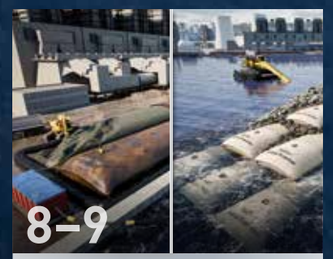
Securing contaminated sites

Geotextiles for the treatment of contaminated soils and sediments

HUESKER
Ideen. Ingenieure. Innovationen.

Active environmental protection with innovative treatment methods

- Active sediment capping
- Impermeable sediment capping



- Efficient dewatering of sludge
- Sediments as a building core

- Securing contaminated soil in engineered structures

- Base sealing with leachate filter

- Runoff treatment along traffic infrastructure

- Remediation of contaminated sites for creation of usable space

Restoration of contaminated areas

Environmental protection through treatment of contaminated soils

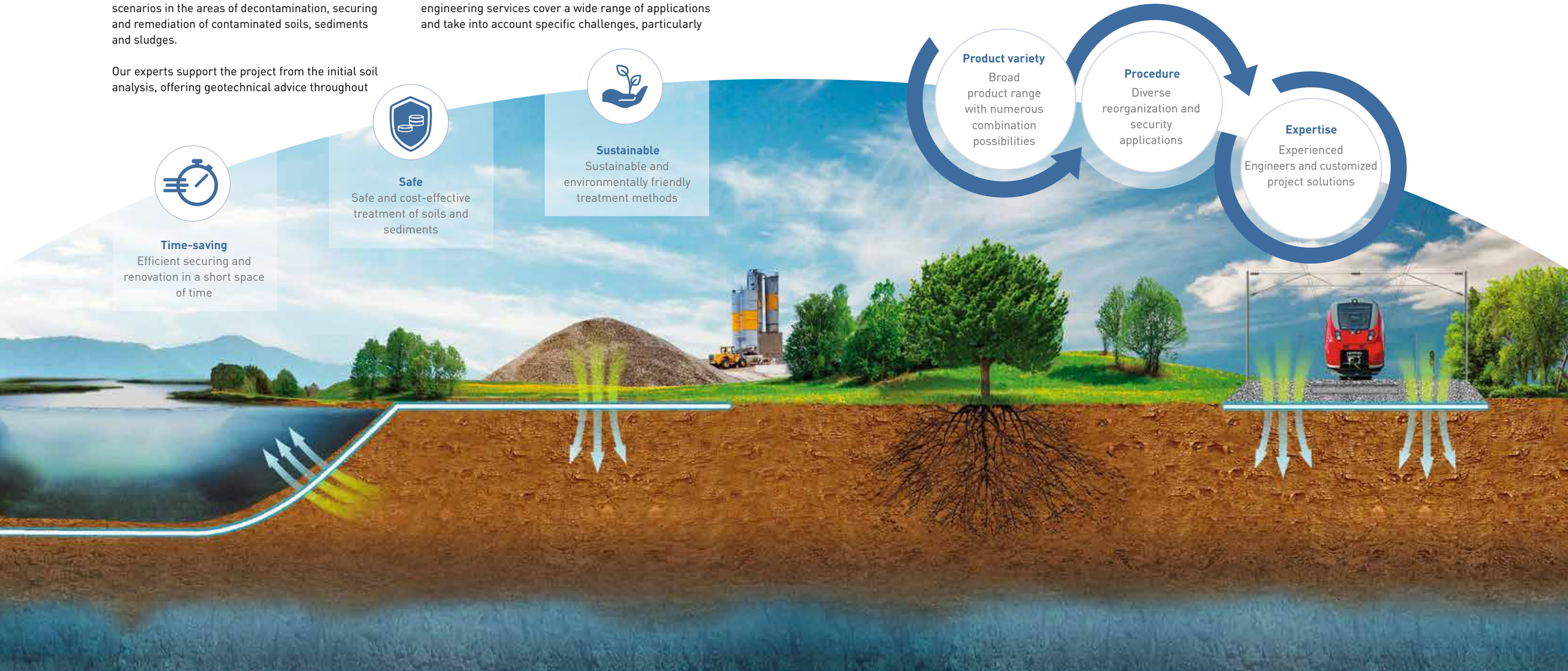
Effective and sustainable methods for treating contaminated soils and sediments are becoming increasingly important in environmental protection. Holistic approaches not only achieve optimum results, but also make an active contribution to environmental protection. HUESKER is familiar with the complex requirements of environmental pollution and offers specific product combinations for various application scenarios in the areas of decontamination, securing and remediation of contaminated soils, sediments and sludges.

