



Development on Land Affected by Contamination

A guide to help developers meet planning requirements

1. Introduction

This guidance is primarily for property owners, developers, architects and surveyors who want to know what information they should submit to the planning department when they apply to re-develop, or significantly change the use of a piece of land, which could potentially be contaminated. This document is a guidance note only, developers and their consultants are expected to refer to current applicable guidance and good practice.

Contamination, in most cases, is likely to arise from a previous use of the site or an adjacent site that had an industrial activity on it at one time or another. There may also be a ground gas risk to the site from nearby landfills.

A substantial amount of land in Hounslow is at risk of being contaminated as the borough has an extensive industrial history. Factories, landfill sites, gas works and the military have all operated here. These industries have sometimes polluted the land where they operated. This pollution, or contamination, where present has the potential to harm human health, water supplies, natural habitats and property.

The Department of Environment (DoE) Industry Profiles (published in 1995) provide a general background on the types of contaminants associated with individual industries¹.

2. The Planning Process

The role of the planning process is to ensure that land is made suitable for its proposed end use. All planning applications (including prior approval and permitted development applications) have to be considered for potential contamination issues to ensure compliance with the Town and Country Planning Act 1990, the National Planning Policy Framework (NPPF) and the Hounslow draft Local Plan. The NPPF states that 'the effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potentially sensitivity of the area or proposed development to adverse effects from pollution, should be taken into account'².

On any site where there is a potential for contamination to influence the site the Planning Officer will consult the Land Quality Department. For sites that have been previously developed or are situated on agricultural land a Phase I Preliminary Risk Assessment (PRA) is required. An exception to this is small permitted developments (i.e. an extension at a single dwelling, permitted developments to a more sensitive end use i.e. offices to residential will still require a PRA/standard conditions). The PRA should be submitted with the original planning application.

¹ DoE Industry Profiles Available from:

http://www.claire.co.uk/index.php?option=com_content&view=article&id=198:doe-industry-profiles&catid=76&Itemid=662

² Department for Communities & Local Government 2012



As a result of consultation with the Land Quality Department, the planning officer may make one of the following recommendations for planning applications on potentially contaminated sites;

- Consent is refused outright (this is very rare)
- Consent is refused and/or the decision deferred until further supporting information is provided
- Consent is granted conditionally³ requiring certain information to be provided and possibly remediation and validation works to be undertaken to discharge condition(s).
- Consent is granted without conditions.

It is essential that the applicant provides as much information as possible to the Local Planning Authority (LPS) as possible, at every stage of the planning process. Withholding information, however trivial, may cause a delay to the application. The onus is on the applicant to keep the LPA well informed about the development at all times.

3. Competency

Any assessment on land potentially affected by contamination will need to be undertaken by a competent suitably qualified person, i.e an environmental consultant specialising in land contamination with demonstrable experience in dealing with similar sites. Certain sites are likely to require a consultant with specific expertise. For example;

- A high risk site such a petrol filling station with Total Petroleum Hydrocarbon (TPH) groundwater contamination and a TPH plume extending from a redundant tank would require a consultant with extensive hydrogeological experience able to model the plume and derive remedial targets.
- A former chemical manufactory site presenting extensive contamination of soils with a range of solvents likely to require detailed risk assessment and should be undertaken by a consultant with extensive human health risk assessment experience, particularly where contaminants present do not have generic assessment criteria.

Failure to use a competent consultant will likely result in delays to the development and further costs incurred for additional phases of work that could otherwise have been avoided. Conditions cannot be discharged until the site has been suitably assessed and potentially investigated, remediated and verified to the satisfaction of the local authority.

