clean up

MJCA
Technical advisers on environmental issues

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Proposed Housing and Planning Bill

The Government made a commitment to get planning permission in place on 90% of brownfield land suitable for housing by calling on national and local government departments to release sufficient previously-developed land to build 150,000 new homes by 2020.

The Bill is intended to enable local planning authorities or neighbourhood groups to grant planning permission in principle for housing sites at the point when a site is allocated in an adopted local or neighbourhood plan document or a local brownfield register the intention being to avoid unnecessary delays during the planning process. The development of brownfield land will be supported by requiring local authorities to prepare, maintain and publish local registers of specified land.

Government plans are to introduce a new zonal system effectively granting automatic planning permission in principle on suitable brownfield sites in an effort to build more new homes quicker and to protect the Green Belt. Typically it is expected that for land to be considered for housing from a register of Brownfield Land, the land must have the potential for at least 10 dwellings (0.2ha or more) and not be within a designated ecological area such as a SAC, SPA, SSSI or in Flood Zone 3b.

Land contamination - The cost of remediation

In 2005 the Homes and Communities Agency (HCA) published a remediation cost guide document to assist project managers and development partners as part of a project appraisal process in the assessment of the likely costs of the remediation of land contamination including the demolition of buildings and structures. A revised edition of the document was published in March 2015 which includes additional guidance on pre-acquisition site investigations and expands the cost assessment to include problems associated with the demolition phase.

There are a number of summary sections set out in the document including information on policy for contaminated land, regulation and procedural context associated with key construction and design issues. A section on due diligence and risk assessment sets out the processes for evaluating the potential risks for the management of land due to contamination which need to be considered prior to acquisition and during the development process. This information is essentially a summary of the document Model Procedures for the Management of Land Contamination CLR11 published by Defra in 2002. This phased assessment approach comprises a preliminary risk assessment, site characterisation, generic and detailed quantitative risk assessment and an options appraisal prior to remediation implementation. There is a section in the guidance document on site demolition including issues which need to be considered during these works for example health and safety, occupier's liability and security of derelict buildings as there may be hazards associated with the stability of these structures and risks associated with building materials for example the management of asbestos containing materials.

The document includes a cost model which can be used as a basis for an initial assessment of the potential benchmark of the costs of remediation and which can be used to check estimates provided from other sources. The benchmark costs are based on the remediation costs per hectare of land. A summary of the benchmark costs is presented in a table in the document using criteria based on the site sensitivity taking into account the risk to groundwater as a key

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Land contamination the cost of remediation

"The guidance does not take account of possible options to minimise remediation costs during the development of land with contamination in particular the opportunities to reuse contaminated materials"

factor, the proposed development land use and the potential for contamination based on the previous land uses. Whilst the information presented in this summary table is helpful it clearly needs professional judgement to be useful and there is further guidance in the document setting out how to narrow the range of the potential remediation costs based on a range of low and high category factors. For example an assessment as to whether contamination is likely to be associated with isolated hot spots resulting in the application of a lower risk category or if there is site wide contamination resulting in a higher risk category.

The range of costs presented in the document are quite broad as the assumptions applied are generalised although the assessment process provides a helpful indication of the likely cost range. The guidance does not take account of possible options to minimise remediation costs during the development of land with contamination in particular the opportunities to reuse contaminated materials which may be possible with little or no treatment where it is safe and suitable to do so, particularly when considering the development use and layout. Many practitioners working in the remediation of land contamination for site development will have knowledge of the likely range of costs for remediation and experience of the management of land contamination and this updated document should be helpful in supporting judgements regarding costs.

New British Standards

A new version of BS 5930 (2015) Code of Practice for Ground Investigation has been published. This standard has been the bedrock of guidance for site investigation since it was first published in 1981 setting out the standards for investigation techniques and testing. It was revised in 1999 with two amendments in 2007 and 2010 to incorporate European standards related to the Eurocodes standards for sampling, testing and soil and rock description. Eurocodes are a set of harmonised technical rules developed by a European Committee for the standardisation of structural design for construction works in the European Union.

Although the contents of the revised document have changed very little, throughout the new version of BS5930 (2015) there are updates to current best practice and cross references to European Standards and other British Standards documents, for example that the investigation of potentially contaminated sites should be in accordance with BS 10175:2011 + A1:2013 code of practice and ground gas assessment should be in accordance with BS 8576:2013 Guidance on Investigations for Ground Gas. Permanent Gases and Volatile Organic Compounds (VOCs). The new document provides a comprehensive account of aspects of the planning, recording and reporting of site investigations with greater emphasis placed on desk study and field reconnaissance, health and safety legislation relevant to site investigation and integrated investigation, for example combining geotechnical and contaminated land investigations.

