

# Investigation at Bensham Park, Salters Lane Summary Report

## Scope and Objective

As a part of their statutory duties under the Environmental Protection Act 1990 (EPA), Darlington Borough Council carried out a review of historic uses of land in the Borough. Bensham Park and Salters Lane South allotments was identified as a former landfill site where there was a potential for contamination which could present possible risks to people and the environment. Because of this potential, the Council commissioned a specialist consultant (Buro Happold) to carry out an investigation and risk assessment of the site. The main objective of this investigation was to determine whether or not contamination was present and if so, whether or not this gave rise to unacceptable levels of risk.



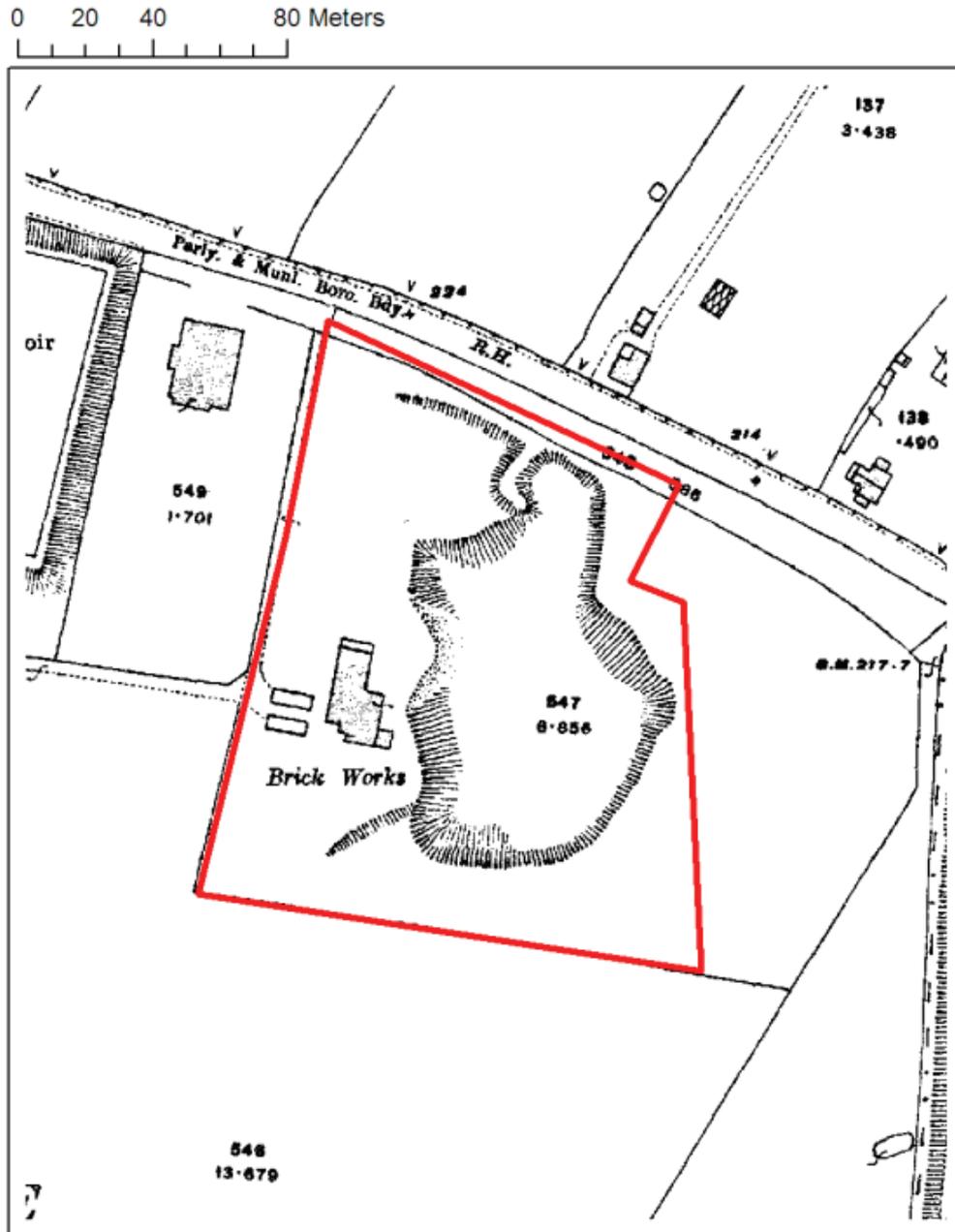
Site Investigation  
Salters Lane North (Bensham Park)  
Landfill  
Scale: 1:1500



