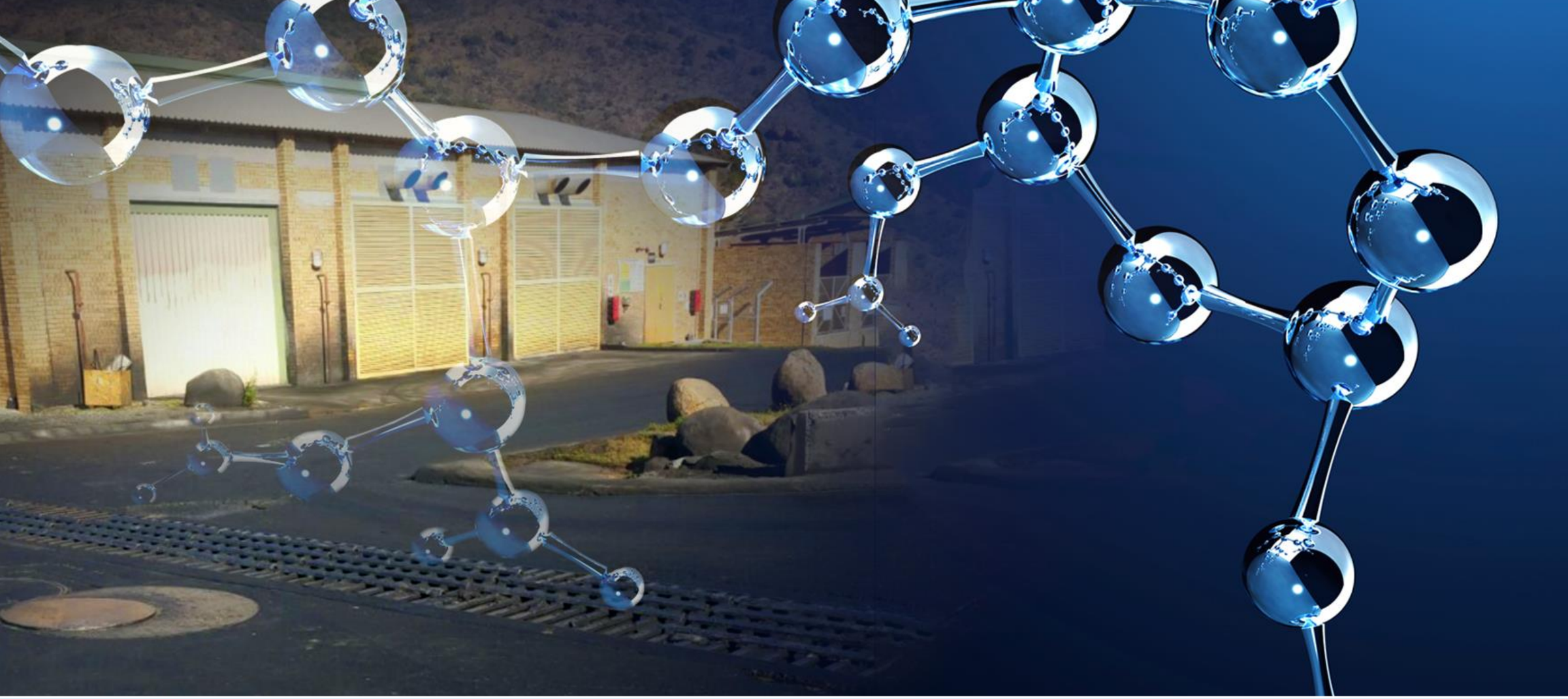

Mechanised Underground Mining And Hydrocarbon Contamination

Presented by Lubritech Manufacturing

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INDEX

INDEX

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THE PROBLEM

HYDROCARBON CONTAMINATION…

This is not only a

SAFETY HAZZARD

but an

Environmental problem

as well

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IGNORING PRO-ACTIVE HYDROCARBON CONTAMINATION CONTROL

There could be lapses in adherence to good practice in environmental management and ignoring pro-active hydrocarbon contamination control.

