E R G O F I T O I N A C T I O N

Give Nature What Nature Wants

Bio Hydrocarbon Remediation

ERGOFITO

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HYDROCARBON POLLUTION:

Hydrocarbons in whatever form are generally the most common contaminant that requires remediation due to their widespread occurrence and the risks they pose to humans, animals, environmental and all living organisms.

Total Petroleum Hydrocarbons (TPH) is a term used to describe hydrocarbon compounds derived from Petroleum Sources. Common fuels such as Petrol, Diesel, Kerosene and Lubricating Oils/Greases all fall within the TPH category. Due to the diversity of compounds that comprise TPH and the environmental and human health risks they pose, the remedial methods used to address them need to be considered on a site-specific basis.

Although hydrocarbons are simple organic substances (comprising only carbon and hydrogen) there are a huge number of different compounds, each exhibiting different chemical and physical properties. To rationalize the behavior of TPH once released into the environment it is easiest to look at the structure and size of specific compounds. TPH compounds that have an aliphatic structure (i.e. straight or branched chains of carbon molecules) will behave differently to aromatic compounds (ringed chains of carbons). Similarly TPH compounds that have less carbon molecules will also act differently.

Lighter end TPH compounds (i.e. less than 16 carbon atoms) tend to be more mobile due to greater solubility, greater volatility and lower organic partitioning coefficients. Lightweight aromatic compounds, such as benzene, are also more toxic making them of greater concern if released into the environment. Heavier TPH compounds typically have opposing properties, tending to adsorb into the organic fraction of soil.

Heavier aromatic compounds, referred to as Polycyclic Aromatic Compounds (PAH), can also have higher toxicity and are typically more persistent in the environment. PAH's are commonly found in coal tar, heavy oils and creosotes.



ERGOFITO IN SITU BIO-REMEDIATION

On site remediation of soil, fresh or sea water contaminated with all types of hydrocarbons, is the most cost effective and intelligent means of dealing with contamination. **Ergofito Aqua** is a simple yet highly effective in situ remediation technology that helps companies deal efficiently with contaminated soils and/or spills. Upon application, **Ergofito Aqua** immediately starts to attack the hydrocarbons and converts them into humus thereby eliminating the need for expensive excavation, relocation

and disposal of the waste elements. Once the process of conversion is complete, the hydrocarbon waste is converted into an organic fertilizer, rich in nutrients and minerals that are available for new plant growth and animal life.

ERGOFITO AT WORK:

Ergofito is certified in numerous countries around the world, including USA, Saudi Arabia, South Africa, Republic of Congo, Nigeria, Pakistan, New Zealand, in the whole of the EU and more.

It is actively utilized in the following fields:

BIO-REMEDIATION

- Pit Closures
- Pipeline & Flow Line Leaks
- Well Head &Tank Farm Leaks
- In Situ Soil Remediation
- Tank Cleaning
- Compressor Stations
- Surface Hydrocarbon Spills
- Drill Cuttings

ODOR CONTROL

- Landfill Odor Control
- Vapor Suppression
- Tank Degassing
- Sewage Odor Control
- Effluent Odor Control

Efficient On-Site Remediation:

Some of the conventional methods of bio-remediation, while sometimes effective in the short term are not normally economical or environmentally friendly in the long term. These technologies are either dependent on chemicals or high-temperature incineration fraught with technical complexity. Smaller incinerations are costly, creating toxic emissions with no public acceptance.

Ergofito Aqua was developed to counter the limitations of conventional on-site remediation. As a 100% organic fluid oil remediation product it can be utilized on-site even in the most sensitive ecosystems. Its natural ingredients are derived from glucides and essential amino acids which form powerful decomposing agents that stimulate the natural predisposition of certain bacteria to produce enzymes capable of breaking down the hydrocarbons in organic matter.
The hydrocarbons are thereby transformed into bacterial proteins that form a biological mud and a mixture of soluble fatty acids. This final product is completely environmentally friendly and favors the development of beneficial organisms and microbes. This process is fast, cost-effective and in most cases enables the re-use of

the treated soil while providing adequate protection for human health and the environment.
The immediate evidence of mitigation is exhibited in sharp declines in Total Petroleum Hydrocarbon (TPH) levels in the treated areas. Results are achieved in a fraction of the time and expenses normally required for soil excavation, relocation, disposal, incineration, or traditional bioremediation methods. The long-term benefit from using **Ergofito** products is that they facilitate biodegradation by natural means.

DOSAGE:

Dosage is dependent on the level of THC and the time that is available to resolve the pollution problem.
The general dosage requirements are as follows:

Oil pollution in soil:

Apply 10 to 50 grams of **Ergofito Aqua** per square meter of hydrocarbon-polluted soil. The **Ergofito Aqua** is diluted 1:20 with water for application. (1 Kg of **Ergofito Aqua** add 20 liters of water)

If the hydrocarbon is deeper than 30 cm, expose the deeper soil to surface and apply as above. The amount of THC will dictate the amount of **Ergofito Aqua** per square meter. In case of excessive pollution or time restrain, you can apply up to 150 grams of **Ergofito Aqua** per square meter.

Please note: If the ground is measured in cubic meters and the soil may have been transported from a different site to a place of remediation, do not exceed 30 cm thickness as **Ergofito** is an aerobic product and requires air.

Please refer to extensive samples, references and lab results on **Ergofito** for typical applications (Available on request). Results are obtained from seven days from application onwards and generally after 30 days the THC is reduced between 60 and 95%.

Oil pollution in water (fresh or sea water):

Apply 10 to 50 grams of **Ergofito Aqua** per square meter of hydrocarbon-polluted water. The **Ergofito Aqua** is diluted 1:20 with water for application. (1 Kg of **Ergofito Aqua** add 20 liters of water).

As **Ergofito Aqua** has a natural surfactant, once **Ergofito Aqua** is applied on the pollutant hydrocarbon it will stick to the THC until it is decomposed. Even if strong winds split the polluted patch into a vast area, decomposition will take place, as **Ergofito Aqua** cannot be washed away, by ether surf or winds. It can be applied on rocks, tidal pools, marshes and any possible crevasses that nature may offer.

Dosage can be increased up to 150 grams per square meter in area where hydrocarbons may have accumulated in thick layers. It makes no difference if the water is

salty (up to 65000 ppm) or fresh, or even water polluted with sewage or other organic pollutants.

Results are obtained from seven days from application onwards and generally after 30 days the THC is reduced between 60 and 95%.

FACTS:

When faced with tar pits or old caked open-air hydrocarbons reservoirs, dosage and methods may vary. In many cases, as in the oil tanks regular cleanup's, it is recommended to set a small area aside where all hydrocarbon can be depolluted by **Ergofito Aqua** (see picture below) The water jets assure moisture for the bacteria.

All bacteria is affected by ambient temperature, the warmer it is the faster and more efficiently the bacteria will work. Many situations are encountered in the field of hydrocarbon pollution. Selection of the right approach and application of **Ergofito Aqua** may affect the speed of results.

Ergofito bacteria will resolve the hydrocarbon problem without any side effects.

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