

Site Investigation for land at
Trough Laithe Farm, Barrowford Road, Lancashire

Appendix 12

Tier 1 Risk Assessment Screening Values

Legislation Framework which Drives the Contamination Assessment of Land in England and Wales

Tier 1 Threshold Values

		Elements and compounds	Small Terrace (mg/kg)	Med/Large Terrace (mg/kg)	Semi-detached (mg/kg)	Detached (mg/kg)	Phytotoxic pH <6 (mg/kg)	Phytotoxic pH 6-7 (mg/kg)	Phytotoxic pH >7 (mg/kg)
Silty clay	Metals/Semi-metals	Arsenic	32.4				N/A		
		Beryllium	51						
		Boron	291 (2)*						
		Cadmium	11				N/A		
		Chromium (III)	3000						
		Chromium (VI)	4.3				N/A		
		Copper	2330				100	135	200
		Lead	210				N/A		
		Mercury (methyl)	7.4				N/A		
		Mercury (inorganic)	169				N/A		
		Nickel	127				60	75	110
		Selenium	351				N/A		
		Vanadium	79				N/A		
		Zinc	3750				200	200	300
	PAH	Acenaphthene	205				N/A		
		Acenaphthylene	168				N/A		
		Anthracene	2260				N/A		
		Benzo(a)anthracene	3.1				N/A		
		Benzo(a)pyrene	0.83				N/A		
		Benzo(b)fluoranthene	5.56				N/A		
		Benzo(ghi)perylene	10.7				N/A		
		Benzo(k)fluoranthene	8.5				N/A		
		Chrysene	6.0				N/A		
		Dibenz(ah)anthracene	0.76				N/A		
		Fluoranthene	257				N/A		
		Fluorene	163				N/A		
Indeno(123-cd)pyrene	3.18				N/A				
Phenanthrene	91.8				N/A				
Pyrene	563				N/A				
Sandy loam	BTEX	Naphthalene	1.54	1.71	1.7	1.97	N/A		
		Benzene	0.079	0.082	0.082	0.085	N/A		
		Toluene	119	122	122	125	N/A		
		Ethylbenzene	62.5	68	67.9	71.6	N/A		
		Xylene	41.7	45.5	45.3	50.9	N/A		
		Phenol	184	207	206	224	N/A		
	Aliphatic	5-6	30				N/A		
		6-8	73				N/A		
		8-10	19				N/A		
		10-12	93 (48) ^{vap}				N/A		
		12-16	740 (24) ^{sol}				N/A		
		16-35	45000 (8.48) ^{sol}				N/A		
		35-44	45000 (8.48) ^{sol}				N/A		
	Aromatic	8-10	27				N/A		
		10-12	69				N/A		
		12-16	140				N/A		
16-21		250				N/A			
21-35		890				N/A			

Notes:

The soil organic matter has been assumed to be 1% as this is the most conservative value for organic compounds. Inorganic compounds unaffected by this parameter.

Silty clay strata appears to prove more conservative threshold values for metals, semi-metals and several PAH compounds.

Sandy loam strata appears to prove more conservative threshold values for TPH compounds, phenol and naphthalene.

The assessment of hydrocarbon fractions should be completed additively to determine the total risk of the whole range of compounds present as well as by single TPH fractional units, however this should be undertaken on a sample by sample basis where significant hydrocarbon concentrations have been encountered to derive a compound TPH concentration.

Lead thresholds will be modified to follow the CLEA 1.05 system rather than the blood lead methodology.

 Blue colouration of the threshold box indicates that new tox values and procedures were adopted for the generation of the concentrations.

 Purple coloration of the threshold box indicates a C4SL value - only relevant for lead.

All thresholds not coloured dark green have utilised LQM/CIEH Generic Assessment Criteria for Human Health Risk assessment, 2nd edition, 2009.

* The threshold within the brackets represents the ecological threshold for water soluble boron, and should be adopted as the primary risk driver

Vap denotes where the threshold is exceeded beyond the vapour saturation limit.

Sol denotes where the threshold is exceeded beyond the solubility saturation limit.

Legislation Framework which drives the Contamination Assessment of Land in England and Wales

Foreward

In the UK, contaminated land is regulated by the planning and development control system and the contaminated land regime set out in Part IIA of the Environmental Protection Act 1990. The Water Resources Act 1991 is also incorporated within the Part IIA legislation.

