

**AUCTION 26.05.23**

# Kuybyshevskoye deposits in Turkestan region

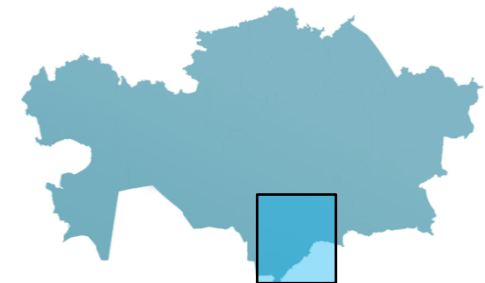


**Location:** Kuybyshevskoye quartzite deposit is located in the Tulkubas district of South Kazakhstan region, 7 km northeast of the village Turar Ryskulov.

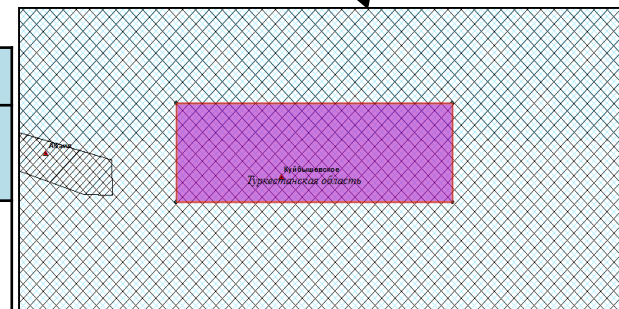
Brief geological description: The deposit is confined to the siliceous bundle of the Kokbulak formation, one of the layers of which, at a thickness of 35-45 m, can be traced to 840 m, the fall of the layer to the north at angles of 38-45°. The useful thickness has been explored to a depth of 40-50 m. The chemical composition of quartzites is aged, average contents (%): SiO<sub>2</sub> – 86.98; Fe<sub>2</sub>O<sub>3</sub> – 4.21; Al<sub>2</sub>O<sub>3</sub> – 4.21; TiO<sub>2</sub> – 0.92; CaO – 0.17; MgO – 0.42. The bulk mass of quartzites is 2.3 t/m<sup>3</sup>, the loosening coefficient is 1.5. The volume mass of limestones was 2.65 t/m<sup>3</sup>, the loosening coefficient was 1.5. In the laboratory of silicon and powder materials at the South Kazakhstan University, the "Technological regulations for the production of crystal and glass" were developed by order of Glass K LLP. Experimental melting of glassmaking in an inductive furnace with a graphite crucible was carried out from the quartzites of the Kuybyshevskoye deposit and raw materials suitable for the production of brand glasses were obtained C-070-2, Б-100-1, Б-100-2, ПБ-150-1, ПБ-150-2 и ПС-250.

Quartzites contain silica in an amount of at least 80-85%, enrichment is carried out by hydrometallurgical leaching of impurities to a silica concentration of 99.5-99.9%.

The process of thermal reduction of silicon is carried out in an electric arc furnace, while the following charge composition is consumed for 1 ton of Kr3 grade silicon: quartzite (concentrate) - 2580 kg, charcoal – 370 kg, low-ash coal - 560 kg, petrocoke - 370 kg, wood chips (birch) – 1320 kg. The specific power consumption is 13 MWh/ton of silicon. Mining and geological conditions and mining technical features of the field development are favorable for open-pit mining. The explored depth of the useful thickness in the inventory counting circuit reaches 50 m. There are no layers of empty rocks inside the useful thickness, there is no overburden.



**Kuybyshevskoye**  
the territory for the extraction of solid minerals for obtaining the right of subsurface use, which is included in the management program of the state subsoil fund



## Extract from the state inventory accounting as of 01.01.2022

Landmine	Balance reserves
Kuybyshevskoye	A+B+C1 – 476,0 thousand.t.

# Narkyzyl deposits in Dzhambyl region

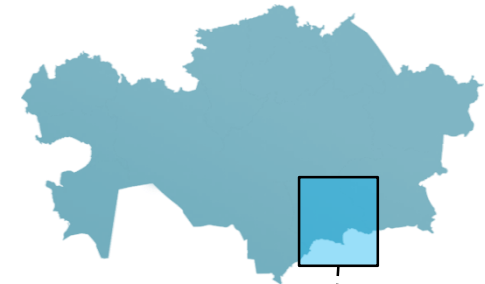


**Location:** Narkyzyl is located in Krasnogor district, Dzhambyl region.

**Brief geological description:** The deposit is confined to the Zhaysan syncline. It was discovered in 1987 by V.E. Sinitsyn and R.M. Gutermacher. Disjunctive disturbances are north-western; the largest fault is the North-Kendyktas. Barite mineralization is confined to the carbonaceous-siliceous-carbonate layered formation of the Khasan formation of the Lower Cambrian, rhythmically overlapping flyschoid sediments. The thickness of the layers is from centimeters to the first meters. Barite mineralization is contained in three ore zones located at different local stratolevels and traced for 20 km in length and 5 km in width. The main component of the ore is barium, presented in the form of sulfate, the next most common are carbonates (calcite and dolomite), quartz.

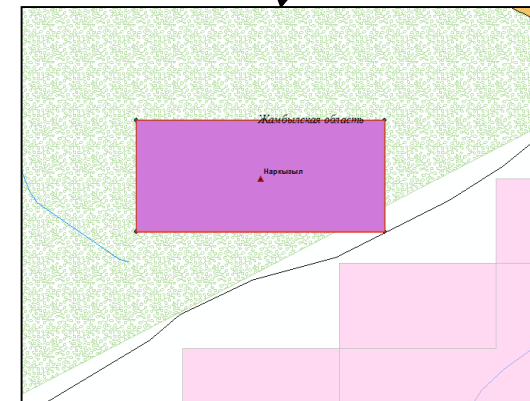
Chemical composition of barite ores, %:  $\text{SiO}_2$  – 2,0-12,0 (1,6);  $\text{Fe}_2\text{O}_3$  – 0,3-0,8(0,5);  $\text{CaO}$  – 8-29,0(17,0);  $\text{Al}_2\text{O}_3$  – 0.1-0,9;  $\text{TiO}_2$  – 0,0255-0,08;  $\text{Na}_2\text{O} + \text{K}_2\text{O}$  – 0,06-0,13; п.п.п. – 0,1-0,2 (0,15). Impurity elements in barites, %: Cu, Pb, Zn – 0.0007-0,1; S – 9,8-13, Mn, Cr, V, Ni – 0,01-0,0003; Mo, Zr – 0,003-0,0005.

Average barite content 68.83 %, in industrial ores – 69,4 %.



**Narkyzyl**  
the territory for the extraction of solid minerals for obtaining the right of subsurface use, which is included in the management program of the state subsoil fund

Extract from the state inventory accounting as of 01.01.2022			
Landmine (field)	Balance reserves, thousand tons		Off-balance reserves, thousand t
	A+B+C1	C2	
Narkyzyl	18,19	32,5	



# Priozernoye deposits, Kariernyi district in Kostanay region



**Location:** The site of the deposit is located in the Auleskolsky district of Kostanay region, 140 km south-east of Kostanay.

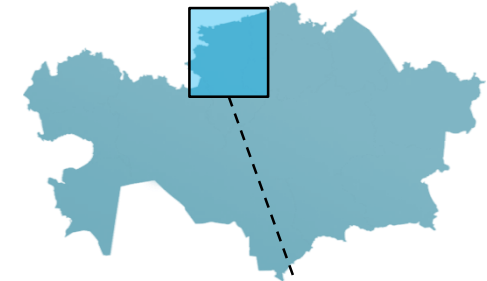
**Brief geological description:** Terrigenous deposits of the Lower Jurassic age, represented by conglomerates, gravelites, sandstones, siltstones, interlayers and layers of brown coal, take part in the geological structure of the deposit. They form a gentle (angles of incidence 5-10%) brachysyncline complicated by a series of tectonic disturbances of the discharge type.

The coals of the deposit are mainly humus, low-sulfur (1.3%) grade 2B. Their ash content is 2%, volatile yield is 49%, the highest calorific value is 6.6 tons kcal/kg, the lowest is 2.9 thousand kcal/kg of working fuel. They can be used as energy and household fuel.

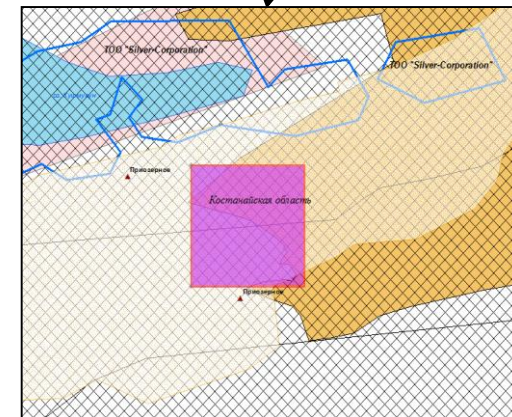
Mining and geological conditions are favorable for open-pit mining of the western part of the deposit. Coal seams are distributed unevenly in the section of the formation. In its lower part there are five coal seams, in which 95% of the reserves of the deposit are concentrated.

The strata have, in general, a simple structure, their average thickness ranges from several meters (Intermediate strata No. 1, 2, 3) to 18-22 m (V.M and N.M strata). the latter are the main working layers in which 48% and 40% of the field's reserves are concentrated, respectively.

The length of the deposit is 12 km, the width is up to 3.5 km. The relief is very difficult, since the deposit occupies the eastern edge of Lake Kushmurun (a strip 500-800 m wide), the steep slope of its indigenous shore with a height of 78.5 m and a small section of the watershed plateau adjacent to it. The deposit was studied at the stage of detailed exploration in 1950-1953 .



**Priozernoye, Kariernyi district** the territory for the extraction of solid minerals for obtaining the right of subsurface use , which is included in the management program of the state subsoil fund



## Extract from the state inventory accounting as of 01.01.2022

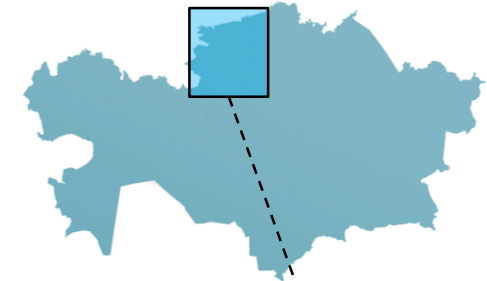
Landmine	Balance reserves
Priozernoye	A+B+C1 – 341922 thousand.t.

# Zhanyspay deposits in Kostanay region

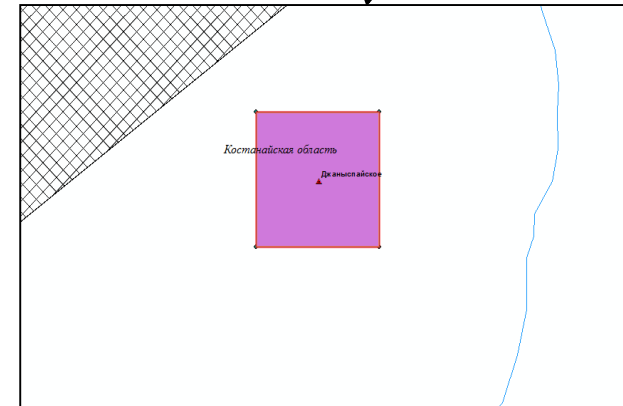


**Location:** Kostanay region.

**Brief geological description :** The Janispay deposit is confined to the depression of the same name of the north-eastern strike with a length of 80 km and a width of 25 km. The depression was identified by the Turgai geophysical expedition in 1947-1948, located in the Oktyabrsky district of Kostanay region. The central part of it is crossed by the Akmola-Magnitogorsk railway line. The Kushmurun and Duzbai formations are coal-bearing. In the context of the first, nine coal seams were identified, of which two layers are of major industrial importance: Powerful 1 (0.7-29 m) and Powerful 2 (0.7-15). The structure of the layers is simple. In the direction of the board, the depressions split and wedge out. In the Duzbai formation, 26 layers of coal from 0.5 to 7 m were found, lying at depths from 110 to 570 m. The distance between the layers does not exceed 10-15m. Brown, humus, fusenized coals, ash content 18%, working humidity 32%. Low-sulfur coals (0.7%). The heat of combustion of the combustible mass is 6.5 thousand kcal/kg. The total reserves of the field are estimated at 28.5 billion tons, including 16.5 billion tons up to a depth of 300 m.



**Zhanyspay** the territory for the extraction of solid minerals for obtaining the right of subsurface use, which is included in the management program of the state subsoil fund



**Extract from the state inventory accounting as of 01.01.2022**

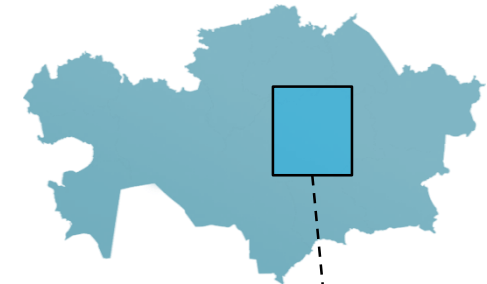
Useful component	Balance reserves	
	coal	A+B+C1 – 353739,0 thousand.t.

# Kenespay deposits in Karaganda region



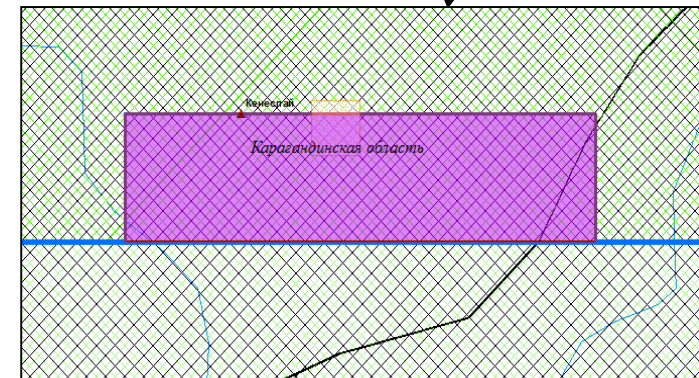
**Location:** is located 80 km southwest of the city of Karaganda.

**Brief geological description:** The Tekturma ridge is a chain of low mountains or grids stretched in the latitudinal direction south of Karaganda for 300 km, from the Aktau mountains in the west almost to the city of Karkalinsk in the east. Ultrabasic and basic rocks of the Tekturmas complex are mainly represented by merpentinites, among which small bodies of gabbro and gabbro-diabases are developed. Massifs of ultrabasic Kenespai rocks are located in the central part of the serpentine belt. The rocks of the Paleozoic basement, the products of their weathering and loose Cenozoic sediments lying on them take part in the geological structure of the area. Mineralization is confined to the Mesozoic weathering crust, which underwent chemical transformation at the beginning, and subsequently erosion. Erosive remnants of the transformed weathering crust have been preserved, mainly along the coils and, less often, along the gabbro. The weathering crust covering the serpentine massifs is similar to the Khalilov type of weathering crust of the southern Urals in zoning – a sequential alternation of lithological varieties of weathering products.



**Kenespay** the territory for the extraction of solid minerals for obtaining the right of subsurface use, which is included in the management program of the state subsoil fund

Extract from the state inventory accounting as of 01.01.2022		
Useful component	Balance reserves	
	gold	A+B+C1 – 145,3 kg



# Bogembay deposits in Aqmola region

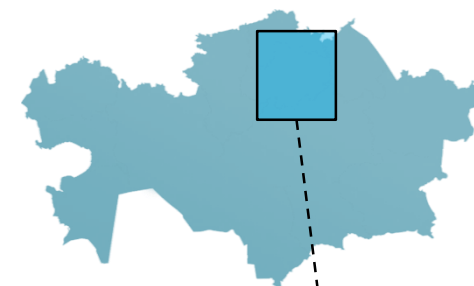


**Location:** The Bogembay deposit is located in the Alekseevsky district of Aqmola region, 150 km northeast of Astana.

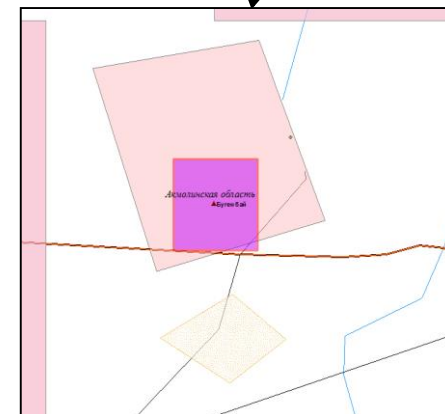
In orographic terms, the deposit area is a hilly plain with absolute elevations of 300-400m, dissected by the valley of the Aksu River.

**Brief geological description :** The geological structure of the deposit involves terigenno-sedimentary deposits of lower carbon age (gray-colored sandstones, siltstones, mudstones, coal beds), composing a relatively small, synclinal structure (4x11km), divided by tectonic disturbance into two mulds (Northern and Southern) (Fig. 12.1).

According to their position in the section, lithological composition, fauna, and the nature of coal bearing, these deposits, by analogy with the Karaganda basin, are divided into three formations. Industrial coal bearing is associated with the Karaganda suite, at the base of the section of which one complex coal seam with a capacity of 1-5m is installed. The formation consists of two interlayers, of which the lower one is of practical importance, with a capacity of 2.5 m. The thickness of the upper layer sometimes increases from 0.6 m to 2m, but usually it is wedged or replaced by carbonaceous mudstones. The maximum depth of the coal seam is 400m. Coal deposits are stone, humus, high-ash and very difficult to enrich. The ash content of the coal mass is 35-45%, the sulfur content is 1.0–1.5%, phosphorus is 0.01–0.02%, the heat of combustion per combustible mass is 8000-8500 kcal/kg, the lowest working fuel is 4500-5500 kcal/ kg, the volatile yield is 20-22%. The coals are slightly sintered, the thickness of the plastic layer is 8-12 mm. They belong to the OS brand and are suitable only as an energy fuel.



