Contaminated Land Expert Panel Case Study

Role of the Contaminated Land Expert Panel:

The Contaminated Land Expert Panel has been set up by Defra to support Local Authorities (LA) in England and Wales in making decisions on whether land is or is not contaminated under Part 2A of the Environmental Protection Act 1990 (as amended). The Panel's work focuses on cases that are not straightforward and where there is ambiguity over whether the land is considered legally contaminated or not (i.e. which side of the Category 2 / Category 3 boundary does the land lie).

The Panel has provided a view on whether it is reasonable to determine a site based on the information that they have been provided. This will not always mean that each member of the Panel would have individually provided the same view. Nor does this view seek to usurp the local authority's responsibility to make the decision about whether land in its area is contaminated land.

For further details on the Contaminated Land Expert Panel go to:
www.claire.co.uk/conlandexpertpanel

Expert Panel Brief:

Prior to the Local Authority (LA) determining the site as "contaminated land" and proposing remediation, the LA asked the panel for their view on the following:

- "*Has the legal test (SPOSH) been met for the asbestos contamination based on the potential for increased exposure in the area of concern in years to come?*
- *Are the findings for the remainder of the contamination assessment (i.e. no other significant contaminant linkages) for human health sufficient (including vapour risks)?"*
- The LA also sought the panel's views on whether there is sufficient justification to assign the relevant part of the front garden area of the southern property to Category 2 on the basis of the observed asbestos and potential impacts on current site users under current land use conditions. The local authority is also concerned that any change in the use of the area by future site users could increase risks and may justify reassigning the area to Category 2.

The LA can ask the Panel specific questions, but these may not be answered depending on what information is provided and whether is within the remit.

Key Facts about the site:

- Small gas works located on site from c. 1870s to the 1950s in Wales
- Semi-urban area
- 0.12 hectare site
- Site now occupied by two houses
- The two houses are separated by a rock cliff formed during quarrying, prior to the construction of the gasholder on the southern part of the site
- Historical mapping shows a former gasholder base underlying the footprint of one of the houses
- Contaminants of concern: asbestos, and hazardous ground gas/vapours from volatile Total Petroleum Hydrocarbons (TPH) and Polyaromatic Hydrocarbons (PAHs) as identified by the local authority.

Summary of Case Study

The focus of the Panel and this case study is on asbestos and therefore gas/vapours are not discussed further in the case study.

As part of its statutory duties under Part 2A, the LA initially undertook a high-level desk based review (including examination of historical maps) of its area prioritising human health as a key receptor and past uses according to their potential to cause severe pollution. This review identified a former gasworks on land used for residential purposes, and this site was brought forward for detailed inspection.

The LA undertook a phased approach to investigating the site. They commissioned an environmental consultant to undertake a Preliminary Risk Assessment (PRA) of the site in 2013. The work included the collation and assessment of historical documentary information and a walkover. From a review of historical maps, the gas works waste was present between 1870s and 1950s, and no longer evident by 1959. The site was separated by a rock cliff formed during quarrying prior to the construction of the gas holder. Two residential houses were erected, one on the north and one on the southern part of the site. On the southern part of the site a house appeared on the 1994 historic map, believed to have been built on the footprint of the former gasholder. The information derived from the desk top investigation identified six potential contaminant linkages as moderate to low risk across the whole site. A conceptual site model was formulated. Recommendations were made for a preliminary site investigation to determine the extent and nature of contamination present.

An intrusive site investigation was carried out across the whole site in 2014 using window samples and boreholes to obtain soil samples and enable groundwater and gas/vapour monitoring. A total of 12 window samples and 2 boreholes were drilled. A total of 15 soil samples were sent for chemical analysis and were screened for Banded Total Petroleum Hydrocarbons (TPH), heavy metals, Semi Volatile Organic Compounds (SVOC) and Cyanide Compounds. Ten were selected for the presence of asbestos fibres. Ground gases and vapour from Volatile Organics were measured in installed boreholes.

The concentration of each contaminant was compared to Soil Guideline Values (SGVs if available (EA, 2008)) and Generic Assessment Criteria (GACs) published by LQM/CIEH (LQM, 2009) and CL:AIRE/EIC (CL:AIRE, 2010) or GACs developed by the consultant using the CLEA model. In addition, in March 2014, new screening levels (draft C4SLs) were published by Defra (Defra, 2014) which were also used.

To understand the potential source of contaminants, the site was separated into zones which were defined by the current and historical layout of the site. These were as follows:

Zone 1a – North Property back garden
Zone 1b – North Property front garden
Zone 2 – South Property – the area of the former gas holder base & back garden
Zone 3 – South Property - the remainder of the outside area.