A new version of BS8485:2015, Code of practice for the design of protective measures for methane and carbon dioxide ground gases in new building developments has also been published. The document has expanded four fold since the last edition in 2007 reflecting changes in good practice and clearer guidance on interpreting gas monitoring data and selecting membranes, changes to the gas protection scores in the assessment process and including a range of worked examples for a range of different of ground conditions and building types.

Hazardous gases may be generated from contamination, mine workings or buried wastes but can also be present in the ground naturally. Methane is flammable and an asphyxiant, and carbon dioxide is toxic and an asphyxiant. This standard provides guidance on site investigation techniques, how to interpret monitoring data and characterise the ground gas conditions at the sites and to assess protective design solutions for new buildings for different situations although recognising that professional judgement is necessary. Whilst the focus of the standard is on carbon dioxide and methane and it does not provide recommendations for other hazardous ground gases, there are annexes providing guidance on relevant references for radon and volatile organic compounds.

ACUMEN

The Assessing, Capturing and Utilising Methane from Expired and Non-operational landfills (ACUMEN) project led by the Environment Agency has published recently a report entitled "Managing landfill gas at closed and historic sites" together with three Excel-based tools to assist in the assessment of options for managing landfill gas at closed landfills. The aim of the ACUMEN project was to assess options for reducing methane emissions from closed landfills as the quality and quantity of landfill gas tails off over time. There are economic and technical uncertainties which can make decisions about the investment in managing landfill gas difficult and may restrict the take up of new technologies to manage methane emissions from closed and historical landfill sites. It is estimated that there are approximately 20,000 closed landfill sites in the UK. The report presents the findings from the ACUMEN project and guidance for using the Excel based tools together with many case studies and detailed technical summaries of the practical field scale demonstrations. The Excel based tools include:

- The ACUMEN Portfolio Screening Tool which has been developed to enable owners of multiple closed landfills to screen and prioritise their sites based on their potential to support a power generation scheme.

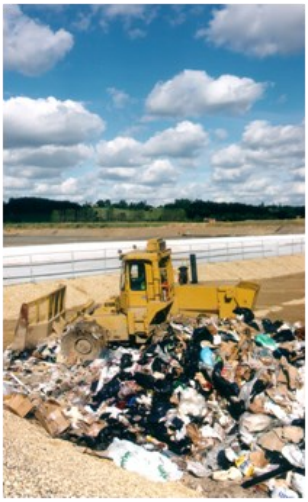
- The ACUMEN Gas Estimation Tool which has been developed to enable owners of closed landfills to estimate the rate of landfill gas generation at their sites without the need for detailed data or modelling.

- The ACUMEN Cost Benefit Analysis Tool which has been designed to help estimate the financial and social costs and benefits of applying the different gas management technologies.

The report includes an overview of some innovative landfill gas monitoring techniques, including continuous in-ground gas monitoring and the assessment of landfill gas accumulation in monitoring boreholes following displacement by injection of nitrogen gas and how these techniques can be used alongside more established traditional landfill gas monitoring approaches such as surface emission surveys, spot monitoring and flux box testing to assess landfill gas management options for the site. The report includes a chapter on residual landfill gas management and an overview of some of the available technologies and options for managing methane at closed sites although it does not present an exhaustive list of available technologies.

The ACUMEN Cost Benefit Analysis (CBA) Tool can be used to estimate the costs and benefits associated with different gas management options, based on projected scenarios from a base year and over a set period of time. The tool provides for a range of gas management interventions to reflect the application of realistic landfill gas management scenarios, for example operating a flare concurrently with a small landfill gas engine. Where there is an economic case based on the CBA tool for changing the way landfill gas is managed at a closed landfill, funding options may also need to consider financial incentives for the sale of electricity produced from landfill gas engines under the Renewable Obligations Order which is to incentivise electricity generation from renewable sources in the UK through the issue of Renewable Obligation Certificates (ROCs).

It is necessary to apply for planning permission to construct a landfill gas utilisation plant and planning consent may also be necessary for installations small in size or located in a facility that already has some form of planning permission in place. Furthermore planning permission is also needed for any transmission links to the electricity grid. Landfill gas utilisation plant will normally need an Environmental Permit under the Environmental Permitting Regulations. In England, the Environment Agency has published a Low Risk Position Statement which covers smaller landfill gas engines, such as those at closed or historical landfill sites. To comply with this position statement the operator must collect the gas in accordance with best practice, currently defined in document entitled "Landfill Gas Industry Code of Practice – Management of Landfill Gas, March 2012".



