# BS10175: 2011
# Investigation of potentially contaminated sites – Code of practice

## What has significantly changed – Part 2

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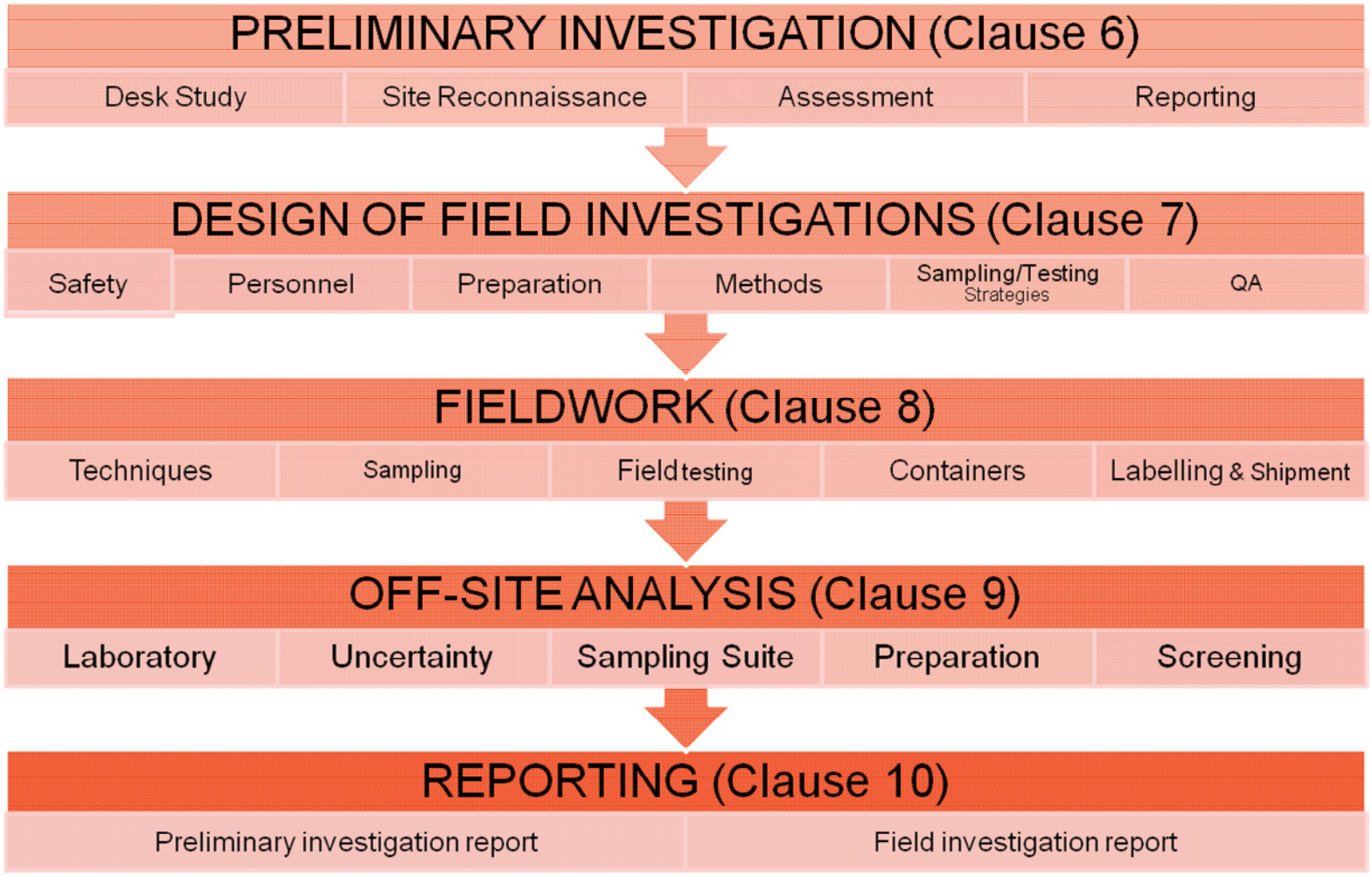
# BS10175 – Overview Clauses 6 to 10



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# Clause 6

# Preliminary investigation

# Clause 6 Preliminary investigation

## Good Practice

- Always carried out before any sampling or analysis.
- Two-step process (Date collection; Assessment and reporting).
- Data collection involves :

  (a) Desk study research and consultation; and
  (b) Site reconnaissance.