Our experts support the project from the initial soil analysis, offering geotechnical advice throughout the process, to the recommendation of remediation methods. The focus here is on the safe and sustainable improvement of contaminated areas.

This strategic approach reduces the risk of any recontamination along with any costs for continuous treatment measures such as pump and treat processes. Our diverse product range and customer-oriented engineering services cover a wide range of applications and take into account specific challenges, particularly any legal requirements such as the obligation to 'clean up' in accordance with the polluter pays principle. Our environmentally friendly and cost-effective treatment methods not only aim to eliminate contamination, but also reduce potential further environmental impacts.

Thanks to the expertise and the many years of experience of our specialists, project partners can be sure of receiving the right treatment strategy for their contaminated site. This ensures long-term compliance with any legal requirements and guarantees the environmental compatibility of the methods used on site.

A unique combination for your project



Sediment Capping

Long-term barrier against pollutants

The decontamination or dredging of contaminated sediments at the bottom of a waterbody poses a complex challenge. In such situations, it is crucial to prevent the remobilization of pollutants so as not to contaminate downstream and neighbouring watercourses. For this purpose, the bottom of the watercourse can be provided with a filter layer made of innovative geocomposites.

An active cover acts as a reliable barrier for pollutants and at the same time allows water to flow through, maintaining the essential exchange of surface and groundwater.

Products: Tektoseal® Active

Alternative for maximum loads

The technical and economic efficiency of water-permeable sediment covers depends on project-specific conditions. In the case of very high pollutant concentrations, it may be advisable to remove the sediments from the ecosystem entirely or to cover them with a dense concrete cover. In this case, a water-impermeable geotextile product such as Incomat is applied to prevent pollutants from escaping. Depending on the product variant, a dense concrete cover with variable mat thickness can be used.

Products: Incomat®

Scan and find out more ➡

Advantages of sediment capping

- Avoidance of pollutant carryover through remobilization
- Low transportation and waste volumes
- Dimensioning / simulation possible using software
- Proven and standardized method

Products: SoilTain® DW, SoilTain® Bags as pollutant filters

Efficient dewatering of sludge

Economic and ecological treatment

The dredging, transportation and disposal of contaminated dredged material often involves considerable costs and logistical effort. An efficient solution for this is to dewater the sediments before transportation. The use of geotextile dewatering systems has proven to be a modern, cost-efficient method. These geotextile containers can be used to effectively dewater various types of sludge. Dewatering in geotextile tubes does not require the use of external energy and is therefore emission-free. For large quantities of material to be dewatered, these tubes offer both economic and ecological advantages.

The tubes, made from a specialized high-performance filter fabric, offer high process performance with a small footprint and thus promotes efficient construction progress.

Advantages of geosynthetic sludge dewatering

- Permanent removal of the contaminated material from the environment
- Re-use of the sludge as a building material
- High dry solid content
- Maximum flexibility thanks to different tube sizes

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Sediments as a building core

Groynes and breakwaters made of geotextiles

Contaminated sediments can be permanently encapsulated in geotextile tubes. The sediments serve as filling material for specially developed coastal protection tubes, which are used in modern hydraulic engineering. The option of permanent storage in filter-stable tubes depends on the local conditions and should be examined by experts beforehand.

The large-format coastal protection tubes are suitable for use with groynes, dykes and breakwaters and contribute effectively to the sustainable protection of coastal and shoreline areas. As a customized system solution, they enable the realization of optimized structure geometries and cross-sections. When compared to conventional rubble stone structures, they help to significantly reduce the cost and offer a significant reduction in the cost-intensive transportation of, for example, armour stones.

Advantages of permanent storage

- Sediments can be used as fill material for geotextile tubes
- Avoidance of long transportation routes to the site
- CO_2 savings through the use of in-situ material instead of laboriously extracted stones
- Savings in disposal costs and landfill volumes

Products: SoilTain® CP Tubes

Products: Tektoseal® Active, Stabilenka®

Securing contaminated soil in engineered structures

Sustainable re-use of contaminated soils in earthworks

Contaminated soils can be reused in engineering structures and thus be given new added value. Through the use of a geotextile contaminant barrier, the soils can be used, for example, for the construction of new embankments, such as infrastructure or noise protection embankments.