**Bogembay** the territory for the extraction of solid minerals for obtaining the right of subsurface use, which is included in the management program of the state subsoil fund



Extract from the state inventory accounting as of 01.01.2022			
Landmine(field)	Balance reserves, thousand tons		Off-balance reserves, thousand tons
	A+B+C1	C2	
Bogembay	161883,4	94703,6	

# Zhedeusu deposits in Eastern-Kazakhstan Region

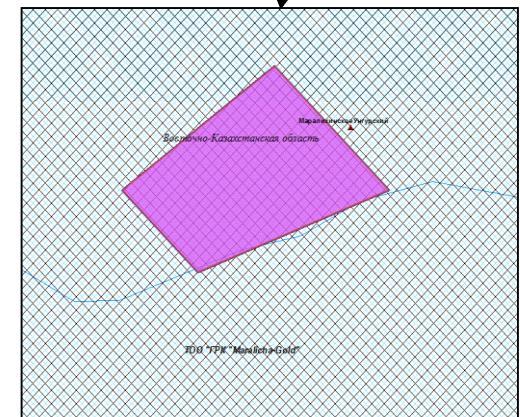


**Location:** It is located in the East Kazakhstan region, 60 km northeast of the village. Kurchum.

**Brief geological description:** The area of the Zhedeusu deposit is located in the southeastern closure of the Irtysh structural-metallogenic zone, where the Kurchum-Kaldzhirsky ridge-anticlinorium stands out. The main role in the placement of the gold mineralization of the area belongs to the processes of magmatism, the manifestations of which are associated with the zones of deep and feathering faults. The Maralikha gold ore node is one of the main sources of formation of valley placers of the Kurchum, Maralikha rivers, as well as numerous spoon placers. Sedimentary and metamorphic deposits of the Paleozoic, intrusive rocks of Permian and Carboniferous ages, sedimentary deposits of the Cenozoic take part in the geological structure of the area. The Zhedeusu deposit covers the valley of the Kurchum River for 10 km. The valley of the Kurchum River in this segment is developed in Paleozoic rocks, represented by quartz-chlorite-sericite shales on sandstones, siltstone-sandstones. The smooth pattern of the valley is controlled by discontinuous tectonics. The productive horizon is localized in the lower part of the section of boulder-pebble deposits and in the weathered part of the raft. The content of clay material in the productive horizon is 3-5%. The placer in the plan has a ribbon-like (in the lower part of the plot) and a trickle (in the upper part) building. The width of the industrial contour varies from 20 to 120 m. The average gold content in the industrial formation ranges from 0 to 3731 mg/m<sup>3</sup>, averaging 731 mg/m<sup>3</sup> (in the lower section) and 495 mg/m<sup>3</sup> (in the upper section). In general, according to the placer, high gold contents (more than 1 g/m<sup>3</sup>) are confined to the weathered part of the raft. According to the results of furrow testing, 30% of the metal from the productive horizon is concentrated in loose boulder-pebble deposits and 70% is concentrated in the bedrock of the raft.



**Zhedeusu** the territory for the extraction of solid minerals for obtaining the right of subsurface use, which is included in the management program of the state subsoil fund



## Extract from the state inventory accounting as of 01.01.2022

Useful component	Balance reserves
gold	A+B+C1 – 72,04 kg

# Khayruzovskoye deposits (The Outlier 3, The Outlier 2, The Outlier 5) In Eastern-Kazakhstan region



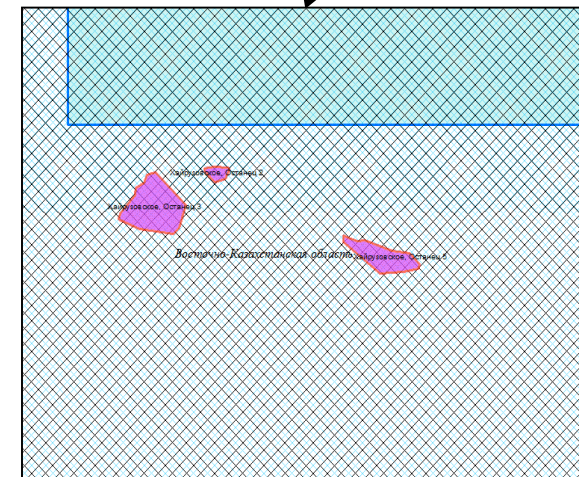
**Location:** located in Eastern-Kazakhstan.

**Brief geological description:** Khayruzovskoye wollastonite deposit. The mineral is composed of epidote-garnet- calcite-wollastonite rocks, localized in the form of outliers measuring 80-320x40-50 m in a granodiorite massif, characterized by variable quality of the mineral. Chemical composition of wollastonite in %: SiO<sub>2</sub> – 49,0; TiO<sub>2</sub> – 0,1; Al<sub>2</sub>O<sub>3</sub> – 2,1; Fe<sub>2</sub>O<sub>3</sub> – 1,1; CaO – 41,1; Mg, 1; K<sub>2</sub>O – 0,3; Na<sub>2</sub>O – 0,2; K<sub>2</sub>O + Na<sub>2</sub>O – 0,5.

Physical properties: bulk weight-2.89 g/cm<sup>3</sup>; water absorption-0.91%; porosity-1.14%; compressive strength-824.0 kg/cm<sup>2</sup>. Mineralogical composition of wollastonite scarn: wollastonite-52%, quartz-9.2%, calcite-17.8%, garnet-3.3%, diopside-6.9%, epidote-2.5%, feldspar-4.3%, sphene-0.2%, others-1.8%. The resulting concentrate (after enrichment) meets the quality requirements of paint, porcelain, electro-ceramic, abrasive and other industries.



**Khayruzovskoye (Outlier 3, Outlier 2, Outlier 5)** the territory for the extraction of solid minerals for obtaining the right of subsurface use, which is included in the management program of the state subsoil fund



## Extract from the state inventory accounting as of 01.01.2022

Useful component	Balance reserves	
wollastonite	A+B+C1 – 983,0 thousand t.	C2-101,0 thousand t.



# Kendyrlykskoye deposits, Karaungur site In Eastern-Kazakhstan region

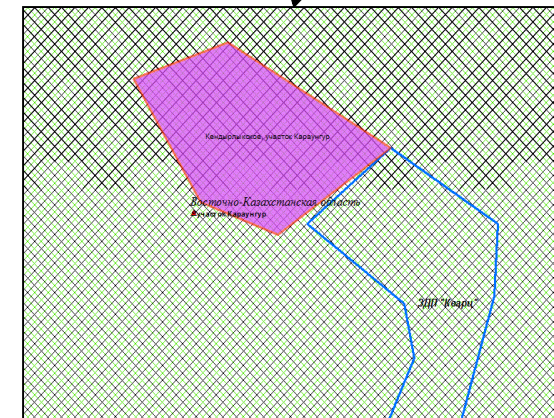
**Location:** The Kenderlykskoye deposit, Karaungur site is the largest complex uranium-coal deposit in Eastern Kazakhstan, the deposit is located in the Zaisan district of the East Kazakhstan region, 50-65 km southeast of Zaisan. The deposit has been known since the last century, has been studied fully and has been used periodically for local needs.

**Brief geological description:** The coals of the deposit are confined to the Middle Upper Carboniferous (Kendyrlyk formation), Upper Permian (Akkolkan formation) and Upper Triassic (Tologai formation) deposits. The Kendyrlyk formation contains one layer of coal, with a capacity of 2.1-2.7 m, and two layers of oil shale. Its coal bearing is established only on the south-western wing of the mulda and can be traced along the stretch for 16 km. From 28 to 51 coal seams have been identified in the Accolkan formation, of which only 10 have a working capacity of 0.6 - 1.6 to 5.1 m, a total of 19 m. All layers have a complex, unstressed structure. The deposits of the Tologai formation fill the central part of the syncline and enclose up to 48 layers of brown coal, of which 16 have a working capacity of 0.6 to 7.2 m. The total capacity of the working layers is 40 m. The coals of the first two formations are humus, stone, high-ash (from 19-30 to 45%), low-sulfur (0.4 - 0.9%), according to the degree of metamorphism they belong to gas and partially to long-flame. The heat of combustion per combustible mass is up to 7.7 thousand kcal / kg; the yield of resin on dry coal is 3.7-10%. The coals of the Tologai formation are brown, leafy matte and dense semi-shiny. Their ash content varies in the range of 10-55% (on average 34%), low-sulfur, the yield of resin with semi-coking is 6-10%. Reserves of coal up to a depth of 1800 m are estimated at 587 million tons, brown - at 1033 million tons (up to a depth of 600 m). 73 million tons of stone and 67 million tons of brown coal are suitable for underground mining. The deep horizons of the Kendyrlyk deposit are considered inactive. The coals of the deposit are important as energy fuel, and the coals of the Kendyrlyk and Tologai formations can be used as raw materials for semi-coking and gasification. Coal reserves are provided by operating enterprises for a period of more than 50 years.



**Kendyrlykskoye,  
Karaungur site**  
the territory for the extraction  
of solid minerals for obtaining  
the right of subsurface use ,  
which is included in the  
management program of the  
state subsoil fund

Extract from the state inventory accounting as of 01.01.2022			
Deposits(site)	Balance reserves		Off-balance reserves, thousand tons
	A+B+C1 –	C2-	
Kendyrlyk(Karaungur)	4927,3	7134,4	2238,1



# Kendrylykskoye deposits, Угольное поле (2-ая угленосная свита)



## в Восточно-Казахстанской области

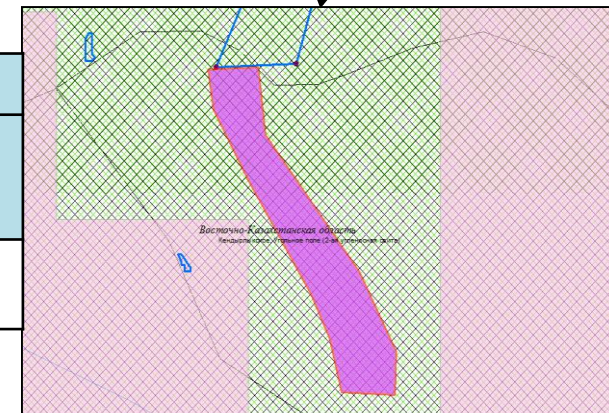
**Location:** The Kenderlykskoye coalfield deposit (2nd coal-bearing formation) is the largest complex uranium-coal deposit in Eastern Kazakhstan, located in the Zaisan district of the East Kazakhstan region, 50-65 km southeast of Zaisan. The deposit has been known since the last century, has been studied fully and has been used periodically for local needs.

**Brief geological description:** The coals of the deposit are confined to the Middle Upper Carboniferous (Kendrylyk formation), Upper Permian (Akkolkan formation) and Upper Triassic (Tologai formation) deposits. The Kendrylyk formation contains one layer of coal, with a capacity of 2.1-2.7 m, and two layers of oil shale. Its coal bearing is established only on the south-western wing of the mulda and can be traced along the stretch for 16 km. From 28 to 51 coal seams have been identified in the Accolkan formation, of which only 10 have a working capacity of 0.6 - 1.6 to 5.1 m, a total of 19 m. All layers have a complex, unstressed structure. The deposits of the Tologai formation fill the central part of the syncline and enclose up to 48 layers of brown coal, of which 16 have a working capacity of 0.6 to 7.2 m. The total capacity of the working layers is 40 m. The coals of the first two formations are humus, stone, high-ash (from 19-30 to 45%), low-sulfur (0.4 - 0.9%), according to the degree of metamorphism they belong to gas and partially to long-flame. The heat of combustion per combustible mass is up to 7.7 thousand kcal / kg; the yield of resin on dry coal is 3.7-10%. The coals of the Tologai formation are brown, leafy matte and dense semi-shiny. Their ash content varies in the range of 10-55% (on average 34%), low-sulfur, the yield of resin with semi-coking is 6-10%. Reserves of coal up to a depth of 1800 m are estimated at 587 million tons, brown - at 1033 million tons (up to a depth of 600 m). 73 million tons of stone and 67 million tons of brown coal are suitable for underground mining. The deep horizons of the Kendrylyk deposit are considered inactive. The coals of the deposit are important as energy fuel, and the coals of the Kendrylyk and Tologai formations can be used as raw materials for semi-coking and gasification. Coal reserves are provided by operating enterprises for a period of more than 50 years.



**Kendrylykskoye, Coal field (2nd coal-bearing formation)**  
the territory for the extraction of solid minerals for obtaining the right of subsurface use, which is included in the management program of the state subsoil fund

Extract from the state inventory accounting as of 01.01.2022			
Deposits(site)	Balance reserves		Off-balance reserves, thousand tons
Kendrylykskoye, Coal field (2nd coal-bearing formation)	A+B+C1 – 10043	C2-0	

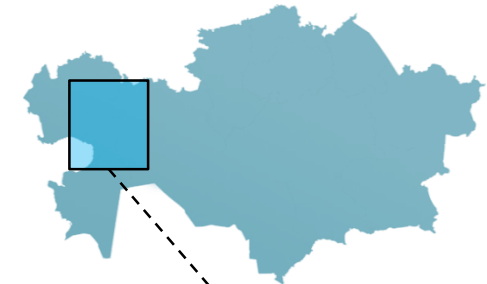


# Deposits 108 in Atyrau region

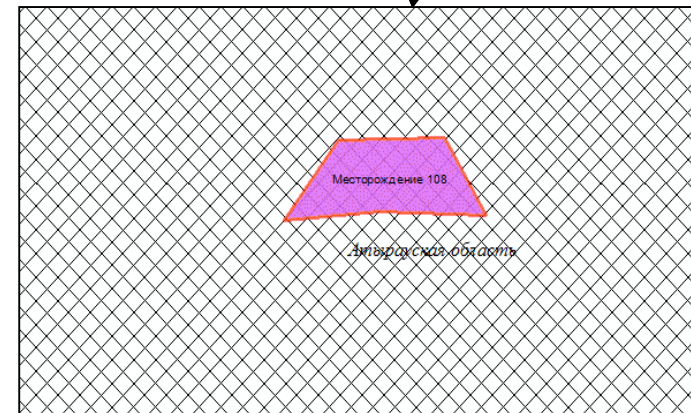


**Location:** The deposit is located in Atyrau region.

**Brief geological description:** Geologically, the deposit is one of the largest salt domes of the Caspian syncline. The core of the dome is composed of chemogenic sediments and brought to the daytime surface, where the arched part of it is crowned with eluvial formations (Khazar and Khvalyn deposits). Ore bodies, in the form of eluvial "blind" lenses of boron-bearing salts, including asharite, ulexite, hydroboracite, etc., are deposited in accordance with the gray gypsum (gypsum hat) containing them. The sizes of ore bodies are in the range of 400- 650 m in length and 75-230 m in width, the depth of occurrence is up to 40 m. Rich ore lenses (up to 15-30%) gradually turn into poor ores (9-12%) and further into boron-bearing clays. ) In 1964-1991, rich ores with a B<sub>2</sub>O<sub>3</sub> content of up to 15-20% were mined. When working off balance reserves of rich ore, off-balance ores were also mined along the way, which were stored in special dumps on the sides of quarries. All ore bodies were formed under identical conditions, so their composition is similar in all deposits. The mineralogical composition of ores is as follows, in %: asharite (14-18, with an average of 14), ulexite (5-8,8, cf.6), invoice (1-4, cf.2), gypsum (60-70, cf.63), anhydrite (3-7, cf.4), clay minerals (2-15, cf.4), calcium (2-7, cf.2), magnesite (1-5, cf.2), other 2. Chemical composition of borate ores in %: B<sub>2</sub>O<sub>3</sub> -7.4, CaO - 28, 80z-36, SO<sub>3</sub>-Z, AOZ-up to 1, GeO-up to 5, SiO<sub>2</sub>-2, GegOz-OD, MgO-up to 6, H<sub>2</sub>O-9%, and others - 2.4.



**Deposits 108**  
the territory for the extraction of solid minerals for obtaining the right of subsurface use, which is included in the management program of the state subsoil fund



## Extract from the state inventory accounting as of 01.01.2022

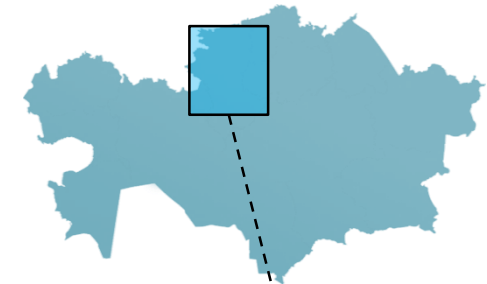
Useful component	Balance reserves
Boron	A+B+C1 – 35,3 thousand t.