A generic quantitative risk assessment was undertaken for each zone and the following conclusions were made:

Zone 1a, there was no evidence of contamination encountered so no further investigation in this area was deemed warranted.
Zone 1b, one sample taken at shallow depth showed elevated concentrations of PAH and therefore further characterisation of the soil in this area and more detailed risk assessment was required.
Zone 2, no evidence of contamination in the shallow soils was encountered so no further investigation in this area was deemed warranted.
Zone 3, three samples taken from shallow depth in the front and side outside areas showed elevated concentrations of SVOCs, the majority being PAH. Soft landscaped areas had not been analysed. Therefore, additional characterisation of the soil and more detailed risk assessment was recommended.

No evidence of asbestos containing material (ACM) was observed during this phase of the site investigation or identified in the analysed samples. The consultant recommended further site investigations and quantitative risk assessment only in the southern part of the site.

In 2015, the LA tendered further work to undertake additional shallow soil sampling and to carry out a detailed quantitative human health risk assessment. Hand dug pits were undertaken at 25 locations across both properties with 24 soil samples collected of which 20 were analysed.

Asbestos was identified for the first time in 2 out of 20 soil samples analysed on the southern part of the site in the lawn area that had not been sampled previously. Both were taken at 0.2m bgl. The samples were typically asbestos cement and no free fibres were reported in relation to either sample.

One sample contained both chrysotile and crocidolite and the other only contained chrysotile. Amosite was not found in any samples. Asbestos weight percentages were measured at 0.536% and 0.0048%

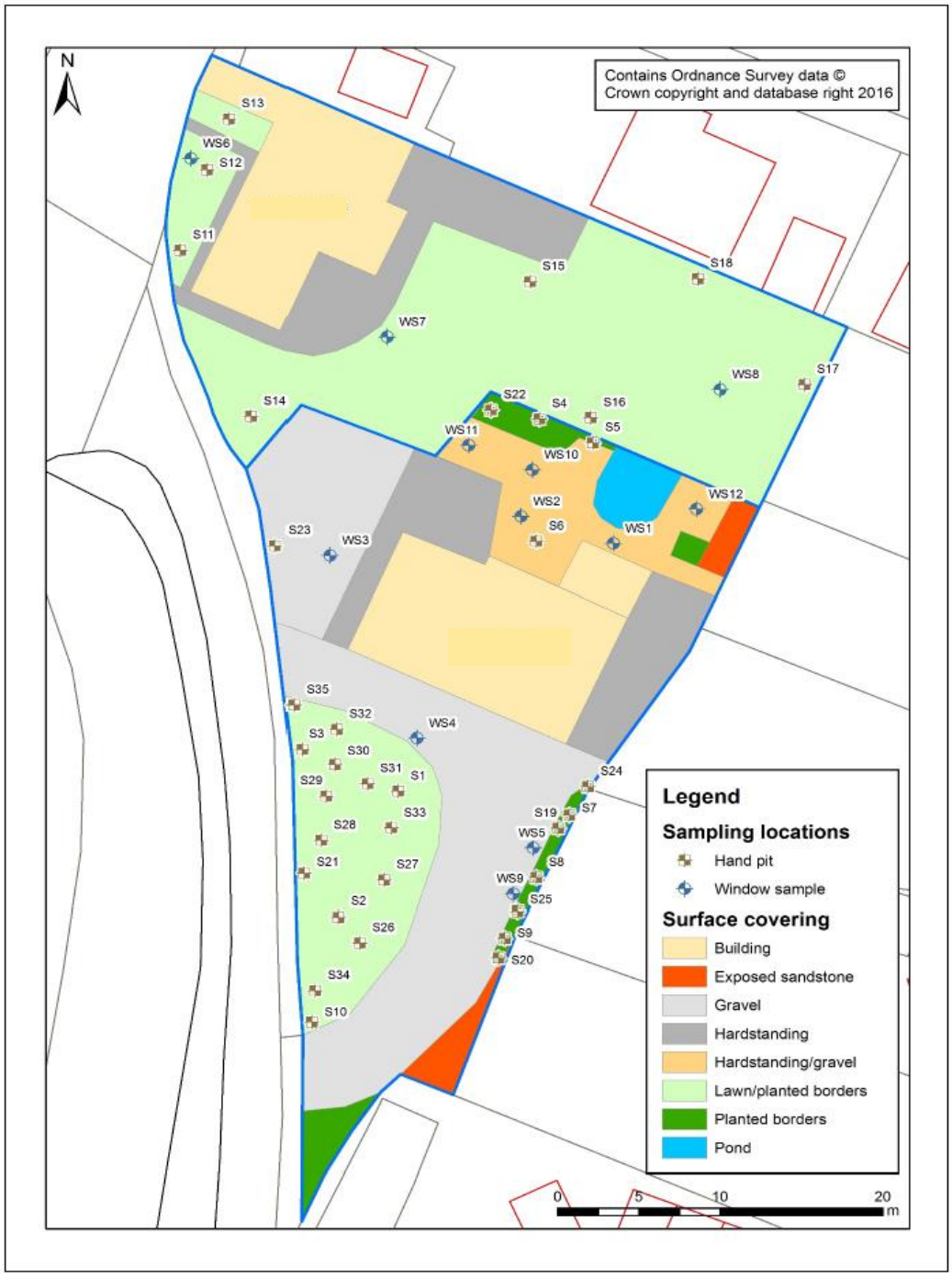
From the contamination results received from the additional soil samples and the detailed risk assessment, the LA concluded that the general soil quality was not likely to pose a risk to human health for the northern and southern parts of the site; however further investigation was required to ascertain the level of asbestos contamination present in the lawn area of the southern part of the site where asbestos had been encountered.

