Report No. 6177/1
Date: March 2005

GEOENVIRONMENTAL APPRAISAL

of land at

PARK STREET, WOMBWELL

Prepared for

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PARK STREET, WOMBWELL (BEN BAILEY HOMES LIMITED)

SUMMARY OF GEOENVIRONMENTAL ISSUES

The site is located off Park Street on the eastern edge of Wombwell, approximately 7km south east of Barnsley town centre (NGR SE 404 027). The site occupies an area of 1.7 hectares (4.2 acres) in total. A disused former plant service depot and a former fuel filling station currently occupy the site.

Encia Consulting Limited were commissioned by Ben Bailey Homes Limited to provide a geoenvironmental appraisal of the site. The Ben Bailey viability sketch layout indicates the site is to be redeveloped with 42 two and three storey houses, with associated gardens, POS and adoptable roads and sewers. Encia's investigation included the excavation of ten trial pits and advancement of eight window-sampling boreholes.

A summary of salient geoenvironmental issues is provided in the table below.

Issue	Remarks
Made Ground	Between 0.5 and 3.5m (average 0.9m) thick generally comprising sand and fragments of brick, ash, clinker, sandstone, limestone, concrete, metal, glass and timber.
Natural Ground	Weathered sandstone generally directly underlies the made ground. Impenetrable (by trial pitting/window sampling) sandstone was encountered at a minimum depth of 1.4m bgl.
Contamination	Widespread hydrocarbon contamination within both the made ground and sandstone across the site. Groundwater locally contaminated with TPH (diesel). Hydrocarbon contamination will require treatment\removal or QRA to determine actual level of risk to human health prior to redevelopment. 300mm cover layer including 150mm of topsoil, recommended where made ground remains beneath gardens/landscaped areas to isolate undesirable material.
Hazardous Gas	Simple gas measures required.
Mining & Quarrying	No special precautions required.
Preparatory Works	Demolition of existing buildings and grubbing up of surface hardstand, removal of existing fuel tanks, treatment of widespread organic contamination, re-profiling to achieve final ground levels and provision of clean cover layer in gardens and landscaped areas.
Foundations	Shallow strip and trench fill footings across majority of the site. Piled foundations may be required in areas of deep made ground - subject to final ground levels.
Groundwater & Excavations	No significant inflows of shallow groundwater anticipated. Shallow excavations likely to remain relatively stable in the short term
Flooding	Site falls outside of extent of extreme flood.
Highways	Access roads and pavements will be constructed over engineered fill, for which a minimum CBR value of 5% is considered appropriate
Further Work	A post demolition site investigation should be carried out to improve coverage in previously inaccessible areas.

Significant development abnormals relating to geoenvironmental issues at the site are:

- Demolition of existing buildings, including asbestos removal, and grubbing up of existing surface hardstand areas
- Site-wide re-profiling to achieve final ground levels, including full turnover of made ground to ensure identification of all obstructions & areas of hydrocarbon contamination
- Provision for treatment of organic contamination in soil and groundwater, subject to QRA recommendations
- Removal of below-ground fuel storage tanks
- Provision of 300mm clean cover layer over undesirable made ground beneath gardens and landscaped areas
- Basic gas protection measures

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Fire Officer	Sirius	25/11/03	Search Response
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Barnsley MBC - SYMAS	Sirius	02/12/03	Mining/Mineral Report
Barnsley MBC	Sirius	09/12/03	Environmental Search Response
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FOREWORD (Geoenvironmental Investigation Report)

This report has been prepared for the sole internal use and reliance of the Client named on page 1. This report shall not be relied upon or transferred to any other parties without the express written authorisation of Encia Consulting Limited (Encia); such authorisation not to be unreasonably withheld. If any unauthorised third party comes into possession of this report, they rely on it at their peril and the authors owe them no duty of care and skill.

The report presents observations and factual data obtained during our site investigation, and provides an assessment of geoenvironmental issues with respect to information provided by the Client regarding the proposed development. Further advice should be sought from Encia prior to significant revision of the development proposals.

The report should be read in its entirety, including all associated drawings and appendices. Encia cannot be held responsible for any misinterpretations arising from the use of extracts that are taken out of context.

The findings and opinions conveyed in this report (including review of any third party reports) are based on information obtained from a variety of sources as detailed within this report, and which Encia believes are reliable. All reasonable care and skill has been applied in examining the information obtained. Nevertheless, Encia cannot and does not guarantee the authenticity or reliability of the information it has relied upon.

The report represents the findings and opinions of experienced geo-environmental consultants. Encia does not provide legal advice and the advice of lawyers may also be required.

Intrusive investigation can only investigate shallow ground beneath a small proportion of the total site area. It is possible therefore that the intrusive investigation undertaken by Encia, whilst fully appropriate, may not have encountered all significant subsurface conditions. Consequently, no liability can be accepted for conditions not revealed by the exploratory holes. Any opinion expressed as to the possible configuration of strata between or below exploratory holes is for guidance only and no responsibility is accepted as to its accuracy

It should be borne in mind that the timescale over which the investigation was undertaken may not allow the establishment of equilibrium groundwater levels. Particularly relevant in this context is that groundwater levels are susceptible to seasonal and other variations and may be higher during wetter periods than those encountered during this commission.

Where the report refers to the potential presence of invasive weeds such as Japanese Knotweed, or the presence of asbestos containing materials, it should be noted that the observations are for information only and should be verified by a suitably qualified expert.

This report assumes that ground levels will not change significantly from those existing at present and that houses will be of two storey construction. If this is not to be the case, then some modification to this report may be required.

It should be noted that the banning of the co-disposal of hazardous and non-hazardous waste was introduced in July 2004, as a result of the implementation within the UK of the Landfill Directive. This will considerably affect the current practices and procedures for the handling and disposal of wastes, in particular hazardous wastes. In addition, it will be a requirement for all wastes to be pre-treated and to comply with certain waste acceptance procedures prior to sending wastes to landfill. The full potential effects of these important changes are not known at this stage, but it is perceived that disposal costs will rise, particularly for hazardous wastes, and waste pre-treatment may, in some cases, become an 'additional' redevelopment cost with regard to the remediation of contaminated sites.

Should this report recommend that materials could be excavated and removed off site for landfill disposal, then it should be noted that the costs, timescales and implications of the pending changes to waste management legislation cannot be predicted at this stage. Encia Consulting Limited will not be responsible for changing practices, etc that may affect the viability of necessary remedial actions or of the implications of potential alternative treatment techniques.

Encia reserve the right to amend their conclusions and recommendations in the light of further information that may become available.

GEOENVIRONMENTAL APPRAISAL & REMEDIAL STRATEGY

of land at

PARK STREET, WOMBWELL

1 INTRODUCTION

1.1 The Commission and Brief

1.1.1 Encia Consulting Limited (Encia), were commissioned by Ben Bailey Homes Limited to carry out a geoenvironmental appraisal of land at Park Street, Wombwell.

1.1.2 Correspondence regarding Encia's appointment, including the brief for this investigation, is included in Appendix E. The agreed scope of works included:

- A review of previous investigations carried out by others
- a site walkover and inspection
- an assessment of the land use history
- determination of the site's environmental setting
- an intrusive ground investigation comprising 10 trial pits and 8 window sampling boreholes
- assessment of the geotechnical properties of the near surface deposits to enable provision of foundation and highway recommendations
- a qualitative assessment of contamination risks, with respect to potential receptors
- the provision of recommendations with respect to site preparatory and remedial works

1.2 The Proposed Development

1.2.1 Ben Bailey propose to redevelop the site with 42 two and three storey residential dwellings with gardens, POS and adoptable roads and sewers in accordance with their Viability Sketch layout drawing (Drawing 6177/7 included in Appendix B).

1.3 Report Format and Limitations

1.3.1 All standard definitions, procedures and guidance are contained within Appendix A, which includes background, generic information on:

- Assessment of the site's environmental setting.
- Ground investigation fieldwork (including techniques, in-situ testing and sampling).
- Geotechnical Testing.
- Contamination Testing (including current guidance and notes about organics analyses).
- Hazardous Gas (including potential sources and notes about current guidance).

1.3.2 General notes and limitations relevant to all Encia geoenvironmental investigations are described in the Foreword and should be read in conjunction with this report. The text of the report draws specific attention to any modification to these procedures and to any other special techniques employed.

1.3.3 Primary aims of this exploratory phase of investigation were to identify salient geoenvironmental issues affecting the site to enable the Client to obtain budget costs for the necessary site preparatory and remedial works. Supplementary investigation to satisfy the Local Planning Authority, develop a Remedial Strategy and enable refinement of budget abnormals is anticipated.

2 SITE DESCRIPTION

2.1 General

2.1.1 The site location is shown on Drawing Number 6177/1 presented in Appendix B to this report. Site details are summarised in the Table below.

Detail	Remarks
Location	Off Park Street on the eastern edge of Wombwell, approximately 7km south east of Barnsley town centre.
NGR	(NGR SE 404 027)
Area	1.7ha (4.2 acres)

2.1.2 The site can be divided into three separate areas based on the historic and present day uses, as summarised below and shown on Drawing 6177/2.

Site Area	General Location	Area (m^2)
A	Disused former plant service depot	9880
B	Disused former fuel filling station	1180
C	Unoccupied office building ('The Grange') surrounded by grassed areas	5505

2.1.3 During this investigation access was only available to Areas A and B.

2.1.4 Where appropriate these three site areas are discussed separately in the following sections of the report.

2.2 Site Features

2.2.1 An Encia Engineer completed a walkover survey of the site on 17th October 2004. A photographic record of salient site features at the time of the walkover survey is presented in Appendix C to this report.

2.2.2 Existing salient features are summarised in the Table below and shown on Drawing Number 6177/2 presented in Appendix B to this report.

Feature	Remarks
Current Access	Off Park Street, along north eastern edge of site
Topography	Area slopes down from a high point of approximately 51m AOD on the southwestern boundary to around 44m AOD at the boundary with Area B. Area B is relatively level at an elevation of about 42.5m AOD. A concrete and brick retaining wall separates these two areas of the site.
Nature of boundaries	Northeast - Stonewall Northwest - Stonewall Southwest - Chainlink Fence Southeast - Chainlink Fence & Brickwall.
Surrounding land uses	Northeast - Park Street Northwest - Wombwell Junior & Infant School Southwest - Playing fields. Southeast - Poplar Road (Residential development)

2.2.3 A number of fuel storage tanks (FST's) have been identified on site (see Drawing 6177/2) the details of which are summarised in the table below.

Location	Description
Area A – Western Boundary	3 FST's (above ground) – 2 Derv, 1 Gas oil *Now filled with water*
Area A – Southwestern Corner	Brick bund – probably containing an FST *No apparent residual staining*
Area A – Access Road	4500 litre buried FST *Indicated by label inside manhole - position unknown*
Area B – Northern end of kiosk	Petrol Filling Station Buried FST's *Indicated by vent pipes & manhole covers*

2.2.4 There are several buildings on the site, as shown on Drawing 6177/2 and described below:

A1 Single-storey steel-framed corrugated metal sheet clad former workshop & training building

A2 Single-storey brick-built former warehouse

A3 Large modern steel-framed corrugated metal sheet clad former workshop, with two vehicle inspection pits and separate areas used for offices

A4 Two-storey brick-built office building

B1 Former filling station shop

B2 Single-storey steel-framed corrugated metal sheet clad former garage/workshop

C1 Two-storey brick built office building (renovated nursing home)

C2 Unoccupied bungalow with adjacent garage

2.2.5 The majority of Areas A and B are covered by reinforced concrete or tarmac hardstanding.

2.3 Japanese Knotweed

2.3.1 During the site walkover, we did not notice the presence of any Japanese Knotweed. However, it should be noted that we are not qualified ecologists and as such cannot be guarantee the absence of Knotweed or other invasive vegetation.

3 SITE HISTORY

3.1 In order to investigate the development history and previous land uses at the site and immediate surrounding land, site centred extracts from Ordnance Survey (OS) plans dating back to 1854 were examined. These plans are presented in Appendix F to this report.

3.2 The table below provides a summary of the salient points relating to the history of the site with respect to the proposed end use. It is not the intention of this report to describe in detail all the changes that have occurred on or adjacent to the site. Significant former uses/operations are highlighted in bold text for ease of reference.

Date(s)	Site	Surrounding Land
1854 to 1892	'Poplar Farm' occupies northern part of site Park Street bounds site to northeast	Open fields surround site to south & west, with Wombwell Hall on opposite side of Park Street, with Dearne & Dove Canal c. 100m beyond Residential development has taken place c. 50m to north of site by 1892
1903	No significant changes	School developed between site & residential development to north
1930	'Wombwell Grange' shown on southern part of site	Residential development along Park St to south of site
1938 to 1956	No significant changes	No significant changes
1962 - 1966	Main site no longer named as Poplar Farm **'Garage'** shown in northern corner of site	Row of rectangular shaped buildings to the south of site labelled 'Rural Studies Dept (Wombwell County Secondary School)'
1969	Majority of Poplar Farm buildings demolished, new buildings located in Area A of site	Embankments shown around fields to southwest of site
1982	**Two sets of tanks** shown within Area A of site, which is now labelled **'Depot'**	Part of school to north labelled as 'Works'
1982 – 1989	No significant changes	No significant changes
2000	Wombwell Grange extended & large building in southwest of Area A (Building A3) constructed	No significant changes

4 ENVIRONMENTAL SETTING

4.1 General

4.1.1 Notes describing how the site's environmental setting has been assessed are included in Appendix A to this report. The responses received from the Coal Authority, Landmark, Barnsley MDC, the BGS and the Environment Agency are presented in Appendix E.

Issue	Data reviewed	Summary
Geology	1:50,000 BGS map (Sheet 87, Barnsley) 1:10,560 BGS map (Sheet SE 40 SW) BGS Memoir\Technical Report	No drift deposits are indicated beneath the site. Site is underlain by the Oaks Rock Sandstone (Carboniferous Middle Coal Measures). Swinton Pottery Coal (0.3 to 1.2m thick) approximately 10m below the base of the Oaks Rock sandstone. However, is shaley and poor quality in the Wombwell area & therefore unimportant and unlikely to have been worked. A fault, with the downthrow to the northeast, is shown running along the northeastern site boundary parallel to Park Street.
Mining	Coal Authority Report SYMAS Report BGS maps	5 seams at 160 to 585/590m depth have been worked, but ground movements from these workings will now have ceased. Geological fault running down Park Street should present no problems to future development (SYMAS).
Quarrying	Local Authority search Historical OS Plans	Two closed landfill sites within 250m of the site (see Section 4.2).
Radon	BRE Report BR211 BGS Stage 2 Report	Basic radon protective measures are required for the site.
Hydrogeology	Environment Agency Groundwater Vulnerability map (Sheet 12 Vale of York) Landmark Report	Site is not located within 1km of a groundwater Source Protection Zone. Coal Measures strata recorded as a Minor Aquifer Residual soils have a high leaching potential due to urban location of the site. No licensed groundwater abstractions within 500m of site.
Hydrology	Environment Agency Landmark Report	The Dearne & Dove Canal, located approximately 100m northeast of the site, has a poor (E) Water Quality classification. No licensed surface water abstractions within 500m of site.
Flood Risk	Environment Agency	The site is outside of the extent of the extreme flood. This means that the chance of flooding each year is 0.1% (1 in 1000) or less.

4.2 Landfills

4.2.1 Information from historical OS plans and Barnsley MDC (copied to Appendix D) indicates that there are two known landfill sites within 250m of the site (126m and 230m northeast).

4.2.2 These have been categorised as Category 4 landfills, which have been licensed to accept material that would not be expected to give rise to landfill gas in substantial quantities.

4.2.3 They also identify a landfill site located 375m northeast of the site which is a Category 1 landfill, which is known to be producing landfill gas and from which gas is migrating.

5 PREVIOUS INVESTIGATION FINDINGS

5.1 General

5.1.1 Encia have been provided with a copy of a *"Geoenvironmental Appraisal Report of land at Park Street, Wombwell" (Ref. C0204, dated April 2004),* issued by Sirius Geotechnical & Environmental Limited.

5.1.2 The report covers a desk study and two phases of intrusive investigation at the site, with both geotechnical and chemical testing of samples recovered. A quantitative risk assessment (QRA) has been carried out to assess the risks posed by organic contamination at the site.

5.1.3 Extracts of the Sirius Report (factual data only) are copied to Appendix J.

5.2 Summary of Sirius Works & Findings

5.2.1 Sirius's ground investigation works comprised:

- 13 trial pits (TPs 1 & 3 to 14) excavated to between 0.4 and 3.5m depth
- 5 cable percussive boreholes (Cs 1 to 5) drilled to a maximum depth of 3.5m
- 4 rotary percussive probeholes (Rs 1 to 4) drilled to a maximum depth of 21.7m
- 13 window sample holes (WSs 4 to 16) sunk to depths ranging between 1.0 and 3.0m
- 6 gas monitoring wells were installed in WS 10 and in all five cable percussive boreholes with response zones in both made and natural ground.
- 4 groundwater monitoring wells installed in the rotary probeholes, with response zones sealed in natural ground.
- Chemical laboratory tests (including total metals, total phenols, cyanide, water soluble boron, TEM, total & water soluble sulphate, sulphide, sulphur, total PAH, total and speciated TPH, GRO, BTEX and MTBE)
- Gas monitoring; 4 visits between 10 December 2003 and 16th January 2004.

5.2.2 A summary of Sirius's findings and recommendations is presented in the table below.

Issue	Findings
Ground Conditions	Up to 3.4 m of made ground was encountered which typically consisted very loose to loose sandy gravel or very soft to firm sandy clay with variable proportions of gravel sized fragments of limestone, sandstone, coal, brick, clinker, concrete & burnt shale. Deepest made ground behind retaining wall between depot & filling station (Areas A & B) Weathered sandstone bedrock strata found directly beneath the made ground, though locally, residual soft and stiff sandy clay was encountered.

Issue	Findings
Contamination	No significant inorganic contamination within made ground save a single elevated lead level. Extensive diesel contamination identified across site within made ground and natural bedrock strata (max. 10,000mg/kg TPH). Diesel contamination identified within groundwater (max. 230µg/l TPH) QRA concluded no groundwater remediation required and contamination may remain insitu provided a 750 mm clean cover placed to isolate end-users. Hydrocarbon contamination likely to have migrated onto adjoining land.
Mining	No shallow coal seams encountered in rotary probeholes drilled; therefore sufficient competent strata exist above Swinton Pottery & Newhill Coals Oaks Rock sandstone may be fissured (both natural & mining induced) - suitably strengthened foundations required where weak or fractured rocks are encountered
Hazardous Gas	No methane recorded, with carbon dioxide concentration consistently above 5% in one of the wells reaching a maximum of 6.7%. Gas was considered likely to be due to aerobic degradation of hydrocarbon contamination, rather than migration of hazardous gas from landfills.
Remediation	Recommended 750mm of clean cover in garden\landscaped areas and gas retardant membranes to be incorporated into new buildings. Off-site disposal of soils only required if soil saturated with hydrocarbons are encountered during course of works
Foundations	Sandstone bedrock considered to have allowable bearing capacity of 200kPa, allowing for 25mm maximum permissible settlement Conventional strip/trench fill footings (up to c. 3m deep) suitable for 2 to 3-storey houses across c. 50% of site Piles recommended for remainder of site (due to deep made ground & thickness of proposed cap)

6 GROUND INVESTIGATION DESIGN

6.1 Preliminary Conceptual Site Model

6.1.1 Historical plans show that the northern part of the site has been largely occupied by a fuel-filling garage, with the main part of the site existing as a plant service depot, both uses are considered to have the potential to have caused ground contamination.

6.1.2 In addition, a number of fuel storage tanks (FST's) have been identified on the site, which are potentially significant sources of contamination. The condition and contents of these FST's are summarised in Section 2.2.

6.1.3 At this site potential pollutant linkages can be defined as follows:

Sources: *Fuel filling station and plant service depot operations, in particular fuel storage tanks.*
contaminated made ground material.

Pathways: *ingestion*
dermal contact
inhalation of contaminated particulates
surface water drainage system

Targets: *end users of the site (residents)*
construction workers (temporary or transient)
Coal Measures strata (*Minor Aquifer*)

6.1.4 Clearly this preliminary conceptual site model is subject to modification in light of data arising from the ground investigation.

6.2 Investigation Strategy

6.2.1 The preliminary conceptual site model was used as a basis for design of an appropriate ground investigation, the scope of which is summarised below. Careful consideration was given to the preliminary conceptual site model and historical features.

6.2.2 The locations of the exploratory holes listed in the table below are shown on Drawing Number 6177/3 in Appendix B.

Initial Ground Investigation Strategy

Exploratory holes	Purpose
TPs 101-110	To determine the general nature of soils underlying the site, including the: • nature, distribution and thickness of made ground • nature, degree and extent of contamination • proportion of undesirable elements eg biodegradable matter, foundations etc • suitability of the ground for founding structures and highways
TPs 101, 102 & 107. WSs 101-103	To delineate potential hydrocarbon contamination around bunded area along the western site boundary, within Area A, containing three raised above ground fuel storage tanks.
TPs 108, 109	To delineate potential hydrocarbon contamination around 4500-litre underground diesel tank located close to a pump house and diesel pump at the top of the access road into Area A.
WSs 104-108	To delineate potential hydrocarbon contamination around disused former fuel filling station.

6.2.3 An assessment of potential contaminants associated with the former uses was undertaken with reference to CLR8 and the following DETR Industry Profiles:

- Road vehicle fuelling, service and repair – garages and filling stations
- Road vehicle fuelling, service and repair – transport and haulage centres

6.2.4 As a consequence of this assessment, anticipated potential contaminants include:

- Metals & their compounds *(lead, chromium, zinc, copper etc)*
- Acids and alkalis
- Organic compounds *(PAH's, petroleum hydrocarbons, naphthalene, benzene, MTBE)*
- Inorganic compounds *(battery acids)*

7 FIELDWORK

7.1 Objectives

7.1.1 The original investigation strategy is outlined in Section 6.2 above.

7.2 Exploratory Hole Location Constraints

7.2.1 No access was made available for investigation in Area C (unoccupied office building 'The Grange' and the surrounding grassed areas).

7.2.2 Due to physical obstructions and uncertainty over the locations of the filling station tanks, only limited access was available to Area B. Therefore window-sampling boreholes were utilised to minimise disruption.

7.2.3 It should be noted that window sampling allows only a limited inspection of the ground (cf trial pitting). Consequently, some uncertainties may remain and a supplementary, post-demolition ground investigation may be required to obtain regulatory approval for the proposed redevelopment.

7.3 Scope of Works

7.3.1 Fieldwork was supervised by Encia on 20th and 22nd October 2004 and comprised the exploratory holes listed below.

Scope of Ground Investigation Works

Technique	Exploratory holes	Final depth(s)	Remarks
Trial pitting (machine dug)	TPs 101 to 110	1.9 to 3.0m	All terminated in natural strata
Window Sample boreholes	WSs 101 to 108	1.5 to 2.4m	All terminated in natural strata

7.3.2 Notes describing ground investigation techniques, in-situ testing and sampling are included in Appendix A to this report.

7.3.3 Exploratory hole logs are presented in Appendices G and H to this Report. These logs Include details of the:

- Samples taken.
- Descriptions of the solid strata, and any groundwater encountered.
- Any visual or olfactory evidence of contamination.

8 GROUND CONDITIONS

8.1 General

8.1.1 A complete record of strata encountered beneath the proposed development site is given on the various exploratory hole records, presented in Appendices G and H. However, a summary of the ground conditions is provided below.

8.1.2 Typical ground conditions across the site are described below in Sections 8.2 (made ground) and 8.3 (natural ground).

8.1.3 Whilst not encountered during this investigation, the possibility of asbestos sheeting, used as shuttering, and\or fragments of asbestos sheeting within the hardcore beneath concrete slabs, cannot be entirely discounted.

8.2 Made Ground

8.2.1 The made ground on site is a heterogeneous mixture of materials and it is unlikely, even with a huge amount of sampling, that it could be accurately characterised. Nonetheless, the bulk of the made ground across the majority of the site (both areas A & B) can be categorised as granular fill.

8.2.2 The granular fill comprises locally clayey sand and gravel with a mixture of fragments in varying proportions of brick, ash, clinker, sandstone, limestone, concrete, metal, glass and timber.

8.2.3 The thickness of the made ground typically increases towards the north east (see Drawing 6177/4) from about 0.5m to 3.5m adjacent to the retaining wall dividing Areas A and B.

8.2.4 It is considered likely that the site has been levelled using cut and fill methods, giving the site its current 'stepped' profile.

8.2.5 The majority of the external areas of the site (Areas A & B) are covered by either reinforced concrete or tarmac hardstanding between 0.2 and 0.3m thick.

8.3 Natural Ground

8.3.1 Beneath the made ground, natural ground was encountered in the majority of the exploratory holes, and typically comprised medium dense sand and gravel/cobble sized sandstone fragments over weak weathered sandstone.

8.3.2 0.4m of firm to stiff very sandy clay was encountered beneath the made ground in TP107.

8.4 Visual & Olfactory Evidence of Organic Contamination

8.4.1 Visual and/or olfactory evidence of organic (diesel) contamination was identified, within the made ground, sandstone or both, in over 50% of the exploratory holes excavated by both Encia and Sirius.

8.4.2 Exploratory locations where evidence of significant organic contamination was noted are summarised below:

Evidence of Organic Contamination

Expl. Locn(s)	Site Area	Material	Depth m bgl	Observation
TP101	Area A	Made Ground	0.25 to 0.6	Slight odour of hydrocarbons.
TP102	Area A	Made Ground	0.25 to 0.5	Slight odour of hydrocarbons.
TP104	Area A	Made Ground	0.2 to 0.6	Slight odour of hydrocarbons.
TP105	Area A	Made Ground	0.5 to 0.8	Moderately strong odour of hydrocarbons.
TP106	Area A	Made Ground	0.3 to 0.6	Slight odour of hydrocarbons.
TP107	Area A	Made Ground	0.25 to 0.6	Moderately strong odour of hydrocarbons.
TP108	Area A	Sandstone	2.7 to 3.0	Strong odour of hydrocarbons.
TP109	Area A	Made Ground & Sandstone	0.3 to 2.8	Strong odour of hydrocarbons.
TP110	Area A	Made Ground & Sandstone	0.25 to 2.8	Strong odour of hydrocarbons.
WS102	Area B	Made Ground	0.25 to 0.5	Slight odour of hydrocarbons.
WS106	Area B	Sandstone	1.8 to 2.4	Strong odour of hydrocarbons.
WS107	Area B	Sandstone	1.2 to 1.6	Strong odour of hydrocarbons.
WS108	Area B	Sandstone	1.8 to 2.1	Moderately strong odour of hydrocarbons.

8.4.3 Selected samples of potentially contaminated materials were scheduled for chemical testing to determine the nature and extent of the identified contamination, see Section 9 below.

8.5 Groundwater

8.5.1 Seepages/inflows of groundwater were encountered within the weathered sandstone, at around 2.5m bgl, in trial pits TP108 and TP109 during the investigation.

8.5.2 Groundwater was recorded towards the base of the made ground (0.9m bgl) in trial pit TP109, however Encia consider it likely that the inflow of groundwater encountered came from a drain.

8.6 Stability

8.6.1 Stability of excavations within both the made and natural ground was generally good.

8.6.2 Shallow excavations are likely to remain relatively stable in the short term.

9 CONTAMINATION ANALYSIS

9.1 General

9.1.1 Notes outlining current guidance with respect to the interpretation of analytical data are included in Appendix A to this report.

9.1.2 The main site area (Area A) has been used as a plant service depot for approximately 25 years. A fuel-filling station\garage has occupied the northern area of the site (Area B) for approximately 40 years.

9.1.3 A number of associated above ground and buried fuel storage tanks have been identified on site, containing petrol, diesel and waste oils.

9.1.4 The site's former usage is likely to have given rise to some ground contamination. Furthermore up to 2m (average 0.9m) of made ground was encountered in many of the exploratory locations during the ground investigation.

9.1.5 An assessment of potential contaminants associated with the former uses has been undertaken; see Section 6.2.

9.2 Testing Scheduled

9.2.1 The testing scheduled is based on the above assessment, also taking into account visual and olfactory evidence recorded during the ground investigation.

Inorganic Determinands

9.2.2 Combining both Sirius's and Encia's investigations, a total of 23 samples of made ground and 15 samples of natural ground were analysed at a UKAS accredited laboratory for a "standard" suite comprising:

pH, water soluble boron, and total metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium and zinc)

9.2.3 In addition to the above, Sirius' standard suite included cyanide, elemental sulphur, sulphide, sulphate, water soluble sulphate, total phenols and toluene extractable matter.

9.2.4 21 of these samples were also analysed for a leachable metals suite comprising:

arsenic, boron, cadmium, chromium, copper, lead, mercury, nickel, selenium and zinc

Organic Determinands

9.2.5 60 samples of made and natural ground were analysed for the following determinands to assess the degree of organic contamination with a view to characterising any material requiring remediation.

Total Petroleum Hydrocarbons (TPH), BTEX and Speciated PAH

9.2.6 Notes describing the various organics analyses are included in Appendix A to this report.

Summary of Degree of Ground Contamination (Inorganics) at Park Street, Wombwell.

Site Area	Sample Location & Depth (m)		Material	Contaminant Concentrations in mg/kg unless otherwise stated. *Trigger Level Concentrations are Shown in Brackets and assume a* ***residential with gardens*** *end-use.*										
				pH	As (20)^{5}	Cd ♣	Cr (130)^{5}	Pb (450)^{5}	Hg (8)^{5}	Se (35)^{5}	B (3)*	Cu ♣	Ni (50)^{5}	Zn ♣
Area A	TP101	0.2	MG: GRANULAR FILL (brick, stone, ash, clinker, slag & timber)	10.7	-	-	-	-	-	-	-	-	-	-
	TP105	0.5	MG: GRANULAR FILL (stone, ash & slag)	9.3	-	-	-	-	-	-	-	-	-	-
	TP106	0.3	MG: GRANULAR FILL (ash, clinker, brick & slag)	9.1	-	-	172	-	-	-	-	-	-	-
	TP110	0.2	MG: GRANULAR FILL (stone, brick, ash, timber & metal)	8.5	-	-	-	825	-	-	-	-	-	-
	TP3	0.5	MG: GRANULAR FILL (brick, concrete & trace pipe, foam & metal)	8.8	-	-	-	-	-	-	-	-	-	-
	TP3	2.5	MG: GRANULAR FILL (brick, concrete & trace wood and rubber)	9.8	-	-	-	-	-	-	-	-	-	-
	TP4	0.4	MG: GRANULAR FILL (concrete, clinker & coal)	12	-	-	-	-	-	-	-	-	-	-
	TP6	0.4	MG: GRANULAR FILL (brick, concrete, stone & clinker)	7.8	-	-	-	-	-	-	-	-	-	-
	TP6	1.0	MG: GRANULAR FILL (coal & brick)	7.5	-	-	-	-	-	-	-	-	-	-
	TP9	0.5	MG: GRANULAR FILL (stone & concrete)	9.5	-	-	-	-	-	-	-	-	-	-
	TP12	0.5	MG: GRANULAR FILL (stone, brick, clinker & glass)	9.9	-	-	-	-	-	-	-	-	-	-
	TP13	0.7	MG: GRANULAR FILL (stone, brick, clinker & glass)	9.2	-	-	-	-	-	-	-	-	-	-
	TP14	0.3	MG: GRANULAR FILL (stone, burnt shale, clinker & coal)	8.5	-	-	-	-	-	-	-	-	-	-
	WS5	1.4	MG: GRANULAR FILL (stone, concrete & brick)	10.4	-	-	-	-	-	-	-	-	-	-
	WS6	0.3	MG: GRANULAR FILL (stone)	4.9	-	-	-	-	-	-	-	-	-	-
	WS8	0.3	MG: GRANULAR FILL (stone & brick)	8.9	-	-	-	-	-	-	-	-	-	-
	TP101	0.7	Weathered Sandstone	7.8	-	-	-	-	-	-	-	-	-	-
	TP106	1.0	Weathered Sandstone	8.3	-	-	-	-	-	-	-	-	-	-
	TP3	3.5	Weathered Sandstone	7.5	-	-	-	14000	-	-	-	-	-	-
	TP4	0.8	Weathered Sandstone	8.9	-	-	-	-	-	-	-	-	-	-
	TP5	0.7	Weathered Sandstone	7.1	-	-	-	-	-	-	-	-	-	-
	TP6	1.3	Weathered Sandstone	7.7	-	-	-	-	-	-	-	-	-	-
	TP9	1.5	Weathered Sandstone	8.1	-	-	-	-	-	-	-	-	-	-
	TP12	1.5	Weathered Sandstone	8.1	-	-	-	-	-	-	-	-	-	-
	TP13	1.0	Weathered Sandstone	7.6	-	-	-	-	-	-	-	-	-	-
	TP14	1.5	Weathered Sandstone	7.9	-	-	-	-	-	-	-	-	-	-
	WS5	2.0	Weathered Sandstone	8.1	-	-	-	-	-	-	-	-	-	-

Site Area	Sample Location & Depth (m)		Material	Contaminant concentrations in mg/kg unless otherwise stated. Trigger Level Concentrations are Shown in Brackets and assume a **residential with gardens** end-use. pH	As (20)$	Cd ♣	Cr (130)$	Pb (450)$	Hg (8)$	Se (35)$	B (3)*	Cu ♣	Ni (50)$	Zn ♣
Area A	WS6	1.5	Weathered Sandstone	5.4	-	-	-	-	-	-	-	-	-	-
	WS8	1.5	Weathered Sandstone	6.5	-	-	-	-	-	-	-	-	-	-
Area B	WS105	0.2	MG: GRANULAR FILL (stone, brick, charcoal & clinker)	9.5	-	-	-	-	-	-	-	-	-	-
	WS107	0.5	MG: GRANULAR FILL (stone, brick, ash & shale)	8.9	-	-	-	-	-	-	-	-	-	-
	WS108	0.5	MG: GRANULAR FILL (stone & brick)	9.4	-	-	-	-	-	-	-	-	-	-
	WS12	0.8	MG: GRANULAR FILL (stone with trace coal & brick)	9.1	-	-	-	-	-	-	-	-	-	-
	WS13	0.3	MG: GRANULAR FILL (stone, concrete; brick & clinker)	9.4	-	-	-	-	-	-	-	-	-	-
	WS13	1.0	MG: GRANULAR FILL (stone, brick, concrete & trace clinker)	8.9	-	-	-	-	-	-	-	-	-	-
	WS14	0.2	MG: GRANULAR FILL (stone & concrete with trace tarmac)	10.8	-	-	-	-	-	-	-	-	-	-
	WS14	0.8	Weathered Sandstone	9.0	-	-	-	-	-	-	-	-	-	-
	WS105	0.6	Weathered Sandstone	8.0	-	-	-	-	-	-	-	-	-	-

Key		Source of Guidance Trigger Level	
-	Parameter tested for but not found to be in excess of threshold concentration	*	ICRCL Guidance Note 59/83, Second Edition (1987) – (Phytotoxics only)
	Parameter not tested for	$	*DEFRA and the EA Contaminated Land Exposure Assessment* (CLEA) – March '02
#	All pH results listed to confirm which soil guideline values are to be used in CLEA assessment	0	Dutch Intervention Levels
♣	*Tier 1 Value is pH dependent*	0	BRE Special Digest 1, Concrete in Aggressive Ground (2001)
	Samples analysed by Sirius	♣	Professional judgement based on Dutch Intervention Values

Summary of the Leachability Testing on samples from Park Street, Wombwell

Sample Location & Depth (m)			Material	Contaminant Concentration in µg/litre Unless Otherwise Shown									
				As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	Se	B
				(10)*	(5)*	(50)*	(2000)*	(25)*	(1)*	(20)*	(5,000)*	(10)*	(1000)*
Area A	TP101	0.2	MG: GRANULAR FILL (brick, stone, ash, clinker, slag & timber)	19	-	-	-	-	-	-	-	-	-
	TP105	0.5	MG: GRANULAR FILL (stone, ash & slag)	-	-	-	-	-	-	-	-	-	-
	TP106	0.3	MG: GRANULAR FILL (ash, clinker, brick & slag)	-	-	-	-	-	-	-	-	-	-
	TP110	0.2	MG: GRANULAR FILL (stone, brick, ash, timber & metal)	-	-	-	-	-	-	-	-	-	-
	TP3	0.5	MG: GRANULAR FILL (brick, concrete & trace pipe, foam & metal)	-	-	-	-	-	-	-	-	-	-
	TP3	2.5	MG: GRANULAR FILL (brick, concrete & trace wood and rubber fragments)	-	-	-	-	-	-	-	-	-	-
	TP4	0.4	MG: GRANULAR FILL (concrete, clinker & coal)	-	-	-	-	-	-	-	-	-	-
	TP6	0.4	MG: GRANULAR FILL (brick, concrete, stone & clinker)	-	-	-	-	170	-	-	-	-	-
	TP9	0.5	MG: GRANULAR FILL (stone & concrete)	-	-	-	-	-	-	-	-	-	-
	TP12	0.5	MG: GRANULAR FILL (stone, brick, clinker & glass)	-	-	-	-	-	-	-	-	-	-
	TP13	0.7	MG: GRANULAR FILL (stone, brick, clinker & glass)	-	-	-	-	-	-	-	-	-	-
	TP14	0.3	MG: GRANULAR FILL (stone, burnt shale, clinker & coal)	-	-	-	-	-	-	-	-	-	-
	WS5	1.4	MG: GRANULAR FILL (stone, concrete & brick)	-	-	-	-	-	-	-	-	-	-
	WS6	0.3	MG: GRANULAR FILL T (stone)	-	-	-	-	-	-	-	-	-	-
	WS8	0.3	MG: GRANULAR FILL (stone & brick)	-	-	-	-	-	-	-	-	-	-
	TP5	0.7	Weathered Sandstone	-	-	-	-	-	-	-	-	-	-
Area B	WS105	0.2	MG: GRANULAR FILL (stone, brick, charcoal & clinker)	-	-	-	-	-	-	-	-	-	-
	WS107	0.5	MG: GRANULAR FILL (stone, brick, ash & shale)	-	-	-	-	-	-	-	-	-	-
	WS108	0.5	MG: GRANULAR FILL (stone & brick)	-	-	-	-	-	-	-	-	-	-
	WS12	0.8	MG: GRANULAR FILL (stone with trace coal & brick)	-	-	-	-	-	-	-	-	-	-
	WS14	0.2	MG: GRANULAR FILL (stone & concrete with trace tarmac)	-	-	-	-	-	-	-	-	-	-

Key		Source of Guidance Trigger Level	
-	Parameter tested for but found not to be in excess of relevant trigger level concentration	*	Water Supply (Water Quality) Regulations 1989, as amended in 2000
	Parameter not tested for		Samples analysed by Sirius