# Varvarinskoye deposits (Site 3) in Kostanay region

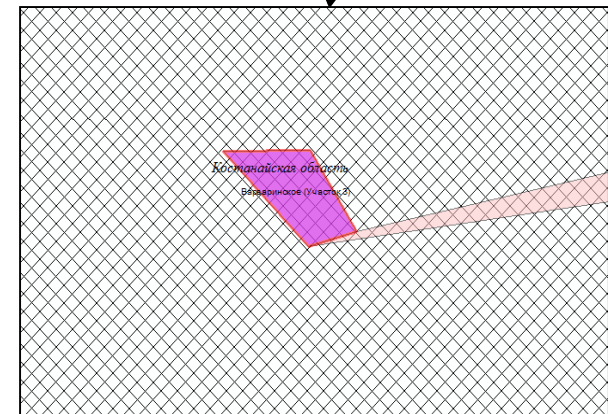


**Location:** The Varvarinskoye field is located in the Taranovsky district of Kostanay region, 97 km west-southwest of Kostanay.

**Brief geological description:** At the base of the section there are limestones of the famen of the eastern wing of the Petrovsky anticline, complicating the Denisov synclinorium. Karst craters in limestone overlain by weathering crust products are filled with bauxite, variegated, kaolinite and lignite clays of Cenomanian-Turonian. Above the section, they are replaced by quartz-hardened sandstones of the Turonian and glauconite-quartz sands of the Eocene (Fig. 20). Six ore sites have been identified, of which eight ore bodies of site 1 are of practical interest. The ore bodies are arranged in a backstage manner and are grouped into three groups: 1-4, 5 and 6-8. The largest 1 and 7 ore bodies, in which up to 65% of bauxite reserves are concentrated. All ore bodies have a lenticular shape, elongated in the north-east direction, the length along the strike is from 100 to 400 m, the thickness is 1.3-43.3 m, the depth of the subhorizontal roof is from 0.5 to 62.7 m. The chemical composition of bauxite: Al<sub>2</sub>O<sub>3</sub> - 37.21%; SiO<sub>2</sub> - 8.4%; Fe<sub>2</sub>O<sub>3</sub> - 32.96%; CaO - 0.10%; flint module - 4.4. The bauxite-bearing thickness of 80-120 m is composed of clay, stony and friable differences of bauxite, overlapping with each other and with bauxite and kaolinite clays. According to the scale of mineralization, the deposit is small.



**Varvarinskoye (Site 3)** the territory for the extraction of solid minerals for obtaining the right of subsurface use, which is included in the management program of the state subsoil fund



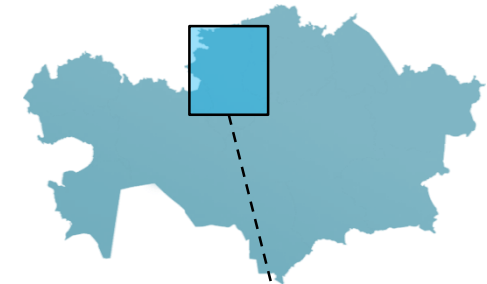
Extract from the state inventory accounting as of 01.01.2022		
Useful component	Balance reserves	
	bauxite	A+B+C1 – 2000,0 thous. t.

# Tobolskoye deposits (II site) in Kostanay region



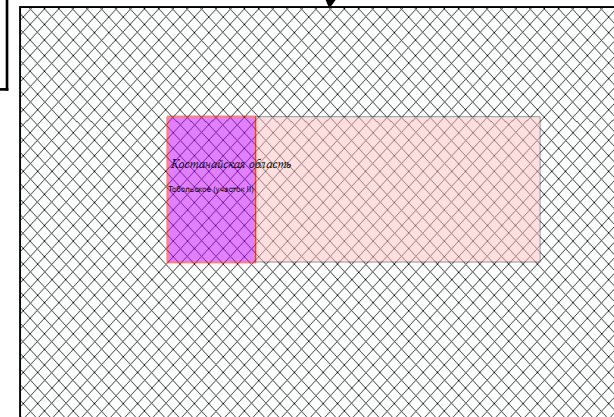
**Location:** The Tobolsk deposit is located 20-25 km south-east of the Denisovka railway station, Kostanay region.

**Brief geological description:** The deposit is represented by 16 deposits (sections): Baikonissskaya Vostochnaya, central and western, Aikon-Sorskaya and Aikon-Sorskaya severnaya, Aksakal-Kopinskaya, Kurzhun-Kopinskaya, Yuzhno-Livanovskaya, No. No. V-X. All of them are genetically related to the continental fine-grained sandy deposits of the Chilikta and Chagraya formations of the Oligocene and the products of their washing. There are three types of placers: primary sands of the upper horizons of the Chilikta formation of the Middle Oligocene, washed sands of the lower horizons of the Chagrai formation of the Upper Oligocene and re-deposited sands of the Neogene-Quaternary age. The size of the deposits ranges from 770 to 7600 m in extent, from 280 to 1500 m in width and from 0.5 to 10 m in power.



**Tobolskoye (II site)** the territory for the extraction of solid minerals for obtaining the right of subsurface use, which is included in the management program of the state subsoil fund

Extract from the state inventory accounting as of 01.01.2022			
Deposits (site)	Balance reserves thous. t.		Off-balance reserves, thousand tons
	A+B+C1	C2-12	
Tobolskoye	A+B+C1 – 407	C2-12	118



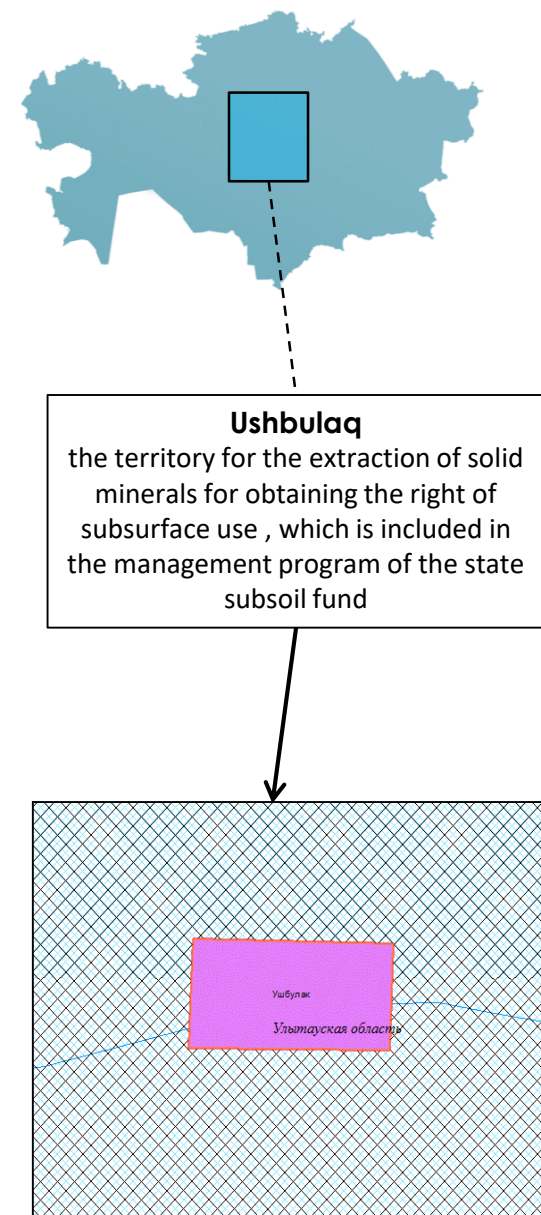
# Ushbulaq deposits in Ulytau region



**Location:** The Geres deposit is located 25 km to the CER from the railway station Akkul, 15 km to the south from the village. Priezernoye and 17 km south of the village . Bogdanovka.

**Brief geological description:** They are confined to a rodusitic variegated thickness of Early Permian age within the Akmola syncline, which is a structural element of the Dzhezkazgan depression.

Rhodusite-asbestos ores of deposits are relatively simple in material and mineral composition. Among them, veined, interspersed and veined-interspersed types of ores are distinguished. The content of rhodusite-asbestos in ores ranges from 300 g/t to 2000 g/t. According to the structural and textural features and a number of physical properties within the deposits, three main varieties of rhodusite are distinguished: rhodusite-asbestos (fibrous rhodusite); loose (microfibre) rhodusite; strong (dense, "crystalline", microfibre, opalized) rhodusite. In terms of chemistry, optical, and X-ray properties, all varieties are identical. According to the chemical composition, rhodusite-asbestos of the Akmola syncline is a magnesium-ferruginous sodium hydrosilicate. Technological tests have established the conformity of the quality of rodusit-asbestos deposits Kumola and Ushbulak (after wet enrichment) TU 21-37-29-83 "Rodusit asbestos" and TU 21-22-14-75 "Asbestos blue".



Extract from the state inventory accounting as of 01.01.2022

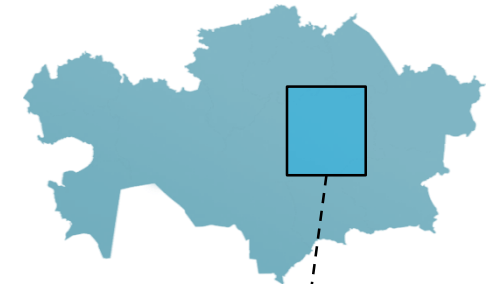
Deposits (site)	Balance reserves thous. t		Off-balance reserves, thousand tons
	A+B+C1 – 6,7	C2 – 2,2	
Ushbulaq	A+B+C1 – 6,7	C2 – 2,2	2,7

# Sulushoqy deposits in Karaganda region



**Location:** The Sulushoqy deposit is located in the Karaganda region, 60 km northwest of the ores. Akchatau.

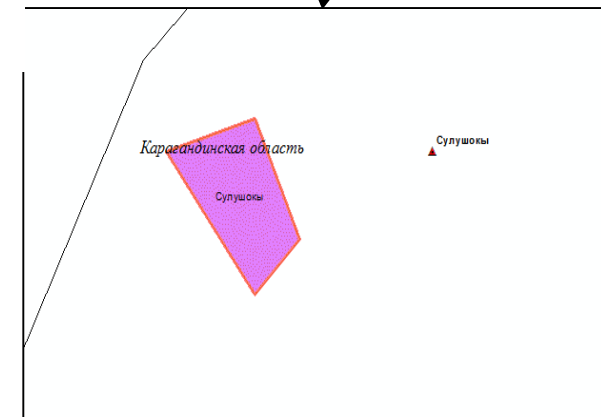
**Brief geological description:** the structure of the deposit involves tuffs and subvolcanites of liparite-dacite composition of carbon, broken through by granites of the Karatal massif, which is associated with the scarring and keratinization of the host rocks. Scarns are bustamite, garnet-bustamite, garnet and wollastonite. Gold-silver mineralization is localized in garnet-bustamite rocks of contact-infiltration type controlled by the sublatitudinal zone of crushing and brecciation of the host rocks (Fig. 33). Ores are low-sulfide (sulfides up to 1%). Ore composition: gold, pyrite, chalcopryrite, silver minerals, chlorargyrite, native silver, manganese minerals, fluorite, quartz, chalcedony, garnet, malachite, iron and manganese hydroxides and other neoplasms. The high concentration of gold (more than 100 g/t) and silver (2.5 kg/t) is confined to the hypergenesis zone and is closely related to manganese minerals. In primary ores, the content of gold is 28 g/t, silver is 1700 g/t; lead (up to 1%), copper (tenths of a percent), manganese (up to 10%), rarely arsenic (0.005%) and molybdenum (0.001%) are present. The deposit is small, the oxidized ores have been worked out by the miners in a quarry.



**Sulushoqy**  
the territory for the extraction of solid minerals for obtaining the right of subsurface use, which is included in the management program of the state subsoil fund

Extract from the state inventory accounting as of 01.01.2022.

Type of mineral	Balance reserves		Off-balance reserves, thousand tons
Gold, kg	A+B+C1 – 84	C2 – 189	-
Silver, t	A+B+C1 – 5,1	C2 – 8	-

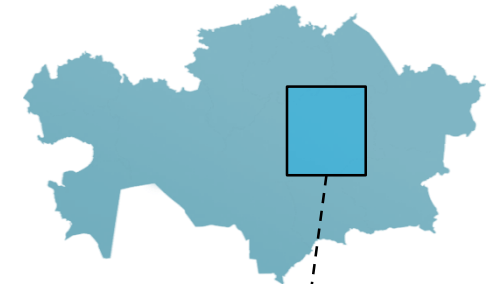


# Bosaga deposits in Karaganda region

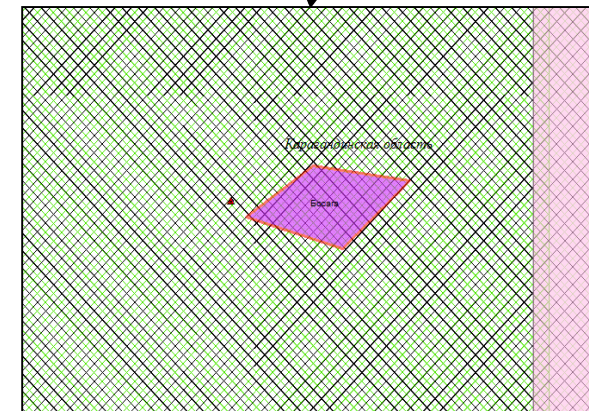


**Location:** Месторождение находится в Агадырском районе Карагандинской области.

**Brief geological description:** It is dated to the southern wing of the Aidarly-Aktau syncline to the exocontact of the intrusion of granodiorites of the Bosaginsky massif of the Upper Ordovician age. The complication is localized in the zone of development of wollastanoite, wollastonite-garnet and garnet skarnoids. Near-ore changes-calcification, calcitization, epidotization, opalization and pyritization. The power of near-ore changes from 3 to 18 m. The ore-containing skarnoid zone completely inherits the lenticular-layered structure of the original siliceous-carbonate rocks, has sharp contacts between newly formed rock varieties. The occurrence is steep along the contact plane of the intrusion, the thickness of the zone is 120 m. Wollastonite is suitable for the manufacture of fine ceramics, as an abrasive and as a molding material. The most rational scheme for the enrichment of wollastonite ore is magnetic—electric, which allows to obtain a concentrate with a wollastonite content of 75-91%, with 69% extraction, and a garnet concentrate with a garnet content of up to 95%.



**Bosaga**  
the territory for the extraction of solid minerals for obtaining the right of subsurface use, which is included in the management program of the state subsoil fund



Extract from the state inventory accounting as of 01.01.2022.			
Deposits(site)	Balance reserves thous. t		Off-balance reserves, thousand tons
Bosaga	A+B+C1 – 5127	C2 – 237	

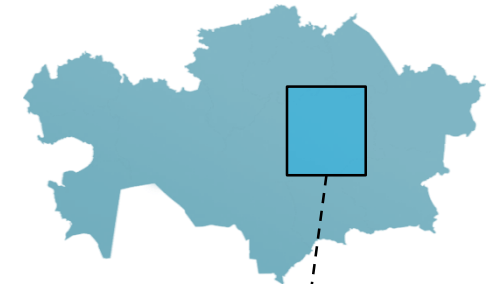
# Syurpriz deposits in Karaganda region



**Location:** The deposit is located in the Shetsky district of the Karaganda region, 60 km east of the village of Nura-Taldy and 25 km northwest of the Alaigyr deposit.

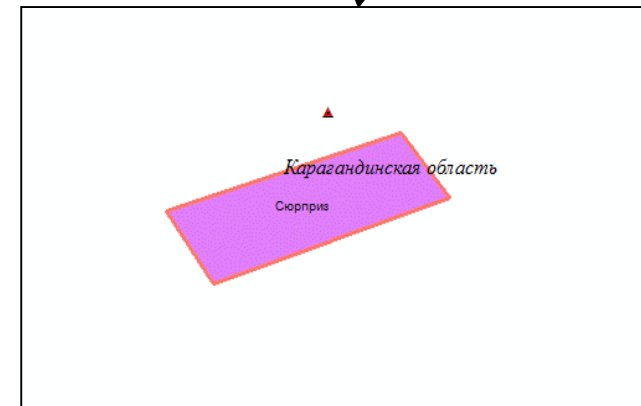
**Brief geological description:** The deposit was discovered in 1981 by A. L. Burmak.

The deposit is located in the Uspenskaya crumple zone and is confined to the horizon of Lower Turneian limestones and siltstones lying in the exocontact of the Late Permian Kuttu-Adam-Irek intrusive granite massif of the Akchatau complex. Near-ore changes are expressed in intensive contact metasomatism (fig. 66). The ore-bearing stratum lies monoclinaly with a drop of 30-500 to the northwest. One formation-like deposit "Surprise" with a stretch to the northeast and east-northeast, falling 30° to the northwest, was identified. Its length is 795 m, width is 15-65 m, power is 11.5-36.5 m. The depth of the roof is from 0 to 150 m. The weathering crust is developed from the surface to a depth of 0-10 m. Mineral composition of the ore mass, %: wollastonite - 35-70; calcite -16.5, there are quartz and single grains of epidote, garnet, pyroxene.



