Baroid Surface Solutions™
ENVIRO-FIX™ Solids Stabilization Process

- For stabilizing drilled cuttings from water-, oil-, and synthetic-based drilling fluid systems
- Can turn oily sludge into a much easier material to handle and dispose of
- Can provide cost effective cuttings treatment

Drilled cuttings and similar materials are often physically unstable and unsuitable for landfill and difficult to transport and contain. If improperly managed, drilled cuttings may expose the operator to environmental liability. In these strictly regulated times, cuttings can only be disposed of once it has been determined that the material poses no threat to the environment.

Reduces Costs and Complexity

The ENVIRO-FIX process is performed on-site where the cuttings are generated, thus eliminating the high risk and costs associated with transportation. The end product is a soil-like substance that can often be safely disposed of on location in some cases, depending on local legislation. If transportation is still required, the ENVIRO-FIX process stabilizes solids which can usually be handled and contained much more easily and at a significantly lower cost than the storage options available for the wet, untreated cuttings.

Easily Handles Most Types of Solids

The ENVIRO-FIX process can successfully treat most types of drilling waste solids:
- Drill solids from pits or solids control equipment
- Cuttings from oil or synthetic drilling fluids
- Solids resulting from centrifuging drilling fluid to reduce volume
- Sludges left after the drilling fluid dewatering process

During the ENVIRO-FIX process, simple and reliable mechanical equipment is used to blend the BAR-FIX™ treatment product, with the solids at rates of up to 50 cubic yards or 38 cubic meters per hour. Specially trained Baroid Surface Solutions personnel keep the process running efficiently and monitor end product consistency. The process is based on pozzolanic chemistry and forms an inert, watertight, stable crystalline matrix. As water is prevented from entering the cuttings, no oil, grease or hydrocarbon leaching can occur. Any heavy metals in the cuttings are chemically bonded into the structure of the matrix and therefore do not leach out.

Portable ENVIRO-FIX System
Rigs Up Easily

The ENVIRO-FIX system travels as a single load and can be set up quickly at the rig site.

The table below and the photograph on the back show the laboratory analysis and appearances of oil-based cuttings before and after the ENVIRO-FIX process.

<table>
<thead>
<tr>
<th>Typical ENVIRO-FIX Process Test Data</th>
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<tbody>
<tr>
<td><strong>Sample before Treatment:</strong></td>
</tr>
<tr>
<td>Oil and grease, wt. %:</td>
</tr>
<tr>
<td><strong>Leachate from Sample after Treatment:</strong></td>
</tr>
<tr>
<td>Oil and grease, wt. %:</td>
</tr>
<tr>
<td>Arsenic, mg/L:</td>
</tr>
<tr>
<td>Barium, mg/L:</td>
</tr>
<tr>
<td>Cadmium, mg/L:</td>
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<tr>
<td>Lead, mg/L:</td>
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<tr>
<td>Mercury, mg/L:</td>
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</tbody>
</table>
Multiple Disposal Options

The ENVIRO-FIX™ system has been widely used in the United States, the United Kingdom, Venezuela, Bolivia, and Indonesia. Depending on the local legislation, the soil-like end product can be disposed of on location, transported to a sanitary landfill, or, as shown below, used in road construction. These options can result in significant savings when compared to those available for untreated cuttings.

**Before**

**After**

ENVIRO-FIX Process

Road in Venezuela surfaced with cuttings treated by the ENVIRO-FIX process.

Baroid ENVIRO-FIX unit in use in Algeria.