OilCure

INNOVATIVE ENVIRONMENTAL REMEDIATION

OIL DIGESTER

The Effective Choice - Naturally

SOIL | GROUND WATER | MTBE

www.allcure.co.za
Tel: 061 469 8370
Francois Viljoen
Mobile: 082 805 0405
Email: cois@allcure.co.za

100% NATURAL

AllCure

Think beyond green!

Bioremediation

Bioremediation is a "green" technology and a natural process that uses microbes and enzymes to transform hydrocarbons into non-toxic carbon dioxide and water. Bioremediation can achieve the elimination of hydrocarbon contamination in many environments with a speed and thoroughness much greater than traditional methods and at significantly lower costs.

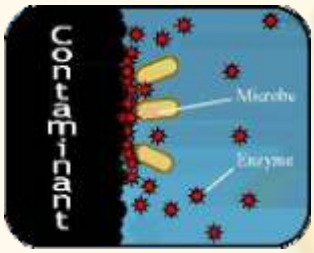
Bioremediation poses lower environmental and health risks, as well as being less obtrusive, and requires a smaller environmental footprint.

OilCure Oil Digester Products offer lower clean-up costs and significantly shorten the time frame by allowing ex-situ or in-situ remediation.

Bioremediation is typically faster and is very cost effective relative to other technologies and has become widely-accepted among regulatory agencies. The **OilCure Oil Digester** Products are a complete bioremediation system that provides the material for a safe, effective, easy-to-use and significantly lower-cost alternative to off-site disposal of hydrocarbon-contaminated soils, ground water and MTBE contamination. Bioremediation should be considered as an environmentally and economically-desirable option for any site where hydrocarbon bases remediation is required.

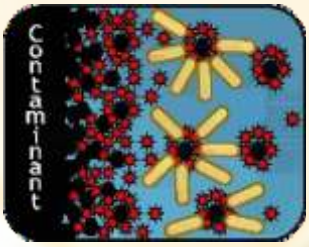
Technology

OilCure Oil Digester Products increase the surface area of the oil droplets by wetting them out and making them more water soluble. This enables the microbes to secrete the various enzymes to do the cleavage and digestion of the oil and organic chemicals. The enzymes chop the long-chains of the hydrocarbons into two carbon units which can then be used as a carbon source for the microbes to reproduce. This results in water and carbon dioxide as by-products.



The **OilCure Oil Digester** Products are a mixture of 12 naturally-occurring microbes and several types of enzymes coupled with a nutrient package that accelerates the digestion process. The enzymes are constantly being produced by the microbes and, as the population of the microbes are increased, the amount of the enzymes are increased. The biodegradation of petroleum-based compounds can be accomplished both in oxygen-rich (aerobic) and in oxygen-poor (anaerobic) environments.

The **OilCure Oil Digester** Products use all-natural Nano-Technology to break down the adsorption of hydrocarbons in groundwater and aquifer matrix. The Nano Technology breaks down macroscopic clumps of petroleum into smaller units while increasing the surface area. Their continuous chain-collision resembles nuclear fission, where original size Nano particles fragment into significantly smaller particles. By continuous fragmentation of the original size of Nanoid particle, active-Nanoids produce significantly smaller Nanoidal particles making them more accessible for different sizes of openings. The Nano Technology action also allows the microbes to migrate through the soil and water matrixes more easily.



The unique characteristic of our microbial blend is its ability to adapt to the changing distribution of hydrocarbon by-products and produce more enzymes needed to digest a particular type of hydrocarbon. The food-grade botanical extracts increase the attack ratio for the microbes and enzymes.

OilCure Oil Digester - Soil

- A powerful blend of 12 strains of microbes, enzymes and natural botanical nutrients designed to digest hydrocarbons in soil remediation applications.
- Treats a wide range of hydrocarbons, such as crude oil, gasoline, drilling mud, diesel and more.
- Biologically converts hydrocarbons into carbon dioxide and water.
- Available in a ready-to-use liquid formula.
- Changes the surface of the soil particles from hydrophobic to hydrophillic.
- Highly effective on free-product.
- All-natural ingredients that FDA-GRAS lists as safe for plants, animals, aquatic life and humans.

Applications

Topical Spills: **OilCure Oil Digester - Soil** is applied by saturating the contaminated soil and tilling to ensure complete coverage and increase oxygen levels. It is essential to ensure the soil is kept moist during the bioremediation process which can be accomplished by an irrigation/sprinkler system. Additional applications may be necessary to achieve the desired TPH levels depending on site conditions.

Ex-Situ Applications: Common methods of ex-situ are land farming and soil washing. Land farming consists of spraying contaminated soils with microbes and nutrients. The soil is periodically tilled to ensure complete saturation and provide oxygen. Soil washing is a process in which contaminated soil is excavated, screened to remove debris and then washed with ***OilCure Oil Digester - Soil*** to bioremediate the contaminants.

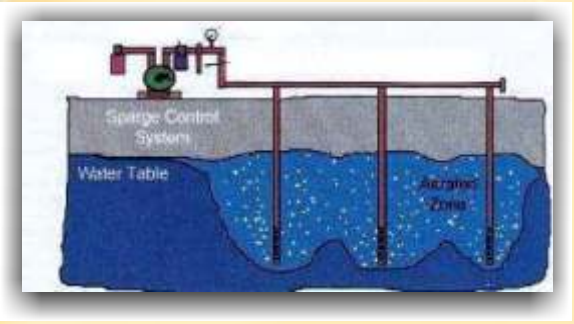
In-Situ Applications: In situations where removal of the soil is impractical, **OilCure Oil Digester - Soil** can be used to treat the contaminant in place without disturbing the site. This process usually requires pumping of OilCure Oil Digester - Soil, oxygen (air sparging) and nutrients under pressure into the soil through injection wells.

