



**envirotech**  
**solutions** LTD

**enviro**  
**peat**™

**The 100% natural oil  
& chemical absorbent**

**THE 100% NATURAL OIL & CHEMICAL  
ABSORBENT**



## COMPANY PROFILE – ENVIROTECH SOLUTIONS

**envirotech solutions** are a relatively new company focusing on environmental issues directly related to specific industry requirements.

Our specific target/focus areas are in:

- **Used filter element recycling**
- **Absorbing and cleaning up industrial spills**

This technical document refers directly to the aspect of our company profile in regard to **\*absorbing and cleaning up industrial waste\***

**envirotech solutions** have a distribution agreement with New Zealand growing media for the promotion and distribution of the **enviropeat™**. (See following NZGM company profile)

The background of **envirotech solutions** stems directly from the hydraulics industry. With over 40 years of experience in hydraulics it was identified that our industry along with many others had not embraced the environmental aspects or our specific industries in regard to disposal and clean up of industrial related products.

Hence the formation of **envirotech solutions**.

## COMPANY PROFILE - NZGM

New Zealand Growing Media (NZGM) is a privately owned family company. NZGM has established itself as a quality manufacturer and supplier of peat and peat based products. The company has been operating for more than 25 years and has been a prominent and successful domestic supplier and exporter of exceptional quality peat based products throughout this period.

NZGM is based in Browns, Southland and specialises in producing high quality peat, potting mixes, mushroom casing, nursery blends, specialist growing media products and an oil spill absorbent - **Enviropeat™**. All our peat based products are produced using the highest quality sphagnum peat.



NZGM is committed to providing our customers with solutions to the environmental issues they face on a day to day basis, at the best possible price. It is what you expect. It is what we strive to achieve and deliver.



## **Sources of peat:**

Peat lands of one kind or another occur in most countries, except those which are arid. About three million squares kilometres, or about 2% of the earth's land surface, are covered in peat. Approximately 80% of this area is accounted for by the peat resources of Canada, the former USSR, and Finland. 1,660 square kilometres of peat land occur in New Zealand representing 0.6% of the area of the country – roughly the same area as Stewart Island. Small isolated areas in the South Island and the Chatham Islands contain New Zealand's main deposits of Sphagnum moss peat.

## **What is it?**

Peat is an accumulation of dead plant material that has incompletely decomposed, principally due to lack of oxygen. The peat bogs that New Zealand Growing Media (NZGM) controls are the type derived from the sphagnum moss, and are known geologically as High Moor Peat Bogs. This generally means that the peat bogs have grown on their clay base raised up above the surrounding landform to these peat bogs resulting in a silt free environment. This leads to the development of a particularly pure grade of sphagnum peat.

## **Enviropeat™:**

Enviropeat™ is an exceptionally pure, high quality sphagnum peat sourced from Southland, New Zealand. Enviropeat™ is used for absorbing and cleaning up industrial spills and waste including oil, diesel, hydraulic fluid, alcohols, aromatics, carbonyl compounds, hydrocarbons, and heavy metals. It also has the ability to filter industrial wastes, untreated effluents, algae and mining remnant waste.

## **Ecological:**

Enviropeat™ is a non-leaching organic fibre. It is incredibly economical and environmentally friendly i.e. the bacteria within the peat will break down the contaminant over time and return back to its natural state. NZGM is the only company in New Zealand producing such a product.

Enviropeat™ is a non-toxic, all natural 100% organic industrial absorbent that is economical, non-abrasive, non-leaching and, in its natural state is already bio-degraded. When given a hydrocarbon food source, the naturally occurring bacteria propagate rapidly within the fibres to break down the contaminant into its non-harmful form.

## **Enviropeat™ process:**

Enviropeat™ is a highly quality sphagnum peat moss that is harvested and dried through a dehydration process. The drying process allows the fibres to absorb hydrocarbons where the water was once stored. The fibre encapsulates the hydrocarbon and will not allow leaching. Once the hydrocarbons are truly absorbed and controlled, contaminants can be quickly picked up and disposed.



## HOW DOES IT WORK?

The key to Enviropeat™ miracle action is in New Zealand Growing Media's unique drying process. That process releases the natural waxes found within the peat and transforms it to a hydrophobic state. The cellular structure of peat is then ready to draw in any hydrocarbon based pollutant on contact. Once the hydrocarbon is encapsulated it will not leach. Naturally occurring bacteria then go to work breaking down the hydrocarbons into their simplest form – harmless to the Enviropeat™ – returning the peat back to its natural state. Enviropeat™ is an effective vapour suppressant and absorbent of hydrocarbons on land and water, in wet and dry conditions making it ideal to treat free flowing hydrocarbons even in extreme flooding.