Summary of Degree of Ground Contamination (Organics) at Park Street, Wombwell

Sample Location and Depth (m)			Material	Contaminant concentrations in mg/kg Threshold Concentrations shown in Brackets assume a **residential with gardens** end use								
				TPH C_{10}-C_{40} (500)#	TPH Carbon Bandings C_{10}-C_{26} (C_{10}-C_{24}) [C_{10}-C_{21}]	TPH Carbon Bandings C_{26}-C_{40} (C_{24}-C_{40}) [C_{21}-C_{40}]	Benzene (1) ⁰	Toluene (130) ⁰	Ethyl Benzene (50) ⁰	o-Xylene (25) ⁰	m&p-Xylene (25) ⁰	Total PAH US EPA 16 (40) ⁰
Area A	TP101	0.2	MG: GRANULAR FILL (brick, stone, ash, clinker, slag & timber)	13800	9640	4190	-	-	-	-	-	212
	TP102	0.2	MG: GRANULAR FILL (brick, clinker, ash, stone, timber & glass)	1450	678	768	-	-	-	-	-	57
	TP104	0.5	MG: GRANULAR FILL (stone, brick, ash & glass)	23100	13000	10200	-	-	-	-	-	158
	TP106	0.3	MG: GRANULAR FILL (ash, clinker, brick & slag)	1510	775	738	-	-	-	-	-	-
	TP107	0.2	MG: GRANULAR FILL (brick, ash, clinker, timber & glass)	2270	1540	732	-	-	-	-	-	140
	TP109	0.3	MG: GRANULAR FILL (brick, ash, clinker & timber)	4070	3060	1010	-	-	-	-	-	370
	TP110	0.2	MG: GRANULAR FILL (stone, brick, ash, timber & metal)	7840	3830	4000	-	-	-	-	-	164
	WS101	0.2	MG: GRANULAR FILL (stone, brick & limestone)	-	-	-	-	-	-	-	-	-
	WS102	0.2	MG: GRANULAR FILL (stone, brick & ash)	5260	3720	1550	-	-	-	-	-	-
	TP3	0.5	MG: GRANULAR FILL (brick, concrete & trace pipe, foam & metal)	970								140
	TP3	2.5	MG: GRANULAR FILL (brick, concrete & trace wood & rubber)	1400	(650)	(730)	-	-	-	-	-	73
	TP4	0.4	MG: GRANULAR FILL (concrete, clinker & coal)	-								-
	TP6	0.4	MG: GRANULAR FILL (brick, concrete, stone & clinker)	-								-
	TP6	1.0	MG: GRANULAR FILL (coal & brick)	-	(-)	(-)	-	-	-	-	-	-
	TP9	0.5	MG: GRANULAR FILL (stone & concrete)	2400								110
	TP9	1.0	MG: GRANULAR FILL (stone & brick)	1000	(140)	(900)	-	-	-	-	-	
	TP11	0.5	MG: GRANULAR FILL (stone & brick)	4000	(2800)	(1100)	-	-	-	-	-	
	TP12	0.5	MG: GRANULAR FILL (stone, brick, clinker & glass)	-								-
	TP13	0.7	MG: GRANULAR FILL (stone, brick, clinker & glass)	-								-
	TP14	0.3	MG: GRANULAR FILL (stone, burnt shale, clinker & coal)	9000	(8200)	(780)	-	-	-	-	-	1200
	WS5	1.4	MG: GRANULAR FILL (stone, concrete & brick)	3100								1300
	WS6	0.3	MG: GRANULAR FILL (stone)	-								-
	WS8	0.3	MG: GRANULAR FILL (stone & brick)	-								-
	BH3	2.5	MG: GRANULAR FILL (stone, brick, coal & trace timber)	3900	(2200)	(1700)	-	-	-	-	-	
	BH3	3.0	MG: GRANULAR FILL (stone, brick, coal & trace timber)	8800	(4500)	(4300)	-	-	-	-	-	
	BH3	3.0	MG: GRANULAR FILL (stone, brick, coal & trace timber)	5300	(2200)	(3100)	-	-	-	-	-	
	BH5	0.2	MG: GRANULAR FILL (stone & concrete)	2400	(620)	(1800)	-	-	-	-	-	
	TP7	1.5	Weathered Sandstone	-			-	-	-	-	-	
	TP101	0.7	Weathered Sandstone	-	-	-	-	-	-	-	-	-
	TP104	1.5	Weathered Sandstone	-	-	-	-	-	-	-	-	-
	TP108	2.7	Weathered Sandstone	1190	994	197	-	-	-	-	-	-
	TP110	2.1	Weathered Sandstone	3330	1880	1450	-	-	-	-		-
	WS102	0.6	Weathered Sandstone	-	-	-	-	-	-	-	-	-

Sample Location and Depth (m)			Material	Contaminant concentrations in mg/kg Threshold Concentrations shown in Brackets assume a **residential with gardens** end use									
				TPH C_{10}-C_{40} (500)[a]	TPH Carbon Bandings		Benzene (1)[b]	Toluene (130)[b]	Ethyl Benzene (50)[b]	o-Xylene (25)[b]	*m&p*-Xylene (25)[b]	Total PAH US EPA 16 (40)[b]
					C_{10}-C_{26} (C_{10}-C_{24}) [C_{10}-C_{21}]	C_{26}-C_{40} (C_{24}-C_{40}) [C_{21}-C_{40}]						
Area A	WS103	0.8	Weathered Sandstone	-	-	-	-	-	-	-	-	-
	TP3	3.5	Weathered Sandstone	1700	(1300)	(440)	-	-	-	-	-	42
	TP4	0.8	Weathered Sandstone	-								-
	TP5	0.7	Weathered Sandstone	-								-
	TP6	1.3	Weathered Sandstone	-			-	-	-	-	-	-
	TP9	1.5	Weathered Sandstone	-	(-)	(-)	-	-	-	-	-	
	TP9	2.5	Weathered Sandstone	2100	(1800)	(310)	-	-	-	-	-	
	TP11	0.7	Weathered Sandstone	-	(-)	(-)	-	-	-	-	-	
	TP12	1.5	Weathered Sandstone	-								-
	TP13	1.0	Weathered Sandstone	-								-
	TP14	1.5	Weathered Sandstone	-	(-)	(-)	-	-	-	-	-	-
	WS5	2.0	Weathered Sandstone	1700								-
	WS6	1.5	Weathered Sandstone	-								-
	WS8	1.5	Weathered Sandstone	-								-
	BH1	2.0	Weathered Sandstone	-	(-)	(-)	-	-	-	-	-	
	BH5	0.6	Weathered Sandstone	1300	(110)	(1200)	-	-	-	-	-	
	BH5	1.7	Weathered Sandstone	810	(80)	(730)	-	-	-	-	-	
Area B	WS106	0.5	MG: GRANULAR FILL (stone & brick)	-	-	-	-	-	-	-	-	-
	WS11	0.5	MG: GRANULAR FILL (stone)	610	[250]	[350]	-	-	-	-	-	-
	WS12	0.8	MG: GRANULAR FILL (stone with trace coal & brick)	-				-				-
	WS13	0.3	MG: GRANULAR FILL (stone, concrete, brick & clinker)	-				-				-
	WS13	1.0	MG: GRANULAR FILL (stone, brick, concrete & trace clinker)	-				-				-
	WS13	1.0	MG: GRANULAR FILL (stone, brick, concrete & trace clinker)	-	[-]	[-]	-	-	-	-	-	
	WS13	1.7	MG: GRANULAR FILL (stone & trace concrete & brick)	10,000	[3440]	[6500]	-	-	-	-	-	
	WS14	0.2	MG: GRANULAR FILL (stone & concrete with trace tarmac)	-				-				-
	WS12	1.4	Sandy CLAY	-	[-]	[-]	-	-	-	-	-	-
	WS11	1.0	Weathered Sandstone	-	[-]	[-]	-	-	-	-	-	
	WS14	1.3	Weathered Sandstone	-	[-]	[-]	-	-	-	-	-	
	WS104	1.0	Weathered Sandstone	-	-	-	-	-	-	-	-	-
	WS106	2.2	Weathered Sandstone	4790	2460	2330	-	-	-	-	-	-
	WS107	1.2	Weathered Sandstone	3620	1520	2090	-	-	-	-	-	-
	WS108	1.8	Weathered Sandstone	1210	468	739	-	-	-	-	-	-
	WS14	0.8	Weathered Sandstone	-				-				-

Key		Source of Guidance Trigger Level	
-	Parameter tested for but not found to be in excess of threshold concentration	0	Dutch E-3c Intervention Levels for Soil Remediation (1994)
	Samples analysed by Sirius	#	*Professional Judgement of Encia – based on requirements of regulators for remediation of* hydrocarbons at other sites in the area and Dutch Intervention value for mineral oil
	Parameter not tested for		

Note: TPH = all hydrocarbons between C_{10} and C_{40}

Summary of Groundwater Contamination at Park Street, Wombwell (undertaken by Sirius)

Site Area	Sample Location	**Inorganic** Contaminant Concentrations in µg/l unless otherwise stated. Trigger Level Concentrations are Shown in Brackets												
		pH	As	B	Cd	Cr	Cu	Pb	Hg	Ni	Zn	Se	CN	NH3
			(10)*	(1)* mg/l	(5)*	(50)*	(2)* mg/l	(25)*	(1)*	(20)*	(5)* mg/l	(10)*	(50)*	(500)*
Area A	R1	7.1	-	-	-	-	-	-	-	-	-	-	-	-
	R2	7.1	-	-	-	-	-	-	-	-	-	-	-	-
	R3	7	-	-	-	-	-	-	-	-	-	-	-	570
Area B	R4	7	-	-	-	-	-	-	-	-	-	-	-	3800

Site Area	Sample Location	**Organic** Contaminant Concentrations in µg/l unless otherwise stated. Trigger Level Concentrations are Shown in Brackets										
		pH	Phenol	Benzene	Toluene	Ethyl Benzene	Xylenes	PAH	TPH (10) *			
			(0.5)*	(1) *	(1,000) #	(150)#	(70)#	(0.1)*	TPH C_6 to C_{40}	GRO C_6 to C_{10}	DRO C_{10} to C_{21}	LRO C_{21} to C_{40}
Area A	R1	7.1	< LoD	< LoD	-	-	-	< LoD	170	5	115	50
	R2	7.1	< LoD	< LoD	-	-	-	< LoD	< LoD	-	-	-
	R3	7	< LoD	< LoD	-	-	-	< LoD	230	8	190	34
Area B	R4	7	< LoD	< LoD	-	-	-	< LoD	< LoD	-	-	-

Key		Source of Guidance Trigger Level	
-	Parameter tested for but found not to be in excess of relevant trigger level concentration	*	Water Supply (Water Quality) Regulations 1989, as amended in 2000
	Parameter not tested for	#	Dutch E-3.c Intervention Level for Soil Remediation (1994)
< LoD	Parameter concentration is below limit of detection (which is greater than trigger concentration	##	Dutch E-3.c Intervention Level for mineral oil (1994)

9.3 Soil/Fill Contamination Results

9.3.1 The soil/fill contamination test results are summarised in the tables on pages 12 to 17.

9.3.2 Laboratory test certificates as received from the laboratory are presented in Appendix I to this report.

Inorganic Determinands

9.3.3 Of the 38 samples of natural and made ground analysed for inorganic parameters, three of the samples of made ground yielded slightly elevated concentrations of chromium and lead.

9.3.4 One sample of natural material (Sirius TP3) recorded anomalously high lead (14,000 mg/kg). It is considered likely that this has resulted from leaching of aqueous lead compounds, probably from car battery liquids. However, equally it may have resulted from unrepresentative sampling or the inclusion of foreign material into the sample.

9.3.5 No elevated levels of lead were recorded in the overlying made ground or indeed across the site. Furthermore, no elevated levels of soluble lead were recorded in any of the groundwater samples from the four monitoring wells, three of which are located within 25m radius of TP3.

9.3.6 These samples are classified by comparison of parameters concentrations with the relevant current UK guidance threshold value for an end use including domestic gardens and any area where plants are to be grown (the most sensitive of the proposed end-uses).

9.3.7 Statistical analysis of the results yielded by the samples of granular fill, carried out in accordance with the methods outlined in CLR7, indicate the upper 95th percentile bound values (US_{95}) for each of these determinands are below the current UK guidance values.

9.3.8 The statistical analysis undertaken on lead results in the samples of weathered sandstone indicate the elevated lead recorded in TP3 is an outlier, the arithmetic mean of the remaining results (shown in brackets), being well within the guidance threshold value.

Results of Statistical Analysis of Soil Contamination Data

Stratum	Chromium (130)	Lead (450)
	US_{95}	Arithmetic Mean
Granular Fill	51	102
Weathered Sandstone	-	**1716** (13)

Leachables

9.3.9 Of the leachability tests conducted on twenty samples of made ground, two samples recorded a concentration of lead and arsenic marginally in excess of the maximum permissible concentration as defined in the Water Supply (Water Quality) Regulations 1989, as amended in 2000.

Organic Determinands

9.3.10 In the absence of UK guidance values, these samples have generally been classified by comparison with risk-derived Dutch Intervention Values (DIV), which are based on both human and ecotoxicological data.

9.3.11 With respect to TPH, the Dutch intervention level for mineral oil (broadly equivalent to TPH) is 5,000mg/kg. However, Encia typically give further consideration to results that are in excess of 500mg/kg, based on the experience of similar sites and the requirements of regulators.

9.3.12 This "Tier 1" TPH concentration is ten times lower than the Dutch intervention level and therefore considered conservative. With respect to remediation, a higher "target" concentration might be acceptable, but this would normally be subject to the results of a quantitative risk assessment.

9.3.13 Of the 35 samples of made ground and 31 samples of weathered sandstone analysed for TPH, 21 samples of made ground and 10 samples of sandstone yielded concentrations above 500mg/kg. In eight of the samples of made ground the level of TPH contamination also exceeded the DIV.

9.3.14 Twelve of these samples of made ground from Area A also yielded concentrations of Total PAH (Polycyclic Aromatic Hydrocarbons) above the DIV of 40mg/kg.

Water Contamination Results

9.3.15 The groundwater contamination test results are summarised in the tables presented on page 17.

9.3.16 The significance of the results has been assessed by comparison with the Water Supply (Water Quality) Regulations 2000 and Dutch Groundwater Intervention Levels.

9.3.17 Two of the four groundwater samples analysed are considered to be contaminated with elevated TPH levels with respect to the broadly equivalent Water Quality threshold level for mineral oils.

9.3.18 No elevated levels of PAH's, or volatile compounds were recorded in any of the monitoring wells.

10 CONTAMINATION (QUALITATIVE RISK ASSESSMENT & REMEDIATION)

10.1 Revised Conceptual Ground Model

10.1.1 The Preliminary Conceptual Site Model has been amended in light of data obtained during the ground investigation, and a revised Conceptual Site Model is presented as Drawing No. 6177/5 in Appendix B.

10.2 Environmental Setting & End Use

10.2.1 The laboratory analytical results indicate that significant organic (fuel) contamination exists in both the made ground and natural ground (weathered sandstone) beneath this site. In order to assess the significance of this contamination, consideration must be given to the site's environmental setting and the proposed end use.

10.2.2 The underlying solid strata (Oaks Rock Sandstone of the Middle Coal Measures) is classified as a minor aquifer. The nearest surface watercourse is the Dearne & Dove Canal, approximately 100m northeast of the site. There are no 'natural' watercourses within 500m of the site. Therefore, the site's environmental setting is considered to be of moderate sensitivity.

10.2.3 With respect to human health, the proposed end use (residential) is sensitive. Transient risks to construction workers can be addressed by the adoption of appropriate health and safety measures, see Section 13.4.

10.2.4 The Preliminary Conceptual Site Model (see Section 6.1) has been amended in light of data obtained during the ground investigation, and the revised Conceptual Site Model is described in Section 10.2, below.

10.3 Pollutant Linkages

10.3.1 In terms of a proposed redevelopment of this site, plausible pollutant linkages can be summarised as follows.

Sources

10.3.2 Visual and/or olfactory evidence of organic (diesel) contamination was identified, within the made ground, sandstone or both, in over 50% of the exploratory holes excavated by both Encia and Sirius, and confirmed by the results of the laboratory testing.

10.3.3 Across the northern/northeastern part of Area A the fuel contamination exists in both the made ground and natural strata (weathered sandstone).

10.3.4 Around the existing raised fuel storage tanks on the southwest boundary of Area A (marked "i" on Drawing 6177/2) the contamination appears mostly to be restricted to the made ground, with the exception of CP5 where fuel contamination extends into the weathered sandstone.

Pathways

10.3.5 Potential contaminant pathways include:

- ingestion
- dermal contact
- inhalation of contaminated particulates
- surface water run-off, including existing drainage infrastructure
- downward infiltration of leachable/mobile contaminants to groundwater

Receptors

10.3.6 Potential contaminant receptors include:

- the environment - Coal Measures Strata (minor aquifer)
- construction workers
- end users of the site (residents)

10.3.7 It can be concluded that there are plausible pathways between actual contaminant sources and potential receptors. Consequently, some remedial action will be required, either treatment\removal of the source, or "breakage" of the pathway.

10.4 Potential Remedial Options

Inorganic contamination

10.4.1 Statistical analysis of the results for all samples of made ground, carried out in accordance with the methods outlined in CLR7, indicates the upper 95th percentile bound values (US_{95}) for each of these determinands are below the current UK guidance threshold values.

10.4.2 The made ground does however contain materials considered undesirable in near surface soils in garden areas.

10.4.3 Where residual made ground remains beneath garden and landscaped areas it is recommended that a 300mm thick surface cover of "clean" soil comprising 150mm of "clean" subsoil and 150mm topsoil be placed over the made ground in accordance with the guidance given in NHBC Standards Chapter 9.2.

10.4.4 Such a blinding layer would only be required in proposed garden and landscaped areas where made ground remains after site re-profiling (i.e. not beneath hardstanding or buildings).

10.4.5 The anomalous elevated level of lead identified in TP3, though isolated, is considered to present an unacceptable risk to end-users, particularly given the likely site regrade which would reduce the depth of cover. Therefore, remedial\treatment works will be required.

10.4.6 TP3 is located within an area where significant hydrocarbon contamination is present within the made ground and weathered sandstone strata. Therefore, the material contaminated with lead will be excavated out, treated and subject to validation analysis prior to replacement.

Organic Contamination

10.4.7 Significant widespread organic contamination was identified, within the made ground, sandstone or both, in over 50% of the exploratory holes excavated by both Encia and Sirius, based on:

- Observations made during the ground investigations
- Laboratory test results

10.4.8 Two areas of significant organic (hydrocarbon) contamination have been identified and are summarised in the table below and shown on Drawing No 6177/6.

Areas of Organic Contamination

Area	Material	Depth m bgl	Observations & Typical Composition
Area A & B	MG: Granular Fill Weathered Sandstone	GL – c. 3.5	Up to 1,300 mg/kg PAH Up to 23,000 mg/kg TPH contamination (both diesel & lubricating range organics)
Area A	MG: Granular Fill Weathered Sandstone	GL – c. 2.0	Up to 1,200 mg/kg PAH Up to 13,000 mg/kg TPH contamination (both diesel & lubricating range organics)

10.4.9 Hydrocarbon contamination can be mobile and as such may pose a potential risk to the environment and human health.

10.4.10 Leaving the hydrocarbon contamination in-situ and untreated might be acceptable if it can be demonstrated, probably by means of Quantitative Risk Assessment (QRA), that the contamination poses no risk to human health or controlled waters.

10.4.11 A QRA is currently being undertaken and will be issued under separate cover. Once site-specific target concentrations have been derived for all the relevant determinands, an appropriate remediation strategy could be formulated.

10.4.12 At this stage it is considered that the following remedial options could be utilised:

Remedial Techniques (organic contamination in soil\fill)

Technique	Remarks	Feasible?
Excavation & disposal	Not in line with current Government philosophy regarding sustainable development. Majority of soil likely to be classed as hazardous waste, therefore costs likely to be prohibitive.	UNLIKELY
Ex-situ bioremediation	Field or laboratory trials would be needed to confirm: that contaminants are degradable; anticipated treatment duration; which nutrients and fungal enzymes are best suited.	POSSIBLE
Solidification or Stabilisation	Laboratory trials would be needed to confirm the ability of E-Clays or cement-based products to immobilise the contaminants. In-situ treatment could be constrained by presence of obstructions. Ex-situ treatment could be constrained by depth of contamination.	POSSIBLE
Thermal treatment	Ex-situ thermal desorption could be appropriate for removal most organics.	POSSIBLE

Remedial Techniques (organic contamination in groundwater)

Technique	Remarks	Feasible?
Pump & treat	Need to consider possibility of partitioning from adsorbed phase and radius of influence (especially with respect to adjacent land).	POSSIBLE
Bioremediation	Suitable for quite a wide range of compounds.	POSSIBLE
Chemical oxidation	Aggressive treatment able to destroy most organic compounds.	POSSIBLE
Attenuation Monitoring	Requires modelling and regulatory liaison.	POSSIBLE

10.4.13 Estimation of the volume of grossly contaminated soil/fill requiring removal or treatment can only be approximate at this stage and is dependent on the target concentration(s) agreed with the Local Authority and\or Environment Agency. Contractors with experience of brownfield sites should be asked to review the site investigation data and make their own assessment once target concentrations have been agreed.

Waste Classification

10.4.14 Disposal of the made ground off site is not considered appropriate, economically viable, nor in line with current Government philosophy regarding sustainable development. However, some excess arisings may be generated by excavations for foundations, sewers etc.

10.4.15 In the context of waste soils generated by remediation and\or groundworks activities on brownfield sites, the following definitions (from the Landfill Regulations 2002) apply:

- **Inert** (e.g. uncontaminated 'natural' soil, bricks, concrete, tiles & ceramics).
- **Non-**Hazardous (e.g. soil excavated from a contaminated site which contains dangerous substances, but at concentrations below prescribed thresholds).
- **Hazardous** (e.g. soil excavated from a contaminated site which contains dangerous substances at concentrations above prescribed thresholds).

10.4.16 Dangerous substances include compounds containing a variety of determinants commonly found in contaminated soils on brownfield sites, for example arsenic, lead, chromium, benzene etc.

10.4.17 Soil arisings generated by excavations at this site are likely to be classified as follows:

Soil Type	Waste Classification	Remarks
Fuel contamination	Hazardous	Where DRO > 10,000 mg/kg
General Made Ground	Non-hazardous	Where not affected by fuel contamination

10.4.18 Estimation of the volume of soil/fill that might be classified as hazardous waste can only be approximate at this stage. Contractors with experience of brownfield sites should be asked to review the site investigation data and make their own assessment.

Groundwater

10.4.19 Groundwater in two locations (R1 and R3 in Area A) is contaminated with TPH determinands.

10.4.20 Based on the results of the Tier 1 assessment, it is apparent that contamination (most significantly diesel) of the groundwater is significant. Consequently, given the nature of the proposed development and the site's environmental setting, treatment or removal of contaminated groundwater may be required.

10.4.21 A QRA is currently in preparation to establish the risk to the environment and end users of the site, and further determine the level of remediation (if any) that will be required.

10.5 Summary of Potential Pollutant Linkages & Mitigation

10.5.1 In terms of the proposed redevelopment plausible pollutant linkages, and feasible remediation options, can be summarised as follows:

Receptors	Pathways	Contaminants	Remediation Options
Human Health (Future residents) ◊	*Consumption of contaminated vegetables*	Metals, Hydrocarbons	No elevated inorganic determinands.
	Ingestion		
	Inhalation (dust and\or vapours)		QRA and/or removal/treatment of hydrocarbon contamination validated to site remediation targets.
	Dermal contact		
	Fire and explosion	Methane, Hydrocarbons	A/A
	Permeation of water supply pipes	BTEX, Halogenated aliphatics & aromatics, Phenol, CN, Sulphate, Sulphide & Chloride	QRA and/or treatment/removal of organic contamination validated to site remediation targets
Buildings	*Fire and explosion*	Methane, Hydrocarbons	Simple gas protection measures required in new buildings.
	Chemical attack on building materials and services	Sulphate	DS2/ACEC AC-4_z conditions should be assumed for concrete in contact with natural and made ground.
Plants	*Phytotoxicity*	Cu, Ni, Zn & B	No elevated phytotoxic determinands.
Groundwater	*Contamination of water resources*	Metals, Hydrocarbons	QRA and/or treatment/removal of organic contamination validated to site remediation targets

◊ transient risks to construction workers will be addressed by the adoption of appropriate health and safety measures in accordance with the Health and Safety at Work Act 1974 and regulations made under the Act including for example the COSHH Regulations.

11 HAZARDOUS GAS

11.1.1 Information from historical OS plans and Barnsley MDC obtained by Sirius indicates that there are two known landfill sites within 250m of the site (126m and 230m northeast.

11.1.2 These have been classified as category 4 landfills, which have been licensed to accept material that would not be expected to give rise to landfill gas in substantial quantities.

11.1.3 They also identify a landfill site located 375m northeast of the site which is a category 1 landfill, which is known to be producing landfill gas and from which gas is migrating.

11.1.4 The site is also located in an area which does require basic radon protection measures.

11.1.5 Sirius constructed six gas-monitoring wells at the site, which were monitored on four occasions in December 2003 and January 2004. Their results are summarised in the table below.

Summary of Sirius's Gas Monitoring Results

Well	Range of Methane Concentrations (%.v/v)	Range of Carbon Dioxide Concentrations (%.v/v)	Range of Positive Flow Rates (litre/hour)
CP1	0	5.6 - 6.7	0 - 0.2
CP2	0	0 - 4.9	0
CP3	0	0.3 - 1.1	0 - 0.1
CP4	0	0.2 - 0.5	0
CP5	0	0.6 - 0.8	0
WS10	0	0 - 0.6	0
R1	0	0.3	0.1
R2	0	0.1	0.8
R3	0	0	0.3
R4	0	0.1	0.8

11.1.6 Site classification should generally be based on results obtained over a prolonged period, usually in excess of 6 months (and in excess of 12 months if significant concentrations and flows of methane are recorded). However, no methane has been recorded in any of the wells installed at this site.

11.1.7 The worst-case borehole gas volume flow rate for carbon dioxide is less than 0.06 litres/hour, well within Characteristic Situation 1. Although the worst-case carbon dioxide concentration of 6.7% would place the site at least within Characteristic Situation 2.

11.1.8 It is anticipated that the bulk of existing made ground will remain on site, probably subject to some redistribution. It is therefore recommended that simple precautionary measures are incorporated within all new buildings constructed on this site. Simple measures should comprise:

- 1200 gauge polyethylene DPM or DPC, with suspended concrete floors or ground bearing floor slabs.
- continuous membrane across cavity walls
- cavity tray in external walls
- fully sealed service entries/exits

11.1.9 However, in addition to these basic measures, suspended floors with a ventilated sub-floor void would be preferable (although not essential). Suspended floors may be required for the majority of properties built on this site in any case, in accordance with NHBC Standards Chapter 5.1, due to anticipated final thicknesses of made ground (ie >600mm).

12 GEOTECHNICAL ISSUES

12.1 Foundation Recommendations

12.1.1 The Ben Bailey Viability Sketch layout plan (dated September 2004) indicates the proposed development will comprise 42 units of two and three-storey construction.

12.1.2 Weathered sandstone was encountered across the site at typical depths of between 0.5 and 3.5m bgl, the deepest being behind the retaining wall separating Areas A and B.

12.1.3 Although this retaining wall will be removed, and the ground levels re-profiled, during site remedial works some deep made ground may remain.

12.1.4 Made ground is not considered a suitable foundation material and foundations should therefore be taken through these materials into underlying strata of adequate bearing capacity.

12.1.5 Subject to final levels and regrade proposals, it is considered strip and\or trench fill footings extending beneath the made ground into the underlying medium dense sand gravels or weathered sandstone strata, will be suitable across the majority of the site of the site area.

12.1.6 Foundations of plots placed over any relict foundations should be taken to greater depth than the relict foundations and into natural ground of adequate bearing capacity.

12.1.7 Foundations will be required to be placed below a line drawn up at 45° from the base of any service or similar excavation.

12.1.8 Foundation excavations should be dug using a machine bucket without teeth in order to keep disturbance of the base to a minimum.

12.1.9 Where rock is encountered at shallow depth, foundations on rock should be placed entirely on rock and not partially on rock and partially on residual soil. This may, depending on surface gradient, necessitate significant overdeepening of foundations.

12.1.10 Where deep made ground (> 3m) remains after site reprofiling, raft foundations on re-engineered made ground or pile foundations may be adopted.

12.1.11 Raft foundations placed on engineered fill may also be suitable following removal of the gross contamination and replacement of the processed arisings in engineered layers.

12.1.12 However, the suitability of the made ground for placement as engineered fill should be confirmed by field trials.

12.1.13 Alternatively, piled foundations could be utilised and should extend into the underlying bedrock. The safe working load that may be supported on a pile is dependent on the pile diameter, its founding depth and the method of installation. Preliminary estimates are for pile lengths in the order of 4m, but advice should be sought from a specialist piling contractor.

12.1.14 Piles can provide an enhanced pathway for the vertical migration of mobile contaminants. The Environment Agency may therefore object to the adoption of piles as a foundation solution.

12.1.15 Where piled foundations are utilised, or the depth of made ground exceeds 600mm, suspended floor slabs should be utilised in accordance with NHBC Standards. This is likely to affect the majority of the plots.

12.1.16 A plot specific foundation schedule could be undertaken once site regrade and remedial proposals have been finalised and Encia have prepared an earthworks model for the site.

12.1.17 Ben Bailey Homes or their groundworker should seek further advice from Encia if unexpected ground conditions are encountered in foundation or sewer excavations.

12.2 Soluble Sulphate and pH

12.2.1 In accordance with BRE Special Digest 1 (2001), this site has been classified as brownfield with a mobile groundwater regime.

12.2.2 It is envisaged foundations will extend to depths of up to 5m through made ground and natural strata.

12.2.3 Twenty-eight soil and four groundwater samples taken from this depth range were submitted for pH and water-soluble sulphate (2:1 soil/water extract) as part of Sirius's contamination testing, the results of which are summarised below.

Summary of Sulphate and pH results

Soil type	Lowest pH values	Highest Soluble Sulphate Concentration (mg/l)
GRANULAR FILL	4.9	1.8
WEATHERED SANDSTONE	5.4	0.2
GROUNDWATER	7.0	0.2

12.2.4 Therefore, in accordance with Table 2 of SD1, sub-surface concrete should be Design Sulphate Class DS-2, with the site allocated an ACEC Classification of AC-4_Z.

12.3 Excavations

12.3.1 Based on the results of the investigation it is unlikely that major groundwater flows will be encountered in shallow excavations.

12.3.2 Excavations in natural ground should remain stable in the short term but if left open for any significant period of time, may require shoring most notably in granular soils and made ground.

12.4 Highways

12.4.1 Made ground is present across the site and it is strongly recommended that consultation regarding the specification of the highways should be made with the adopting authority. However, it is considered that the following options would be suitable to enable the construction of the highways.

12.4.2 Given that the made ground is generally less than 2m thick across the majority of the site the following options are considered suitable.

- Excavation of the full thickness of made ground and replacement with suitable aggregate in accordance with Series 600 (Earthworks) of The Highways Agency (HA) '*Specification for Highway Works*' 1998.

- Excavation of the full thickness of made ground, screening, selection and replacement of suitable made ground materials in engineered layers in accordance with Series 600. Unsuitable materials include any soft or wet materials, biodegradables including topsoil, wood, peat or lignite, scrap metal, frozen material and material which, by virtue of its particle size or shape, cannot be properly and effectively compacted (e.g. oversize material or gravels which are tabular).

12.4.3 It is recommended that site trials be undertaken to confirm that the soils can be compacted effectively with the plant available during the earthworks.

12.4.4 Where the made ground is re-engineered it is considered that a CBR value of 5% should be achievable.

12.4.5 Crushing of demolition/hardstand/foundation arisings will generate aggregate which (subject to confirmatory testing) should be suitable for use as unbound pavement materials within the highways at the site.

13 REDEVELOPMENT ISSUES

13.1 General

13.1.1 This report has presented options with respect to foundation solutions, treatment of contamination etc that are considered technically feasible and in line with current good practice. Consequently, we would expect to obtain regulatory approval for whichever option is adopted, although this cannot be guaranteed. Copies of this report should be forwarded to the relevant regulatory authorities (NHBC & Local Authority) for their comment/approval. Overview of Anticipated Remedial Works.

13.2 Remedial Strategy

13.2.1 Redevelopment of this site will almost certainly be subject to planning conditions relating to remediation and validation. Once a specific, preferred development strategy has been decided, Encia could liaise with local Planning Authority and NHBC and prepare a detailed Remediation Strategy document for approval.

13.2.2 The Remediation Strategy document would include:

- General background information, including site location, site description and a summary of ground investigation data
- An overview of existing constraints on development and the aims of the proposed remedial works
- Specific details of the anticipated site remedial\preparatory works
- Details of site supervision and validation
- A summary of implications for redevelopment

13.2.3 The anticipated remediation works are summarised below:

- Demolition and removal/crushing of buildings, hardstanding areas and relict foundations/below ground structures
- Treatment/removal of organic contamination within Area A of the site, with continued monitoring for any further localised organic contamination
- Import of material to provide clean cover in gardens/landscaped areas
- Supervision of the works by a suitably qualified consultant to include detailed records, testing requirements, etc
- Validation of the remediated site in the form of a detailed Completion Statement confirming that the works set out in this document and agreed were completed and that the site is suitable for its intended use

13.2.4 It is strongly recommended that the demolition contractor should chase-out all significant buried structures, and survey-in the resultant excavations before making them safe by backfilling. At the very least, relevant features should be surveyed-in before "hiding" them beneath a veneer of rubble. Similarly, it would be prudent to complete a drainage survey prior to blading rubble across the site to leave it safe and secure.

13.3 Health & Safety Issues

13.3.1 During the reclamation and construction phases of the site development it will be necessary to protect the health and safety of site personnel. General guidance on these matters is given in the Health and Safety Executive (HSE) document "Protection of Workers and the General Public during the Redevelopment of Contaminated Land". In summary, the following measures are suggested to provide a minimum level of protection:

- All ground workers should be issued with protective clothing, footwear and gloves. Personnel should be instructed in why and how they are to be used.
- Hand-washing and boot-washing facilities.
- Care should be taken to minimise the potential for off-site migration of contamination by the provision of dust suppression control and wheel cleaning equipment during the construction works.
- Good practices relating to personal hygiene should be adopted on the site.
- The contractor should satisfy the Health & Safety Executive with regard to any other matters concerning the health, safety and welfare of persons on the site.

13.3.2 Access into excavations etc. must be controlled. Gas detection apparatus and breathing equipment (if required) must be available whenever access to such places is required.

13.3.3 Before site operations are started, the necessary COSHH statements and Health & Safety Plan should be drafted in accordance with the CDM regulations.

13.4 New Utilities

13.4.1 Post demolition and subject to regrade proposals, the bulk of the existing made ground will remain on site. This made ground contains contaminants at concentrations above the guidance threshold values for an end use that includes domestic gardens and utility workers are likely to come into direct contact with the made ground.

13.4.2 Although utility workers will only be exposed to the contaminated soil/fill for a relatively short time, the contaminants represent a risk and simple precautionary measures are required, i.e. good personal hygiene and basic personnel protective equipment.

13.4.3 In addition to the above, the atmosphere in shored trenches in excess of 1.2m should be monitored for oxygen and hazardous gas (methane & carbon dioxide), prior to personnel entering such excavations. Monitoring should continue whilst personnel are working in deep excavations.

13.4.4 Utility trench excavations are likely to yield contaminated arisings. Poor handling and control of such arisings could give rise to contamination of the clean capping material and/or areas of the site previously devoid of any contamination. It is therefore recommended that any arisings from beneath the capping layer are stockpiled in designated areas from which the clean capping material has been stripped.

13.4.5 It is recommended that trenches for services including site drainage and water supply are cut over size in order to isolate pipe materials from potential contaminants and to enable maintenance to be conducted in "clean" material.

13.4.6 It is strongly recommended that all statutory service bodies are consulted at an early stage with respect to the ground conditions within which they will lay services in order to enable them to assess at an early stage any potential abnormal costs.

13.4.7 It is likely that the Water Company will request the use of ductile iron mains, with plastic coated copper house connections, given that residual organic contaminants will still be present post-remediation, albeit at trace concentrations.

14 SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

14.1 General

14.1.1 Ground investigation is generally best undertaken post demolition; access constraints associated with continued operations, existing buildings and underground service runs can prevent thorough inspection of the ground via extensive trial pitting/trenching.

14.1.2 Consequently, some uncertainties may remain and contractors with experience of brownfield sites should be asked to review the site investigation data and make their own assessment. A supplementary, post demolition ground investigation may be required to more accurately assess the nature of the made ground beneath the site.

14.1.3 Nonetheless, useful data has been obtained and this investigation has resolved much of the uncertainty below ground. Our investigation report should enable Remediation to provide you with budget costs for the necessary site preparatory and remedial works.

14.1.4 Made ground comprising granular fill has been encountered across the site typically to depths less than 2m, though locally in excess of 3.5m.

14.1.5 The weathered strata of the Oaks Rock Sandstone was encountered beneath the made ground.

14.1.6 Ben Bailey Homes are considering redeveloping the site with two and three storey residential housing with associated gardens, POS and adoptable roads and sewers. No site layout has been provided at this stage.

14.2 Hazardous Gas

14.2.1 Simple precautionary gas protection measures should be incorporated within all new buildings constructed on this site and would comprise

- 1200 gauge polyethylene DPM or DPC, with suspended concrete floors or ground bearing floor slabs.
- continuous membrane across cavity walls
- cavity tray in external walls
- fully sealed service entries/exits

14.2.2 Suspended floors with a ventilated sub-floor void are likely to be required in most dwellings given the thickness of made ground at the site.

14.3 Contamination & Remediation

14.3.1 No significant inorganic contamination has been identified within the made ground materials.

14.3.2 However the made ground is considered undesirable near surface in gardens or areas of soft landscaping. Where made ground materials remain such areas, they should be isolated beneath a minimum 300mm clean cover (comprising 150mm topsoil and 150mm subsoil).

14.3.3 Two significant "hotspots" of gross hydrocarbon contamination have been located across much of Areas A and B, seemingly associated with nearby fuel tanks.

14.3.4 Whilst typically remaining within the made ground materials, locally the contamination has migrated into the underlying weathered sandstone bedrock and the groundwater.

14.3.5 Subject to a QRA, these hotspots and any associated water fractions may require treatment and/or disposal off site prior to construction of the proposed development.

14.4 Foundations

14.4.1 Subject to final ground levels, it is considered that shallow strip and trench fill foundations would be suitable across the majority of the site. However, raft foundations constructed on re-engineered made ground, or piled foundations are recommended where excessively deep made ground remains.

14.5 Further Work

14.5.1 A post demolition site investigation should be carried out to confirm ground conditions in areas previously inaccessible.

APPENDIX A
GENERAL NOTES

Generic Notes – Encia Geoenvironmental Investigations

1. Environmental Setting

General

Third party information obtained from the British Geological Survey (BGS), the Coal Authority, the Local Authority etc is presented in the Correspondence Appendix of this Geoenvironmental Report.

Geology, Mining & Quarrying

In order to establish the geological setting of a site, Encia refer to BGS maps for the area, and the relevant geological memoir.

A coal mining report is obtained from the Coal Authority. Further information is sourced from the Local Authority and by reference to current and historical OS plans.

Landfills

Encia obtain data from the Landmark Information Group, the Environment Agency and the Local Authority with respect to known areas of landfilling within 250m of the proposed development site. Reference is also made to historical OS plans, which are inspected for evidence of backfilled quarries, railway cuttings, colliery spoil tips etc.

Radon

Radon is a colourless, odourless gas, which is radioactive. It is formed in strata that contain uranium and radium (most notably granite), and can move though fissures eventually discharging to atmosphere, or the spaces under and within buildings. Where radon occurs in high concentrations, it can pose a risk to health.

In order to assess potential risks associated with radon gas, Encia refer to BRE Report BR211, 1999: "*Radon: guidance on protective measures for new dwellings*".

