



MAU
Max Aicher Umwelt

Reuse of inorganic mineral waste materials

For sustainability and resource conservation

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MAX AICHER
UNTERNEHMENSGRUPPE



The Max Aicher Umwelt GmbH part of Max Aicher Unternehmensgruppe

The Max Aicher Umwelt GmbH is part of the Max Aicher group of companies that employs about 4500 people in 18 countries.

These companies and employees passionately perse technology, know-how, high quality products, industrial processes, services and sustainable progress.

The Max Aicher group of companies generates a turnover of about a billion Euro per year and produces approximately 1.5 million tons of steel in Bavaria and Hungary.

The commercial activities of the group of companies has continued to grow over the years and has focused on maximising synergistic effects between the companies.

The company's activities now include steel and production, environment and recycling, real estate and projects, building and construction and well as recreation and tourism.

The Max Aicher Umwelt GmbH has specialised on the processing and utilisation of inorganic mineral by-products and slag from electric steel production. Our goal is to establish a closed recycling system in which we can refrain from using new natural resources.

The Max Aicher Umwelt is shareholder of the Deusa International GmbH, based in Thüringen. This potash company, which is steeped in tradition, produces

potassium salt products in accordance with the most modern environmental requirements.

The subsidiary, NDH Entsorgungsbetreibergesellschaft operates the stowing mines Bleicherode and Sollstedt as well as the potash tailings pile in Bleicherode.

Since the end of the 19th century, potash has been mined underground in the German Federal State Thuringia. To ensure general safety, the excavated areas are filled with foreign underground stowaged. The waste that is to be used for underground stowage must have a mineral structure and must also have suitable physical and

structural properties.

Potash is not found in a pure form and this means that after extraction and processing a loose salt residue, comprising about 75% of the mined amount, remains. This residue is partly deposited on dumps. The re-cultivation of the potash residue dump in Bleicherode not only results in a reduction of the pollution from salt entering the environment, but also improves the appearance of the landscape.

In addition to underground stowing mines and re-cultivation of dumps, Max Aicher Umwelt GmbH also provides other environmentally friendly disposal solutions for inorganic mineral wastes.





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Stowing mines Bleicherode & Sollstedt Underground stowage to protect the environment

Many years of potash extraction from the Bleicherode and Sollstedt mines resulted in large underground cavities. Even before the potash mining operations ceased 1990 in Bleicherode and 1991 in Sollstedt, non-mined materials started to be brought in for stowing.

In the early 1990s engineers started to develop recipes based on inorganic mineral waste. The existing cavity volume is estimated to be approximately 4 million cubic metres, and this means that we can accept a volume in excess of 300,000 tonnes per year.

Our customers transport the waste to us by road and rail, and is stored temporarily in silos.

Our highly-qualified and experienced staff employ state-of-the-art technical systems to guarantee the reliable processing of your waste.

We will assist you with material analyses as well as with the completion of the various approval documents, including such as mining suitability certificate or proof of disposal.

Utilisation of waste for underground stowing

The following are examples of inorganic mineral waste used for stowing:

- Filter dust and slags
- Solid waste from waste gas treatment
- Used foundry sand
- Bottom ash and boiler ash
- Filter cake and Furnace linings

Not suitable waste

Waste which is not suitable for stowing if it is:

- Gassing
- Infectious
- Explosive
- Radioactive
- Spontaneously combustible
- Or if it reacts with the host rock





Applied processes

Flush stowing

The waste is fed into a mixing plant where it is mixed with pit lye as a transport medium and transported to the underground cavities via dedicated pipelines. The solids settle out and the pit lye is pumped back to the surface again.

Big Bag stowing

Waste is transferred into big bags in a big-bag-plant and conveyed underground to the faces. The big bags are conveyed underground via a shaft conveyor system. Big Bags that have been conditioned by Customer can be brought directly to the underground face.

Bulk-material stowing

In the case of bulk material stowing, the waste is deposited as loose fill in the voids.

