ}54'00''$ degrees of eastern longitude and $49^{\circ}50'00''$ degrees of northern latitude. It is at the northern shore of Aчит Nuur Lake depression, and the front foot of Bairam and Khalchig Mountains at elevations of 2050-2100 meters above sea level.

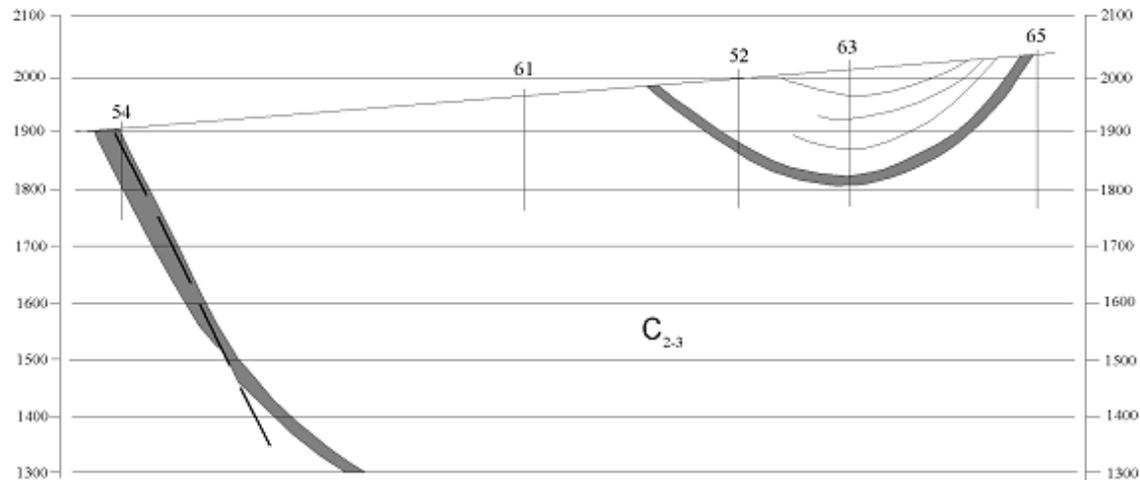


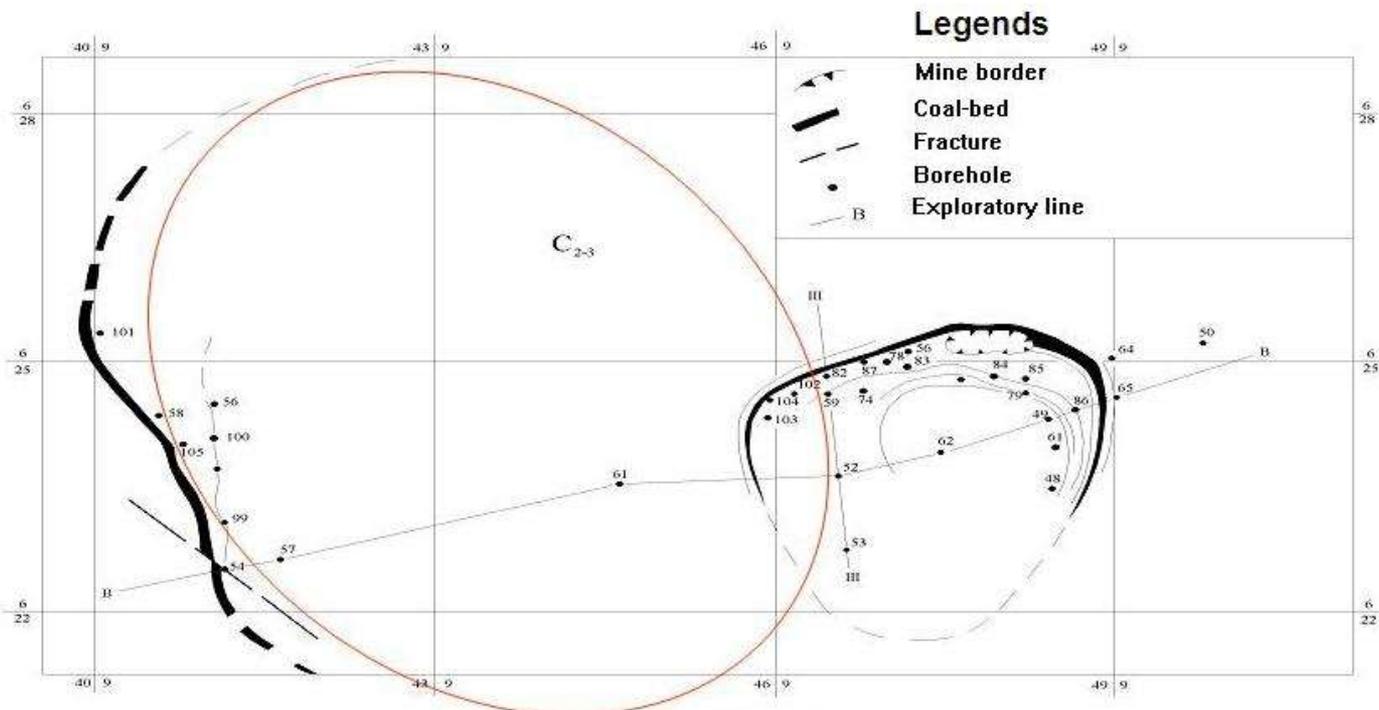
Figure 5

Geological Profile along with B-B line

Legends:

-  Coal horizons and level
-  54 Prospecting borehole, and its number
-  61 Borehole at profile, and its number
-  B Prospecting line
-  B Tectonic fracture

