Russia roots for potash

Ailbhe Goodbody visited EuroChem's VolgaKaliy potash project near Volgograd, Russia, in April to learn about how the company is progressing with construction of the facility

Overview of construction at VolgaKaliy

EuroChem is Russia's largest mineral fertiliser producer, and is aiming to establish itself as one of only four fertiliser companies with a significant presence in all three fertiliser nutrient categories – nitrogen, phosphorous and potassium (NPK). The other three companies that are in this category are PotashCorp, Mosaic and Agrium.

EuroChem is already active in nitrogen and phosphate, and has expanded into potash. The company has obtained development licences for two large greenfield potash projects: EuroChem-VolgaKaliy, at the Gremyachinskoe deposit near Volgograd in western Russia, and EuroChem-Usolskiy, at the Verkhnekamskoe deposit near Perm.

EuroChem says its projects at VolgaKaliy and Usolskiy represent the biggest single investment in the potash sector for over 50 years, at US$7 billion – of this, US$4 billion is for VolgaKaliy and US$3 billion is for Usolskiy. The company has spent US$1.5 billion so far, and the peak investment years are from now until 2015.

The combined annual production capacity of these projects is 8Mt/y, which will make EuroChem a top-five fertiliser producer by nutrient capacity. Based on the company's current schedule, ore production is expected to start in late 2017 at VolgaKaliy and in late 2017 or early 2018 at Usolskiy.

EuroChem has decided to focus more on the VolgaKaliy site, as it has a number of advantages over Usolskiy, such as a more convenient location. The VolgaKaliy mine is close to roads and railways, which is an advantage in cutting transport costs. It also has oil and gas pipelines nearby. Clark Bailey, director of mining at EuroChem, says: "This is an extraordinarily great location, not just for the resources."

VolgaKaliy is also only around 500km from the company's Tuapse port on the Black Sea. The port can handle 2.5Mt/y of potash, and EuroChem has a fleet of Panamax ships there.

VolgaKaliy is in a region with a varied climate, with temperatures reaching as high as 45°C in summer and dropping as low as -40°C in winter. When arranging the layout of the site, EuroChem says that the key priority was to minimise the area of the site used and keep the facilities as close together as possible, as this keeps transport and logistics costs down. The buildings used for processing were also built as large as possible, to minimise logistics costs.

GREMYACHINSKOE

The Gremyachinskoe deposit is a flat potash layer 1,000-1,250m in depth, protected by a thick salt layer. As of April,

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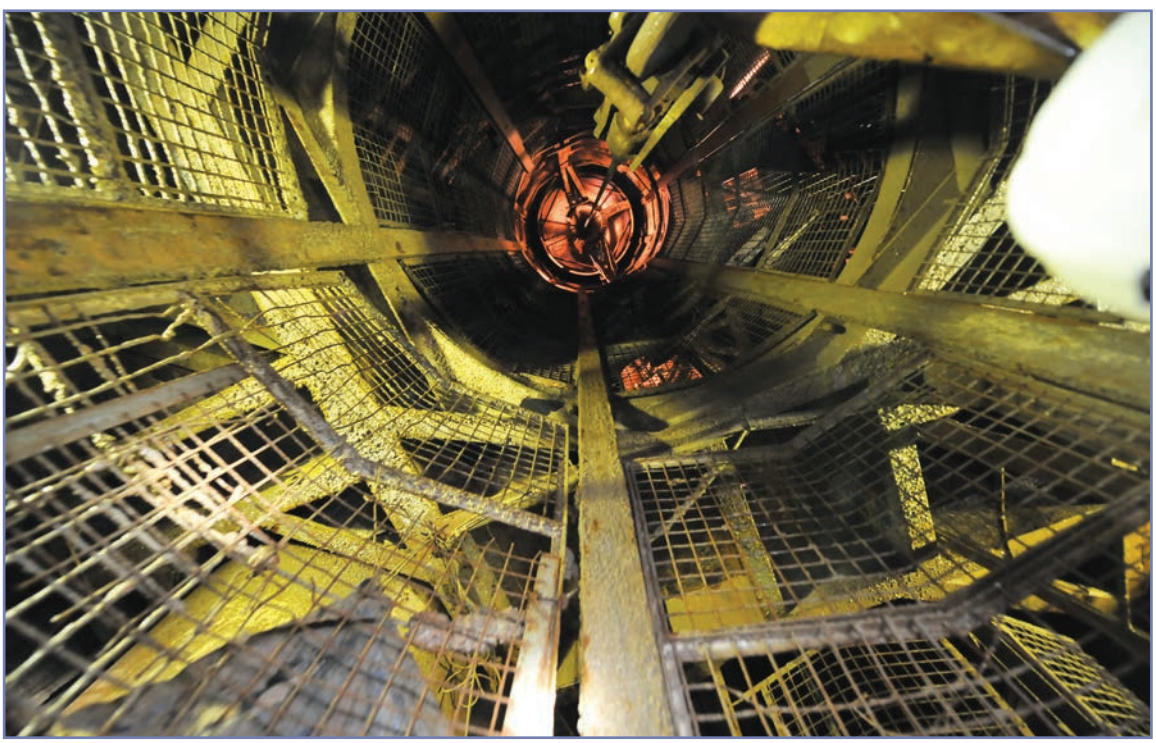