When considering an application for development, the potential for the land to be contaminated is a material consideration, and the planning authority should satisfy itself that any contamination is properly assessed and adequately remediated, based on a suitable for use approach. This is to ensure that the land is made suitable for its proposed new use.

For those development sites where potential sources of contamination are present on site as of the 1 March 2009 (England) and 6 May 2009 (Wales), and are either suspected of, or known to be a source of contamination, a remediation notice may be placed on this site/operator under the Environmental Damages (Prevention and Remediation) Regulations 2009. This may include diffuse contamination and potentially includes developer's site practices.

The legislation in the form of Acts and Regulations, aims to deter pollution events from occurring. When pollution events do occur, apportionment of the 'blame' for the pollution event has a specific protocol to be followed to assess which parties, assuming multiple parties have utilised sites, is responsible. The polluter will then be expected to clean up the pollution event ideally voluntarily, or a remediation notice is posted whereby the polluter will be forced to undertake the works, assuming their appeal was unsuccessful.

Developers should not take on liability for all previous pollution the vendor and previous owners have left on the site. If some liability has to be taken to progress the sale of the site, a full appreciation of the liabilities of the contamination must be understood. It is common during the course of the ground investigation that all sources of historical contamination are not revealed and hence it is prudent to keep liability for these unknown events with the previous operators.

The developers own conduct is relevant to the legislation, as fuel tanks are often on site as mobile point sources, or static point sources for the refuelling of plant. Also, soils [generic term for all non-construction materials] used to raise site levels, form engineering platforms (i.e. piling and roads), and for use in garden areas are imported to site. The developer will be responsible under the Environmental Damages Regulations for their operations.

The legislation is complex and often is interchangeable depending upon the time of release for the contamination and the receptors which have been detrimentally affected by the contamination. A summary of the most relevant legislation is noted below.

Environmental Protection Act 1990 – Part IIA

Recent guidance has been published by the Department of Environment, Food and Rural Affairs (DEFRA Circular 01/2006) '*Environmental Protection Act 1990: Part IIA – Contaminated Land*' (September 2006), which replaced the former DETR Circular 02/2000, and continues the promotion of the 'suitable for use approach'. DEFRA note '*The "suitable for use" approach focuses on the risks caused by land contamination. The approach recognises that the risks presented by any given level of contamination will vary greatly according to the use of the land and a wide range of other factors, such as the underlying geology of the site. Risks therefore need to be assessed on a site-by-site basis*'.

The “suitable for use” approach then consists of three elements:

*(a) **ensuring that land is suitable for its current use** – in other words, identifying any land where contamination is causing unacceptable risks to human health and the environment, assessed on the basis of the current use and circumstances of the land, and returning such land to a condition where such risks no longer arise (“remediating” the land); the new contaminated land regime provides general machinery (sic – mechanisms) to achieve this;*

*(b) **ensuring that land is made suitable for any new use, as planning permission is given for that new use** – in other words, assessing the potential risks from contamination, on the basis of the proposed future use and circumstances, before official permission is given for the development and, where necessary to avoid unacceptable risk to human health and the environment, remediating the land before the new use commences; this is the role of the town and country planning and building control regimes; and*

*(c) **limiting requirements for remediation to the work necessary to prevent unacceptable risks to human health or the environment in relation to the current use or future use of the land for which planning permission is being sought** – in other words, recognising that the risks from contaminated land can be satisfactorily assessed only in the context of specific uses of the land (whether current or proposed), and that any attempt to guess what might be needed at some time in the future for other uses is likely to result either in premature work (thereby risking distorting social, economic and environmental priorities) or in unnecessary work (thereby wasting resources).*

The “suitable for use” approach provides the best means of reconciling our various environmental, social and economic needs in relation to contaminated land. Taken together with tough action to prevent new contamination, and wider initiatives to promote the reclamation of previously-developed land, it will also help to bring about progressive improvements in the condition of the land which we pass on to future generations.

With regard to the definition of statutory nuisance and contaminated state, ‘from the entry into force of the contaminated land regime in April 2000, most land contamination issues were removed from the scope of the statutory nuisance regime. This is the effect of an amendment to the definition of a statutory nuisance in section 79 of the 1990 Act, consisting of the insertion of sections 79(1A) and (1B); this amendment was made by paragraph 89 of Schedule 22 to the Environment Act 1995. Any matter which would otherwise have been a statutory nuisance will no longer be treated as such, to the extent that it consists of, or is caused by, land “being in a contaminated state”. The definition of land which is “in a contaminated state”, and where the statutory nuisance regime is therefore excluded, covers all land where there are substances in, on or under the land which are **causing harm** or where there is a **possibility of harm being caused**.

