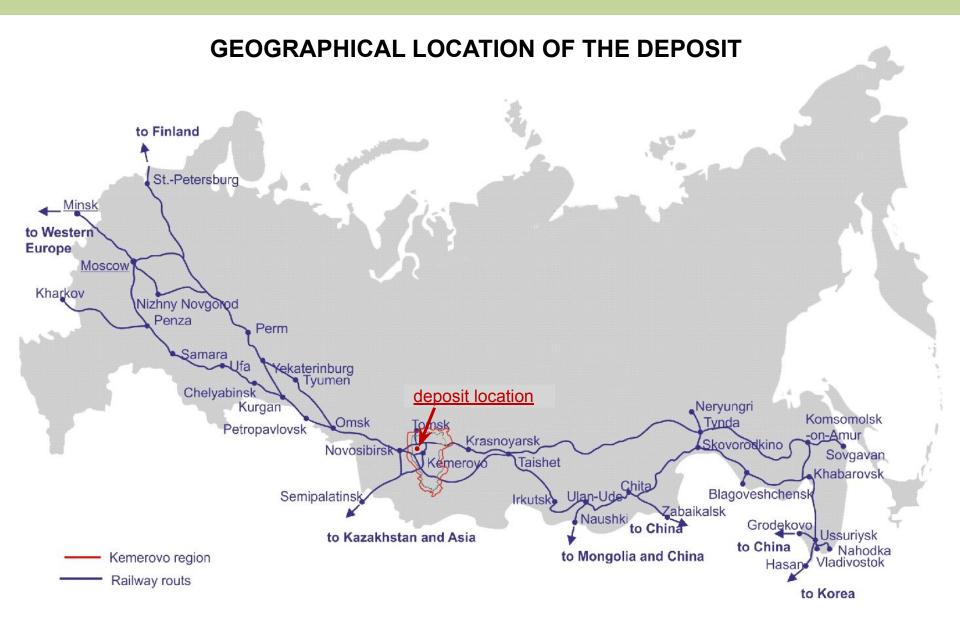


# Glushinskiy Coking Coal Deposit Development Project



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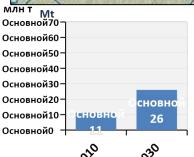


#### **DEVELOPMENT STRATEGY FOR RUSSIAN PORTS**

	2010	2015	2020	2025	2030
Ports of Russia, million tonnes	65,0	104,0	119,0	119,0	137,0
Ports of Ukraine and Baltic states, million tonnes	35,0	24,0	17,0	17,0	9,0
Total, million tonnes	100,0	128,0	136,0	136,0	146,0

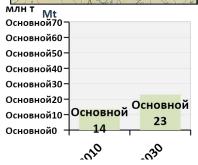
# North direction





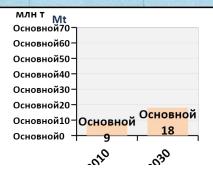
# West direction





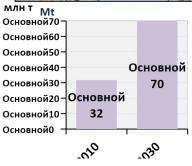
# South direction





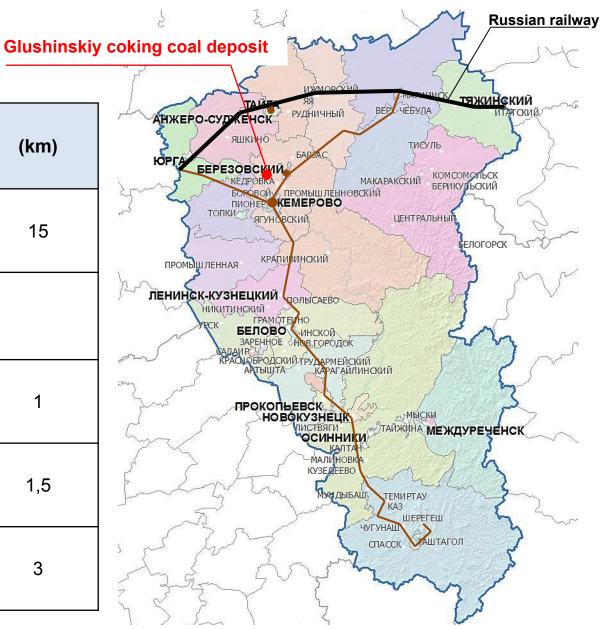
# East direction





# DEPOSIT LOCATION ON THE MAP OF KEMEROVO REGION

Distances from the Deposit to	(km)
Kemerovo city	15
Kemerovo – Anzhero-Sudzhensk railway main line	
(links Trans-Siberian Railway)	
Kemerovo – Anzhero-Sudzhensk motorway	1
"Baikal" Federal highway (M53)	1,5
Power line 220/110/35/6	3

