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Iron Ore Department (LLP "Orken")

The Iron Ore Department (LLP "Orken") is a complex of four enterprises of Kazakhstan: the Lisakov branch of LLP "Orken" (Kostanay region), the representative office "Orken-Kentobe" LLP "Orken" (Karaganda region), the representative office "Orken-Atansor" LLP " Orken" (Akmola region), representative offices of "Orken-Atasu" LLP "Orken" (Karaganda region). The main activity is the extraction, processing and enrichment of iron ore from the Lisakovsk, Kentobe, Atasu, Atansor deposits and the subsequent supply of finished products, iron ore concentrate, to the main consumer - ArcelorMittal Temirtau JSC.

Lisakovsky branch of Orken LLP

The Lisakov branch of Orken LLP is one of the four subdivisions of the iron ore department (Orken LLP). Its history began with the discovery in 1949 of the Lisakovsky deposit of brown iron oolitic ores. A characteristic feature of the deposit is that the ore was located almost on the surface. Such an arrangement of the ore body makes it possible to efficiently and economically develop the deposit using modern high-performance mining and transport equipment with insignificant capital and operating costs.
The total geological reserves of oolitic ores are 6 billion tons, under the subsoil use contract - 1 billion tons. The field is a plateau-like deposit, stretching along strike for 100 km and with a width of several hundred meters to 6 km.
Capital mining work began in 1969. The first shipment of raw ore was made in 1971. Institute "Mekhanobr" in Leningrad and a number of other research and industrial enterprises carried out work on the development and selection of technology for the enrichment of Lisakovskaya ore. Based on the results of technical and economic calculations, a decision was made to commission capacities according to the gravitational-magnetic scheme. The first section was introduced in 1972, the second - in 1973, the third - in 1974.

During the operation of the enterprise, several generations of employees have changed. Historical conditions, names, forms of ownership of the enterprise changed. Only one thing has remained unchanged - the team has always adequately coped with all the tasks set, no matter how difficult and responsible they may be.
As part of Orken LLP, the Lisakov branch began its activities on March 1, 2000. The enterprise is the legal successor of the Lisakovsky Mining and Processing Plant.

The assets of the Lisakovsky branch of Orken LLP include a mine, a railway shop, a gravity-magnetic enrichment plant for processing the original ore to produce iron ore concentrate, a central laboratory, a motor transport and mechanical repair shops, a technological dispatching and communications section, a power plant, production preparation and nutrition sections and management. Today LF LLP "Orken" is one of the main enterprises of the city of Lisakovsk.
At various times, the staff of the Lisakovsky branch of Orken LLP solved complex tasks to ensure the life of the enterprise. From 1975 to 1992, a pilot plant for roasting-magnetic enrichment was operated at the Lisakovsky GOK using a stepwise suspended bed furnace (SHS - 1.0) as a thermal unit. The design capacity of the plant for raw ore is 1 million tons per year. Part of the concentrate was used to conduct large-scale industrial tests of agglomerated calcined magnetic concentrate in modern blast furnaces in the form of sinter, uncalcined pellets, uncalcined ore-flux-coal pellets and roasted pellets from 1981 to 1985.

Lisakovsky concentrate of gravity-magnetic enrichment has low consumer properties due to the high content of phosphorus. In this regard, CJSC "Mekhanobr Engineering" proposed a new technology for dephosphorization and increasing the metallurgical quality of the

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concentrate. Since 2004, the Lisakov Branch has begun work on the construction of a department for the removal of harmful impurities and the installation of process equipment. Since 2012, work on the site has been suspended until the design results are achieved by contractors at a pilot plant with a complete development of the technological process.

Today, the miners of the Lisakov branch of Orken LLP have a new goal - the commissioning of site No. 5, which contains 68.6 million tons of type 1 ore. A total of 240,820 thousand tons of ore have been mined since the beginning of the operation of the quarry and the operation of the gravity-magnetic enrichment factory. The company's team is working with full dedication, as they understand the importance of commissioning a site that will eliminate the shortage of type 1 ore and, as a result, prevent a decrease in production.