BR211 provides a preliminary indication of the measures required for a particular site, but it is also often necessary to request a Stage 2 Protective Measures Site Report from the BGS.

The level of protection needed is site-specific and is determined by reference to the radon potential map for the area followed by a geological assessment of the site. This information is contained in the Annexes of BR211.

Annex A – derived from statistical analysis of radon measurements in existing houses carried out by the NRPB and grouped on a 5km grid.

Annex B - based on an assessment of the same radon measurements grouped by geological units. The maps show the 5km grid squares underlain completely or in part, by geological units which potentially exceed the action levels for radon protective measures. The grid squares are coded according to the highest potential within the square. In many cases the actual geological radon potential varies considerably within a grid square.

Encia adopt the following procedure when assessing risk associated with radon.

Firstly, Annex A maps are reviewed to see whether the site requires full, basic or no measures. If the site is in a dark brown square, full radon protection measures are required. If the site is in a light brown square, reference should be made to Annex B.

Secondly, Annex B maps are reviewed to see whether a further geological assessment is required which may result in upgrading the result from Annex A. If a site lies within a shaded square, it may require radon protection, and Encia request a Stage 2 Protective Measures Site Report from the BGS.

If the site is in a square that is not coloured or shaded in either set of maps then no radon protection is needed and therefore a BGS Report is not normally necessary.

The BGS geological assessment involves checking whether the site is on or close to a geological unit that has statistically been found to have elevated radon potential. The geological assessment is based on either 1:50,000 or the 1:250,000 scale data. The search area specified as part of the request is increased by 50m in areas where 1:50,000 data is available and by 500m in areas with 1:250,000 scale data to allow for potential inaccuracies in the position of boundaries. The BGS report indicates the highest level of protection required within the search area and its buffer zone.

When requesting a BGS report, Encia select the search radius carefully, since too large a search radius may result in the inclusion of areas underlain by geological units of a higher radon potential, thereby giving rise to recommending too high a level of protection.

The report also includes (where available), a list of the geological units included in the assessment. Encia check that these actually underlie the site, rather than the buffer zone only.

On the basis of radon measurements in dwellings and on their geological interpretation, the BGS report stipulates the level of protective measures required for the proposed development site, and this could be:

1. no measures,
2. basic measures, or
3. full measures.

Details of these measures are provided in the Hazardous Gas section of this Geoenvironmental Report.

Hydrogeology

Encia obtain information from the Environment Agency (EA) and the Landmark Information Group with respect to:

- groundwater quality
- recorded pollution incidents
- licensed groundwater abstractions

Reference is also made to the EA document "*Policy and Practice for the Protection of Groundwater*" (1998) and the relevant Groundwater Vulnerability Map.

Bedrock and any overlying granular Drift deposits are classified by the EA:-

- **Major aquifers:** "*Highly permeable formations, usually with a known or probable presence of significant fracturing. They may be highly productive and able to support large abstractions for public water supply and other purposes*".

- **Minor aquifers**: *"Fractured or potentially fractured rocks which do not have a high primary permeability, or other formations of variable permeability. Although these aquifers will seldom produce large quantities of water for abstractions, they are important both for local supplies and in supplying base flow to rivers".*
- **Non-aquifers**: *"Formations which are generally regarded as containing insignificant quantities of groundwater. However groundwater flow through such rocks, although imperceptible, does take place and needs to be considered in assessing the risk associated with persistent pollutants. Some non-aquifers can yield water in sufficient quantities for domestic use".*

Groundwater vulnerability is determined by 4 variables:

1. The presence and nature of overlying soil (the weathered zone affected by living organisms; soil in the UK can extend up to 2m in depth). Physical properties of the soil affect the downward passage of water and it's ability to attenuate pollutants. The EA make reference to a three-fold classification of soil types:-

   - Soils of **low** leaching potential are defined as *"soils in which the pollutants are unlikely to penetrate the soil layer because either water movement is largely horizontal, or they have the ability to attenuate diffuse pollutants".*
   - Soils of **intermediate** leaching potential are defined as *"soils which have a moderate ability to attenuate diffuse source pollutants or in which it is possible that some non-adsorbed diffuse source pollutants and liquid discharges could penetrate the soil layer".*
   - Soils of **high** leaching potential are defined as *"soils with little ability to attenuate diffuse source pollutants and in which non-adsorbed diffuse source pollutants and liquid discharges have the potential to move rapidly to underlying strata or to shallow groundwater".*

   In urban areas and restored mineral workings the soil information is based on fewer observations than elsewhere. A worst-case vulnerability (H) is therefore assumed for these areas and for current mineral workings by the EA. All are given a designation of **HU** unless proved otherwise.

2. The presence and nature of Drift, which often overlies bedrock. Where Drift is of substantial thickness and low permeability, it can provide an effective barrier to surface pollutant migration. Permeable Drift is classified as a Minor Aquifer except where it is in probable hydraulic continuity with a Major Aquifer, where it is regarded as part of the Major Aquifer unless proven otherwise by site investigation.

3. The nature of the geological strata (bedrock). Rocks that contain groundwater in exploitable quantities are called aquifers.

4. The depth of the unsaturated zone; ie that part of the aquifer which lies above the water table

The EA have also designated Source Protection Zones, which are based on proximity to a groundwater source (springs, wells and abstraction boreholes). The size of a Source Protection Zone is a function of the aquifer, volume of groundwater abstracted and the effective rainfall, and may vary from tens to several thousand hectares.

Hydrology

Encia obtain information from the Environment Agency and the Landmark Information Group with respect to:

- surface water quality
- recorded pollution incidents
- licensed abstractions (groundwater & surface waters)
- licensed discharge consents
- site susceptibility to flooding

The EA have set water quality targets for all rivers. These targets are known as River Quality Objectives (RQOs). The water quality classification scheme used to set RQO planning targets is known as the River Ecosystem scheme. The scheme comprises five classes (RE1 to RE5) which reflect the chemical quality requirements of communities of plants and animals occurring in our rivers.

General Quality Assessment (GQA) grades reflect actual water quality. They are based on the most recent analytical testing undertaken by the EA. There are six GQA grades (denoted A to F) defined by the concentrations of biochemical oxygen demand, total ammonia and dissolved oxygen.

The susceptibility of a site to flooding is assessed by reference to the Environment Agency's Indicative Floodplain Maps which provide a general overview of areas of land in natural floodplains and therefore potentially at risk of flooding from rivers or the sea. The maps use the best information currently available, based on historical flood records and geographical models. They indicate where flooding from rivers, streams, watercourses or the sea is possible. However the maps do not show flood defences which offer vital protection in many areas.

For flooding from rivers the maps indicate the extent of flooding for a one in one hundred (or a one per cent) chance of flooding each year, for flooding from the sea and tidal estuaries, the maps show a one in two hundred (or 0.5 per cent) chance of flooding each year.

It should also be noted that as the floodplain shown is the 1 in 100 year (or 1 in 200 year as appropriate), areas outside this may be flooded by more extreme floods (e.g. the 1 in 1000 year flood). Also, parts of the areas shown at risk of flooding will be flooded by lesser floods (e.g. the 1 in 5 year flood). In some places due to the shape of the river valley, the smaller floods will flood a very similar extent to larger floods but to a lesser depth.

If a site falls within the indicative floodplain, it is recommended that a flood survey be undertaken by a specialist consultant who can advise on appropriate mitigating measures; ie raising slab levels, provision of storage etc.

COMAH & Explosive Sites

Encia obtain information from the Landmark Information Group with respect to COMAH or explosive sites within 1km of the proposed development site. Encia's report refers to any that are present, and recommends that the Client seeks further advice from the HSE.

Areas around COMAH sites (chemical plants etc) are zoned with respect to the implementation of emergency plans. The HSE are a statutory consultee to the local planning authority for all COMAH sites. The COMAH site may have to revise it's emergency action plan if development occurs. This might be quite straightforward or could entail significant expenditure. Consequently, the COMAH

site may object to a proposed development (although it is the Local Authority who have final say, and they are likely to place more weight on advice from the HSE).

Preliminary Conceptual Ground Model

The site's environmental setting (and proposed end use) is used by Encia to assess the significance of any contamination encountered during the subsequent ground investigation

Assessment of contaminated land is based on an evaluation of pollutant linkages (source-pathway-receptor). Contaminants within the near surface strata represent a potential source of pollution. The environment (most notably groundwater), site workers and end users are potential targets.

Potential pollutant linkages are shown on a preliminary conceptual site model, presented as a Drawing in an Appendix to this Geoenvironmental Report. The preliminary model is revised in light of data arising from the subsequent ground investigation.

2. Ground Investigation Fieldwork

General

Encia Ground Investigations are undertaken in accordance with current UK guidance including:

- BS5930:1999 *"Code of practice for site investigation"*
- BS10175:2001 *"Code of practice for the identification of potentially contaminated sites"*.
- Contaminated Land Reports 1 to 6, most notably CLR Report No. 4 *"Sampling strategies for contaminated land"*
- *"Guidance on the protection of housing on contaminated land"* - NHBC & EA R&D Publication 66 (2000)
- *"Development of appropriate soil sampling strategies for land contamination"* - EA R&D Technical Report P5-066/TR (2001)
- AGS: 1996 *"Guide to the selection of Geotechnical Soil Laboratory Testing"*

Exploratory hole logs are presented in Appendices to this Geoenvironmental Report. These logs include details of the:

- Investigation technique adopted
- Samples taken
- Descriptions of the solid strata, and any groundwater encountered.
- Results of any in-situ testing
- Any gas\groundwater monitoring well installed

Exploratory Hole Locations

Exploratory hole locations are selected by Encia, prior to commencement of fieldwork, to provide a representative view of the strata beneath the site and to target potential contaminant sources identified during the preliminary investigation (desk study). Additional exploratory locations are often determined by the site engineer in light of the ground conditions actually encountered; this enables better delineation of the depth and lateral extent of organic contamination, poor ground, relict structures etc.

Investigation Techniques

Ground conditions can be investigated by a number of techniques; the procedures used are in general accordance with BS5930: 1999 and BS1377: 1990. Techniques most commonly used by Encia include:

- Machine excavated trial pits, usually equipped with a backactor and a 0.6m wide bucket.
- Cable percussive (Shell & Auger) boreholes, typically using 150mm diameter tools and casing.
- Window or Windowless Sampling boreholes. Constraints associated with existing buildings, operations and underground service runs can render some sites partly or wholly inaccessible to a mechanical excavator. In such circumstances, window sampling is often the most appropriate technique. A window sampling drilling rig can be manoeuvred in

areas of restricted access and results in minimal disturbance of the ground (a 150mm diameter tarmac/concrete core can be lifted and put to one side). However, it should be noted that window sampling allows only a limited inspection of the ground (especially made ground with a significant proportion of coarse material).

- Rotary percussive open-hole probeholes are typically drilled using a tricone rock roller bit with air as the flushing medium. Probeholes are generally lined through made ground with temporary steel casing to prevent hole collapse.

Where installed, gas\groundwater monitoring wells typically comprise a lower slotted section, surrounded by a filter pack of 10 mm non-calcareous gravel and an upper plain section surrounded in part by a bentonite seal and in part by gravel or arisings. The top of the plain pipe is cut off below ground level and the monitoring well protected by a square, stopcock type manhole cover set in concrete, or the plain pipe is cut off just above ground level and the well protected by 100mm diameter steel borehole helmet set in concrete.

Monitoring well details, including the location of the response zone and bentonite seal are presented on the relevant exploratory hole logs.

In-situ Testing

Where relative densities of granular materials given on the trial pit and window sample logs are based on visual inspection only, they do not relate to any specific bearing capacities. However, wherever possible Encia employ a Mackintosh probe to assess relative density. Mackintosh probe results can be related to approximate allowable bearing capacities.

The relative densities of granular materials encountered in cable percussive boreholes are based on Standard Penetration Test (SPT) results. SPTs are carried out boreholes, in accordance with BS 1377 1990, Part 9 Section 3.3. Where full penetration (600mm) is not possible, N values are calculated by linear extrapolation and are shown on the logs as N* = x.

The strength of cohesive deposits is determined using a hand shear vane.

Shear strength test results reported on trial pit logs are considered to be more reliable than those reported on window sample logs. Significant sample disturbance occurs during window sampling and consequently shear strength results on disturbed window samples are generally lower than results obtained during trial pitting, in-situ or in large excavated blocks.

Sampling

Representative soil/fill samples are taken at regular intervals from the exploratory holes to assist in description of the ground and to allow selected laboratory testing to be performed. The type of sample taken is dependent on the nature of the stratum and the purpose of the analysis.

Where the soils encountered contain a significant proportion of coarse grained material, truly representative samples are not typically obtained - only the finer fraction is placed in sample containers. However, a visual estimate of the amount of coarse material is made on site.

NB: Coarse constituents not sampled are defined as: coarse gravel, cobble and boulder. (i.e. any 'particles' with an average diameter greater than 20mm).

Occasionally, unrepresentative 'spot' samples are also taken from some exploratory locations for contaminant analysis, typically where unusual, localised pockets of materials are encountered.

Samples of soil for chemical testing are placed into 1 litre plastic tubs prior to delivery to the selected laboratory. Samples of water are taken in one litre, brown glass bottles and stored in

cool boxes, at a temperature of approximately 4°C, until delivery to the selected laboratory. Soil\fill samples for organic analysis are also stored in cool boxes.

Groundwater

Where encountered during fieldwork, groundwater is recorded on exploratory hole logs. If monitoring wells are installed, groundwater levels are also recorded on one or more occasions after completion of the fieldwork.

It should be borne in mind that the rapid excavation rates used during a ground investigation may not allow the establishment of equilibrium water levels. Water levels are likely to fluctuate with season/rainfall and could be substantially higher at wetter times of the year than those found during this investigation.

Long-term monitoring of standpipes or piezometers is always recommended if water levels are likely to have a significant effect on earthworks or foundation design.

Description of Strata

The soils encountered during an Encia ground investigation are described (logged) in general accordance with BS 5930. The descriptions and depth of strata encountered are presented on the exploratory hole logs and summarised in the Ground Conditions section within the main body of text.

The materials encountered in the trial pits are logged, samples taken, and tests performed on the in-situ materials in the excavation faces, to depths of up to 1.2m; below this depth these operations are conducted at the surface on disturbed samples recovered from the excavation.

Key to Exploratory Hole Logs

Keys to logs are presented in the Appendix(ces) containing the logs. There are two Keys - Symbols & Legends and Terms & Definitions.

3. Geotechnical Laboratory Tests

General

Soil samples are delivered to the laboratory for testing along with a schedule of testing drawn up by Encia. All tests are carried out in accordance with BS 1377:1990.

The test results are presented as received in an Appendix to this Geoenvironmental Report.

The following laboratory testing are routinely carried out on a selection of samples:

- Atterberg limits & moisture contents
- Soluble sulphate & pH

The additional tests are typically only scheduled where significant earthworks regrade is anticipated:

- Grading.
- Compaction tests
- Particle density.

Atterberg Limits & Moisture Content

The Liquid and Plastic Limits of samples of natural in-situ clay are determined using the cone penetrometer method and the rolling thread test. These tests enable determination of an average Plasticity Index (PI) for each "type" of clay, although judgement is applied where variable results are reported.

PI can be related to shrinkability (low, medium or high) and then to minimum founding depth. Encia typically only consider a soil to be shrinkable if the proportion finer than 63μm is >35%.

PI results are compared against guidance given in the NHBC Standards, Chapter 4.2 (revised April 2003), which advocates the use of modified Plasticity Index (I'p), defined as:

I'p = Ip * (%< 425μm/100)

ie if PI is 30%, but the soil contains 80% < 425μm, then: I'p = 30 * 80/100 = 24%.

It should be noted that in accordance with the requirements of BS 1377, the % passing the 425μm sieve is routinely reported by testing labs.

Encia apply engineering judgment where PI results are spread over a range of classifications. Consideration is given to:

- the average values for each particular soil type (ie differentiate between residual soil and alluvium),
- the number of results in each class and
- the actual values.

Unless the judgment strongly indicates otherwise, Encia typically adopt a conservative approach and recommend assumption of the higher classification.

Soluble Sulphate and pH

Sulphates in soil and groundwater are the chemical agents most likely to attack sub-surface concrete, resulting in expansion and softening of the concrete to a mush. Another common cause of concrete deterioration is groundwater acidity.

The rate of chemical attack depends on the concentration of aggressive ions and their replenishment at the reaction surface. The rate of replenishment is related to the presence and mobility of groundwater.

Encia refer to BRE Special Digest 1 (SD1) "Concrete in aggressive ground. Part 1: Assessing the aggressive chemical environment" (2001). SD 1 provides definitions of:

- the nature of the site (greenfield, brownfield or pyritic)
- the groundwater regime (static, mobile or highly mobile)
- the Design Sulphate Class (DC Class) and
- the Aggressive Chemical Environment for Concrete (ACEC Class)

Encia reports clearly state each of the above for the site being considered.

The concentrations of sulphate in aqueous soil/fill extracts are determined in the laboratory using the gravimetric method. The results are expressed in terms of SO_4 for direct comparison with BS 5328:1997. The pH value of each sample was determined by the electrometric method.

SD1 also discusses determination of "representative" sulphate concentration from a number of tests. Essentially if <10 samples of a given soil-type have been tested, the highest measured sulphate concentration should be taken. If >10 samples have been tested, the mean of the highest 20% of the sulphate test results can be taken. With respect to groundwater, the highest sulphate concentration should always be taken.

With respect to pH (soil & groundwater) the value used is the lowest value if <10 samples have been tested and the mean of the lowest 20% if >10 samples have been tested.

4. Contamination Laboratory Analysis & Interpretation

General

An assessment of potential contaminants associated with the former usages of the site is undertaken with reference to CLR 8 "*Potential contaminants for the assessment of land*" and the relevant DETR Industry Profile(s).

Common Inorganic Contaminants

These include:

- metals, most notably cadmium, copper, chromium, mercury, lead, nickel, and zinc.
- semi-metals, most notably arsenic, selenium, and (water soluble) boron
- non-metals, most notably sulphur
- inorganic anions, most notably cyanides (free & complex), sulphates, sulphides, and nitrates.

With respect to the terminology used by most analytical laboratories:

Total cyanide = Free cyanide + Complex cyanide

Total cyanide (CN) is determined by acid extraction; whereas free cyanide is the water soluble fraction.

Complex cyanide is "bound" in compounds and is hard to breakdown. Laboratory determination of complex CN involves subjecting the sample to uv digestion for determination of both free and total CN.

Thiocyanate (SCN) is a different species combined with sulphur.

Elemental sulphur (S) and free sulphur are the same. Total sulphur is all forms, including that present in sulphates (SO_4), sulphides etc

There are 2 forms of chromium (Cr), chromium VI and chromium III. chromium VI is the more toxic of these. In soils, total chromium is determined by a strong aqua regia acid digestion. Chromium VI is an empirical method based on a water extract test.

Common Organic Contaminants

Petroleum hydrocarbons are a mixture of hydrocarbons produced from the distillation of crude oil. They include aliphatics (alkanes, alkenes and cycloalkanes), aromatics (single or multi benzene ringed compounds) and hydrocarbon-like compounds containing minor amounts of oxygen, sulphur or nitrogen.

Petroleum hydrocarbons can be grouped based on the carbon number range:-

GRO – Gasoline Range Organics (typically C_6 to C_{10}). Also referred to as PRO – Petroleum Range Organics
DRO – Diesel Range Organics (typically C_{10} to C_{28})
LRO - Lubricating Oil Range Organics (typically C_{28} to C_{40})
MRO – Mineral Oil Range Organics (typically C_{18} to C_{44})

However, it should be borne in mind that the terms "GRO" and "DRO" analysis are purely descriptive terms, the exact definition of which varies.

Total Petroleum Hydrocarbons (TPH) is also a poorly defined term; some testing laboratories regard TPH as hydrocarbons ranging from C_5-C_{40}, whereas other define TPH as C_{10}-C_{30}.

The composition of a TPH plume migrating through the ground can vary significantly; this is primarily dictated by the nature of the source (eg petrol, diesel, engine oil etc). Furthermore, different hydrocarbons are affected differently by weathering processes, and this can result in further variation in the chemical composition of the TPH.

Gasoline contains light aliphatic hydrocarbons rapidly (especially within the C4 to C5 range) that will evaporate. The aromatic hydrocarbons in gasoline are primarily benzene, toluene, ethylbenzene and xylenes, referred to as BTEX. Small amounts of polyaromatic hydrocarbons (PAHs) such as benzo(a)pyrene may also be present.

Diesel and light fuel oils have higher molecular weights than gasoline. Consequently, they are less volatile and less water soluble. About 25 to 35% is composed of aromatic hydrocarbons. BTEX concentrations are generally low.

Heavy Fuel Oils are typically dark in colour and considerably more viscous than water. They contain 15 to 40% aromatic hydrocarbons. Polar NSO compounds are also present.

Lubricating Oils are relatively viscous and insoluble in groundwater. They may contain 10 to 30% aromatics, including the heavier PAHs. NSO compounds are also common.

Polycyclic Aromatic Hydrocarbons (PAHs) have more than two fused benzene rings as a structural characteristic. PAH compounds are present in both petrol and diesel, although in significantly lower concentrations than in coal tars. Certain PAH compounds are carcinogenic (Benzo(a)pyrene) and\or mobile in the environment (naphthalene).

Polychlorinated Biphenyls (PCBs)

Volatile Organic Compounds (VOCs)

Semi-Volatile Organic Compounds (sVOCs)

Phenols

Solvents, pesticides, herbicides

Dioxins & furans

Methods of Analysis (Organic Compounds)

Toluene Extractable Matter (TEM) results provide a screening test for organic contamination. The sample is air dried at 30^{0}C and ground prior to addition of the solvent (toluene). The solvent extraction is aggressive and most organic compounds (fuels, oils, tars, humic material, animal fats and vegetable oil) are dissolved, as are some other inorganic contaminants such as sulphur. However, the volatiles (lighter fuel fraction etc) are lost during evaporation of the solvent.

Total Petroleum Hydrocarbon (TPH) by IR (also known as mineral oil by some testing laboratories) is undertaken on "as received" samples. Tetrachloroethylene is the solvent, and fluoroscil is used to remove humic material, animal fats and vegetable oil. Consequently this

analysis detects a wide range of "mineral" organics from volatiles (BTEX and gasoline), through diesel and oils to tars (including the very heavy, stable tars such as asphalt and bitumen).

TPH by GC-FID is a more refined analytical technique which only detects hydrocarbons (aliphatic and aromatic) in the range C_{10} to C_{40} (volatiles, heavy tars, humic material and sulphur are not detected). The laboratory can provide a breakdown of the TPH results into diesel range organics (**DRO**) and heavier lubricating oil range organics (**LRO**).

GRO (PRO) by GC-FID analysis detects the more volatile C_6-C_9 hydrocarbons (aliphatic and aromatic), including those organic compounds present in petrol.

Speciated VOC (by GC-MS) analysis quantifies the concentrations of 30 USA-EPA priority compounds. These include chlorinated alkanes and alkenes (in the molecular weight range chloroethane to tetrachloroethane); trimethylbenzenes; dichlorobenzenes; and the 4 BTEX compounds (benzene, ethyl-benzene, toluene & xylene).

Speciated sVOC by (GC-MS) analysis quantifies the concentrations of a variety of organic compounds, including the 16 USA-EPA priority PAHs, phenols, 7 USA EPA priority PCB congeners, herbicides & pesticides.

Note: PAHs are hydrocarbons and consequently (where present) will be picked-up when scheduling TPH. by GC-FID. Naphthalene (the lightest PAH) is also one of the 58 US EPA VOCs.

Speciated TPH by GC-FID *provides a "banded" TPH, initially split into aromatic and aliphatic* fractions and then further divided into fraction specific carbon bandings based upon behavioural characteristics.

Note: Risk assessment models require physiochemical properties (solubilities, toxicities etc) of compounds in order to model their behaviour in the environment. These physiochemical properties cannot be derived from a single "TPH", "GRO" or "DRO" value. However, the carbon banded fractions can be used in risk assessment models.

If the relative proportion of each carbon banding within the "TPH" impact at a site is known, the risks posed by each individual fraction can be assessed and a simple back calculation applied to calculate an overall "TPH" screening value based upon the percentage weight fraction of each banding present in the "TPH". Specialised analytical techniques and data interpretation skills are required to identify each carbon banding.

Current Guidance

The UK approach to the consideration of contaminated land is based upon the principles of risk assessment. This in turn is founded upon the use of so called source⇨pathway⇨target principles in order to establish the presence, or potential presence, of a pollutant linkage.

Encia Consulting Ltd adopts a tiered approach to risk assessment, consistent with UK guidance and best practice. The initial step of such a risk assessment (or Tier 1) is the comparison of site data with appropriate guidance levels, intervention levels or remedial targets.

In March 2002 DEFRA and the Environment Agency published a series of technical research papers (R & D Publications CLR 7, 8, 9 and 10) introducing the UK approach to the assessment of risk to **human health** from land contamination. This methodology and approach represents current scientific knowledge and thinking. The overall methodology also included the Contaminated Land Exposure Model (CLEA) and some Soil Guideline Values (SGV's).

At the time of writing this report, these guidelines only address seven contaminants and the development of both the CLEA model and additional SGV's is ongoing. Where published, SGV's have been utilised as intervention values for the purpose of an initial Tier 1 assessment.

Where SGV's were not published at the time of writing this report, appropriate Tier 1 human health related assessments have been based upon information that was best available at the time of the study.

Tier 1 **groundwater** risk assessments are undertaken by comparing leachate concentrations with the appropriate water quality standard. Depending upon the specific characteristics and environmental setting of the site the appropriate standard is likely to be one of the following:

- Water Supply (Water Quality) Regulations 1989
- Environmental Quality Standards (for Freshwater)
- The Surface Waters (Abstraction for Drinking Water) Regulations

The tier 1 risk assessment of **landfill gas** is undertaken through reference to the following documents:

- Approved Document C, Building Regulations 1991
- CIRIA Report 149, "Protecting Development from Methane", 1995

Should any Tier 1 criteria be exceeded, then three potential courses of action are available. (The first is only applicable in terms of human health, but the second and third could also be applied to groundwater or landfill gas).

- Undertake further statistical analysis following the approach set out in Appendix A of CLR 7 in order to determine whether contaminant concentrations of inorganic contaminants within soil\fill actually present a risk (only applicable to assessing the risk to human health).
- Based on a qualitative risk assessment, advocate an appropriate level of remediation to "break" the pollutant linkage - for example the removal of the contaminated materials or the provision of a clean cover.
- Carry out a more detailed quantitative risk assessment in order to determine whether contamination risks actually exist.

The potential risk to **building materials** is considered through reference to relevant BRE Digests, with particular emphasis on BRE Special Digest 1, 'Sulphate and Acid Resistance of Concrete in the Ground', 2001.

With respect to the interpretation of the **calorific values**, at present there are no accepted methods to assess whether a sample is combustible and under what circumstances it might smoulder. Some guidance is given in ICRCL Note 61/84 "Notes on the fire hazards of contaminated land" which states that:

"In general.....it seems likely that materials whose CV's exceed 10MJ/kg are almost certainly combustible, while those with values below 2MJ/kg are unlikely to burn".

Since the withdrawal of the ICRCL values in December 2002, there has seemingly been no direct UK reference for the assessment of potential **phytotoxic effects** of contaminants. Encia however continue to use the former ICRCL values for copper, nickel and zinc as the withdrawal of this guidance was in relation to human health implications only.

5. Hazardous Gas

General

Hazardous gas is considered to be any mixture of potentially explosive, toxic or asphyxiating gases, most notably methane, carbon dioxide and oxygen (deficiency).

In addition, radon, a naturally occurring radioactive gas is also considered. Further information about radon is included in Notes 1. – Environmental Setting.

Assessment of potential risks associated with hazardous gas are based on a review of data obtained from the Landmark Information Group, the Environment Agency and the Local Authority and the British Geological Survey.

Reference is also made to historical OS plans, which are inspected for evidence of backfilled quarries, railway cuttings, colliery spoil tips etc.

Where landfilling has occurred within 250m of the site boundary, the Local Planning Authority may request a landfill gas investigation in accordance with the Town and Country Planning General Development Order, 1988.

Sources

Potential sources of hazardous gas are:

- Landfill sites
- Made ground, especially where significant depths are present
- Shallow mineworkings associated with coal extraction
- Geological strata, including peat, organic silts, coal-bearing strata and limestone (reaction with acidic waters), granite (radon)
- Groundwater can sometimes act as a "carrier" for hazardous gas.
- Leakages from pipelines or storage tanks
- Sewers, septic tanks and cess pits

Generation

Wherever biodegradable material is deposited, landfill gas (principally a mixture of methane and carbon dioxide) is likely to be generated by microbial activity. Carbon dioxide is an asphyxiant and toxic; methane is flammable and a mixture containing between 5% and 15% methane by volume in air is explosive. Landfill gas in the ground is unlikely in itself to pose a significant risk, though it may damage vegetation. However, infiltration of landfill gas into confined spaces (e.g. cellars, services, etc) may give rise to considerable risk.

There is no typical figure for the length of time that landfill gas will be evolved, but at many sites significant gas generation continues for at least 15 years after the last deposit of waste.

Migration

Gas migration from a landfill site may occur in several ways. It may migrate through adjacent strata; the distance of migration being dependent on the pressure gradients, volume of gas and

permeability of the strata. Where there are faults, cavities and fissures within the strata, gas may move considerable distances. Other migration pathways for gas include man-made features such as mine shafts, roadways and underground services.

Gas migration is influenced by a number of climatic factors, such as atmospheric pressure variations, water table level variations and the influence of a covering of snow or ice over the surface of the site and surrounding area.

Current Guidance

Guidance on landfill gas monitoring control at landfill sites is given in two technical memoranda, Waste Management Paper Nos. 26 and 27, published by the Department of the Environment.

Waste Management Paper 27, 1991 recommends that no dwellings should be constructed within 50m of any landfill that has the capacity to produce large volumes of landfill gas. No garden should extend to within 10m of the landfilled waste. However, development closer to landfill has been permitted where a comprehensive gas risk assessment has been completed (typically based on a minimum of 6 to 12 month monitoring programme) and appropriate gas exclusion measures designed.

The current advice with regard to monitoring for landfill gas is that if the trigger value of 1% volume (20% LEL) for methane and 1.5% volume for carbon dioxide is exceeded then remedial/control measures will be required.

It should be noted that the guideline limit for carbon dioxide of 1.5% volume recommended in Waste Management paper No. 27 is the short term (10 minute) occupational exposure limit for carbon dioxide quoted by the Health and Safety Executive in their publication, EH40. The long-term (8 hour) occupational exposure limit for carbon dioxide is 0.5% volume.

Approved Document C to the Department of the Environment's Building Regulations 1992, requires that where there may be gaseous contamination of the ground but the level of methane is unlikely to exceed 1% by volume, the ground floor of any house or similar small building shall be constructed of suspended concrete and ventilated as described in BRE Digest Report "Construction of New Buildings on Gas Contaminated Land". The document also requires specific design measures to be taken if a level of 5% volume carbon dioxide exists or is exceeded within the ground.

Although the above guidance is still relevant it has been more recently updated with the following documents published by the Construction Industry Research and Information Association (CIRIA).

CIRIA Report 149 'Protecting Development from Methane' (1995)
CIRIA Report 150 'Methane Investigation Strategies' (1995)
CIRIA Report 151 'Interpreting Measurement of Gas in the Ground' (1995)
CIRIA Report 152 'Risk Assessment for Methane and other gases from the ground (1995)

The above documents are intended to provide advice on how to investigate and deal with gas contaminated ground with respect to development.

CIRIA report 149 characterised sites based on the recorded methane / carbon dioxide concentration and emission rates recorded during a suitable gas investigation. Characteristic situation 1 is deemed to be the lowest risk scenario with the risk rating increasing up to 6. The characteristic situations are classified as follows:

Gassing regime in ground			
Methane (% by volume in air)	Carbon dioxide (% by volume in air)	Emission rate [1] (m/s)	Characteristic situation [2]
<0.1	<1.5	Not detected	1
>0.1 - 1	>1.5 - 5	Not detected	2
>1 -5	<5	Not detected	3
>5 - 20	<20	<0.01	4
>20	>20	>0.01 - 0.05	5
>20	>20	>0.05	6

Notes:
1. Emission rate values measured as equivalent total gas flow velocity from a 50mm diameter borehole; for methods of measurement see Crowhurst and Manchester (1992).
2. Highest measured parameter used as determining factor.

CIRIA Report 151 (1995) identified that there is currently inadequate guidance on trigger concentrations for ground gases. The current emphasis on using gas concentrations for trigger values particularly in Waste Management Paper 27 and the Building Regulations, should be revised to consider gas pressures, borehole flow rates and estimated surface emission rates.

It was concluded that the most important aspect of relating the gas regime below or adjacent to a site, to the risk it poses to any development, is the surface emission rate, i.e. how quickly the gas is coming out of the ground. The lower the surface emission rate the lower the risk. This is considered further in the DETR Partners in Technology Report ' Passive venting of soil gases beneath buildings' (September 1997).

CIRIA Report 149 (1995), reference Table 28, reviewed over 100 case studies of development affected by gas to establish current UK practices for gas control. The report classified the gassing regimes found within 6 Characteristic Situations. The highest measured parameter, either methane or carbon dioxide concentration and/or emission rate were used to define the Characteristic Situation for each case history site. The report then related the typical range of mitigation measures that had been adopted at each study site to the characteristic gas situation.

To achieve a more consistent design of protection measures Table 28 of CIRIA 149 was rewritten (Wilson and Card, 1999) in terms of borehole gas volume flow rate and gas concentrations, as reproduced in the Table below. This was done to reflect the importance of recognising the gas surface emission rate.

Characteristic Situations based on Gas Flux

Characteristic Situation	Limiting CH_4 Concentration (% v/v)	Limiting CO_2 Concentration (% v/v)	Limiting Borehole Flow Velocity (m/s)	Limiting Borehole Gas Volume Flow (litre/hour)	
				CH_4	CO_2
1	<0.1	<0.1	<0.005	<0.035	<0.035
2	<1.0	<1.5	<0.005	<0.35	<0.5
3	<5.0	<5.0	<0.005	<1.75	<1.75
4	<20	<20	<0.01	<14	<14
5	>20	>20	<0.05	<70	<70
6	>20	>20	<0.05	>70	>70

Notes:
Borehole flow velocity measured in 50 mm diameter standpipe
Table 28, CIRIA 149 - not detected: has been replaced with assumed flow velocity of 0.005 m/s.

Gas Monitoring Procedure

Encia adopt a standard gas monitoring procedure, in accordance with CIRIA guidance. This procedure involves the measurement, in the following order of:

- Atmospheric temperature, pressure and ambient oxygen concentration on site immediately prior to and on completion of monitoring.
- Gas emission rate.
- Methane, oxygen and carbon dioxide concentrations using an infra-red gas analyser.
- Standing water level using a dipmeter.

In addition, ground conditions at each sampling location are recorded together with prevailing weather conditions and any other observations such as any vandalism.

Where samples of gas are required for laboratory analysis, Gresham Tubes are used. Gas concentrations in the well are typically recorded immediately before and after retrieval of a sample.

