

RAW MATERIALS SHAPE OUR FUTURE

Mining in the Free State of Saxony –
A Tradition of Innovation



STATE MINISTRY FOR
ECONOMIC AFFAIRS, LABOUR
ENERGY AND CLIMATE ACTION



Free State of
SAXONY

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"Saxony is rich in raw materials, with energy and mineral resources that are unique in Germany. Making use of these resources and managing them responsibly is important for the future viability of Saxony's economy."

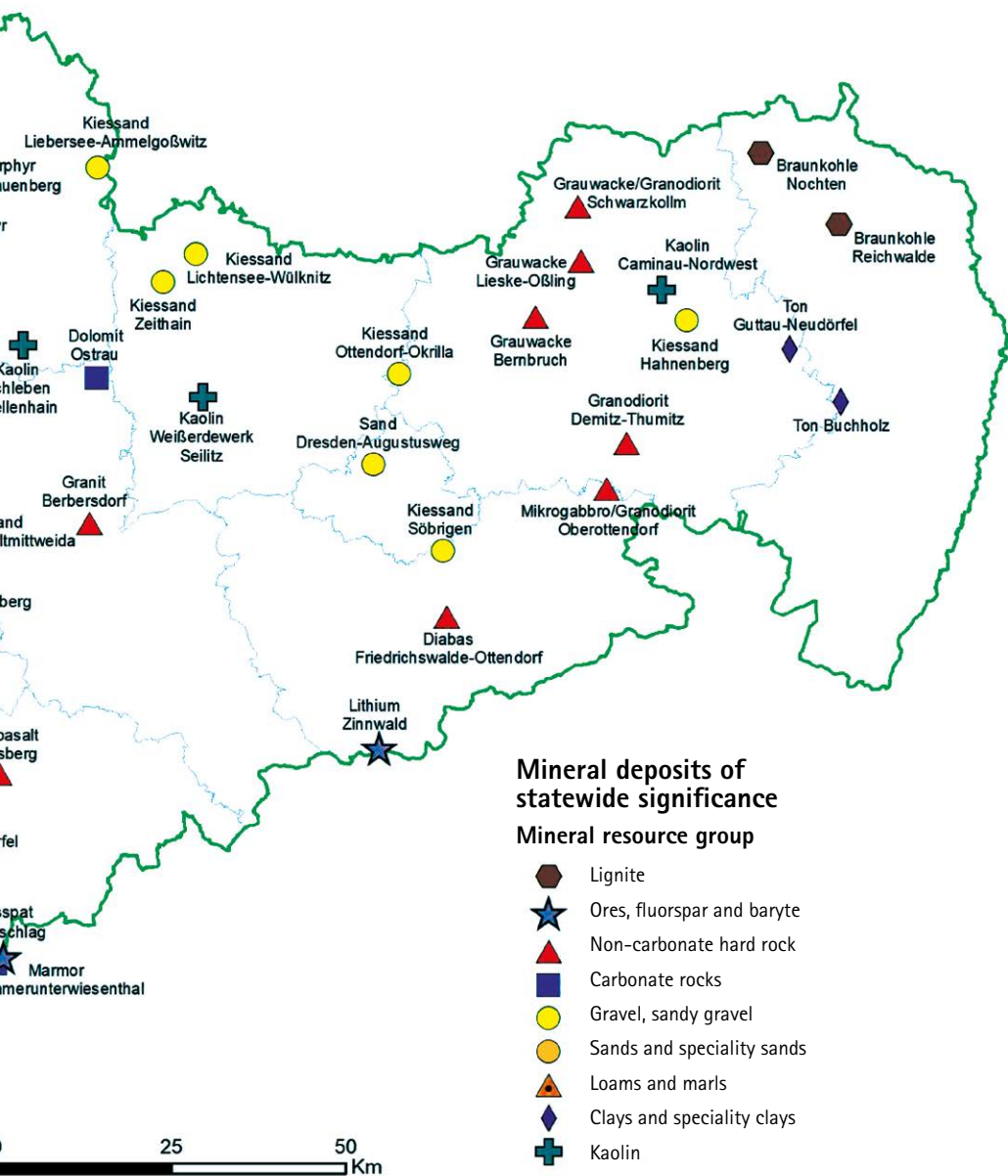
Dirk Panter, Saxon Minister of Economic Affairs