- **Pressure of reducing Operating Costs**
- **Lack of information on impact of contamination**
- **Training on how to handle oil spills effectively**

Inadequately controlling hydrocarbon contamination on mining sites can have many negative consequences for a company:

- **Safety**
- **Environmental**
- **Metallurgical Plant Performance**

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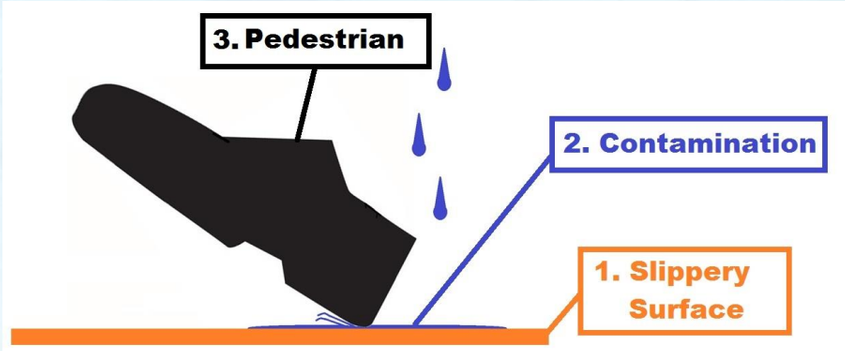
SAFETY FIRST

- Pipe bursts, fuel and oil spills occur on a regular basis at above and underground workshops and mining areas.
- Due to these spills, decline's, roadways and all concrete areas are covered with oil on a daily basis causing slippery and unsafe surfaces prior to it being washed away.
- Mines use thousands of litres of degreaser every month to wash these spills away and moving the oil from point A to point B.

Mine Safe



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IMPROVED SAFETY EXAMPLE

Before

After HTech

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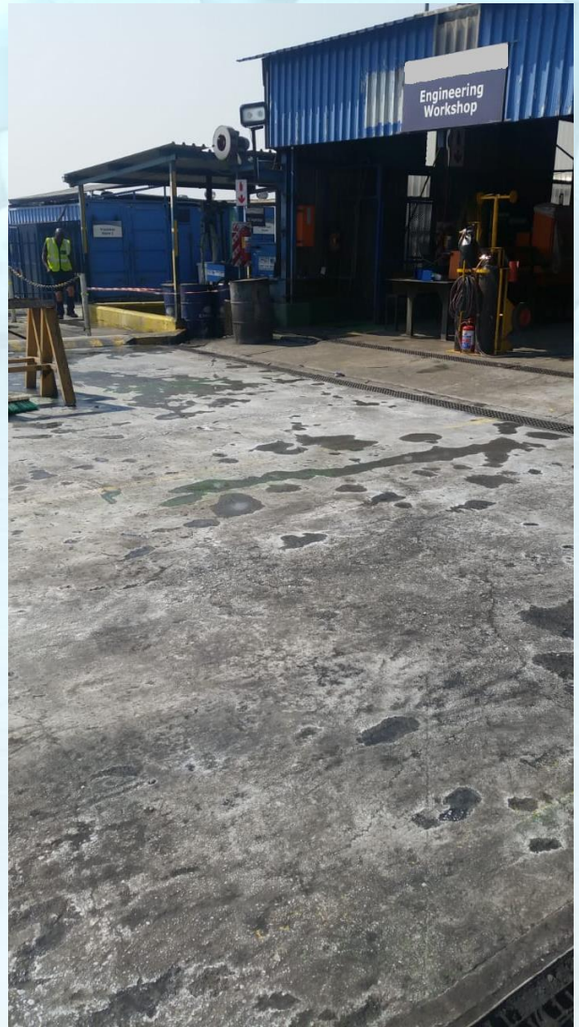
IMPROVED SAFETY EXAMPLE

Before

After HTech



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IMPROVED SAFETY EXAMPLE

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ENVIRONMENTAL

Fuel and Oil spills often occur during routine operations, and fuel and oil leaks can occur in fuel and oil systems which are assumed to be leak-tight and failsafe.

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ENVIRONMENTAL

- Mechanized mining equipment moves the oil via the large tyres and pressurized hoses that break and leak onto all surfaces that it travels on, including above ground.

- This happens on a daily basis, hence the surface areas become saturated with hydrocarbon contamination. Even after it is washed off it quickly turns black again due to capillary action.

- The hydrocarbons need to be pulled out of these roadways on a continuous basis every day as they are deposited on a daily basis. In the event that a mine used **HTech** from day 1, on a daily basis, this saturation would not have taken place.

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WHAT IS CAPILLARY ACTION AND HOW DOES IT WORK?