APPENDIX B
DRAWINGS

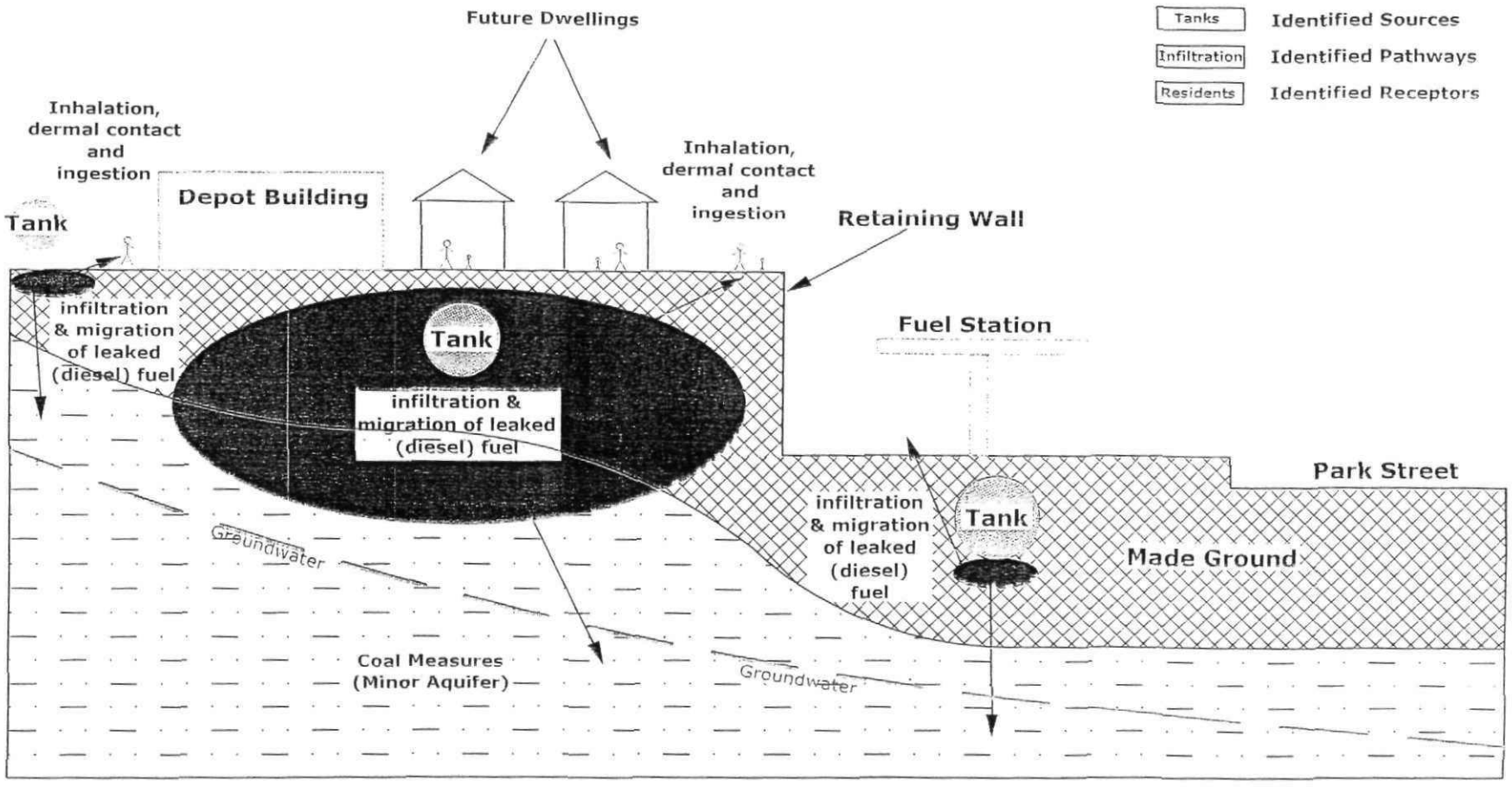


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ENCIA CONSULTING LIMITED

CLIENT	Ben Bailey Homes
JOB TITLE	Park Street, Wombwell
DRAWING TITLE	Site Location Plan

DRAWN BY	SIGNATURE	DATE	STATUS	
JWH		31/03/05	Final	
APPROVED	SIGNATURE	DATE	SCALE	DRG NO.
RLM		31/03/05	1:50,000	6177/1



ENCIA CONSULTING LIMITED
ENCIA HOUSE, AUDBY LANE
WETHERBY, WEST YORKSHIRE
TEL: - 01937 589955 FAX: - 01937 589944

CLIENT: BEN BAILEY HOMES LTD

JOB TITLE: PARK ST WOMBWELL

DRAWING TITLE: REVISED CONCEPTUAL SITE MODEL

DRAWN	OGO	SIGNATURE	DATE MAR 05
APPROVED	RLM	SIGNATURE	DATE MAR 05

STATUS: FOR COMMENT ☐ DRAFT ☐ FOR APPROVAL ☐ FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
NTS	A4	6177/5	



NOTES

NO ACCESS

HYDROCARBON CONTAMINATION

WS105 MG: Clean SST: Clean — SUMMARY OF CONTAMINATION

AREA BOUNDARY

SITE BOUNDARY

N

REV.	DESCRIPTION	DATE

ENCIA

CONSULTING LIMITED

ENCIA HOUSE, AUDBY LANE
WETHERBY, WEST YORKSHIRE
TEL: – 01937 589955 FAX: – 01937 589944

CLIENT

BEN BAILEY HOMES LIMITED

JOB TITLE

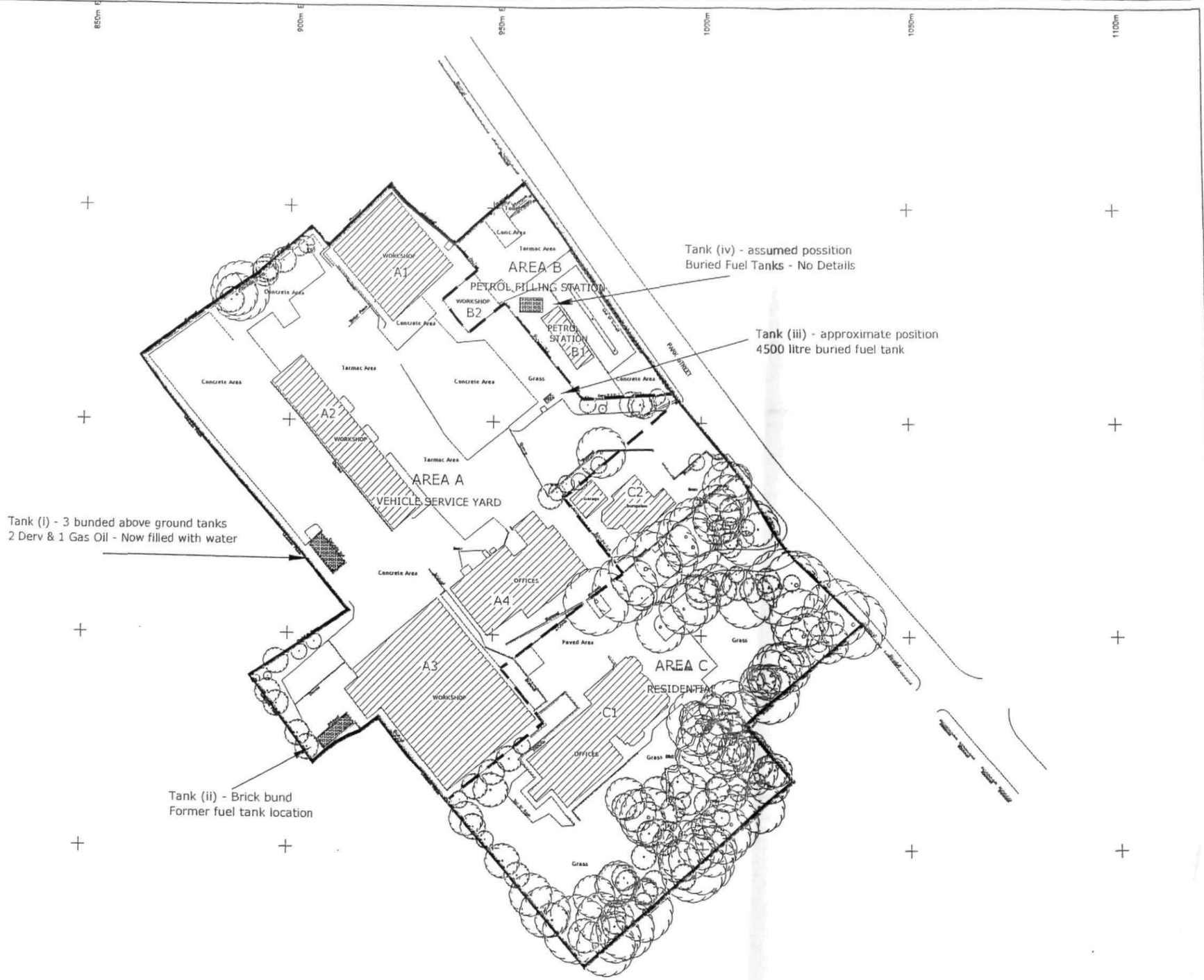
PARK STREET, WOMBWELL

DRAWING TITLE

AREA OF IDENTIFIED HYDROCARBON CONTAMINATION

DRAWN	SIGNITURE	DATE	STATUS
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APPROVED	SIGNITURE	DATE	FOR APPROVAL ☐
RLM		MAR 05	DRAFT ☐
			FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
1:500	A3	6177/6	0



NOTES

A1 BUILDING NUMBER (see report text

TANK LOCATIONS

AREA BOUNDARY

SITE BOUNDARY

N

REV.	DESCRIPTION	DATE

ENCIA

CONSULTING

LIMITED

ENCIA HOUSE, AUDBY LANE
WETHERBY, WEST YORKSHIRE
TEL: – 01937 589955 FAX: – 01937 589944

CLIENT

BEN BAILEY HOMES LIMITED

JOB TITLE

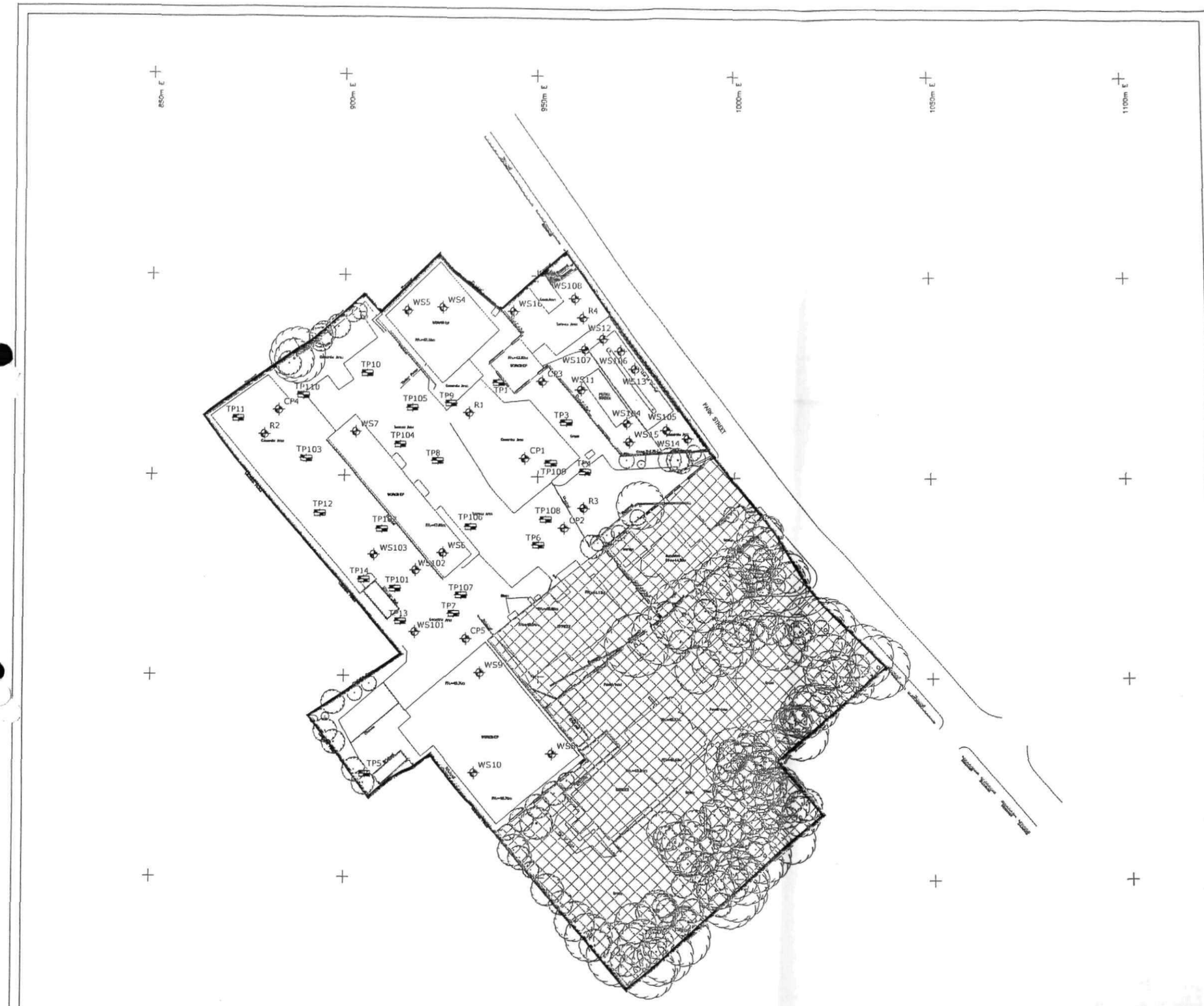
PARK STREET, WOMBWELL

DRAWING TITLE

SITE FEATURES PLAN

DRAWN	SIGNITURE	DATE	STATUS
OGO		MAR 05	FOR COMMENT ☐
APPROVED	SIGNITURE	DATE	FOR APPROVAL ☐
RLM		MAR 05	DRAFT ☐
			FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
1:1,000	A3	6177/2	0



NOTES

ENCIA INVESTIGATION WORKS

- TP101 TRIAL PIT
- WS101 WINDOW SAMPLE BOREHOLE
- NO ACCESS FOR INVESTIGATION

SIRIUS INVESTIGATION WORKS

- TP1 TRIAL PIT
- WS11 WINDOW SAMPLE BOREHOLE
- CP1 CABLE PERCUSSION BOREHOLE
- R1 ROTARY PROBE HOLE

ENCIA
CONSULTING
LIMITED
ENCIA HOUSE, AUDBY LANE
WETHERBY, WEST YORKSHIRE
TEL: – 01937 589955 FAX: – 01937 589944

CLIENT

BEN BAILEY HOMES LIMITED

JOB TITLE

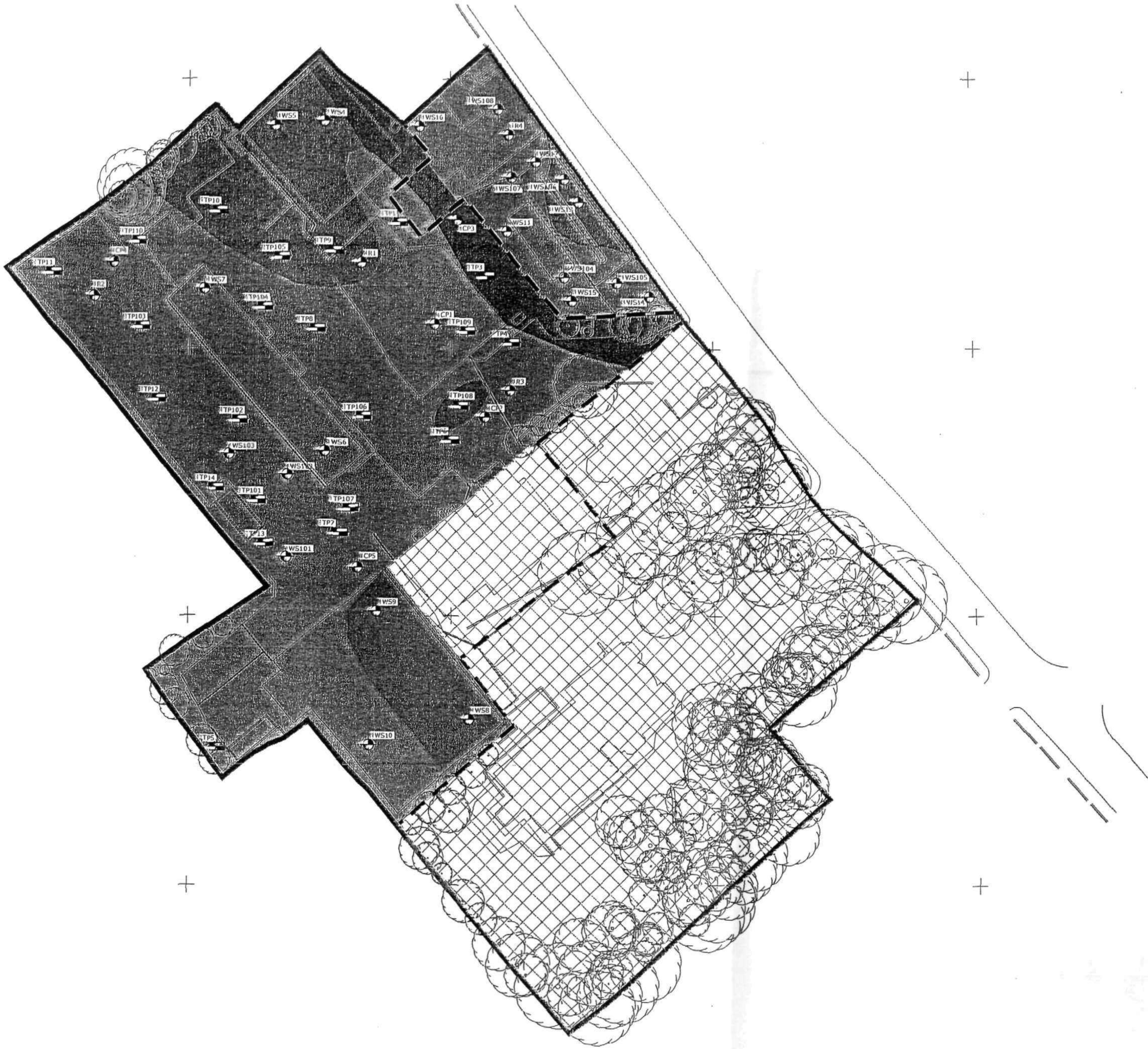
PARK STREET, WOMBWELL

DRAWING TITLE

SITE INVESTIGATION WORKS

DRAWN	SIGNITURE	DATE	STATUS
OGO		MAR 05	FOR COMMENT ☐
APPROVED	SIGNITURE	DATE	FOR APPROVAL ☐
RLM		MAR 05	DRAFT ☐
			FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
1:1,000	A3	6177/3	0



NOTES

MADE GROUND THICKNESS < 1.2m

MADE GROUND THICKNESS 1.2 - 2.5m

MADE GROUND THICKNESS > 2.5m

NO ACCESS FOR INVESTIGATION

N

REV.	DESCRIPTION	DATE

ENCIA

CONSULTING
LIMITED

ENCIA HOUSE, AUDBY LANE
WETHERBY, WEST YORKSHIRE
TEL: – 01937 589955 FAX: – 01937 589944

CLIENT

BEN BAILEY HOMES LIMITED

JOB TITLE

PARK STREET, WOMBWELL

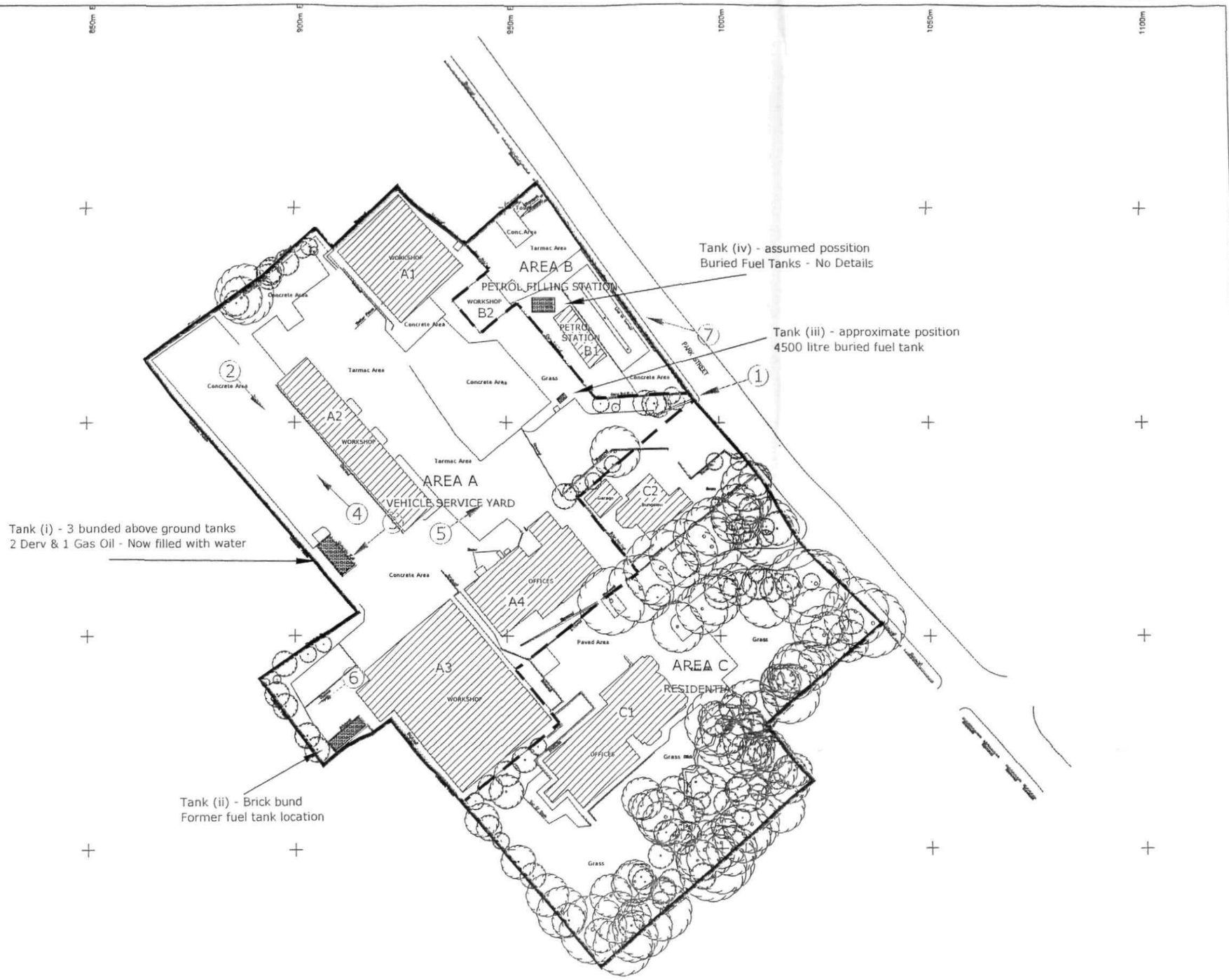
DRAWING TITLE

MADE GROUND THICKNESS

DRAWN	SIGNITURE	DATE	STATUS
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APPROVED	SIGNITURE	DATE	
RLM		APRIL 05	DRAFT ☐ FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
1:1,000	A3	6177/4	0

APPENDIX C
PHOTOGRAPHIC SURVEY



NOTES

1 PHOTOGRAPH & DIRECTION

A1 BUILDING NUMBER (see report text

TANK LOCATIONS

AREA BOUNDARY

SITE BOUNDARY

N

REV.	DESCRIPTION	DATE

ENCIA

CONSULTING LIMITED

ENCIA HOUSE, AUDBY LANE
WETHERBY, WEST YORKSHIRE
TEL: – 01937 589955 FAX: – 01937 589944

CLIENT

BEN BAILEY HOMES LIMITED

JOB TITLE

PARK STREET, WOMBWELL

DRAWING TITLE

PHOTOGRAPH SURVEY

DRAWN	SIGNATURE	DATE	STATUS
OGO		MAR 05	FOR COMMENT ☐
APPROVED	SIGNATURE	DATE	FOR APPROVAL ☐
OGO		MAR 05	DRAFT ☐
			FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
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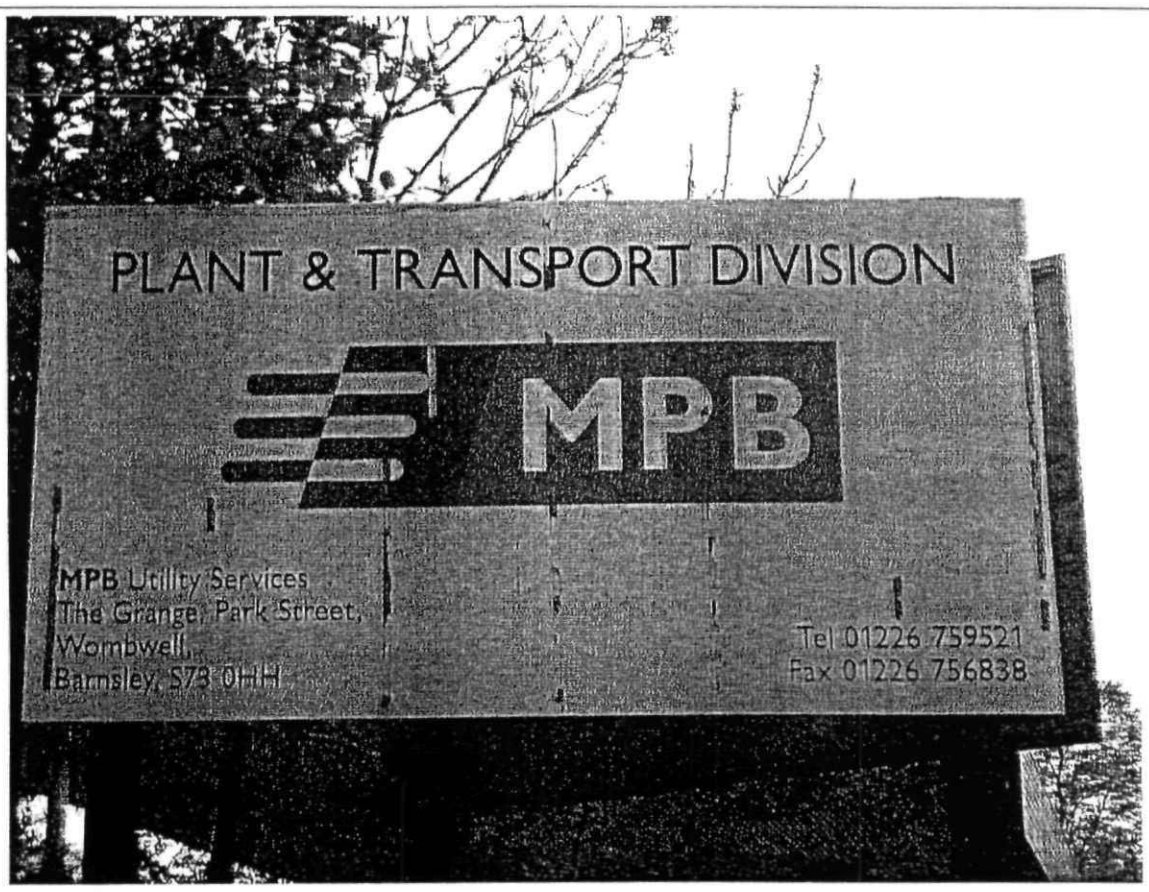


Photo 1 – Entrance To Vehicle Service Yard (Area A)



Photo 2 – Rear Yard (Area A)

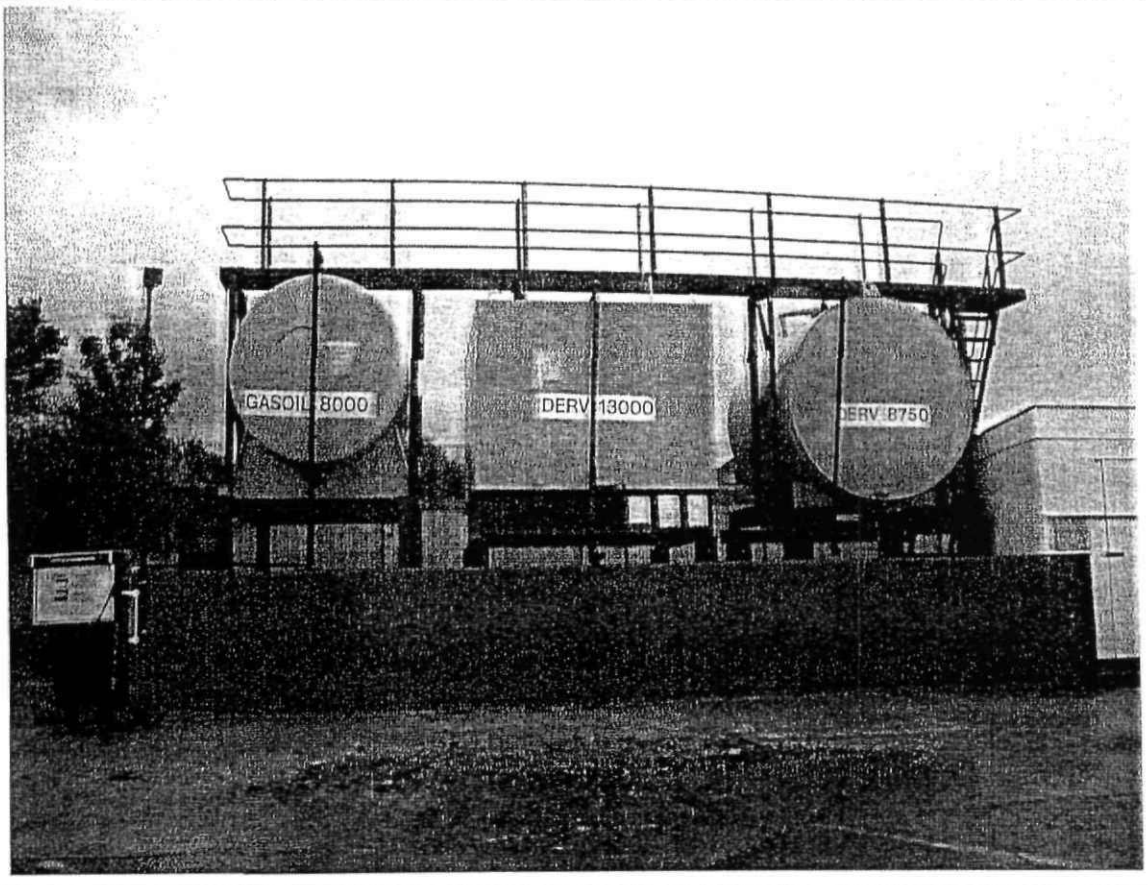


Photo 3 – Bunded Fuel Tanks (Area A – "i")

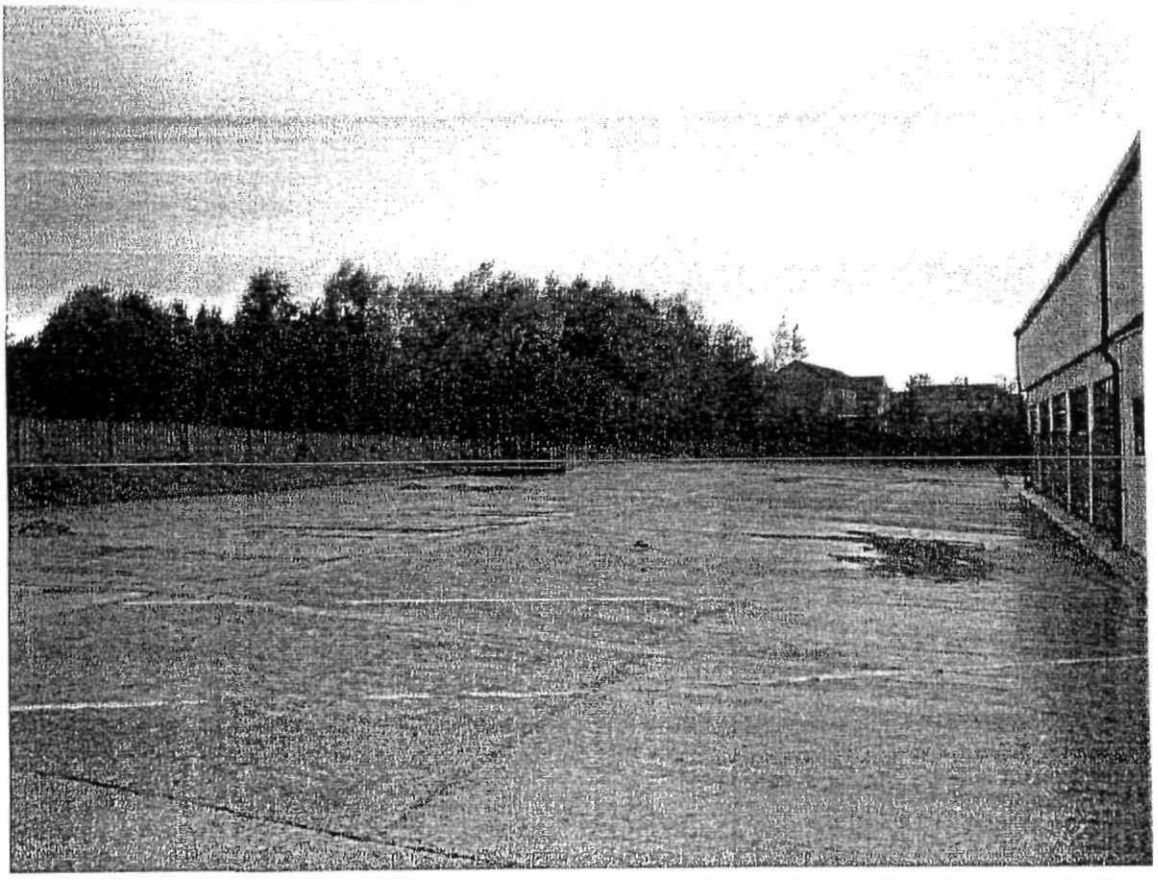


Photo 4 – Rear Yard (Area A)

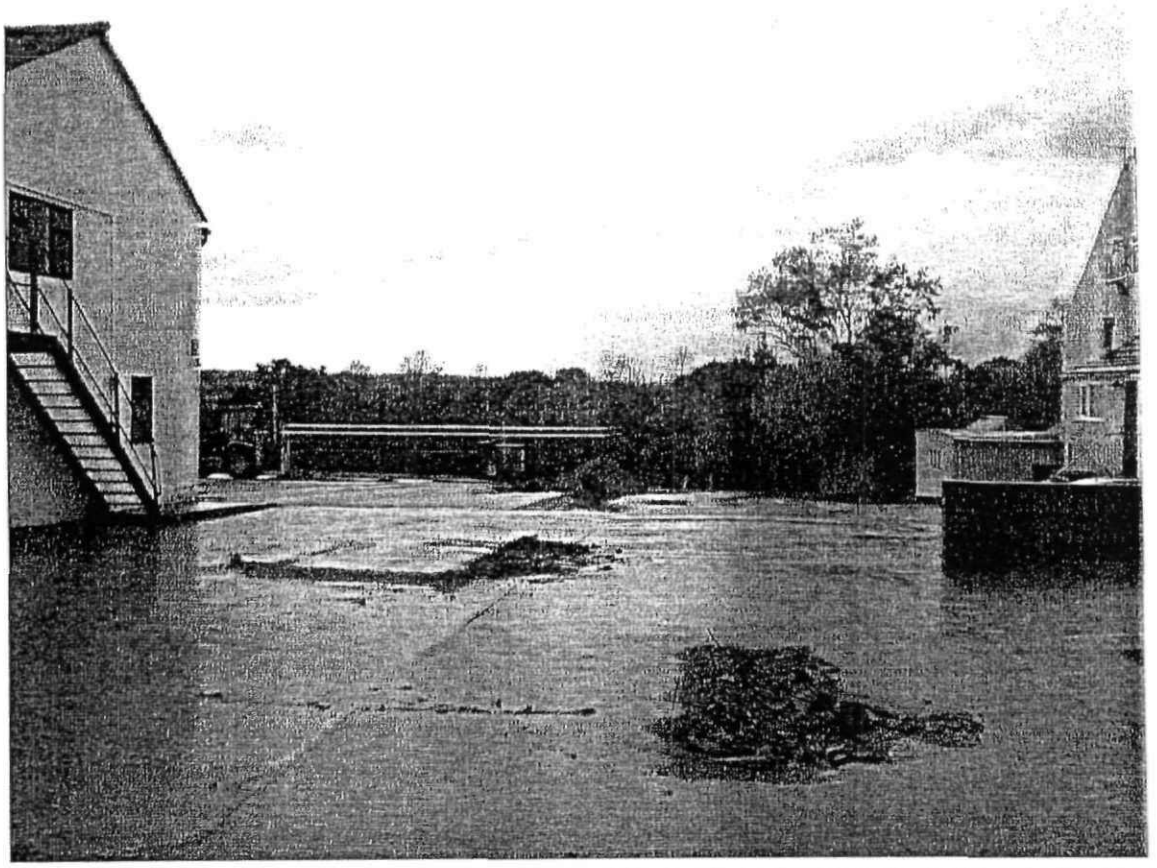


Photo 5 – Hardstand (Area A)

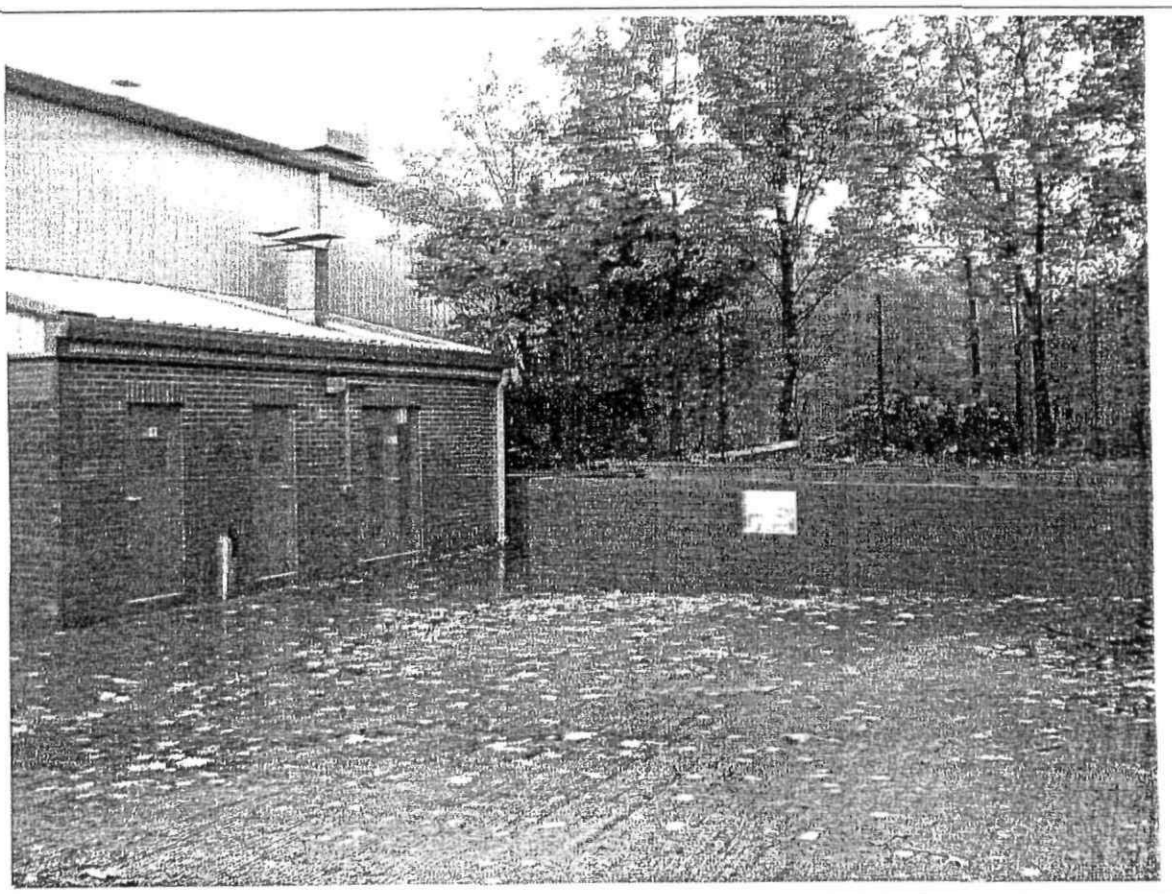


Photo 6 – Former Tank Location (Area A – "ii")



Photo 7 – Former Petrol Filling Station (Area B)

APPENDIX D
SEARCH RESPONSES & OTHER CORRESPONDENCE

BARNSLEY
Metropolitan Borough Council

Assistant Director, Planning and Transportation:
Ruth Middleton BA (Hons), MRTPI, Dip Surv

Building Control Manager:
Ken Jackson MIBC
Central Offices, Kendray Street, Barnsley, S70 2TN

PLANNING and TRANSPORTATION SERVICE — BUILDING CONTROL SERVICE

FAX TO :- Hellen Corker

FROM :- DAVE MURDOCH

SIRIUS.

Phone :-
Fax Phone :- 0191 378 1537

Dial Direct: (01226) 772664
Fax Phone: (01226) 772698

Number of Pages :-
(including this page)

Date :- 25/11/03

YOUR REF CO204 PARK ST WOMBWELL

Underlying Ground Conditions Sandstone
FAULT Runs down the length of Park St
No Mining has taken place since 1976
Part of site within 250m of a Category 2 Landfill area.
Possible petroleum & Diesel Contaminants on Site

Dave Murdoch.

