MINING WITH ICE-ROCK FILLING

Description
The suggested method is designed to improve the efficiency of mining through the optimum utilization of mineral resources, logistic facilities, and climate conditions. The original resource-saving method of permafrost mining implies long-wall mining and filling the worked-out space with ice-rock material which provides lower losses and mineral dilution than the traditional room-and-pillar method (3% and 21% against 28-30% and 30-35%, for losses and dilution, respectively). The key idea is to use frozen waste overburden instead of gold-bearing ore as support.

Technical appraisal and economic benefits
- 10 times as low ore losses and 40% lower dilution than in the old room-and-pillar method, tested at a medium-thickness inclined ore body (Badran deposit);
- effective support of the worked-out area without building up the filling cemented with expensive materials;
- reduced environmental damage;
- possibility to combine the new method with other mobile and cheap methods applied to low-grade deposits.

Application areas
Mining industry.
The method is recommended for underground permafrost mining in ore bodies of any thickness and dip provided that the ore and the host rocks allow stable breakage headings for the period of mining and filling.

Development stage
Full-scale testing at Badran gold ore deposit in the Republic of Sakha (Yakutia).

Patent situation
Patent of the Russian Federation. Know-how on
- production technology of ice-rock filling;
- effective techniques for enhancement of stability of artificial support;
- shortening ice-rock freezing time.

Commercial offers
Contracts for technology transfer.

Estimated cost
Under the contract.

Contacts
Sergey M. Tkach, Cand. Sc., Deputy Director
Institute of Mining of the North, Siberian Branch of the Russian Academy of Sciences
43, Prosp. Lenina, Yakutsk, 677018, Russia
Phone: (4112) 44-59-37
Fax: (4112) 44-59-30
E-mail: igds@ysn.ru
http://www.sitc.ru/vnc/gorny.htm