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### Site history and ground conditions

The majority of the area of Bensham Park was formerly a clay pit (providing clay for the nearby brick works), which was infilled by up to about 10m of domestic waste between about 1939 and 1948. Topsoil (approx 100 to 300mm thick) covers the landfill material with reworked natural materials (Made Ground) covering the northern part of the site. The landfill is underlain by Glacial Till (a gravelly clay interbedded with sands & gravels), with Magnesian Limestone underlying this at about 30 metres below ground level.



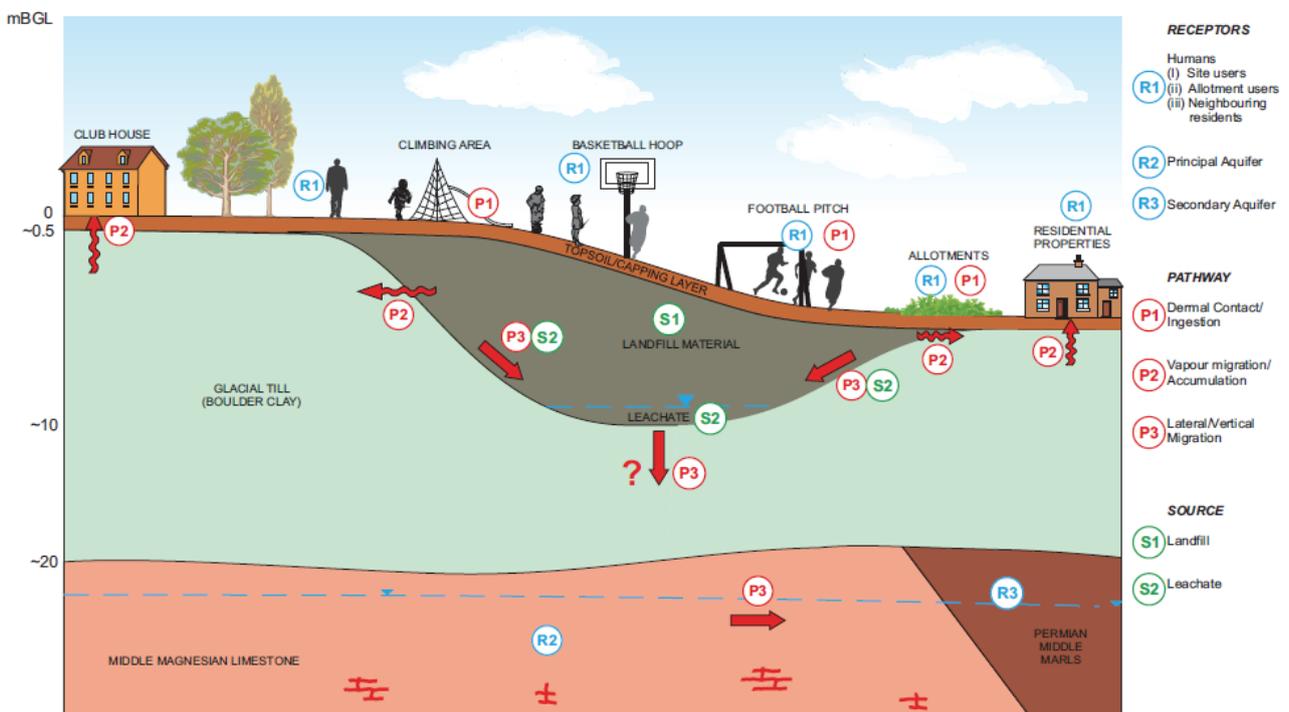
Site Investigation  
 Salters Lane North (Bensham Park)  
 Landfill  
 Scale - 1:1500, 1915 Historical Map



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## Potential hazards and design of site investigation

A Conceptual Site Model was compiled for the site and this is shown in the figure below. This model explores potential contaminant sources, sensitive receptors and potential linking pathways that may exist at the site. The model identified the presence of the landfilled wastes giving rise to a potential for contamination; of soils (e.g. by heavy metals), of groundwater (by leachate) and by landfill gases. The site investigation was therefore designed in accordance with British Standards and government guidance to examine all of these potential hazards. Samples were taken and chemical analysis carried out of soils and groundwater. Landfill gas was monitored and samples taken for chemical analysis.