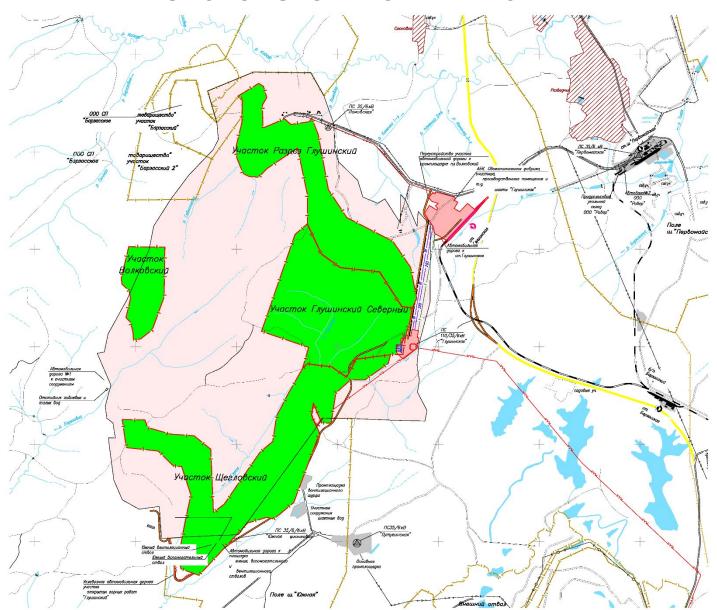


# ROVER LLC.

## **LAYOUT**



#### SECTORS OF ROVER LLC.



# ROVER'S ON-BALANCE RESERVES AS AT 01 January 2015

NAME OF SECTOR	Or	-balance r	eserves as	at 01 Janua	ary 2015 (t	housand tor	ns)
	Grade	В	C1	B+C1	C <sub>2</sub>	Subtotal	TOTAL
	Glushinsk	kiy deposit					
Scheglovskiy –north (KEM 00587TЭ)	К	0	12325	12325	0	12325	12325
	ксн	8143	17616	25729	0	25759	
	кж	0	233	233	0	233	
Glushinskiy -north (KEM 15272 TЭ)	КО	0	359	359	0	359	46236
	КС	5633	2197	7830	0	7830	
	К	0	12055	12055	0	12055	
	кж	0	646	646	0	8379	
Glushinskiy open-pit mine (KEM15424 TЭ)	КСН	3877	2559	6436	0	77	7082
Volkovskiy (KEM 15317 TЭ)	КС	0	5082	5082	255	5337	5337
Total amount of Glushinskiy open-pit mine reserves							70980

According to the infrastructure of Rover LLC., there is a possibility of increasing the reserves up to 500-600 mln. tons.

# **Specifications of Rover LLC. coal producers**

Coal producer	On-balance reserves, thousand tons	Way of a reserve development	Stage of development
Glushinskiy open-pit mine	7082	open, underground	working
Scheglovskiy open-pit mine	12325	open, underground	working
Glushinskaya-north mine	46236	underground	under construction
Volkovskiy open-pit mine	5337	open	under construction

# Glushinskiy open-pit mine Characteristics of the plant

Item	Unit	Open-pit mine
On-balance reserves	thousand tons	7082
Number of working seams	psc.	2
Coal Grade		KZh— coking fat coal KCH -coking low-caking low-metamorphized coal
Year of launching		working
Life of mine	year	15
Mining technique		Working, underground

## **Coal Seam Characteristics**

Coal Seam	Kemerovskiy	Volkovskiy
Coal's grade	KZh coking fat coal	KCH -coking low-caking low-metamorphized coal
Seam Thickness – average (m)	0,85	7,45
Average seam ash content (%)	12,8	11,7
Volatile matter (Vdaf), (%)	27,8	21,3
Thickness of the plastic layer(Y), (mm)	18	8
Calorific value (Qdaf), (kcal/kg)	8520	8550
Sulfur content, (Sr), (%)	0,36	0,29
Phosphorus content, (Pd), (%)	0,018	0,005

## General information about the open-pit mine

Glushinskiy open-pit mine is a working plant that includes a geological area Glushinskiy open-pit mine allocated to surface mining.