**Syurpriz**  
the territory for the extraction of solid minerals for obtaining the right of subsurface use, which is included in the management program of the state subsoil fund

Extract from the state inventory accounting as of 01.01.2022			
Deposits(site)	Balance reserves thous. t		Off-balance reserves, thousand tons
	A+B+C1	C2	
Syurpriz	755,3	2633,8	-

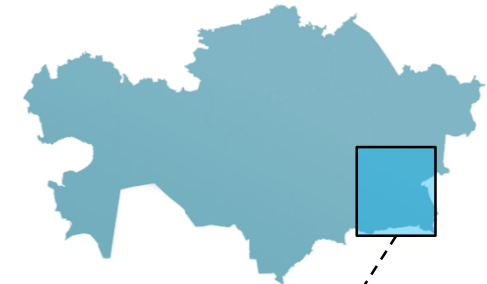


# Tursun-tore deposits in Zhetysu region



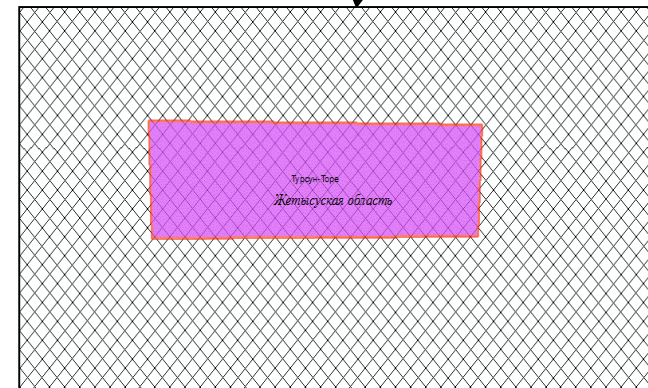
**Location:** The deposit is located in the Almaty region, 150 km from the railway station of Mulaly and 40 km from the paved highway -Alma-Ata-Leninogorsk.

**Brief geological description:** The deposit was discovered in 1966. Ore bodies are localized in tectonic cracks. The deposit is localized in sedimentary-terrigenous sediments of the Silurian-Devonian, intensively shale and crushed. The genesis of the mineralization is plutogenic-hydrothermal, gold-quartz mineral type, poor-sulfide ore formation. The near-ore changes of the host rocks are represented by calcification - 1-2 m, crushing 1-3 m. Near-surface changes of bodies are poorly expressed -single nests and deposits of iron hydroxides, malachite, azurite are noted in the near-surface part. The hydrogeological conditions of the development are simple - the maximum water inflow into the mine workings (underground mining during tunnel opening) does not exceed 20 cubic meters/ hour. Water supply: domestic - a spring with a flow rate of 1-1.5 l/sec, technical - water r.Tastybien is 6 km from the deposit.



**Tursun-tore**  
the territory for the extraction of solid minerals for obtaining the right of subsurface use, which is included in the management program of the state subsoil fund

Extract from the state inventory accounting as of 01.01.2022			
Deposits(site)	Balance reserves, kg		Off-balance reserves
	A+B+C1	C2	
Tursun-tore	342	155	23

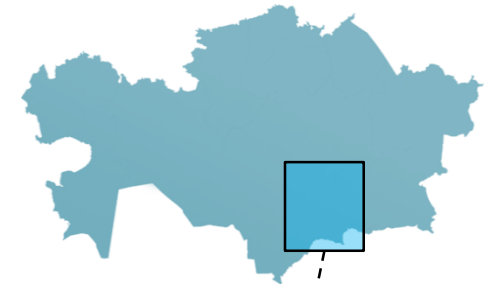


# Tiesay deposits in Dzhambyl region



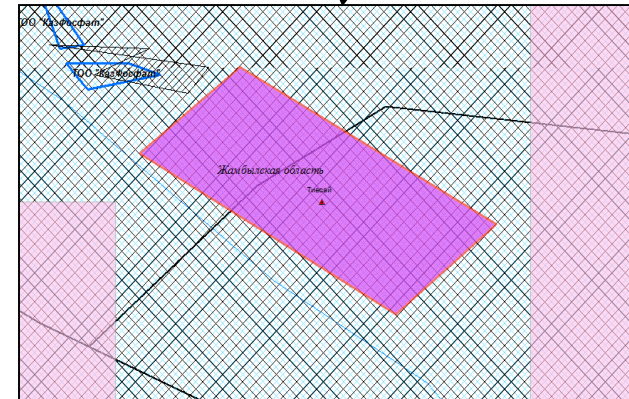
**Location:** The deposit is located in the Sarysu district of Zhambyl region.

**Brief geological description:** The field has a length of up to 6.5 km with a width of up to 700 m. The area of the deposit is 3.2 km<sup>2</sup>. Terrigenous formations of the Karaoi series of the Upper Precambrian and Cambrian carbonate deposits of the Tamdinsky series are developed at the deposit. The phosphorite-bearing deposits of the Chulaktau formation, which lies at the base of the Tamdinsky series, are confined to the stratigraphic contact. The phosphorite horizon at the deposit is represented by one reservoir body. Two phosphorite bundles separated by a layer of phosphate conglomerates with a capacity of up to 7.2 m are isolated in the structure. Phosphate minerals: fluorapatite, calcium phosphate, carbonates. Phosphate substance is a part of oolites, pseudophosphates, phosphate fragments. The deposit is dominated by the siliceous-phosphate type of ores, to a lesser extent – carbonate-siliceous-phosphate.



**Tiesay**  
the territory for the extraction of solid minerals for obtaining the right of subsurface use, which is included in the management program of the state subsoil fund

Extract from the state inventory accounting as of 01.01.2022			
Deposits(site)	Balance reserves, thous.t		Off-balance reserves, thous.t
	A+B+C1	C2	
Tiesay	5472	17895	658

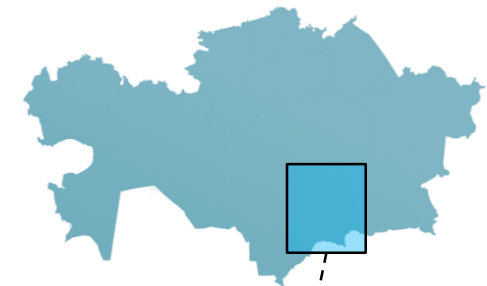


# Kaynazar in Dzhambyl region

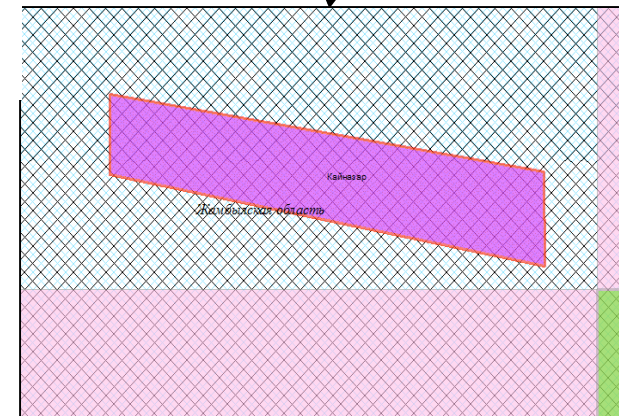


**Location:** The deposit is located northeast of the city of Karatau.

**Brief geological description:** The structure of the monocline involves carboniferous terrigenous-sedimentary deposits with a thickness of 3500 m, including a productive layer of clay limestones and fine-grained marls of Late Visean age. Within the horizon, 25 indigenous deposits and five deluvial ruins of flints with colored chalcedony were identified. The deposits are lenticular, have a west-northwest strike consistent with the strike of the host rocks and a north-northeast fall. Along the strike, the deposits are traced at 10-150 m (on average 50 m) with a width of 2-100 m (on average 25 m) and a thickness of 0.05-1.5 m (on average 0.25 m). The deposits are characterized by sharp contacts with the rocks of the sole and roof, as well as weakly expressed surrounding zones of silicification (1-2 m wide) and chloritization (10-15 cm). From the surface to a depth of 1 m, the deposits are destroyed with the formation of deluvial ruins of chalcedony-containing flints inheriting the strike of the indigenous deposits. The mineral composition of chalcedony-containing flints is represented by chalcedony, quartz and opal. Chalcedony has a cryptocrystalline microspherulite structure (the size of spherulites is thousandths and hundredths of mm); fibrous varieties are less common. Quartz in industrial chalcedony-containing flints is coarse-crystalline (up to 2.5 cm). Opal is rare in the deposit, forms close accretions with chalcedony. The color of technical chalcedony is bluish-gray; flint - gray, black, red. Ornamental chalcedony is characterized by cherry-red, honey color, high (7-7.5) hardness, shell fracture, glass luster, viscosity. Colored chalcedony is suitable for the production of jewelry and handicrafts. The maximum output of products from industrial raw materials is 46%, on average 15%.



**Kaynazar**  
the territory for the extraction of solid minerals for obtaining the right of subsurface use, which is included in the management program of the state subsoil fund



Extract from the state inventory accounting as of 01.01.2022

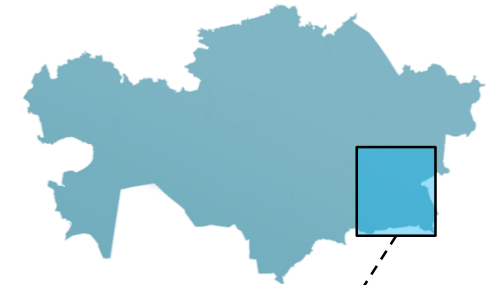
Deposits(site)	Balance reserves, t		Off-balance reserves, t
	A+B+C1	C2	
Kaynazar	14,7	2,7	-

# Tasty-bien deposits in Zhetysu region.

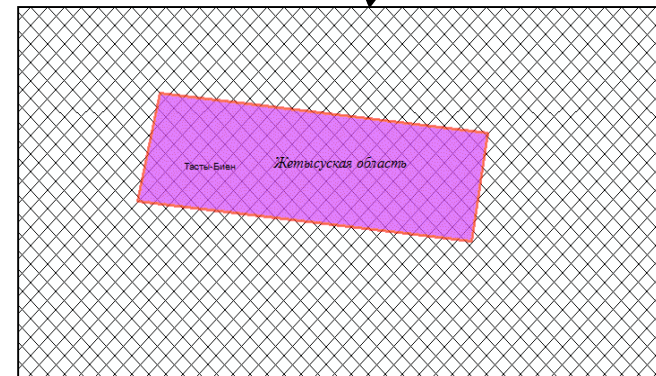


**Location:** It is located in the Kopylsky district of Taldykorgan region, 80 km east of Taldykorgan.

**Brief geological description:** Quartz-vein type deposit. Ore-bearing - sand-shale rocks of the Middle Devonian. The vein zone of the sublatitudinal strike is traced by ditches at 200 m, represented by two quartz veins 70 and 50 m long, 0.7 and 0.8 m thick with a gold content of 41.6 and 33.0 g/t, respectively. In vein 2 at a depth of 20 m, the gold content in the core sample is 13.4 g/t. The veins are branching, of variable power (from 0.02 to 1.3 m) and strike, traced by wells to a depth of 50-60 m. Core composition: quartz (up to 85%), pyrite, chalcopryrite, galena, sphalerite. Gold is free in quartz, up to 2 mm in size, extremely uneven distribution (from 0.5 to 930 g/t). In a gross sample weighing 45 tons, the content was 79 g/t. The deposit is small, undiscovered. The State Balance Sheet of the Republic of Kazakhstan as of 01.01.12 has gold reserves in the category C1-187 kg, C2 -338 kg (31.17 g/t).



**Tasty-bien**  
the territory for the extraction of solid minerals for obtaining the right of subsurface use, which is included in the management program of the state subsoil fund



Extract from the state inventory accounting as of 01.01.2022			
Useful component	Balance reserves		Off-balance reserves
	Gold	A+B+C1 – 187 кг.	

# Belogorskoye deposits in Eastern-Kazakhstan region



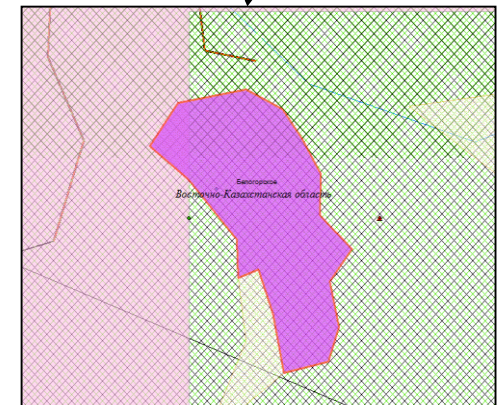
**Location:** it is located in the Ulan district of the East Kazakhstan region

**Brief geological description:** The deposit belongs to the pegmatite tantalum-tin formation. Ore bodies of complex structure, with inflations, clamps and branches. In general, the shape of the bodies is irregular-tiled. Ore bodies are represented by powerful (up to 20 m) and extended (up to 1200 m) pegmatites of microcline-albite and albite composition. The main ore bodies - the veins Western, Eastern, Central, Southern and Unnoticed have a stretch of 315-320 °, the fall of the SW 45-50 °. The internal structure of the veins is zonal (from the periphery to the center): microcline-block quartz-albite-microcline-quartz-albite. The greysens of recumbent vein blocks are the most rich in tantalite. Ore minerals are tantalite-columbite, fine- and coarse-crystalline beryl, less often - cassiterite. Pegmatite bodies in the form of a series of close veins form a fan in the plan, expanding in a south-easterly direction, composing several suites. Each suite has a stem-the main vein. According to Yu.A.Sadovsky, the formations are linear-prismatic in their structure. Tantalum mineralization is the main thing. Its content in ores ranges from 0.004 to 0.0096%. Of practical importance are also: tin with a content in ores from 0.015 to 0.08%, beryllium - 0.04-0.055%, niobium - 0.008-0.0085%. Associated components - quartz, mica, feldspar, their satellite elements: The deposit has been worked out by quarries, at depth - by tunnels, deeper and on the flanks - preserved.



## Belogorskoye

the territory for the extraction of solid minerals for obtaining the right of subsurface use, which is included in the management program of the state subsoil fund



## Extract from the state inventory accounting as of 01.01.2022

Useful component	Balance reserves		Off-balance reserves
	A+B+C1	C2	
Beryllium(BeO)	A+B+C1 – 1358 t	C2 – 341 t	2816 t
Pewter	A+B+C1 – 617 t	C2 – 157 t	502 t
Tantalum	A+B+C1 – 243 t	C2 – 42 t	299
Niobium	A+B+C1 – 224 t	C2 – 57 t	0

# Kendrylykskoye deposits, 1st coal-shale field in the East Kazakhstan region



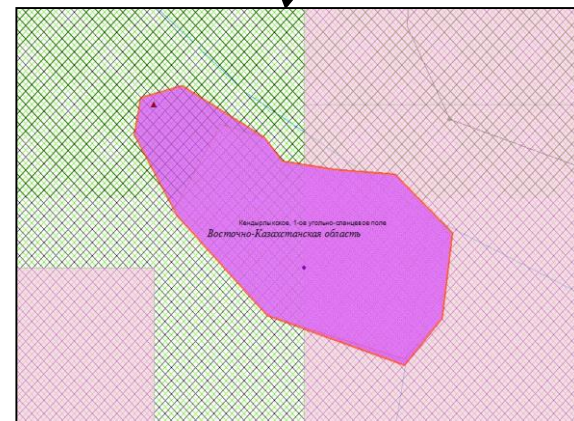
**Location:** The deposit is located in the Zaisan district of the East Kazakhstan region, 50-65 km south-east of the city of Zaisan.

**Brief geological description :** The coals of the deposit are confined to the Middle Upper Carboniferous (Kendrylyk formation), Upper Permian (Akkolcan formation) and Upper Triassic (Tologai formation) deposits. The Kendrylyk formation contains one layer of coal with a capacity of 2.1-2.7 m and two layers of oil shale. Its coal bearing is established only on the south-western wing of the mulda and can be traced along the stretch for 16 km. From 28 to 51 coal seams have been identified in the Accolcan formation, of which only 10 have a working capacity of 0.6-1.6 to 5.1 m, a total of 19 m. All layers have a complex, unstressed structure. The deposits of the Tologai formation fill the central part of the syncline and enclose up to 48 layers of brown coal, of which 16 have a working capacity of 0.6 to 7.2 m. The total capacity of the working layers is 40 m. As part of the Kenderlyk deposit, the Karaungur, Saikan, Akkoin coal plots, shale and brown coals are allocated - Site 1, Site 2. Combustible shales within the Kendrylyk deposit are located on the northwestern flank, 4-8 km from the industrial coal seams of the Karaungur and Saikan sites. Oil shales are localized at three stratigraphic levels: the lower one is the Kenderlyk formation; the middle one is the Karaungur formation and the upper one is the Taranchinsky formation. The most productive are the oil shales of the lower stratigraphic level – the Kenderlyk formation. The most fully studied are the shales of the Kenderlyk formation, the least studied are the shales of the Saikan formation.



## Kendrylykskoye, 1st coal-shale field

the territory for the extraction of solid minerals for obtaining the right of subsurface use, which is included in the management program of the state subsoil fund



### Extract from the state inventory accounting as of 01.01.2022

Useful component	Balance reserves		Off-balance reserves
	A+B+C1		
Coal	11 281 thous. t.	0	0

# Severnoye (Vostochny section) deposit in Kostanay region

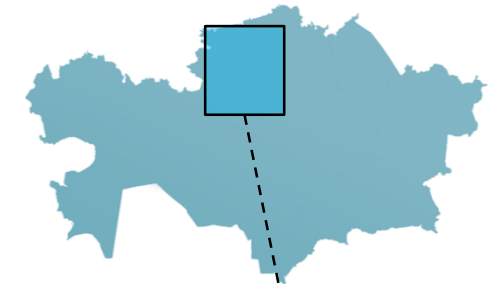


**Location:** It is located 12 km northeast of Arkalyk, 3 km north of Verkhne-Ashutsky birthplace

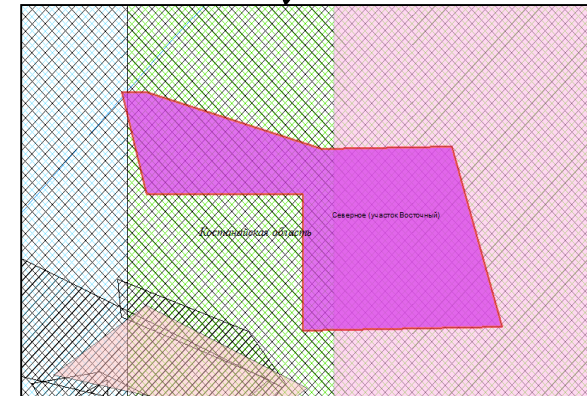
**Brief geological description:** The deposit is located in the zones of erosion-karst depressions developed in the north-eastern wing of the Arkalyk syncline. The ore deposits are confined to the bauxite-bearing suite of the Paleogene. From the surface, the formation is overlain by variegated sandy-clay deposits of the Paleogene with a thickness of 40 m. Mineralization is controlled by the contact of Fran clay shales and mudstones with Famen limestones. Refractory clays are deposited in the roof and sole of ore bodies.