To prevent pollutants from escaping and entering the environment, a large geotextile pollutant filter is installed under the structure. The highly effective geocomposite adsorbs the pollutants and binds them in its active layer. In the case of easily mobilizable pollutants, an improvement in soil quality can occur over time, as precipitation releases the pollutants from the soil matrix and transports them to the filter layer, where they are safely and permanently bound.

Advantages of securing contaminated soil in technical structures

- Value-adding use of the scarce resource soil
- Long-term improvement in soil quality
- Reduction of transportation requirements
- Avoidance of landfill costs

Leachate filtration in landfills

Effective filtering of PFAS from leachate

The installation of contaminated soils in mono-areas of a landfill requires special precautions. In these areas, the deposited waste must be secured in such a way that the spread of pollutants via the leachate, to other landfill areas, is prevented. When storing PFAS-contaminated soils in mono-areas, a large-area geotextile contaminant filter can replace the seperation and filtration nonwoven above the drainage layer. This effectively filters leachate and pollutants before they leave the mono-area via drainage systems. This provides additional protection for the adjacent landfill areas against PFAS contamination.

Thanks to this method, the landfill operator is able to accept and dispose of PFAS-contaminated soils as they pose no further risks.

Advantages of geosynthetic leachate filtration

- Simple installation of the leachate filter
- No complex system technology required for water treatment
- Laying by plant operator or earthworks company

Products: Tektoseal® Active PFAS

Products: Tektoseal® Active

Runoff treatment along traffic infrastructure

Binding pollutants in infrastructure construction

Transport infrastructures such as roads, parking lots, railroad lines and airports are exposed to pollutants from oils and other substances. Precipitation on asphalt or paveing stones carries the pollutants into the groundwater. In the case of paved surfaces, there is also a risk of pollutants seeping into the ground through the joints.

The absorption of pollutants from precipitation runoff by active geocomposites effectively prevents the substances from entering the groundwater. A geotextile pollutant filter can, for example, be installed along a road to clean the water flowing from sealed surfaces into the ditch. In the case of paved surfaces, the filter can be placed directly under the paving to treat water seeping through the joints and permanently bind pollutants.

Advantages of groundwater protection with active geocomposite

- Efficient alternative to conventionally sealed trenches
- Direct infiltration reduces the volume of stormwater retention basins
- Enables the construction of sponge cities without the risk of spreading pollutants
- Other possible applications, e.g. on temporary tank surfaces

Remediation of contaminated sites to create usable space

Securing and reinforcing contaminated sludge

The remediation of sludge ponds poses a particular challenge in the treatment of contaminated sites. By using special geosynthetics, extremely soft and contaminated subsoils can be safely covered and stabilized. Effective covering of the sludge prevents pollutants and odours from escaping into the environment.

The use of geogrids enables the reinforcement and stabilization of soft, inhomogeneous soils, which increases their load-bearing capacity. This increased load-bearing capacity makes it possible to drive over or for safe overbuilding of the areas. The rehabilitated sludge ponds can thus be put to a new use.

Products: Stabilenka®, Tektoseal® Active

Advantages of sludge pond remediation with geotextiles

- Time-saving covering thanks to large panel solution
- Large-scale consolidation of soft subgrade soils
- Creation of usable space
- Encourages green spaces and habitats for animals and plants

Our products

For securing contaminated sites

The diverse product range and our customer-orientated engineering services cover a wide spectrum of applications, taking into account the specific requirements of each project. The products are not only aimed at eliminating contamination, but also at minimising the risk of further environmental pollution. HUESKER supplies the right solutions for your project.

Incomat® Standard

Geotextile concrete mat for quick installation for sealing and used as protection against erosion and mechanical damage.

Stabilenka®

The strongest reinforcement fabric with exceptionally high tensile strength - ideal for ballast fills on soft subgrade soils.

SoilTain® DW

The large-format dewatering tube for fast and efficient sludge dewatering.

SoilTain® Tubes

Large-format coastal protection tube for economic and ecological coastal and shore protection.
The erosion-proof packed sand offers long-lasting protection and a seamless barrier.