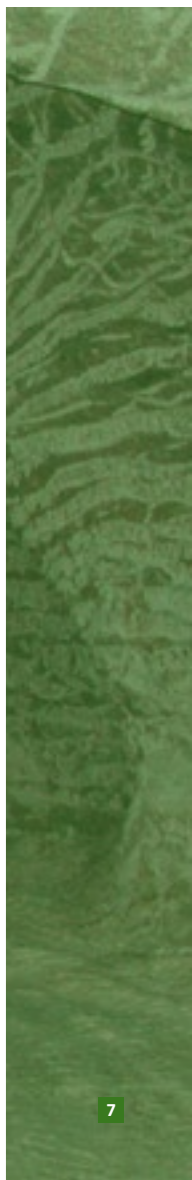
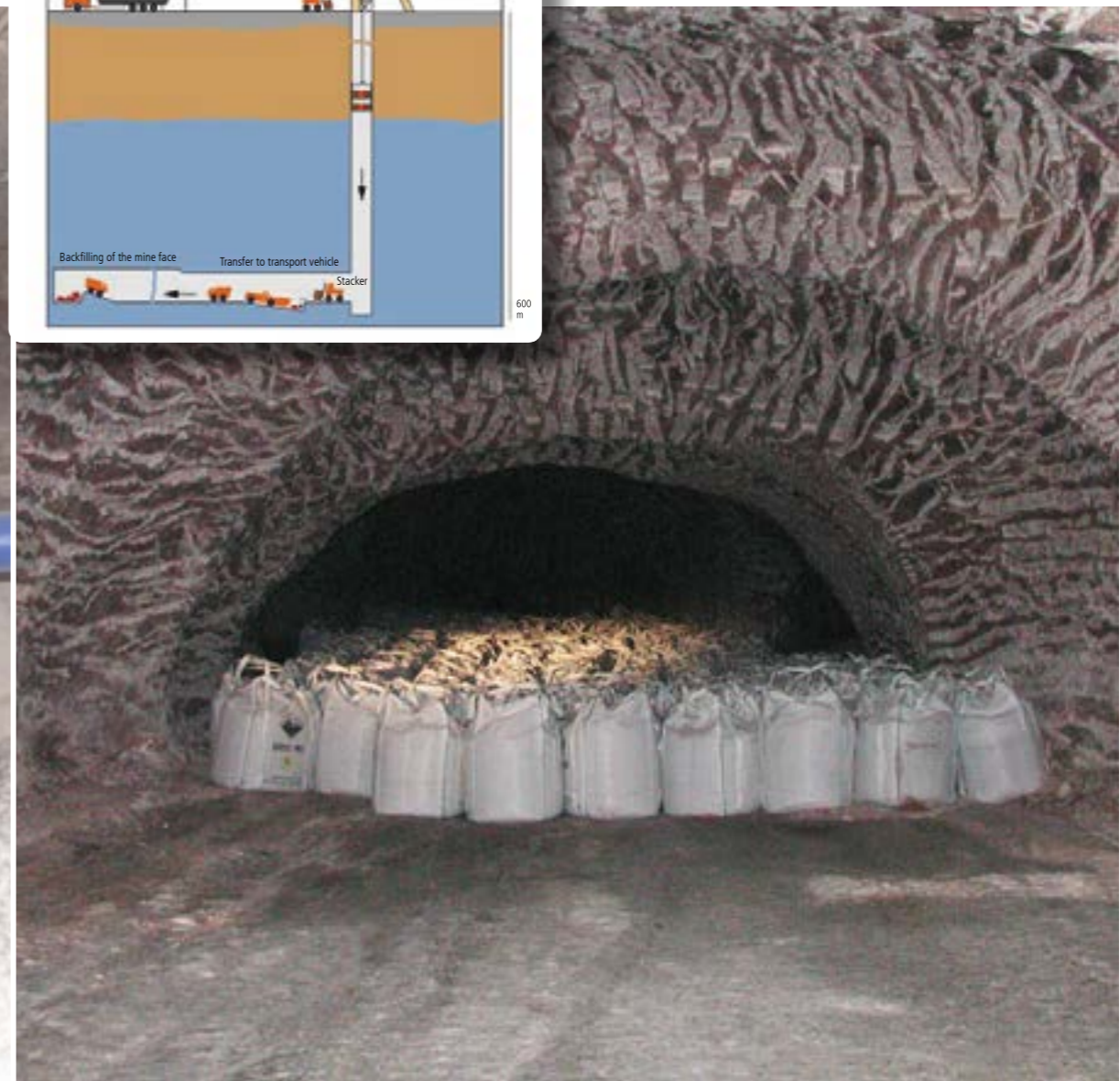
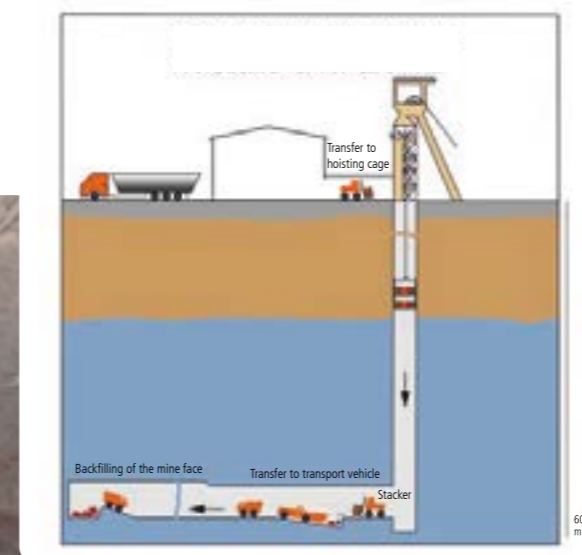
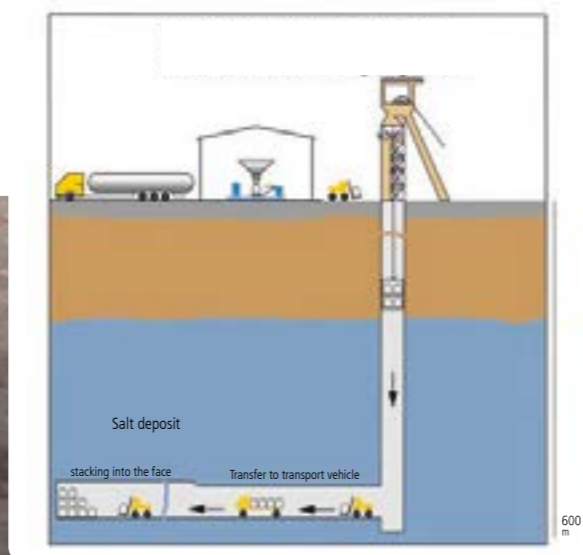
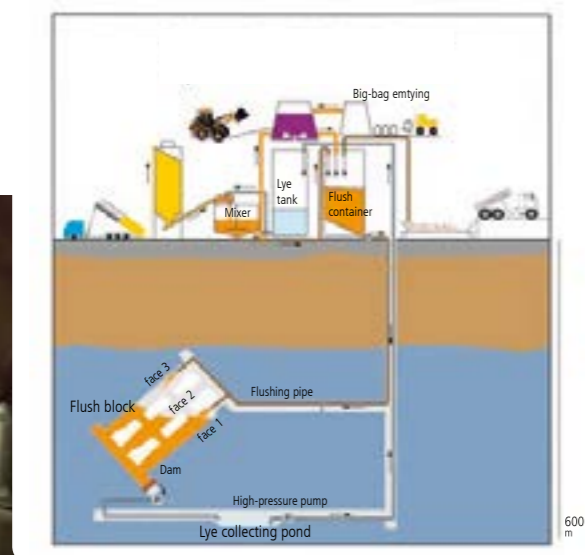
The waste intended for this purpose is poured into special containers in the bulk-material plant and conveyed underground via a shaft conveyor system. The containers are then emptied into a bunker. Special vehicles are then used to transport it further into the mine where it is then deposited.