### On land:

For a land spill, apply Enviropeat™ around the perimeter of the spill to prevent the spill from spreading further. Once contained apply Enviropeat™ to the remainder of the spill. Once fully absorbed, the Enviropeat™ can be swept up and removed. No hosing down, detergent or chemicals are required to clean up the spill.



### On water:

On water, apply Enviropeat™ around the perimeter of the spill whether in a loose form or as a sock or boom. Scatter Enviropeat™ over the contained area and allow to cake. Remove using an appropriate extraction method such as fine nets or a wet suction recovery system.



**Ecology:**

The spent Enviropeat™ can be disposed of in landfills, incinerated or land farmed with no polluting effects. Due to the fact that Enviropeat™ will not leach the hydrocarbon it is possible to landfill where local regulations permit. Since Enviropeat™ is also an energy source it will assist in the incineration of absorbed hydrocarbons. When blended with soil and land farmed, naturally occurring bacteria in Enviropeat™ will go to work to break down the hydrocarbons into their basic elemental form, completely harmless to the environment.

**TECHNICAL PROCEDURE:**

Enviropeat™ is a very versatile product. Due to its absorption capability – up to 4 times its weight – and to the fact that it will not absorb water and it can float on the surface waters, Enviropeat™ can be successfully applied both on soil and on water.

**On soil:**

Spread Enviropeat™ all over the contaminated area. By mechanical means, mix the affected soil with the absorbent in order to ensure the contact. Be sure that Enviropeat™ reached the sufficient depth to absorb and retain the contamination from expanding. Almost instantaneously, Enviropeat™ will absorb the pollutant and facilitate the initiation of biodegradation. In order to take place, the biodegradation requires:

The Host – Enviropeat™

Oxygen

Water

Nutrients

Temperatures above 10°C

If all these conditions are accomplished, the bioremediation will rend the land to its initial use in up to 120 days.

The technology, "in situ", does not require neither special outfits (other then the existing in agricultural enterprises), nor qualified personnel, and consequently, the de-pollution expenses are much lesser over the expenses required for the uncover. The action is considered fulfilled when the soil chemical parameters reached the witness level. At that time, the land could be reused as for initial purpose.

## **On Water:**

Enviropeat™ is manually or mechanically spread on the polluted surface. The absorption is almost instantaneous and the product 'kept' in the cells float on the water surface up to 72 hours, time within it can be by simply, inexpressive means, recovered. Being hydrophobic, Enviropeat™ doesn't absorb the water, and after recovery, it can be burnt either in thermal ovens (heaters) (it produce approx. 2% ashes), or at the same place of the accident (it burns under control, without explosive burn hazard). The recovered absorbent from water surface is biodegradable in time, without affecting environment quality.

## **Concreted surfaces:**

Onto concreted surfaces with petroleum leaks, Enviropeat™ is spread out and rubbed, the contact between pollutant and absorbent being accomplished.

Enviropeat™ holds hydrocarbons, and become easy to recover. The resulting product will be cremated or stored in dedicated storage locations. The surfaces where Enviropeat™ was applied are no longer slippery and ensure adherence.

## **Tanks, recipients or hydrocarbon slurries cleaning:**

Enviropeat™ is spread over the residues. After mixing to realize contact between residue and product, Enviropeat™ will absorb the residue until saturation. Initially, the product has a brown coloured fibrous aspect, and in case of melting with residues, it become humid, ark coloured. At this moment, the product can be removed (there is no longer accidental pollution danger), it can be packed and burned in thermal ovens, or can be stored in the landfill without pollution danger, the main characteristics of it being biodegradability.

## **Enviropeat™ can be used also to:**

Water filtration  
Petrochemical Industry  
Oil wells  
Recipient slurries treatment  
Fuel stations  
Digging platforms  
Road safety (oil spot removal from road)



Ships  
Airports  
Workshop leak removal  
Paint & ink industry  
Slaughter – houses  
Ports



**Perth Petroleum Services**  
OIL & CHEMICAL SPILL EQUIPMENT

Wayne Collingwood  
Manager Ravensdown Growing Media  
Ravensdown Fertiliser Co-operative Limited  
Head Office: Level 1, 32 Oxford Terrace  
P O Box 1049,  
Christchurch, New Zealand

Dear Wayne,

Just a quick note to advise you of our successful launch of your peat.

Having compared it to the Canadian product, we felt your peat suited our climate better. Having slightly more weight amongst other advantages, it has been a very successful launch.

In the last few months we have had a considerable take-up rate of your peat. These include some of the world's largest miners but also many of our distributors have put in stock. That is the most pleasing result.

