

1. EPA Demonstration Trial (2002) - TPH, PAH, BTEX

Newcastle Steelworks closure area, Newcastle (NSW)

Introduction

INNOVA SOIL TECHNOLOGY, with the permission of BHP Billiton and the NSW state government established their mobile Direct-heated Fast-quenched Thermal Desorption (**DFTD**) facility on the site of the former BHP steelworks, Newcastle NSW. The main objective of the EPA demonstration trial was to establish **INNOVA**'s plant and test performance on coal tar contaminated soils. The establishment work involved plant assembly, electrical fit-out, piping installation and an exhaustive process commissioning program.



Project Scope

Once the process was commissioned **INNOVA** tested and proved the capabilities of the **DFTD** process over a six month period by conducting eight separate trials and treating 3,000 tonnes of highly PAH contaminated material on the site. Several independent consultant reviews were undertaken during the course of the trials :

- Independent audit of incoming (contaminated) and product (cleaned) soils – by Parsons Brinkerhoff Australia Pty Ltd (formerly PPK Environmental)
- Independent measurements of stack emissions – by HLA Envirosiences Pty Ltd
- Independent assessment of DFTD operations – by William Troxler (recognised world expert) of Focus Environmental Inc. (USA).



Soil Results Summary	FEED SOIL RANGE (mg/kg)	TREATED SOIL RANGE (mg/kg)
BTEX	nd	nd
TPH	580 – 1,340	nd (<1000ppm)
PAH	79 - 410	0.3
BaP	7 - 29	nd

The results of all three reviews were uniformly excellent:

- PB measured contaminant levels in the incoming soil at 400 to 2000 ppm PAH (acceptable sensitive land use level is 20 ppm) and levels in the product (cleaned soil) at n.d. (not-detectable) levels.
- HLA measured stack emission levels to be compliant and indeed at or below “world’s best practice” levels; for example:
 - Measured DFTD Carbon Monoxide Levels – 22 ppm; US best practice acceptance level 100 ppm
 - Measured DFTD Sulphur Dioxide Levels – 1.4 ppm; US levels range 100-1000ppm
- Bill Troxler (Focus Environmental – USA) reported very favourably on the operation of the DFTD system; for example:
 - “...It should be noted that the **INNOVA** plant incorporates several innovative features for which there is no comparable U.S. experience”.
 - “...This is a unique and important feature of the **INNOVA** plant in terms of energy efficiency and minimizing greenhouse gas emissions”.
 - “...**INNOVA** plant should give excellent performance in treating high boiling point compounds, including compounds such as PAHs, PCBs, and dioxins/furans”.
 - “...Therefore, the Innova system design for both gas temperature and gas residence time capabilities far exceeds normal U.S. practices”.
 - “...Rapid quenching of the combustion process gas to minimize the residence time of the process gas in this “dioxin formation temperature window” is currently accepted as a best operating practice to prevent the formation of dioxins and furans.

.... The Innova system is the first system to utilize a specially designed “dry” heat exchanger to perform this rapid quenching function.”

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- In addition to the independent assessments, **INNOVA** conducted internal diligence to confirm the operating costs associated with the process. The **INNOVA** process is capable of treating contaminated soils on large-scale remediation projects at a price better or comparable to the previously accepted lowest cost methods of “dumping” and “containment”.
- **INNOVA** has liaised with the NSW EPA with regard to approvals and licensing requirements. The independent reports and assessments described above were submitted in January 2003 to the NSW EPA in support of future applications for a SITE SPECIFIC operating licence.

Excavations and screening operations on the BHP site, Newcastle



Clean treated product soil

HLA Envirosciences performing stack emissions testing



DFTD process in operation on the BHP site, Newcastle