We ensure acceptance reliability thanks to:

- Long-term approval based on large cavity capacity
- High storage capacity for the waste to be stowed

We ensure low environmental impact because we:

- Ensure that the waste entirely disposed of using underground stowing
- Verification of long-term safety
- Continuous support from qualified specialist scientific institutions





Recultivating dumps A new, green landscape

The recultivation of the potash waste dump in Bleicherode started in 1991 with scientific support from the potash research institute and the University of Göttingen. The dump was covered over with three layers of water-absorbent material, which had the effect of counteracting the leaching out of salts in solution due to precipitation. Recultivation has the effect of blending the waste dump harmoniously into the surrounding landscape.

Approval

The following types of waste are acceptable for the purpose of recultivating the dump:

- Excavated soil
- Building rubble
- Used foundry sand
- Paper sludge
- Bedding residues
- Sewage sand
- Other approved material

Biological containment of the dump

During the pilot project „Development of a process for re-cultivating potash dumps“, the consortium with the German Federal Environment Foundation, K-UTEC Sondershausen, the University of Göttingen, the University of Kassel-Witzenhausen, Clausthal University of Technology, Freiberg Mining Academy, GW mbH and NDH Entsorgungsbetreibergesellschaft mbH, investigated innovative methods to achieve biological seal containment. This involved covering the dump with three layers of water-absorbent material and then re-cultivating it.

The waste is separated into distinct sections in a grid pattern, and this is clearly recorded for future references.

Since the end of 2009 a photovoltaic system has been in operation on the dump, generating power in an environmentally-friendly manner.

We are happy to provide you with details of how your waste could be used.





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Active Landscape Protection Conversation of natural resources

Max Aicher Umwelt GmbH has been a long-standing partner for large industrial plants and municipal waste disposal operations. We are there for you when you require assistance with the preparation and disposal of waste, by-products and slags in an environmentally friendly manner.



First-hand experience

Max Aicher Umwelt GmbH is recognised as a dependable and professional service provider. We work alongside our customers to develop new solutions and to improve existing ones. It is a matter of great importance to us that our products are environmentally friendly. We are always on hand to be of service to you, developing sustainable solutions for safely disposing of your waste and thereby safeguarding our environment. We operate throughout the German-speaking region as well as the neighbouring European countries.

We will be happy to provide you with details of other environmentally friendly disposal options for disposing of inorganic mineral waste that we can offer besides underground stowing and dump re-cultivation. Do get in

touch and ask us about these options.

We are able to provide an individualised, comprehensive support service with processes that are tailored to the needs of our customers and with short paths of communication. Our highly-qualified engineers are at your service with all their knowledge and experience to help you find the perfect solution and to assist with the necessary approval process.

Take advantage of our expertise. For us, combining economic and ecological consideration do not in any way represent a contradiction; instead it forms the basis for our work. We will assist you with our expertise and facilities for the sake of a clean environment.





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