Looking up skip shaft #1 at VolgaKaliy

Panorama of the mine site at VolgaKaliy

the Joint Ore Reserves Committee (JORC) estimate of proven and probable reserves is 492Mt with 39.8% potassium chloride (KCl) nutrient content.

Olivier Harvey, head of investor relations at EuroChem, says: "According to JORC, the life of mine is 58 years. However, we've upped the size of the mill since that, so it will be 46 years at full capacity."

The VolgaKaliy site will allow EuroChem to produce complex fertilisers with full integration. The company already uses 150,000t/y of potash, which it buys on the open market; it plans to use the first 1.4Mt/y produced at VolgaKaliy internally. In 2012, EuroChem purchased a fertiliser plant in Antwerp, Belgium, from BASF to process the potash.

The rest of the potash will be sold on the global market; the main markets for potash are Brazil, India, China and south-east Asia. There is currently a global demand for around 55-56Mt/y, and the market growth is approximately 2%.

The Verkhnekamskoe deposit, where the Usolskiy project is based, is a much shallower orebody at around 500m. This means that it is cheaper to mine, but as the site is further from a port (approximately 1,600km) and the KCl concentration is lower (30.8%), it is not as advantageous as VolgaKaliy. The JORC estimate of proven and probable reserves at Usolskiy is 420Mt.

Most of the other potash projects currently in operation worldwide are brownfield projects that are upgrading older equipment and techniques. A greenfield project such as VolgaKaliy requires a lot of infrastructure, such as office buildings, staff accommodation, transport connections and power lines.

Worldwide, there are two other fully approved greenfield potash investments at the moment. However, EuroChem says that the potash it will produce will be very competitive on price when compared with other producers.

"It's going to be hard to beat us on price," says Bailey. "The resource itself is an advantage, because of the ore quality

Gremyachinskoe facts

Licence area:	96.9km^2
Depth:	1,000-1,250m
Licence acquired:	2005, via auction
Purchase price:	US$106 million (Rb3.1 billion)
Productive layer:	from 1,004m to 1,295m
Productive layer capacity:	from 2m to 21.5m
Average thickness of productive layer:	8.9m

and the thickness of the deposit, and the mining area is quite flat as well. Labour and materials are also cheaper here than they are in other potash-producing countries, such as Canada."

PROJECT HISTORY

Phase I of the VolgaKaliy project, for an initial capacity of 2.3Mt/y of KCl, involves the construction of social infrastructure, a cage shaft, skip shaft #1 and a processing facility. The total investment for this stage of the project is US$2.6 billion, of which US$1.1 billion had been spent as of December 31, 2012.