- Interpretation and reporting involves:

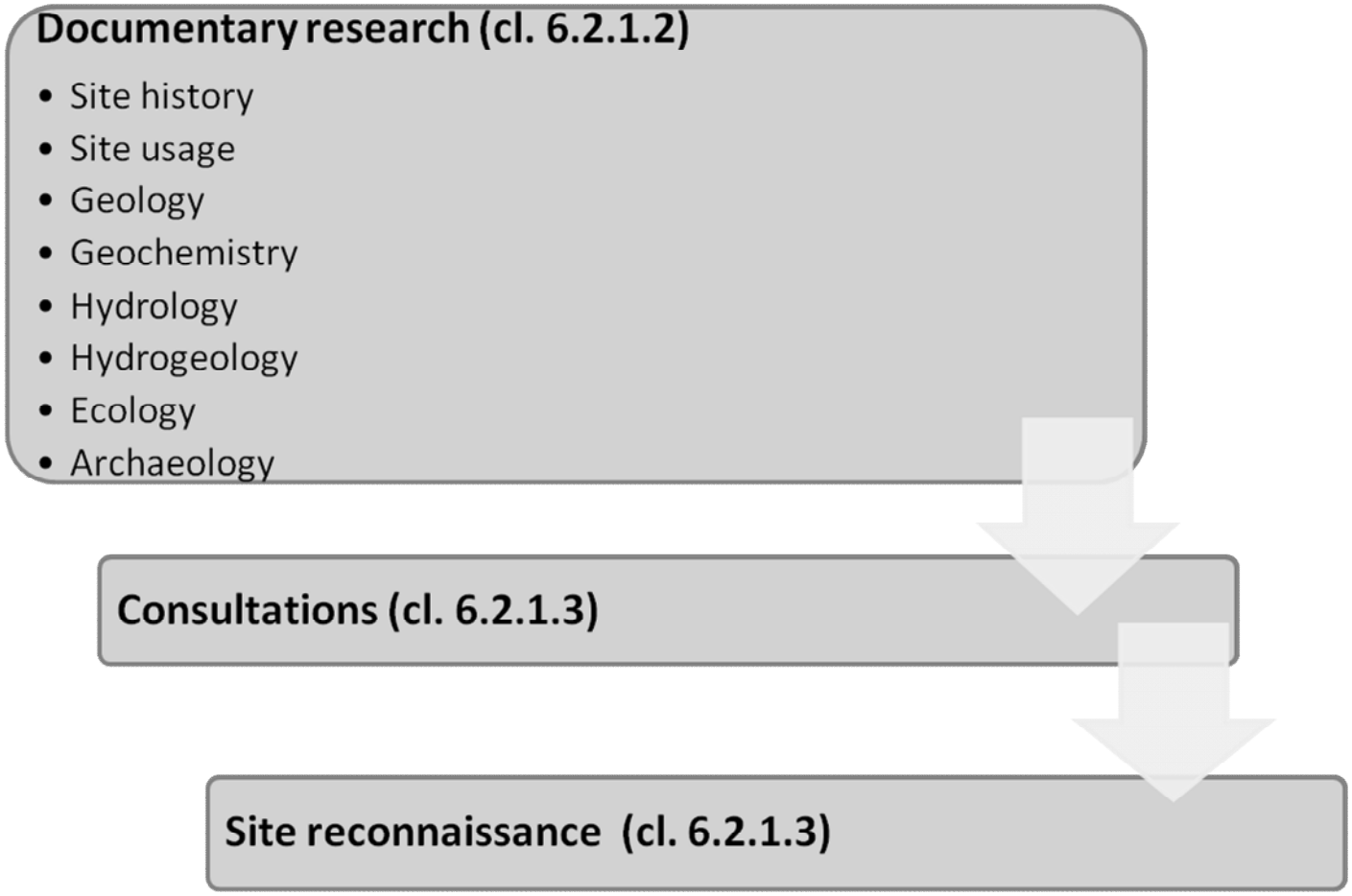
(a)Formulating the initial conceptual model;

(b)Preliminary risk assessment; and

(c)Report, with conclusions and recommendations.