Tektoseal® Active PFAS

The pollutant barrier for perfluorinated and polyfluorinated alkyl substances (PFAS) can be installed evenly and erosion-proof on and in soil and underwater.

Tektoseal® Active HM

The safe pollutant barrier for metals and radionuclides. The particularly efficient cation adsorbers are permeable to water, but insurmountable barriers for substances such as lead, mercury or arsenic.

Tektoseal® Active AC

The pollutant filter for persistent organic pollutants (POP) reliably protects and remediates contaminated soil and water.

Tektoseal® Active AS

The pollutant barrier with mechanically solidified and oil-absorbing polymer for absorbing oil, gasoline, diesel and kerosene in infrastructure projects.

Tektoseal® Clay

High-performance geosynthetic clay liner for groundwater protection and remediation of contaminated sites.

The best product for every project

Together we always find the best possible product configuration for your project!

1. Situation analysis and target definition
Together with you, we evaluate project-specific issues such as the pollutant situation and local soil and groundwater conditions. Since no project is the same, we develop appropriate product configurations and solution approaches for the specific objective.

2. Project-specific preliminary tests
For projects with challenging baseline conditions and targets, we are happy to perform laboratory tests on the contaminated leachate or your soil sample. The best project-specific active ingredient is selected by simulating the specific site conditions, and its effectiveness is determined.

3. Development of the installation concept
After the successful pre-testing phase, we develop the installation concept taking into account the specific application. Finally, a laying plan containing all the construction details is formulated.

4. Final product configuration
Based on the successful preliminary tests and the planning of the installation concept, your Tektoseal Active product solution is finally designed by combining the best active ingredient and the right geotextiles.

5. Delivery & construction supervision
The product is manufactured as requested and delivered to the construction site. Our engineers will also be happy to assist you with the installation on site.

Project examples

Pollutant and odour filter on contaminated site
Germany | Covering a contaminated site as a safety measure for construction work. Simple installation of Tektoseal Active AC. Pollutants and odours are bound by the activated carbon and do not reach the ground surface. Application as temporary or permanent protection of contaminated sites.

Securing contaminated sediments
Australia | Securing sediments with high PAH and TPH contamination in a bay in Sydney. Installation of approx. 5,000 m² of Tektoseal Active AC as a barrier layer to improve the water quality.

Economic maintenance dredging
Germany | The remediation plan provided for the hydraulic removal of approx. 50,000 m³ of contaminated dredged material using suction dredgers, combined with its dewatering and storage in SoilTain tubes. This process combines the permanent removal of sediment from the watercourse by hydraulic extraction with efficient dewatering and safe encapsulation of the material.

Sludge removal from the bottom of a construction pit
Germany | The high groundwater level makes cut-and-cover tunnel construction challenging. Before the base is concreted, a layer of fine sediment left over from the underwater excavation must be hydraulically removed from the base of the excavation pit. Due to the limited space available, the extracted sludge was pumped into SoilTain tubes directly next to the excavation pit. After dewatering, the material in the tubes can be removed.

HUESKER Services

HUESKER services begin with providing the customer with initial advice and it ends with supporting the realisation of the project on site. What we provide are safe, customised, ecologically sound and economically viable project solutions.

Engineering Services

Technical consulting
We will recommend the appropriate product types for your specific requirements.

Technical design
Our engineers assist design practices by performing verifiable design calculations in accordance with international codes of practice.

Project-specific placement plans
We will prepare installation and placing recommendations plus installation diagrams.

International knowledge transfer
Best-practice solutions and techniques from our global network.

Product Services

Custom-designed project solutions
We will partner with you in developing custom-fabricated products to meet your particular requirements.

Alternative solutions
We will propose alternative design solutions as well as recommendations for adjustments and optimisations.

Documents

Certificates and approvals
Our products have numerous certifications and approvals that are issued, for example, by BAM, BAW, BBA, EBA, IVG and SVG, depending on the product type.

Tender documents
We would be happy to provide you with proposals for your specification texts.

Technical guidelines
Technical guidelines will help you to ensure the best-practice installation of your product on site.

On-The-Spot

On-site instruction
Where required, our application technicians can offer installation assistance related to the specifics of product installation.

Installation aids
We can offer you practical installation aids to facilitate the application of our products.

Training
Product and application specific instruction.

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