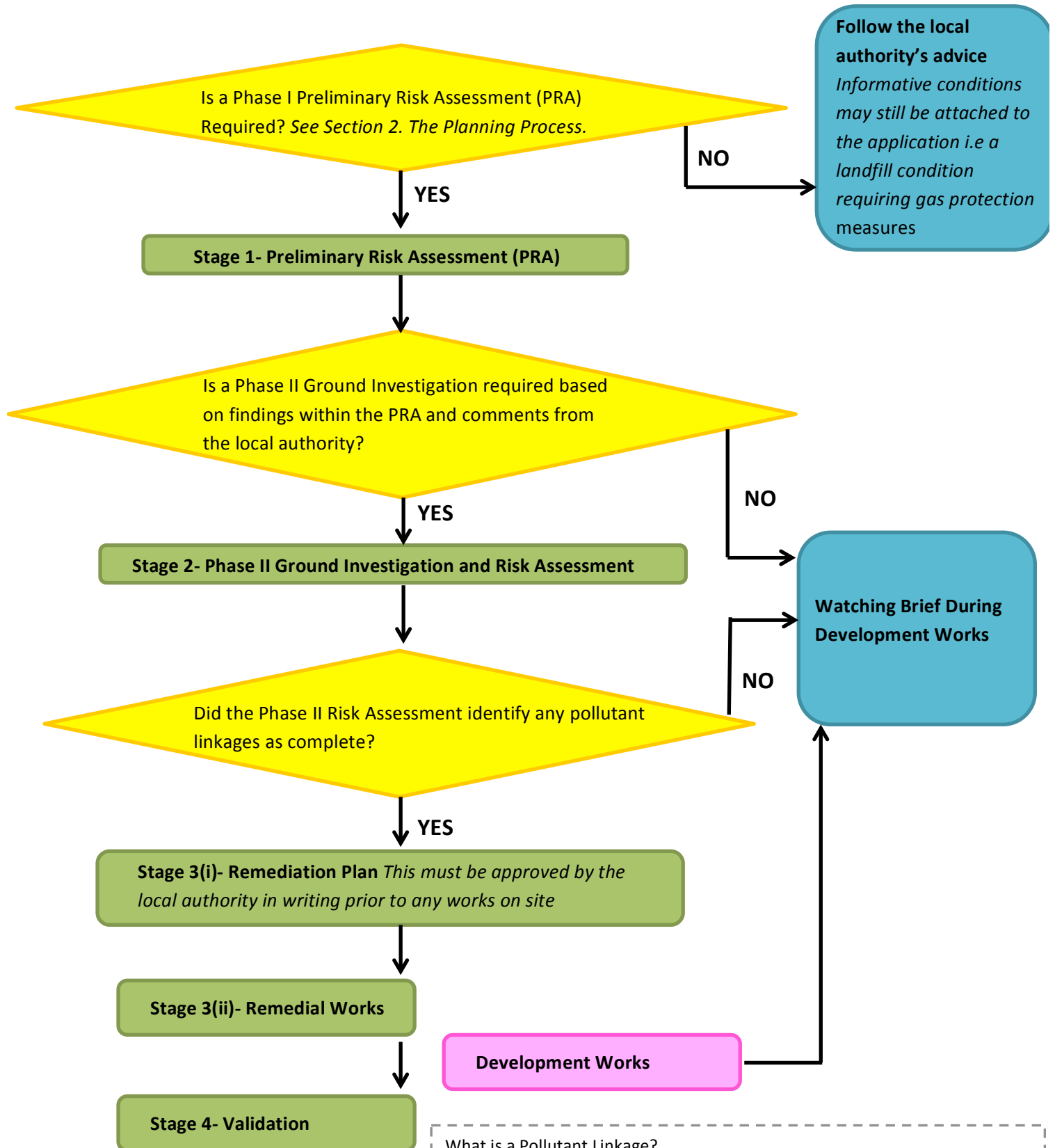
4. Discharge of conditions

To discharge land contamination conditions the Local Planning Authority will require, at all relevant stages that works undertaken are satisfactory. Reports submitted must demonstrate that the site is suitable for use and does not pose an unacceptable risk to the wider environment.

³ Conditions will be specific to each site but will generally comprise of the requirement for a Phase I Preliminary Risk Assessment and dependant on findings a satisfactory site investigation, remediation plan, remediation works and verification works.



Procedure for dealing with land potentially affected by contamination



What is a Pollutant Linkage?

A Pollutant Linkage is the relationship between a contaminant, pathway and receptor. A Pollutant Linkage is considered complete when a contaminant is found to be present at unacceptable levels and a viable pathway exists for that contaminant to reach and adversely impact an identified receptor (such as river or residents at a property).

Stage 1- Phase I Preliminary Risk Assessment (PRA)

The PRA will be undertaken in line CLR11.

