

UNDERGROUND REUTILISATION

Planning safety
Diverse procedures
Long-term-safe solutions



Leading in Europe in underground disposal

First underground disposal facility, worldwide

Approximately 480,000 tons of waste reutilised annually

C A P A C I T I E S | R A N G E S

K+S Entsorgung is a pioneer in the sector of long-term safe underground disposal of hazardous wastes. In 1972, we established the very first underground waste disposal plant worldwide. Today, we are leading in Europe, and operate the largest number of facilities in this sector.

We continuously monitor the situation on the disposal market, in order to be able to act with foresight. We have therefore invested in new capacities for the disposal of the increasingly rising volumes – particularly of fly ashes.

A range of treatment and depositing procedures, as well as extensive redundancies at our five reutilisation facilities guarantee sustained safety – without bottlenecks. This allows us to handle the day-to-day fluctuations of waste types and volumes.

We are part of the K+S Group, one of the world's leading suppliers of fertilisers, plant care as well as salt products. This allows us to continuously invest in the latest technologies and sufficient capacities. Embedded in this logistic, technological and economic network, we have been able to further expand our position on the European market.

As a wholly-owned subsidiary of the K+S Aktiengesellschaft, we are leading in Europe in the underground disposal of hazardous wastes – with the largest number of underground facilities, the longest ranges and the most encompassing system solutions.



Waste analysis and disposal concepts

Coordination of transport and packing

Support in authorisation procedures

Five facilities for underground reutilisation

PERFORMANCE | SAFETY

Salt mining results in underground caverns. Pillars, left to stand between the mining chambers, support the rock overburden. In some of the older mining fields, these pillars no longer meet today's high safety standards. By back-filling with non-mining wastes we can ensure long-term safety.

Our reutilisation techniques serve to meet two important objectives: we save resources, as we do not use valuable raw materials for supporting the pillars, and, by reutilising waste in a long-term safe and maintenance-free way, we prevent the accumulation of inherited burdens for future generations.

The waste is utilised in depths between 500 and 700 metres, in massive layers of rock salt, way below all water-bearing strata. Water-impermeable layers of clay and other rock formations above the rock salt seal off the deposits. After cessation of mining operations, the mine shafts are sustainably sealed. This is to prevent any environmental impact of the wastes, for now and for the future.

In 2007, the German Ökoinstitut (Institute for Applied Ecology) compared underground utilisation with aboveground disposal.

"For wastes with a high hazard potential, underground disposal is the only disposal method safeguarding entombment of the contaminants."

Underground reutilisation has been proven to be the most ecological method. Inspection authorities and independent experts have attested to the excellent safety standards at our disposal facilities. These standards are certified and continuously documented.

Our underground reutilisation is long-term-safe and maintenance-free.



Wide range of materials accepted

More than 4 m. tons of wastes reutilised since 1992

Alternative reutilisation processes

TECHNOLOGY | DIVERSITY

In order to be accepted into our maintenance-free underground reutilisation, wastes need to comply with the specific requirements of the individual mine's conditions. We have developed a variety of procedures, for making use of the characteristics of the non-mining wastes to create appropriate backfill materials. We have established the technical expertise and the capacities needed for flexibly adapting to modifications of volumes and material composition, even at the time of delivery.

The procedure employed is chosen in accordance with the type of waste and the former mining caverns' properties:

Stacking is best suited for stabilising low-ceilinged caverns with a height of between 3 and 4 metres. At a state-of-the-art facility above ground we condition these wastes and fill them into Big-Bags. Within a very short time, the wastes harden to concrete-like consistency. Some types of waste may also be packed without previous treatment. Then we stack the Big-Bags in the mining caverns. Any gaps between the Big-Bags and the pillars are then filled with salt. This is how we create a direct connection with the surrounding rock mass, thereby achieving optimal supporting effects.

High mining caverns are backfilled with a specially adapted backfill mixture, by tipping backfill. In an aboveground plant appropriate backfill materials are produced. Via a pipe or packed in bags they are transported below ground, where dump trucks are used to transport the materials to the former mining caverns. The conditioned wastes are then covered with salt.

In cathedral-type mining caverns, pump-stowage is more appropriate. In a special underground conditioning facility a high-consistency substance is produced and pumped into the mining caverns via pipes.

For more details on our processes, please refer to

- our DVD
- our website at www.ks-entsorgung.com

or contact us directly.