Representative office of "Orken-Kentobe" LLP "Orken"

The Kentobe iron ore deposit is located in the Karkaralinsky district of the Karaganda region. The total geological reserves are 131.6 million tons, of which 22.6 million tons are for open pit operations.
The deposit was discovered in 1949. In 1950-1980, it was explored. And since 1983, direct operation began. The length of the deposit is 2.5 km. The width of the deposit is 300 m. The design capacity of the enterprise per year is 2.5 million tons of raw ore, 2.1 million tons of iron ore concentrate. The development of the deposit is carried out by an open method according to the project created by the Uralgiproruda Institute JSC (Yekaterinburg).
The Kentobe mine is an easily processed raw material with good magnetic properties. Since February 16, 2001, the enterprise has been a part of the iron ore department of ArcelorMittal Temirtau JSC. It included: mining and crushing sections, railway and motor transport workshops, technical control department, power section, administrative staff. Work is carried out on a rotational basis.
The applied system for the development of the Kentobe deposit is transport with external dumping. Rock overburden and ore are developed with preliminary drilling and blasting.
For loading the rock mass, excavators of the EKG-5A straight shovel type with a bucket volume of 5.0 m3, KOMATSU PC1250 straight shovel with a 5.5 m3 bucket, and CAT-385 with a 5.0 m3 backhoe bucket are used.
Drilling of wells involves roller drilling machines SBSh-250 MN.
The main mode of transport for the transportation of ore and overburden rocks is automobile: BelAZ-7523, KOMATSU HD-465 and CAT-773E, as well as vehicles of contractors.
The mined ore is transported to the crushing and processing plant. At the complexes of large, medium and fine crushing, the ore is crushed, and then subjected to dry magnetic separation, that is, the enrichment process is carried out at the crushing and processing plant - this is the separation of rock from iron ore.
The dosage of wagons to the norm of carrying capacity, their weighing and inspection takes place in the railway workshop. Here, enriched iron ore concentrate with an iron content of 55-56% is shipped and sent by rail to the steel department of ArcelorMittal Temirtau JSC.

Representative office of "Orken-Atasu" LLP "Orken"

The representative office of "Orken-Atasu" LLP "Orken" became part of the Iron Ore Department on January 6, 2003. The main activity is the extraction, processing and enrichment of iron ore from the Western Karazhal deposit and the subsequent supply of finished products, iron ore concentrate, to the main consumer - ArcelorMittal Temirtau JSC.
The Western Karazhal deposit is located in the Zhanaarkinsky district of the Karaganda region, 350 km. southwest of the city of Temirtau. Discovered in 1932 by geologist I.G. Nikolaev and was studied over several stages until 1985. After a six-year break, exploration work resumed in 1939-1941. From that time on, exploration was carried out almost continuously until 1967.
The deposit is located within the wing of the Zhailma trough and extends from west to east for 5500 m with a southern dip at an angle of 350 . The ore deposit that makes up the deposit is a consistent mineralization in the form of layers of iron and manganese ores with a thickness of iron ores (2.0 - 20.6m), manganese ores (2-8m) with blow-ups up to 30m. The ore deposit has been traced to a depth of up to 1720m, dipping to the west at an angle of (10-150).
The deposit is conditionally divided into three mine fields: I - 64m, II - 46m, III - 24m. The total thickness of the ore strata averages 44 m.
According to the mineralogical composition, the iron ores of the Western Karazhal deposit are a mixture of the main ore minerals hematite and magnetite with a variable amount of quartz and calcite. Minor minerals are siderite, ferruginous chlorites, stilpnomelane, and pyrite.
According to the predominance of iron minerals, hematite, magnetite-hematite and magnetite natural types of ores are distinguished. According to the predominance of the main ore minerals, brownite, hausmanite, jacobsite and hematite-brownite ores are distinguished among manganese ores.
The average content of the main chemical components (iron and manganese) in the balance ores of the Western Karazhal is respectively: iron ores - 51.06 and 1.03%; manganese ores - 9.28 and 20.04%.
In both iron and manganese ores, the content of such harmful components as arsenic and