Page 1 of

FACSIMILE TRANSMISSION

Local Authority BUILDING CONTROL

If replying by facsimile transmission please use Fax Phone: (01226) 772698
Address all other correspondence to the Building Control Manager

Awarded for excellence

TOTAL P.01

South Yorkshire
Fire and Rescue Service

B R O'Donnell, OStJ, QFSM, MIFireE
Chief Fire Officer / Chief Executive

Your Ref:

Our Ref:

Dearne District Fire Safety
Broadway
Barnsley
South Yorkshire S70 6RA
Telephone: 01226 282222
Fax: 01226 247712
Website: www.syfire.org.uk

FAX COVER SHEET

TO:	NAME: Helen Cowker	DATE: 25/11/03
	ORGANISATION:	NO. OF PAGES: 2 inc this one.
	FAX NO.: 0191 378 1537	
FROM:	NAME: Simon Walsh.	DIRECT LINE:

MESSAGE:

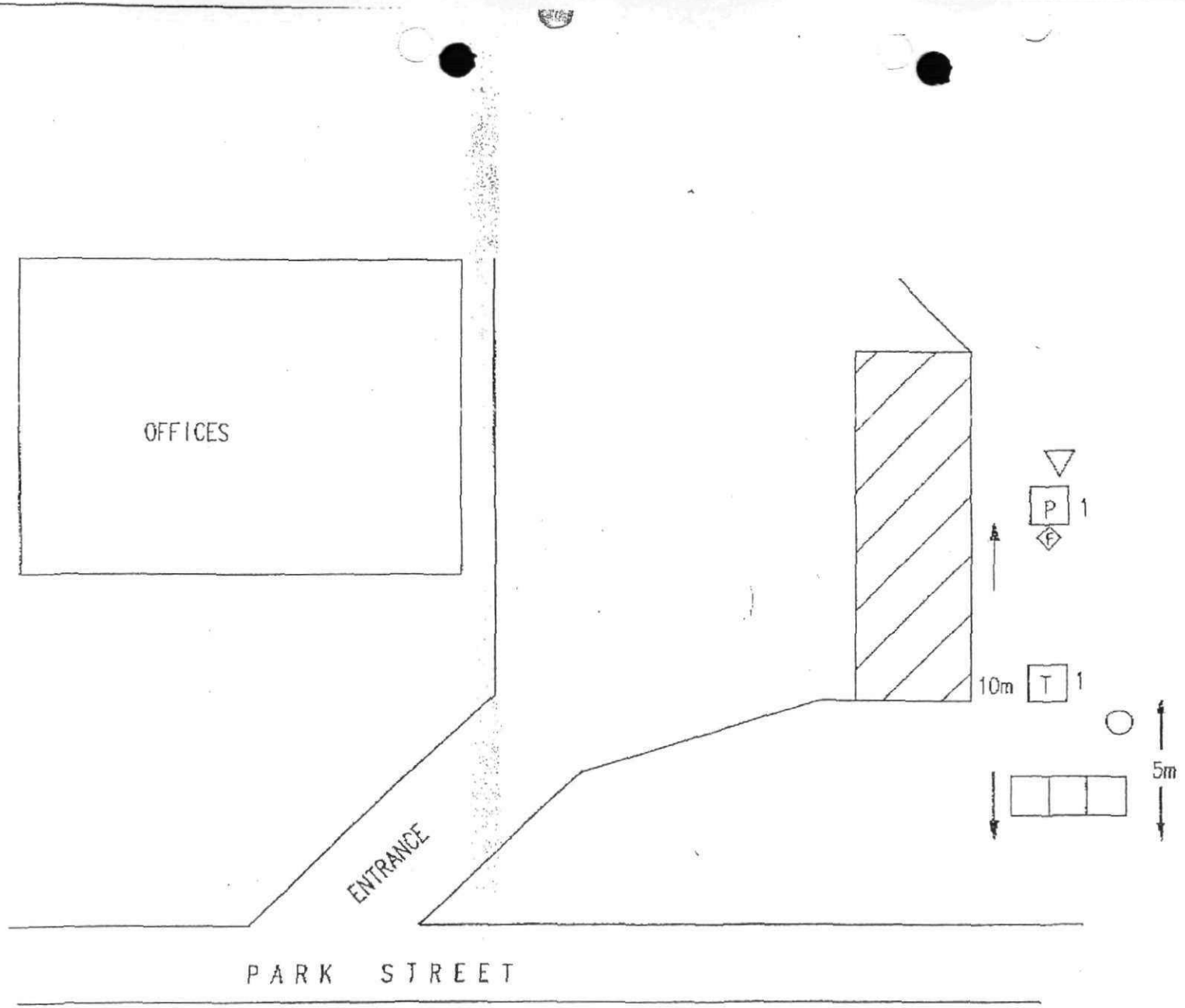
Site plan for MP Burke.

Awarded for excellence

SOUTH YORKSHIRE FIRE AND CIVIL DEFENCE AUTHORITY

INVESTOR IN PEOPLE

FIRE KILLS
YOU CAN PREVENT IT



SOUTH YORKSHIRE FIRE & CIVIL DEFENCE AUTHORITY

Approximate Scale NONE	Sheet 1 of 1
Drawn P.T.	Approved
Scheme R.A.F	Plan No NA18

This plan forms part of petroleum licence no. A21 and must not be defaced. It is unlawful for any other purpose to set fire to or smoke

M P BURKE DEVELOPMENTS LTD
78 PARK STREET
WOMBWELL
BARNSLEY S73 0HH

T, STORAGE TANK (NUMBERED)

P, PUMP WITH SITE NUMBER

STANDARD FIRE EXTINGUISHER

VENT PIPE STACK

INTERCEPTOR

F, FIREMANS SWITCH

TANKER STAND

The Coal Authority,
Mining Reports Office,
200 LICHFIELD LANE,
BERRY HILL,
MANSFIELD,
NOTTINGHAMSHIRE,
NG18 4RG
Telephone: 0845 762 6848
DX 716176 MANSFIELD 5
On-Line Service: www.coalminingreports.co.uk

The
COAL AUTHORITY

The Coal Authority	
Cost:	£38.30
Plus V.A.T.	£6.70
Total Received:	£45.00
V.A.T. Reg Number	598 5850 68

H CORKER,
SIRIUS,
SUITE 2,
HALL ROAD,
LANGLEY MOOR,
DURHAM

INFORMATION
ACTION
0 4 DEC 2003
COPIES
FILE

This matter is being dealt with by Darren Moody

Our Ref: 547178-03

Your Ref: 0285 C0204 HC

Electronic Ref:

Date: 27 November 2003

Dear Sir,

Coal Mining Report

LAND OFF, PARK ROAD, WOMBWELL, BARNSLEY, SOUTH YORKSHIRE

I refer to the enquiry dated 25th November 2003, received 26th November 2003, in connection with the above.

This report is based on and limited to the records in the possession of The Coal Authority at the time the search is answered.

Ordnance Survey (O.S.) is undertaking a Positional Accuracy Improvement Programme of its mapping data. The Coal Authority (CA) has no control over the timing of issue of Positionally Improved mapping data by O.S. or over users of that data. In some instances the relative position between surface features and coal mining features may alter as a consequence of this programme. The CA will ensure that the integrity of its database is maintained by replotting some mining information to sustain the relationship between that mining information and the improved O.S. surface positions, some of which are now being released. However, mining reports are currently being produced against pre improved O.S. mapping whilst the Authority updates its database in line with the O.S. changes.

Past Underground Mining

The property is within the likely zone of influence on the surface from workings in 6 seams of coal at 160m to 590m depth, the last date of working being 1977.

Ground movement from the above mentioned past coal workings should by now have ceased.

Present Underground Mining

The property is not within the zone of likely physical influence on the surface from any present underground coal workings.

Future Underground Mining

The property is not within a geographical area for which a licence to extract coal by underground methods is awaiting determination by the Coal Authority.

The property is not within a geographical area for which a licence to extract coal by underground methods has been granted.

The property is not within the zone of likely physical influence at the surface from plans of future workings in our possession.

However reserves of coal exist in the locality which could be worked at some time in the future subject to feasibility, licences, and planning consents.

We have no record of any notice of the risk of the land being affected by subsidence being given under S.46 of the Coal Mining Subsidence Act 1991.

Shafts and Adits

We have no knowledge of any mine entries within, or within 20 metres of, the boundary of the property.

Surface Geology

Records in our possession do not disclose any fault or other line of weakness at the surface as having affected the stability of the property.

Past Opencast Mining

The property is not located within the geographical boundary of an opencast site from which coal has been extracted by opencast methods.

Present Opencast Mining

The property does not lie within 200 metres of the geographical boundary of an opencast site within which coal is being extracted by opencast methods.

Future Opencast Mining

The property is not within 800 metres of the geographical boundary of an opencast site for which a licence to extract coal by opencast methods is awaiting determination.

The property is not within 800 metres of the geographical site boundary of an opencast site for which a licence to extract coal by opencast methods has been granted.

Subsidence

The records in our possession do not disclose any damage notice or claim having been given, made or pursued in respect of the property since 1 January 1984.

The records in our possession do not disclose any current "Stop Notice" affecting the property.

The records in our possession do not show any request having been made to execute preventative works under S.33 of the Coal Mining Subsidence Act 1991.

Withdrawal of Support

The property lies within a geographical area in respect of which a notice of entitlement to withdraw support was published in 1983.

The property does not lie within a geographical area in respect of which a notice has been given under S.41 of the Coal Industry Act 1994, revoking the entitlement to withdraw support.

Working Facilities Orders

The property is not within a geographical area that is the subject of an Order made under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

Payments to Owners of Former Copyhold Land

The property is not within an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Additional Remarks

These replies are prepared in accordance with the 2003 editions of the Coal Authority's Terms and Conditions, User Guide and the Law Society's Guidance Notes.

Copyright in coal mining reports and certificates and the information contained therein is with the Coal Authority. All rights are reserved and unauthorised use is prohibited. Copyright and other Intellectual Property is not transferred to external parties by possession of a mining report or certificate.

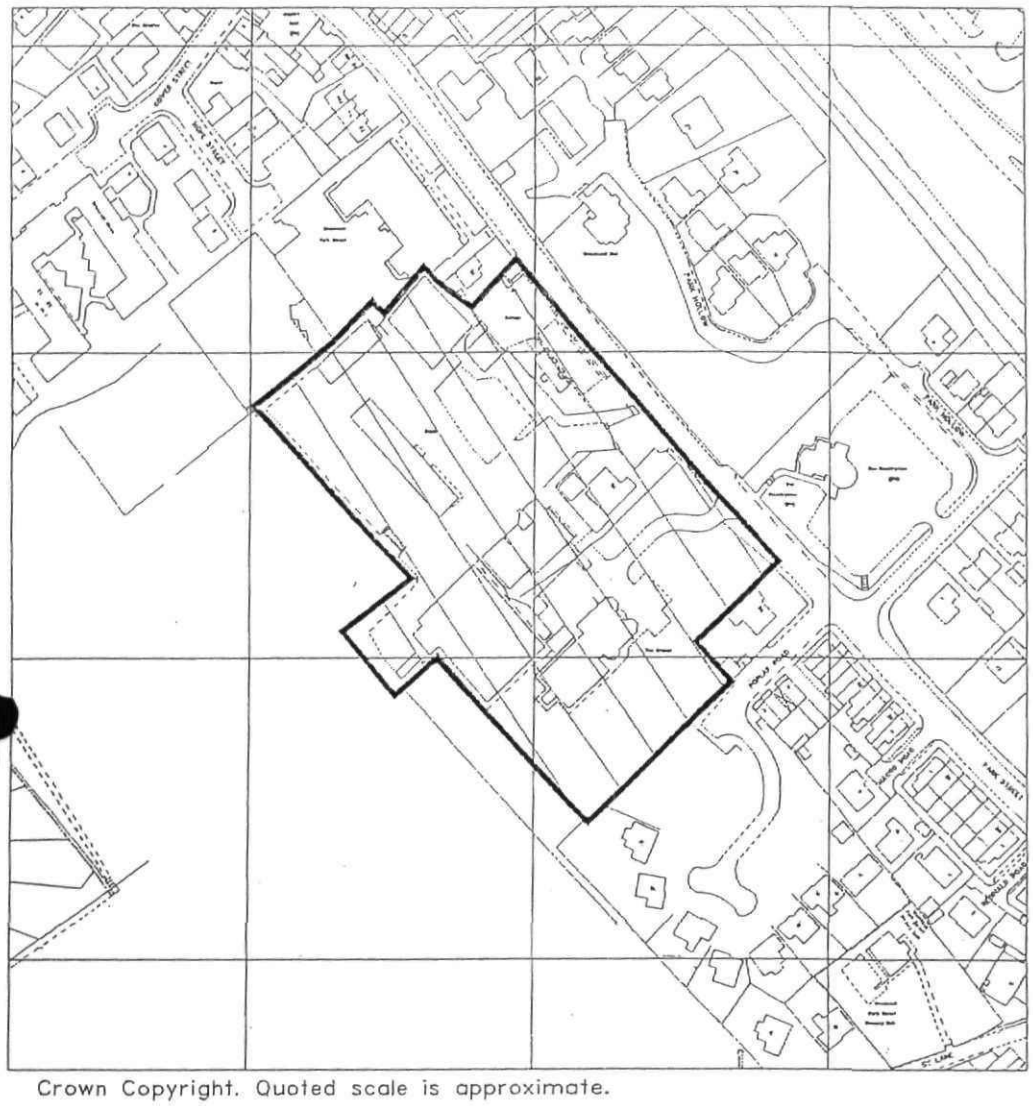
We acknowledge the receipt of your remittance in payment of our fee.

Yours faithfully

A Schofield

Albert Schofield

Director of Mining Information and Services



Crown Copyright. Quoted scale is approximate.

SCALE: 1:2500

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This is a plan of the boundaries of the property in respect of which this report has been prepared. It is the responsibility of the user to ensure that the boundaries shown correspond with those of the property.

APPROXIMATE POSITION OF ENQUIRY BOUNDARY SHOWN

BARNSLEY
Metropolitan Borough Council

INFORMATION
ACTION
05 DEC 2003
COPIES
FILE

Planning & Transportation Service
Assistant Director, Ruth Middleton BA (Hons). MRTPI. Dip Surv
South Yorkshire Mining Advisory Service
Mining Advisory Manager: C. P. Naylor, CEng., MIMM.,
Central Offices, Kendray Street, Barnsley, S70 2TN
Tel: (01226) 772685 Fax: (01226) 772688
Email: SYMAS@barnsley.gov.uk

My Ref: RCH/SML/M2982/2 Your Ref: C0204

Date: 2nd December, 2003 Enquiries to: Mr. R. C. Hunter Dial Direct: (01226) 772687

Sirius Geotechnical & Environmental,
Suite 2,
Russell House,
Mill Road,
Langley Moor.
DH7 8HJ

FOR THE ATTENTION OF HELEN CORKER

Dear Sir,

LAND OFF PARK STREET, WOMBWELL

Further to your fax of the 25th November 2003, in respect of the above, please find enclosed a mineral report and plans which outline the mining and geological information.

Yours faithfully,

C. P. Naylor

C. P. Naylor,
Mining Advisory Manager.

Enc.

SOUTH YORKSHIRE MINING ADVISORY SERVICE

MINERAL REPORT

IFIDENTIAL

Date: 2/12/2003
Ref: RCH/SML/M2982/2

LAND OFF PARK STREET, WOMBWELL

TUATION

The land under consideration is shown edged orange on the attached plan no. M2982/2A.

EOLOGY

Geological records indicate the site is situated on the Oaks Rock Sandstone of the Middle Coal Measures.

The conjectured position of a geological fault along the north-east boundary of the land is shown in blue on plan. The fault is estimated to have a vertical displacement of about 15 m in this vicinity.

Natural fissures may be present in the sandstone bedrock which may have been opened out by past mining activities as indicated below.

MINING

The following coal seams were extracted in the past within the support area of the site:

Seam	Depth (m)	Thickness (mm)	Date
Low Beamshaw	160	650	1944
Barnsley	285	2000	Pre 1900
Swallow Wood	310	1380	1962
Parkgate	500	1520	1928
Silkstone	585	910	1976

All subsidence movement from these workings will have ceased over 25 years ago, and as the site lies remote from the active coalfield it should not be affected in the future.

FORMER LAND USE

The relevant Ordnance Survey Sheet 283/2 (1930 Edition) shows the site to be occupied by Poplar Farm and Wombwell Grange with a tramway in Park Street (see attached plan no. M2982/2B).

LANDFILL

The site lies within 250 m of a Category 4 (No. 143) Landfill Site, as indicated on the current Borough Landfill Site Map and is illustrated on attached plan no. M2982/2C.

CONCLUSIONS

1. The site is stable from the deep mining subsidence aspect and will remain so in the future.

2. The site is located on the Oaks Rock Sandstone that may be fissured both naturally and mining induced. Any future development will require suitably strengthened foundations where any fractured/weak ground is encountered.

   The geological fault running along the line of Park Street to the north-east of the site should present no problems to any future development.

   The location has been undermined in the past in four coal seams and there has been no history of associated fault movement.

3. Future development works should taken into account the possible existence of former foundations/services that may remain from past structures occupying the site.

4. The site lies within 250 m of a Category 4 (No. 143) Landfill Site which is a site which the Waste Disposal Site Licence indicates has been licensed to accept material that would not be expected to give rise to landfill gas in substantial quantities.

   Or a site which has been granted an exemption from Waste Management Licensing pursuant to the provisions of the Waste Management Licensing Regulations 1994.

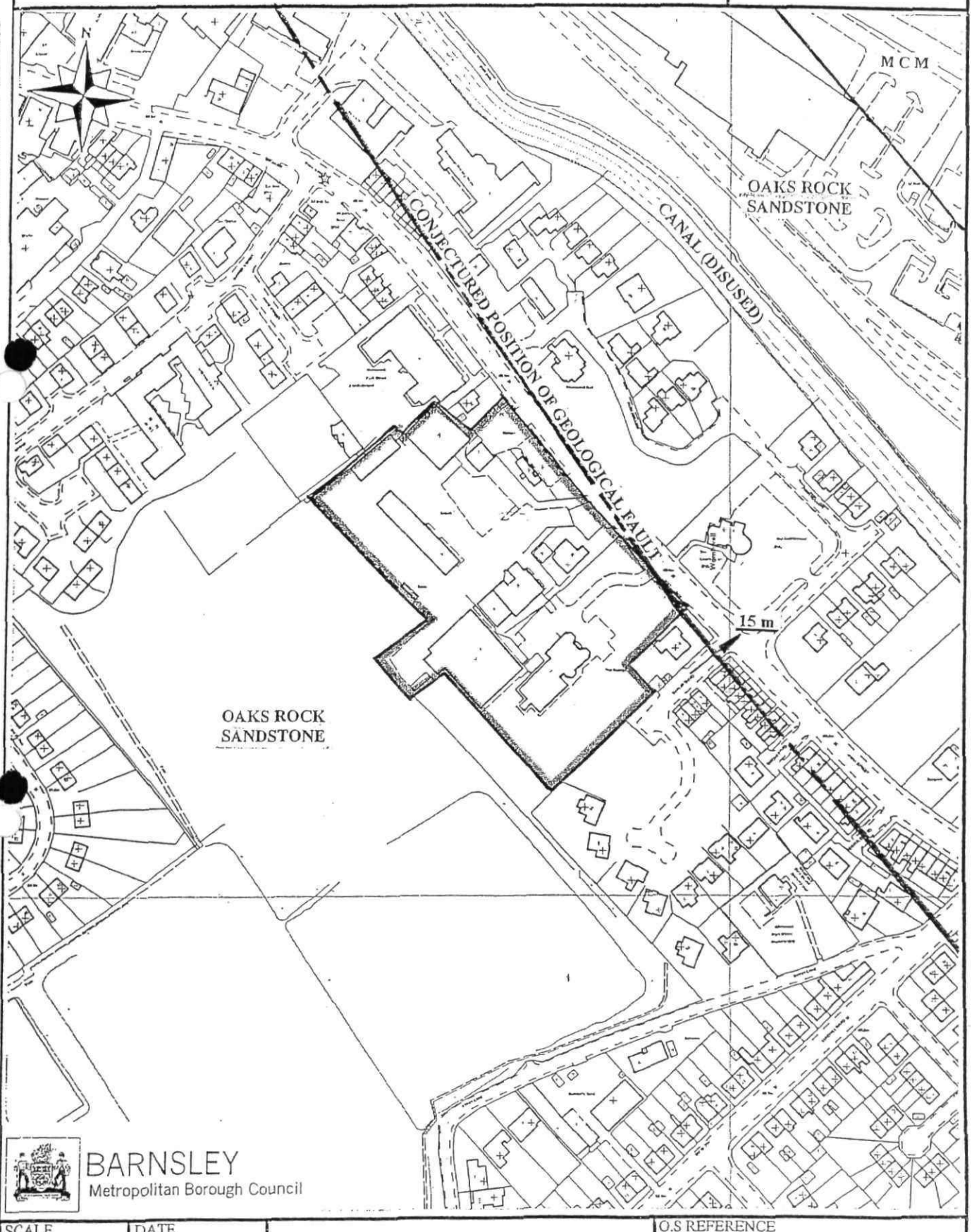
C. P. Naylor,
Mining Advisory Manager.

DRAWING TITLE

LAND OFF PARK STREET, WOMBWELL, BARNSLEY

DRAWING NO.

M2982 / 2A



BARNSLEY
Metropolitan Borough Council

SCALE	DATE		O.S REFERENCE
1 : 2500	3 / 12 / 03	SOUTH YORKSHIRE MINING ADVISORY SERVICE	SE 4002
DRAWN BY: S M L	CHECKED BY: RCH		C. P. NAYLOR C.ENG M.I.M.M MINING ADVISORY MANAGER

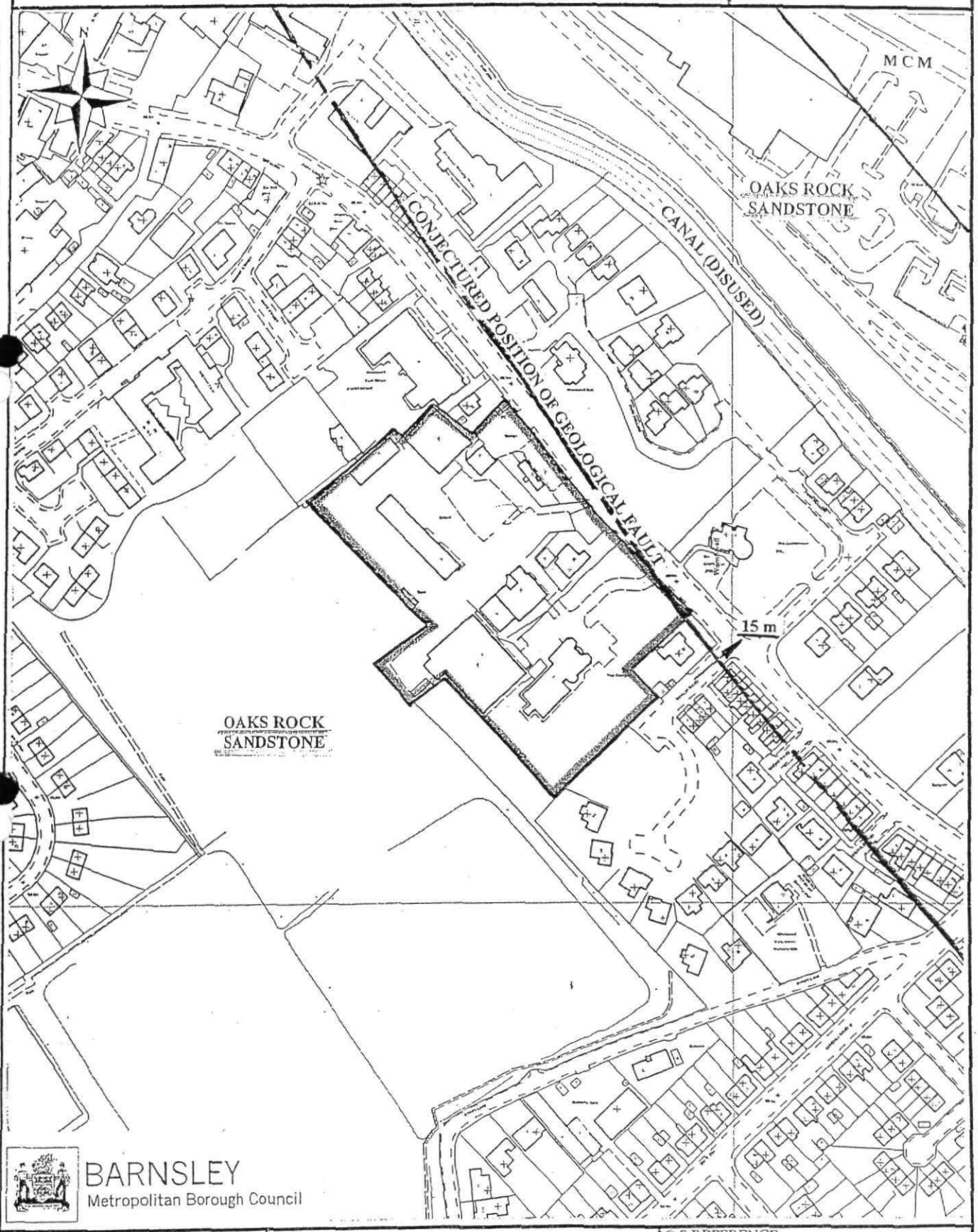
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DRAWING NO.

M2982 / 2A



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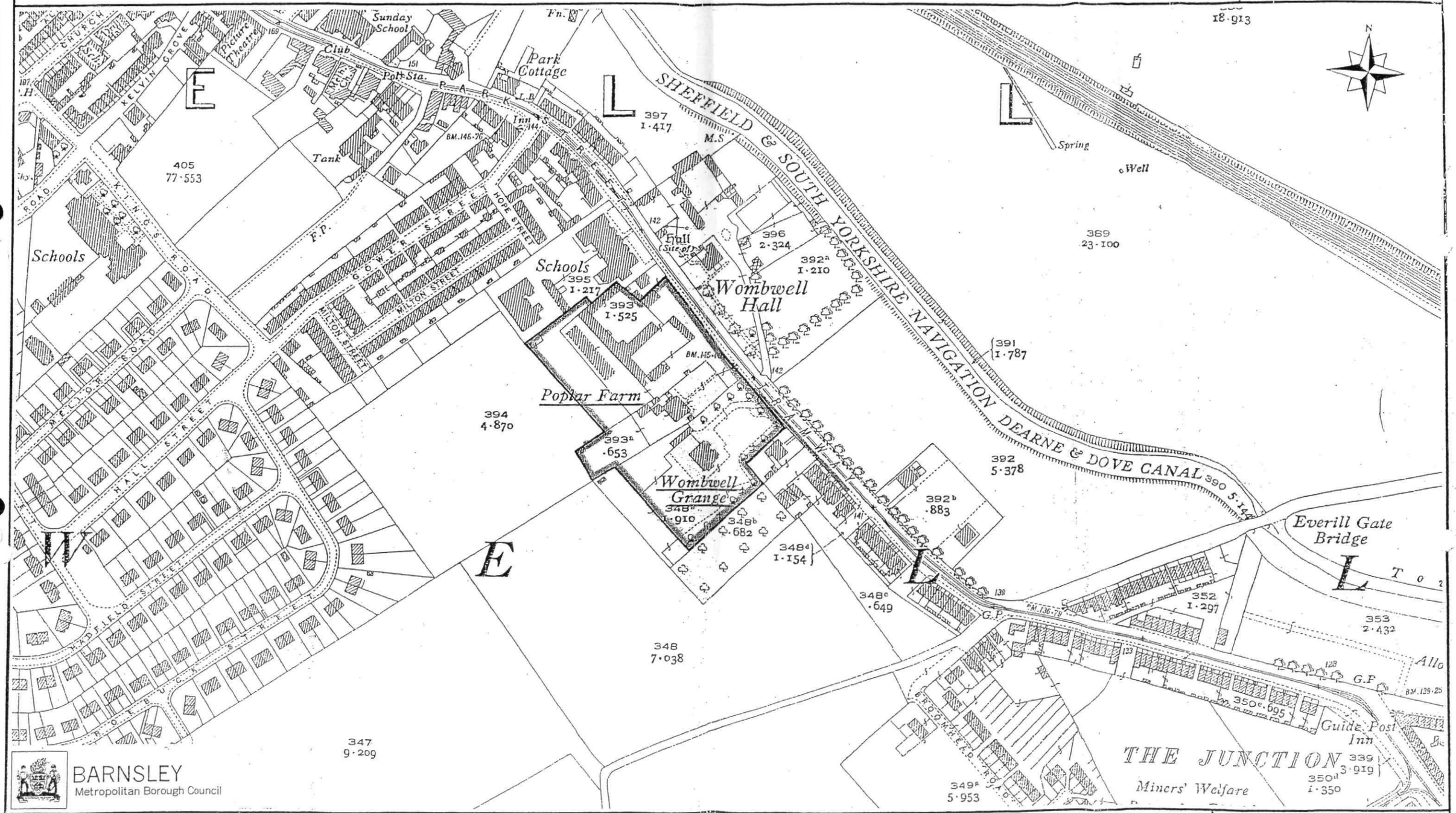
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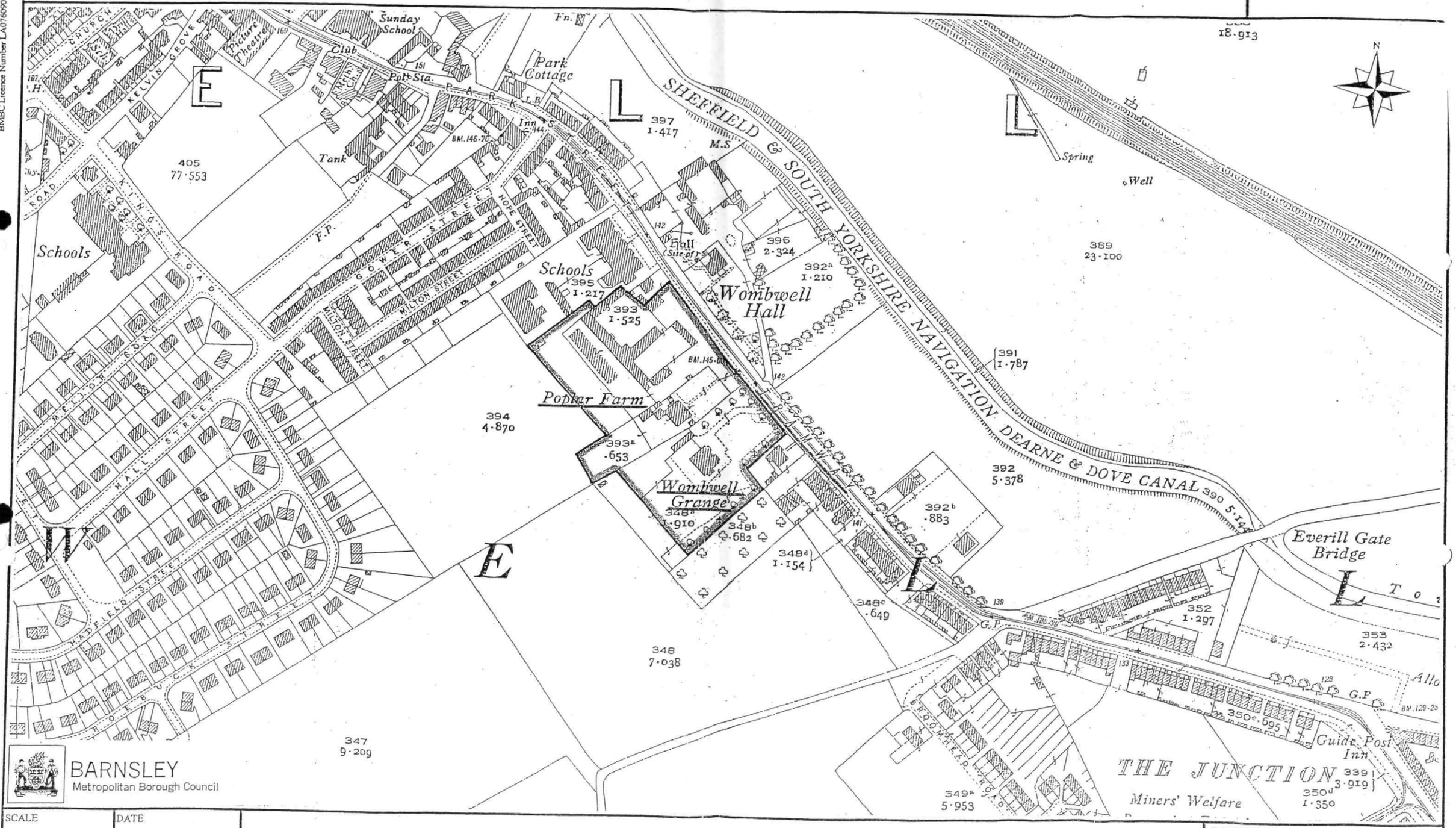
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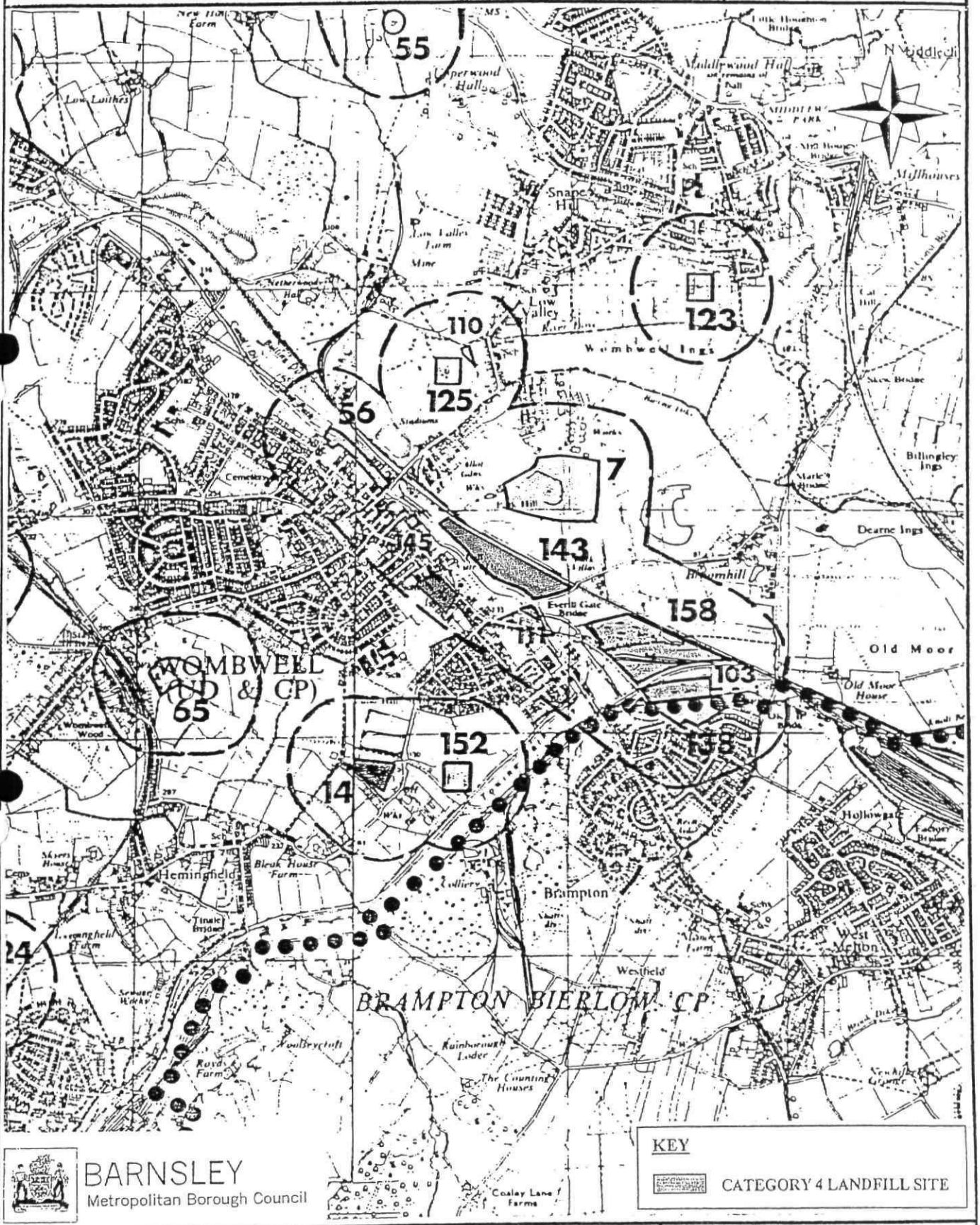
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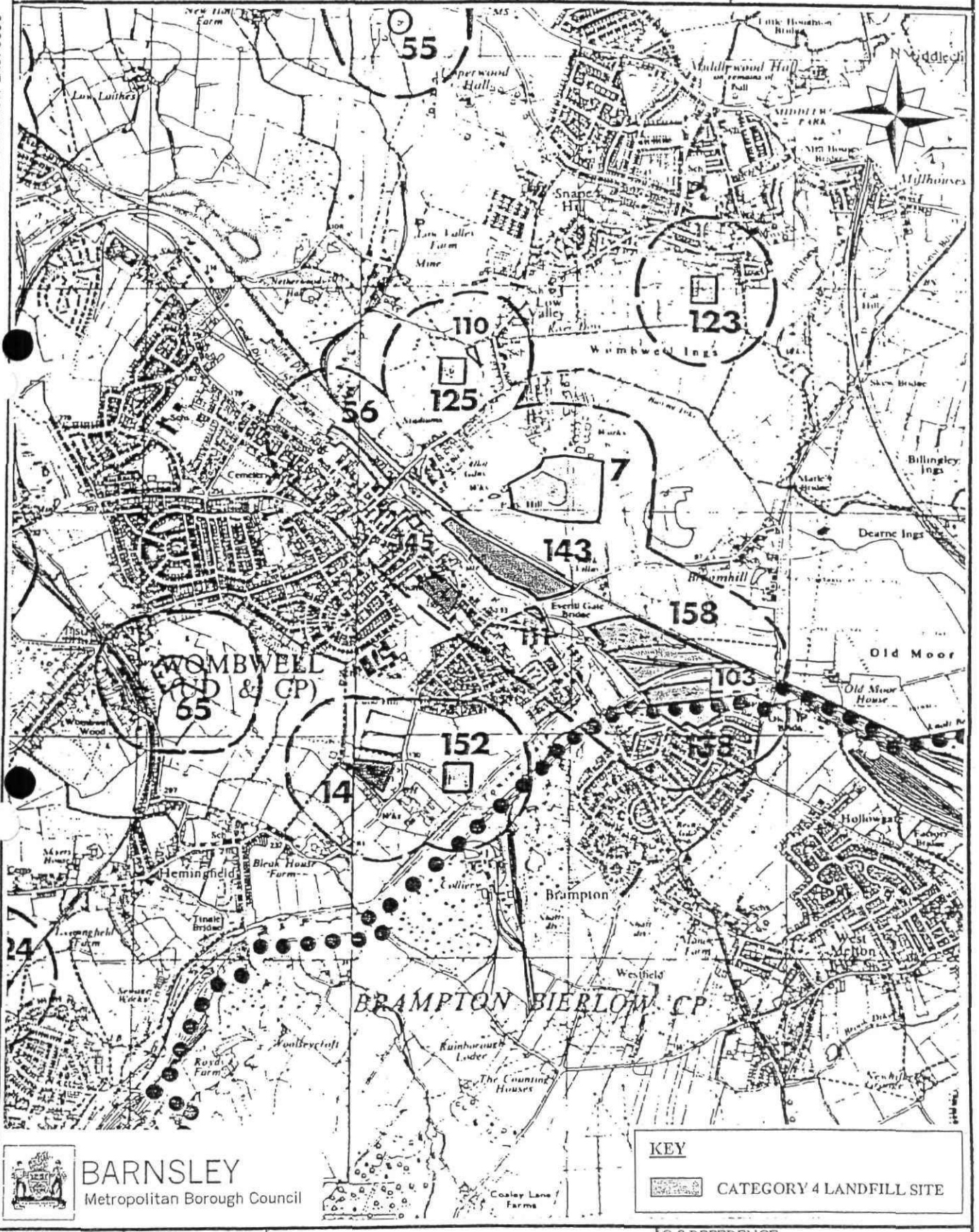
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KEY

CATEGORY 4 LANDFILL SITE

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LANDFILL SITES REGISTER - LANDFILL GAS MONITORING

No.	Site	National Grid Ref.	Planning Permission	Waste Disposal Site Licence	Site Operator	Landfill Material	Landfill commenced	Landfill completed	Category response	Total Volume 000's m³	Final Land Use
143 Closed	Land to the north of Wombwell Bypass Wombwell Barnsley	408 028	B/90/1926/WW	WD20 B787	VHE Construction Limited	Building Extraction Demolition Waste	1991	1992	4	137	Industrial Estate Bulk fill completed
144 Active	Redfearn Glass off Burton Road and adjacent to Far Field Lane Monk Bretton Barnsley	374 088	B/90/0757/BA Issued 5/10/90	WD20 B771 Issued 31/8/90	PLM Redfearn Glass	Glass Furnace Refractory Blocks Construction Demolition Excavation		Active	4		Extension to site curtilage Active
145 Closed	Catholic Club, Rear of 23 Park Street Wombwell Barnsley	402 029	B/79/1647/WW Issued 25/10/79		Mr C W Hadfield				2		Extension to Car Park
146 Closed	Bower Hill Oxspring	271 021	PR 1366 Issued 20/1/66 B/96/0259/PR (re-excavation/ screening/ compaction of fill)		Mr Walsh Yorkshire Land		Completed 1996		2		Form stockyard Residential
147 Closed	Stallite Batteries West Street, Worsbrough Barnsley	360 036	WB 940 Issued 30/4/65		Mr A Smith		April 1965		2		
148 Closed	Barnsley Cemetery, South East Corner, off Cemetery Road,	356 054	18735 Issued 13/12/64		BMBC				2		Cemetery

LANDFILL SITES REGISTER - LANDFILL GAS MONITORING

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BARNSLEY
Metropolitan Borough Council

Environmental Health and Trading Standards
Assistant Director Environmental Health & Trading Standards: Michael G. Hanson
Central Offices, Kendray Street, Barnsley S70 2TN

My Ref: JSC/104607 Your Ref: C0204 Date: 09 December 2003

Enquiries To: Mr J Scott Dial Direct: (01226) 772456 Fax: (01226) 775699

INFORMATION
ACTION
11 DEC 2003
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Dear Madam

Re Park Street, Wombwell, NGR 440390, 402640

Further to your fax requesting information in respect of the above site, I can now supply you with the information held by this Authority.