In 2016, a further 10 hand dug pits were undertaken in the lawn area of the southern part of the site only with 20 soil samples taken and 15 analysed. One sample detected asbestos. This was identified as containing chrysotile and described as ACM debris. No free fibres were detected. See Figure 1 for sample locations.

The consultant concluded that based on the available site investigation data and associated interpretations there is not currently considered sufficient evidence to formally determine part of the front garden area of the property as Contaminated Land under the Part 2A regime based on the observed asbestos and the potential associated current impacts on human health. However, they felt that if the use of the garden area changed then risks may increase and determination may be appropriate.

Following a review of the findings the LA sought the views from the Contaminated Land Expert Panel about their concerns that there remains the possibility of significant future risks to site users from the identified asbestos materials (e.g. if the lawn was ever removed and replaced with a land use where it was more likely that the ACMs were disturbed, degraded and resulted in an increased potential for fibre generation and hence exposure, such as a flower bed or vegetable plot). There was also concern that remedial measures may therefore be required to address potential future risks to human health from asbestos in the front garden area of the property. Since the principal risks are through asbestos fibre inhalation, any future remediation strategy would be required to break or remove the relevant contaminant linkages.

Figure 1: Sampling locations



Expert Panel's Remarks:

This case study is a summary based on the works and assessment carried out by the LA and the Panel's comments are therefore restricted to the information that was made available to it.

The Panel reviewed the available information and the questions that the LA asked in the context of the process documented in the Contaminated Land Statutory Guidance - Wales (Welsh Government, 2012). It was the Panel's view that the ground conditions identified at the properties did not meet the definition of Contaminated Land on the basis that the assessment presented to the Panel did not clearly identify unacceptable risks to statutory receptors, taking into account the

overarching objectives of the Welsh Government's policy on contaminated land and Part 2A, and the Welsh Government's statutory guidance on the requirements for that assessment.

The Panel agreed with the Local Authority that the risk from contaminant linkages associated with contaminants other than asbestos was low and was consistent with the statutory guidance definition of Category 4. For the presence of asbestos in the soil, identified in the lawn area of the front garden of one property, the Panel concluded that the risk assessment presented did not provide the robust evidence required to support the conclusion that the risk associated with the contaminant linkages was of sufficient concern that the land poses a significant possibility of significant harm. The reasons for this are:

- Insufficiently strong case for taking action under Part 2A on a precautionary basis (Category 2); including the inconsistency in proposed response to the presence of asbestos cement fragments and debris in soil compared to the Local Authority's advice to homeowners on the removal and disposal of asbestos cement in and around the home.

- Lack of robust evidence presented that it is possible that sufficient respirable asbestos fibres could be released to air during soil disturbance activities

- Lack of reference to and incomplete application of relevant and authoritative technical guidance, including insufficient consideration of the assumptions in the risk assessment and the associated uncertainty in the estimation of exposure and risk

- Lack of assessment as to whether the health benefits of remediation would outweigh the health impacts of regulatory intervention, and the cost benefit of action looking at wider economic, environmental and social factors to support a Category 2 decision.

The Panel was unanimous that the site met the definition of Category 4 on the basis of the lack of robust evidence that SPOSH existed, the qualitative judgement that the risk to residents was likely to be low, the low frequency of detection (3 out of 50 samples), the predominant form of the identified asbestos as asbestos cement, and consideration of whether such soil conditions could be typical for properties with (or historically with) outhouses, sheds or similar buildings clad or roofed in asbestos cement.

The overwhelming majority of the Panel additionally concluded that a change in the use of the lawn area would not alter the risk evaluation; for example, the use of the lawn area as a flowerbed, vegetable patch or children's play area. It was considered that a reasonable and proportionate action for the Local Authority could be to make the residents aware of the Authority's advice to homeowners on the removal and disposal of asbestos, should the residents encounter asbestos cement fragments in their garden.

References:

CL:AIRE/EIC, 2010. Soil Generic Assessment Criteria for Human Health Risk Assessment, January 2010.

Defra, 2014. SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document, March 2014.

Environment Agency, 2008. Soil Guideline Vales and Toxicology Reports.

LQM/CIEH, 2009. Generic Assessment Criteria for Human Health Risk Assessment, 2nd Edition, Land Quality Press.

Welsh Government, 2012. Contaminated Land Statutory Guidance - Wales. http://gov.wales/topics/environmentcountryside/epq/contaminatedland/guidance2012/?lang=en