

Lead by a team of dedicated experts, **Innova Soil Technology** is one of Australia's leading soil remediation providers.

The company's patented process, which includes a unique energy recovery and closed loop rapid quench system, offers a complete and total solution to land contamination. Working to world's best practice standards, the fully portable plant has distinct advantages to ensure superior emission control and stable performance. The result is safe, reliable and efficient on-site treatment of all hydrocarbon contaminated soils.

With low operating costs, this process competes favourably with previously cheaper alternatives to treatment, such as off-site disposal and on-site containment. As the cost of sending contaminated soil to landfill is on the rise worldwide, Innova Soil Technology's treatment capabilities offer a highly competitive solution to contaminated land problems.

Prior to commencing any large scale project, Innova undertakes extensive laboratory analysis to determine the best possible approach to site remediation. Also carefully considered are the technological, environmental and social aspects of any remediation project.

HOW THERMAL DESORPTION WORKS

Thermal Desorption works to clean the soil free of hydrocarbon contaminants by gently heating the soil in a rotary dryer until such point that the contaminants evaporate, leaving the soil matrix clean. The temperature of the soil is continuously logged and kept above a set point to ensure the soil is cleaned, this works much in the same way as a steam autoclave for ensuring hygiene for dental

or medical instruments. The soil is removed, rehydrated and placed in a temporary soil stockpile awaiting independent sampling and validation. The contaminant laden off-gases are then broken down to essentially Carbon Dioxide and water in a conversion chamber.

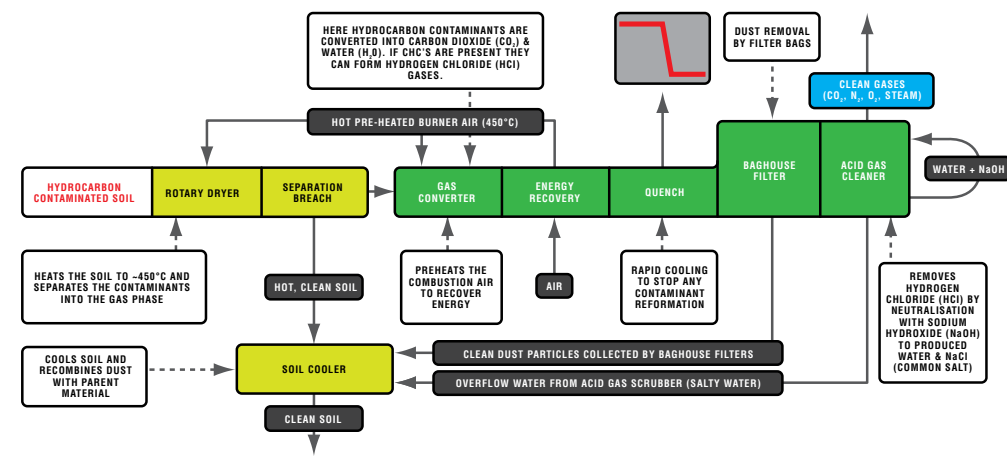
THE INNOVA ADVANTAGE

The Innova direct heated, fast quenched, thermal desorption (DFTD) process takes in contaminated soil and produces clean soil, carbon dioxide and water vapour. Unlike indirect fired thermal desorption, there are no residuals or condensed contaminants left to deal with after treatment.

The Innova process remediates the soil without destroying its physical properties or integrity, allowing for the beneficial reuse of soil on-site. It can treat a wide range of soil types such as clay, sand, soil, sludge and sediments.

The process is based on technology widely used in the USA and Europe for the last 20 years. Offering a number of advantages over traditional

thermal desorption systems, the Innova DFTD process still maintains widely proven and robust engineering components. The innovative features provide increased energy efficiency, significantly reduced operating costs and superior control of emissions. Several measures have been employed to ensure that all stack gas and pollution control standards are met, including complete contaminant conversion, dioxin elimination and dust and gas removal. Innova's plant consists of a series of integrated components designed to achieve successful contaminant separation and subsequent conversion, energy recovery, fines reconstitution and product cooling.



DIRECT-HEATED FAST-QUENCHED THERMAL DESORPTION (DFTD) - PROCESS

- Contaminated soil, at up to 30 Tonnes per hour, enters the rotary dryer (desorber) and is gently heated to around 450°C to evaporate the hydrocarbon contaminants.
- The clean soil is then removed from the process, via a separation breach with an airlock valve, cooled and re-hydrated in the soil cooler, ready for beneficial reuse as clean fill.
- Meanwhile, the contaminant vapours are ducted from the separation breach into the conversion stage of the plant where they are heated to over 1000°C, destroying the hydrocarbon contaminants and leaving CO₂ and water vapour. The gas stream is then quench-cooled to around 200°C in < 100ms to stop contaminants such as dioxins or furans from forming in the off gas.
- Heat captured in the gas cooling stage is used to preheat air fed to the desorber and conversion stages, increasing energy efficiency.
- A filter baghouse is used to remove dust particles from the gas stream, which are then combined with the clean product soil.
- An acid gas wet scrubber is used to remove any acid Gases, such as HCl through neutralisation with NaOH to produce common salt (NaCl).

CONTAMINANTS TREATED

There are many former industrial activities that can cause site contamination including town gasworks, coke ovens, chemical plants, pesticide plants, rail infrastructure, ship yards, fuel tank farms, explosive plants, tanneries and timber preservation yards.

The Innova process is suitable for treatment of all organic based contaminants including:

- All petroleum products
- Solvents
- Oils
- Greases and lubricants
- Coal tars and sludges
- Creosote
- Electrical oils (PCBs)
- Chlorinated hydrocarbons
- Pesticides and herbicides
- TNT and other explosives
- Dioxins and Furans



INNOVA EXPERTISE

The project team, consisting of technical, chemical and process engineering experts, is well versed in the development, management, monitoring and conduct of the thermal desorption process for treatment of contaminated soils and hazardous waste. A critical independent review, undertaken during the commissioning phase of the plant, determined that the DFTD process exceeded international best practice in many aspects.

Innova has successfully completed a number of projects including:

- Treatment of PCB impacted soil for Harvey Norman Springvale, VIC
- Treatment Trial of TPH and PAH impacted dredged Newcastle Harbour Sediments
- Treatment of PAH contaminated soil for Koppers Carbon Materials and Chemicals Facility, Mayfield NSW
- Treatment trial of coal-tar contaminated soil for AGL Gasworks, Newcastle, NSW
- Treatment of coal-tar contaminated soil at the BHP Closure area Newcastle for BHP Billiton
- Demonstration for the NSW EPA at the BHP closure site, Newcastle NSW

REMEDIATION SERVICES

Innova prides itself on providing a fully integrated remediation service by offering the following:

- Environmental permit and licence applications and regulatory negotiations
- Implementation of community relations programs
- Laboratory Treatability Studies
- Pilot and Commercial Scale trials
- Process equipment design and manufacture
- Process operator training
- Thermal desorption services
- Remediation earthworks management

Innova also manages preliminary site investigations, soil sampling and site assessments; remediation project design; as well as Remediation Action Plan (RAP) development for our clients.





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A proven, cost
effective and
permanent solution
to contaminated
land problems