# Clause 6 Preliminary investigation

- Revisions : Clause 6.2 Data collection



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# Clause 6 Preliminary investigation

## Revisions : **Desk study, General (cl. 6.2.1.2.1)**

Addition of considerations i), j) and k) :

i) The potential for the site to contain or have been affected by unexploded ordnance (UXO) (see CIRIA C681: *Unexploded ordnance (UXO): A guide for the construction industry* [37]).

j) Review of developers' designs and plans where the site is to have a change of use, with details recorded of the future use/characteristics of the site.

j) Any foreseeable events or changes (e.g. flooding, rising groundwater, change of use of neighbouring sites) that could have an impact on the assessment.

# Clause 6 Preliminary investigation

## Revisions : **Desk study, Site history (cl. 6.2.1.2.1)**

Addition of extent of research:

> The extent of research into the history of the site will depend upon a number of factors including the complexity of past potentially contaminative uses on and adjacent to the site, the vulnerability of the site geology and local water environment, and the degree of confidence required by the client. The methods and extent of research should be agreed with the client in advance and modified as necessary according to the findings of the preliminary investigation.

Table 3 updated

Notes 2 to 6 added with additional information sources

# Clause 6 Preliminary investigation

## Additional Notes : **Desk study, Site history (cl. 6.2.1.2.1)**

*NOTE 2 Reports can be purchased from a number of private companies which provide a collation of publically available information relevant to characterizing a site's history, geology, hydrogeology and environmental setting and identifying the locations of potentially contaminative land uses, pollution incidents and other features of relevance to a preliminary investigation. These reports do not usually contain geology mapping data at 1:10.560 or 1:10,000 scales, although they are procured and referred to particularly in mining areas.*

*NOTE 3 Geological maps, datasets and logs of borehole and wells can be purchased from the British Geological Survey and be ordered online at www.bgs.ac.uk/GeoIndex.*

*NOTE 5 Other base maps that can be considered alongside OS maps are UKMap (http://www.geoinformationgroup.co.uk/products/mapping) and Russian Maps, (http://www.russianmaps.co.uk/) which have the benefit of focusing on military establishments.*



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# Clause 6 Preliminary investigation

## Revisions : **Desk study, Site usage (cl. 6.2.1.2.2)**

- Informative text in BS10175:2001 concerning types of contaminated sites removed.

- Note 1 added concerning availability of recent aerial views on internet map sites.

*NOTE 1 Recent aerial views, and sometimes street-level views of the site, can be obtained on internet map sites. These can help establish the context of the site and recent condition. However, the date of the imagery might not be stated and the current condition of the site could be very different to that shown online.*

# Clause 6 Preliminary investigation

Revisions : **Desk study, Geology, geochemistry, hydrology and hydrogeology (cl. 6.2.1.2.3)**

- No significant changes.
- Updating of data sources and types of information available, for example:
  - groundwater vulnerability maps for Scotland from the BGS;
  - borehole and well records from the BGS; and
  - English Heritage for aerial photographs.

# Clause 6 Preliminary investigation

## Revisions : **Desk study, Ecology and archaeology (cl. 6.2.1.2.4)**

- Clarified that designations be investigated.

The preliminary investigation should determine whether the site (or its immediate environs) has been designated as an area of ecological or archaeological significance.

The preliminary investigation should also determine whether there are species (e.g. bats, nesting birds and water voles) or habitats of importance subject to legal protection (e.g. Wildlife and Countryside Act [13] or Habitat Regulations [14]).