Bauxites are stony, friable, clayey and sugary; leguminous, breccia-like, pelitomorphic and collomorphic. The organic matter content ranges from 2% in gray bauxites to 60-70% in lignites, the zonal part of which is represented by gibbsite. The alumina content is 28-53%, the average is 46.7%. Silicon module 3,4-4,6. The ores contain elevated concentrations (up to industrial) of gallium, niobium, zirconium, and rare earths.

Technological tests using the Bayer method have established the possibility of alumina extraction at the level of 85.7-87%. The quality of bauxite corresponds to the B-3 and B-4 brands.



**Severnoye (East section)**  
the territory for the extraction of solid minerals for obtaining the right of subsurface use, which is included in the management program of the state subsoil fund



Extract from the state inventory accounting as of 01.01.2022

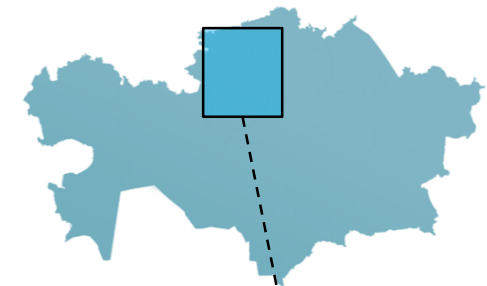
Useful component	Balance reserve		Off balance
Bauxite	A+B+C1 – 2049 тыс. т.	C2 – 723 thous.t.	0

# Severnoye deposit (uch. Severny) in Kostanay region

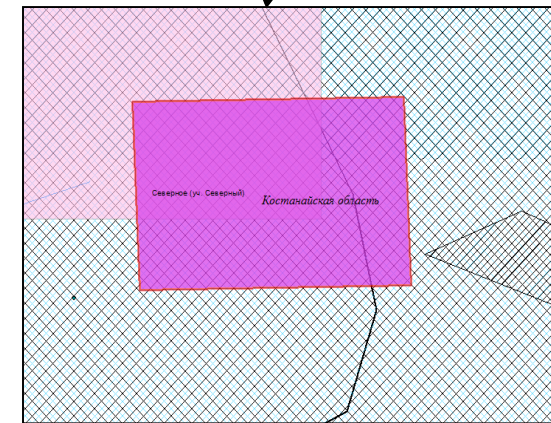


**Location :** Расположено в 12 км северо-восточнее г. Аркалык, в 3 км к северу от Верхне-Ашутского месторождения

**Brief geological description:** The deposit is located in the zones of erosion-karst depressions developed in the north-eastern wing of the Arkalyk syncline. The ore deposits are confined to the bauxite-bearing suite of the Paleogene. From the surface, the formation is overlain by variegated sandy-clay deposits of the Paleogene with a thickness of 40 m. Mineralization is controlled by the contact of Fran clay shales and mudstones with Famen limestones. Refractory clays are deposited in the roof and sole of ore bodies. Bauxites are stony, friable, clayey and crusty; leguminous, breccia-like, pelitomorphic and collomorphic. The organic matter content ranges from 2% in gray bauxites to 60-70% in lignites, the zonal part of which is represented by gibbsite. The alumina content is 28-53%, the average is 46.7%. Silicon module 3,4-4,6. Concentrations of gallium, niobium, zirconium, and rare earths have been increased (to industrial) in ores. Technological tests using the Bayer method have established the possibility of alumina extraction at the level of 85.7-87%. The quality of bauxite corresponds to the B-3 and B-4 brands.



**Severnoye (uch. Severny)**  
the territory for the extraction of solid minerals for obtaining the right of subsurface use, which is included in the management program of the state subsoil fund



## Extract from the state inventory accounting as of 01.01.2022.

Useful component	Balance reserve		Off balance
	A+B+C1 – 0	C2 – 120 thous.t.	
Bauxite	A+B+C1 – 0	C2 – 120 thous.t.	0

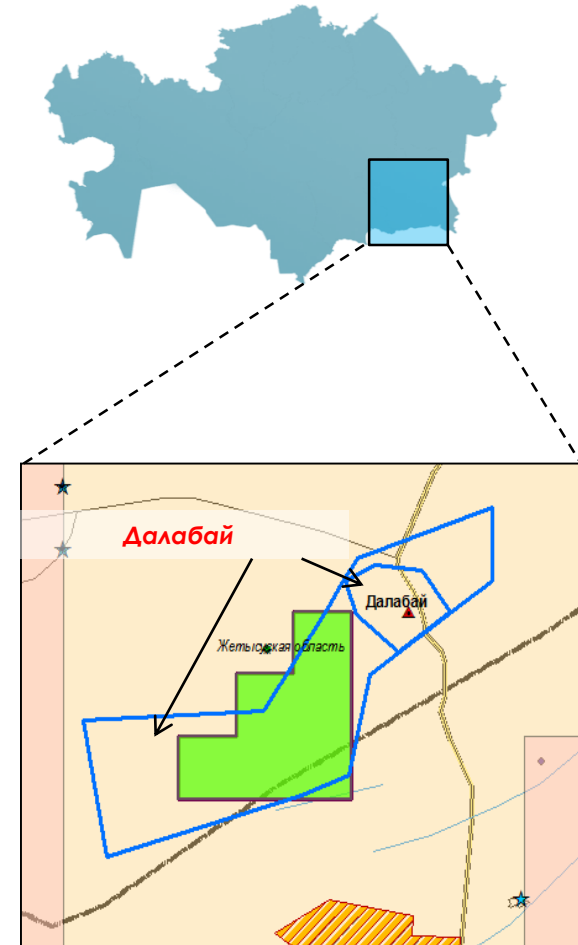
Exploration and mining sites planned  
for auction

# Dalabai deposit in Almaty region



**Location:** The Dalabai deposit is located on the territory of the Koxsu district of Almaty region, 18 km northwest of the district center of PO.Saryozek

**Brief geological description:** The deposit is located in a volcanic dome structure composed of volcanogenic-terrigenous rocks of the late Permian-Triassic. The dome is broken by necks, stocks of basalt, andesite porphyrites and liparite porphyries of Triassic age. In the axial part of the structure, there are large discontinuous disturbances of the sublatitudinal and northeastern strike, controlling hydrothermal metasomatites of propylite, propylite, kaolinite and cercite composition. The length of the prirazlomny metasomatites is 100-2500 m, the power is 10-150 m. Linear zones of quartz veining bearing gold mineralization are confined to them. There are 4 ore zones – Northern, Central, North-Eastern and Southern. All of them are of the north-eastern strike, a complex zonal structure without clear contacts with the host volcanites. A secondary enrichment zone with gold and silver has been developed at the deposit up to a depth of 20-30 m. In the southern zone, with a capacity of 2.5 m and a length of 230 m, the average gold content is 9 g/t, silver 120 g/t. In the unprocessed blocks, there were reserves with an average gold content of 2.19 g/t, silver 35.14 g/t, corresponding to a small deposit. The deposit is poorly explored on the flanks and especially at depth. The deposits are poorly explored on the flanks and especially at depth. Stocks in the future can be increased several times.



## Extract from the state inventory accounting as of 01.01.2022.

Useful component	Balance reserve	Off balance
gold	C1 – 515, 70 kg.; C2 – 836,97 kg	-
silver	C1 – 1207000t.	-

# Kushmurunskoye deposits in Kostanay region



**Location:** The Kushmurun deposit is confined to a depression in the basement rocks with a length of 20 km and a width of 4-5 km, a depth of about 500 m and is located in the Semiozerny district of Kostanay region, 40 km northeast of the district center of the village of Semiozerny and 140 km southeast of Kostanay.

**Brief geological description:** The deposit is confined to a depression in the rocks of the fendment, made by Jurassic coal-bearing deposits. The length of the depression is 20 km, width 4-5 km, depth about 500 m. The main productive strata of the deposit is the Kushmurun formation with a capacity of 110-270 m . Coal - bearing sediments are overlain by Cretaceous and Cenozoic formations with a thickness of 30-120 m . The coal-bearing deposits are folded into the brachysynclinal fold of the SV strike, complicated by tectonic disturbances. The occurrence of rocks is flat with angles of 3-50, rarely 100. In the zones of tectonic disturbances, there is a crumpling and fragmentation of rocks with steep angles of incidence (600). 28 conditioned and 6 substandard formations were identified (34 in total): in the Chernihiv formation - 5, Kushmurunskaya - 19, Duzbayskaya - 10. Oil shale was found in the formations: NM, Pr1, Pr1a, 8 and 8a. In the NM formation, it composes the upper and lower part, in Pr1 it consists of 2-3 packs of sapropel coal and oil shale, in the remaining layers it composes the upper part or is completely composed of oil shale. Calorific value of 2429-5634 kcal, Total. 2.9%, As - 55%.



## Extract from the state inventory accounting as of 01.01.2022

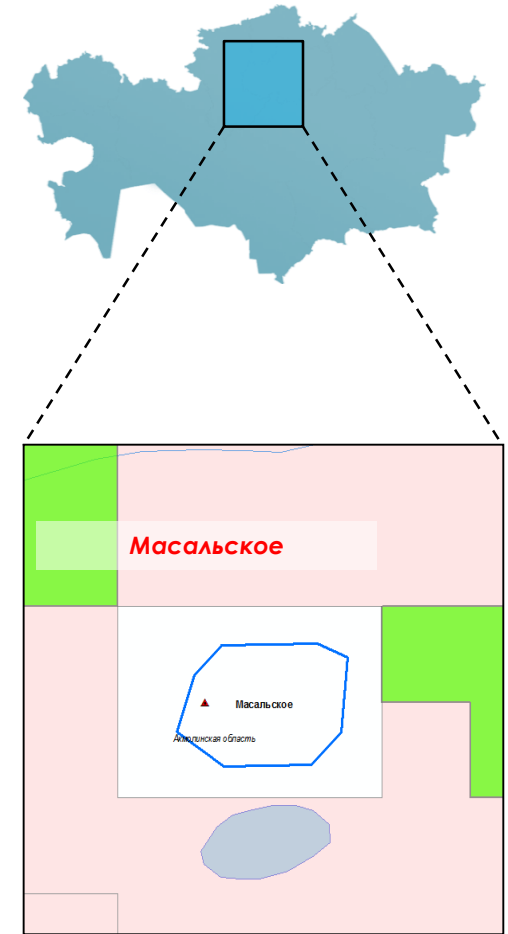
Useful component	Balance reserves	Off balance
Oil shale	A+B+C1 – 459806,801 thous.t.	-

# Masalskoye field in Akmola region

**Location :** Masalskoye iron ore deposit is located in Zharkainsky district of Akmola region, south of the city of Yesil, 16 km east of the railway station Priishimskaya.

**Brief geological description:** The Masalskoye deposit is located in the southern part of the Zharkainagach anticlinorium and is confined to an array of gabbro-pyroxenite composition. The geological structure of the deposit involves ultrabasic rocks of the Ordovician, a metamorphosed complex of volcanogenic sedimentary rocks and intrusive formations of medium-basic composition; mineralization is associated with ultrabasic rocks. According to volcanogenic-sedimentary and intrusive rocks, the weathering crust of areal and linear types, with a thickness of up to 45 m, is developed. Mineralization has been traced by wells to a depth of 500 m and is predicted to depths of 1000-2000 m. The ore-containing array has the shape of a rod. The distribution of useful components in the ore massif is uneven, against the general background of iron contents at the level of 10-17% there are isolated lenses and small bodies with an iron content of 30-40%. Magnetite mineralization contains industrial concentrations of titanium and vanadium, in the ratio  $Fe:TiO_2:V_2O_5 = 88.8:10.3:0.9$ . At the same time, platinum group minerals are often associated with the titanomagnetite natural type of ores, however, studies to establish the platinum content of the ores of the Masal deposit have not been conducted. In the future, the issue of the presence of platinum group minerals in the ores of the Masala iron ore deposit requires detailed study.

According to the complexity of the geological structure for exploration purposes, the Masalskoye field is assigned to the 2nd group, which we can agree with.



**Extract from the state inventory accounting as of 01.01.2022**

Useful component	Balance reserves	Off balance
Iron ores	C1 – 528464,0 thous.t.; C2-200691,70 thous.t.	-

# Kushmurunskoye deposit in Kostanay region



**Location:** The Kushmurun deposit is confined to a depression in the basement rocks with a length of 20 km and a width of 4-5 km, a depth of about 500 m and is located in the Semiozerny district of Kostanay region, 40 km northeast of the district center of the village of Semiozerny and 140 km southeast of Kostanay.

**Brief geological description:** The deposit is confined to a depression in the rocks of the fundament, made by Jurassic coal-bearing deposits. The length of the depression is 20 km, width 4-5 km, depth about 500 m. The main productive strata of the deposit is the Kushmurun formation with a capacity of 110-270 m. Coal-bearing sediments are overlain by Cretaceous and Cenozoic formations with a thickness of 30-120 m. The coal-bearing deposits are folded into the brachysynclinal fold of the SV strike, complicated by tectonic disturbances. The occurrence of rocks is flat with angles of 3-50, rarely 100. In the zones of tectonic disturbances, there is a crumpling and fragmentation of rocks with steep angles of incidence (600). 28 conditioned and 6 substandard formations were identified (34 in total): in the Chernihiv formation - 5, Kushmurunskaya - 19, Duzbayskaya - 10. Oil shale was found in the formations: NM, Pr1, Pr1a, 8 and 8a. In the NM formation, it composes the upper and lower part, in Pr1 it consists of 2-3 packs of sapropel coal and oil shale, in the remaining layers it composes the upper part or is completely composed of oil shale. Calorific value of 2429-5634 kcal, Total. 2.9%, As - 55%.



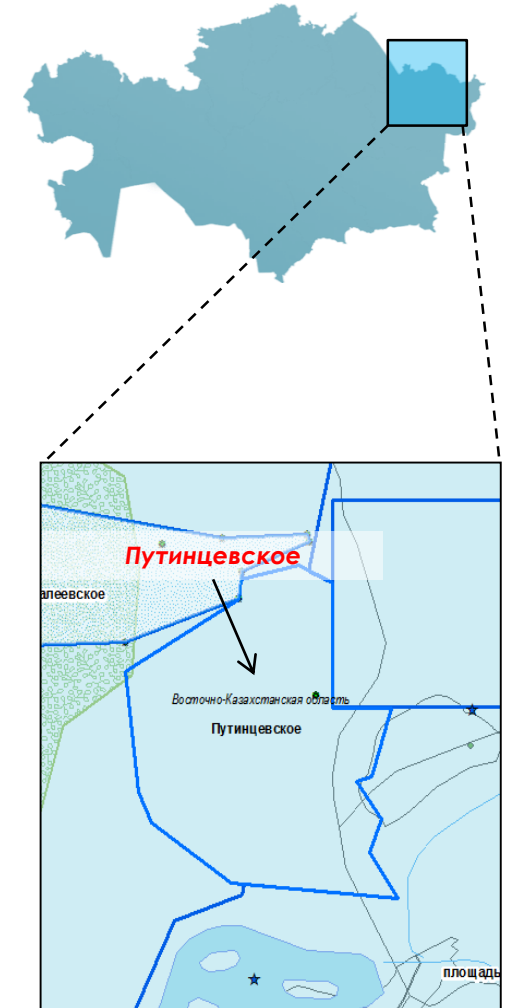
## Extract from the state inventory accounting as of 01.01.2022

Useful component	Balance reserves	Off balance
Oil shale	A+B+C1 – 1037602 thous.t.	-

# “Putintsevskoe” deposit in the East Kazakhstan region

**Location:** The Putintsevskoye deposit is located in the Zyryanovskiy district of the East Kazakhstan region on the western outskirts of the village of Putintsevo; it has been developed intermittently since 1820.

**Brief geological description:** The deposit is confined to the Maleevsko-Putintsevskaya anticline in the northwestern part of the Revnyushensk anticline. The anticline, in turn, is complicated by higher-order folds, diversely oriented discontinuous disturbances and zones of dissociation. The structure of the ore field involves thin-layered siltstones, sandstones, carbonaceous-clay shales of the Kamensk formation of the Upper Devonian, clay, calcareous-clay shales, sandstones, rhyolitic effusions, their tuffs, tuffites of the Maslyansk formation of the Middle Devonian. Intrusive formations are represented by formation and secant deposits of diabases, gabbro, dikes of diorite and diabase porphyrites. Two ore sections have been allocated at the deposit - the Main and the North-Western. The ore - bearing shale strip was traced laterally at 600 m with a width of 80-100 m . It revealed seven main and a number of smaller vein and according to the underlying lenticular ore bodies, 60-250 m long, 0.5-9 m thick.