- On a daily basis mechanised mining equipment moves the oil contamination from underground to above ground by means of oil sticking to the large tyres and leaking hoses.
- Due to concrete and soil being porous the area is saturated with hydrocarbons and seeps into the concrete or soil.
- Core drilling has shown that this can be up to 200mm in concrete and in soil a few meters.
- Heat from the sun fast track this process. When an area is washed and cleaned, it will become slippery and unsafe again as soon as the oil moves to the surface due to the capillary action.

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WHAT IS THE SOLUTION?

HTech

- **HTech** changes hydrocarbons to inert organo-silicates.
- **HTech** is at the forefront of natural and environmentally safe treatment of the remediation of oil staining and pollution.
- **HTech** is safe to use and will have little or no negative impact on the downstream flotation circuit of the concentrator plant.
- **HTech** has been specifically designed to render the hydrocarbons inert.
- **HTech** is environmentally safer to use than detergents and solvent based degreasers.

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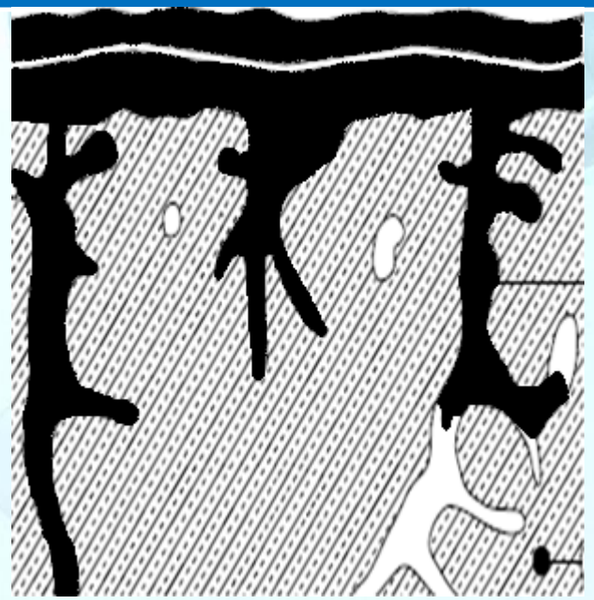
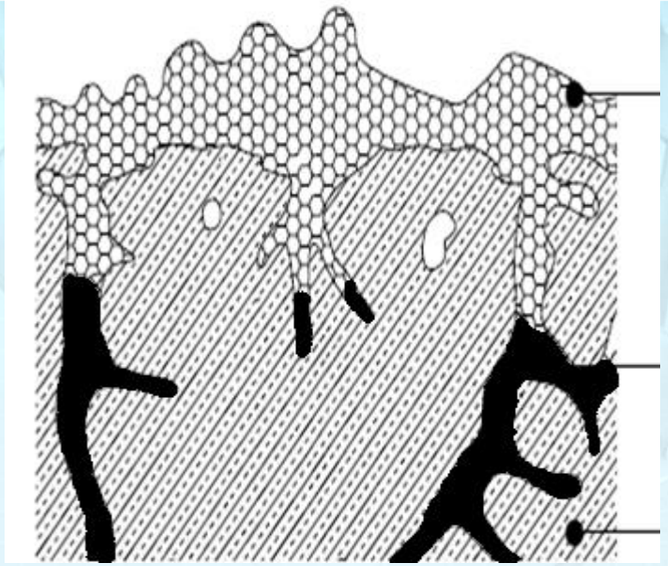
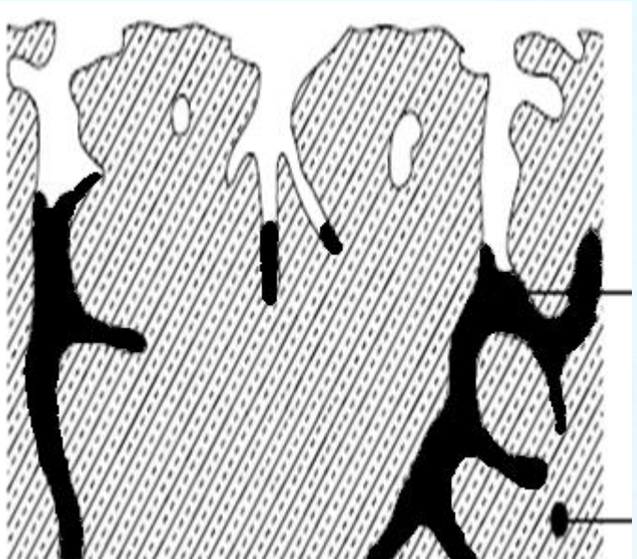
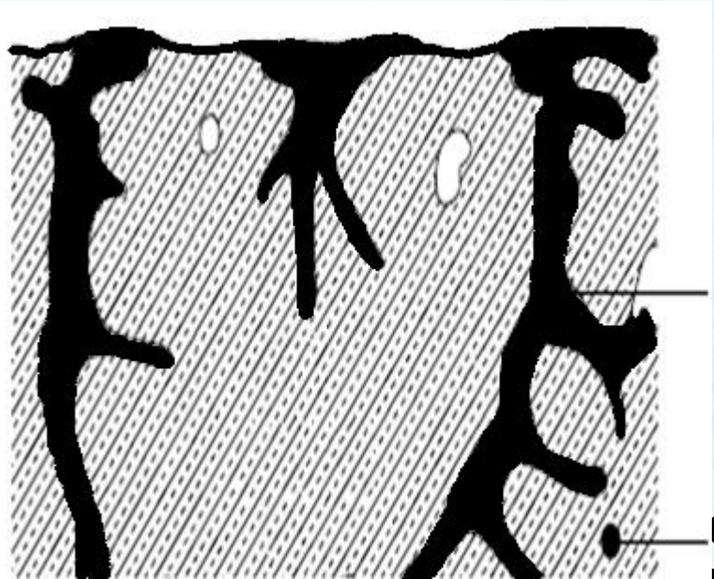
OIL-CONTAMINATED CONCRETE FLOOR









