



**SOUTH ZHAUR PROJECT**

**Exploration of Tungsten and Molybdenum  
Deposit “South Zhaur” in the Karaganda  
Region of the Republic of Kazakhstan**

**Astana, 2016**

# Information about W&Mo reserves Kazakhstan

## SOUTH ZHAUR PROJECT

Kazakhstan holds the world's leading positions in tungsten and molybdenum reserves.

There are about 18 tungsten deposits on the Kazakhstan State Balance of mineral resources.

Total on-balance reserves of WO<sub>3</sub> is about **2,079,907** tonnes, including 1,934,745 tonnes (A+B+C<sub>1</sub> categories) and 145 162 tonnes (C<sub>2</sub> category) according to Russian Classification System.

The main part of tungsten reserves in Kazakhstan is stockwork deposits: Upper Kayrakty (Verkhneye Kairakty), Karaoba, Boguty and Koktenkol.

**The largest stockwork deposit is Upper Kayrakty deposit (in the immediate vicinity of the South Zhaur deposit)**, followed by a slightly smaller Boguty deposit. Number of fields, including South Zhaur, remain underexplored and undervalued.

All stockwork deposits in Kazakhstan are suitable for open-pit mining, which is the most productive and cost-effective method. Stockwork ore deposits are tungsten and molybdenum complexes, sometimes with a high content of bismuth.

The value of these deposits is also increased by the presence of rare earth elements in the main molybdenum-tungsten ores.

The content of rare earth elements of the Upper Kayrakty deposit is estimated at **4.5 kg/tonne** of ore.

As for South Zhaur deposit, there is the highest content of rare earth elements with **5.5 kg/tonne** of ore.

# Information about the Project

## SOUTH ZHAUR PROJECT

### The purpose of the Project is

Exploration, calculation and registration of the deposit reserves in the State Register of Mineral Reserves and Resources, and further organization of industrial production.

### General information on the field

South Zhaur deposit is located 45 km east of Upper Kayraky deposit and “Kayraktinskiy Mining and Metallurgical Combine (MMC)” and is geographically part of the Shet district of the Karaganda region of the Republic of Kazakhstan.

Mineralization is localized in the zone of leucocratic granites of Akchatau ore field. 16 ore bodies allocated within the ore-bearing stockwork which were involved in the calculation of reserves. They are traced along strike - up to 1000 m, up to 540 m in depth. The thickness from the first meters is up to 140 m. Ore bodies have not been studied along the strike and at depth, which suggests the potential for production expansion.

### The average content:

- of  $WO_3$  is 0,186%,
- of molybdenum is 0,011%
- of bismuth is 0,005%.

Potential reserves of **WO** is estimated to be **about 200,000 metric tonnes, molybdenum - 12,000 metric tonnes and bismuth - 5,800 metric tonnes.**

# Location

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The South Zhaur deposit is located in the Shet district of the Karaganda region, about 45 km from Upper Kayraky deposit.

The closest distance to the railway station - 45 km (Upper Kayraktinsky MMC). The deposit is located 3 km from the highway Ekaterinburg-Almaty.



# Information about the Project

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The internal structure, morphology and composition of ores as well as their technological properties were preliminarily studied and production tests were conducted.

Also at an early stage in the South Zhaur deposit the trial mining conducted in the amount of 30 thousand tonnes of ore. Processing was carried out at the pilot plant - Upper Kayraktinskiy MMC.

As a result of these studies the conditioned **scheelite concentrate containing 55% WO<sub>3</sub> with recovery of 78%** was obtained.

It is proved that this ore deposit are relatively free-milling.

The South Zhaur deposit has commercial value, it is suitable for open-pit mining with a fairly high level of profitability and **could be considered as an additional resource base for “Kayraktinskiy MMC”**.

# Comparison of Upper Kayrakty and South Zhaur deposits

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### Comparison table of the main technical and economic indicators

Indicators	Units	Upper Kayrakty (A+B)	South Zhaur (anticipated)
<b>Geological (on-balance) reserves of A + B categories</b>			
Resource	mln t	270	<b>107.2</b>
<b>Grade:</b>			
WO <sub>3</sub>	%	0.136	<b>0.186</b>
Molybdenum	%	0.0032	<b>0.011</b>
<b>Contained :</b>			
WO <sub>3</sub>	thou t	368.2	<b>199.38</b>
Molybdenum	t	8,547.0	<b>11,771.6</b>
<b>Stripping ratio</b>	M <sup>3</sup> /t	1.39	<b>1.96</b>
<b>Volume of stripping</b>	mln t	375.30	<b>193.76</b>

### The analysis shows that:

- 1) The volume of ore and metal reserves of the Upper Kayrakty is 2.5-2.7 times higher than the South Zhaur's reserves. This leads to the increase in cost of mining and ore processing at least by 3-5 times.
- 2) However, according to the content of the main components (metals) in the ore, the South Zhaur deposit is clearly preferable that is reflected in the output of the final product (concentrate) at a lower cost of the mining and processing of ore. This leads to faster development of the South Zhaur deposit.

### The on-balance reserves of the Upper Kayrakty deposit

	Units	Category		
		A	B	C1
Resource	mln t	85.8	184.2	581.3
WO <sub>3</sub>	thou t	125.6	242.6	764.6
Mo	t	3,066.0	5,481.0	28,794.0
Bi	t	29,086.8	45,560.4	112,756.3

# **Prospecting Program and Contract**

## **SOUTH ZHAUR PROJECT**

- The Tungsten and Molybdenum Exploration Contract for the South Zhaur deposit concluded on 4 August 2014.
- Prospecting program for the South Zhaur deposit prepared by "Training Center "Timerlan-2011 " LLC in 2013.

Basic contract options:

- Period of exploration - **5 years**;
- Exploration costs - **USD 5,484.48 thousands**.