It should also be noted that the statutory nuisance regime continues to apply to the effects of deposits of substances on land which give rise to such offence to human senses (such as stench) as to constitute a nuisance, since the exclusion of the statutory nuisance regime applies only to harm (as defined in section 78A(4)) and the pollution of controlled waters.’

Also addressed within the DEFRA guidance is the issue of ‘contaminated land’. ‘Before the local authority can make the judgement that any land appears to be **contaminated land** on the basis that **significant harm** is being caused, or that there is a **significant possibility** of such harm being caused, the authority must therefore identify a **significant pollutant linkage**’.

This means that each of the following has to be identified:

- (a) a **CONTAMINANT**;*
- (b) a relevant **RECEPTOR**; and*
- (c) a **PATHWAY** by means of which either:*

- (i) that **contaminant** is causing **significant harm** to that **receptor**, or*
- (ii) there is a **significant possibility** of such harm being caused by that **contaminant** to that **receptor**.*

Regarding the source – pathway – receptor (SPR) relationship, where any of the three elements of the SPR are not present, there is no risk and therefore land cannot be classified as statutory ‘contaminated land’. Additional comment with respect to controlled waters DEFRA Circular 01/2006 pg. 90 notes the following with respect to controlled waters.

Section 78A(9) defines the pollution of controlled waters as: ‘*the entry into controlled waters of any poisonous, noxious or polluting matter or any solid waste matter*’.

Before determining that pollution of controlled waters is being, or is likely to be, caused, the local authority should be satisfied that a substance is continuing to enter controlled waters or is likely to enter controlled waters. For this purpose, the local authority should regard something as being “likely” when they judge it more likely than not to occur.

Land should not be designated as contaminated land where:

- (a) a substance is already present in controlled waters;*
- (b) entry into controlled waters of that substance from land has ceased; and*
- (c) it is not likely that further entry will take place.*

Substances should be regarded as having entered controlled waters where:

- (a) they are dissolved or suspended in those waters; or*
- (b) if they are immiscible with water, they have direct contact with those waters on or beneath the surface of the water.*

The term “continuing to enter” should be taken to mean any entry additional to any which has already occurred. Section 86 of The Water Act 2003 will further amend the definition of pollution to controlled waters, as defined in the Environmental Protection Act 1990, by amending Section 78A to include the term, under subsection (2)(b): ‘*significant pollution of controlled waters is being caused or there is a significant possibility of such pollution being caused*’. This Act is being implemented in stages, with the first stage of commencement outlined in CLAN 5/04.

Recently, DEFRA have announced that it is suspending plans for guidance on contaminated land decision making and will instead begin industry consultations on a review of the Part IIA statutory guidance. Until this review has been completed, the aforementioned assessment of the legislative process is assumed.

Environmental Damage (Prevention and Remediation) Regulations, 2009

In 2009 the Environmental Damage (Prevention and Remediation) Regulations No. 153 were enacted. This legislation is designed to prevent contamination events occurring. The meaning of Environmental Damage has been detailed below:

An important point to note is that the Regulations are a 'backstop', only applying when something has gone wrong and there is an imminent threat or actual 'environmental damage' within the scope of the Regulations. The emphasis should be on proactively putting in place appropriate pollution prevention measures to reduce risks to the environment. Those running businesses and other operations can reduce the likelihood of ever being caught by the Regulations' requirements by minimising risks to the natural resources covered by the Regulations. This means that businesses should be aware, in particular, where they:

- *Operate within or near areas of high biodiversity value, especially Sites of Special Scientific Interest (SSSIs);*
- *Operate near water bodies; and/or*
- *Carry out activities with potential risks to human health*

This is so they can take the necessary steps to manage the relevant risks effectively, including implementing and monitoring appropriate pollution prevention measures.