"It is estimated that there are approximately 20,000 closed landfill sites in the UK"

New waste classification—WM3

The Hazardous Waste (Miscellaneous Amendments) Regulations 2015, which give effect to the new waste classification system in England, came into force in July 2015. The Environment Agency together with Natural Resources Wales (NRW), the Scottish Environment Protection Agency (SEPA) and Northern Ireland Environment Agency (NIEA) have published supporting guidance entitled "Guidance on the classification and assessment of waste (1st edition 2015). Technical Guidance WM3". The earlier version of the technical guidance WM2 was based on the chemical legislation contained within the Dangerous Substances Directive (DSD) and Dangerous Preparations Directive (DPD). Via a staged process over a number of years the DSD and DPD have been replaced by the Classification, Labelling and Packaging Regulations (CLP) which introduce a new system of chemical classification based on hazard statements replacing the old methodology which was based on risk phrases.

Generally for waste classification assessment of contaminated soil it is necessary to base the assessment on the likely worst case substance or combination of substances that may reasonably exist associated with a contaminant and that is most likely to result in each hazardous property applying. The hazard statements associated with specific compounds are not comparable directly in many cases with the risk phrases applicable previously and, due to the CLP methodology for hazard statement identification, the hazardous waste thresholds for a number of substances particularly metal compounds have changed as a result of the introduction of WM3. For example arsenic and chromium (III) compounds now have a lower hazardous waste threshold whereas mercury has a higher hazardous waste threshold. WM3 introduces the requirement to consider whether a waste contains 14 specified Persistent Organic Pollutants (POPs) (for example DDT, dioxins and furans and PCBs) and whether the POPs are present at or above the thresholds specified in WM3.

There is specific guidance in WM3 on the assessment of construction and demolition waste containing asbestos, waste containing coal tar, waste soils and waste containing or contaminated with oil all of which may be encountered during the investigation and development of contaminated land.

Where asbestos is recorded in soil as fibres that are free and dispersed at 0.1% by weight or more then this exceeds the hazardous waste threshold. Where the waste contains identifiable pieces of asbestos containing material which is any particle of a size that can be identified as potentially being asbestos by a competent person if examined by the naked eye, then these pieces need to be assessed separately. The waste is hazardous if the concentration of asbestos in the piece of asbestos containing material is 0.1% or more.

Coal tar and many coal tar distillates are potentially carcinogenic hazardous substances if the concentration of such materials is at or above 0.1%. Coal tar is complex mix of hydrocarbon compounds which have to be added together to determine the concentration of coal tar and therefore the 0.1% concentration for hazardous waste threshold needs to be applied to the sum of all the fractions of the coal tar. Assessments based on polycyclic aromatic hydrocarbons (PAHs) alone are not consistent with the guidance and cannot be used to classify a waste as non-hazardous. If the concentration of coal tar is known then benzo[a]pyrene (BaP) as a marker compound for carcinogenicity may be used to assess if the waste is hazardous and where the concentration of BaP is less than 0.005% of the concentration of the coal tar and not the waste as a whole, the coal tar is not carcinogenic and not necessarily hazardous waste. Where the concentration of BaP is at or above 50 ppm (mg/kg) in asphalt road surface (black top) and not the waste as a whole, then the amount of coal tar present is considered to 0.1% or more and classed as hazardous waste.

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New waste classification—WM3 continued

An example of an assessment of waste soil in provided in the guidance document comprising a desk study and intrusive site investigation including a range of analysis reflecting the likely contamination at the site. The classification assessment needs to determine the concentration of the worst case substance calculated from the analytical results. Leaching test results for example testing for waste acceptance criteria (WAC) should not be used for waste classification and hazardous waste assessment purposes as this analysis is only applicable for landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous. The analytical data from the site investigation may identify certain cations and anions but does not identify the precise substances that are present which would need further testing using other techniques for example X-Ray Diffraction. A more typical approach would be to make an informed judgement based on the history of the site and likely contaminants associated with its use to determine the worst case substances that could plausibly be associated with the waste soil at the specific site and to assign a hazard statement code and associated hazardous properties for the worst case substance. Analytical results for soil testing for metals will provide typically the cation concentration and it is therefore necessary to calculate the concentration of the whole compound and to assess this concentration with the associated hazardous properties of that compound. For example a concentration of zinc reported in the laboratory data first needs to be recalculated as a concentration of the worst case compound, for example zinc oxide and this recalculated concentration compared with the hazardous property. It is also important to remember to factor back in the moisture content when comparing the results with the hazardous waste thresholds.