OilCure Oil Digester - Groundwater

- A powerful blend of 12 strains of microbes, enzymes and natural botanical nutrients designed to digest hydrocarbons in groundwater remediation applications.
- Treats a wide range of hydrocarbons, such as crude oil, gasoline, fuels oils, diesel and multiple aromatics.
- Biologically converts hydrocarbons into carbon dioxide and water.
- Available in a ready-to-use liquid formula.
- Highly effective on free-product.
- Injected directly into groundwater.
- All-natural ingredients that FDA-GRAS listed as safe for plants, animals, aquatic life and humans.

Applications

In-situ groundwater bioremediation can effectively degrade organic constituents which are dissolved in groundwater. In-situ bioremediation of groundwater can be combined with other saturated zone remedial technologies (e.g., air sparging).

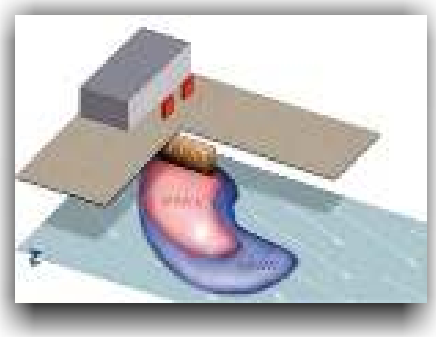


To accomplish this, extraction wells are drilled and the groundwater is pumped into tanks. The contaminated water is inoculated with **OilCure Oil Digester - Groundwater** along with nutrients and air sparging and treated before it is pumped back into the ground. The added nutrients and air assist the microbes in bioremediating the MTBE contaminated groundwater. Groundwater can also be treated underground by pumping **OilCure Oil Digester Groundwater**, nutrients and air into the injection wells.

BioRem-2000 Oil Digester - MTBE

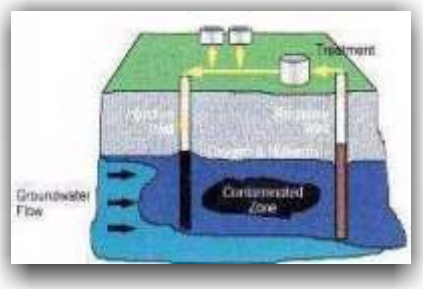
- A powerful blend of 12 strains of microbes, enzymes and natural botanical nutrients designed to digest MTBE in groundwater applications.
- Biologically converts MTBE into carbon dioxide and water.
- Available in a ready-to-use liquid formula.
- All-natural ingredients that FDA-GRAS lists as safe for plants, animals, aquatic life and humans.

The characteristics of MTBE are unlike those of other gasoline constituents as MTBE is highly soluble and migrates quickly with groundwater and does not adhere well to soil particles. Because MTBE behaves differently in soil and water than other hydrocarbon constituents, the choice of an effective remediation technology may be different when MTBE is present with other fuel contaminants at a site.



While MTBE was initially thought to be resistant to biodegradation, this perception has changed dramatically in the last few years. New research initiatives has shown the efficacy of new specific strains of bacteria in OilCure Oil Digester and improved methods of biodegrading MTBE, including exsitu bioremediation in bioreactors.

The typical method is using an ex-situ bioreactor which is colonized by microbes in OilCure Oil Digester - MTBE as well as the addition of oxygen (air sparging) and nutrients to promote the aerobic degradation of the MTBE. To accomplish this, extraction wells are drilled and the groundwater is pumped into tanks. The contaminated water is inoculated with OilCure Oil Digester - MTBE along with nutrients and air sparging and treated before it is pumped back into the aquifer (rather than discharge it to a sewage treatment plant which was standard practice). The added nutrients and oxygen assist the microbes in bioremediating the MTBE-contaminated groundwater. The ideal system would continually recirculate the water until cleanup levels had been achieved.



Groundwater can also be treated underground by pumping OilCure Oil Digester - MTBE, nutrients and air into the wells. For in-situ application of OilCure Oil Digester - MTBE, the product is introduced into an aerobic zone (i.e., area of air sparging) by injection/extraction wells.

The microbes in OilCure Oil Digester - MTBE actually need a small amount of BTEX to be present to act as a carbon source and induce MTBE-degrading enzymes.

OilCure Oil Digester - Nutrient Blend

- OilCure Nutrient Blend aids the all-natural strains of microbes in accelerating the digestion of hydrocarbons in soil applications.
- A superior, slow-release nutrient source, stimulant, and accelerant.
- Produces excellent plate counts.
- The food-grade botanical extracts increase the attack ratio for the microbes and enzymes.
- Bio-based, all-natural and completely biodegradable.

The addition of nutrients may be necessary if the environment does not contains adequate amounts of nutrients, such as nitrogen and phosphorus. Microbes require nutrients to support cell growth and sustain the biodegradation processes. Nutrients may be available in sufficient quantities in the aquifer but, more frequently, nutrients need to be added to maintain adequate microbe populationsThe nutrients help keep the efficiency of the system as close to 100% as possible, as well as increasing the population of microbes and enzymes through increased reproduction. This allows the statistics of the reaction to improve by increasing the number of collisions per second.