- Included invasive species

The presence of invasive plant species, such as Japanese Knotweed and Giant Hogweed, should also be determined. Subsequent ground investigations should be designed to avoid any spread of these species.

# Clause 6 Preliminary investigation

Revisions : **Data collection, Consultations (cl. 6.2.1.3)**

Added clarity on parties who should be contacted but no significant changes.

# Clause 6 Preliminary investigation

## Revisions : **Data collection, Site Reconnaissance (cl. 6.2.1.4)**

A reconnaissance of the site, neighbouring land and the local area should be made, ideally after carrying out documentary research (see also **6.2.1.2**).

Arrangements for the reconnaissance visit, including access, should be agreed with the client and the site owner and/or occupier, as appropriate, before being undertaken.

The visit should be made by a suitably qualified, trained and experienced person.

# Clause 6 Preliminary investigation

Revisions : **Data collection, Site Reconnaissance (cl. 6.2.1.4) contd.**

- **Duty to report immediate threats added**

  If during the site reconnaissance anything is seen that is considered likely to pose an immediate threat to human health and safety or the environment, this should be reported immediately to whoever is in control of the site so that any essential urgent action can be taken.

# Clause 6 Preliminary investigation

## Revisions : **Data assessment and reporting (cl. 6.3)**

- No substantial changes

Risk assessment remains outside the scope of the code of practice – reference made to CLR 11 (now published).

# Clause 7

# Design and planning of field investigations

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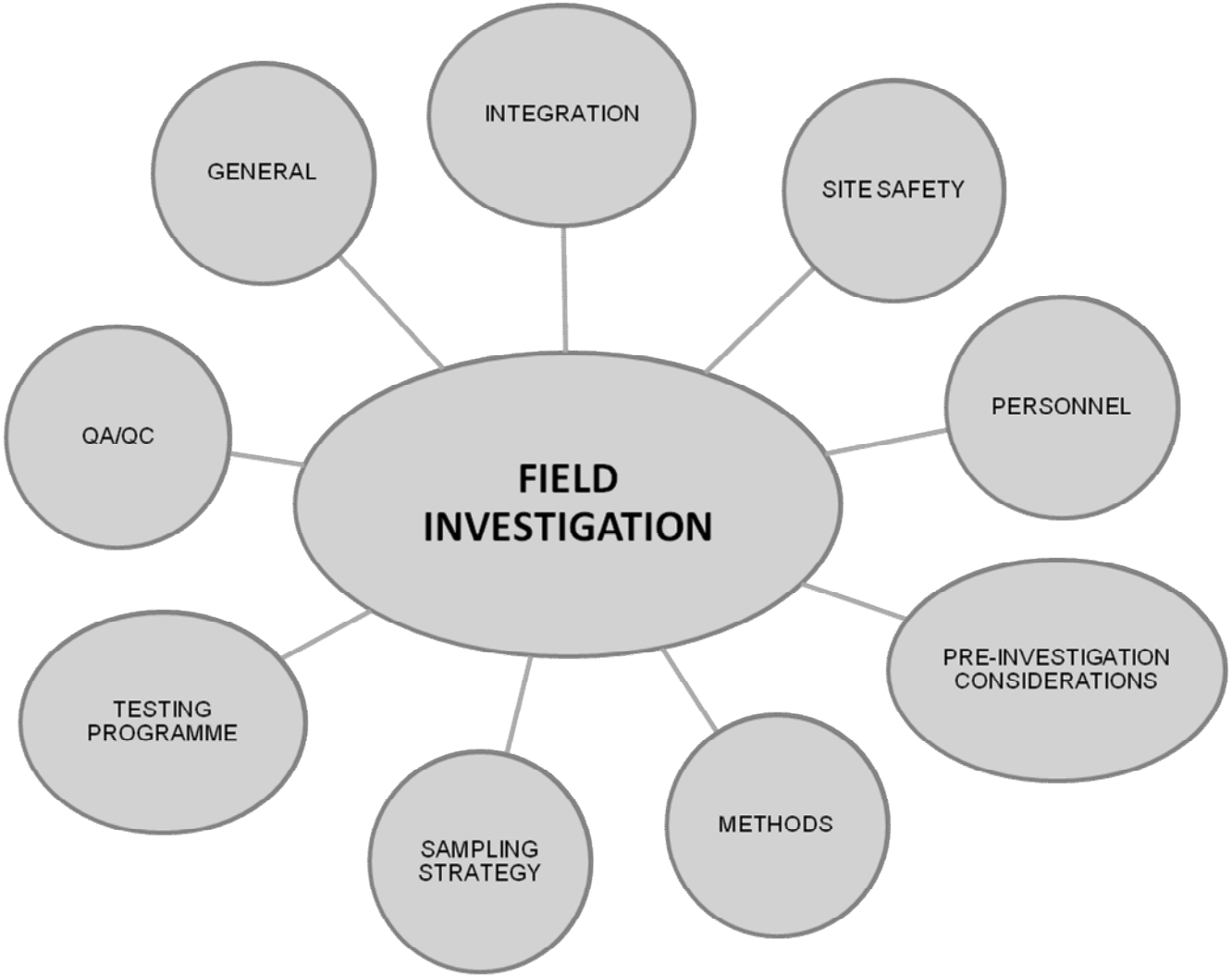