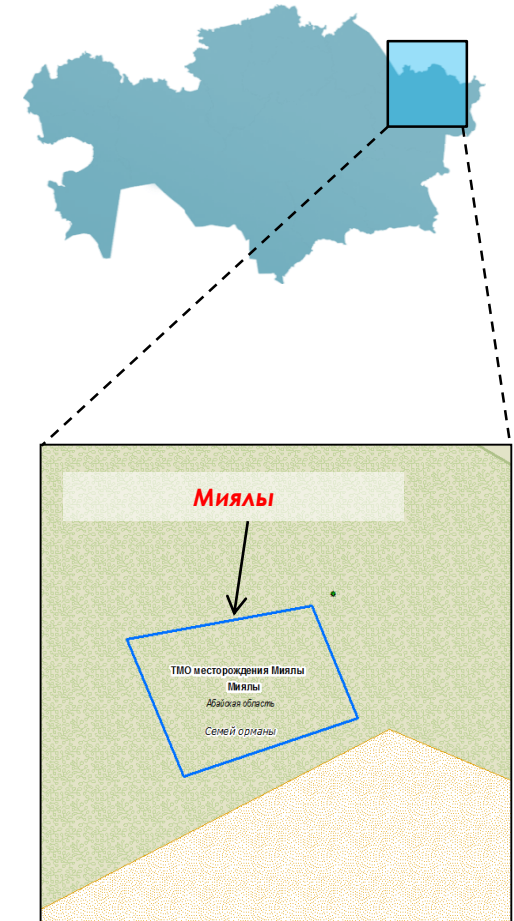
## Extract from the state inventory accounting as of 01.01.2022

Useful component	Balance reserves	Off balance
copper	C1 – 13,6 thous.t,	2,7 thous.t
lead	C1 – 17,50 thous.t	0,70 thous.t
zinc	C1 – 25,5 thous.t	1,10 thous.t
gold	C – 388 kg	94,0 thous.t
silver	C2 – 17,5 t	5,5 thous.t
cadmium	C2 – 491,6 thous.t	18,8 thous.t

# Miyaly deposit in East Kazakhstan region

**Location:** The Miyaly deposit is located on the territory of the Zharminsky district of the East Kazakhstan region, 90 km west of the city of Ust-Kamenogorsk.

**Brief geological description:** The indigenous gold mineralization at the deposit is confined to the sedimentary column of Early Carboniferous age, composed of tuff sandstones and siltstones, broken by dikes of quartz albitophyres. Ore bodies are represented by quartz veins accompanied by zones of interspersed sulfide mineralization. Gold-bearing quartz veins have a small length - from 10 to 100 m, the power is 1-3 m. Zones of hydrothermally altered rocks with a thickness of up to 30 m are marked in the vein bands. 15 mineralized zones with quartz-vein mineralization extending from 90 to 970 m have been identified within the deposit. The gold content in veins and mineralized rocks ranges from traces to 71.6 g/t, averaging 4-6 g/t. From the surface to a depth of 40-50 m, the rocks in the hypergenesis zone are strongly hardened, numerous pseudomorphoses of iron oxides by sulfide minerals are noted. All minerals are found in the form of scattered grains, less often - small clusters and nests. Gold is present in the form of small plates, their surface is mainly covered with a film of iron oxides. The gold content in the ores is comparable to the primary ones and varies from traces to 25.2 g/t.



## Extract from the state inventory accounting as of 01.01.2022

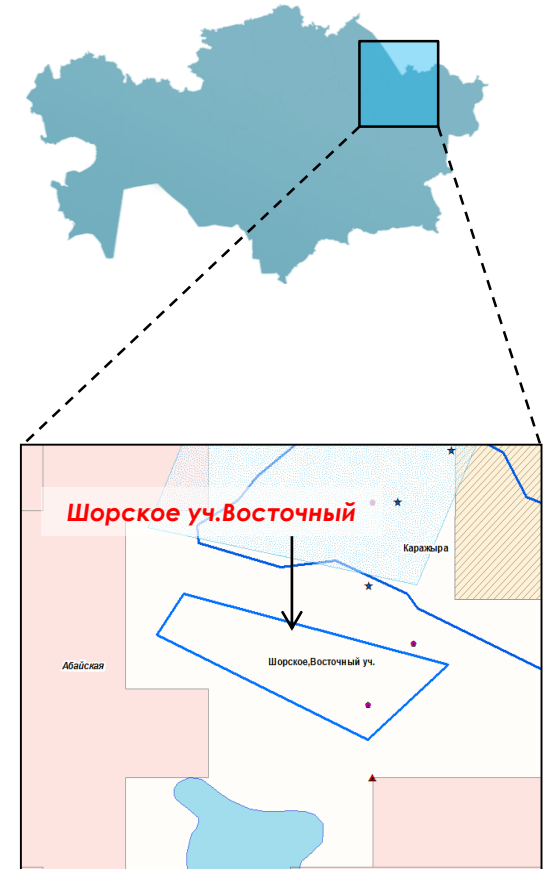
Useful component	Balance reserves	Off balance
gold	C2 - 380,50 kg.	-

# Shorskoye deposit of East Kazakhstan region



**Location:** The Shorskoye copper-molybdenum deposit is located in the East Kazakhstan region, 130 km southwest of the city of Semipalatinsk.

**Brief geological description:** The deposits of the Karasuk formation of the Upper Devonian - Lower Carboniferous, the Koyandin formation of the Tournaisian tier of the Lower Carboniferous, and the Kokon formation of the Visei tier of the Lower Carboniferous take part in the geological structure of the ore occurrence. The deposits of all these formations are represented by multi-grained sandstones, siltstones, carbonaceous mudstones with layers of gravelites and conglomerates, alternating jasper, jasper quartz, siliceous siltstones. These deposits are penetrated by intrusions of gabbro, gabbro diorites, plagiogranites, biotite granites. Ore mineralization is represented by molybdenum and chalcopyrite, which form stockwork-type ore bodies. Ore mineralization is observed in the form of separate inclusions of minerals, their aggregative accumulations or in the form of variously oriented veins reaching a thickness of up to 2 cm. The molybdenum content of furrow and core samples ranges from 0.05% to 2%, copper from 0.1% to 0.7%.



## Extract from the state inventory accounting as of 01.01.2022

Useful component	Balance reserves	Off balance
copper	C1 – 4,8 тыс.т.; C2- 2,4 thous.t.	-
silver	C2 – 13,0 t.	-
molybdenum	C1 – 8260,7 т., C2 – 4122,6 т.	-
tellurium	C2 – 15,22 т.	-
rennius	C2 – 5,68 т	-
selenium	C2 – 13,12 т.	-

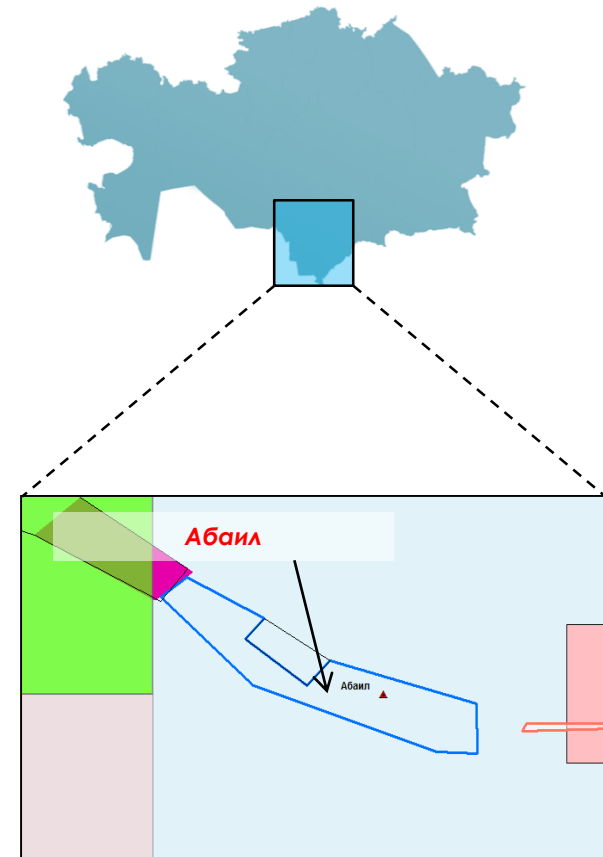
# The Abail deposit in the Turkestan region



**Location:** The Abail deposit is located in the Tyulkubas district of South Kazakhstan Region, 8 km northeast of the Abail railway station and 15 km northeast of the Tyulkubas railway station.

**Brief geological characteristics:** The deposit is located in the northwestern lock part of the Abail anticline. Host rocks are represented by limestones of the Kokbulak Formation of the Cambrian. The rocks are collected in large folds of northwestern direction. The deposit has a large number of crushing, buckling zones and steeply dipping faults that break ore pillars into separate blocks. Six sections are identified: Western, Transitional, Central, Intermediate, Eastern and Abail II.

Two types of ores are distinguished at the deposit: primary and oxidized (to a depth of 20-175 m). The primary ores composing the lower horizons of the deposit are divided into pistomaisite-siderosilicate (commercial) and ankerite (poor non-commercial). In both types of ores, the main minerals are ankerite and siderite; quartz and pyrite are present as impurities; calcite, dolomite, sericite, barite, chalcopryrite, chalcocite are less common; arsenopyrite, galena, sphalerite are isolated. The primary ores contain (%): iron 36.9, sulfur 0.37 to 5.27, phosphorus 0.022, arsenic up to 0.23, manganese 1, copper 0.073, lead 0.03, titanium 0.3.



Extract from the state accounting of reserves as of 01.01.2022.

Useful component	Balance reserves		Off-balance reserves
iron	A+B+C1 – 20 320,6 thousand t.	C2-7936 thousand t.	8984 thousand t

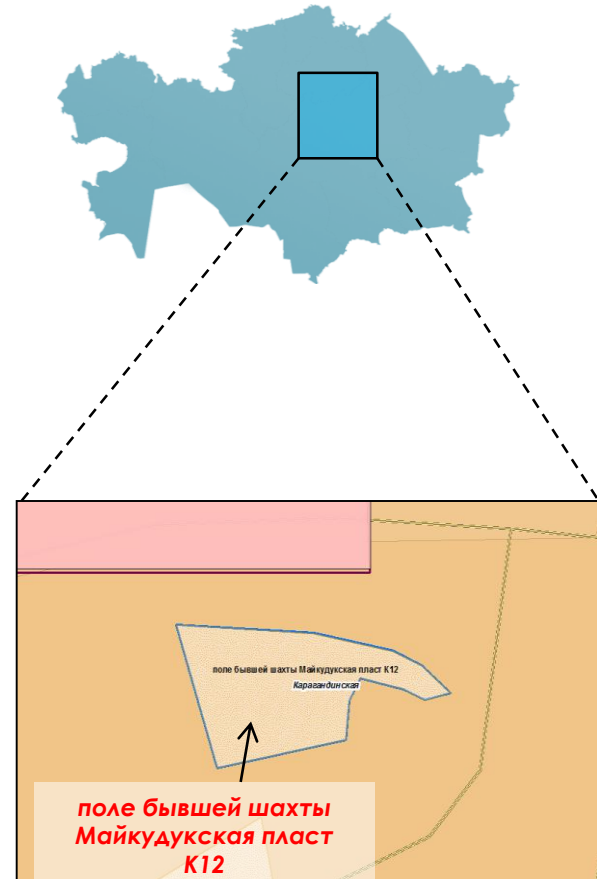
# The Maikuduk deposit of Karaganda region



**Location:** Maikuduk deposit in administrative terms the site is located on the lands of the Oktyabrsky district of Karaganda.

**Brief geological characteristics:** The  $K_{12}$  formation, 6-8 m thick, lies above the  $K_{10}$  formation. The dividing sequence is represented by sandstones, the roof of the  $K_{10}$  formation and the soil of the  $K_{12}$  formation is argillites. The thickness of the dividing sequence is 30-35 m in the west and 12-18 m in the east. Above the  $K_{12}$  formation, there is a thick sequence (70-100 m) separating it from the  $K_{13}$  formation, composed of sandstones with gravels, siltstones, and mudstones; it contains one or two coal-bearing interlayers ( $K_{12}^1$ ,  $K_{12}^2$ ), which are not of working thickness and are not widespread. The coal-bearing sequence in the evaluated area lies at angles of  $10-25^\circ$ .

In terms of the complexity of the geological structure, the site is reasonably assigned to the second group, with which we can agree



## Extract from the state accounting of reserves as of 01.01.2022.

Useful Component	Balance reserves	Off-balance
Hard coal	C1 – 1155 thous.t	-

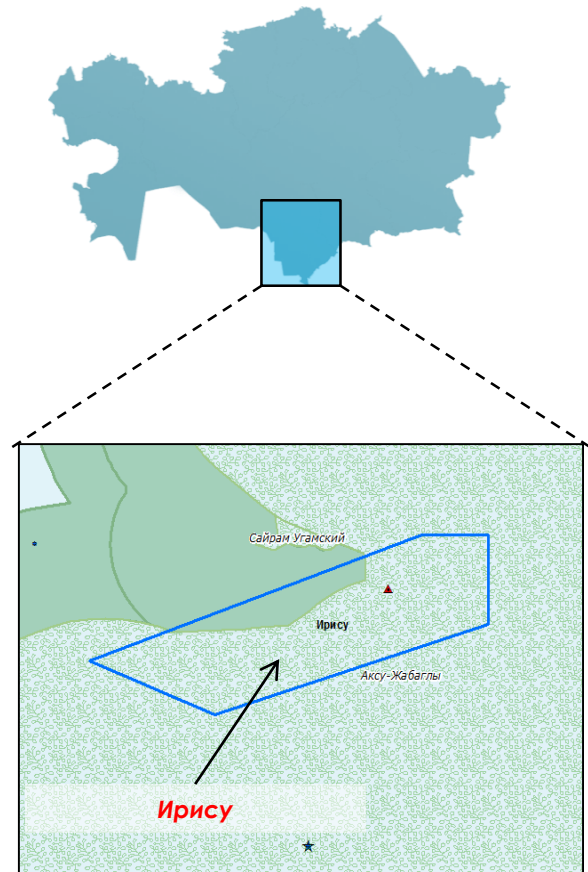
# The **Irisu** deposit in the Turkestan region



**Location:** Irisu deposit is located in the territory of Tulkubas district of Turkestan region. From the nearest railway station Tyulkubas the deposit is 18 km to the south-east, and the distance to Karaganda Metallurgical Plant by railroad is 1186 km.

**Brief geological profile:** The geological structure of the area involves Upper Devonian, Lower Carboniferous, Cretaceous and Neogene-Quaternary sedimentary formations, which in the southeast of the area are broken by intrusion of alkaline composition.

The area is characterized by iron ore and associated cobalt and copper mineralization. Subordinate position is occupied by small deposits and ore occurrences of iron (siderite type), lead, zinc, vanadium and gold. Ore bodies of the deposits are composed of sulfide-magnetite ores, which are transformed into martite-magnetite ores in the oxidation zone. Depending on the composition of sulfides, they are divided into pyrite-magnetite, chalcopyrite-magnetite and pyrrhotite-magnetite. The first type of ores is characteristic of the Third and Aksu ore zones, the second type is present mainly in the First and Fourth ore zones, and pyrrhotite-magnetite ores occur as interlayers and nests in the ore bodies of the First and Third zones.



Extract from the state accounting of reserves as of 01.01.2022.			
Useful component	Balance reserves		Off-balance reserves
	titanium	A+B+C1 – 37 600 thousand t.	
copper	A+B+C1 – 260,9 thousand t.	C2-0	-

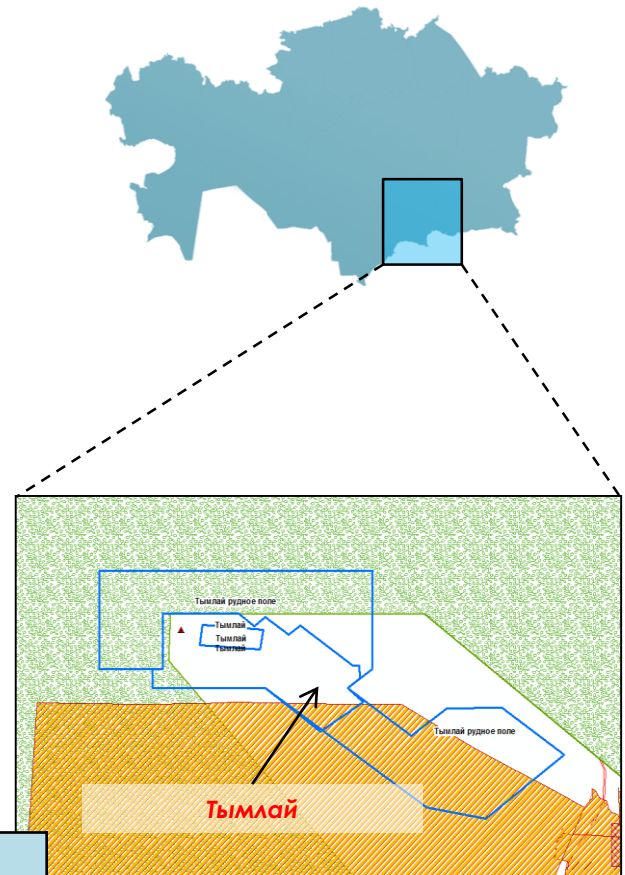
# The Tymbai deposit in Zhambyl region

**Location:** Zhambyl region, northwest of the railway station Khantau

**Brief geological profile:** The deposit is confined to an interbedded intrusion of basic and ultrabasic rocks, deposited among Upper Cambrian sediments. The intrusion is composed of micaceous peridotites of the ultramafic alkaline series. In the basement of the intrusion lie coarse-crystalline gabbro, gabbro-diorites and diorites with poor phenocrysts of titanomagnetite. The intrusion is underlain by quartz-sericite shales of the Jambul Formation of the Upper Cambrian and overlain by diabase porphyries of the Ashisu Formation of the Upper Cambrian. Siltstones, polymictic sandstones, and conglomerates of the Middle and Upper Ordovician lie unconformably on the Cambrian rocks.