## Site investigation results

The results of the site investigation showed that;

- the landfill materials were up to 9.5m thick and were typically overlain by between 100 to 300mm of topsoil;
- soil contamination was generally limited to landfill materials where some samples recorded elevated concentrations of; lead, arsenic and benzo(a)pyrene (a compound formed during burning of organic material);
- topsoils and Made Ground across the site were generally uncontaminated although some samples recorded elevated concentrations of benzo(a)pyrene (topsoil and Made Ground) and lead (Made Ground) ;
- a groundwater body is not present at shallow depth or in the landfill, but a water table is present in the Magnesian Limestone. There is no evidence that the landfill has caused pollution of this groundwater.
- landfill gases consist of slightly elevated concentrations of carbon dioxide, but rarely methane and at very low flow rates.

## Criteria for assessing risk

Risk assessment involves the consideration of the potential effect of a hazard (e.g. a source of contamination) on a receptor (e.g. people or groundwater etc). The level of any risk depends upon both the probability of an event occurring together with the severity of the consequence of that event. In order to understand the potential effect of contamination the chemical analytical data from the investigation must be put into context. This is done by comparing the data with "generic assessment criteria"- published by the Environment Agency and other authoritative bodies, and also against site specific criteria derived by Buro Happold in accordance with

government guidance. These criteria are minimum risk values and not “critical concentrations” or “action values” above which harm will occur. They are therefore a useful starting point in the statistical assessment which has been carried out for all of the chemicals recorded on the site.

### Potential risks at Bensham Park

At Bensham Park the topsoil, Made Ground and landfill material contain some contaminants at or above minimum risk values. The landfill material also contains some hazardous materials such as glass, metal, bottles, ceramics and in one location, asbestos tiling. However, the contaminant concentrations recorded in the investigation are not highly elevated above minimum risk levels, which are conservative in the context of the site (such as the potential for exposure etc). Consequently, the risk assessment indicates that the recorded contamination does not present unacceptable levels of risk to people using Bensham Park or to the wider environment. There is therefore no requirement for remedial action in this part of the site.

Similarly, the potential risks to people and buildings from landfill gas are assessed as Low and therefore no special gas protection measures or precautions are necessary for the building on site and surrounding properties.

### Potential risks at the Allotments



#### Eastern allotments

The topsoil in the allotment area generally comprised 200 to 300mm of sandy ashy soil which included pieces of pottery, coal and brick overlying boulder clay over natural soils (Boulder Clay). Soils in the eastern allotments recorded average contaminant concentrations below the minimum risk values. Therefore there is no evidence that there is, or is likely to be, an unacceptable level of risk to people from the soils on the Eastern Allotments.

#### South-western allotments and north of Plot 62

Approximately 1.5m of landfill material was found beneath a thin cover of topsoil in a localised area north of Plot 62. The landfill materials in this plot contained some contaminants above minimum risk values. Similarly, the topsoils within the south-western allotments also contained some contaminants above minimum risk values. However, in both of these areas, the contaminant concentrations recorded in the investigation are not highly elevated above minimum risk levels, which are conservative in the context of the site (such as the potential for exposure etc). Consequently, the risk assessment indicates that the recorded contamination does not present unacceptable levels of risk to people using those allotments. Nonetheless, because of the limited thickness and generally poor quality of topsoils in these areas it is recommended that clean topsoil is imported to provide an appropriate growing medium, which will also further reduce the level of any risk related to contamination of the underlying soils.

### Potential Risks to Controlled Waters

There is no evidence of significant pollution of groundwater associated with contamination in the soils at Bensham Park or the Allotments.