The PRA will establish;

- Site location and setting (including a site boundary)
- Current land uses on and in the vicinity of the site
- Historical land use on and in the vicinity of the site
- Any landfill or waste sites within 250m of the site
- Details of pollution incidents
- Environmental Permits
- Potential sources of contamination and associated contaminants of concern
- Geology and potential for Made Ground
- Hydrogeology and hydrogeology including any abstraction and discharge licenses
- A site reconnaissance or site walkover survey will need to be carried out as part of this assessment. This will involve physically visiting the site to assess current use, surface conditions and any visible evidence of contamination such as asbestos debris, staining or waste drums, tanks etc.

You will need to review sources including historical maps, geological maps, hydrogeological maps and relevant environmental searches. For more complex sites such as filling stations or more recent chemical sites it may be necessary to obtain more detailed information such as detailed site plans or information on former operations and processes.

The PRA will develop a site specific conceptual model (CSM). *The CSM must identify potential **receptors** such as human health and controlled waters, potential **pathways** and **potential sources** of contamination. The conceptual site model will then identify which potential **pollutant linkages** are plausible given the information obtained from the PRA. The conceptual site model should be as detailed as possible and in line with current guidance assign potential severity and probability of risk to potential pollutant linkages through a risk ranking evaluation. An excerpt from a good, robust conceptual site model is provided below. It is always recommended that conceptual site models are given in table form, for complex sites it may be of benefit to also produce a graphic conceptual site model to aid understanding of the CSM.*

Source	Pathway	Receptor	Severity	Probability	Risk	Pollutant Linkage	Comments
Redundant tanks, interceptors and residual contaminants within made ground Potential contaminants including TPH, BTEX and MTBE	Migration by surface run-off	Surface Water Drainage	Medium	High Likelihood	High	Plausible	Plans obtained from client and GPR survey indicate two redundant tanks remain on site. Site walkover survey identified free product within interceptors on site. Site sits directly on superficial Principal Aquifer and River Crane is present 100m south.
	Migration in solution or via product via groundwater	Underlying Principal Aquifer River Crane 100m south	Severe	High Likelihood	Very High	Plausible	
	Inhalation of vapours	Future site residents	Severe	High Likelihood	Very High	Plausible	
	Ingestion and adsorption via direct contact		Severe	High Likelihood	Very High	Plausible	

The PRA will produce conclusions and recommendations *i.e. to inform the scope of the site investigation, if required.*

The Phase I PRA must be completed before moving onto the Phase II Ground Investigation.