With regard to waste containing or contaminated with oil, typically a site investigation of contaminated land will analyse samples of soil for total petroleum hydrocarbons (TPH). There are a range of analytical techniques for hydrocarbons some of which make it possible to characterise the type of hydrocarbon and carbon banding groups present. If the hydrocarbon contamination in samples of soil is petrol or diesel from a known source such as a spill or identified by laboratory hydrocarbon profiling, this contaminated waste soil is regarded as carcinogenic and if the concentrations recorded in samples of soil are above the hazardous waste threshold of 0.1% (1000mg/kg) for petrol and 1% (10,000mg/kg) for diesel the soil is hazardous waste. For waste containing oil from an unknown source or which cannot be identified by the laboratory, markers can be used to assess the hazardous nature of the waste where all reasonable efforts have been taken to identify the specific oil or petroleum group. In such circumstances if the concentration of BaP is less than 0.01% of the TPH concentration, there has been appropriate and representative sampling and the laboratory analysis confirms that the contamination has not arisen from petrol or diesel, the waste is not above the hazardous waste threshold.

Through the current approach to the remediation of land contamination typically less waste soil needs to be removed off site than was the case under earlier approaches. However, where it is necessary for contaminated waste soil to be removed off site, careful classification of the waste soil in accordance with WM3 is important. MJCA has developed in-house tools to assist in the classification of waste to determine whether it is or is not hazardous.

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MJCA

ABOUT MJCA

MJCA provides independent advice on environmental issues to the public and private sectors. Delivering our services to high technical standards and commercial awareness enables us to provide practical, cost effective advice and sustainable solutions. Further information regarding our services can be found on our website www.mjca.co.uk

CONTACT US

Please contact Kevin Eaton for more information on any of the issues raised in this newsletter, or on any other Contaminated Land issues.

More C4SLs on their way

At the beginning of 2015 the Soil and Groundwater Technology Association (SAGTA) whose members include the Homes and Community Agency, National Grid and Shell announced that they are to support the next phase of preparing Category 4 Screening Levels (C4SLs) for possibly up to 50 substances. A Steering Group has been established which comprises professionals from Defra, Environment Agency, Natural Resources Wales, Public Health England/Wales, Homes and Community Agency and representatives from several local authorities. A consultation process invited selected industry representatives from a wide-range of backgrounds and who are technically focussed to select a range of substances which together with a response from an open consultation will be used to derive an initial short-list of 25 substances.

Defra have published previously C4SL for six contaminants (arsenic, cadmium, chromium VI, lead, benzo (a) pyrene and benzene) as part of the SP1010 project. The publication of more generic assessment criteria (GAC) for soils will add to the reference data available currently including the GACs for 89 potential contaminants presented in the document entitled "The LQM/CIEH S4ULs for Human Health Risk Assessment" published in 2015 referred to as "Suitable for use levels" (S4ULs), the GACs are published for 35 substances presented in the Environmental Industries Commission (EIC) document entitled "The Soil Generic Assessment Criteria for Human Health Risk Assessment" and the Soil Guideline Values (SGVs) published by the Environment Agency which are still in use.

The C4SLs were developed using the Contaminated Land Exposure Assessment (CLEA) software tool changing some of the parameters regarding the frequency and duration for potential exposure to contaminated soils from those applied in the original CLEA software tool to derive the SGVs. The parameters and exposure modelling methodology presented in the SP1010 project were applied to the development of the S4ULs for generic land uses including residential with and without home grown produce, allotments, commercial and public open space. The Environment Agency published an update of the CLEA software tool in September 2015 to include the library data sets from the Defra research project SP1010. Generic and site specific risk assessment criteria can be derived using the CLEA software tool and it is also possible to assess whether a measured concentration in soil and where available a measured concentration in ambient air, indoor air and vegetables will present a risk to human health under certain circumstances. There are modifications to the model to allow the derivation of exposure factors for dioxins, furans, and dioxin like poly chlorinated biphenyls (PCBs) to use in deriving site specific assessment criteria.

Comparison of the concentrations of contaminants recorded in samples of soil with GACs provides an initial assessment regarding land contamination. If a substance is recorded at a concentration in soil which exceeds a GAC this does not mean necessarily that the land is contaminated land as defined in legislation nor does it mean that there is a potential risk to the health of site users. To assess the potential health risks to site users requires more detailed site specific quantitative risk assessment.