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**YOUR GUIDE TO  
BROWNFIELD BIOREMEDIATION  
2008 - 2009**

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## About SpillAway

Today, SpillAway International Ltd are the leading manufacturer of diverse bioremedial and bio-based products for hydrocarbon and organic waste solutions to the industrial, food processing, marine and land remediation sectors.

Having harnessed the innovative technology of bioremediation, SpillAway are able to offer comprehensive solutions to all hydrocarbon and organic contaminated land on site and with the minimum of interruption.

All products within the SpillAway range are:

- non-chemical based
- pH neutral
- non-toxic
- non-hazardous
- non-caustic
- non-corrosive
- non-flammable
- safe to use
- readily biodegradable
- made from 100% naturally occurring and renewable sources

The microbes used within the products will literally “eat” hydrocarbon and organic waste, allowing for the total degradation of hydrocarbons in soil and groundwater within 60 days.

## What is Bioremediation?

Bioremediation is the process of using naturally occurring, safe and beneficial micro-organisms to degrade environmentally harmful contaminants and turn them into non-toxic compounds. In particular, these organisms will break down most petroleum hydrocarbons and transform them into harmless gases & water. Further, this natural process will produce valuable bio-nutrients that can be utilised by both plant and aquatic life. The process of bioremediation is listed as one of the United States Environmental Protection Agency's (EPA) innovative technologies.

All of our bioremedial products contain completely natural micro-organisms that can be found in the soil and water all around us, SpillAway have merely augmented nature's way of disposing of hydrocarbons. As a provider of off the shelf solutions, all of SpillAways products are easy to use and ready to be used, the products are simply activated by adding water.

Once activated, our products will un-adhere and digest all hydrocarbon and organic waste from soil, leaving trace residues of water and harmless gases. The process is not only completely natural and environmentally sound, but is cheaper than other methods and poses no health and safety risks to staff and operatives.



## The Products



### HC-300 Kit™

HC-300™ is our full strength bioremediation formula for use on brownfield regeneration or disaster recovery projects. With an active content of almost exclusively non-spore forming bacteria, HC-300™ is used as a heavy shock treatment and can bring even the most heavily contaminated sites to within permissible levels within 60 days.

**Available in 20litre Pails / 205litre Drums**



### Dry Remediate™

Using a highly absorbent microscopic powder to carry the bacterial content of this product, Dry Remediate™ is the perfect product for shallow level and ex-situ projects. Simply till Dry Remediate™ into soil and activate with water. Dry Remediate™ can also be used to stiffen and stabilise sludge, allowing for the safe transportation of contaminated sludges, whilst the presence of water will release oxygen from the powder, helping biodegradation and further improving carbon footprints.

**Available in 15kg Pails**



### Liquid Remediate™

Liquid Remediate™ can be used either as a stand alone product for small scale spills such as equipment leaks, or as the 1st phase “soil-washer” in large scale projects. Natural solubalizers in the product help it un-adhere contaminants from the soil, allowing more surface contact with the products microbes, resulting in quicker bioremediation.

**Available in 20litre Cubitainers / 205 litre Drums / 1000litre IBCs**

## **In-Situ Bioremediation (Shallow)**

Due to the ease of use of SpillAway products, Shallow level bioremediation (up to 1.5 metres deep) can be completed in-situ with the minimum of labour and equipment costs and, where local obstructions such as flora, utilities lines or buildings are present, SpillAways bioremediation techniques offer non-intrusive solutions.

Implementation typically lasts one day for smaller sites (up to 1000m<sup>3</sup>) and we aim to reach target levels within 60 days of implementation.

The implementation techniques themselves can be as simple as tilling the soil with Dry Remediate Powder™, followed by diluting and broadcast spraying of our liquid products (HC-300™ is diluted 5:1 with water and Liquid Remediate™ is diluted at 10:1 with water). Non-intrusive techniques include slotted pipe systems and gravity feed wells.