Please keep as abreast of any new developments,

Yours truly,

Matthew Baldock  
Partner





## TEST

Tests for determining Enviropeat™ capacity absorption for:

Oil petroleum different products – gas, Diesel, motor oil (M 20W40). Test purpose was to determine absorption ratio. The sample quantity was of 50 grams oil petroleum in a 1000 ml Berzelius vessel containing distilled water. The oil petroleum concentration after absorption and resulted by-product removal was determined. The environmental temperature was approx. 20°Celsius.

Enviropeat™ (g)	Added gas (g)	Remain gas (g)	Absorption percent (%)	Absorption Mass Ratio
25	50	0.2	99.6	1:2
20	50			1:2.5
15	50	0.4	99.2	1:3.33
10	50	1	98.0	1:5
8.5	50	2.2	95.6	1:6
5	50	13.7	72.8	1:10

Enviropeat™ (g)	Added Diesel (g)	Remain Diesel (g)	Absorption percent (%)	Absorption Mass Ratio
25	50	0.32	99.3	1:2
20	50	0.59	98.8	1:2.5
15	50	1.18	97.6	1:3.33
10	50	2.2	95.6	1:5
8.5	50	2.7	94.5	1:6
5	50	15.2	69.6	1:10

Enviropeat™ (g)	Added motor oil (M 20W 40) (g)	Remain motor oil (M 20W 40) (g)	Absorption percent (%)	Absorption Mass Ratio
25	50	0.42	99.1	1:2
20	50	0.65	98.7	1:2.5
15	50	1.4	97.2	1:3.33
10	50	2.8	94.4	1:5
8.5	50	3.1	93.8	1:6
5	50	17.3	65.4	1:10

### Heavy metal absorption by solutions filtration through an Enviropeat™ layer.

Heavy metal concentration was determined using a HACH DR 890 colorimeter. The analyze methods have been those recommended by HACH Company, USA.

Metal	Initial concentration (ppm)	Final concentration (ppm)	Analyse method
Copper	120	<1	8506,CuVer 1,2
Chrom6+	275	<1	8023,Chroma Ver3
Zinc	8	<1	8009, Zinco Ver5
Iron	25	0.25	8008, fero Ver IR
Molybdenum	25	0.25	8036, Moly Ver 1,2,3,6

ICIM Bucharest has tested the oil petroleum absorption capacity existing into water, working on synthetic samples of distilled water in mixture with known quantities of oil petroleum. Thus the following oil petroleum was tested:

Gas

Diesel

Motor oil

To test the holding back gas from water capacity with Enviropeat™, three identical samples were realized, by a mixture of 200 ml of water with 40 ml of gas. Different quantities of Enviropeat™ have been used, ensuring Enviropeat™ vs. gas ratio between 1:3 and 1:6.

Analytical determination results are the following:

Enviropeat™ (g)	Oil petroleum quantity (g)	Waste water concentration treated with Enviropeat™ (g/L)	Treated with Enviropeat™ water concentration (g/L)	Absorption (%)	Absorption rating
10	30	125	0.115	99.9	1:3
7.5	30	125	0.152	99.87	1:4.5
5	30	125	0.190	99.3	1:6

This test shows that Enviropeat™'s absorbency rating for gasoline is over 99%.

A similar test has been made on a sample of 200 ml. demineralised water and 40 ml. Diesel fuel with a concentration of the mixture of 138g/L, in order to determine the Enviropeat™'s absorption rating for Diesel fuels.

The analytical results of this test are:

Enviropeat™ (g)	Qty. Diesel fuel (g)	Conc. Of Contaminated water sample (g/L)	Conc. Of water sample after treat. With Enviropeat™	Absorption (%)	Absorption rating
15	33	138		99	1:2.2
10	33	138		94	1:3.3
7.5	33	138		90	1:4.4
5	33	138		89	1:6.6

The absorption percentage for Diesel fuels spilled in water were over 89 %, and for an increased quantity of absorbent per one unit of hydrocarbon (1:2.2) the absorption percentage was over 99%.

After the tests made in order to determine the Enviropeat™ absorption's capacity for oils from water, these are the results obtained:

Enviropeat™ (g)	Qty. hydrocarbon (oil) (g)	Conc. Of Contaminated water sample (g/L)	Conc. Of water sample after treat. with Enviropeat™	Absorption (%)	Absorption rating
10	38	190	0.608	99.6	1:3.8
15	38	190	1.3	99.3	1:7.6

After the tests conducted by INCDPM-ICIM Bucuresti in order to establish Enviropeat™ absorption's efficiency for different types of hydro-carbons, the results obtained were very good.

# Technical Analysis



## Toxicity Characteristic Leaching Potential (TCLP)

A TCLP test was performed on Enviropeat after fully absorbing waste engine oil. The results are as follows:

Units	g/m <sup>3</sup>
C7-C9	<0.03
C10-C14	0.46
C15-C36	6.50
Total	6.99

The most stringent leaching requirement by landfill operators is 100g/m<sup>3</sup>.

