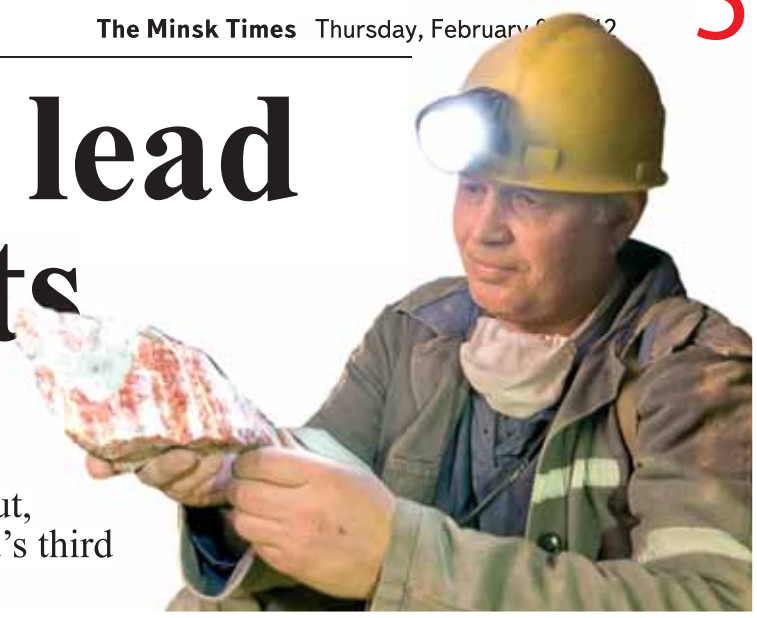
Mining labyrinths lead to valuable deposits



The Starobin deposit of potash salts (around which has grown the town of Soligorsk) was formed about 350m years ago. People have been extracting sylvinite ore there for only a short period of time — just over 50 years — but, over this time, Belarusian industrial giant Belaruskali has become the world's third largest enterprise for potash fertiliser production.

By Ignaty Filippovich

Potassium labyrinth

Before my 'underground experience', I put on the special uniform worn by all Belaruskali employees: blue cotton trousers and shirt and a jacket bearing fluorescent strips and the 'Belaruskali' logo, as well as rubber boots. It's obligatory to wear a helmet with lamp and I hang a self-rescuer (rather like a thermos) on my shoulder. It can be used for breathing in an emergency, so could save my life. "It's enough for sixty minutes of activity or three hundred minutes if you sit quietly waiting for help," notes Alexey Bashkardin, Deputy Chief Engineer on Labour Protection at the fourth pit.

We sign a journal to record our entry and approach the mine shaft with its 'lift-cage'. Within a few minutes, we're 670m below sea level, at an absolute depth of 824m, where the 'third potassium horizon' is being developed. Soligorsk's subsoil riches meet us with a light breeze, as fresh air is supplied to the pit from the surface. A futuristic looking angular vehicle, as we might see in sci-fi films, awaits us in the tunnel; it has no windows except for a windscreen and the seats are simple benches. I'm invited to travel in the cabin with the driver but am warned to keep my hands well inside the vehicle. A minute later, I understand why; the tunnel is only 20cm wider than the vehicle itself.

