

# RemScan®

## RemScan + TPH in Soil App

Measures Total Petroleum Hydrocarbons and Texture in Soil

Used for Oil Spill Assessment, Delineation,  
Remediation and Monitoring

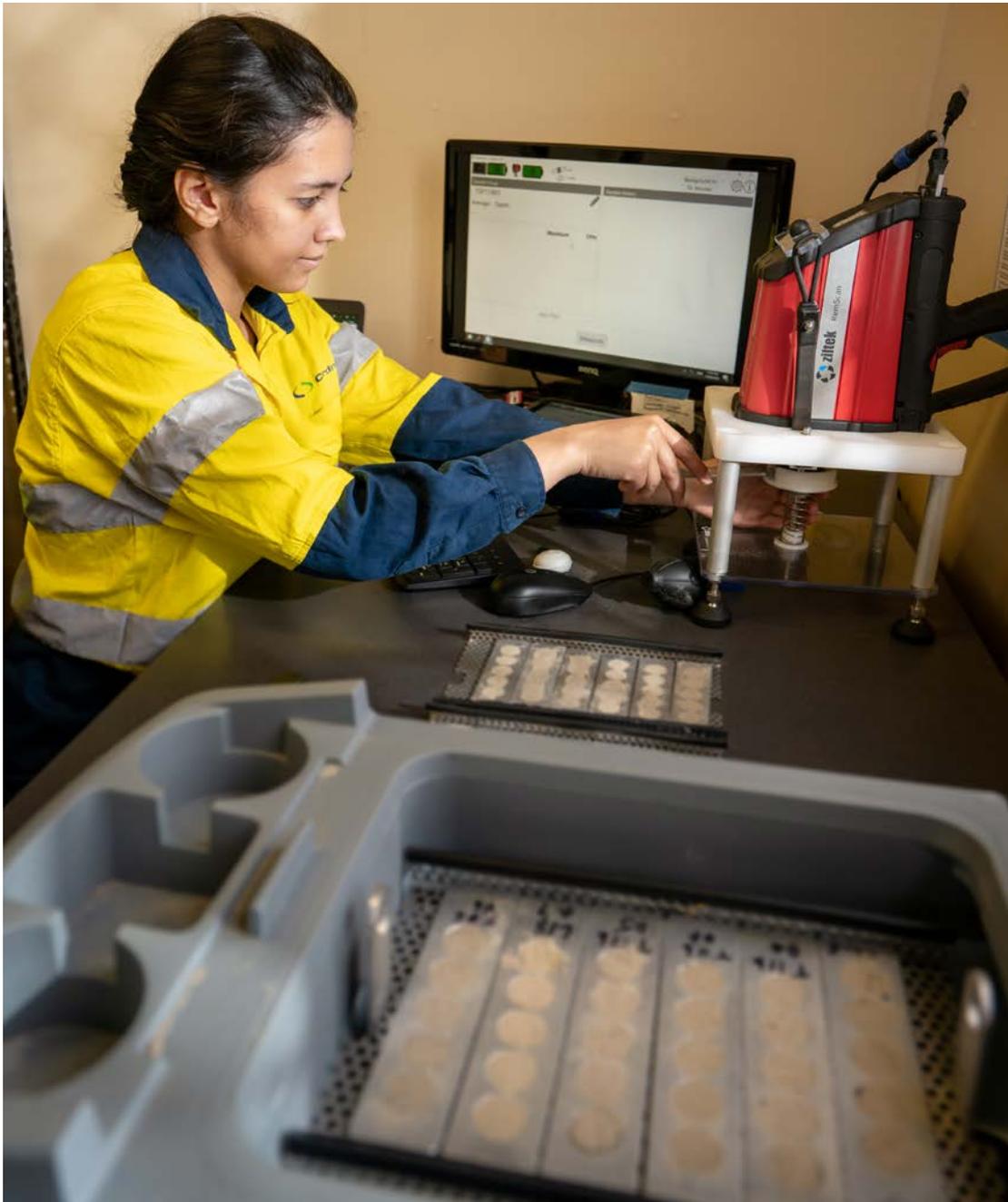


Photo courtesy of Cardno

## FEATURES AND BENEFITS

RemScan is a portable hand-held instrument for rapid measurement of oil and texture in soil. The user simply pulls the trigger for an accurate measurement in less than 20 seconds. The data is recorded automatically on a Tablet for easy download.

RemScan is used for oil spill assessment, delineation, remediation and monitoring.

RemScan can be used *in-situ* to measure directly in the field, or *ex-situ* in a site hut or lab.

The **TPH in Soil App** is one of a number of Apps for RemScan. Other Apps include Oil on Metal and Agriculture.