## Hydrocarbon Degraders

A comparison between Enviropeat and competitor product, to absorb and degrade hydrocarbons was performed. The results below are expressed as colony forming units per gram:

Micro-organism	Competitor	Enviropeat
Aerobic Heterotrophic Bacteria	$1.5 \times 10^3$	$1.3 \times 10^5$
Actinomycetes	<10	<10
Total Anaerobes	10	50
SRB's	<10	100
Yeast	<10	$3.0 \times 10^6$
Fungi	<10	$1.6 \times 10^6$
Hydrocarbon Degraders	$10^2$	$10^5$

## Absorption rates

The absorption rate of enviropeat has been measured for seven agri-chemicals and 3 fuel based products. The results have been calculated on the basis of the weight of the liquid absorbed per kilogram of enviropeat. The results are as follows:

Substance	Kg's of substance absorbed
Glyphosate 360	2.63
Pasture Guard 2,4-D	2.00
Pasture Guard MCPA	2.55
Pasture Guard MCPB	2.60
Accelerate	1.75
Maize Guard	2.00
Diazinon	2.33
Petroleum	2.50
Diesel	2.00
Motor Oil (M20 W20)	2.00

**Enviropeat – providing environmental solutions**



## **WHY CHOOSE NEW ZEALAND GROWING MEDIA?**

- NZGM is ISO 9001:2000 registered
- High quality product
- NZGM is committed to New Zealand's commercial growers – its our priority
- Over 100 years of resource remaining
- Flexible to our customers requirements
- Open lines of communication between our companies
- NZGM has 8 qualified, trained and quality conscious staff
- All communication and business dealings are carried out with the highest integrity
- Peat is harvested and stored in a manner that ensures the most consistent structure and moisture content is maintained
- NZGM is committed to working with its customers to develop the best results possible
- All product delivered will be free of contaminants that may have an adverse effect on hygiene standards





## FAQ

### **How is Enviropeat processed?**

Enviropeat is processed at our plant in the heart of Southland, New Zealand. Once harvested off our peat bogs it is hot air dried where the hot air forces the moisture out of the peat. At the completion of the drying cycle it is sent to a dry storage unit. It is then distributed to our baling room where it is compressed into bales or to our bagging operation where it is bagged for distribution.

### **Can Enviropeat be used on water?**

Enviropeat is hydrophobic and therefore will float on water. Enviropeat will float for 72 hours before it starts to re-hydrate, providing plenty of time for recovery. Even if recovery is not completed before it begins to re-hydrate, the hydrocarbon absorbed will continue to be locked up inside Enviropeat and will not leach out. Enviropeat is excellent for cleaning up spills along shorelines, rivers, ponds, lakes, troughs and other waterways.

### **How do I use Enviropeat?**

On land

Apply Enviropeat around the perimeter of the spill to prevent the spill from spreading further. Once contained apply Enviropeat to the remainder of the spill. Once fully absorbed, the Enviropeat can be swept up and removed.

On water

Apply Enviropeat around the perimeter of the spill whether in a loose form or as a sock or boom. Scatter Enviropeat over the contaminated area and allow to cake. Remove using an appropriate extraction method such as fine nets or a wet suction recovery system.

In soil

Blend Enviropeat into the contaminated area. The pollutant is immediately encapsulated and will no longer spread or leach. Water, Sun and Nitrogen are introduced to the mix. Metabolic synthesis now occurs where the Nitrogen and the enzymes in Enviropeat break down the pollutant.

### **How do I dispose of spent Enviropeat?**

Enviropeat can be disposed of in several ways, including: Landfill – due to the fact that Enviropeat does not leach, spent Enviropeat can be disposed of in landfills, where local regulations permit. (Contact local authorities for advice and instruction.)

Incineration - since Enviropeat is also an energy source it will assist in the incineration of absorbed hydrocarbons. After incineration only a 2% inert ash residue will remain. Bio-remediation – Enviropeat can be blended with contaminated soil on site. This process locks up the hydrocarbon. The naturally occurring enzymes in Enviropeat then break down the hydrocarbons to their basic, harmless elemental state.

**What is the shelf life of Enviropeat?**

Provided it is stored in a dry location, Enviropeat will last for many years without any change to its properties or characteristics.

**How does Enviropeat suppress highly flammable vapours?**

Enviropeat encapsulates the highly flammable product into its cellular structure. An extra layer of Enviropeat is applied to the spent Enviropeat trapping the flammable vapours. This is essential when cleaning up spills which are highly flammable, turning a potentially volatile situation into a manageable one.