

Rapid Mapping of Soils in China using a Handheld Device

Richard Stewart (richard.stewart@ziltek.com) (Ziltek Pty Ltd, South Australia, Australia)

Background/Objectives. In 2015, the Chinese Government published a national soil survey which showed that 16% of all soil and 19% of farmland was contaminated by organic and inorganic chemical pollutants. The clean-up costs are estimated at around 146 Billion USD.

The future soil remediation strategy will require the widespread analysis of soils across China. Off-site laboratory analysis of soils will be a time-consuming and costly exercise and there is a high demand for infield screening tools to reduce cost and allow strategic sampling to complement the laboratory analysis.

Approach/Activities. In 2017, a handheld infrared device (RemScan™) was used to measure total petroleum hydrocarbons (TPH) in soil collected from the Jinshan region of China. The instrument was calibrated using local soils and then validated against selected soils that were then sent for TPH (C₁₀ to C₃₆) analysis at an accredited commercial laboratory using US EPA Method 3570:8015C.

Results/Lessons Learned. The calibration model for Site 607 is shown in Figure 1 below. The results show an excellent correlation between RemScan™ and an accredited external laboratory for both the calibration and validation samples.

Because the handheld instrument collects the entire infrared signature during each soil measurement, other soil properties can also be measured; these include soil texture and nutrient parameters.

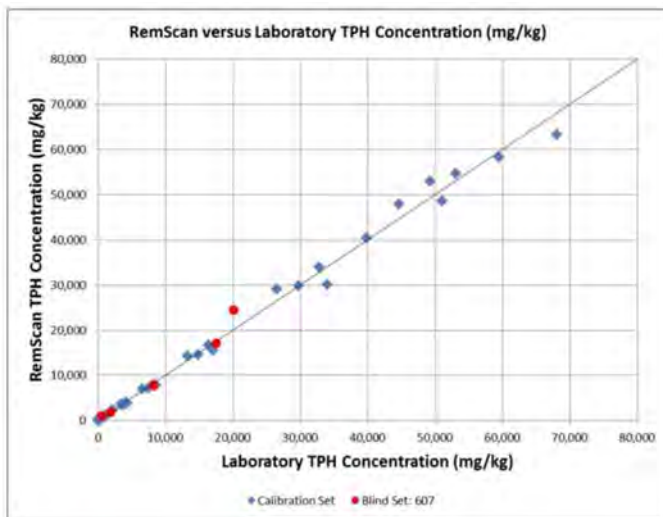


Figure 1: Cross validation of RemScan™ predictions versus laboratory data for blind samples and calibration samples for Site 607