Phase II of the project is for an additional 2.3Mt/y capacity, making the capacity 4.6Mt/y in total. It involves the construction of skip shaft #2 and the expansion of the processing facility. The total investment in this phase amounts to US$1.4 billion.

As of April, skip shaft #1 has been sunk to 572m deep. The shaft, which is planned to reach a final depth of 1,147m, is being sunk by the EuroChem-VolgaKaliy team using a traditional freezing method.

The shaft cuts through an aquifer, which can cause a number of problems such as flooding. EuroChem uses a technique that was first used in Poland, where boreholes are drilled around the shaft and coolant is used to freeze the ground around it. The shaft can then be sunk and the concrete lining is put in place.

Difficult geological conditions encountered in May 2011 slowed down the sinking rate of the cage shaft. The cage shaft had been sunk to 100m via cementation, but was unable to progress using this method.

In the December quarter of 2011, EuroChem announced that it was dismantling the cementation equipment and that it would resume the cage shaft-sinking using freezing technology. The company put in freeze holes down to 820m, a few metres below the aquifer, to give an ice wall down the shaft. Ground freezing for the cage shaft is set to start soon, but due to the delays the shaft will not be completed until 2015.

In October 2012, EuroChem stated that it was filing a US$800 million claim against South African contractor Shaft Sinkers for delays in building the cage shaft at VolgaKaliy. The claim, which was filed in Zurich (Switzerland) and Paris (France), included US$165 million for incurred costs that were written off, as well as forgone profits from the delay in the start-up of potash production.

A decision was made to bring forward the start of sinking operations for skip shaft #2 instead, which is expected to start this year, ahead of the original schedule. Thyssen Schachtbau has already drilled and cased 44 holes as well as control boreholes. EuroChem has hired a contractor called US-30 for the shaft construction and is currently negotiating the contract terms; US-30 is also creating the shafts at Usolskiy.

The second phase of the project is expected to finish building in 2020. It will take approximately two years to wrap it up, so 2022 is the estimated date that the mine will begin working at full capacity.

The processing plant at VolgaKaliy is also currently under construction. So far, workers' facilities, 18,000m^2 of storage space, temporary roads, a waste dump road, a water reservoir and an assembled transformer substation have been completed. As of April, a total of 16,108 of the 17,662 piles (91%) had been sunk, and 8,807m^2 of sandwich panels had been assembled.

Looking upwards into skip shaft #1

Headframe at VolgaKaliy

INFRASTRUCTURE

EuroChem has already developed infrastructure for the VolgaKaliy site. Around 10.3km of railway has been built to connect the site to the main lines, and the Gremyachaya railway station is used for freight operations. High-voltage (110/10kV) electricity lines connect the Kotelnikovo and Zalivskaya substations to the processing plant, and there is a 110/10kV 10MVA substation on the site for freezing. Electricity distribution lines, a communication network and a natural-gas supply have also been developed.

The company will continue the development of further railway infrastructure, and is constructing a core 220/10kV substation. Design works are also under way for a gas distribution station, an external gas pipeline and gas distribution systems for the processing plant.

At the very first stage of operations, EuroChem built accommodation for its construction workers. The accommodation has capacity for about 1,000 people.

EuroChem says that social infrastructure is very important in the development of this project, and can be a very serious limitation factor at mine sites. Attracting skilled personnel can be a problem at any mining project, and EuroChem had two options – either to have staff working on location but living elsewhere, or to build a permanent town to attract workers to live there full-time. The company chose the second option, which is more expensive but more attractive to potential staff and will help the development of the region. ►

"It's going to be hard to beat us on price. The resource is an advantage, because of the ore quality and the thickness of the deposit, and the mining area is quite flat as well"

The construction site of the Vostochniy residential area for Eurochem's employees

Construction has begun on an additional 240,000m^2 of housing near the project site, in the Vostochniy and Dubovaya Roscha residential areas. The new accommodation is integrated into the existing town, which will include facilities such as hospitals, schools, leisure centres, hotels and kindergartens. A total of 49 houses and 234 flats will be constructed in 2013, and the development of water and sewerage infrastructure is also under way.