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## Clause 7 Design and planning of field investigations

Revisions : Clauses 7.3 and 7.4

### Clause 7.3 Site safety and environmental protection

- Core reference for safety is given as BS ISO 10381-03
- Additional recommendation regarding coring through hard surfaces

Coring through hard surfacing followed by probing or sampling should only be undertaken if service locations are known and are avoided or if hand excavation through the cored hole can be undertaken.

### Clause 7.4 Sampling personnel

- New

The experience of sampling personnel should reflect the requirements of the sampling programme and investigation requirements. Sampling personnel should always be aware of what the samples are intended for and have experience and knowledge of: .....

# Clause 7 Design and planning of field investigations

## Revisions : Sampling strategies, soils (cl. 7.7)

**From clause 7.7.2.1 Sampling locations"**

The number and pattern of sampling locations should be informed by the risk assessment and the required degree of confidence that hazards have been identified. The more sensitive the receptors or the greater the hazard, the greater the degree of confidence needed in the outcome of the risk assessment and the subsequent risk management (see R&D Technical Report P5-066/TR for more information).

**From Commentary to 7.7.2.2 Targeted (judgemental) sampling**

*The application of statistical tests (for example, calculating upper or lower confidence limits using the approach outlined in the CIEH/ CL:AIRE document, Guidance on Comparing Soil Contamination Data with a Critical Concentration [52]) are valid only in relation to unbiased sample data. Consequently, data collected from targeted sampling cannot be used in the application of statistical tests.*

**From clause 7.7.2.3.3 Non-targeted sampling density**

*Typical densities of sampling grids can vary from 25 m to 50 m centres for exploratory investigations, and 10 m to 25 m centres for main investigations. A greater density of sampling grid (for example 10 m centres or less) should be considered where .....*



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# Clause 7 Design and planning of field investigations

## Revisions : Sampling strategies (cl. 7.7)

- Sampling Strategy – Composite Sampling

**From clause 7.7.2.4 Composite sampling**

*Changed from "is not recommended" to "should not normally be used".*
*"Cluster sampling" introduced as an appropriate strategy for surface samples and in certain other circumstances.*

- Sampling Strategy – Water Sampling

**From clause 7.7.3.1.1 Designing a groundwater sampling strategy**

Water samples obtained during trial pitting can be used for screening for the presence of groundwater contamination and to establish whether it is necessary to install monitoring wells. However, caution should be applied when considering the analytical data from such samples, since the ground disturbance caused by digging can affect the composition of the water sample. It is not good practice to obtain water samples for chemical testing during the drilling of boreholes for the same reason.