Landfill Sites

There are five closed landfills within 500m of the above site, the details of which are listed below;

Landfill Site Ref: - 143
Address - Land to the north of Wombwell Bypass, Wombwell
Waste Disposal Licence - WD20 B787
Site Operator - VHE Construction Ltd
Landfill Material - Building, Extraction and Demolition Wastes
Landfill Commenced - 1991
Landfill Completed - 1992
Final End Use – Industrial Estate
Distance and Direction – 150m, North West
This is classified as Category 4, meaning the Waste Disposal Site Licence indicates the site has been licensed to accept material that would not be expected to give rise to landfill gas in substantial quantities.

Landfill Site Ref: 145
Address - Catholic Club, Rear of 23 Park Street, Wombwell
Planning Permission - B/79/1647/WW
Site Operator - CW Hadfield
Final End Use - Extension to Car Park
Distance and Direction – 200m, North
This site is classified as a Category 2 site, which means that insufficient information is known as to the material that was put into this site to permit an adequate response to be made to the extent to which landfill gas may be present.

Hellen Corker
SIRIUS
Russell House
Suite 2, Mill Road
Langley Moor
DH7 8HJ

Landfill Site Ref: - 111
Address – Part of disused Canal, Everill Gate Lane, Wombwell
Waste Disposal Licence - WD2 B25
Site Operator – Barnsley MBC
Landfill Material – Inert, Excavation and Spoil Wastes
Landfill Commenced – Oct 1990
Landfill Completed - 1990
Final Land Use – Open Space
Distance and Direction – 330m, East
This is classified as Category 4, meaning the Waste Disposal Site Licence indicates the site has been licensed to accept material that would not be expected to give rise to landfill gas in substantial quantities

Landfill Site Ref: - 56
Address - Land between Littlefield Lane and Station Road, Wombwell
Waste Disposal Licence - WD2 B19 & WD20 B609
Site Operator – Barnsley MBC
Landfill Material – Excavation Spoil
Landfill Completed - November 1990
Final Land Use – Open Space
Distance and Direction – 420m, North
This is classified as Category 4, meaning the Waste Disposal Site Licence indicates the site has been licensed to accept material that would not be expected to give rise to landfill gas in substantial quantities.

Landfill Site Ref: - 7
Address – Park Hill Site, Station Road, Wombwell
Waste Disposal Licence - WD2 B8, WD2 B16 & WD2 B24
Site Operator – Barnsley MBC
Landfill Material – Domestic, Commercial, and Industrial Waste
Landfill Completed - 1995
Final Land Use – Grassland
Distance and Direction – 420m, North East
This is classified as Category 1, a site which is known to be producing landfill gas and from which gas is migrating.

Historical Land Use
No determinations have been made to date by this Service, under the provisions of the Environmental Protection Act 1990, regarding the classification of contaminated land.

From the current records, compiled for Part IIA of the Environmental Protection Act 1990, we have information of previous uses of the above site that may have caused contamination to occur. The northern half of the site has been used as a garage and a depot since the 1960's, with this still being its present day use. Both these uses have the potential to cause contamination to the site.

With regards to Part IIA of the Environmental Protection Act 1990, the site will be inspected as to whether it could be determined as 'contaminated land'. However, I am unable to give any timescales as to when this will be.

Environmental Protection Act 1990 - Authorised Processes
There are no authorised processes being operated at the above site, or within 250m of the site boundary.

Nuisances
This department has received no complaints of statutory nuisance for this site in the last 3 years.

Reported Incidents.
This department does not hold any information with regard to this. I suggest that you contact the Environment Agency, who holds records relating to pollution incidents.

This information is submitted as being the position to-date and other information may be available in records not held by this Authority at the present time. The Borough Council cannot, therefore accept liability or be prejudiced by the views expressed.

I must also inform you that the Council make a charge for supplying this information and you will be invoiced accordingly in due course. This charge will be £75 + VAT.

I hope this is of help with your enquiry.

Yours faithfully

John Scott
Contaminated Land Officer

Report prepared for:

Hellen Corker
Sirius
Suite 2
Russel House
Mill Road
Langley Moor
Durham
DH7 8HJ

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Radon Protective Measures Site Report – Standard

Advisory report on the requirement for radon protective measures in new dwellings including a BR211 (1999) Stage 2 Geological Assessment

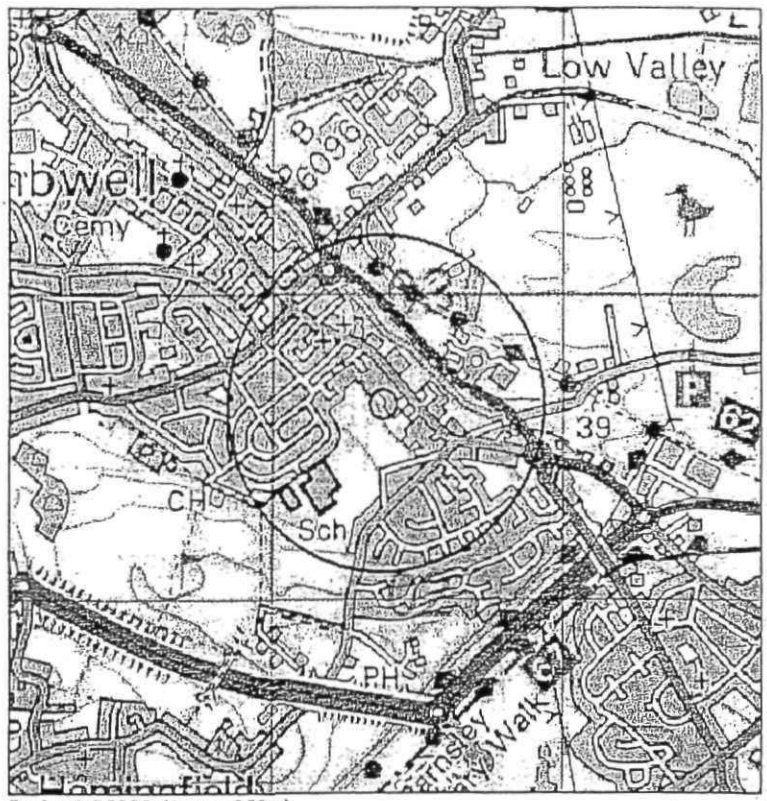
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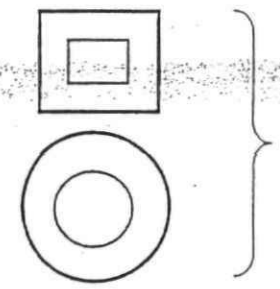
Section 1: Location and extent of report area

Area centred at: 440390,402640
Radius of site area: 50 metres



Scale: 1:25000 (1cm = 250m)

KEY:



INNER RECTANGLE or CIRCLE defines site area (details provided by client).

OUTER LINE shows extent of TOTAL SEARCH AREA comprising the site area and automatically generated buffer zone. The requirement for radon protective measures indicated in Section 2 is based on a geological assessment of the Total Search Area.

Please see Section 4 for details of how the search is carried out

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Section 2: Requirement for radon protective measures

The determination below follows the two stages described in *BR211 Radon: Guidance on protective measures for new dwellings (1999 edition)*, which also provides guidance on what to do if the result indicates that protective measures are required.

Stage 1

Stage 1 (Annex A) of the BR211 (1999) procedure indicates that the minimum level of protection for the report area is **NO** radon protective measures.

Stage 2

The Stage 2 geological assessment carried out for this report indicates **BASIC** radon protective measures are required for the report area. This assessment was derived automatically from the BGS Radon Protective Measures GIS (RPM-GIS) from 1:250,000 scale digital data. Results of the geological search are described in Section 3, and more detail on the assessment procedure is outlined in Section 4.

Result

The BR211 (1999) two-stage procedure indicates, therefore, that ***BASIC RADON PROTECTIVE MEASURES ARE REQUIRED FOR THE REPORT AREA.***

Section 3: Geological units within the search area

Below is a listing, if available, of the possible combinations of Bedrock (Solid) Geology units and overlying Superficial (Drift) Geology units within the total search area derived automatically by the RPM-GIS.

These have been derived (as indicated) from searches of either:

a) Combined 1:250,000 Bedrock (Solid) and 1:625,000 Superficial (Drift) geology maps
b) 1:50,000 Bedrock (Solid), Superficial (Drift) and Artificial geology maps

1:250,000 data

1. MIDDLE COAL MEASURES (FORMATION)(SANDSTONE 3D00); No drift
2. MIDDLE COAL MEASURES (FORMATION)(SANDSTONE 3D00); Alluvium (inc

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River Terrace Deposits in Scotland)

3. MIDDLE COAL MEASURES (FORMATION)(ARGILLACEOUS ROCKS, UNDIFFERENTIATED); No drift

4. MIDDLE COAL MEASURES (FORMATION)(ARGILLACEOUS ROCKS, UNDIFFERENTIATED); Alluvium (inc River Terrace Deposits in Scotland)

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Section 4: Determining the level of radon protection.

BR 211 (1999) sets out a two-stage procedure to help determine the level of radon protection required in new dwellings and extensions.

In Stage 1 of the procedure, the 5 km grid square radon potential maps (Annex A, BR211,1999) produced by the National Radiological Protection Board (NRPB) are used to make the primary determination of the level of radon protection needed. The NRPB maps are based on the average estimated proportion of homes exceeding the radon Action Level for each 5 km square of the Ordnance Survey National Grid.

In Stage 2, a second series of maps produced by the BGS (Annex B, BR211,1999) is used to decide whether it is necessary to consider upgrading the requirement for protection indicated by Stage 1. This procedure has the objective of avoiding cases of underprotection that might occur had the guidance depended solely on the average radon level in the 5 km grid square indicated by the NRPB maps. The BGS maps in Annex B (BR211, 1999) show those 5 km grid squares that are underlain, completely or in part, by geological units that require either basic or full protection to be installed in new dwellings.

A geological assessment may need to be carried out where the site falls within a shaded grid square on the BGS map in Annex B of BR211 (1999). The geological assessment checks whether a site is on or close to a geological unit which potentially exceeds the action levels for either basic or full radon protection. Consideration must be given to installing basic or full radon protection if the geological assessment shows that this is indicated. If a site falls within one of the shaded squares, it does not necessarily mean that it must have radon protection. This is because some of the grid squares contain bed rocks and unconsolidated (drift) deposits with lower radon potential than the maximum levels shown on the 5 km grid maps in Annex B (BR211, 1999).

In many cases the geological radon potential varies considerably within a grid square. In other cases, only a very small area (sometimes only a few hundred square metres) with a radon potential exceeding the thresholds for basic or full protection occurs within the shaded grid square. The level of protection that might be required is thus site specific, and can be determined by reference to the relevant radon potential map in BR211 (1999) followed by a geological assessment of the site.

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The geological assessment in this report is produced by the BGS Radon Protective Measures Geographical Information System (RPM GIS), which has been developed to provide Stage 2 Geological Assessments (RPM Site Reports). The assessment is derived from a geologically based interpretation of radon measurements in dwellings which were provided to the BGS by the NRPB without prejudicing confidentiality undertakings to householders and the Department of the Environment, Food and Rural Affairs (DEFRA). The reliability of a geological radon potential assessment is approximately proportional to the number of radon measurements available and the scale of the geological maps.

The RPM GIS currently comprises 1:250,000 scale data with more detailed information for twenty 1:50,000 scale geological map sheets covering the most radon-prone parts of Derbyshire, Northamptonshire, Nottinghamshire, Leicestershire, Lincolnshire, Oxfordshire, Shropshire, Somerset and Yorkshire. The RPM-GIS is being upgraded to 1:50,000 scale over the next 12 months as new digital maps become available through the BGS DiGMapGB programme.

The search area (circle or rectangle) for a site is increased by a buffer zone of 50 m in areas with 1:50,000 scale data and 500m in areas with 1:250,000 scale data. This is to allow for potential inaccuracies in the position of the geological boundaries. In many cases a number of combinations of bed rock and drift with differing geological radon potentials will occur within the total search area. Following the precautionary principle, the requirement for protective measures is derived from the highest geological radon potential encountered within the total search area.

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Section 5: Follow-up Detailed Radon Protective Measures site report

For most parts of the UK, a higher resolution assessment of radon protective measures requirements can also be provided by BGS. This will comprise:

i. Assessment by a qualified geologist of the relevant 10,000, 1:10,560 or 1:50,000 scale geological map(s) covering the total search area from BGS archives.
ii. Identification of the level of radon protective measures indicated for all geological units encountered within the site and the immediately surrounding area.

The basic charge for a Detailed Radon Protective Measures Report is **£165 (incl. VAT & Delivery)**. Reports for very large or geologically complex sites may, however, have to be supplemented with additional charge – in such cases, enquiry staff will confirm the charge with the client before proceeding.

The Radon follow-up reports can be ordered from:-
Geological Enquiries, British Geological Survey, Keyworth, Nottingham NG12 5GG; Tel: 0115-936-3192; Fax: 0115-936-3192; e-mail: geohelp@bgs.ac.uk. An on-line ordering facility is available on the BGS Website: www.bgs.ac.uk/georeports.

Section 6: What is radon ?

Radon is a naturally occurring radioactive gas, which is produced by the radioactive decay of radium which, in turn, is derived from the radioactive decay of uranium. Uranium is found in small quantities in all soils and rocks, although the amount varies from place to place. Radon released from rocks and soils is quickly diluted in the atmosphere. Concentrations in the open air are normally very low and do not present a hazard. Radon that enters poorly ventilated enclosed spaces such as some basements, buildings, caves, mines, and tunnels may reach high concentrations in some circumstances. The construction method and degree of ventilation will influence radon levels in individual buildings. A person's exposure to radon will also vary according to how particular buildings and spaces are used.

Inhalation of the radioactive decay products of radon gas increases the chance of developing lung cancer. If individuals are exposed to high concentrations for significant periods of time, there may be cause for concern. In order to limit the risk to individuals, the Government has adopted an Action Level for radon in homes of 200 becquerels per cubic metre (Bq m^{-3}). The Government advises householders that, where the radon level exceeds the Action Level, measures should be taken to reduce the concentration.

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Section 7: Radon in workplaces

The Ionising Radiation Regulations, 1999, require employers to take action when radon is present above a defined level in the workplace. Advice may be obtained from your local Health and Safety Executive Area Office or the Environmental Health Department of your local authority. The BRE publishes a guide (BR293): **Radon in the workplace.**

BRE publications may be obtained from Construction Research Communications Ltd, 151 Roseberry Avenue, London EC1R 4QX (Tel: 0207 505 6622; Fax: 0207 505 6606).

Section 8: Radon in existing dwellings

Useful information is given in the following free publications which can be obtained by writing to: DEFRA Publications, Admail 6000, London, SW1A 2XX, Tel: 08459 556000.

Radon - A Householder's Guide

Radon - You Can Test for it

Radon - A Guide for Homebuyers and Sellers

Radon - A Guide to Reducing Levels in Your Home

Information in the booklets is also available on the DEFRA website at:
http://www.defra.gov.uk/environment/radioactivity/radon/index.htm

Householders are recommended to follow advice in **Radon - a householder's guide.** The guide outlines simple solutions for dealing with the radon problem depending on whether or not the home has been tested for radon. In radon affected homes, the problem of radon can usually be tackled with simple, effective and relatively inexpensive measures. These measures are comparable in cost to work such as damp-proofing and timber treatment. You can get practical advice about construction work to reduce radon levels from the Building Research Establishment (BRE) **Radon hotline** on **01923 664707.**

Advice about radon, its health risks and details of how to order the radon test may be obtained from the NRPB **Radon Freephone** on 0800 614529 or by post from **NRPB, Chilton, Didcot, Oxfordshire OX11 0RQ.**

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Section 9: Terms & Conditions

General

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Important notes about this report

- The data, information and related records supplied in this report by BGS can only be indicative and should not be taken as a substitute for specialist interpretations, professional advice and/or detailed site investigations. You must seek professional advice before making technical interpretations on the basis of the materials provided.
- Geological observations and interpretations are made according to the prevailing understanding of the subject at the time. The quality of such observations and interpretations may be affected by the availability of new data, by subsequent advances in knowledge, improved methods of interpretation, and better access to sampling locations.
- Raw data may have been transcribed from analogue to digital format, or may have been acquired by means of automated measuring techniques. Although such processes are subjected to quality control to ensure reliability where possible, some raw data may have been processed without human intervention and may in consequence contain undetected errors.
- Detail which is clearly defined and accurately depicted on large-scale maps may be lost when small-scale maps are derived from them.
- Although samples and records are maintained with all reasonable care, there may be some deterioration in the long term.
- The most appropriate techniques for copying original records are used, but there may be some loss of detail and dimensional distortion when such records are copied.
- Data may be compiled from the disparate sources of information at BGS's disposal, including material donated to BGS by third parties, and may not originally have been subject to any verification or other quality control process.
- Data, information and related records which have been donated to BGS have been produced for a specific purpose, and that may affect the type and completeness of the data recorded and any interpretation. The nature and purpose of data collection, and the age of the resultant material may render it unsuitable for certain applications/uses. You must verify the suitability of the material for your intended usage.
- If a report or other output is produced for you on the basis of data you have provided to BGS, or your own data input into a BGS system, please do not rely on it as a source of information about other areas or geological features, as the report may omit important details.
- The topography shown on any map extracts is based on the latest OS mapping and is not necessarily the same as that used in the original compilation of the BGS geological map, and to which the geological linework available at that time was fitted.

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For further information, please contact:

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British Geological Survey
Kingsley Dunham Centre
Keyworth
Nottingham NG12 5GG
Tel: 0115 936 3143
Fax: 0115 936 3276
Email: enquiries@bgs.ac.uk

APPENDIX E
COMMISSION

Ref: 6177/2/RLM/ad

18th October 2004

Mr P Barringer
Ben Bailey Homes
Elizabeth House
Cliff Street
Mexborough
South Yorkshire
S64 9HQ

Dear Phil

Park Street Wombwell

Further to your recent invitation, please find attached our proposal for undertaking a site investigation on the above land. As discussed, the investigation is required to:

- Confirm the findings of the previous investigation carried out by Sirius
- Provide sufficient information for us to issue a remedial strategy report for submission to regulators
- Support a remediation quotation, to be provided by Encia Remediation.

Given the time constraints we do not propose to issue a full interpretative report, unless significant modifications to the Sirius report are required. At this stage, we intend to issue a summary report to be issued with remediation costings, to be followed up with a remedial strategy report later.

The scope of works outlined in this letter should enable us to assess abnormal development issues, associated with ground. However, the nature of site investigation is such that it is not always possible to foresee all the potential issues. Consequently, it is sometimes necessary to recommend additional work, but where this occurs we will inform you immediately, provide costs, and seek your further instruction. We have visited site and reviewed the previous investigation, undertaken by Sirius, to minimise the likelihood of further work.

Ground investigation is generally best undertaken once site operations have ceased and preferably post-demolition; access constraints associated with existing buildings, operations and underground service runs, can prevent thorough inspection of the ground via extensive trial pitting/trenching. Consequently, some uncertainties may remain and a supplementary, post-demolition ground investigation may be required by the relevant regulatory authorities.

Our site investigation proposal allows for the following works:

Desk Study: An examination of historical Ordnance Survey plans will be made to determine whether any past land uses have had any effect on the proposed development. Additionally, published geological plans of the area will be examined and enquiries will be made of the Environment Agency, Coal Authority and the Local Authority.

Fieldwork: At this stage we have allowed for two day's trial pitting and the drilling of approximately 10 window sample boreholes. All trial pits and boreholes will be supervised and logged by an experienced geoenvironmental engineer.

Representative soil samples of natural and man-made ground, including any contaminated samples, will be taken during the works. In-situ shear strengths of any cohesive soils encountered will be determined by the use of a hand-held shear vane. Mackintosh probing will be undertaken within and adjacent to pits in order to determine the in-situ density of any granular soils.

The mechanical excavator will be equipped with a breaker to enable excavation through near-surface and buried concrete slabs and obstructions.

We will make every effort to compact arisings and 'sweep' them over each pit. However, you should be aware that on completion of the investigation, "graves" of spoil (each about 3m long by 1m wide) unsuitable for trafficking, will be left at each trial pit location. At this stage, no allowance has been made for reinstatement of the hardstanding.

If the pitting encounters significant thicknesses of made ground or very soft/loose deposits, boreholes may be required to obtain geotechnical data from greater depth. We will advise you of any need for boreholes within 2 days of completion of the pitting.

Soils Testing: This will comprise routine geotechnical soils analysis, typical of that normally required for greenfield sites. Although no allowance has been for in-situ or laboratory CBR testing, CBR values will be estimated from the strata descriptions and classification test results, where appropriate (i.e. if no significant regrading or reworking of made ground is proposed).

Appropriate chemical analyses, based on our review of the existing SI report and our knowledge of the site's history, have been allowed for. In the event that ground contamination is more significant or different to that anticipated, it might be necessary to carry out additional chemical testing.

Reporting & Timescales: In order to provide you with sufficient information to enable assessment of abnormal costs at the earliest opportunity we will issue a concise **overview** report within 3 days of fieldwork completion. A revised summary report could be issued immediately after receipt of laboratory test results about 2 weeks later.

Allowing for receipt of statutory search information, fieldwork could be commenced within 1 week of receipt of your written instruction to proceed.

Invoicing: The attached proposal provides a breakdown of the costs associated with this project. This breakdown is for information only and the proposal can be regarded as a lump sum price of **£8,863 plus VAT**. Variation will only occur in the event that a given item is not undertaken or that substantial additional works are recommended, in which case we will inform you immediately, provide costs for the required works, and seek your prior consent.

Our proposal allows for submission of the report to the Local Authority and NHBC, and for submission of a single piece of subsequent correspondence with each regulator to address any queries they may have. Any further meetings, correspondence etc, would be chargeable.

We will submit our invoice for this project with the final remedial strategy report.

It should be borne in mind that approval of the recommended remedial and site preparatory works can take several months, and it would be prudent to allow 6 months between report submission and commencement of development.

Underground Services: Utility plans are required in order to protect operatives from the hazards associated with striking buried services and avoid potentially substantial

disruption\repair costs. Therefore copies of any utility plans, relating to underground services within the site, that you are able to forward prior to the proposed fieldworks would be appreciated.

We will make every effort not to damage any services (including review of utility plans and use of a CAT detector). However, Encia cannot accept liability for damage to any underground services that are not accurately marked on plans made available to us prior to commencement of our field investigation, or have not been accurately marked the ground by a responsible third party (e.g. utility company, site owner).

Terms & Conditions: This work will be undertaken in accordance with our Standard Terms and Conditions (a copy of which is available on request).

You will note that in the last two columns of our costed proposal we have included an estimate of the proportion of the total cost of the works that could be eligible for Contaminated Land Tax Relief.

It is hoped the above is sufficient for your present needs. However, should you require any further information, please contact the undersigned.

Yours sincerely

Richard Meredith
for and on behalf of
ENCIA CONSULTING LIMITED

From: Philip Barringer [phil.barringer@ben-bailey.co.uk]
Sent: 01 March 2005 16:36
To: 'Richard Meredith'
Subject: RE: Reporting

Richard
Please take this e-mail as your instruction for the 5 items listed.
Regards
Phil

-----Original Message-----
From: Richard Meredith [mailto:richard.meredith@enciagroup.co.uk]
Sent: Tuesday, March 01, 2005 03:37
To: phil.barringer@ben-bailey.co.uk
Cc: chriss@bbhdesign.com
Subject: Reporting

Phil,

As discussed, please confirm your written instructions to complete reporting (Remedial Strategy and full investigation reports) on the following:-

1) Goldthorpe - Remedial Strategy Report: Fee £*** + VAT.
2) Toll Bar Doncaster - Remedial Strategy Report: Fee £*** + VAT
3) Featherstone Lane - Full SI Report and Remedial Strategy: Fee £*** + VAT
4) Stonegate Foods - Full SI Report and Remedial Strategy: Fee £*** + VAT
5) Park Street Wombwell - Redo existing QRA and provide Full SI Report and Remedial Strategy: Fee £*** + VAT

We have completed items 1-3 already and will issue the reports shortly following your written instructions. We will progress items 4 & 5.

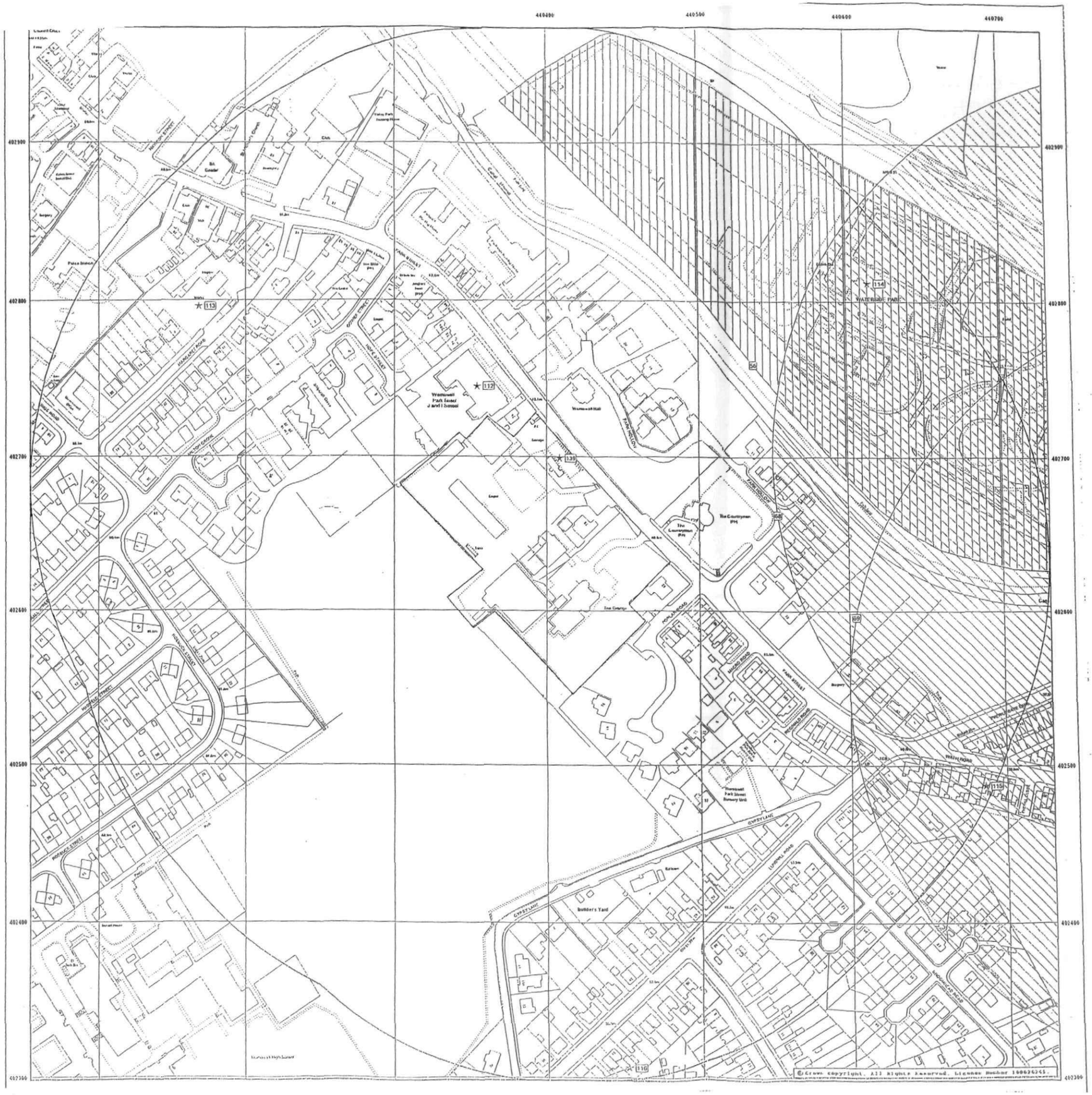
Trust this is in order.

Best regards,

Richard Meredith
Principal Engineer
Encia Consulting Ltd

tel 01937 589955
fax 01937 589944

APPENDIX F
HISTORICAL OS PLANS



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CLIENT DETAILS Envirocheck Order No. EC467041_1_1

Customer Ref: P Taylor,C0294
SIRIUS GEOTECHNICAL & ENVIRONMENTAL
RUSSEL HOUSE, SUITE 2 MILL ROAD
LANGLEY MOOR
CO. DURHAM DH7 8HJ

SITE DETAILS Grid Reference 440390 402640

114, Park Street

Wombwell
Barnsley
S73 0HW

KEY TO THE LEGEND DATABASE

General

- Specified Site
- Bearing Reference Point
- Buffer (250m)
- Reference Number
- Several of Type at Location
- Pylon
- Overhead Transmission Line

Agency and Hydrological

- Air Pollution Control
- Air Pollution Control Enforcement
- Point Location of Contaminated Land Register Entry or Notice
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement Or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Pollution Incident to Controlled Waters
- Substantiated Pollution Incident Register
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Red List Discharge Consent
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Water Abstraction

Waste

- Point Location of BGS Recorded Landfill Site
- BGS Recorded Landfill Site
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facilities (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Point Location of Local Authority Recorded Landfill Site
- Local Authority Recorded Landfill Site
- Registered Landfill Site
- Point Location of Registered Waste Transfer Site
- Registered Waste Transfer Site
- Point Location of Registered Waste Treatment or Disposal Site
- Registered Waste Treatment or Disposal Site

Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

Geological

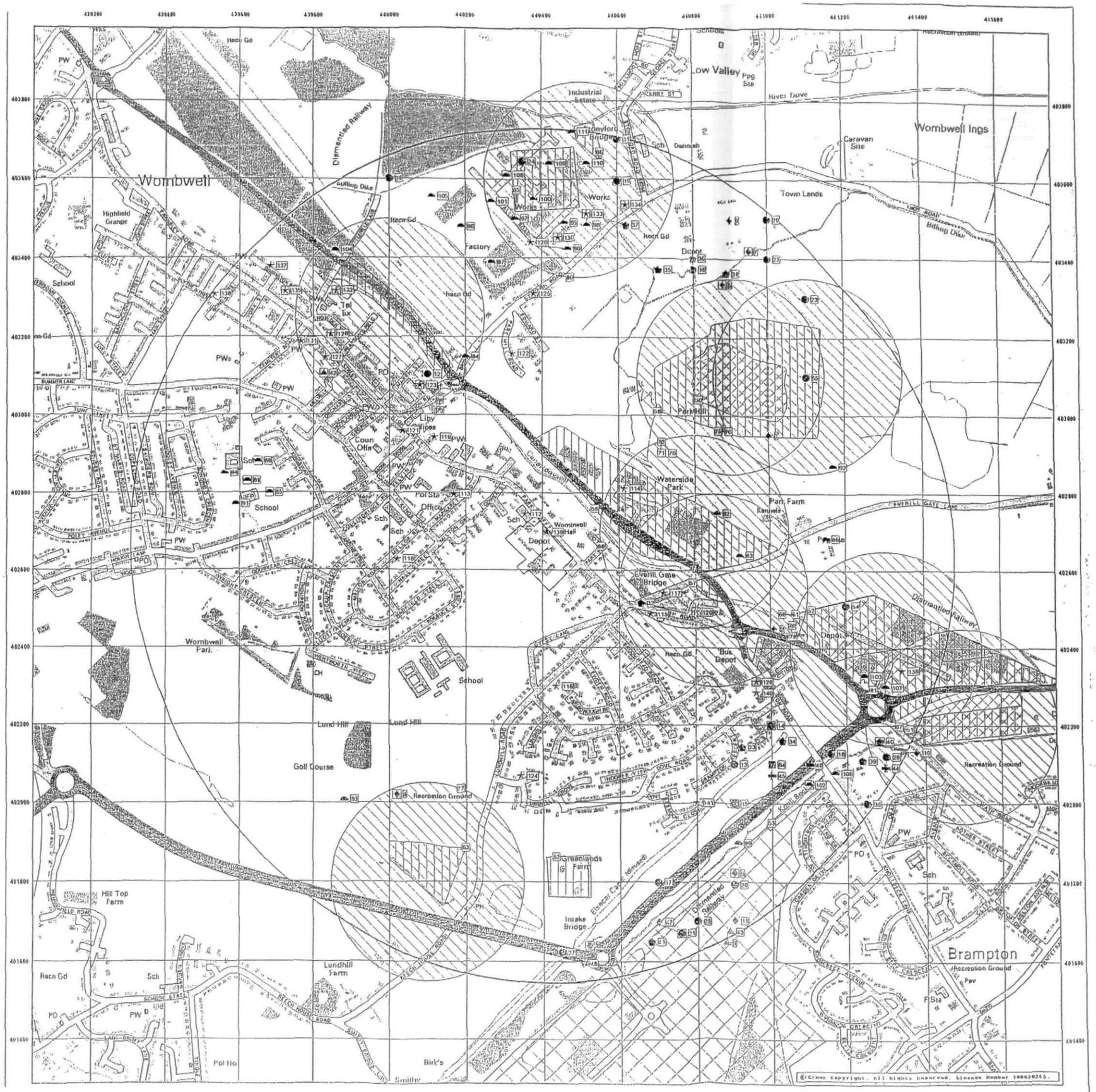
- BGS Borehole
- BGS Recorded Mineral Site

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry

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CLIENT DETAILS Envirocheck Order No. EC467041_1_1

Customer Ref: P Taylor,C0204
SIRIUS GEOTECHNICAL & ENVIRONMENTAL
RUSSEL HOUSE, SUITE 2 MILL ROAD
LANGLEY MOOR
CO. DURHAM DH7 8HJ

SITE DETAILS Grid Reference 440390 402640

114, Park Street

Wombwell
Barnsley
S73 0HW

KEY TO THE LEGEND DATABASE

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- Specified Site
- Bearing Reference Point
- Buffer (1000m)
- Reference Number
- Several of Type at Location

Waste

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- BGS Recorded Landfill Site
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- Licensed Waste Management Facility (Location)
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- Local Authority Recorded Landfill Site
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- Point Location of Registered Waste Transfer Site
- Registered Waste Transfer Site
- Point Location of Registered Waste Treatment or Disposal Site
- Registered Waste Treatment or Disposal Site

Agency and Hydrological

- Air Pollution Control
- Air Pollution Control Enforcement
- Point Location of Contaminated Land Register Entry or Notice
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement Or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Pollution Incident to Controlled Waters
- Substantiated Pollution Incident Register
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Red List Discharge Consent
- Registered Radioactive Substance
- River Quality Sampling Point
- Water Abstraction

Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

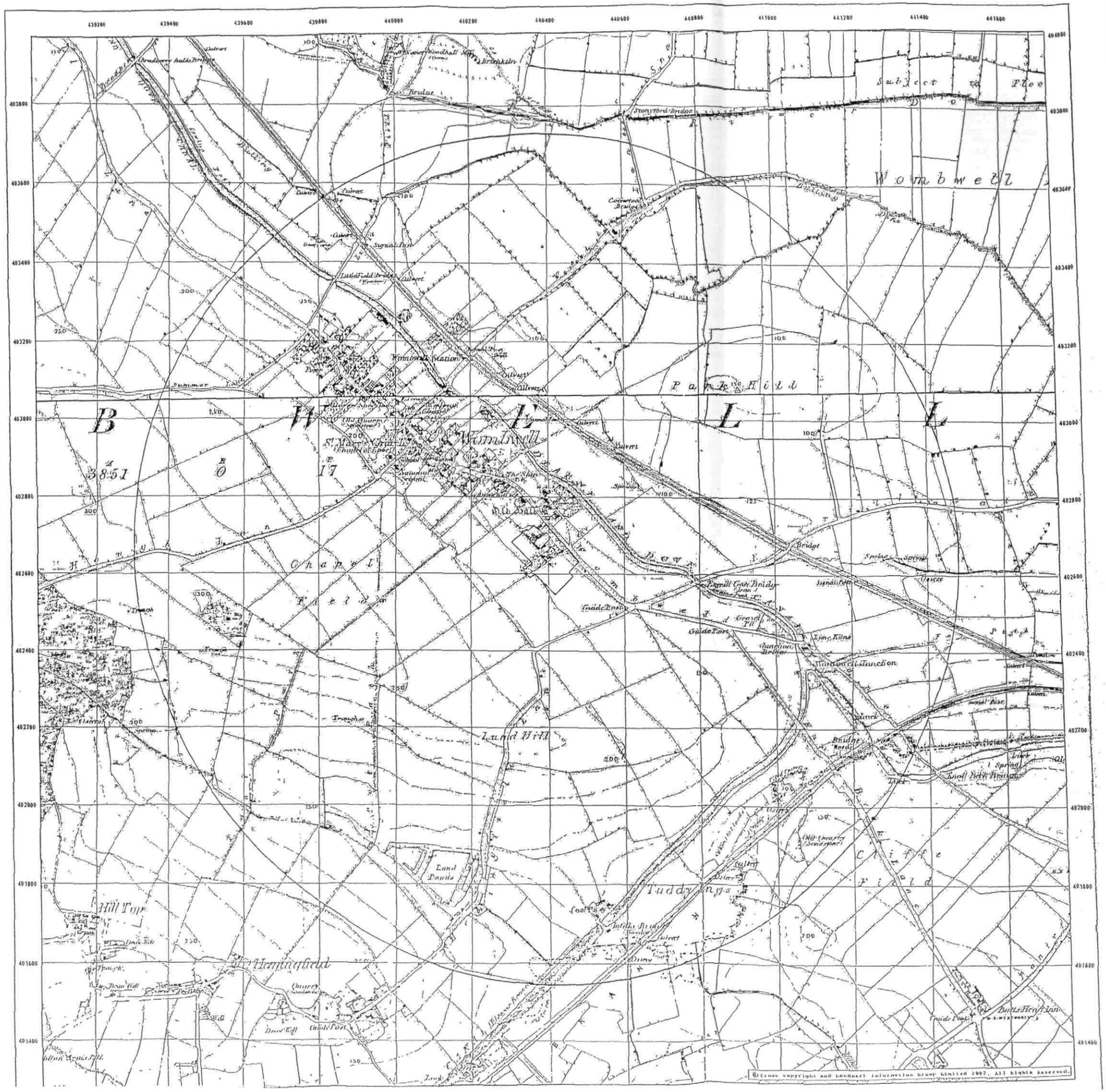
Geological

- BGS Borehole
- BGS Recorded Mineral Site

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry

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Customer Ref: P Taylor,CD204
SIRIUS GEOTECHNICAL & ENVIRONMENTAL
RUSSEL HOUSE, SUITE 2 MILL ROAD
LANGLEY MOOR
CO. DURHAM DH7 8HJ