### Key Benefits

- Accurate and repeatable
- More data
- Make real-time decisions with confidence
- Accelerate project closure

### Key Features

- Measures TPH in soil (>C<sub>10</sub>)
- Measures soil particle size distribution and the Soil Texture Class (IUSS)
- Results in less than 20 seconds
- Accuracy comparable to laboratory
- Direct infield measurement or in on-site lab
- Sample ID, GPS location, depth, photo and notes logged with each measurement
- No incremental costs
- No sample extraction required
- No chemicals
- No licensing requirements
- Non-destructive



## USE CASES

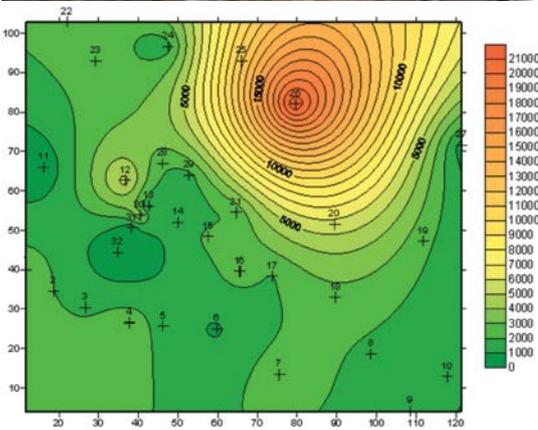
### Site Assessment / Delineation



RemScan is used to measure the concentration of oil on the surface of the soil enabling the user to quickly delineate the contaminated area. Depth profiles can be measured by taking a drill core, laying the core out and using RemScan to directly measure the hydrocarbon concentration at various points (depths) along the core.

Some examples:

1. Site Clean-up. RemScan is used to determine the edge of the contaminated zone which can be marked out prior to excavation of the contaminated soil.
2. Emergency Spill response. RemScan is used firstly to delineate the spill and then, during excavation, to chase the spill and then validate that all of the contaminated soil has been removed.
3. Wash bay fines. RemScan can measure the fines which wash off vehicles in a wash bay. Hydrocarbon contaminated fines can be sent for remediation while clean fines can be dumped.



### Chasing / Validation



While excavation work is being performed, RemScan can measure the remaining soil to check whether all of the contaminated soil has been removed and whether the remaining soil is clean. Once all contaminated soil has been removed, samples can be sent to the laboratory for final auditing and statutory signoff.

## USE CASES

### Sorting



RemScan is used to sort clean soil from contaminated, thereby minimising the amount of soil to remediate.

When soil is being sent to different remediation processes depending on the level of contamination, RemScan can be used to sort the soil to ensure the most efficient processing. For example, highly contaminated soil may be sent to a Thermal Desorption Unit (TDU) while lower concentrations may be sent to bioremediation. Each process works most efficiently when fed with a relatively consistent concentration and RemScan can be used to achieve this objective.

### Monitoring



RemScan is used to monitor the soil after remediation to ensure that it complies with site requirements. For bioremediation processes, RemScan can monitor the decrease in the concentration of the contamination over time to determine the end point. Once the soil is “clean”, it can be removed from the bioremediation pad, thereby increasing the utilisation and throughput of the bioremediation facility.

For thermal desorption or soil washing processes, RemScan can measure the product to ensure that the process has been working efficiently and correctly.

***“The level of customer service provided by Ziltek during this project was outstanding. Ziltek provided excellent support and worked patiently with Cardno through the various issues that inevitably arose over the lifetime of the project”.***

Danny McDonald, Principal Environmental Geoscientist, Cardno

# OPERATION MODES

RemScan is supplied with two modes of operation. The operator can switch between modes, depending on the application.

## Spill Response

Spill Response mode is used for rapid measurements of a new site (like responding to an oil spill at a new site).

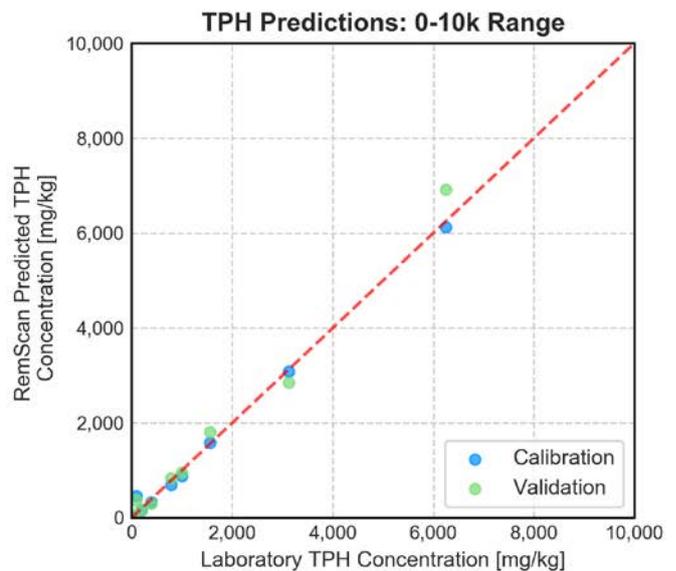
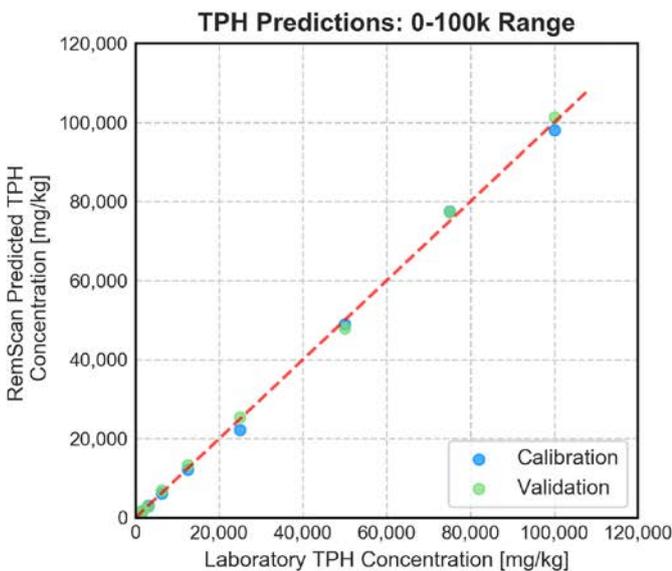
Prior to measurement of soil in the spill zone, the operator simply measures some clean soil to zero the calibration.