The mineralization in the form of disseminated titanium minerals is localized mainly in micaceous peridotites, the body of which dips gently to the west. The plate-shaped ore body has 0.8x2.0 km in plan, 20 m thick on the southern flank and 200 m thick on the northern flank. The overburden ratio is 1 : 3. Mining can be carried out by open-pit method.

The main ore mineral is titanomagnetite. The second most common is ilmenite. Leucoxene, sphene, rutile, and anatase are common. The content of titanomagnetite reaches 70-80% (in schlieras).



Extract from the state accounting of reserves as of 01.01.2022.

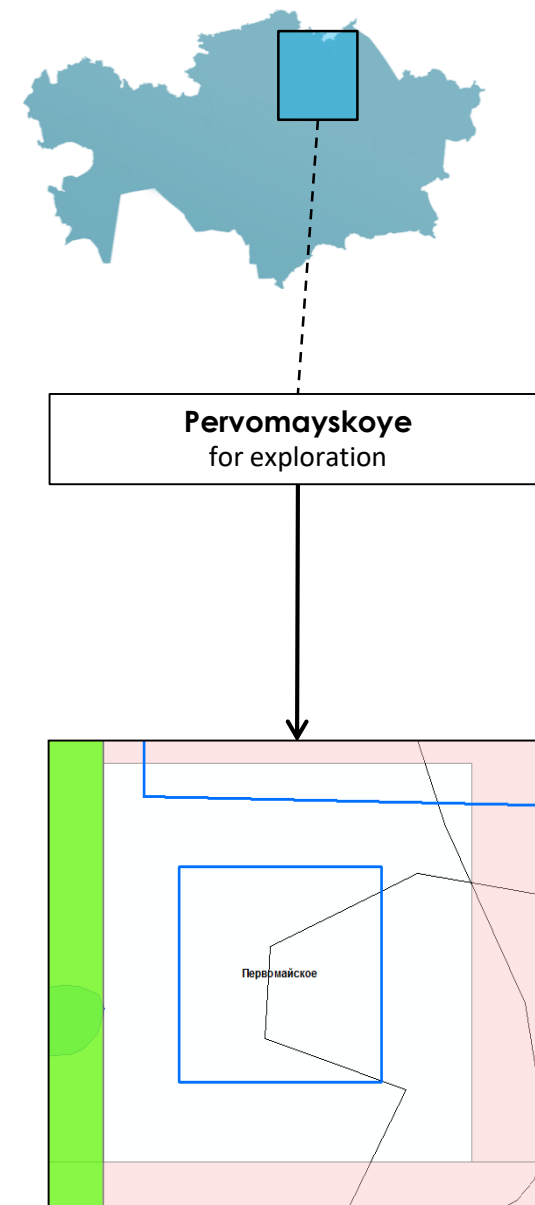
Useful component	Balance reserves		Off-balance reserves
	A+B+C1 – thousand t.	C- thousand t.	
titanium	A+B+C1 – 21 543 thousand t.	C-166,3 thousand t.	
iron	A+B+C1 – 226 100 thousand t.		1800 thousand t.

# The Pervomayskoye deposit in Akmola region



**Location:** The Pervomayskoye deposit is located in the territory of Seletinskiy District of Akmola Region, 30 kilometers south of the Aksu Mine.

**Brief geological profile:** The geological structure of the area involves formations of the Lower and Upper Proterozoic, represented mainly by gneisses of orthoclase-plagioclase-quartz-muscovite composition, tuffaceous sandstones, tuff siltstones with horizons of trachybasalts and trachyandesites (Shingarevskaya suite), siltstones, siliceous siltstones, jaspers, sandstones, tuffs, and volcanogenic and volcanosedimentary formations (basaltites, andesian basalts, tuffs, and tuffaceous sandstones) of the lower-middle Cambrian (Akdym and Aksu series) and sandstones, conglomerates, and siltstones of the lower-middle Ordovician (Ushtogan Formation). Gold halos in the Pervomayskoye ore field generally extend in the meridional direction, or have a northwestern orientation. The former are clearly controlled by the zone of the Tselinograd deep fault, extending in a continuous band (in concentrations of hundredths to tenths of g/t) through the entire area (12 km). The width of the halo band ranges from 2 km in the southern part to 1 km in the northern part of the area. The halos are confined to both volcanogenic-terrigenous strata of the Lower Ordovician and metamorphic rocks of the Shingarevskaya Formation of the Proterozoic and, with rare exceptions, are absent within the Krykkuduk intrusion. According to the peculiarities of the geological structure and the nature of mineralization, the near-fault halo band can be divided into southern and northern parts. In the southern part, halos of gold and satellite elements are mainly confined to the Lower Paleozoic volcanogenic and terrigenous strata; in the northern part - to metamorphic rocks of the Shingarevskaya Proterozoic Formation.



## Extract from the state accounting of reserves as of 01.01.2022.

Field (site)	Balance reserves, kg		Off-balance reserves, kg
	A+B+C1 – 0	C2 – 731,5	
Pervomayskoye (gold)	A+B+C1 – 0	C2 – 731,5	0

# The Vydrikha ore field (eastern flank deposit in East Kazakhstan Region)



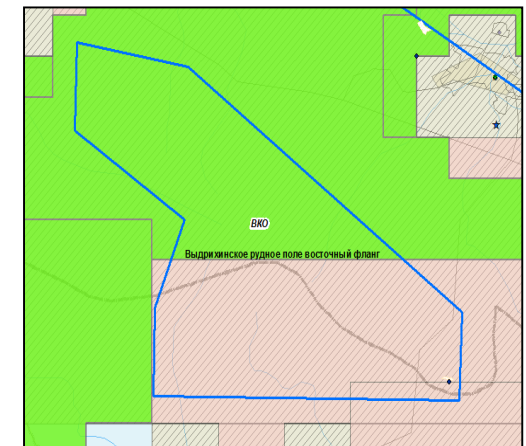
**Location:** the ore field is located in Shemonaikha District of East Kazakhstan Region, 80 km southeast of Ust-Kamenogorsk.

**Brief geological profile:** geographically, the area is located in the southwestern foothills of the Altai mountain system. Geologically, the area is located in the junction band of the Rudno-Altayskaya and Priirtyshskaya structural-formational zones, separated by the deep Irtyshsk fracture. These structures were formed in sharply different geotectonic and paleographic conditions, which determined a sharp difference in the internal structure of the zones and the composition of the composing rocks. In Priirtyshskiy ore district the most widely developed deposits of non-ferrous metals. They are the raw material base of the mining and metallurgical industry. In the described area and beyond it, there are known industrial pyrite-polymetallic deposits: Kamyshinskoye, Rulikhinskoye, etc.

The following ore occurrences and ore points are located within the area: Solonovskoye ore occurrence, Teplushinskoye ore occurrence, Vydrikha ore occurrence, and Avrorinskoye ore occurrence.



**The Vydrikha ore field eastern flank** for exploration of polymetals

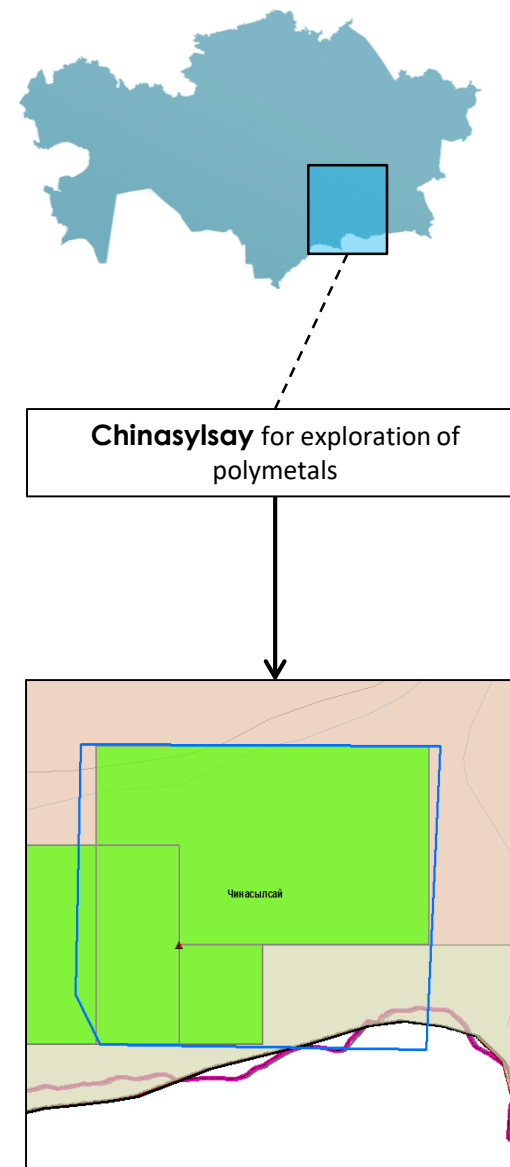


# The Chinasylsay deposit in Almaty region



**Location:** The deposit is located in Almaty region, 35 km from Almaty

**Brief geological profile:** The ore field of the deposit is composed of andesites, rhyolites, sandstones and conglomerates of the Lower and Middle Devonian. In the ore-bearing formation stretching 1800 m, 24 large bodies of stratified and lenticular shape are distinguished. The largest is the First and Sixth ore bodies. The texture of the ores is platy, disseminated, massive, brecciated. The average lead grade is 2.73%, zinc 1.73%, gold 0.9 g/t, silver 23.8 g/t. Near-ore changes include carbonitization, seritization, silicification, chloritization. Oxidation zone is developed at the depth of 10-15 m. The deposit is shallow.

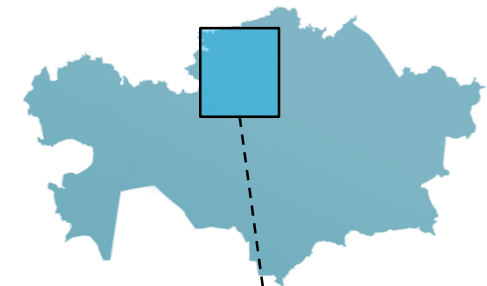


# The Perspective deposit in Kostanay region

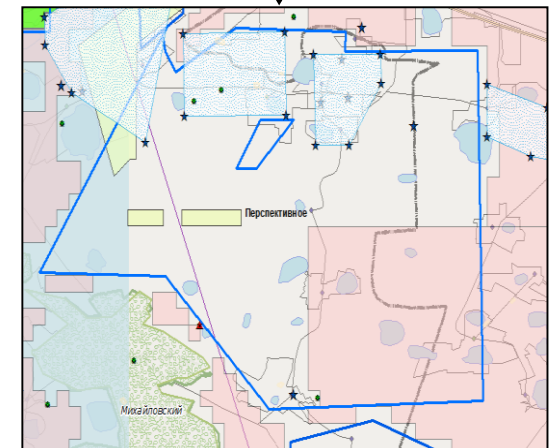


**Location:** The deposit is located in Almaty region.

**Brief geological profile:** is confined to a zone of fractures, which are bridged by shallow fractures. The mineralization is localized in zones of crushing, silicification and mylonitization in volcanogenic-sedimentary rocks of the Zhaisan Formation. Formation is lignite copper-cobalt-nickel. The genesis is hydrothermal volcanogenic. Chalcopyrite is associated with quartz and carbonate, filling the intergrain spaces in them, sometimes as tiny inclusions. Malachite in the form of lappets. There are areas of aggregate ores.



**The Perspective**  
for exploration of rare, non-ferrous and  
precious metals



Extract from the state accounting of reserves as of 01.01.2022.			
Field (site)	Balance reserves, thousand tons		Off-balance reserves, thousand tons

# The Itastybulak deposit in the Aktobe region

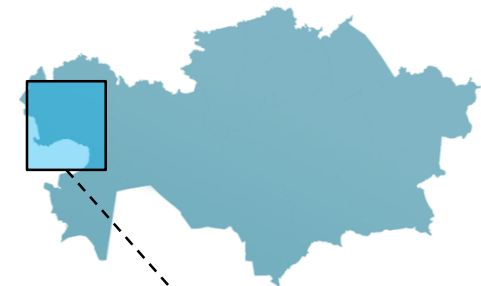


**Location :** Itastybulak deposit is located in Aktobe region, 100 km southeast of Khromtau. It was discovered in 1958.

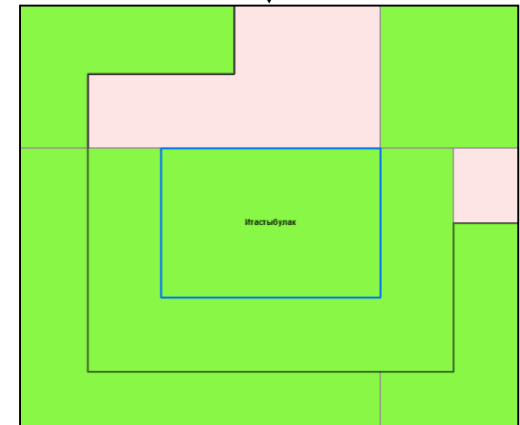
**Brief geological profile:** The ore field is composed of granites of the Borlin massif, south of which quartzites, gneisses, amphibolites and Precambrian shales are exposed. The deposit is confined to the southern periphery of the massif and is controlled by the Borlin regional fault zone. Granites multi-phase, granite age is defined ambiguously and varies from  $C_{1-2}$  - P.

The mineralization is associated with a laccolithic body of fine-grained porphyritic granites and is controlled by crushing and shear zones

It is confined to a system of quartz veins and veinlets dissecting silicified and seriatitized granites. The most extended zones of silicification are developed along the tectonic faults and zones of intense granite cataclasis, having a north-eastern strike, conjugated with the Borlinskaya fault zone. The dip of the ore zones is western - 50-60°. The following spatially closely interconnected types of ores are established: stockwork, quartz-veined vokvartsovannyh and sericitized granites, breccia (fragments of granite and quartz, cemented by fine-grained quartz). There are several zones of quartz-ore veins and disseminated mineralization in the crushing areas of silicified granites. Their thickness is 6-10 m, Mo content reaches 0.2-0.4%. The richest mineralization is in quartz veins and veinlets. It is everywhere accompanied by pyritization, sericitization and silicification. The ores are mainly vein-disseminated, molybdenite is finely scaly, it forms fine inclusions ("rash") in breccia ores and hydrothermally altered rocks. Ore minerals include wolframite, bismuthite, pyrite, and chalcopyrite. The main ore element is molybdenum, the minor ones are tungsten, bismuth; elements-impurities in ores are arsenic, copper, lead.



**Itastybulak**  
for exploration of tungsten-  
molybdenum ores



## Extract from the state accounting of reserves as of 01.01.2022.

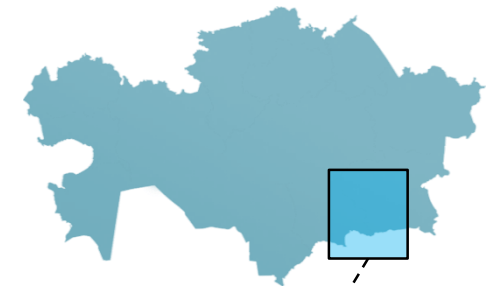
Field (site)	Balance reserves, thousand tons		Off-balance reserves, kg

# The **Uenke-Shyndybulak** deposit in Almaty region

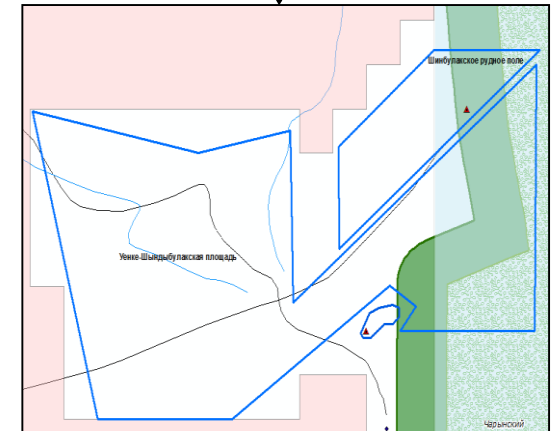


**Location:** The deposit is located in the Enbekshikazakh district of Almaty Region.

**Brief geological profile:** It was discovered in 1960. In 1964, during prospecting and appraisal work, its surface was studied in detail, trenches at a distance of 10-40 m were made, and a pothole with cross-cuts was made. According to the results of these works, the reserves of the deposit were estimated at 1215.8 kg of gold with an average grade of 3.17 g/t.



**Uenke-Shyndybulak Square** for exploration of gold-bearing ores



Extract from the state accounting of reserves as of 01.01.2022.

