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Meeting Paper

Solution Mining and Using Caverns in Permafrost Sands

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SOLUTION MINING AND USING UNDERGROUND STORAGE IN PERMAFROST

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Abstract

Russian's Far East Republic Sakha has successful 10-years experience in some underground caverns solution mining in permafrost and using of such caverns as gas condensate storage.

Solution mining cavern development is granulated ice-filled permafrost deposit "in situ" thawing at the open well part on the depth from 10 m to 100 m and more by the water flow .

The water was injected into the well by the pump from natural water sources through the working columns annulus, and destroyed ground in form of water-sand mixture was pressurized through central (i.e. inner) work column to the surface .

The well water level was maintained beneath the case foot by some " unthawing agent", i.e. compressed air or natural gas .

The case was refrigerated by the cold brine circulation at the annulus. The purpose was out case permafrost thawing and well degermetizing preventing.

Up to this time three underground caverns were build at Mastakh gascondensate field near river Viluy and are used for gas condensate treating and storage.

One cavern was built at the head part of gas pipeline Mastakh field - Yacutsk, the purpose was pipeline drainage liquid storing .

All of them were at the Republic Saha central part, because its geocriological conditions are the best for that type of storage.

Such possibilities of caverns aimed for many purposes building are rather good at some Far North regions and up to this time fairly don't used.