phosphorus pentoxide is low (0.01–0.02% and 0.04–0.09%, respectively).
The basicity coefficient of iron ores is low (0.14 - 0.18), therefore, in the metallurgical processing, iron ores require fluxing.
The sulfur content in manganese ores is low - 0.05–0.06%, arsenic - 0.01–0.02%. Relatively increased content of lead (up to 1.92%) and zinc (up to 0.68%).
Since 1956, iron and manganese ores have been mined open-cast at the West Karazhal deposit. From 1972 to the present, the deposit has been mined underground - the Western Karazhal mine with an annual design capacity of 2,200 thousand tons of iron ore per year.
The extracted iron ore is processed at the concentration plant. The resulting products, iron ore concentrate class 10-60 mm and 0-10 mm with an iron content of 55-56%, are shipped to the consumer ArcelorMittal Temirtau JSC.

Today, the representative office of "Orken-Atasu" LLP "Orken" unites more than 1,000 employees. The share of the local population in the total number of employees is 100%. The life support of the enterprise is carried out by the Western Karazhal mine, a processing plant, a railway and motor transport workshops, a repair and construction site, a laboratory workshop, an energy workshop, central electromechanical workshops, a production preparation and storage facilities, a social complex, a technological dispatching section.

Currently, the miners are building the horizon +44m of the Western Karazhal mine. Since the discovered reserves of the +44m horizon deposit amount to 26.5 million tons of iron ore, with a design capacity of 2.0 million tons of ore per year, these reserves will be worked out within 15 years. Therefore, during 2015-2016. to ensure the continuous production activities of the Orken-Atasu representative office of Orken LLP and the social life of the city, the team plans to begin construction of the next horizon - 70m of the Western Karazhal mine with an annual capacity of 2.5 to 10.0 million tons of ore. The design institute has already been given a task to carry out a feasibility study for the construction of the horizon.

Representative office of "Orken-Atansor" LLP "Orken"

Representative office of "Orken-Atansor" LLP "Orken" is a fairly young enterprise. On November 12, 2004, it became part of the iron ore department of ArcelorMittal Temirtau JSC (Orken LLP).
The Atansor deposit is located in the Enbekshilder district of the Akmola region, 80 km. from Stepnogorsk.
It was opened in 1932 and is the only operating iron ore mine in the Akmola region. The reserves of the deposit amount to 37 million tons and are sufficient for development until 2030.
The design capacity of the enterprise for raw ore is 1.7 million tons per year, finished products (iron ore concentrate) - up to 0.7 million tons per year. Uninterrupted work is carried out by employees of the mining shop, the crushing and processing plant (crushing and screening and processing sections), the motor transport and railway shops, the technical control department, the energy and mechanical services, management, and the workers' camp. Work is carried out on a rotational basis for 15 days.

Martite and magnetite ores are mined here. Due to the different composition and type of ores, tectonic faults in occurrence, the deposit is considered to be quite complex and heterogeneous. To this end, an enrichment plant was designed and put into operation by the end of 2011.
The geological conditions of the Atansor deposit make it possible to develop it in the most efficient way - open pit.
The quarry is equipped with modern highly efficient mining transport and special equipment Kamatsu, Atlas Copco. For drilling operations, a ROC L8 drilling rig is used. Excavation and loading operations are carried out by excavators with a bucket capacity of 4.1 m3 and 5.5 m3. When transporting ore, rocks from overburden operations, Kamatsu dump trucks with a carrying capacity of 35 tons and 55 tons, HOVA dump trucks with a carrying capacity of 30 tons are used. Dumping is carried out with the participation of bulldozers. Loaders are used for storage and blending of ores.
By crushing, screening, dry magnetic separation, the ore goes through the entire technological process of enrichment. The result is an iron ore concentrate with an iron content of 54-55% and tailings with an iron content of less than 20%. Iron ore concentrate is transported by rail to the steel department of ArcelorMittal Temirtau.

Concentrate production and its shipment to the ArcelorMittal Temirtau steel plant is 500,000 tons per year. The company is aware of its responsibility to employees and society. From that, he sees for himself the main task of ensuring stability for the long term.

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