SITE DETAILS Grid Reference 440390 402640

114, Park Street

Wombwell
Barnsley
S73 0HW

Historical Map Legend

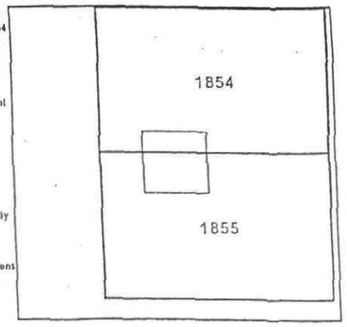
Quarry
Shingle
Railway over Road
Road over Railway
Gravel Pit
Sand Pit
Level Crossing
Railway over River
Other Pits
Road over Stream
Road over Stream
Rough Pasture
Furze
Road over River or Canal
Marsh
Reeds
Sunken Road
Raised Road
Osiers
Instrumental Contour
Arrow denotes flow of Water
Sketched Contour

YORKSHIRE

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1931, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

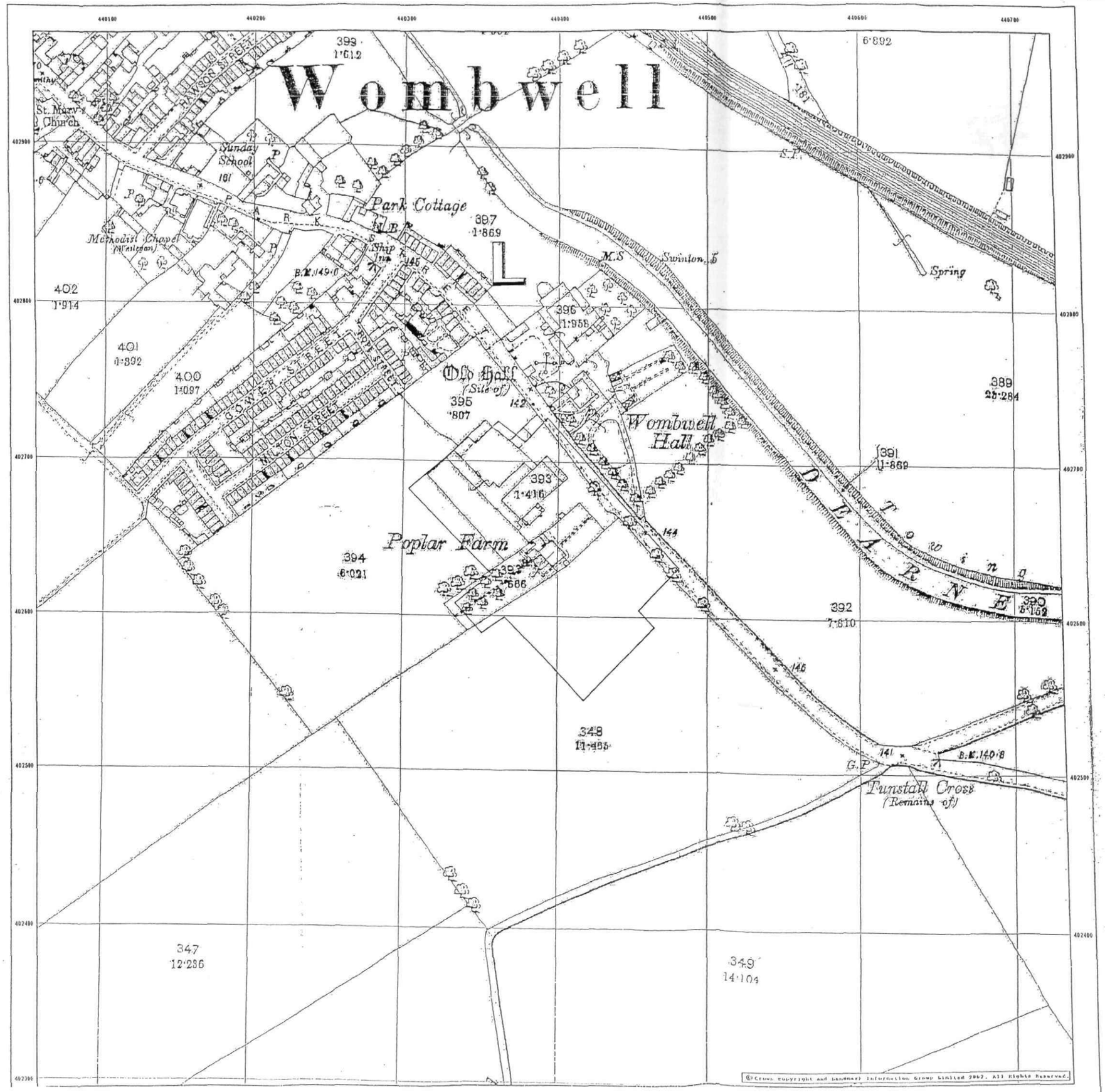
Source map scale - 1:10,560



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Customer Ref: P Taylor,C0204
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LANGLEY MOOR
CO. DURHAM DH7 8HJ

SITE DETAILS — Grid Reference 440390 402640

114, Park Street

Wombwell
Barnsley
S73 0HW

Historical Map Legend

Quarry
Sand Pit
Marsh
Reeds
Gravel Pit
Clay Pit
Rough Pasture
Furze
Refuse Heap
Shingle
Osiers
Ford
Railway crossing River or Canal
Railway crossing Road
Level Crossing
Embankment
Cutting
Road crossing Railway
Road over single Stream
Road over River or Canal
Arrow denotes flow of Water

YORKSHIRE

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Source map scale - 1:2,500

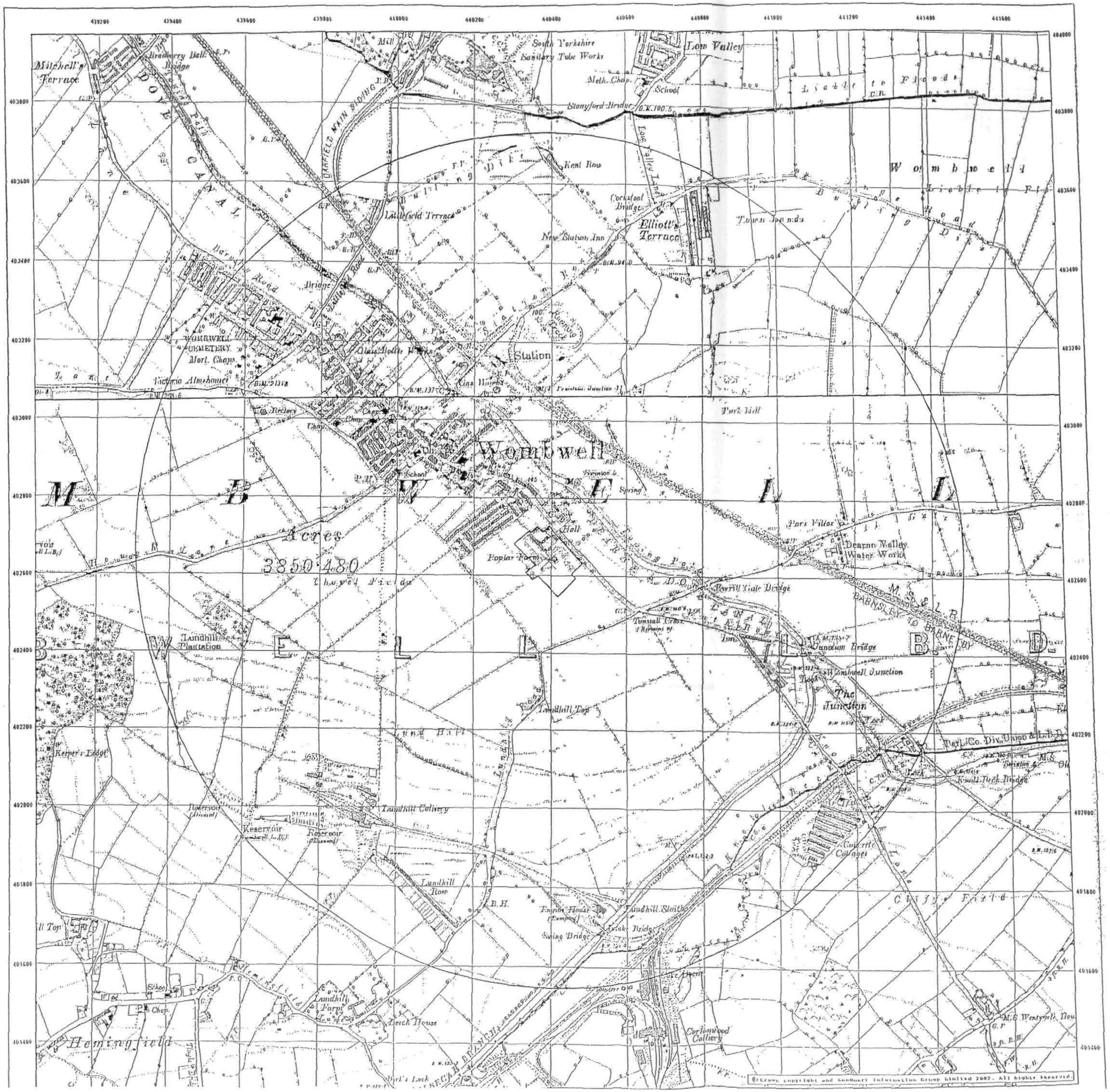
1892

Date(s) of Publication

1 of 1

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LANGLEY MOOR
CO. DURHAM DH7 8HJ

SITE DETAILS Grid Reference 440390 402640

114, Park Street

Wombwell
Barnsley
S73 0HW

Historical Map Legend

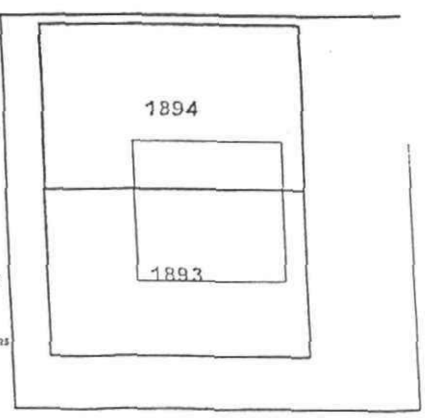
Quarry
Shingle
Railway over Road
Road over Railway
Gravel Pit
Sand Pit
Level Crossing
Railway over River
Other Pits
Road over Stream
Road over Stream
Rough Pasture
Furze
Road over River or Canal
Marsh
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Raised Road
Osiers
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Sketched Contour

YORKSHIRE

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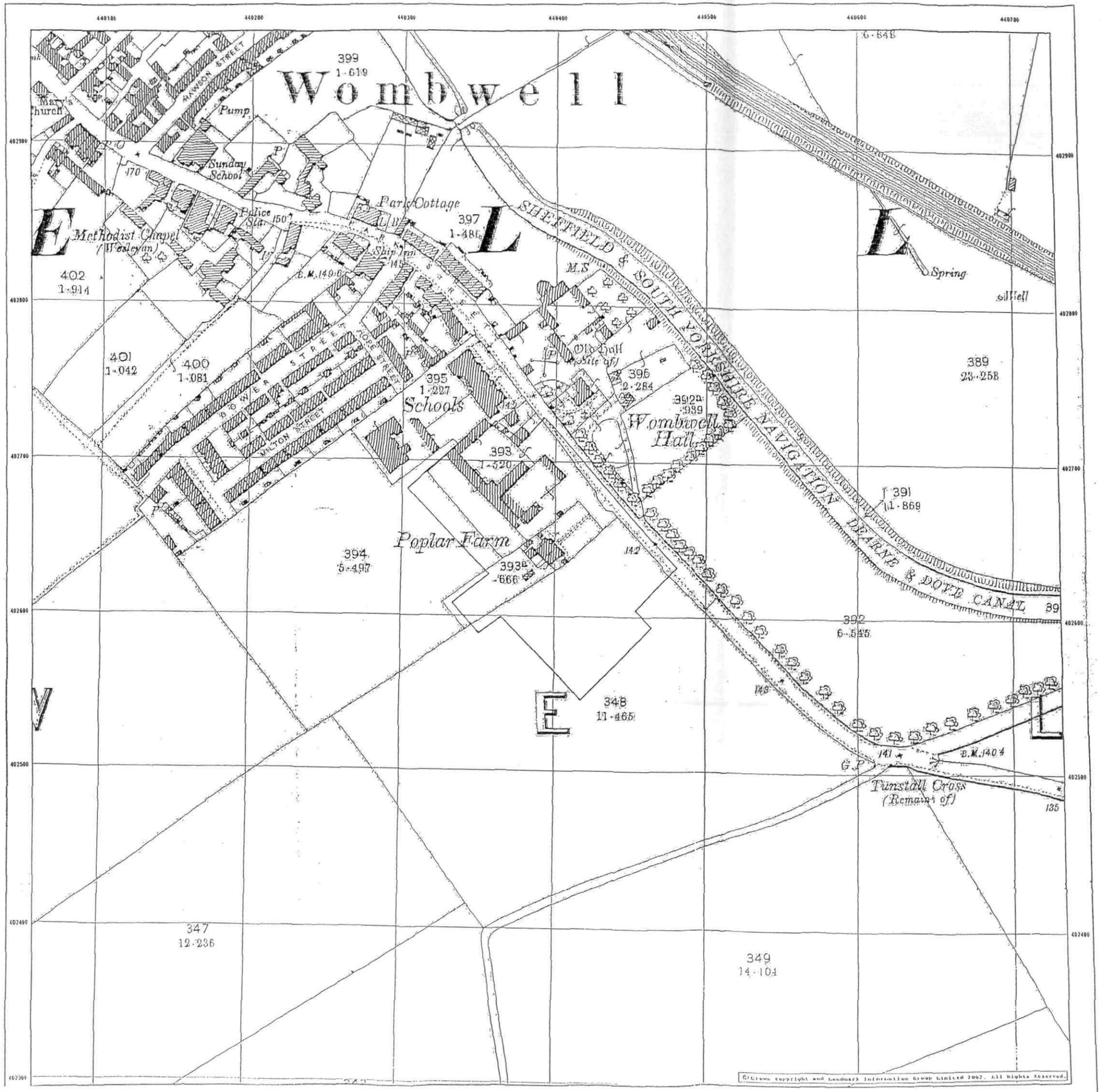
Source map scale - 1:10,560



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RUSSEL HOUSE, SUITE 2 MILL ROAD
LANGLEY MOOR
CO. DURHAM DH7 8HJ

SITE DETAILS — Grid Reference 440390 402640

114, Park Street

Wombwell
Barnsley
S73 0HW

Historical Map Legend

Quarry
Sand Pit
Marsh
Reeds
Gravel Pit
Clay Pit
Rough Pasture
Furze
Refuse Heap
Shingle
Osiers
Ford
Railway crossing River or Canal
Railway crossing Road
Level Crossing
Embankment
Cutting
Road crossing Railway
Road over single Stream
Road over River or Canal
Arrow denotes flow of Water

YORKSHIRE

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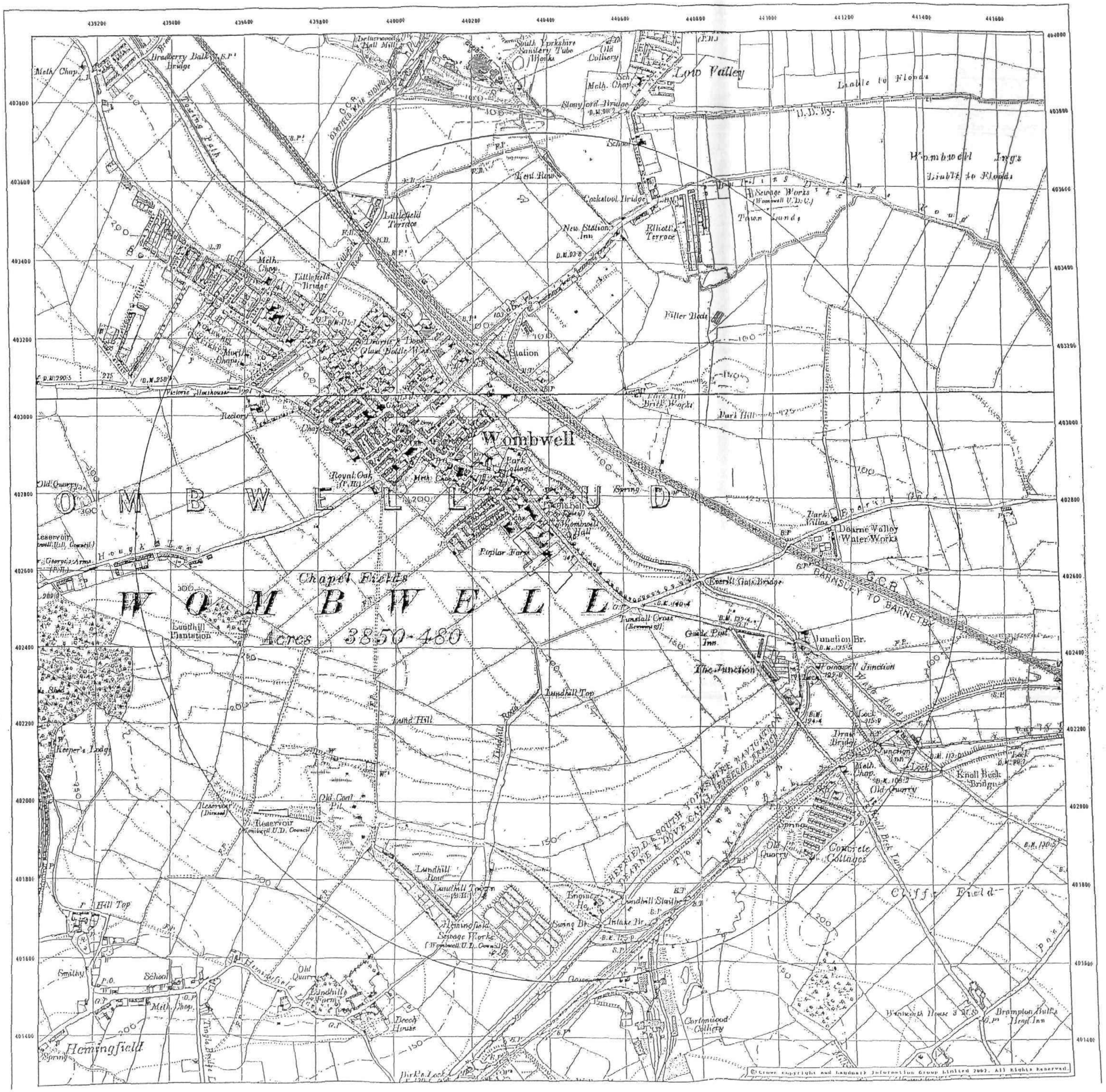
Source map scale - 1:2,500

1903

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Customer Ref: P Taylor,C0204
SIRIUS GEOTECHNICAL & ENVIRONMENTAL
RUSSEL HOUSE, SUITE 2 MILL ROAD
LANGLEY MOOR
CO. DURHAM DH7 8HJ

SITE DETAILS Grid Reference 440390 402640

114, Park Street

Wombwell
Barnsley
S73 0HW

Historical Map Legend

Quarry; Shingle; Railway over Road; Road over Railway; Gravel Pit; Sand Pit; Level Crossing; Railway over River; Other Pits; Road over Stream; Road over Stream; Rough Pasture; Furze; Road over River or Canal; Marsh; Reeds; Sunken Road; Raised Road; Osiers; Instrumental Contour; Arrow denotes flow of Water; Sketched Contour

YORKSHIRE

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Source map scale - 1:10,560

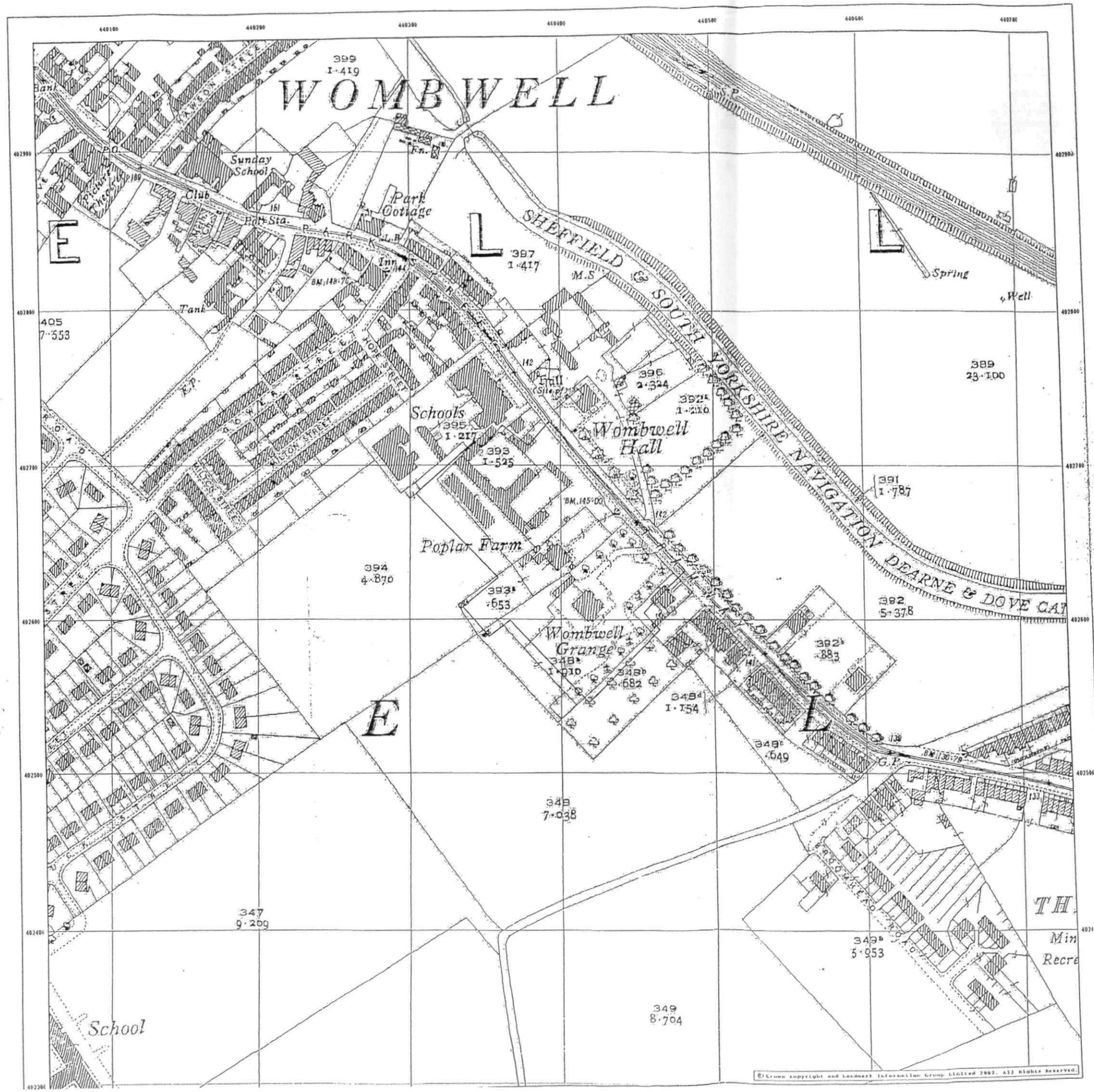
1907

1905

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Customer Ref: P Taylor,C0204
SIRIUS GEOTECHNICAL & ENVIRONMENTAL
RUSSEL HOUSE, SUITE 2 MILL ROAD
LANGLEY MOOR
CO. DURHAM DH7 8HJ

SITE DETAILS Grid Reference 440390 402640

114, Park Street

Wombwell
Barnsley
S73 0HW

Historical Map Legend

Quarry
Sand Pit
Marsh
Reeds
Gravel Pit
Clay Pit
Rough Pasture
Furze
Refuse Heap
Shingle
Osiers
Ford
Railway crossing River or Canal
Railway crossing Road
Level Crossing
Embankment
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Road crossing Railway
Road over single Stream
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YORKSHIRE

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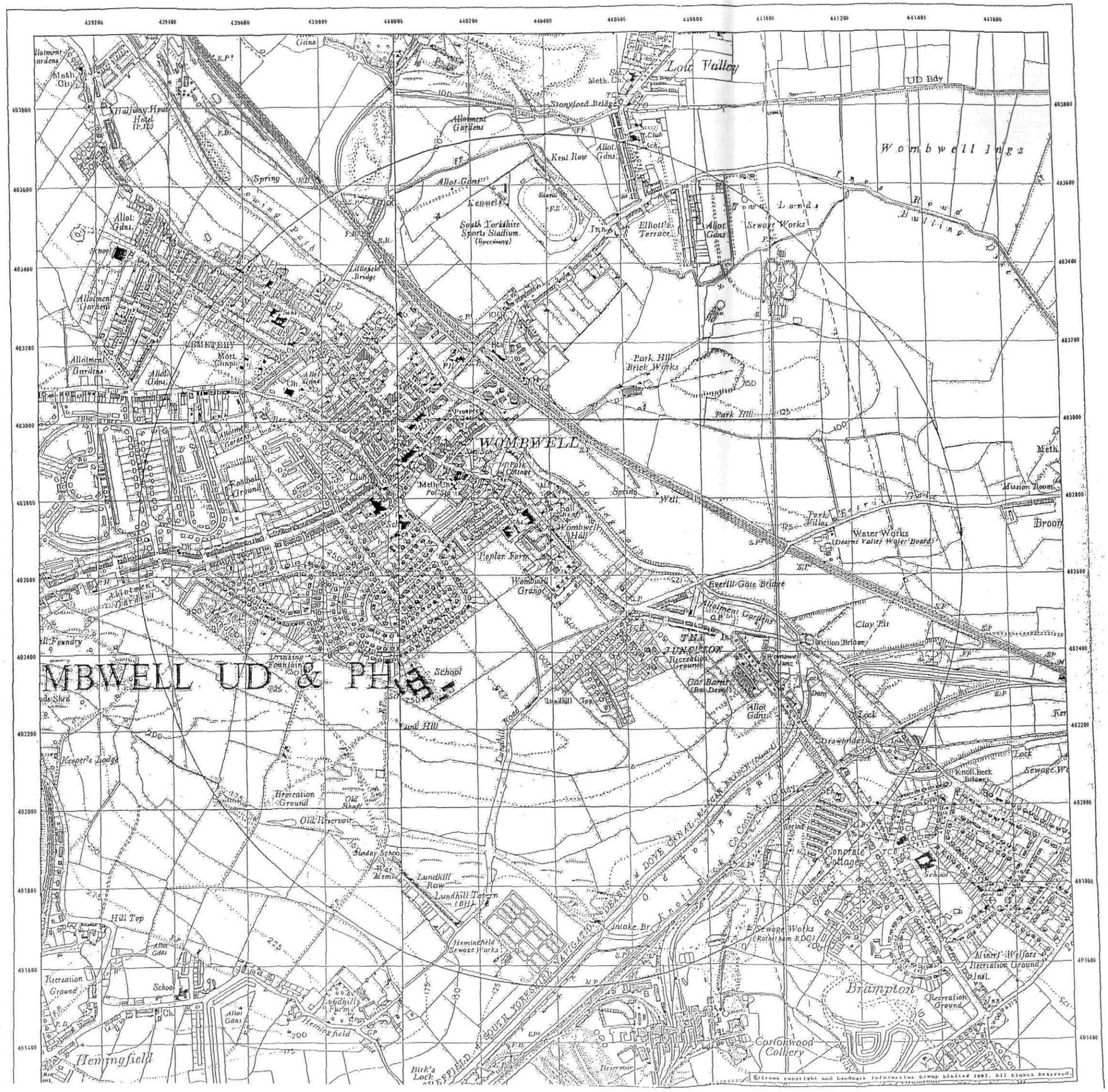
1930

Date(s) of Publication

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CLIENT DETAILS — Envirocheck Order No. EC467041_1_1

Customer Ref: P Taylor,C0204
SIRIUS GEOTECHNICAL & ENVIRONMENTAL
RUSSEL HOUSE, SUITE 2 MILL ROAD
LANGLEY MOOR
CO. DURHAM DH7 8HJ

SITE DETAILS — Grid Reference 440390 402640

114, Park Street

Wombwell
Barnsley
S73 0HW

Historical Map Legend

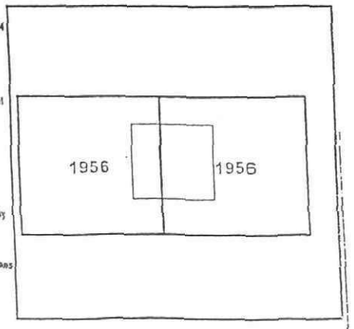
Chalk Pit, Clay Pit, or Quarry
Gravel Pit
Sand Pit
Disused Pit or Quarry
Refuse or Slag Heap
Direction of Flow of Water
Cutting
Embankment
Road Under
Road Over
Level Crossing
Foot Bridge
Non-coniferous Trees
Coniferous Trees
Scrub
Lake, Loch or Pond
Pylon
Electricity Transmission Line
Pole
Shingle
Sand
Standard Guage Multiple Track
Standard Guage Single Track
Siding, Tramway or Mineral Line
Narrow Guage
Bracken
Heath
Rough Grassland
Reeds
Saltings
Marsh

ORDNANCE SURVEY PLAN

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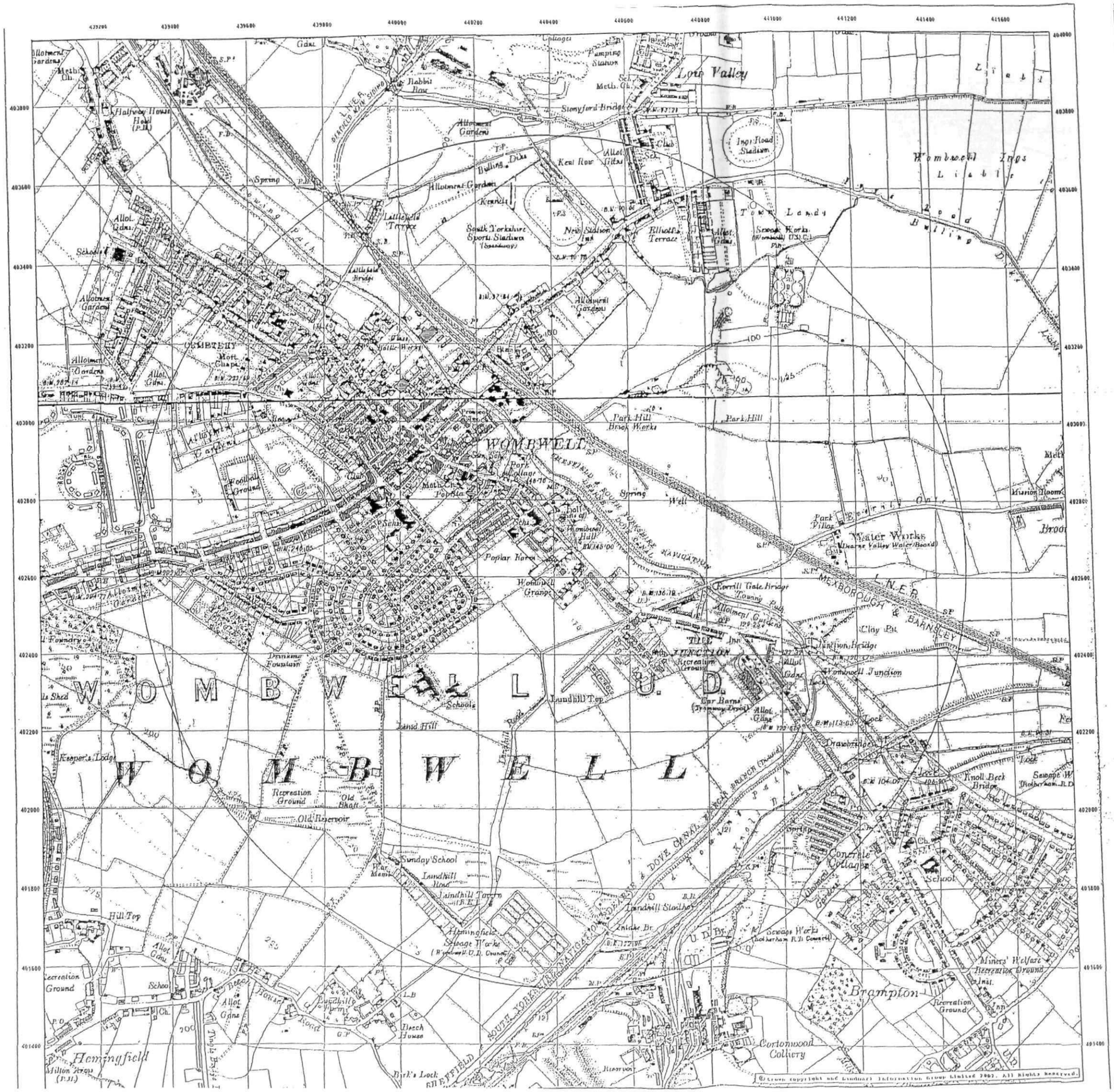


Date(s) of Publication

11 of 15

Ordnance Survey
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CLIENT DETAILS Envirocheck Order No. EC467041_1_1

Customer Ref: P Taylor,C6284
SIRIUS GEOTECHNICAL & ENVIRONMENTAL
RUSSEL HOUSE, SUITE 2 MILL ROAD
LANGLEY MOOR
CO. DURHAM DH7 8HJ

SITE DETAILS Grid Reference 440390 402640

114, Park Street

Wombwell
Barnsley
S73 0HW

Historical Map Legend

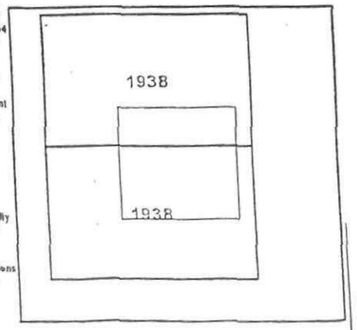
- Quarry
- Shingle
- Railway over Road
- Road over Railway
- Gravel Pit
- Sand Pit
- Level Crossing
- Railway over River
- Other Pits
- Road over Stream
- Road over Stream
- Rough Pasture
- Furze
- Road over River or Canal
- Marsh
- Reeds
- Sunken Road
- Raised Road
- Osiers
- Instrumental Contour
- Arrow denotes flow of Water
- Sketched Contour

YORKSHIRE

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1931, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1971, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Source map scale - 1:10,560



Date(s) of Publication

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CLIENT DETAILS Envirocheck Order No. EC467041_1_1

Customer Ref: P Taylor,C0204
SIRIUS GEOTECHNICAL & ENVIRONMENTAL
RUSSEL HOUSE, SUITE 2 MILL ROAD
LANGLEY MOOR
CO. DURHAM DH7 8HJ

SITE DETAILS Grid Reference 440390 402640

114, Park Street

Wombwell
Barnsley
S73 0HW

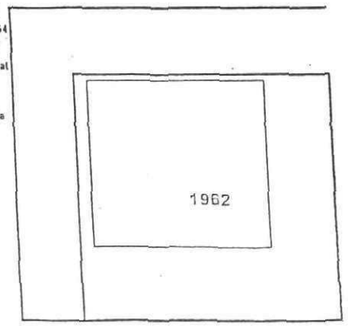
Historical Map Legend

- Inactive Quarry, Chalk Pit or Clay Pit
- Active Quarry, Chalk Pit or Clay Pit
- Culvert
- Slope
- Slope
- Pylon
- Electricity Transmission Line
- Direction of Water flow
- Coppice, Osie
- Marsh
- Saltings
- Orchard Tree
- Reeds
- Rough Grassland
- Scrub
- Heath
- Bracken
- Coniferous Tree (Surveyed)
- Coniferous Tree (Not Surveyed)
- Non-coniferous Tree (Surveyed)
- Non-coniferous Tree (Not Surveyed)

ORDNANCE SURVEY PLAN

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given on the right is often some years later than the surveyed date. Before 1930, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Source map scale - 1:2,500



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LANGLEY MOOR
CO. DURHAM DH7 8HJ

SITE DETAILS — Grid Reference 440390 402640

114, Park Street

Wombwell
Barnsley
S73 0HW

Historical Map Legend

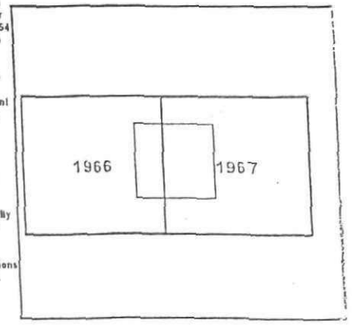
- Chalk Pit, Clay Pit, or Quarry
- Non-coniferous Trees
- Bracken
- Gravel Pit
- Coniferous Trees
- Heath
- Sand Pit
- Scrub
- Rough Grassland
- Lake, Loch or Pond
- Disused Pit or Quarry
- Pylon
- Reeds
- Electricity Transmission Line
- Refuse or Slag Heap
- Pole
- Saltings
- Direction of Flow of Water
- Marsh
- Shingle
- Sand
- Cutting
- Embankment
- Standard Guage Multiple Track
- Standard Guage Single Track
- Road Under
- Road Over
- Level Crossing
- Foot Bridge
- Siding, Tramway or Mineral Line
- Narrow Guage

ORDNANCE SURVEY PLAN

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In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

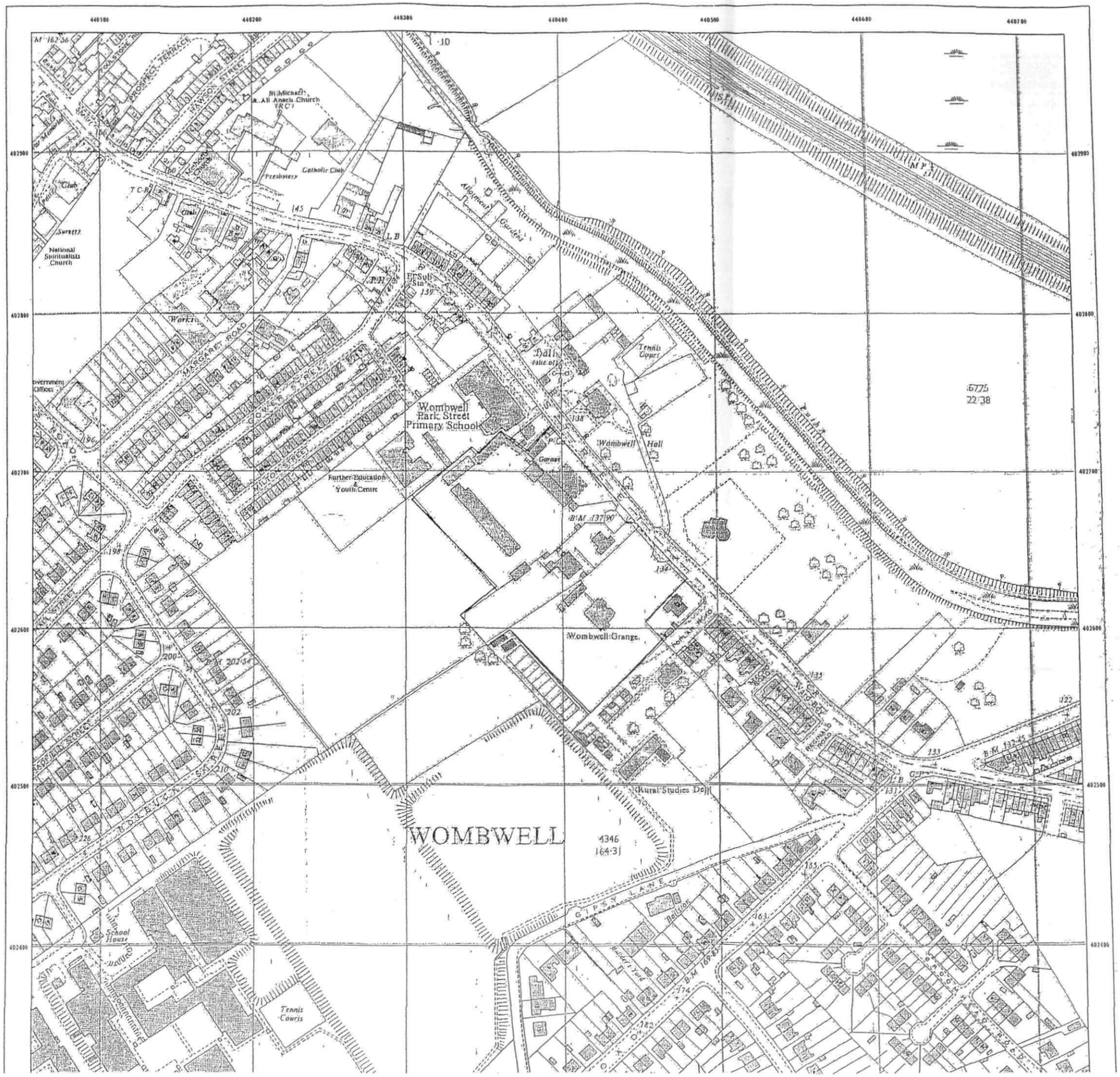
Source map scale - 1:10,560



Date(s) of Publication

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Customer Ref: P Taylor,C0204
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RUSSEL HOUSE, SUITE 2 MILL ROAD
LANGLEY MOOR
CO. DURHAM DH7 8HJ