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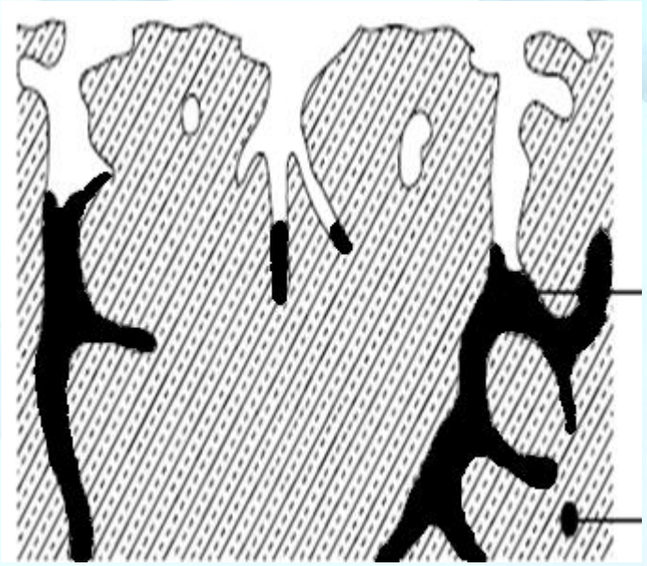
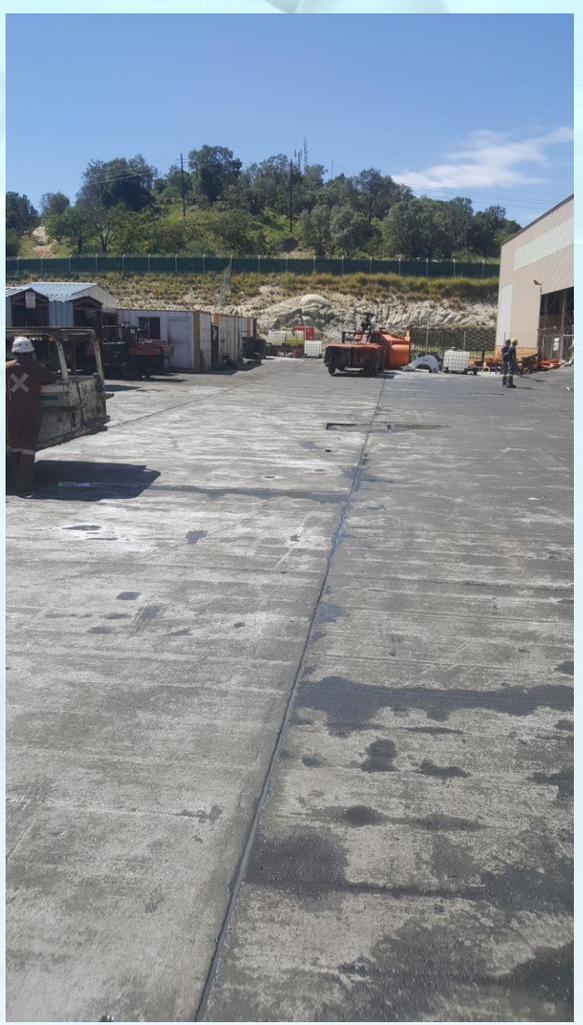
CLEANING WITH HTECH HYDROCARBON ELIMINATOR

THE CAPILLARIES ARE FREE OF OIL AT THE SURFACE





- The surface and part of the capillaries are cleared of the oil.