There are some formations of Kemerovo series in the boundaries of Glushinskiy open-pit mine. Kemerovo series includes Kemerovskiy seam and Volkovskiy seam, both having a great commercial value. Their total average capacity in the area of on-balance reserves is 9.15 meters. Kemerovskiy seam has quite a complicated structure and can be divided into two bands different in capacity and formation.

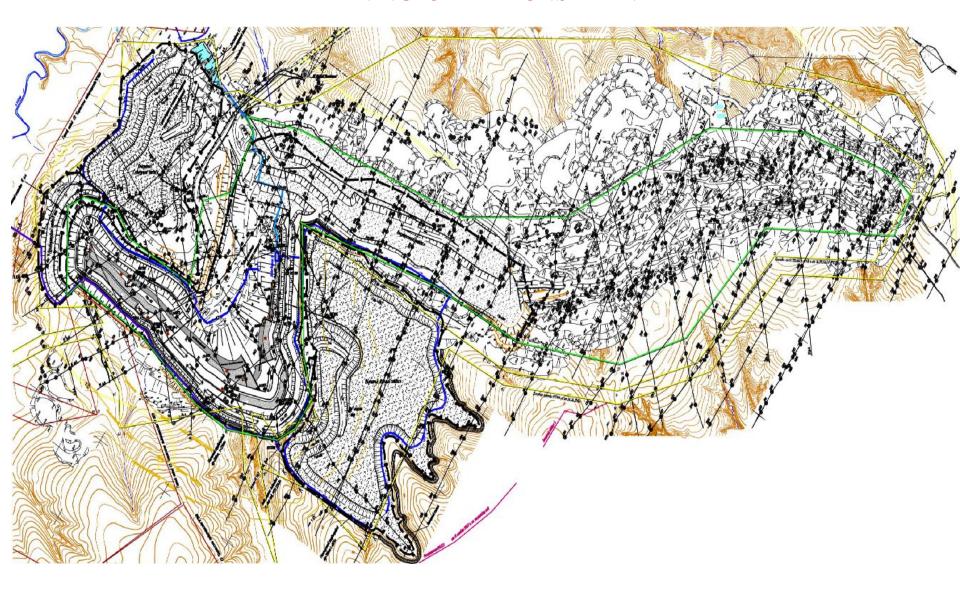
Volkovskiy seam is the main target formation in the mineral resources area Glushinskiy open-pit mine. On a stratigraphical basis it is 62 meters lower than Kemerovskiy seam and has a complicated structure too.

The mineral resources area borders with Barzasskoye Partnership LLC.

The way of Glushinskiy open-pit mine development is determined by the conditions of ground and the peculiarities of the mining method. The territory is exploited in one block. The system of a rolling cross-overs in the working area is responsible for the territory development. During this process the cross-overs transform into fixed ones while the highwalls come to the end position. Overburden rock is transported via cross-overs towards the external Southern and Northern dumping sites and also via transport bankettes to the internal dumping site situated in the exploited area. After that coal is transported to the coal preparation plant.

The choice of mining methods in Glushinskiy open-pit mine is determined by ground conditions of the area of surface mining operations. The angles of slopes vary from 7° to 30° on a territory under construction while an average angle of slope is 15°. According to this project, transport system of development should include autotruck transportation. However, it is possible to use a direct dumping method for cap rocks development due to the fact that Rover LLC. possesses dragline excavators ЭШ-11/70.

#### MINING OPERATIONS PLAN



# Scheglovskiy open-pit mine Characteristics of the plant

Item	Unit	Open-pit mine
On-balance reserves	thousand tons	12325
Number of working seams	psc.	1
Coal Grade		K - coking coal
Year of launching		working
Life of mine	year	62
Mining technique		surface mining, underground

## **Coal Seam Characteristics**

Coal Seam	Kemerovskiy
Coal's grade	К
Seam Thickness – average (m)	3,27
Average seam ash content (%)	18,1
Volatile matter (Vdaf), (%)	24,7
Thickness of the plastic layer(Y), (mm)	14
Calorific value (Qdaf), (kcal/kg)	8500
Sulfur content, (Sr), (%)	0,4
Phosphorus content, (Pd), (%)	0,004

## General information about the open-pit mine

Scheglovskiy open-pit mine is a working plant that includes a geological area Scheglovskiy allocated to surface mining.