***Broadcast Spraying and Tilling***

***Gravity Pipe Feed System***

## **In-Situ Bioremediation (Deep)**

Deep level bioremediation is hampered only by our ability to get to the deepest level of contamination. Through the use of drilling equipment such as Geoprobe, it is possible to treat contamination at levels of 15 metres or more. The drilling equipment drills into the soil on a matrix system and SpillAway HC-300™ and Liquid Remediate™ are injected into the ground under pressure as the drill is retracted, ensuring that our products are distributed evenly through the entire plume of contamination.



***Drilling With Geoprobe***

***Marking Out the Matrix***

## Ex-Situ Bioremediation

There are many scenarios that make in-situ bioremediation impractical, such as a moving water table, nonporous soil conditions or the need to access the affected area immediately. In such cases we would look to ex-situ bioremediation. Soil does not have to be removed from site, merely excavated and moved a more suitable location on site and involves no costly haulage charges. The chosen site is lined with a non-permeable ground sheet to prevent any leaching and the soil is transferred to the area. The soil is tilled or windrowed with Dry Remediate™ and HC-300™ and Liquid Remediate™ are then broadcast sprayed onto the soil.



*Large Scale Land Tilling*

*Broadcast Spraying*

## Sludge Stabilisation

Sludges and sludgy soil can be stabilised using SpillAway absorbent media. Dry Remediate™ and SpillAway+™ are highly porous powder products that create a permanent physical bond with contaminants and will not leach, even under mechanical pressure. Through the use of Dry Remediate™, it is possible to absorb all water and free phase hydrocarbon contamination, making sludges safe and easy to manipulate. The sludges can then be removed ex-situ and the bacterial content in Dry Remediate™ can bioremediate the hydrocarbon contaminants in controlled conditions.

Where sludges are deemed unsuitable for any type of remediation but are unsafe for transportation, SpillAway+™ Absorbent Powder can be used to stabilise sludge to a point where it can be safely transported to a waste handling station. As a non-bacterial product, SpillAway+™ offers a cheap and effective way of preparing sludges for transportation to landfill.



*Sludgy Soils*

*Stabilised Using Dry Remediate™*

## Waste Acceptance Criteria (WAC) Testing

In the event that excavated soils heading to landfill fail WAC testing criteria, it is possible to stabilise heavy metals and organics using SpillAway+™ Absorbent Powder. SpillAway+™ is a highly porous powder that creates a physical bond with the contaminants that it is coming into contact with a will not leach, even under mechanical pressure. The contaminant is then effectively trapped and stabilised within the powder allowing for safe disposal as hazardous waste.

## PAH Treatment

Where high levels of benzopyrene and other PAHs are prevalent it is possible to treat using SpillAways specially formulated product PAH-400™. PAH-400™ is a liquid product and is diluted and applied in exactly the same fashion as our other liquid products. However, it has been specifically engineered to identify and degrade difficult PAHs often related to old coke factories, gas works and heavy industry.

## Dissolving Solids

Where high levels of solidified tar, bitumen and other hydrocarbons are present in soil, it is possible to dissolve these contaminants using JackHammer™ - Tar & Bitumen Remover. JackHammer™ is a biobased, biodegradable and non-polluting product that will take solid and highly viscous contaminants into solution, allowing for more effective bioremediation to take place.

## Land Remediation Tax Relief

In 1998 the government set up the Urban Task Force to look at ways of increasing urban redevelopment.

Contaminated land sites can have significant negative impacts on the environment, local households and businesses and provide a significant barrier to redevelopment of the land.