- Within a few hours oil could rise to the surface again. The process then needs to be repeated again.

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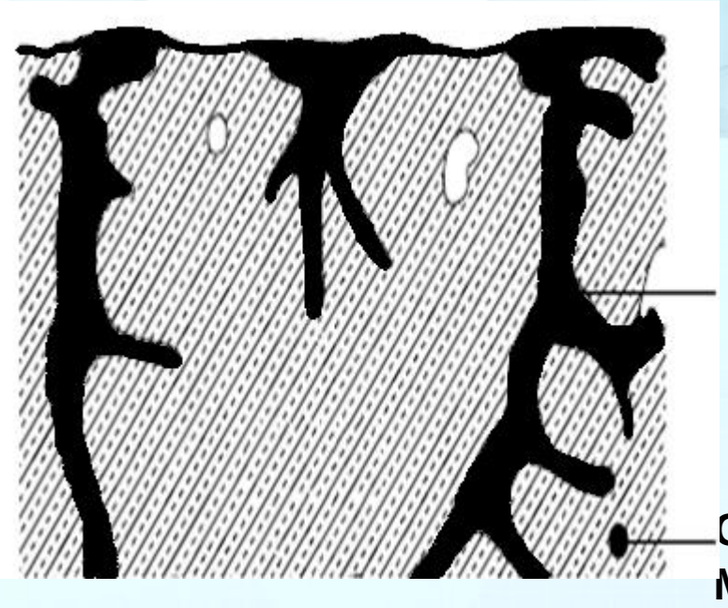
CAPILLARY ACTION BRINGS OIL TO THE SURFACE



- The concrete floor has been treated with HTech and the top layer of Hydrocarbons have been removed. The oil comes to the surface from the capillary action.

- This capillary process can take a number of hours and therefore you could see oil on top of the previously clean concrete.

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HTech

- **HTech PROPERTIES:**

- Non-flammable
- Water-soluble
- Fire-suppressant
- Inert

- **HTech ACTION:**

- Eradicates oil, diesel, petrol, grease, fat stains and slicks from all hard surfaces, including tarred roads.

- There will be no leaking of contaminants into the soil, as they no longer possess their chemical fingerprint.

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HTech

HTech APPLICATION:

- Is safe for use in environmentally sensitive areas.
- Can be used on: Tarred roads, bricks, concrete, mining vehicles, general machinery, steel structures and soil.
- Safety is put first and being compliant follows.
- Positive influence on the metallurgical plant.

EXAMPLES

General Practice

- Degreaser is used to cut the hydrocarbons off the contaminated surface.
- Leaving the floor still slippery until washed off.

Proposed Solution

- **HTech** is used to make the hydrocarbons inert.
- Leaving the floor non slippery

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EXAMPLES

General Practice

- A Broom is used to work the degreaser into the floor.
- This is labour intensive.

Proposed Solution

- HTech is sprayed on with a high pressure hose.
- Time and labour is used productively.

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EXAMPLES

General Practice

- The hydrocarbons are washed off moving the problem from point A to point B.

Proposed Solution

- **HTech** dries out leaving the hydrocarbons inert with minimal impact on the downstream process.

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EXAMPLES

General Practice

- Slippery areas are unsafe and leaves workshops and concrete pad areas non-compliant.

Proposed Solution

- The result is a safe environment, leaving all areas clean & compliant .

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EXAMPLES

General Practice

- Pipes and water ways are contaminated and an environmental problem.

Proposed Solution

- Pipes and water ways are now clean and the mine is compliant in this area.

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EXAMPLES

General Practice

- Fatal accidents can cause a mine to be temporarily closed down, with a Section 54 for a period, resulting in millions being lost.

Proposed Solution

- A clean and compliant working area.
- Safety is improved and risk of accidents reduced.

