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## **The importance of the field of forensic soil examination being aligned with the wider discipline of forensic science**

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The discipline known as criminalistics or trace evidence in forensic science involves the detection and comparison of a wide variety of materials that may be transferred between an offender and a victim or crime scene during the commission of a crime. Materials such as paint, glass, textile fibres and gunshot residues have been at the forefront of criminalistics work. Soil is an extremely common material in the environment and therefore should be a significant contributor to criminalistics work. However this has not been the case in most forensic laboratories.

The complexity of soil requires specialist skills and training that are not available in most forensic science laboratories. The best repository for this skill set is within specialist soil science laboratories and research institutes. However as forensic science is not core business in these organisations there can be a lack of forensic awareness. The key to providing an excellent forensic soil examination capability is to ensure that forensic soil examination is not isolated from the wider discipline of forensic science.

A good example of how broader forensic science questions can impact on soil examination was in a recent Australian homicide matter where a critical issue was not the complexity of soil examination but how the soil was transferred to a victim's clothing [1], [2]. Recent research has looked at this problem and recognised features shown by soil deposits on clothing that can indicate if dragging has been the mechanism of transfer [3]. It is understandable that soil science specialists can get caught up in the detail of soil analysis such as x-ray diffraction data or elemental profiles but it is important that forensic soil science and forensic geology understands that the issues that concern the courts can be more fundamental and difficult to answer.

There are many challenges facing the criminalistics discipline. In particular the impact that human DNA profiling has had on criminal investigation, which has resulted in less attention being given to traditional criminalistics examinations. The ability of DNA results to be backed by sound probability expressions has been used to question the value of resource intensive examinations where conclusions are based on individual expertise and experience. It is important that soil scientists who commit to the forensic applications of their discipline maintain an awareness of issues that also affect the wider criminalistics discipline. This paper will provide an overview of the issues affecting forensic science in general and the importance of the forensic soil science discipline being part of this environment.

### *References:*

[1] Martin B. The State of Western Australia v. Rayney. [No 3]: WASC; 2012. p. 1-369.

[2] Martin B. Judgement summary: The State of Western Australia v. Rayney. [No 3]: WASC; 2012. p. 1-13.

[3] Murray Kathleen R, Robert W Fitzpatrick, Ralph S Bottrill, Ron Berry and Hilton Kobus (2016), *Forensic Science International*, 25, 88-100.