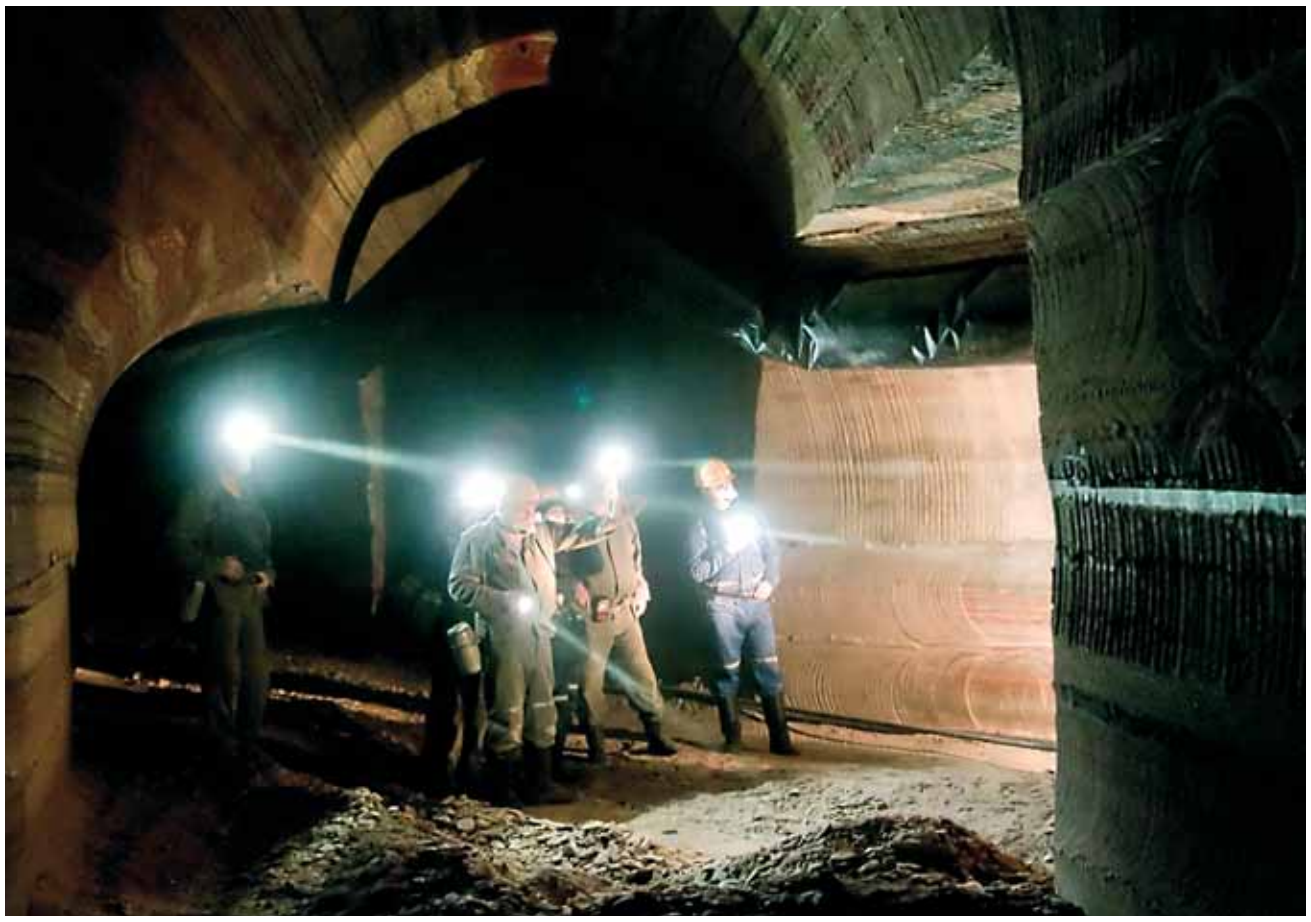
After 9km of 'underground curves' we arrive at a scouring mine tunnel: a long, narrow hole through the sylvinite, where ore is being extracted. The rock above our heads is supported by hydraulic devices while a combine (called a 'winning machine' in mining terminology) moves along the mining face, cutting 80cm wide strips of ore. It's broken into pieces, then transported by conveyor belt to the cargo hole, where it's lifted to the surface and sent to the ore-dressing factory.

My first impression is that this is a version of hell, as the height from floor to ceiling ('bottom' and 'roof') is less than 1.5m; miners are obliged to work on their hands and knees or on hunkers, wearing knee pads. Each shift lasts 6 hours 12 minutes as, according to the Labour Code, the working week mustn't exceed 35 hours underground. It's extremely hot, as there is so much machinery in a limited space, and the clatter is almost unbearable, not to mention the dust. Ear muffs are worn to protect from noise while respirators protect from dust.

A conventional telephone line connects sections of the pit with the surface, as mobile phones don't work at such a depth. The phones look bulky and awkward but are reliable. If anyone is taken ill, you can call the medical station; medical staff are located within 9km of the hole.

"First assistance may be provided by the mining master, and the telephone can be used to call a medical assistant. If the case is serious, an ambulance can be sent immediately — such as for a heart attack. Our miners tend to ignore a raised temperature, as this seems trivial to them," notes Mr. Bashkardin.

When millions of tonnes of capricious nature separate you from the Earth's surface, it's difficult not to let your imagination run wild. If an accident were to occur, the electricity would fail and the machines stop. You might have to walk a dozen kilometres on foot to reach the shaft, with only your helmet lamp to light the way. Imagine the horror of doing so alone. In fact, the miners 'rehearse' such situations twice annually, as preparation is the best course. Evacuation is practised using the militarised mine-and-rescue service and the liquidation plan is updated.