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DOWNSTREAM IMPACT OF HYDROCARBONS

- After passing through oil separation equipment Degreaser and Hydrocarbon contamination still end up in the dams.

- Processing plants use this water in flotation and it has been proven that this could have a negative effect on the process plant performance.

Location	Total Hydrocarbons C10 to C40	Diesel Fuel C10 – C28	Engine Oil C22 – C30	Hydraulic Oil C30 – C40
Process Dam	178 ppm	0 ppm	78 ppm	100 ppm
2nd Process Dam	117,139 ppm	5,526 ppm	54,374 ppm	57,239 ppm
Tailings Dam	363 ppm	0 ppm	152 ppm	211 ppm
Underground Dam	162 ppm	0 ppm	65 ppm	97 ppm

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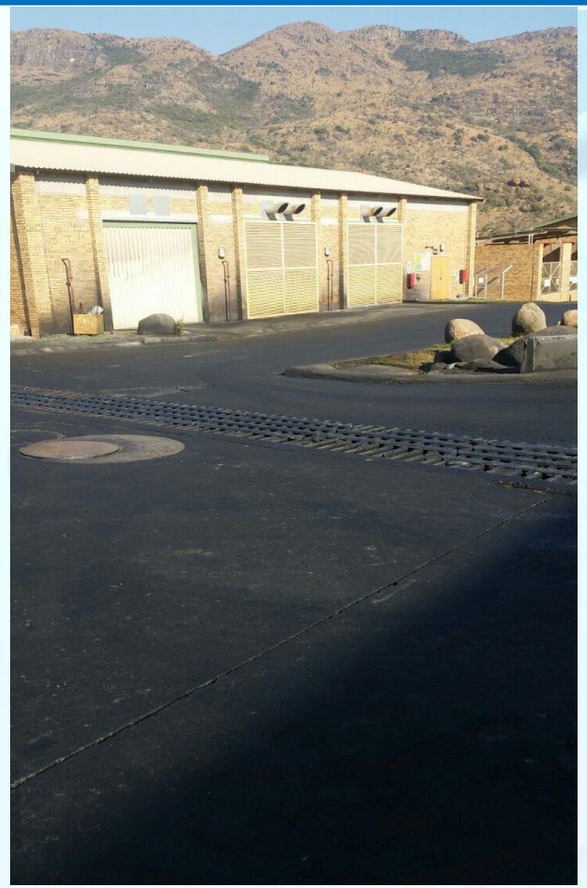

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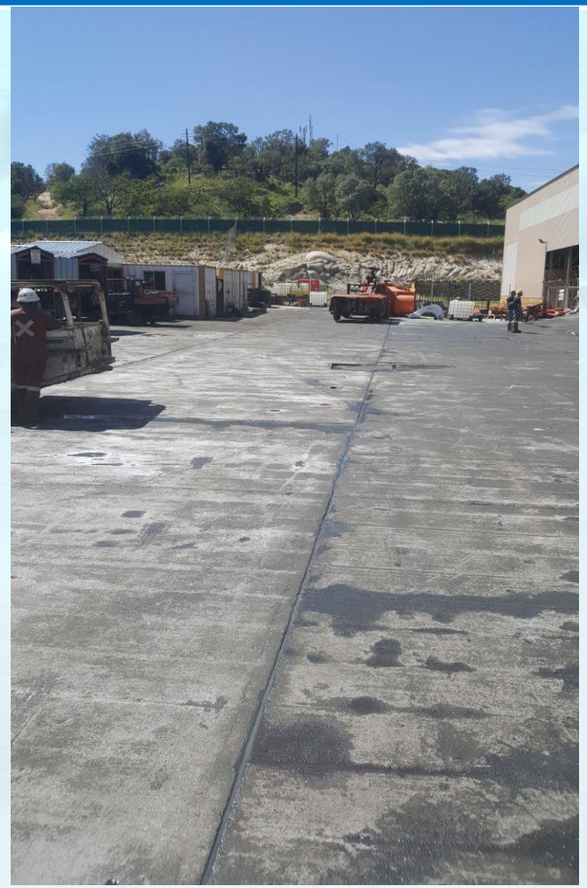

- ✓ Make your Mine *correctly* clean and environmentally compliant
- ✓ Give your employees a clean & safe working environment
- ➢ Call: **0861 000 487** or **Ferdi on 061 426 5621** to set up a demonstration at your mine