Using our ground-breaking methods and state-of-the-art technology, Studsvik’s Freeze-Tec provides clients with an optimal solution to a multitude of waste management issues. We work closely with our customers to deliver an innovative, tailored product that offers significant benefits when handling, managing, and/or treating substances such as aquatic sediments and contaminates, sludge, and residues. Studsvik’s Freeze-Tec offers our customers a range of benefits including:

- Improved environmental performance against conventional technologies to improve your environmental credentials
- Safe handling due to the immobilisation of the media allowing you to maintain a safe working environment
- Cost savings from reduced energy consumption, reduced volumes for transport and easier disposal of dryer materials

**Products and Benefits**

Studvik’s Freeze-Tec Dewatering, Dredging, and Sampling are the central processes and technologies of the Freeze-Tec line. The major benefits of each of these are highlight in the diagram below.

**Freeze-Tec Dewatering**
- Reduces Costs – lower energy consumption along with reduced transport and remediation costs due to greater volume reduction
- Reduces Environment Impact - lower energy consumption, reduced carbon footprint and potential reuse of processed waste as biofuel
- Enhanced Safety - no harmful chemicals used in the process

**Freeze-Tec Dredging**
- Reduces Costs – precision targeting of contaminated materials leads to reduced volumes removed for treatment and storage
- Reduces Environmental Impact – targeted removal mitigates impact on the surrounding area and ecosystem
- Enhanced Safety - stable state of the removed materials reduces the risk to personnel

**Freeze-Tec Sampling**
- Improved Sample Quality - process minimizes the risk of cross contamination
- Increased Sampling Accuracy and Precision - flexible sampling configurations allow for retrieval of accurate sample amounts at precise depths
- Enhanced Safety - sampling process tailored to comply with specified protocols for handling, transport, and storage of collected samples

www.studsvik.com/Freeze-Tec
Freeze-Tec Dewatering

Is an advanced, effective and environmentally sustainable way of drying sludge. Through advanced freeze technology an optimized freeze-thaw cycle is created to remove bound water and transform the sludge into coarse particles with low water content.
- Capable of treating all known types of sludge
- Substantial volume reduction of sludge
- Low energy consumption
- Portable methods can be applied on-site
- Superior reduction of water content
- In some cases, processed sludge can be reclassified as soil or used as biofuel
- Increased variety of options for remediation, refining and recycling

Freeze-Tec Dredging

Is a safe, clean process for the removal of contaminated material. Contaminated sediments are stabilized, in-situ, and are safely removed in a frozen state. The material can then be examined, treated, and disposed of after thawing.
- Prevents the redistribution of contaminated material during the lifting process
- Allows targeted removal of contaminated materials
- Portable and flexible solution, can be tailored to size and shape required
- Offers a safe method for removing radioactive and combustible, unstable materials
- Limits direct human contact with contaminated materials

Freeze-Tec Sampling

Consists of a number of sampling techniques that allow for accurate sample recovery at precise depths and profiles within a sludge or sediment.
- Able to sample all known types of sludge
- Clean removal of the sample without the risk of cross contamination
- Offers three types of sample:
  - Surface sample, removing the top section of the sludge
  - Reversed core sample, removing a sample of the entire depth of the sediment to sample layers
  - Specific depth sample, removing a section from a specific depth
- Able to tailor the sample size to match sampling requirements
- Portable solution allowing it to be used in controlled environments using remote handling equipment

Previous Application Examples

<table>
<thead>
<tr>
<th>Application</th>
<th>Contamination</th>
<th>Customer</th>
<th>Benefits/Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freeze Dredging</td>
<td>Mercury near sewage pipes</td>
<td>Akzo Nobel</td>
<td>No disturbance in the water. Reduced final waste volumes. No need for boundaries surrounding the treated area.</td>
</tr>
<tr>
<td>Freeze Dredging</td>
<td>Sewage sludge in lake, 2000m² Algae overgrowth</td>
<td>City of Storuman (Sweden)</td>
<td>Precision treatment to intended depth (5 cm). No need for slit or bubble curtains. No dispersion of contamination during operation.</td>
</tr>
<tr>
<td>Freeze Dredging/Sampling/Dewatering</td>
<td>PAHs, TBTs, mercury and lead in 3500 m² harbour area (10-120cm depth)</td>
<td>City of Stockholm</td>
<td>Sediment volume reduced and transported in sediment form. Continuous sampling for perfect result without any remaining contaminations.</td>
</tr>
<tr>
<td>Freeze Dewatering</td>
<td>Annual dewatering of 10,000 tonnes of oil decontaminated sludge</td>
<td>Ragn-Sells</td>
<td>20 times less energy consumed in drying/dewater production compared to a traditional belt dryer.</td>
</tr>
</tbody>
</table>