

## Introduction

An unsolved murder case was re-investigated after a number of years. Scanning Electron Microscopy (SEM) was used to perform a comparative analysis between two control soil samples and three evidence samples.

The aim of the SEM study was to provide new information on the origin of the evidence samples in order to assist in the understanding of the sequence of events.






The analysis focussed on the textural characteristics of the inorganic particles (sand grains) and the elemental composition of coatings on the surface of the grains using Energy Dispersive Spectroscopy (EDS).

## TEXTURAL CHARACTERISTICS

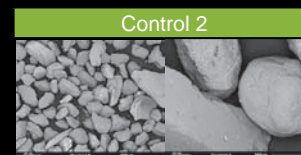
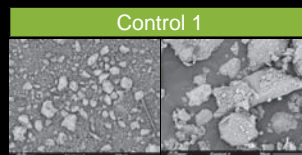
### Grain Size

GRAIN SIZE		
Class	Microns	
SAND	Very Coarse	1000-2000
	Coarse	500-1000
	Medium	250-500
	Fine	125-250
	Very Fine	62-125
SILT	4-62	
CLAY	<4	

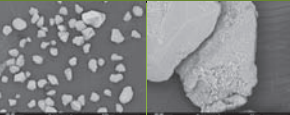
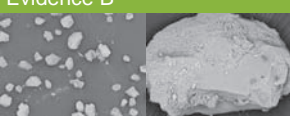

### Roundness

-  Angular
-  Subangular
-  Subrounded
-  Rounded
-  Well rounded

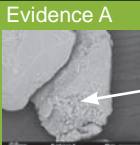
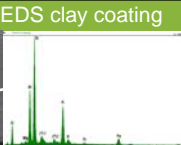
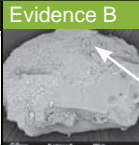
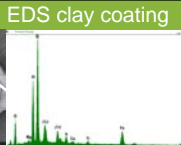
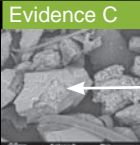
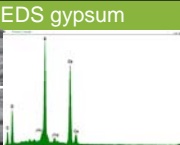
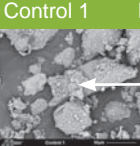
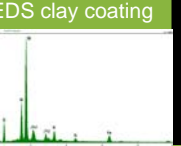
### Sorting



\* Evidence A and B sample size poorly representative for sorting

Evidence A	Grain Size	Roundness	Sorting	Grain Size	Roundness	Sorting
	✓	✓	✗	✗	✗	* ✓
	✓	✓	✗	✗	✗	* ✓
	✓	✓	✓	✗	✗	✗

## ELEMENTAL COMPOSITION

Evidence A	EDS clay coating	Evidence B	EDS clay coating	Evidence C	EDS gypsum
					
		✓	✓	✗	

## Conclusions

- Control Sample 2 can be eliminated as a source of origin for any of the evidence samples
- Evidence Samples A & B present characteristics similar to Control Sample 1
- Evidence Sample C, although texturally similar to Control 1, originates from a completely different source