"In addition to lithium, fluorspar and rare earths, the Free State of Saxony is home to ores containing a wide range of valuable metals. Of particular importance are tungsten, zinc, tin, copper, lead, indium, rubidium, nickel and silver."

Prof. Dr. Bernhard Cramer,
Chief Mining Officer of Saxony





It All Starts with Mining!



Mining has been an integral part of life in Saxony for centuries. This tradition lives on – and is once again gaining importance.

The energy transition, digitalisation and modern technologies require raw materials for batteries, semiconductors, renewable energy and numerous future applications. These resources are also found in Saxony. Extracting them strengthens supply chains, makes companies more resilient and safeguards technological sovereignty in a rapidly changing world.

Domestic raw materials are also indispensable for roads, schools and housing. Sand and gravel cannot simply be sourced from far afield. Extracting them locally secures jobs, reduces the need for

long-distance transport and enables raw material supplies to meet our high standards.

Modern exploration methods, innovative processing technologies and stringent environmental requirements create the conditions for using domestic raw materials responsibly. In doing so, we are committed to transparency, dialogue with the public and drawing on the expertise of our skilled workforce and businesses.

This brochure provides information on current developments, projects and prospects for mining in Saxony. I invite you to form your own view and join Saxony on its path towards a secure supply of raw materials and an innovative future.

With a traditional miners' "Glückauf!"

Dirk Panter

Saxon State Minister of Economic Affairs,
Labour, Energy and Climate Action

From Silver to Lithium: Saxony's Mining Tradition

Mining is thriving in Saxony: Today, the Free State has three open-cast lignite mines and around 200 active mining and quarrying operations extracting ores, stone and other mineral resources. And the sector could grow even further. The Ore Mountains are a particular focus. Both the mountains and the region owe their fitting name to their exceptional wealth of raw materials. Valuable mineral resources are still found there today, including significant deposits of lithium and tin.

Saxony's mining history began more than 850 years ago. The discovery of silver near Freiberg in 1168 set in

motion a development that had a lasting impact on the economy, landscape and culture of the Free State. Initially, mining focused primarily on silver, copper, lead and tin, with bismuth, cobalt, nickel and zinc following later.

In the 19th century, tungsten as well as fluorspar and baryte gained in importance. The 20th century was shaped above all by uranium mining during the GDR era. Lignite is still mined today in the Lusatian and Central German mining regions. Around 30 exploration and mining projects for additional ores, fluorspar and baryte are currently under way.



"As a science-fiction fan, I imagine an extraterrestrial civilisation visiting Earth and first scanning the Earth's mineral potential. Even after more than 800 years of ore mining, the Ore Mountains would shine like a diamond as a geologically rich region for metal ores."

Where History Meets the Future

The Saxon Chief Mining Office (OBA) is one of the oldest authorities in Germany. Its roots in the mining administration of the Electorate of Saxony date back to 1542.

But that does not make the OBA old-fashioned! Quite the opposite: Today, the authority now operates entirely digitally. Applications, documents and decisions are processed and stored electronically. Paper now plays hardly any role in day-to-day work. Permits and inspections are also prepared and managed digitally.

The OBA is responsible for around 400 mining operations in Saxony. It ensures that mining is carried out safely and in accordance with the applicable regulations. This also includes inspecting facilities and monitoring areas where mining took place in the past and where hazards may still exist today.

The OBA also works with mining authorities throughout Germany. The aim is to make procedures simpler and faster. Companies can now submit many applications directly online.