RemScan provides results in terms of green/orange/red to indicate whether the soil is clean or contaminated.

## Site Specific

Site Specific mode is used for large sites and/or where highly accurate measurements are required. RemScan measurements are provided in numerical values in units of mg/kg. Prior to making measurements, RemScan is specifically calibrated for the site by spiking the soil with different concentrations of TPH and measuring with RemScan.

The graph below shows the comparison between RemScan readings and laboratory assays of TPH for a set of samples. Each point represents one sample. The closeness of the points to the diagonal line demonstrates the accuracy of the RemScan.



## SPECIFICATIONS

<b>Measures</b>	Total Petroleum Hydrocarbons >C <sub>10</sub> over 0 - 100,000 mg/kg TPH. Granulometry in terms of [%] Sand, [%] Silt, [%] Clay and the Texture Class according to the International Union of Soil Science (IUSS).	
<b>Modes</b>	Spill Response Mode: Short term project and spill response emergencies. Site Specific Mode: Long term projects and projects that require a higher level of accuracy.	
<b>Field or Lab</b>	Can be used <i>in-situ</i> to measure directly in the field, or <i>ex-situ</i> in a site hut or laboratory. RemScan is truly rugged, portable and built for field use.	
<b>Soil Preparation</b>	Minimal - requires a 30 mm flat air dried surface.	
<b>Soil Measurement</b>	Measures the soil surface only.	
<b>Soil Core Measurement</b>	Can measure soil cores directly.	
<b>Throughput</b>	High rate of up to 120 measurements/hour can be achieved but typically about 60 measurements/hour.	
<b>Standardisation</b>	Easy to standardise in the field – 1 minute each for background and reference caps. Both caps are inert materials so no need to carry calibration gases or hazardous chemicals.	
<b>Accuracy*</b>	<b>TPH (mg/kg)</b>	<b>Relative Standard Deviation (%)</b>
	10,000	6
	2,500	7
	1,000	16
<b>Detection Limit*</b>	Typically 50 mg/kg TPH (at one standard deviation).	
<b>Software</b>	User-friendly interface. Displays current and recent measurements. Sample ID, GPS location, depth, photos and notes logged with each measurement. Secure database for auditing purposes. Data is accessible as a .csv file. Operates on Windows 10 via Bluetooth (Tablet or PC).	
<b>Power Supply</b>	Mains power or battery. Mains power: 100-240 VAC 47-63 Hz. Battery Life: Full day field use provided by 3 x RemScan batteries (4 hours each) and Tablet battery (8 hours).	
<b>Operating Temperature</b>	Operating: 0 to 50 °C (32 to 120 °F). Storage: -25 to 75 °C (-13 to 167 °F).	
<b>Humidity</b>	95% non-condensing.	
<b>Intrinsic Safety</b>	Not Intrinsically Safe.	
<b>Wavelength/ Wavenumber range</b>	2.2 µm to 4 µm (4500 cm <sup>-1</sup> to 2500 cm <sup>-1</sup> ).	

\*Typical accuracy for Site Specific Mode. May vary between different soil types.

## SOFTWARE ADD-ONS

### Oil on Metal App



RemScan measures the amount of oil on bare metal surfaces in tank cleaning and salvage operations.

## HARDWARE ACCESSORIES

### Bench Stand



The Bench Stand is useful when:

- Many samples are to be measured in a site hut (as opposed to in the field). This may be because the soil samples are very wet and need air drying in the hut or because conditions are too inhospitable in the field (too hot or too cold) for personnel to work for long periods.
- If RemScan is going to be recalibrated for different soil types.

### Field Tripod



The Field Tripod has been specifically designed to free-hold the RemScan Tablet.

It is lightweight and fully adjustable.

Specifically designed for field use, but can be utilised in any work environment.

### Backpack



This is used to transport RemScan around the field and enables the operator to carry RemScan around a large site. It has cut-outs for all equipment that may be required in the field.

### Portable Drying Unit



RemScan provides a warning error if samples are above 5% free moisture content, Wet soil samples can be air-dried, or dried using the Portable Drying Unit.

The Portable Drying Unit is used for rapid in-field drying of samples and can dry 35 samples at a time within 30 minutes. The unit is supplied with all accessories. Extra accessories for higher throughput are available upon request.