Belaruskali's miners easily find routes in underground labyrinths

The human factor

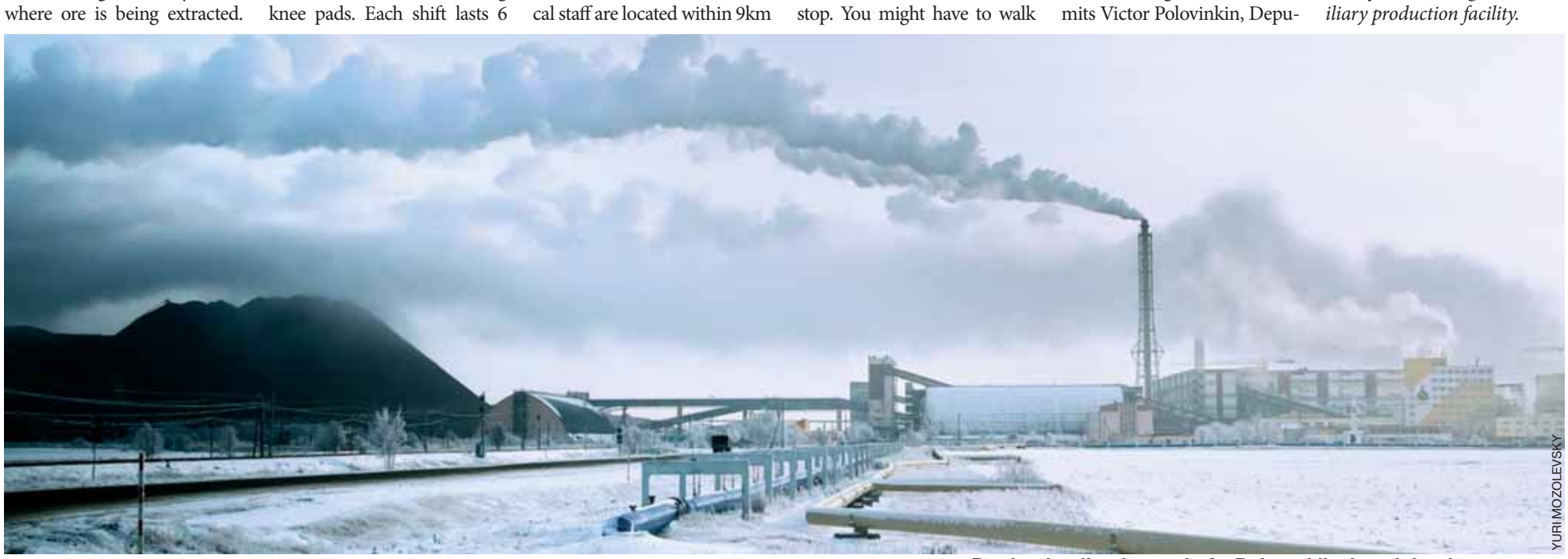
"Under the earth, all living space is created artificially: lighting and ventilation, transport and the power supply. Mining is a risky job, with unusual working conditions," admits Victor Polovinkin, Deputy Head of the Department for Labour Protection, Industrial Security and Mining and Rescue Works. "Each miner's major challenge is to withstand and maintain the artificially created working zone."

Methane levels are constantly monitored, since raised levels are dangerous; if the concentration rises to one percent, work ceases and special ventilation is switched on.

Analysing accidents from 2011, it's evident that most emergency situations occur due to human error. "We are ever updating our equipment and technology but training people to make correct decisions is the hardest task. We have 1,900 employees at our mine, with a third working on the ore face. The situation at the bottom changes every second, so it's vital to make the right decisions, assessing dangers and risks," notes Andrey Golitsyn, the Director of the fourth mining group. "We are constantly instructing people and, if someone doesn't know the safety requirements, they're dismissed, according to the law. All our rules are written in blood."

Vladimir SHPAKOVSKY, Chief Engineer at Belaruskali JSC:

Mining is very dangerous, so we don't indulge in any japes here. Of all industrial enterprises countrywide, we pay the highest salaries, so we can select staff carefully. You don't come here straight out of school, as you need to be well-educated and receive special training. You also need references from working at an auxiliary production facility.



YURI MOZOLEVSKY

Production 'landscape' of a Belaruskli mine pit in winter season