

Evidence in Prosecutions: Sampling and Analysis



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Overview

- Sampling
- Analysis
- Reporting
- Special Cases



Reliable results

- Clear official rules
- Thorough training
- Meticulous attention to detail



Adequate samples?

- How many samples?
 - Statistically valid?
- Correct locations?
- Correct tool?
- Correct container?
- Quantity?



Samples representative?

- Cross contamination?
- Purged/ non purged?
- Multiple layers/ levels?
- Time of year?
- Composite samples?
- Capture volatiles?
- Limited access?



Heterogeneous solids

- Difficult to sample accurately
- Especially mixed wastes
- Must match statutory test



Selecting samples for analysis

- For what parameters?
- Are correct samples analysed?
- Field evidence reasonable?
 - Preserved?



What happens to the sample?

- Correctly preserved?
- Correctly transported?
- Chain of custody?
- Proper record keeping?



Analysis

- Lab qualified for that particular analysis?
- Qualified analyst?
- Using correct method?
- Sample suitable?



Lab Sample Preparation

- Timeliness
- Refrigeration
- Manipulation
 - *Fletcher v. Kingston*
 - *Inco*



Appropriate test?

- Bulk analysis
- Leachate
- Flammability
- Toxicity
- Odour



Quality assurance/ control

- QA/ QC
- Field blanks
- Travel blanks
- Duplicates
- Calibration



Reliability of result

- Good record keeping?
- False precision?
 - Method detection limit
 - Dilution/ masking
- Judgment required?



Reporting

- Official certificate
 - Correct form, correctly completed?
- Chain of custody
- Statute may make admissible



Appropriate benchmark

- Often contentious
- Especially if drawing on other jurisdictions
- Statute may determine



Relevance of result

- Background?
- Natural variability?
- Forms of contaminant
 - Arsenic/ arsenate
 - Chromium: hexavalent v trivalent



Special cases:

- Field variables
- Noise/ Vibration
- Odour
- Lay Evidence



Field variables:

- pH
- Temperature
- Volatiles
- Opacity
- Wind direction/ speed



Noise/ Vibration

- Completely different
- Unique expertise and equipment
- Measured on site
- Logarithmic scale
- Excess over background?
- Level, impulse, tone



Odour

- Samples taken
- Panel of “trained noses”
- Reproducibility?
- “Odour units”
- Detection/ identification/ objection
- Strong emotional element



Lay evidence

- Accurate record keeping?
- Credible?
- Independent?
- Corroboration



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Thank you!!

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