The cost of the housing project is approximately US$300 million, and it is designed to house up to 10,000 people in addition to the staff already on site – approximately 4,500 workers and their families.

HEALTH, SAFETY, ENVIRONMENT

EuroChem says that safety is a core value at the company, rather than just a priority. Bailey explains: "People have a tendency to change priorities, so I don't like to call it a priority. A core value is part of your company and stays with you."

The company aims to become the 'best in class' within the industry, so it has ongoing safety training and is open to modifying policies and procedures for continuous improvement. EuroChem has already done a DuPont audit to see how it can improve safety onsite at VolgaKaliy.

There are also environmental monitoring programmes in place. The construction of a 62,800m^3-capacity polishing lagoon is under way, and equipment has been purchased for full-scale Attached Growth Airlift Reactor (AGAR) biological water-treatment facilities.

A landfill facility for domestic and industrial solid waste has been commissioned, and a wastewater cleaning system will be built to reuse water in technological processes. The new beneficiation plants will have modern dust-control systems.

One of EuroChem's goals is to have zero water discharge onsite. There will be minimal tailings on the surface, as the tailings will be recovered and backfilled into the mine.

The company says that its plans exceed what is required by Russian health-and-safety and environmental regulations. The mine is certified to ISO 9001 quality management, ISO 14001 environmental and OHSAS 18001 health-and-safety standards.

The visiting party in a bucket ready to descend down skip shaft #1

"Because a stigma continues to be attached to Russian companies, we wish not only to explain but also to demonstrate our governance story well in advance"

POSSIBILITY OF FUTURE IPO

EuroChem is a privately held company that currently has two shareholders – its chairman Andrey Melnichenko holds 92% of shares, while its CEO, Dmitry Strezhnev, holds the other 8%. While it has only issued bonds once (for US$750 million in December 2012), the company is upfront with its audited financial information, which is published four times a year online.

Melnichenko has stated: "Sound governance is good for business. Although it is currently a privately held company, there will come a time when we seek to list EuroChem's shares on an international exchange.

"While our sales are global, our assets are still concentrated in Russia. Because a certain stigma continues to be attached to Russian companies as a result of past corporate governance weaknesses, we wish not only to explain but also to demonstrate our governance story well in advance so as to be appropriately valued by the international investment community when the time comes."

Harvey adds: "EuroChem is very special. We don't have to provide the amount of disclosure that we do."

Bailey and Harvey agree that the initial public offering (IPO) will probably happen in the next five years, once the VolgaKaliy and Usolskiy sites have been expanded. With a view to the possible IPO, EuroChem wants to show that it is as good as anyone else in terms of its environmental practices and safety. The company's philosophy is that it is starting from scratch with its greenfield sites, so it can get it right the first time.

When the IPO occurs, EuroChem will most likely be floated in London, UK. Harvey rules out the Moscow Exchange, as Russian listings limit what assets companies can have outside the country.

VolgaKaliy project history to date

Item	2008-09	2011	2012	2013
Skip shaft #1	44 freezing and four thermal boreholes drilled (18m diameter, 520m depth)	Start of shaft sinking	Preliminary cementation works for 620-820m depth conducted by Thyssen Schachtbau; drilling of four injection boreholes	30 boreholes drilled to depth of 623m; warming of plumbed rock area ahead of waterproofing; shaft sinking at 572.5m
Cage shaft	Construction process started by Shaft Sinkers	Borehole tamping attempts at 85-128m; works suspended at 93m; shift from grouting to freezing technology	Preparation works for freezing made by Thyssen Schachtbau; 36 freezing and four thermal boreholes drilled	Foundation strengthening works
Skip shaft #2	–	Decision made to start construction of skip shaft #2	Thyssen Schachtbau conducted drilling and casing of 44 freezing and four controlling and thermal boreholes; US-30 selected as contractor for construction	Construction of pre-sink; expected start of shaft sinking