This modern approach will soon also be visible from the outside. A modern extension (see visualisation) is planned to complement the historic building at the Freiberg site.



From Plan to Mine

Global demand for raw materials is rising rapidly. They are needed for houses and roads, for example, as well as for batteries, mobile phones and the generation of renewable energy. Finding new deposits and planning mines is therefore important – but it is a very lengthy and costly process.

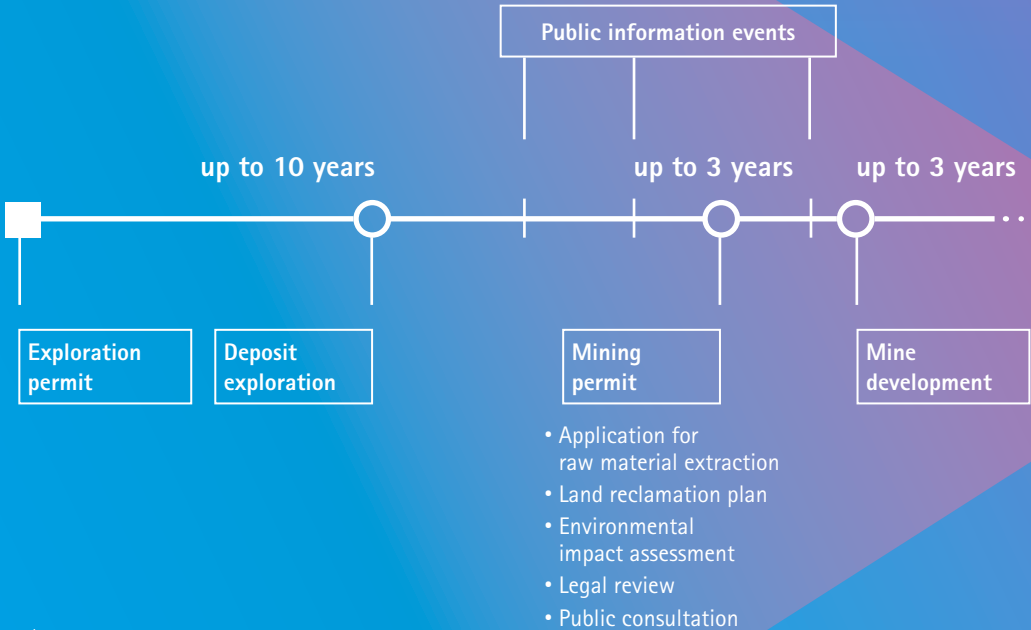
It usually takes many years from initial exploration to the possible start of operations, sometimes more than

ten years. During this time, numerous investigations are carried out, exploratory drilling is undertaken, environmental issues are assessed and plans are repeatedly revised. This is expensive and creates uncertainty for companies. Germany also has stringent regulatory requirements.

Because mining projects directly affect local communities, the public is involved at an early stage.

The aim is to provide transparent information and take account of input from local residents and businesses in the region.

There are two forms of participation: One is required by law and usually takes place once specific plans have been drawn up and made available for public inspection. The other is voluntary and often begins much earlier – for example through public informa-



tion events or community meetings, before final applications have even been submitted. This allows local

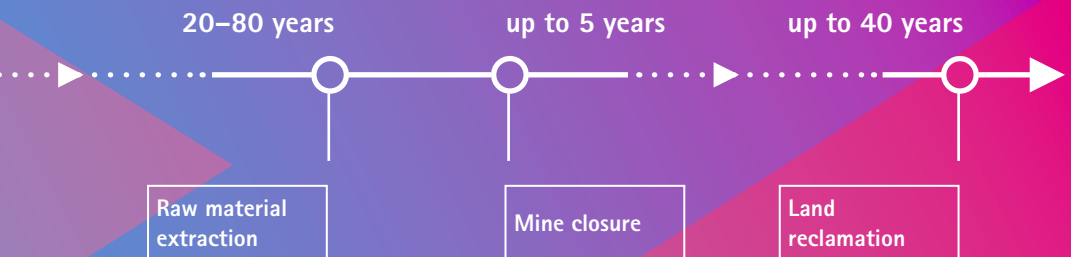
experience to be incorporated, questions to be clarified and potential conflicts to be identified at an

early stage. It helps improve project planning and build mutual understanding.