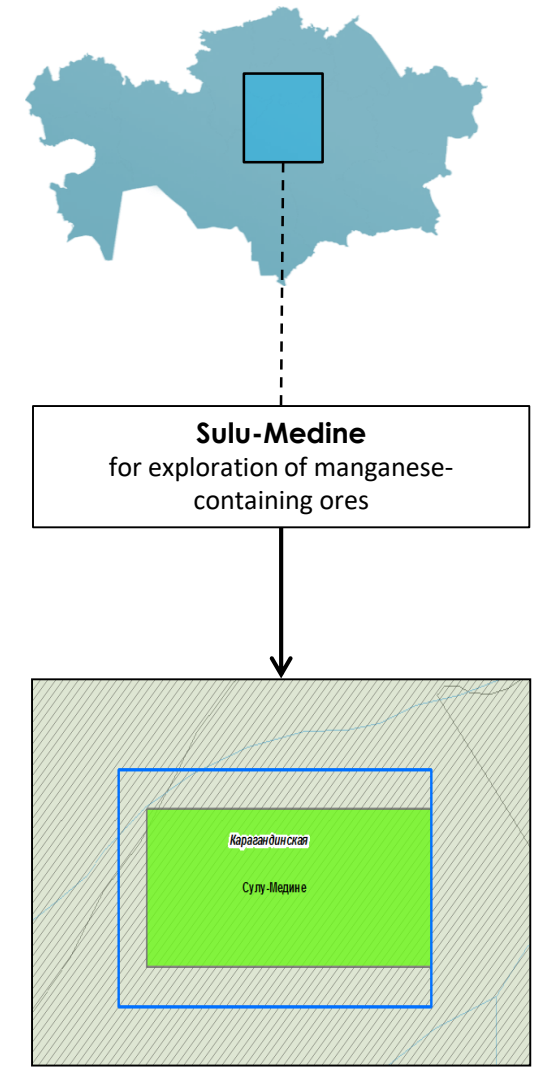
Field (site)	Balance reserves, thousand tons		Off-balance reserves, thous t

# The Sulu-Medine deposit in Karaganda Region



**Location:** Shetsky district of Karaganda region 8 km west of Sulu-Medine, 20 km southwest of Yuzhny village.

**Brief geological profile :** The geological structure of the trough involves Middle-upper Devonian and Lower Carboniferous formations. The southern side of the trough is cut by a tectonic disturbance of sublatitudinal strike, along which the Lower Devonian terrigenous deposits are thrust over the Lower Carboniferous terrigenous-carbonate deposits. In the northern side of the trough, the base of the section contains mottled conglomerates, sandstones, siltstones, andesite-basalts and their tuffs with interlayers of Z<sup>AN</sup> and tuff-sandstones up to 800 m thick. Above them lie limestones of the Famennian Stage, up to 100 m thick. The Lower Turgeny sediments are represented by limestones, calcareous siltstones of Cassin horizon up to 100 m thick; siltstones, gray mudstones with interlayers of sandstones, limestones of Rusakovsky horizon up to 300 m thick. Ore occurrence N9 is confined to the contact of the Kassinsky and Rusakovsky horizons of the Lower Tournaisian, which compose the northern side of the Sulu-Medine trough. The ore-bearing horizon is traced with interruptions for Zkm. It is represented by siliceous siltstones, mudstones - red, brown, gray, up to black.



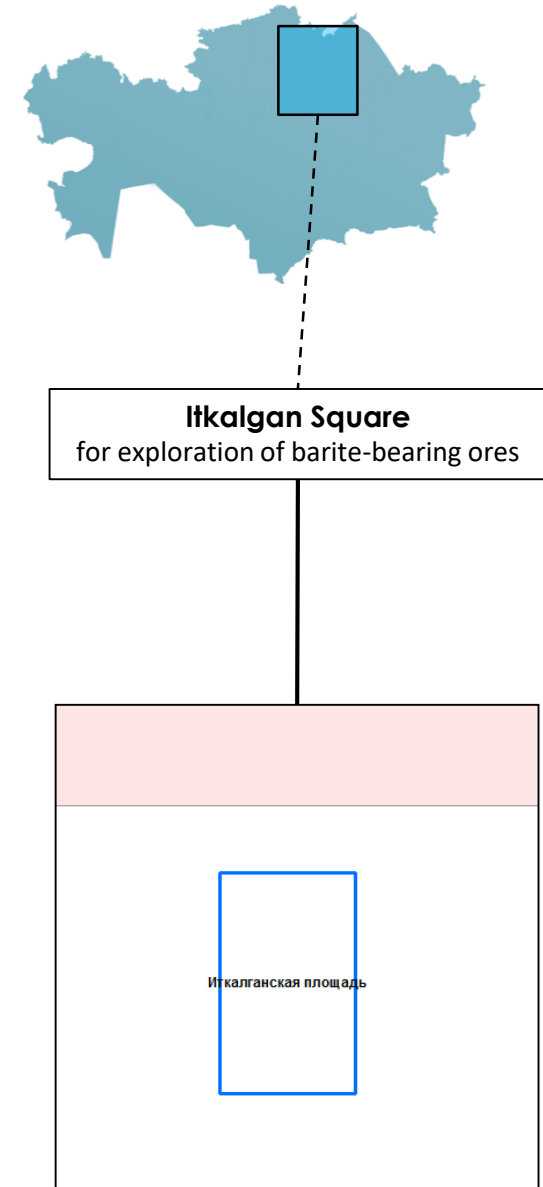
# The **Itkalgan** deposit in the Turkestan region



**Location:** The occurrence is located in Turkestan district of South Kazakhstan region, 53 km from the city of Kentau, 7 km from the village of Achisay to the north.

**Brief geological profile :** Absolute marks are 1000-1280m, with relative excesses of 30-50m. Geological routes (6.0 km) were conducted, three main ditches and two clearing ditches with the total meterage of 3,772 and an exploration trench in the Severnaya vein were passed. Fifty-six trench samples and one large-volume technological sample (82m<sup>3</sup>) were taken. Barite and density analyses were performed. The occurrence is confined to the Devonian sediments of the Famennian stage, to the Shushakov Formation (limestones with pronounced lumpiness, with marl layers) and is represented by two steeply dipping barite veins and numerous tube-shaped outcrops. The thickness of both veins was 7.0 m, respectively, and from 1.0 to 3.0 m for individual outcrops. Barite of two generations, from pure monobarite varieties (white with a blue tint) to milky-white and brecciated barite.

According to the results of production tests barite ore satisfies the requirements of STATE STANDARD OF THE UNION OF SSR class B. As a result of the work conducted the evaluation of barite occurrence from the surface was made, the calculation of forecast reserves in the North and South veins to the depth of 15.0 m, which amounted to: ore - 46.3 thousand tons, barite 35.0 thousand tons. The area is not watered. Open-cut mining of reserves is possible.



# The **Sonkulsai** deposit in the Turkestan region

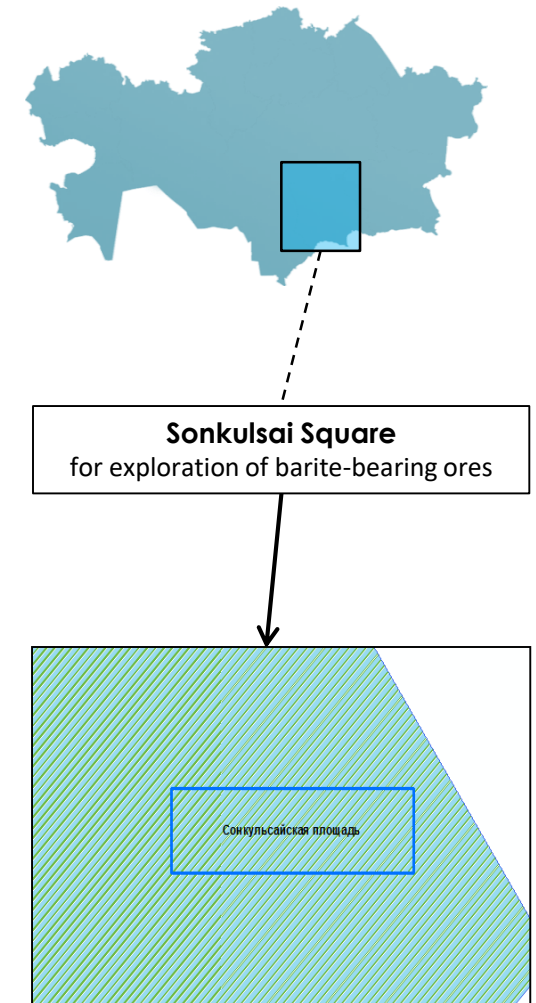


**Location :** The Sonkul-Sai deposit is located on the left bank of the Kara-Sai ravine. At the mouth of this ravine, on the right bank, 1 km lower, is the Mirgalim-Sai deposit, where the Kara-Sai ravine was named Mirgalim-Sai.

**Brief geological profile:** Devonian horizons take part in the structure of this deposit and modern dealluvial deposits have significant development. The deposit is confined to the southwestern wing of the Sonkulsai anticline.

At this deposit, the horizon of the second ribbon limestone was also favorable for ore deposition. It is also of great interest in terms of the presence of a large tonnage of lead and zinc in the ore. A great difficulty in the utilization of useful components of this deposit is the lack of a cost-effective methodology for the enrichment of poor lead-zinc ores.

Geological reserves of this deposit for the upper second ribbon limestone are expressed as about 30 000 tons of lead in ore and 80 000 tons of zinc, subject to the following dimensions of the ore block: the area of the ore layer of 0.5 km<sup>2</sup> and its average thickness is 4 m. The volume weight of the ore equal to 2.8. The average percentage content of lead in the ore equal to 0.6% and zinc 1.4%.

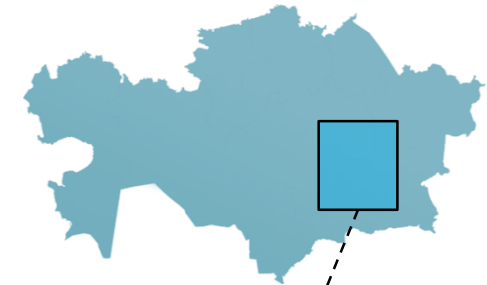


# The **Zhilandin Square** deposit in Zhetysu region

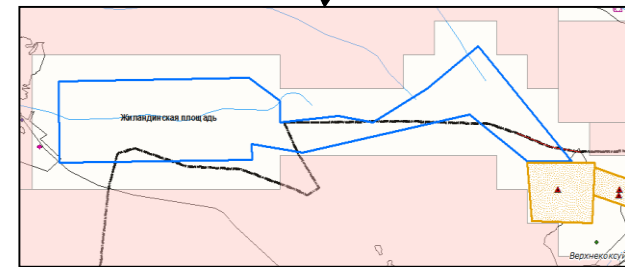


**Location:** Yeskeldy District of Almaty Region, 15 km south of

**Brief geological profile :** The area is confined to the southern contact of the Zhylandy-Kusak laccolith with Devonian deposits (rhyolite tuffs), Riphean and Vendian sediments, and Ordovician carbonate sediments. This area is confined to the western flank of the Tekeli-Sairamnor anticlinorium. Lower Proterozoic granite-gneisses, amphibolites and amphibolite gneisses of the enclosed greenstone belts are developed in the core of the anticline structure. Dome structures of the Lower Proterozoic are overlain by the platform series of the Lower-Middle Riphean: the base of the series - clay-mica schists, quartz-mica schists and quartzites; the middle part of the series - layered and massive limestones, the upper part of the section - carbonaceous shungit-bearing clay siltstones and limestones. As a result of the work performed, the following deposits were identified: Birinshi, Otmetka, Osenneye, Lagernoye, Verkhneye Terekty, Zhilandy, Mynbulak, Vostok, Zhabyk and Konyzdar. There are no balance reserves in the contract area. Projected reserves of P1+P2+P3 categories are as follows: W - 51.5 thousand tons, Bi - 26.7 thousand tons, Ai - 112 tons, Ag - 1200 tons, C - 24.9 thousand tons, Zn - 312 thousand tons, Pb - 88 thousand tons. The main value in the contract area are: gold, silver and bismuth, a commercial discovery of gold-medium parameters deposit is very likely.



**Zhilandin Square**  
for exploration of gold, silver, platinum,  
lead, zinc, bismuth, manganese



# The **Karamola** deposit in Zhetysu region

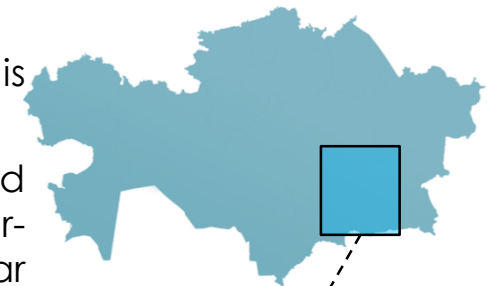


**Location:** northeastern part of the Dzungarian Alatau and is administratively located within the Alakol district of Almaty region

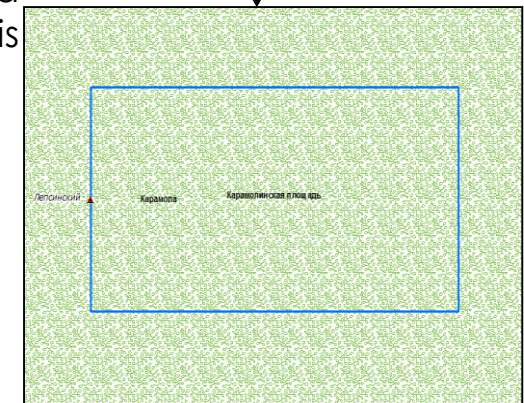
**Brief geological profile:** The Karamola manganese ore deposit is located in the central part of the Tastau structural-formation zone of the Jungar-Balkhash folded system. The above-mentioned zone is the North-Jungar synclinorium, the north-eastern flank of which is displaced in southeastern direction by 350-400 km along the Main Jungar rift.

The strength of manganese ores on Protodiakonov's scale is 15-16 with a loosening ratio of 1.4-1.7. Fracture strength varies from 11900 to 14300 N/cm<sup>2</sup>, volumetric weight of ores is 3.28 t/m<sup>3</sup>.

By the complexity of the geological structure and uneven distribution of manganese content, by the dissociation and parameters of ore bodies, the Karamola deposit belongs to small objects. Deposits of this group, as a rule, are explored and developed simultaneously. This approach is reasonable in relation to the above-mentioned object.



**Karamola**  
for manganese mining



Extract from the state accounting of reserves as of 01.01.2022.			
Useful Component	Balance reserves		Off-balance
	A+B+C1 – 134,5 thous. t	C2 – 341 t	
Manganese (ore)	A+B+C1 – 134,5 thous. t	C2 – 341 t	2816 t

# The Mynaral deposit in Zhambyl region



**Location:** Zhambyl region.

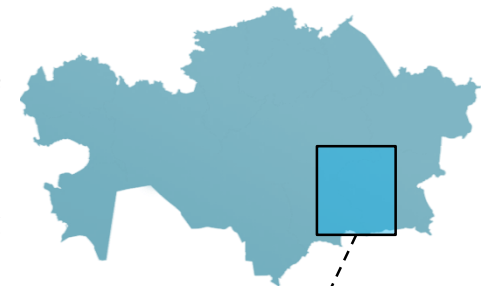
**Brief geological profile:** The deposit area is composed of Lower-Middle Devonian effusive-pyroclastic formations of acidic composition, ruptured by a series of subvolcanic dikes. The main gold-bearing zones of the deposit - Central, Western, Quartz, Southern and Intermediate - are located in dikes of diabase porphyrites.

The ore bodies within the zones are characterized by linear-stockwork gold-quartz mineralization with sulfide content of 1-3% and gold 0.5-19 g/t.

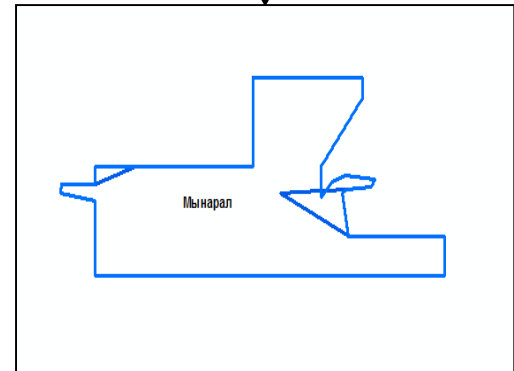
Ore composition: pyrite, chalcopyrite, sphalerite, arsenopyrite, galena, pale ore, gold, silver, carbonate, and feldspar. Flux ores (quartz over 62%), arsenic and antimony are found in amounts of 0.002-0.006%.

A gold ore body in blind occurrence at a depth of 70-300 m, 340 m long, 2.3 m thick with an average gold grade of 11.8 g/t has been identified in the most studied western zone stretching for 1400 m.

It is predicted to continue eastward 400-500 m and to a depth of 600 m. In the 1700 m long Quartz gold-bearing zone, gold grades of 6.4-19.2 g/t have been established at 0.6-1 m thickness. The mineralization is predicted at a depth of 200 m and more. The deposit is shallow, partially worked out and is subject to additional exploration.



**Mynaral**  
for gold mining



**Extract from the state accounting of reserves as of 01.01.2022.**

Useful Component	Balance reserves		Off-balance
	A+B+C1	C2	
Gold	230,49 kg.	480,08 kg.	64,4 kg.