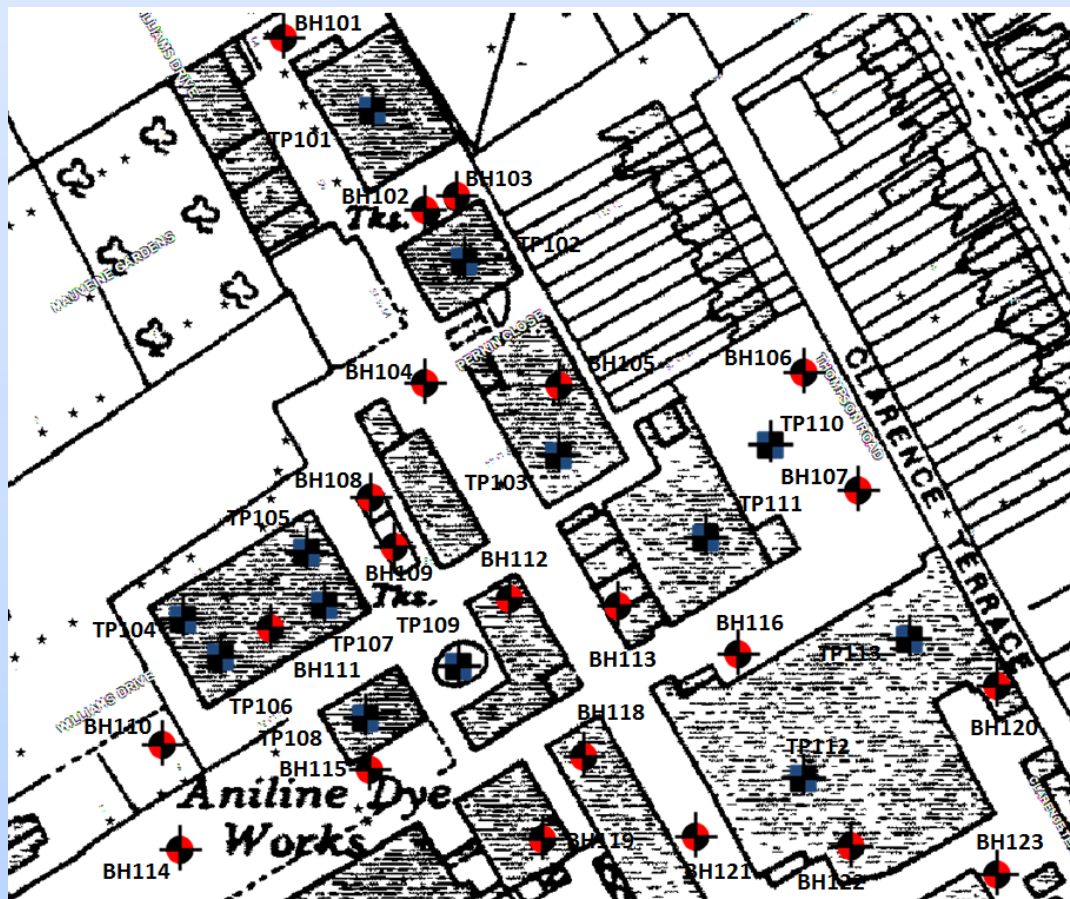


Stage 2- Phase II Ground Investigation and Risk Assessment

Ground Investigation

Where the Phase I PRA indicates plausible pollutant linkages for the site, or at the request of the Local Authority a Phase II will be required. The scope of the Phase II should have been set out in the PRA (which the council would generally provide comment on as part of their initial response). The Phase II report should be undertaken in line with relevant British Standards and current UK guidance i.e. BS10175, BS5930 and CLR11.

The **sampling density** should be appropriate for the size of the site, former land uses, proposed end use and achieve a good coverage of the site. The investigation should also **target potentially contaminative current or historical features** such as tanks, electricity sub-stations, areas of infilling, building footprints etc. An example of a good, targeted initial ground investigation plan is shown below for a dye works.



Investigation methods should be suitable for the nature of the site with regard to geology (i.e. window samples are generally not suitable to progress into gravels or hard clay) and necessary installations/required sampling. Requirements and frequency of gas monitoring, soil sampling, groundwater sampling and surface water sampling will follow relevant guidance.

Stage 2- Phase II Ground Investigation and Risk Assessment continued...

Samples must be tested for contaminants of concern identified within the PRA and made ground from the site should always be screened for asbestos. Labs used should be accredited in accordance with guidance. When analysing Total Petroleum Hydrocarbons (TPH) the TPH-CWG method should be used to avoid complications during risk assessment works and unnecessary further sampling.

For sites where contamination is identified it may be necessary to undertake more than one Phase of site investigation to fully characterise the site, such as where hotspots of contamination are identified and the extent needs to be confirmed (i.e. delineation works).

Risk Assessment

The Phase II report should present a tiered risk assessment and should address the plausible pollutant linkages identified within the PRA. For generic screening criteria, current UK guidance must be used, at present (February 2017);

- LQM/CIEH S4ULs (2015) can be used for human health risk assessment, with C4SLs used for constituents without values.
- For groundwater risk assessment, EQS values should be used from the WFD Directions (2015) and drinking water values should be taken from the Water Supply Regulations (2016).

It is the developer and their consultants' own responsibility to keep up to date with any changes in legislation and guidance.

Where values are elevated or screening criteria are not available further more detailed assessment may then be used to assess the potential risk that these constituents pose to the site. Site specific values may be used for assessment such as CLEA derived values or EA remedial targets provided inputs are from site specific values obtained from methods such as pumping tests and all workings are provided.

The Phase II risk assessment should identify which pollutant linkages are complete for the site.

This risk assessment must be undertaken by a competent consultant(s) with relevant experience (see section 3. Competency).



Stage 3- Remedial Works

Where a site is identified as having complete pollutant linkages, remedial works will be required to make the site suitable for use and, where necessary protect the wider environment such as underlying aquifers and surface waters.

Remediation can take many forms such as excavation of impacted materials, placing of capping layers, protective membranes or chemical/biological methods. The methods must be appropriate to the site and approved by the local authority in writing.

A remediation plan must be approved by the local authority prior to any works commencing on site.