"Good communication costs little but achieves a great deal. It creates clarity, prevents misunderstandings and avoids countless follow-up questions, repeated rounds of coordination and unnecessary frustration."

Stephanie Fox,
Unternehmerverband Mineralische Baustoffe (UVMB) e.V.



Lithium from the Ore Mountains

From headphones to electric cars, from batteries to humanoid robots: Lithium is a key component of modern battery systems that are found – and needed – everywhere. According to experts, the Ore Mountains are home to one of Europe's largest lithium deposits.

In a district of the town of Altenberg in the Eastern Ore Mountains, AMG Critical Materials NV is planning a mine that is expected to extract up to 1.6 million tonnes of ore annually from 2030.

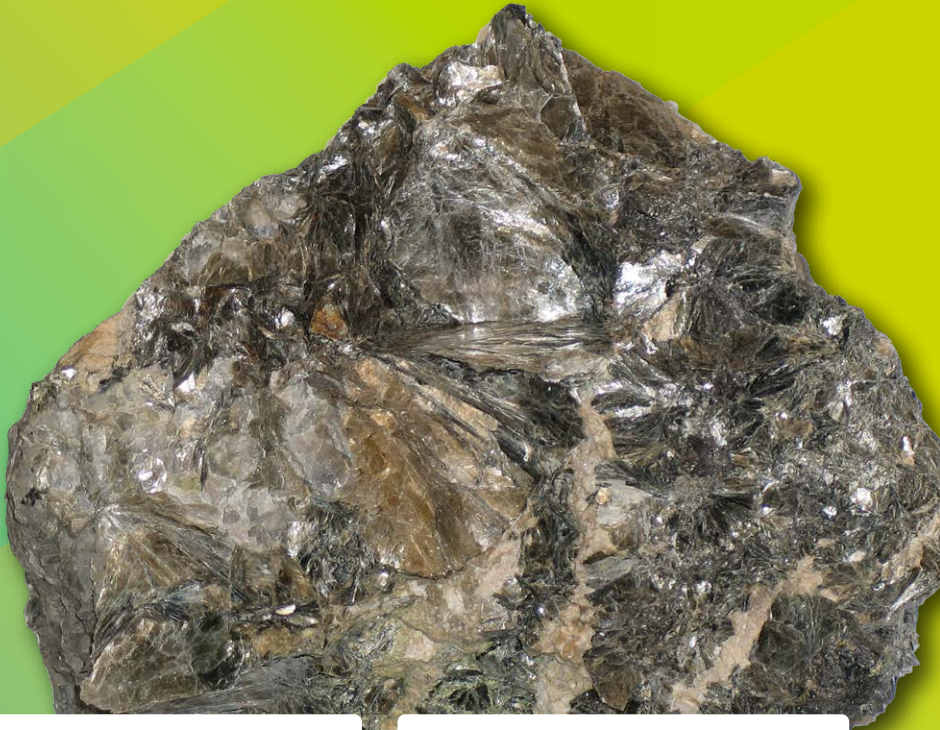
The project demonstrates how new mining operations can be developed in Europe while complying with stringent environmental requirements.

The integrated mining and processing project generates substantial value added in the region. The aim is to create economic opportunities while keeping the impact on nature, the landscape and people's everyday lives as low as possible.