Coal-bearing capacity of Scheglovskiy deposit is determined by formations of Kemerovo series which includes one seam of Kemerovskiy coal. It has a great commercial value as its average capacity is equal to 3.27 meters.

Coal reserves development in Scheglovskiy open-pit mine is fulfilled by four producing sections: Northern, Central, Eastern and Western.

The first section to be exploited is the Northern, then comes the Central, the Eastern and, finally, the Western.

According to the stated order, the development of each section is fulfilled independently. The choice of mining methods is determined by ground conditions of the area of surface mining operations as well as stated order of development and rated capacity. Due to the coal seam ground conditions the combined mining method is used at the open-pit mine.

# MINING OPERATIONS AND TRANSPORTATION LINES NEEDED FOR EXPLORATION OF THE AREA RATED CAPACITY

# Volkovskiy open-pit mine Characteristics of the plant

Item	Unit	Open-pit mine
On-balance reserves	thousand tons	5337
Number of working seams	psc.	3
Coal Grade		КС
Year of launching		2016
Year of rated capacity achievement		2017
Life of mine	year	8
Mining technique		surface mining
Mining method		transport

## **Coal Seam Characteristics**

Cool soom	Volkovskiy seam	Volkovskiy seam	Podvolkovskiy seam
Coal seam	main band	low band	
Coal's grade	KC- coking low caking	KC -coking low caking	KC-coking low caking
Seam Thickness – average (m)	2,65	2,6	3,07
Average seam ash content (%)	12,08	12,91	11,39
Volatile matter (Vdaf), (%)	18,8	18,8	19,4
Thickness of the plastic layer(Y),(mm)	6	6	7
Calorific value (Qdaf), (kcal/kg)	7600	7600	7600
Sulfur content, (Sr), (%)	0,24	0,24	0,25
Phosphorus content, (Pd), (%)	0,004	0,015	0,002

## General information about the open-pit mine

Volkovskiy open-pit mine, which is being designed at the moment, includes a geological area Volkovskiy allocated to surface mining.

Due to the small size of the open-pit mine, only the upper layer of one Kemerovo series (which is a part of Verkhnebalakhonskaya subseries and Balakhonskaya gang) is taken into account in the boundaries of the designed model. Kemerovo series includes Volkovskiy seam main band, Volkovskiy seam low band and Podvolkovskiy seam which have a great commercial value. Their total average capacity in the area of on-balance reserves is equal to 13.69 meters. The amount of vitrinite in coal is 48-49% with the blend reflectance index of 1.26-1.28 %.

In structural and tectonic respect this area represents a part of a thrust block 1-1.

The start of the construction works is in the year 2016. The year of rated capacity achievement is 2017. Life of mine is 8 years.

Due to the small size of the area it is important to avoid its division into sections but at the same time to use the possible length of its seams.

Taking into account the conditions of ground (in particular, the medium pitch of the seams), the current project is aimed to use mainly the transport system of development. Some parts of overburden close to the western pit wall (footwall) are planned to be developed using non-transport system of drag line 3L-10/70 with the waste being located in the near edge zone pile which is behind the technical boundary of the area.

The uncovering of working boundaries of the area must be fulfilled with the following system of opening to surface:

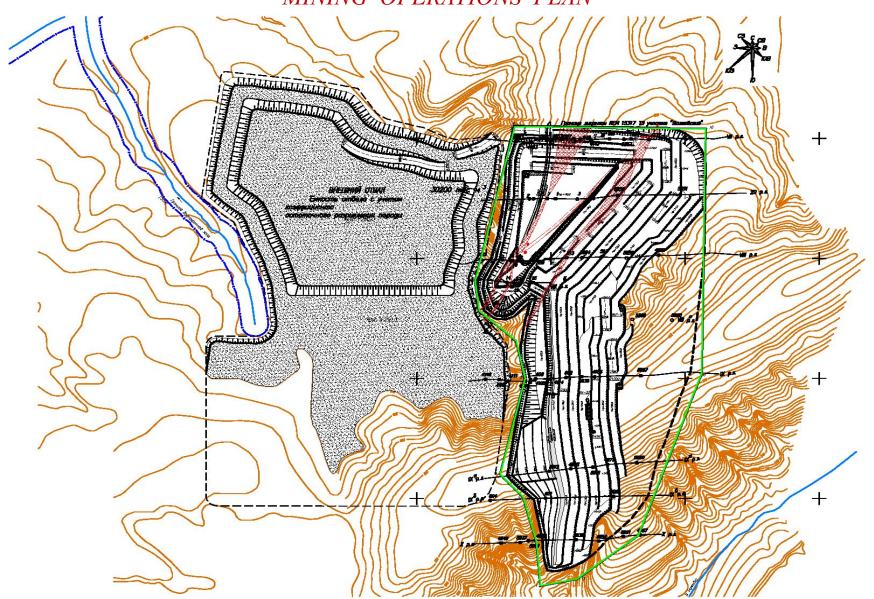
#### its high part

-with the system of half-trenches on the surface;

#### its core body

- -with the external deposit trench driven to the depth which is equal to the power of the pumps in the cross-cut end of the north-western pit wall;
- -with the system of sliding cross-overs in the working area which turn into the system of fixed cross-overs on an unworkable pit wall while the high walls extinguish when reaching the developing boundaries.

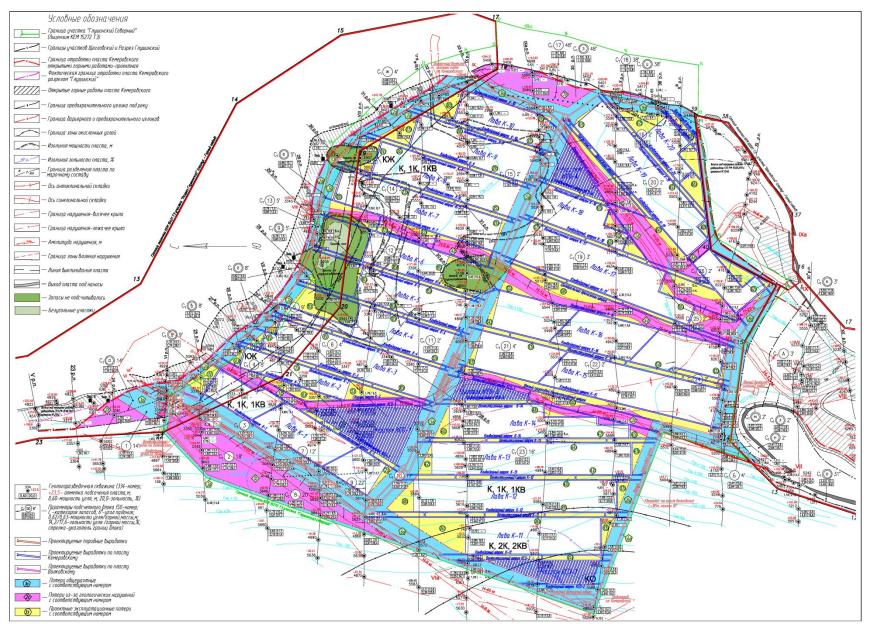
#### MINING OPERATIONS PLAN



# Glushinskaya-North mine Allotment characteristics

Items	Units	Value
On-balance reserves in license boundaries are confirmed by GKZ-State Reserves Committee (record № 3355 from 18 October 2013) as at 01 January 2015, categories B+C1+C1 oxyg.	thousand. tons	46 236
Number of seams (Kemerovskiy, Volkovskiy)	psc.	2
Seam thickness	m	1,5-2,9; 4,9-5,4
Industrial reserves	Thousand tons	31 705
On-balance reserves ash content	%	11,7 – 12,8
Ash content of mind rock	%	20,6-32,7
Mineral product		hard coal
Coal grades according to the all-Union State Standard 25543-88		K - coking coal KO - coking lean coal KC - coking low-caking KZh – coking fat coal

## Mining operations plan for Kemerovskiy seam



# Mining operations plan for Volkovskiy Seam