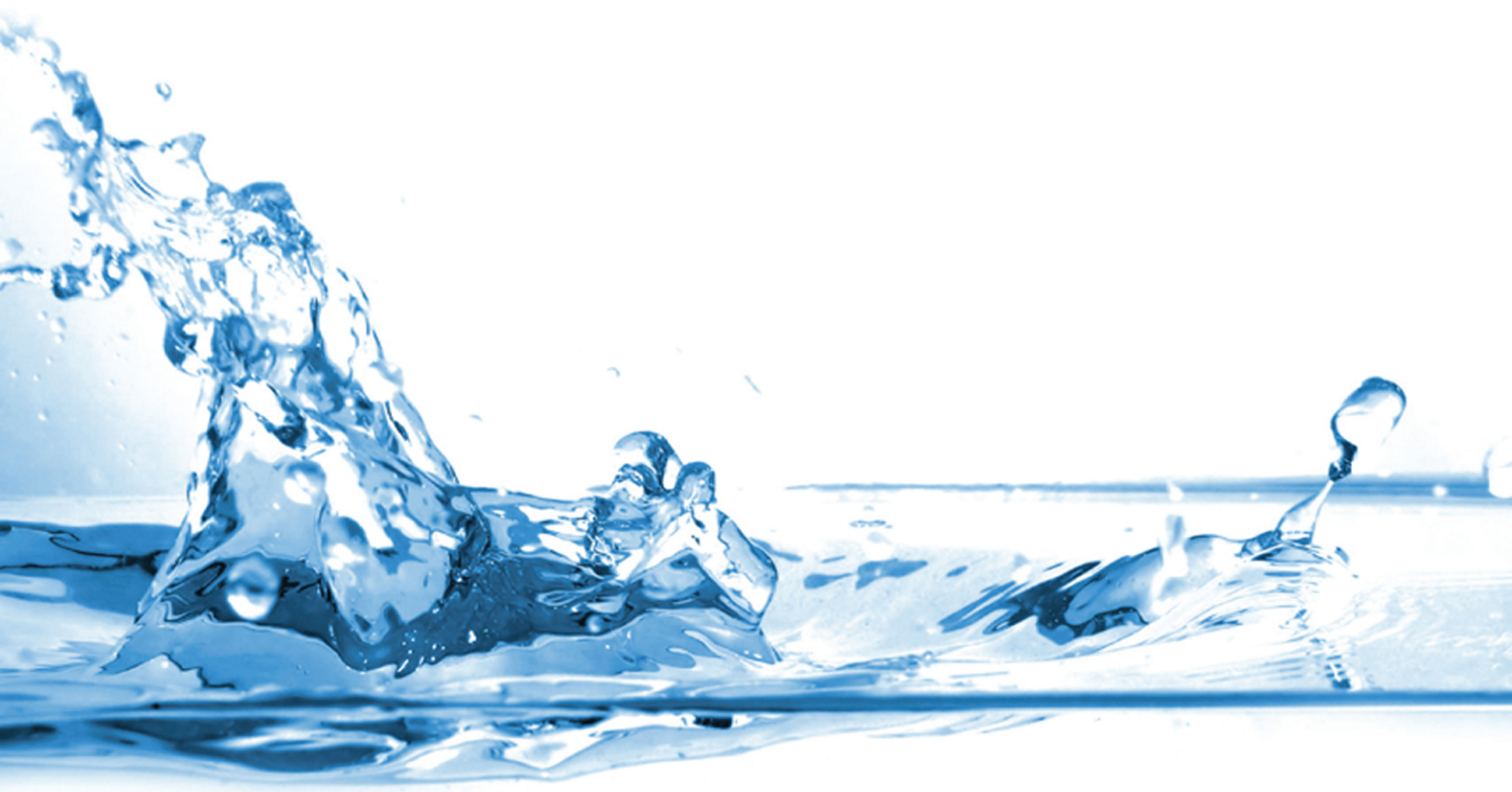
It is for these reasons that the Government has encourages the clean up of contaminated land by introducing an enhanced tax relief for the costs incurred by companies in cleaning up land they acquire in a contaminated state.

Businesses can claim relief from corporation tax if they clean up contaminated land. You can claim tax relief of 150 per cent of the clean-up cost.

For more information see:

<http://www.hmrc.gov.uk/manuals/cirdmanual/CIRD60000.htm>





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