Facts

The lithium mining project in the Eastern Ore Mountains:

- one of the largest lithium deposits in Europe
- 193.5 million tonnes of ore identified
- ore transported through an underground tunnel approximately 9 kilometres long
- no surface transport of ore by lorry



Contribution to supply security

The lithium mining project in the Eastern Ore Mountains can make a tangible contribution to reducing Europe's dependence on raw material imports. The project is still in the planning and permitting phase:

- production of lithium hydroxide (LiOH) as a marketable end product
- planned annual production:
 - initially approx. 18,000 tonnes in Phase 1
 - later up to 35,000 tonnes

This would be enough to produce batteries for up to one million electric cars a year.

Regional benefits

The project is expected to bring the Eastern Ore Mountains the following benefits, among others:

- around EUR 40 million has already been invested in the region
- 300 to 400 direct local jobs
- additional jobs generated by suppliers and service providers (multiplier effect)
- operating life of more than 40 years
- around EUR 50 million in regional value added each year
- EUR 3–5 billion in taxes and levies over the lifetime of the project

Seilitz Kaolin Mine



Großsteinberg Quartz Porphyry Quarry



Kaolin has been mined continuously in Seilitz in the district of Meissen since 1764 – exclusively for the Meissen Porcelain Manufactory.

Initially, the valuable porcelain clay was extracted by open-cast mining; since 1825, it has been mined underground. At the Seilitz Kaolin Mine, known as the smallest mine in Europe, just two miners extract around 150 tonnes of kaolin – known as “white earth” – each year.

The kaolin from Seilitz is exceptionally pure. It contains no iron or titanium oxides, which would give the fired porcelain a grey, yellow or blue tinge. This is what gives

Meissen porcelain its characteristic brilliant white – a hallmark of quality recognised around the world.

After the historic mining area was exhausted, a new mining area was developed from 2019 around 150 metres from the existing shaft. With the new area now in operation, this high-quality kaolin can now continue to be extracted for at least another 50 years.

The Seilitz Kaolin Mine thus combines centuries-old mining tradition with modern raw material extraction – and supplies the raw material for one of Saxony's world-famous products: Meissen porcelain.



Porphyry has been quarried at Großsteinberg near Grimma for more than 100 years. The term porphyry refers to an entire group of volcanic rocks. Up to two million tonnes of pyroxene quartz porphyry are extracted each year from the quarry, which is around one kilo-

metre long. The material is processed into chippings and other aggregates and is used primarily in road and railway construction.

Geological investigations have shown that significantly larger reserves lie beneath the area mined to date than

was originally assumed. Mining is therefore to continue underground in future, with due consideration for the adjacent bird sanctuary. Mining work is scheduled to begin in early 2027 with the driving of the adit.



Sand and Gravel: From Saxony for Saxony!

Sand is found in many everyday products – including toothpaste, glass, ceramics and smartphones.

Yet around 95 per cent of the sand extracted in Germany is used in construction. From roads and railways to bridges and homes, sand and gravel are indispensable.

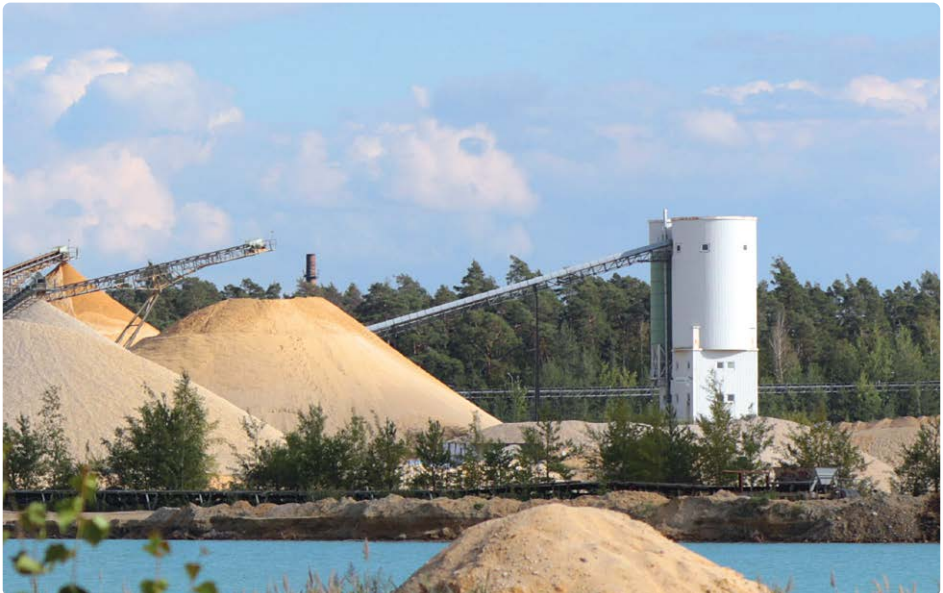
Around 90 companies currently extract sand and gravel in Saxony. Alongside natural stone, they are the most important construction raw materials in the Free State by volume. Hard rock is also extracted and processed into crushed stone and chippings. Extraction takes place at many sites throughout Saxony, mostly in open-cast operations. Larger deposits