Nuurst Khotgors Occurrence

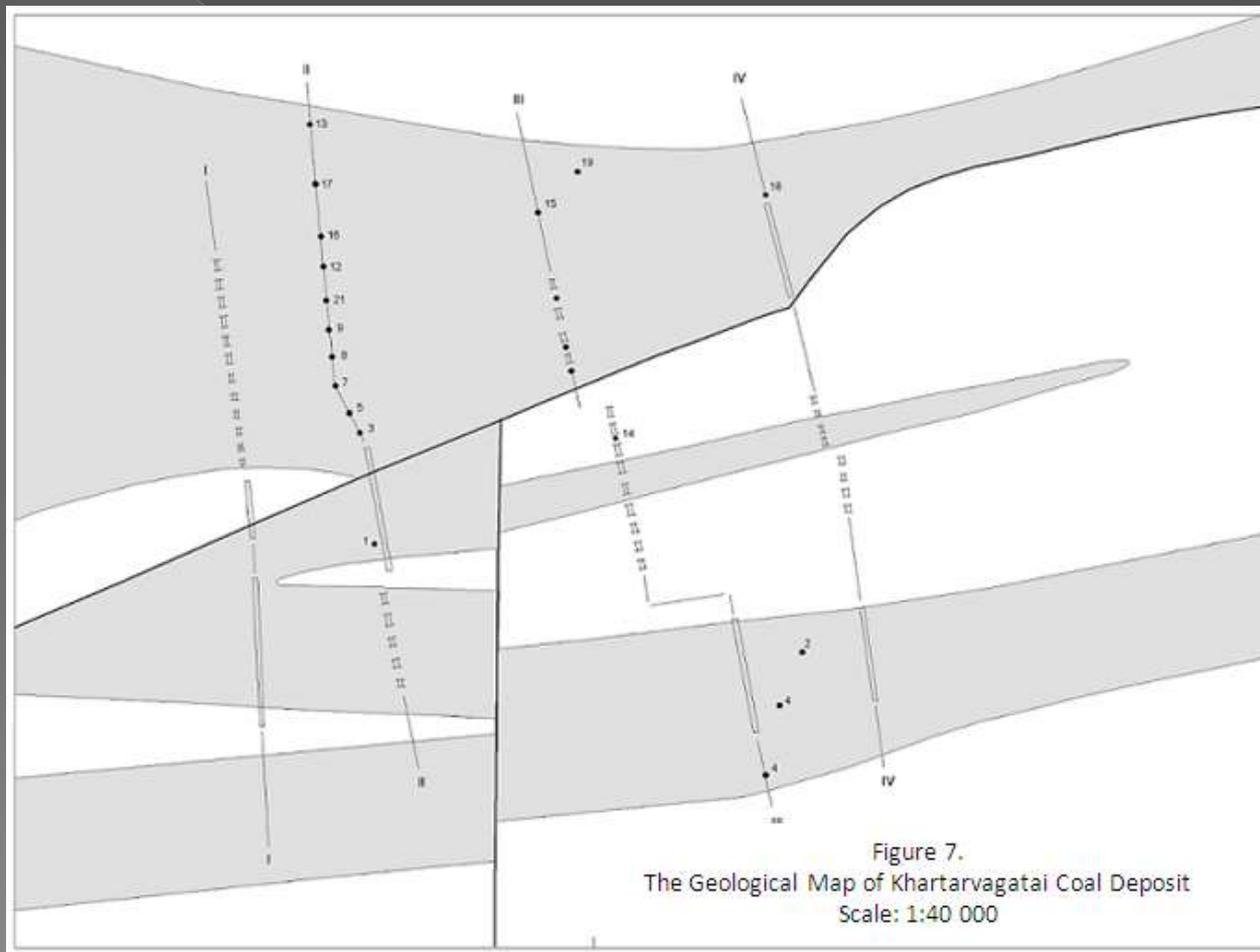


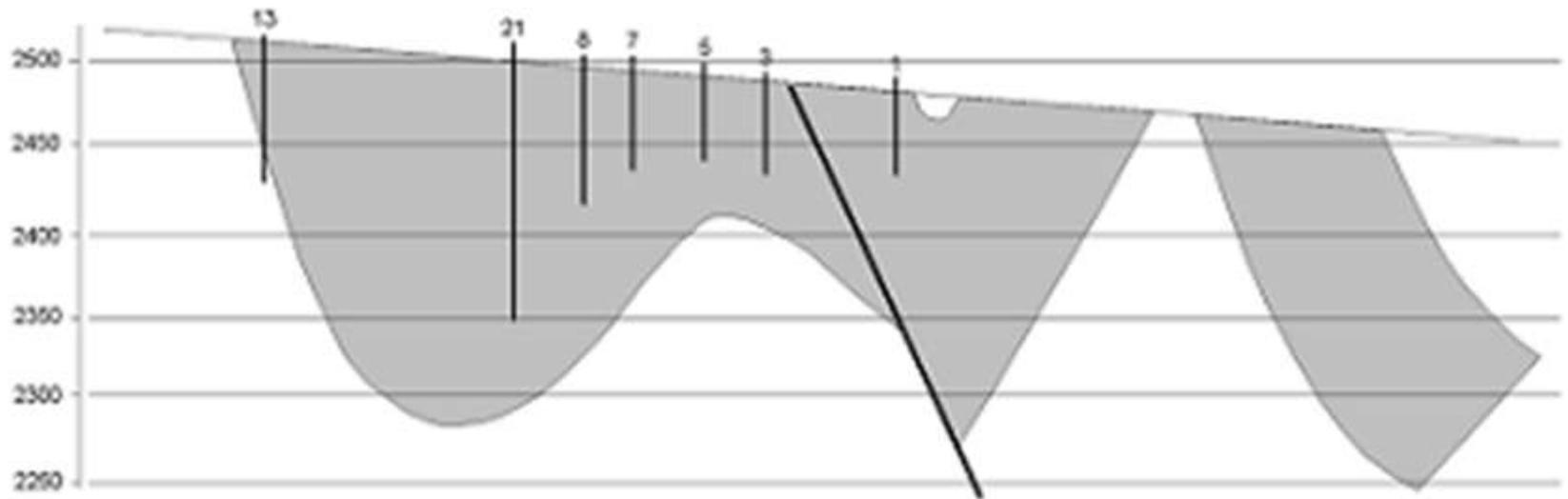
Picture - 4

Map Scale 1:26250

Khartarvagatai Coal Deposit

The Geological Structure





II-III Cross cut of anaseismic

-  Coal Horizons
-  Tectonic fracture
-  Channel or trench
-  Bore pit
-  Borehole, its number
-  Exploratory line

Conclusion on Coalification in Kharkhira Basin

- The geology of Kharkhira coal basin has a complex structure. There is a distribution of sediments from the oldest Cambrian to the Contemporary Period, and amongst there are the carbonaceous sediments from the Middle-Upper Carbon and the Lower-Middle, and Upper Jurassic Periods.
- The sediments of the Middle-Upper Carbon, Lower-Middle, and Upper Jurassic Periods are located within the folding system of *Tsagaan Shiveet* and *Mongol Altai* Structural Formation Zone that stretches from 20 kms to 60 kms in its length. They were dissected through by a tectonic fracture that passes from the southeast towards the northwest and had been separated from each other. The latter process led to the creation of separately positioned lenticular blocs.
- In contrast, the *Termis-Khudengiin* Region has been created in geologically more calm structural zone of Tuva and it makes to differ it from the other.

○

- Sediments of the Middle-Upper Carbon are observed at *Bairam, Turgen Mountain Areas* and also at around of *Khudengiin Khuduu* but sediments of the Jurassic Period are observed at the depressions of both *Khyargas Nuur Lake* and *Uureg Nuur Lake* and on the northern bounds of *Uureg Nuur Lake* areas.
- There is a high probability of its creation at the superimposed basin if it is based on the characters of distribution of the Middle-Upper Carbon period area with coalification, its thickness, composition of facies, coalification characteristics, and its quality. The *Uliastai* Formation of the Middle-Upper Carbon Period is characterized by partings or branching of coalification and non-coalification series, and predominance of thin coal layers. In addition, number of coal horizons are few, and their thicknesses are not great, and coals with complex structure are distributed over the limited area and they are generally marked as Type D and G.
- The lenticular, dissected from each other, blocs, are usually have smaller area which are attributable to abyssal and hypabyssal tectonic fracture as result of intensive folding processes taking place at this region.

THANK YOU FOR ATTENTION