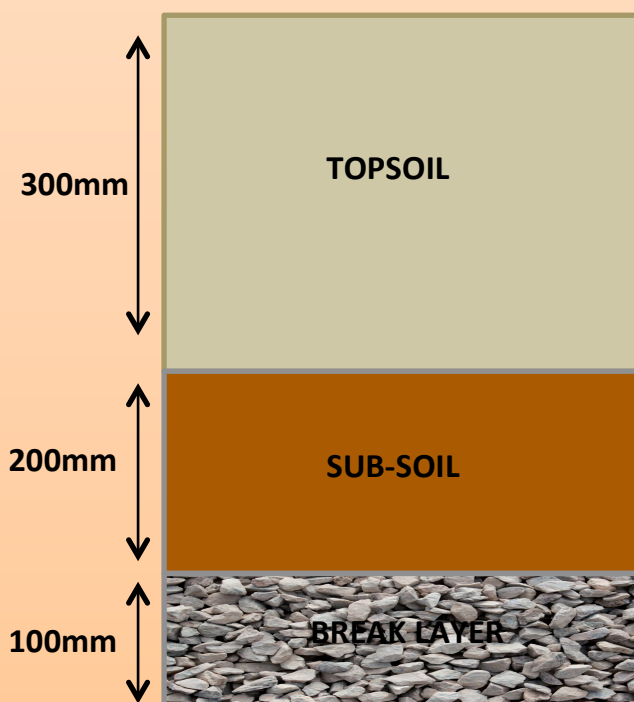
Any remedial works will need to follow industry standard practices and guidance. For soil capping layers the council requires a minimum of 450mm clean cover for areas of landscaping and a minimum of 600mm clean cover for areas of gardens. A break layer or membrane should be included within this layer (max 100mm). A membrane is preferable where asbestos is identified in site soils. A minimum of 150mm topsoil is required as a suitable growing medium, the cover layer should also include sub-soil such as a natural clay. Examples of good cover systems are provided below.

For cover systems, the remediation plan must detail site specific acceptance criteria for chemically validated soils.

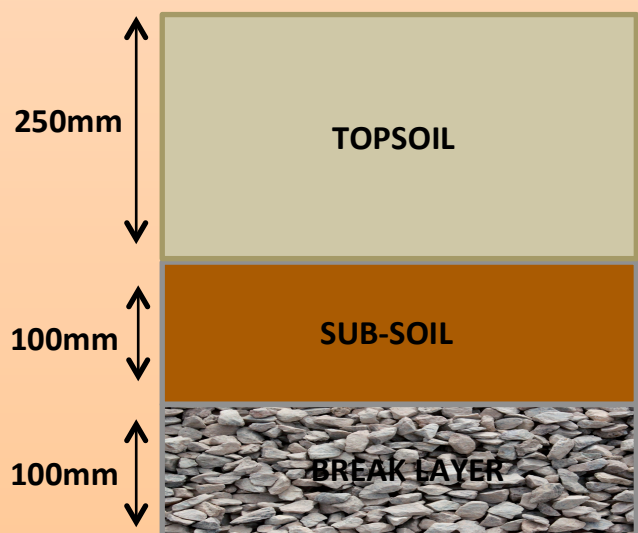
Testing requirements for imported soils are as follows;

- Testing should be undertaken at a frequency of 1 sample per 50m³ of imported fill.
- A minimum of 4 samples per source.

COVER SYSTEM FOR GARDENS



COVER SYSTEM FOR LANDSCAPING





Watching Brief during development works

For potentially contaminated sites the council will generally put a watching brief condition on the development. This requires the developer to be vigilant to any (further) contamination on the site uncovered during development works which was not identified within the Phase II ground investigation. As Phase II site investigations are generally far less intrusive and expansive than ground works during a development it is not uncommon that further, unforeseen areas of contamination are encountered.

If contamination is suspected then a competent person (see section 3-competency) will be required to attend the site and undertake further investigation, sampling and testing. The remediation plan must then be updated to reflect any further findings during this stage.

Validation

Once remedial measures have been completed they need to be independently validated. This should be undertaken at an appropriate stage, i.e gas membranes are to be validated before the ground-slab concrete is poured and capping layers should be validated prior to turf being laid.

The validation report must be submitted to the local authority for approval in writing. For capping layers photographic evidence must be included for depth validation (i.e. with the use of a measuring staff) and for gas protection measures photographic evidence must be included showing the full extents of the membrane, joints, seals and top hats.