of sand and gravel originating from glacial meltwater deposits are found mainly in Lusatia and north-western Saxony. Sandy gravel is also found on the river terraces of the Elbe, Mulde and Neisse. Incidentally, only one third of all deposits in Germany may be extracted. That is because two thirds are located either in nature conservation areas or beneath developed land.



"Securing raw material supplies is not an abstract issue – it is the foundation of our entire society. Without sand, gravel and natural stone, there can be no transport infrastructure and no energy transition."

Stephanie Fox,
Unternehmerverband Mineralische Baustoffe (UVMB) e.V.



Land Reclamation

Raw material extraction often continues for decades and leaves deep scars on the landscape. But even before the first tonne is extracted in Germany – whether from an underground mine or an open-cast operation – it is already clear what will happen afterwards.

Land reclamation is a mandatory part of every approval process. In other words: Plans are drawn up in advance for how former open-cast mining and mine sites will be made usable again.

A few examples from Saxony show what can be achieved.



Bad Schlema Spoil Heap Landscape

Uranium ore was mined at the Schlema-Alberoda mine from 1946 to 1990 – in one of the world's largest uranium deposits. Mining profoundly altered the landscape of the Wismut mining region. In the Aue-Bad Schlema area alone, 42 mine waste heaps were created, covering around 311 hectares.

Twenty-one of these heaps, with a volume of around 42 million cubic metres, are still being remediated by Wismut GmbH today. The work

focuses in particular on the stability of the heaps and on exposure to dust and radon.

When the heaps are reshaped, care is taken to ensure that their form and vegetation allow them to blend harmoniously into the landscape after remediation. Measurements show that radon levels in the surrounding area have now fallen significantly. In many areas, the radiation protection targets for remediation have now been achieved.



To ensure this remains the case, the sites continue to be maintained and regularly monitored. A comprehensive environmental monitoring programme provides ongoing oversight.

Nochten Boulder Park

Following lignite mining, around 7,000 boulders and some 100,000 plants have been used to create a landscaped garden covering approximately 20 hectares. The Nochten Boulder Park in Lusatia is unique in Europe. It lies in the reclaimed landscape of the municipality of Boxberg in eastern Saxony and is now a distinctive visitor attraction.

Some of the enormous boulders are truly magnificent specimens and weigh up to 40 tonnes. They were carried from Scandinavia to Lusatia by glaciers during the Ice Age and were later exposed during open-cast lignite mining around Boxberg. As part of the reclamation process, they were deliberately used in the design of the boulder park.





From Moonscapes to Europe's Largest Chain of Lakes



"Ultimately, we will not be judged by how many cubic metres of overburden or tonnes of coal we extracted, but by what we leave behind."

Joachim Neumann,
Chairman, Oberlausitzer Bergleute association

For decades, lignite mining shaped Lusatia and Central Germany – thousands of people had to leave their villages, forests were cleared, and mining left vast “moon-scapes” in its wake. Even while mining was still under way, the first open-cast sites were reclaimed and former mining pits were flooded. After 1990, the transformation accelerated significantly. Billions of euros were invested in remediating post-mining landscapes. Former open-cast mines were transformed into lakes, natural areas and new places for leisure and recreation.