Certified waste management facilities

Customer proximity is our quality objective

QM-system in accordance with DIN EN ISO 9001:2000

Quality leadership due to employee training

KNOWLEDGE | QUALITY

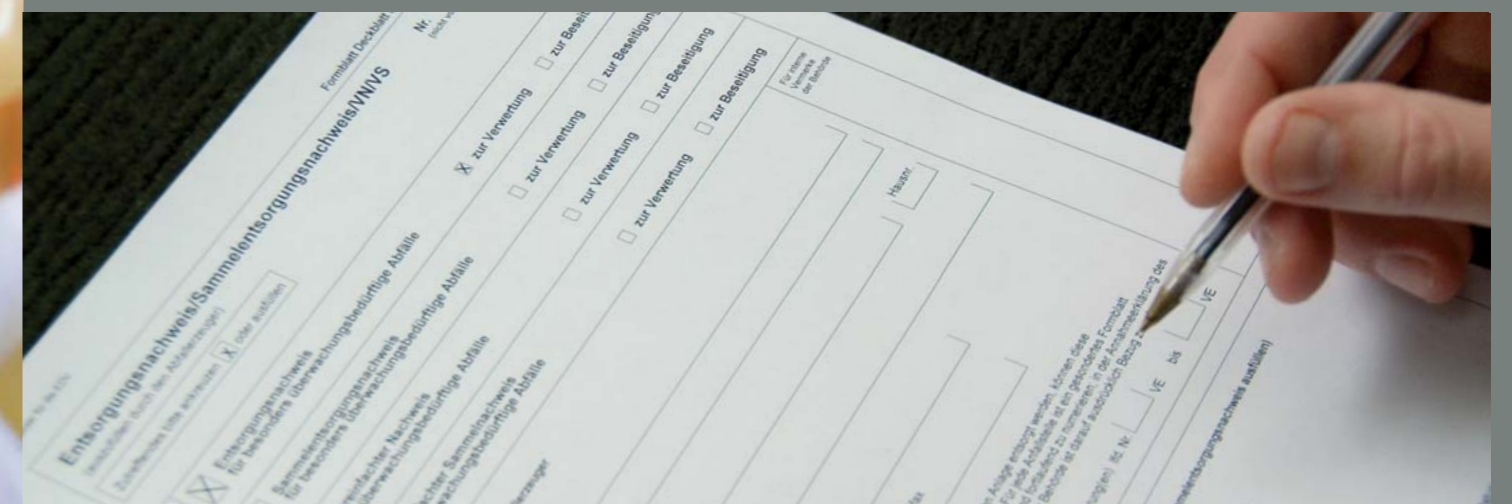
In the sensitive business sector of waste disposal, quality is of the utmost importance. This is why we have developed highly exacting quality guidelines, aimed at guaranteeing environmental safety, planning safety and economic efficiency. We are committed to these high standards, striving to meet them on a daily basis.

Our expert staff guarantees top-grade solutions, as our Quality Management not only encompasses technological excellence and customer service, but also includes continuous staff training. Motivating working conditions promote identification, commitment and continuity.

In order to maintain our quality leadership position, our employees continuously improve all processes and procedures. The experience and insights gained serve to optimise existing technologies, and to generate new ones. Our focus is always on the legal framework and our customers' requirements. Our objectives are flexibility in day-to-day business and long-term reliability in terms of safety and economy.

Technically as well as legally, we are always up-to-date.

According to the IGF-Institute (institute for hazardous materials research, Bochum), annual control measurements have shown that we stay well below the legal threshold values – above and below ground.



On-site contacts in eight countries

Extensive network of logistics and partners

Custom-tailored disposal solutions

Waste analysis

CUSTOMER PROXIMITY | MARKET PROXIMITY

We are represented in eight different European countries, with our own offices. Our staff is fluent in the local language, and is well trained on country-specific requirements. Our conclusive waste management system proves our closeness to the market and to our customers – Europe-wide.

A holistic project management ensures economically assessable, long-term-safe and cost-effective waste disposal concepts. Oriented by these objectives, we organise and coordinate the reutilisation of wastes. Our experienced engineers will find a customised solution for even the most unusual waste consistency. An analysis of the wastes ahead of the official authorisation will offer information on the reutilisation procedure best suited for your waste. This saves time and reduces costs.

Our Europe-wide network is available for support with approval procedures, documentations and with setting up schedules. We recommend and procure appropriate packing materials for your wastes. Our logistic partners are prepared to take on transport, rail or road. And of course we will survey which appropriate site is closest to you, in order to minimise time and expenses.

Our service is designed to match your requirements, and encompasses individual system solutions for the entire disposal route – all the way from the first contact to appropriate reutilisation at one of our facilities.

A customer satisfaction analysis conducted by the University of Kassel on behalf of K+S Entsorgung confirms that 94 % of our clients are more than satisfied with our services.



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