- Sampling Strategy – Gas Sampling

**From clause 7.7.4.2.2 Methods of ground gas examination**

*NOTE Measurements of ground gas in spike holes are not generally recommended.*



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## Clause 7 Design and planning of field investigations

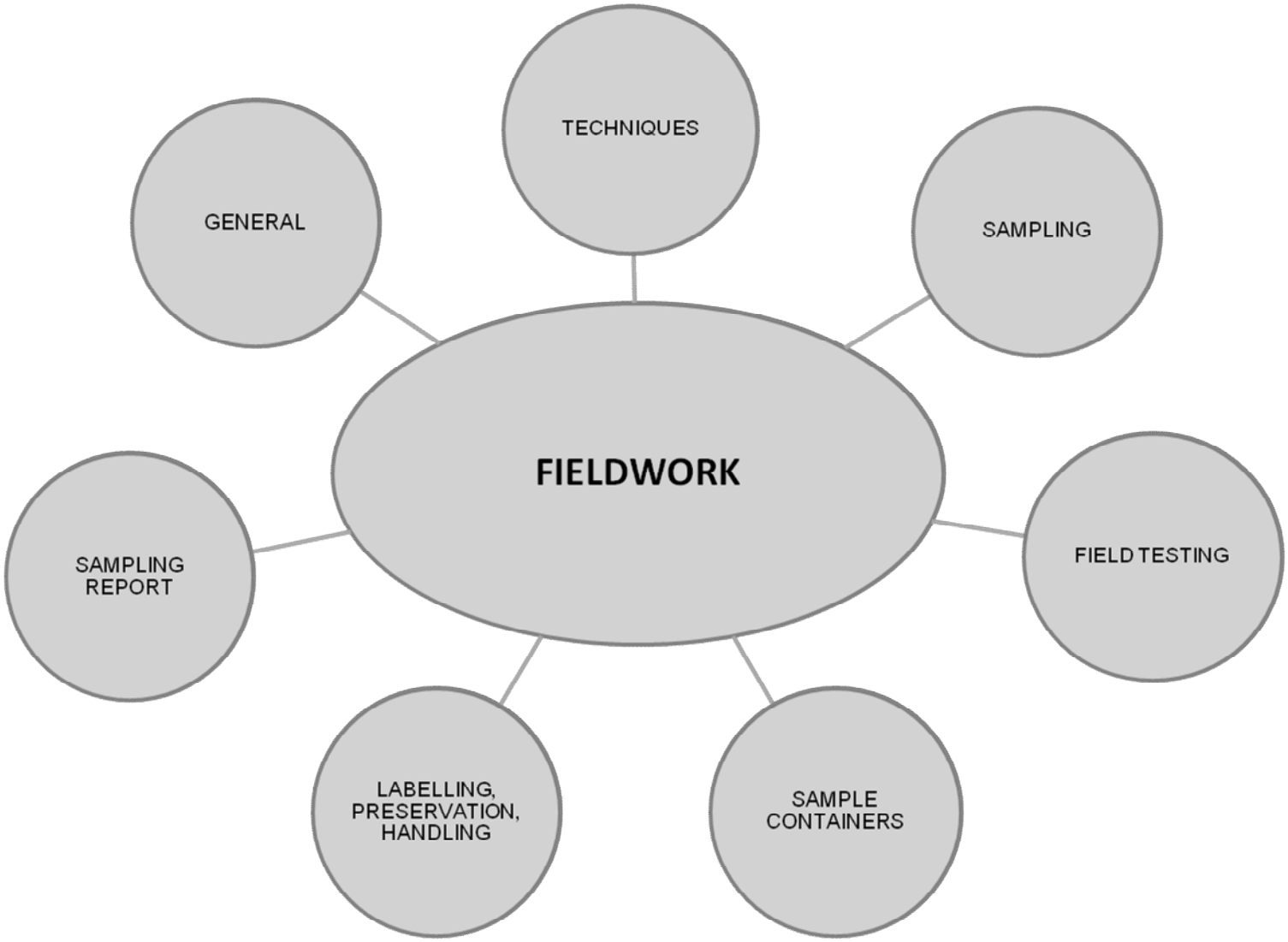
Revisions : Developing a testing programme & QA/QC (cl. 7.8 & 7.9)

- Laboratory analysis should be MCERTS accredited (where possible).
- Reference to recently published ISO standards.
- Recommends MCERTS and UKAS accredited laboratories.
- Sampling uncertainty to be considered for all investigations.
- Informative text on laboratory analysis moved to an Annex (Annex H).