Today, the Lusatian Lakeland is regarded as the largest man-made waterscape in Europe.

Systematic transformation of the mining region in Central Germany began in the early 1990s. Flooding and reclamation transformed former open-cast mines into numerous lakes. This transformation gave rise to the Leipzig New Lakeland, one of Germany's largest interconnected lake districts. Together with Leipzig's rivers and waterways, the lakes form a diverse area for water-based leisure and recreation.

The transformation is also clearly visible in Lusatia. The flooding of Lake Senftenberg marked an early milestone back in the GDR era. The Lusatian Lakeland has continued to grow ever since. Since June 2026, five large lakes have been connected by navigable canals, forming an integrated water network. With a surface area of around 5,300 hectares, Europe's largest man-made interconnected lake system is taking shape here. Further links are planned, with up to ten lakes ultimately set to be connected.



Boxberg Power Plant Solar Park

On land formerly used for open-cast lignite mining, Lausitz Energie Bergbau AG (LEAG) is using reclamation to restore a diverse landscape of forests, agricultural land, nature conservation areas and lakes. Wind and photovoltaic installations on restored mining land form the renewable foundation of the GigawattFactory – the centrepiece of LEAG's strategic transformation. The approximately 30-hectare Boxberg Power Plant Solar Park in Lusatia is part

of LEAG's GigawattFactory. Preparatory construction work began in October 2023. The ground-mounted photovoltaic plant, with a renewable

generation capacity of 25 megawatt-peak (MWp) for sustainable power supply, was commissioned in April 2024.



Crossen: Landscape Evolution

Between 1951 and 1989, around 74 million tonnes of ore were processed at the Crossen processing plant in the Zwickau district, producing approximately 77,000 tonnes of uranium concentrate. The resulting wastewater flowed via an oxbow lake directly into the River Zwickauer Mulde.

For economic reasons, uranium ore processing ended as early as the end of 1989. Dismantling of the old facilities began in 1993. Contaminated demolition material was initially stored at the Crossen mine waste dump

before being transferred to the Helmsdorf tailings facility. Uncontaminated scrap was sold, while demolition rubble was largely reused for roads and tracks on the site.

Dismantling and demolition were fully completed by 1996. Remediation of the former industrial site began in 2003. Today, the former industrial areas and the adjoining site formerly occupied by the Crossen mine waste dump have been renaturalised and integrated into the Zwickauer Mulde floodplain as green spaces and floodwater retention areas.





The Darker Side of Mining

There is great pride in Saxony's 850-year mining history. This is reflected in numerous miners' parades and more than 60 visitor mines.

But mining has also left its mark: Over the centuries, countless adits, shafts and underground voids were created. As a result, the ground in some areas is now riddled with cavities – rather like Swiss cheese. Sometimes the ground gives way, suddenly creating craters or cracks at the surface. Experts refer to this as a surface collapse. Common causes include unstable old

mine workings or changes in groundwater conditions.

When a surface collapse occurs, the Saxon Chief Mining Office closes off the hazardous area and ensures that it is made safe. Even more important, however, is preventing such damage from occurring in the first place. Old mine maps are therefore analysed, at-risk areas investigated and underground voids filled. Historic drainage systems are also repaired to prevent uncontrolled water accumulation underground. Numerous old adits and shafts run beneath the

surface. Where they could pose a hazard, the mine remediation teams in Schneeberg and Freital investigate the ground conditions. This reduces the risk of roads or properties being damaged by a surface collapse.

Mining has shaped Saxony and enriched many regions economically and culturally. Its legacy remains visible, however, and continues to require attention. Making old mine workings safe is therefore an important task in ensuring the long-term protection of people, buildings and infrastructure.

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