The Regulations do not cover all types of damage to the environment. They only cover 'environmental damage' which is one or more of damage to:

- *protected species and natural habitats or to a site of special scientific interest (these are referred to collectively in the guidance as **damage to species and habitats**);*
- *surface water or groundwater (these are referred to collectively in the guidance as **damage to water**); and,*
- *land. (Damage to land is contamination of land by substances, preparations, organisms or micro-organisms that results in a significant risk of adverse effects on human health.*

Regulation 8(1) states they do not apply in relation to:

- (a) damage that took place before the coming into force (CIF) of these Regulations;*
- (b) damage that takes place after (the CIF date), or is threatened after that date, but is caused by an incident, event or emission that took place before (the CIF date); or,*
- (c) damage caused by an incident, event or emission that takes place after (the CIF date) if it derives from an activity that took place and finished before (the CIF date).*

Regulation 8(3) states that the Regulations: only apply to environmental damage caused by pollution of a diffuse character if it is possible to establish a causal link between the damage and specific activities.

Regulation 14(1) states: An operator of an activity that has caused environmental damage, or has caused damage where there are reasonable grounds to believe that the damage is or will become environmental damage, must immediately –

- (a) take all practicable steps to prevent further damage, and*
- (b) notify all relevant details to the enforcing authority appearing to be the appropriate one*

Regulation 14 also covers damage that will become 'environmental damage'. This is where damage has occurred which is not yet 'environmental damage' but is sufficiently likely to become _environmental damage 'if no action is taken. To use the example of a tank, where the tank has leaked and the contamination has already started to enter the aquifer, the damage does not yet qualify as water damage. However, without action to control further migration of contamination into the aquifer, the damage is likely to become water damage.

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Revised Statutory Guidance on the Contaminated Land Regime under Part IIA of the Environmental Protection Act 1990, April 2012

In April 2012, DEFRA issued the revised Statutory Guidance under Part IIA of the Environmental Protection Act 1990 as part of the 'Red Tape Challenge' to simplify policies, in this case associated with planning.

As part of the revisions, a new four category test will be applied to assess whether land is contaminated or not. Category 1 sites are sites which have a high likelihood of contamination and would be considered as a significant problem. Category 4 sites are sites which are obviously not contaminated on the basis of either desktop information or a basic intrusive investigation. Categories 2 and 3 lie between the obviously uncontaminated and contaminated sites, with the division between these categories being considered as contaminated land under Part IIA. Risk assessment will be required to assess whether a site lies within Category 2 or 3. The risk assessment will initially be determined by health risks, then by socio-economic factors should health risks be uncertain, with a default decision of contaminated should the tests not be adequately met (refer to Figure 1).

For the purpose of determining whether a site may be classified as contaminated land, soil guidance values (SGV)/generic assessment criteria (GAC) should not be utilised as determining factors, however these may be used to confirm Category 4 sites where no risk of harm to human health is considered to be applicable. It should be noted that SGV and GAC threshold values are not considered to act as threshold values for Category 4 sites. New Category 4 Screening Levels (C4SL) have been produced for arsenic, cadmium, chromium (VI), lead, benzo(a)pyrene and benzene and represent low observed adverse effect level (LOAEL), and hence is considered appropriate for use as a threshold parameter in accordance with NPPF. Exceedance of C4SL does not necessarily mean that the site will be considered as contaminated land as this threshold will be set sufficiently below the boundary between Category 3 and 4 sites.

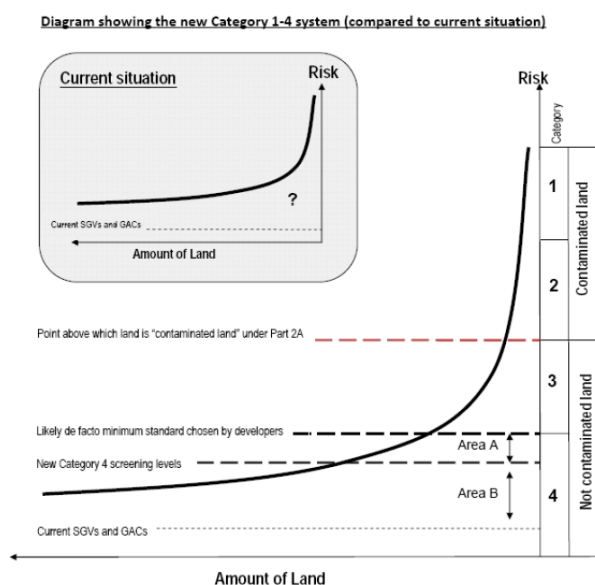


Figure 1: The New Four Category System