# Clause 8

# Fieldwork

# Clause 8 Fieldwork



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# Clause 8 Fieldwork

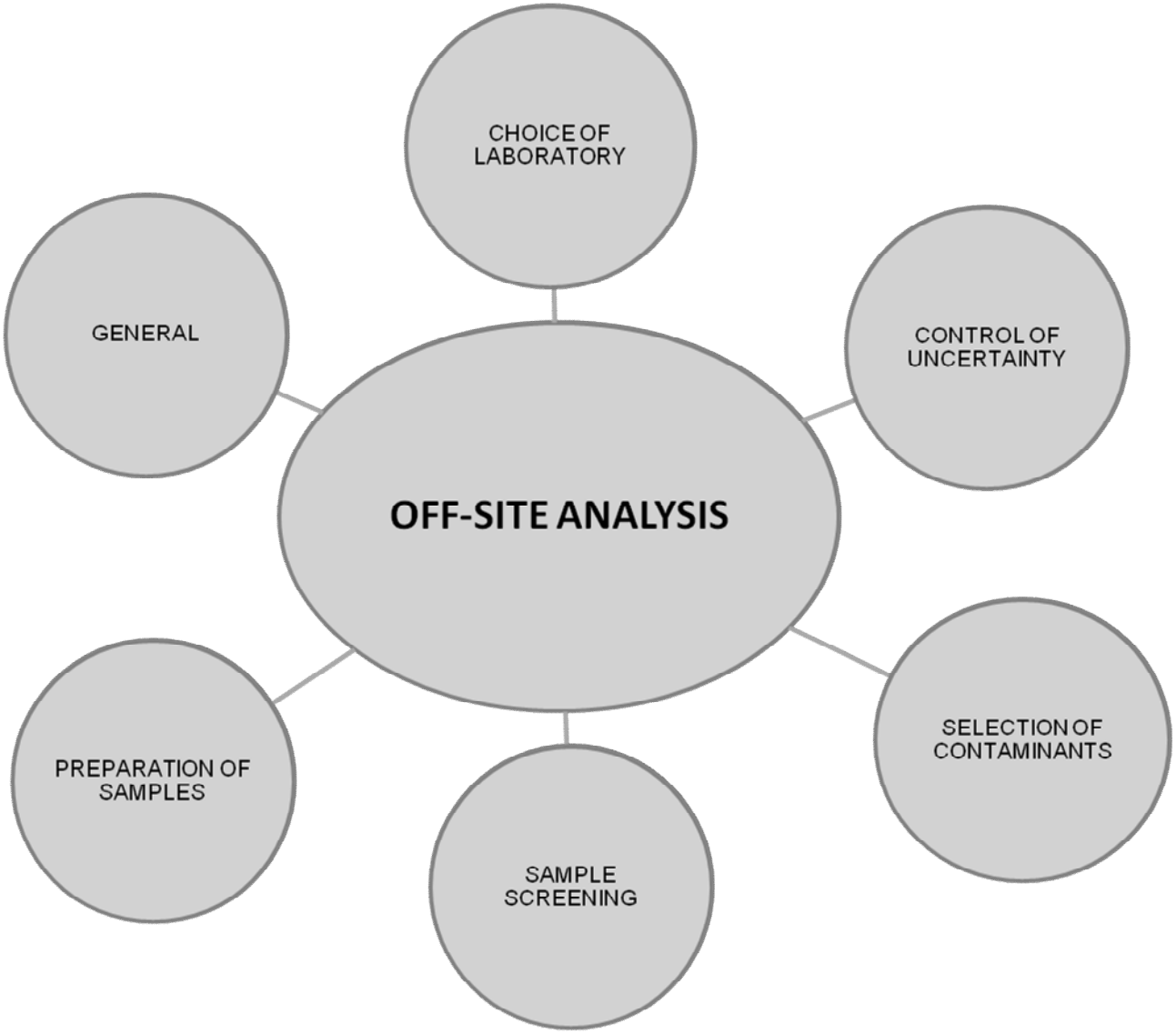
## Main Revisions :

- Update of all the Tables.
- Inclusion of Sonic/Rota-Sonic drilling in Table 6.
- Inclusion of Dynamic sampling using window or windowless sampling tubes in Table 6.
- Definition of “Spot”, “Cluster” and “Spatial composite” samples in Table 9.
- Re-write of “Field testing” and xref to new Annex F.

# Clause 9

# Off-site analysis of samples

# Clause 9 Off-site analysis of samples



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# Clause 9 Off-site analysis of samples

## Main Revisions :

- Considerable textural revision.
- Requirement for MCERTS accreditation where possible.
- Reference to new standard test methods.
- Description of both sub-sampling uncertainty and analytical uncertainty, xref to new Annex D.
- Former text on laboratory screening removed (out of date) and replaced with xref to new Annex G

# Clause 10

# Reports

# Clause 10 Reports

## Main Revisions :

- Reference to specific regulatory requirements and copy correspondence with regulators.
- Expanded definition of contents of Preliminary and Field investigation reports.
- Data to be presented “in as clear and easily assimilated way as possible”.
- Factual observations on the results (e.g. by comparison with an assessment criterion) even if only a factual report .

# Annexes

# ANNEXES

## Revision Annexes

- Annex A Examples of site investigations
- Annex B Example investigation objectives and applications
- Annex C Health and Safety in site investigations
- Annex E Example gas monitoring well construction
- Annex H Suitability of sample containers

## New Annexes

- Annex D The assessment and control of sampling uncertainty
- Annex F Rapid field measurement methods
- Annex G Laboratory analysis
- Annex I Regulation of land contamination

# BS10175:2011 – New ANNEXES

Annex D : Assessment and control of sampling uncertainty

- Replaces the previous very short Annex on ‘collection of a representative sample by means of the 9-point sample method.
- Description of the issues arising from sample variability.
- Guidance and references for duplicate sampling to reduce uncertainty.

# BS10175:2011 – New ANNEXES

Annex F : Rapid field measurement methods

- An up-to-date description of the use of presently available methods for soil, water and gas/vapour analysis in the field.
- Reference is made to the detailed guidance in the Env. Agency's RMT Science report (2009) and ISO 12404

# BS10175:2011 – New ANNEXES

## Annex G : Laboratory analysis

- Provides guidance on :
  - Selection of laboratory analyses;
  - Quality assurance;
  - MCERTS accreditation;
  - Common laboratory analyses methods for contaminated land investigation;
  - Advice on biological, physical and oral bioaccessibility testing.

# BS10175:2011 – New ANNEXES

## Annex I : Regulation of land contamination

- Guidance on the regulatory regimes in England, Scotland and Northern Ireland
- The regulatory process (Part 2A and planning).
- The relationships and expectations between the regulators and site investigation teams, particularly in planning.

# REQUIREMENT UNDER PLANNING

Extract of PPS 23 Annex 2 :

"Development on Land Affected by Contamination"

All investigations of land potentially affected by contamination should be carried out by or under the direction of a suitably qualified competent person and in accordance with BS10175 (2001) *Code of Practice for the Investigation of Potentially Contaminated Sites*. The competent person would normally be expected to be a chartered member of an appropriate professional body (such as the Institution of Civil Engineers, Geological Society of London, Royal Institution of Chartered Surveyors, Institution of Environmental Management) and also have relevant experience of investigating contaminated sites.



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# Bibliography

# BIBLIOGRAPHY

- Standards Publications
- Other Publications
- Further Reading
- Useful websites containing publications on contaminated land

*Thank You*



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