SITE DETAILS Grid Reference 440390 402640

114, Park Street

Wombwell
Barnsley
S73 0HW

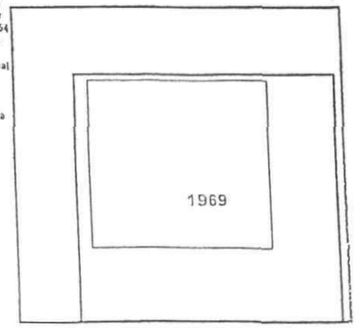
Historical Map Legend

- Inactive Quarry, Chalk Pit or Clay Pit
- Active Quarry, Chalk Pit or Clay Pit
- Culvert
- Slope
- Slope
- Pylon
- Electricity Transmission Line (E TR)
- Direction of Water flow
- Coppice, Osier
- Marsh
- Saltings
- Orchard Tree
- Reeds
- Rough Grassland
- Scrub
- Heath
- Bracken
- Coniferous Tree (Surveyed)
- Coniferous Tree (Not Surveyed)
- Non-coniferous Tree (Surveyed)
- Non-coniferous Tree (Not Surveyed)

ORDNANCE SURVEY PLAN

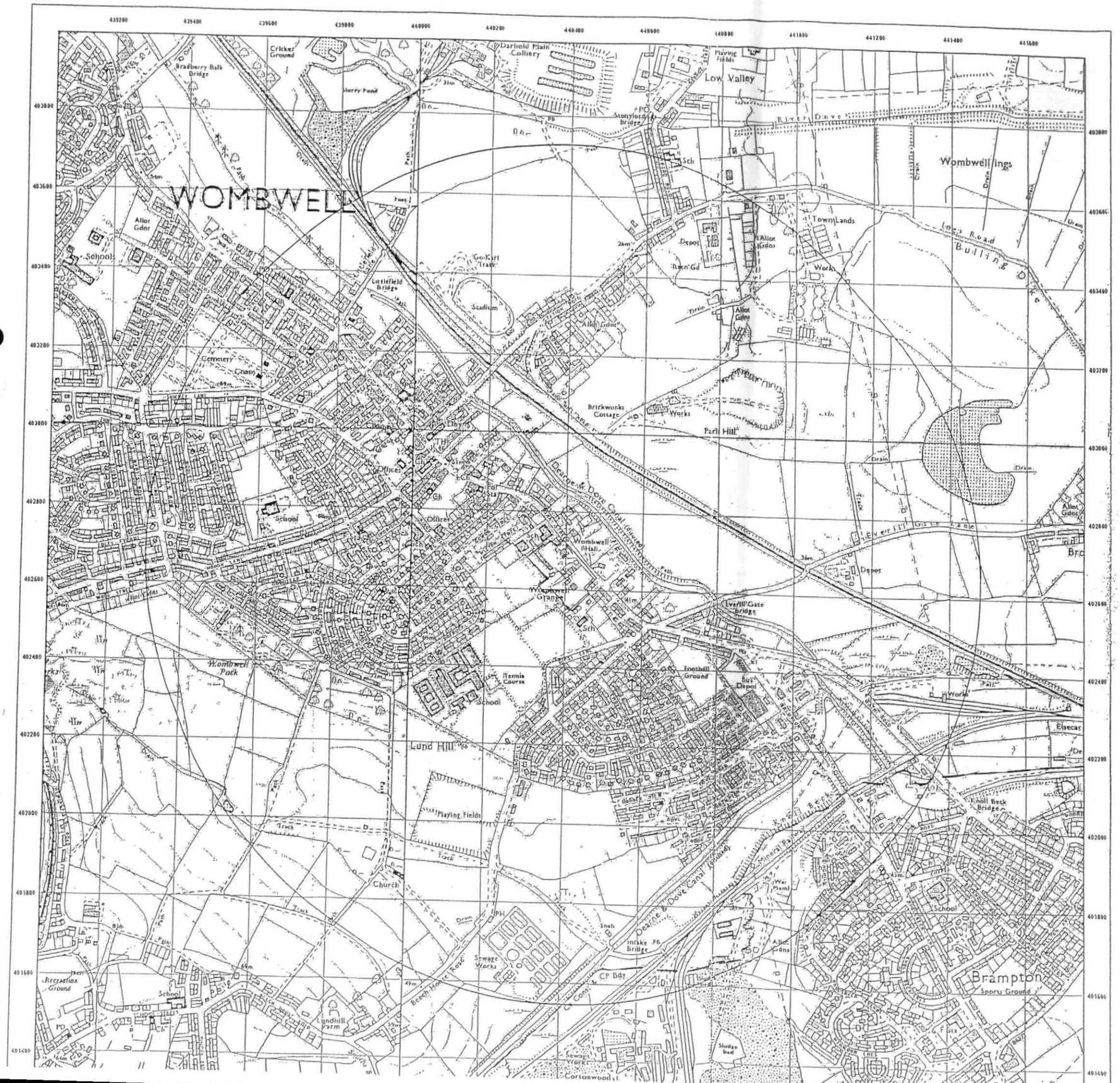
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840 s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given on the right is often some years later than the surveyed date. Before 1936, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Source map scale - 1:2,500



Date(s) of Publication

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Customer Ref: P Taylor,C0284
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LANGLEY MOOR
CO. DURHAM DH7 8HJ

SITE DETAILS Grid Reference 440390 402640

114, Park Street

Wombwell
Barnsley
S73 8HW

Historical Map Legend

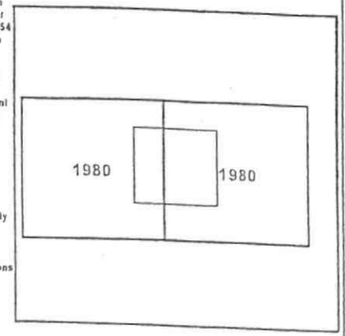
- Chalk Pit, Clay Pit, or Quarry
- Non-coniferous Trees
- Bracken
- Gravel Pit
- Coniferous Trees
- Heath
- Sand Pit
- Scrub
- Rough Grassland
- Lake, Loch or Pond
- Disused Pit or Quarry
- Pylon
- Reeds
- Electricity Transmission Line
- Refuse or Slag Heap
- Pole
- Saltings
- Direction of Flow of Water
- Marsh
- Shingle
- Sand
- Cutline
- Embankment
- Standard Guage Multiple Track
- Road Under
- Road Over
- Level Crossing
- Foot Bridge
- Standard Guage Single Track
- Siding, Tramway or Mineral Line
- Narrow Guage

ORDNANCE SURVEY PLAN

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1939, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

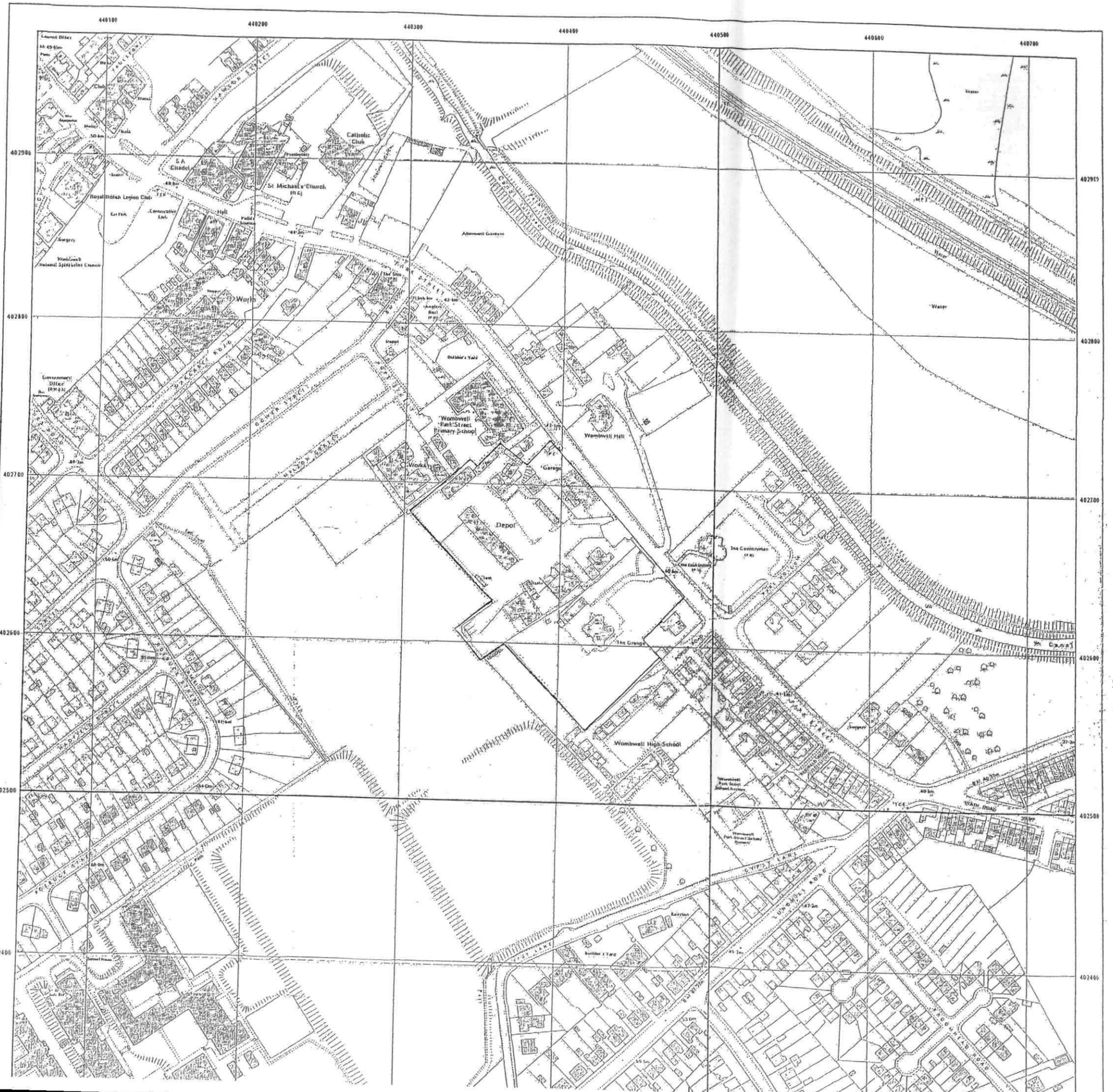
In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Source map scale - 1:10,000



Date(s) of Publication

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SITE DETAILS Grid Reference 440390 402640

114, Park Street

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Barnsley
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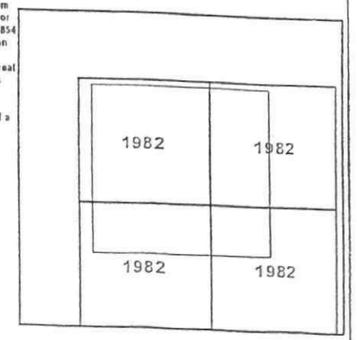
Historical Map Legend

- Inactive Quarry, Chalk Pit or Clay Pit
- Active Quarry, Chalk Pit or Clay Pit
- Culvert
- Slope
- Slope
- Pylon
- E.T.L. Electricity Transmission Line
- Direction of Water flow
- Coppice, Osier
- Marsh
- Saltings
- Orchard Tree
- Reeds
- Rough Grassland
- Scrub
- Heath
- Bracken
- Coniferous Tree (Surveyed)
- Coniferous Tree (Not Surveyed)
- Non-coniferous Tree (Surveyed
- Non-coniferous Tree (Not Surveyed)

ORDNANCE SURVEY PLAN

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given on the right is often some years later than the surveyed date. Before 1936, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Source map scale - 1:1,250



Date(s) of Publication



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LANGLEY MOOR
CO. DURHAM DH7 8HJ

SITE DETAILS

Grid Reference 440390 402640

114, Park Street

Wombwell
Barnsley
S73 0HW

Historical Map Legend

Chalk Pit, Clay Pit, or Quarry — Non-coniferous Trees — Bracken

Gravel Pit — Coniferous Trees — Heath

Sand Pit — Scrub — Rough Grassland

Lake, Loch or Pond

Disused Pit or Quarry — Pylon — Reeds

Electricity Transmission Line

Refuse or Slag Heap — Pole — Saltings

Direction of Flow of Water — Marsh

Shingle

Sand

Cutting — Embankment — Standard Guage Multiple Track

Road Under — Road Over — Level Crossing — Foot Bridge — Standard Guage Single Track

Siding, Tramway or Mineral Line

Narrow Guage

ORDNANCE SURVEY PLAN

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Source map scale - 1:10,000

1989	1989

Date(s) of Publication

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RUSSEL HOUSE, SUITE 2 MILL ROAD
LANGLEY MOOR
CO. DURHAM DH7 8HJ

SITE DETAILS Grid Reference 440390 402640

114, Park Street

Wombwell
Barnsley
S73 0HW

Historical Map Legend

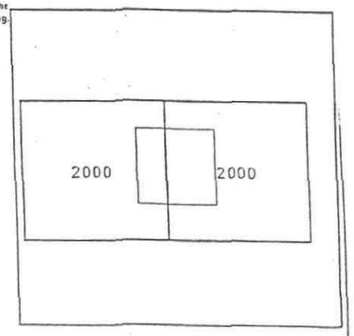
	Non-coniferous Trees		Pylon
	Coniferous Trees		Telephone Line (where shown)
	Orchard		Electricity Transmission Line (with poles
	Rough Grassland		Gravel Pit
	Heath		Shingle
	Scrub		Refuse Tip or Slag Heap
	Marsh, Salt Marsh or Reeds	Sand	Sand
	County Boundary (England only)		Sand Pit
	Civil Parish or Community Boundary		Slopes
	Constituency Boundary		District, Unitary, Metropolitan, London Borough Boundary

ORDNANCE SURVEY PLAN

The historical maps shown were produced from the Ordnance Survey's 1:10,000 colour raster mapping. These maps are derived from Landplan® which replaced the old 1:10,000 maps originally published in 1970.

The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Source map scale - 1:10,000



Date(s) of Publication

APPENDIX G
TRIAL PIT LOGS

TRIAL PIT LOG

ENCIA CONSULTING LIMITED

CLIENT Ben Bailey Homes Ltd

SITE Park Street, Wombwell

TP101

DATE 20/10/2004 Co-ords Sheet 1 of 1

Ground Level 48.8mAOD Scale 1:25

Sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
			MADE GROUND. Concrete with multiple steel reinforcement bars				
1K	0.25		MADE GROUND: Black very sandy angular fine to coarse gravel of clinker, ash, sandstone, slag, timber and brick Occasional cobbles of brick and sandstone. Slight odour of hydrocarbons.	0.25	48.50		
2K	0.70		*(Very weak) thinly to thickly laminated orange-brown fine* and medium grained weathered SANDSTONE. Recovered as slightly clayey very sandy angular fine to coarse gravel and cobbles. (WEATHERED COAL MEASURES)	0.60	48.15		
			(Weak) thinly to thickly laminated grey and locally orange-brown fine and medium grained SANDSTONE. (COAL MEASURES)	1.80	46.95		
			End of trial pit at 1.90 m	1.90	46.85		

Remarks

1 Prior to excavation a Cable Avoidance Tool survey was carried out.
2. The sides of the trial pit remained stable during excavation.
3. Groundwater was not apparent during excavation.
4. On completion the trial pit was backfilled with materials arising
5. Approximate ground level interpolated from site survey drawing

Equipment/Methods	Logged by	JOB	FIGURE
JCB 3CX with 0.6m wide tooth bucket.	LPS	G177	

TRIAL PIT LOG

ENCIA CONSULTING LIMITED

CLIENT Ben Bailey Homes Ltd

SITE Park Street, Wombwell

TP102

DATE 20/10/2004 Co-ords Sheet 1 of 1

Ground Level 48.1mAOD Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
			MADE GROUND. Concrete with multiple steel reinforcement bars.				
1K	0.25		*MADE GROUND: Black and dark brown very sandy angular fine to coarse gravel of brick, clinker, ash, sandstone, timber and glass.*	0.25	47.84		
2K	0.60		(Very weak) thinly to thickly laminated orange-brown fine and medium grained weathered SANDSTONE. Recovered as slightly clayey to clayey very sandy angular fine to coarse gravel. (WEATHERED COAL MEASURES)	0.50	47.59		
			(Weak) thinly to thickly laminated grey and locally orange-brown fine and medium grained SANDSTONE. (COAL MEASURES)	2.00	46.09		
			End of trial pit at 2.20 m	2.20	45.89		

Remarks

1. Prior to excavation a Cable Avoidance Tool survey was carried out.
2. The sides of the trial pit remained stable during excavation.
3. Groundwater was not apparent during excavation.
4. On completion the trial pit was backfilled with materials arising
5. Approximate ground level interpolated from site survey drawing.

Equipment/Methods	Logged by	JOB	FIGURE
JCB 3CX with 0.6m wide tooth bucket	LPS	6177	

TRIAL PIT LOG

ENCIA CONSULTING LIMITED

CLIENT Ben Bailey Homes Ltd

SITE Park Street, Wombwell

TP103

DATE 20/10/2004 Co-ords Sheet 1 of 1

Ground Level 48.5mAOD *Scale 1:25*

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
			MADE GROUND: Concrete with multiple steel reinforcement bars.				
1D	0.25		MADE GROUND: Yellow and brown very sandy angular fine to coarse gravel of limestone and sandstone.	0.25	48.22		
2D	0.50		(Very weak) thinly to thickly laminated grey and locally orange-brown fine and medium grained weathered SANDSTONE. Recovered as slightly clayey very sandy angular fine to coarse gravel. (WEATHERED COAL MEASURES)	0.50	47.97		
			(Weak) thinly to thickly laminated orange-brown fine and medium grained SANDSTONE. (COAL MEASURES)	2.00	46.47		
			End of trial pit at 2.30 m	2.30	46.17		

Remarks

1. Prior to excavation a Cable Avoidance Tool survey was carried out
2. The sides of the trial pit remained stable during excavation.
3. Groundwater was not apparent during excavation.
4. On completion the trial pit was backfilled with materials arising
5. Approximate ground level interpolated from site survey drawing

Equipment/Methods	Logged by	JOB	FIGURE
JCB 3CX with 0.6m wide tooth bucket	LPS	6177	

TRIAL PIT LOG

ENCIA CONSULTING LIMITED

CLIENT Ben Bailey Homes Ltd

SITE Park Street, Wombwell

TP104

DATE 20/10/2004 Co-ords Sheet 1 of 1

Ground Level 48.0mAOD Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
			MADE GROUND: Tarmac.				
			MADE GROUND: Grey and black very sandy angular fine to coarse gravel of sandstone, ash, glass and brick. Slight odour of hydrocarbons.	0.20	47.76		
1K	0.50						
			MADE GROUND: (Firm) orange-brown slightly sandy gravelly clay. Gravel is angular fine to coarse sandstone, brick and clay pipe.	0.60	47.36		
2K	1.00						
			(Very weak) thinly to thickly laminated orange-brown fine and medium grained weathered SANDSTONE. Recovered as slightly clayey very sandy angular fine to coarse gravel and cobbles (<150mm). (WEATHERED COAL MEASURES) From 1.5m to 2.2m bgl: slight odour of hydrocarbons.	1.20	46.76		
3K	1.50						
			End of trial pit at 2.80 m	2.80	45.16		

Remarks

1. Prior to excavation a Cable Avoidance Tool survey was carried out.
2. The sides of the trial pit remained stable during excavation.
3. Groundwater was not apparent during excavation.
4. On completion the trial pit was backfilled with materials arising.
5. Approximate ground level interpolated from survey drawing.

Equipment/Methods	Logged by	JOB	FIGURE
JCB 3CX with 0.6m wide tooth bucket	LPS	6177	

TRIAL PIT LOG

ENCIA CONSULTING LIMITED

CLIENT Ben Bailey Homes Ltd

SITE Park Street, Wombwell

TP105

DATE 20/10/2004 Co-ords Sheet 1 of 1

Ground Level 47.6mAOD Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
			MADE GROUND: 200mm tarmac over limestone gravel subbase.				
1K	0.50		MADE GROUND: Grey and black very sandy angular fine to coarse gravel of limestone, sandstone, ash and slag. Moderately strong odour of hydrocarbons.	0.50	47.07		
2K	1.00		MADE GROUND: *Orange-brown very sandy angular fine to* coarse gravel and cobbles (<300mm) of sandstone and brick. Occasional sandstone boulders (<450mm).	0.80	46.77		
			(Very weak) thinly to thickly laminated orange-brown fine and medium grained weathered SANDSTONE. Recovered as very sandy angular fine to coarse gravel. (WEATHERED COAL MEASURES)	2.00	45.57		
			End of trial pit at 2.30 m	2.30	45.27		

Remarks

1. Prior to excavation a Cable Avoidance Tool survey was carried out.
2. The sides of the trial pit remained stable during excavation.
3. Groundwater was not apparent during excavation.
4. On completion the trial pit was backfilled with materials arising.
5. Approximate ground level interpolated from site survey drawing.

Equipment/Methods	Logged by	JOB	FIGURE
JCB 3CX with 0.6m wide tooth bucket.	LPS	6177	

TRIAL PIT LOG

ENCIA CONSULTING LIMITED

CLIENT Ben Bailey Homes Ltd

SITE Park Street, Wombwell

TP106

DATE 21/10/2004 Co-ords Sheet 1 of 1

Ground Level 47.7mAOD Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
			MADE GROUND: 200mm tarmac over limestone gravel subbase.				
1D	0.30		MADE GROUND: Black very sandy angular fine to coarse gravel of ash, clinker, brick and slag.	0.30	47.44		
			(Very weak) thinly to thickly laminated brown and locally orange-brown fine and medium grained weathered SANDSTONE. Recovered as slightly clayey very sandy angular fine to coarse gravel and cobbles (<150mm). (WEATHERED COAL MEASURES)	0.60	47.14		
2D	1.00						
			End of trial pit at 2.70 m	2.70	45.04		

Remarks

1. Prior to excavation a Cable Avoidance Tool survey was carried out.
2. The sides of the trial pit remained stable during excavation.
3. Groundwater was not apparent during excavation.
4. On completion the trial pit was backfilled with materials arising.
5. Approximate level interpolated from site survey drawing.

Equipment/Methods	Logged by	JOB	FIGURE
JCB 3CX with 0.6m wide tooth bucket.	LPS	6177	

TRIAL PIT LOG

ENCIA CONSULTING LIMITED

CLIENT Ben Bailey Homes Ltd

SITE Park Street, Wombwell

TP107

DATE 21/10/2004 Co-ords Sheet 1 of 1

Ground Level 48.1mAOD Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
			MADE GROUND: Concrete with multiple steel reinforcement bars.				
1K	0.25		MADE GROUND: Black very sandy subangular and angular fine to coarse gravel of brick, ash, clinker, timber and glass. Occasional cobbles of brick and sandstone. Slight odour of creosote.	0.25	47.87		
2K	0.70		(Firm to stiff) friable orange-brown and locally grey very sandy CLAY.	0.60	47.52		
			(Very weak) thinly to thickly laminated grey and locally orange-brown fine and medium grained weathered SANDSTONE. Recovered as slightly clayey very sandy angular fine to coarse gravel. (WEATHERED COAL MEASURES)	1.00	47.12		
			(Weak) thinly to thickly laminated orange-brown fine and medium grained SANDSTONE. (COAL MEASURES)	2.20	45.92		
			End of trial pit at 2.30 m	2.30	45.82		

Remarks

1. Prior to excavation a Cable Avoidance Tool survey was carried out.
2. The sides of the trial pit remained stable during excavation.
3. Groundwater was not apparent during excavation.
4. On completion the trial pit was backfilled with materials arising
5. Approximate ground level interpolated from site survey drawing

Equipment/Methods	Logged by	JOB	FIGURE
JCB 3CX with 0.6m wide tooth bucket	LPS	6177	

TRIAL PIT LOG

ENCIA CONSULTING LIMITED

CLIENT Ben Bailey Homes Ltd

SITE Park Street, Wombwell

TP108

DATE 21/10/2004 Co-ords Sheet 1 of 1

Ground Level 46.4mAOD Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
			MADE GROUND: Tarmac.				
1K	0.25		MADE GROUND: Orange-brown very sandy angular fine to coarse gravel and cobbles of brick, concrete, ash, clinker, slag and timber. Occasional sandstone and concrete boulders (*<400mm*).	0.20	46.22		
			At 0.7m bgl: southwest end; concrete obstruction.				
2K	1.40		(Very weak) thinly to thickly laminated orange-brown fine and medium grained weathered SANDSTONE. Recovered as very sandy angular fine to coarse gravel. (WEATHERED COAL MEASURES)	1.40	45.02		
3K	2.70		Below 2.7m bgl: black discolouration and strong odour of hydrocarbons associated with groundwater inflow.				
			End of trial pit at 3.00 m	3.00	43.42		

Remarks

1. Prior to excavation a Cable Avoidance Tool survey was carried out.
2. The sides of the trial pit remained stable during excavation.
3. Groundwater was encountered at 2.7m bgl during excavation
4. On completion the trial pit was backfilled with materials arising.
5. *Approximate ground level interpolated from site survey drawing.*

Equipment/Methods	Logged by	JOB	FIGURE
JCB 3CX with 0.6m wide tooth bucket.	LPS	6177	

TRIAL PIT LOG

ENCIA CONSULTING LIMITED

CLIENT Ben Bailey Homes Ltd

SITE Park Street, Wombwell

TP109

DATE 21/10/2004 Co-ords Sheet 1 of 1

Ground Level 46.5mAOD Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
			MADE GROUND: Concrete with multiple steel reinforcement bars.				
1K	0.30		MADE GROUND: Black very sandy subangular and angular fine to coarse gravel of sandstone, brick, ash, clinker and timber. Strong odour of hydrocarbons.	0.30	46.21		
			(Very weak) thinly to thickly laminated orange-brown and discoloured black fine and medium grained weathered *SANDSTONE. Recovered as very sandy angular fine to coarse* gravel. *(WEATHERED COAL MEASURES)*	0.90	45.61		
1K	1.40		From 1.4m bgl to 2.5m bgl: strong odour of hydrocarbons.				
			End of trial pit at 2.80 m	2.80	43.71		

Remarks

1. Prior to excavation a Cable Avoidance Tool survey was carried out.
2. The sides of the trial pit remained stable during excavation.
3. Groundwater was encountered at 2.5m bgl during excavation.
4. On completion the trial pit was backfilled with materials arising.
5. Approximate ground level interpolated from site survey drawing.

Equipment/Methods	Logged by	JOB	FIGURE
JCB 3CX with 0.6m wide tooth bucket	LPS	6177	

TRIAL PIT LOG

ENCIA CONSULTING LIMITED

CLIENT Ben Bailey Homes Ltd

SITE Park Street, Wombwell

TP110

DATE 21/10/2004 Co-ords Sheet 1 of 1

Ground Level 47.5mAOD Scale 1:25

sample no & type	depth (m)	in situ test	description	depth (m)	level (m)	ground water	legend
1K	0.25		MADE GROUND. 200mm tarmac hardstand over light brown *and black slightly clayey to clayey sandy angular fine to* coarse gravel of limestone, sandstone, brick ash, timber and metal. Below 0.25m bgl. strong odour of hydrocarbons.				
2K	1.00		(Very weak) thinly to thickly laminated grey and locally orange-brown fine and medium grained weathered SANDSTONE. Recovered as slightly clayey very sandy angular fine to coarse gravel. (WEATHERED COAL MEASURES)	1.00	46.48		
3K	2.10		From 2.1m bgl to 2.7m bgl: strong odour of hydrocarbons.				
			End of trial pit at 2.80 m	2.80	44.68		

Remarks

1. *Prior to excavation a Cable Avoidance Tool survey was carried out.*
2. The sides of the trial pit remained stable during excavation.
3. Groundwater was encountered at 0.9m bgl during excavation
4. On completion the trial pit was backfilled with materials arising
5. Approximate ground level interpolated from site survey drawing.

Equipment/Methods	Logged by	JOB	FIGURE
JCB 3CX with 0.6m wide tooth bucket	LPS	6177	

APPENDIX H
WINDOW SAMPLE LOGS

WINDOW SAMPLE LOG

ENCIA CONSULTING LIMITED

CLIENT Ben Bailey Homes Ltd

SITE Park Street, Wombwell

WS101

DATE 22 Oct 04 Co-ords Sheet 1 of 1

Ground Level 48.8mAOD Scale 1:50

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.25		MADE GROUND: Concrete with multiple steel reinforcement bars.	0.25	48.54		
2D	0.50		MADE GROUND: Brown very sandy angular fine to coarse gravel of sandstone, brick and limestone.	0.50	48.29		
			(Very weak) thinly to thickly laminated grey and locally orange-brown fine and medium grained weathered SANDSTONE. Recovered as very sandy angular fine to coarse gravel. (WEATHERED COAL MEASURES)				
			End of window sample hole at 1.70 m	1.70	47.09		

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. Groundwater was not encountered during drilling.
3. On completion the borehole was backfilled with arisings.
4. Approximate ground level interpolated from site survey drawing

Equipment/Methods	Logged by	JOB	FIGURE
Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods	LPS	6177	

WINDOW SAMPLE LOG

ENCIA CONSULTING LIMITED

CLIENT Ben Bailey Homes Ltd

SITE Park Street, Wombwell

WS102

DATE 22 Oct 04 Co-ords Sheet 1 of 1

Ground Level 48.1mAOD Scale 1:50

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1K	0.25		MADE GROUND: Concrete with multiple steel reinforcement bars.	0.25	47.82		
2D	0.60		MADE GROUND: Dark brown and black slightly clayey very sandy angular fine to coarse gravel of sandstone, brick and ash. Slight odour of diesel.	0.50	47.57		
			(Very weak) thinly to thickly laminated grey and locally orange-brown fine and medium grained weathered SANDSTONE. Recovered as slightly clayey very sandy angular fine to coarse gravel. (WEATHERED COAL MEASURES)				
			End of window sample hole at 1.90 m	1.90	46.17		

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. *Groundwater was not encountered during drilling.*
3. On completion the borehole was backfilled with arisings.
4. Approximate ground level interpolated from site survey drawing.

Equipment/Methods	Logged by	JOB	FIGURE
Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods	LPS	6177	

WINDOW SAMPLE LOG

ENCIA CONSULTING LIMITED

CLIENT Ben Bailey Homes Ltd

SITE Park Street, Wombwell

WS103

DATE 22 Oct 04 Co-ords Sheet 1 of 1

Ground Level 48.7mAOD Scale 1:50

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
			MADE GROUND: 250mm concrete with multiple steel reinforcement bars over limestone subbase.	0.40	48.25		
1D	0.50		MADE GROUND: Orange and grey slightly sandy to sandy angular fine to coarse gravel of sandstone and brick.	0.80	47.85		
2D	0.80		(Very weak) thinly to thickly laminated grey and orange-brown fine and medium grained weathered SANDSTONE. Recovered as very sandy angular fine to coarse gravel. (WEATHERED COAL MEASURES)	1.40	47.25		
			(Weak) thinly to thickly laminated grey fine and medium grained SANDSTONE. (COAL MEASURES)	1.60	47.05		
			End of window sample hole at 1.60 m				

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. Groundwater was not encountered during drilling.
3. On completion the borehole was backfilled with arisings.
4. Approximate ground level interpolated from site survey drawing.

Equipment/Methods	Logged by	JOB	FIGURE
Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.	LPS	6177	

WINDOW SAMPLE LOG

ENCIA CONSULTING LIMITED

CLIENT Ben Bailey Homes Ltd

SITE Park Street, Wombwell

WS104

DATE 22 Oct 04 Co-ords Sheet 1 of 1

Ground Level 42.6mAOD Scale 1:50

Sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
			MADE GROUND: Grey angular coarse limestone gravel.				
1D	0.25		MADE GROUND: Red very sandy angular fine to coarse gravel of brick, shale, sandstone and ash.	0.25	42.39		
2D	1.00		(Very weak) thinly to thickly laminated grey and orange-brown fine and medium grained weathered SANDSTONE. Recovered as very sandy angular fine to coarse gravel. (WEATHERED COAL MEASURES)	0.70	41.94		
			(Weak) thinly to thickly laminated grey fine and medium grained SANDSTONE. (COAL MEASURES)	1.40	41.24		
			End of window sample hole at 1.50 m	1.50	41.14		

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. Groundwater was not encountered during drilling.
3. On completion the borehole was backfilled with arisings.
4. Approximate ground level interpolated from site survey drawing.

Equipment/Methods	Logged by	JOB	FIGURE
Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.	LPS	6177	

WINDOW SAMPLE LOG

ENCIA CONSULTING LIMITED

CLIENT Ben Bailey Homes Ltd

SITE Park Street, Wombwell

WS105

DATE 22 Oct 04 Co-ords Sheet 1 of 1

Ground Level 42.5mAOD Scale 1:50

Sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.25		MADE GROUND: Tarmac hardstand	0.20	42.31		
2D	0.60		MADE GROUND: Dark red very sandy angular fine to coarse gravel of sandstone, brick, charcoal and clinker.	0.50	42.01		
			(Very weak) thinly to thickly laminated light brown fine and medium grained weathered SANDSTONE. Recovered as very sandy angular fine to coarse gravel. (WEATHERED COAL MEASURES)	1.40	41.11		
			(Weak) thinly to thickly laminated grey and locally orange-brown fine and medium grained SANDSTONE. (COAL MEASURES)	1.85	40.66		
			End of window sample hole at 1.85 m				

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. Groundwater was not encountered during drilling.
3. On completion the borehole was backfilled with arisings.
4. *Approximate ground level interpolated from site survey drawing.*

Equipment/Methods
Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods

Logged by	JOB	FIGURE
LPS	6177	

WINDOW SAMPLE LOG

ENCIA CONSULTING LIMITED

CLIENT Ben Bailey Homes Ltd

SITE Park Street, Wombwell

WS106

DATE 22 Oct 04 Co-ords Sheet 1 of 1

Ground Level 42.4mAOD Scale 1:50

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
			MADE GROUND: 250mm concrete with multiple steel reinforcement bars over limestone gravel subbase.	0.40	41.97		
1D	0.50		MADE GROUND: Dark and light grey slightly clayey to clayey sandy angular fine to coarse gravel of sandstone, limestone and brick.				
	1.80		(Very weak) thinly to thickly laminated grey and discoloured black fine and medium grained weathered SANDSTONE. (WEATHERED COAL MEASURES)	1.50	40.87		
3K	2.20		*Below 1.8m bgl: visual and olfactory evidence of hydrocarbons.*				
			End of window sample hole at 2.40 m	2.40	39.97		

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. Groundwater was not encountered during drilling.
3. *On completion the borehole was backfilled with arisings.*
4. Approximate ground level interpolated from site survey drawing.

Equipment/Methods	Logged by	JOB	FIGURE
Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.	LPS	6177	

WINDOW SAMPLE LOG

ENCIA CONSULTING LIMITED

CLIENT Ben Bailey Homes Ltd

SITE Park Street, Wombwell

WS107

DATE 22 Oct 04 Co-ords Sheet 1 of 1

Ground Level 42.4mAOD Scale 1:50

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
			MADE GROUND: Concrete with multiple steel reinforcement bars.	0.30	42.10		
1D	0.50		MADE GROUND: Light brown and orange brown very sandy angular fine to coarse gravel of sandstone, brick, ash and shale.	1.00	41.40		
2K	1.20		(Very weak) thinly to thickly laminated orange-brown fine and medium grained weathered SANDSTONE. Recovered as very sandy angular fine to coarse gravel. (WEATHERED COAL MEASURES) Below 1.2m bgl: visual and olfactory evidence of hydrocarbons.	1.60	40.80		
			End of window sample hole at 1.60 m				

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. Groundwater was not encountered during drilling.
3. On completion the borehole was backfilled with arisings.
4. Approximate ground level interpolated from site survey drawing.

Equipment/Methods	Logged by	JOB	FIGURE
Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.	LPS	6177	

WINDOW SAMPLE LOG

ENCIA CONSULTING LIMITED

CLIENT Ben Bailey Homes Ltd

SITE Park Street, Wombwell

WS108

DATE 22 Oct 04 Co-ords Sheet 1 of 1

Ground Level 42.6mAOD Scale 1:50

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
			MADE GROUND: Tarmac hardstand over limestone gravel subbase.	0.30	42.32		
1D	0.50		MADE GROUND: Orange and red-brown very sandy angular fine to coarse gravel of sandstone, limestone and brick.				
			(Very weak) thinly to thickly laminated orange-brown fine and medium grained weathered SANDSTONE. Recovered as very sandy angular fine to coarse gravel. (WEATHERED COAL MEASURES)	1.20	41 42		
	1.80		(Weak) thinly to thickly laminated grey fine and medium grained SANDSTONE. (COAL MEASURES) Below 1.8m bgl: visual and olfactory evidence of *hydrocarbons*.	1.80	40.82		
			End of window sample hole at 2.10 m	2.10	40.52		

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. Groundwater was not encountered during drilling.
3. On completion the borehole was backfilled with arisings.
4. Approximate ground level interpolated from site survey drawing.

Equipment/Methods	Logged by	JOB	FIGURE
Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.	LPS	6177	

APPENDIX I
CHEMICAL TEST RESULTS

ALcontrol Laboratories

Templeborough House, Mill Close,
Rotherham, S60 1BZ
Tel : 01709 841096
Fax : 01709 841079
customer.services@alcontrol.co.uk

19695

RECEIVED 1 NOV 2004

Mr S James
Encia Group Ltd
Encia House
Audby Lane
Wetherby
West Yorkshire
LS22 7RD

29/10/2004

Dear Mr S James

Your Ref and Description : 6177

Site Name : Park Street, Wombwell

SDG Number : SDG04024267

Please find enclosed the test reports for the samples received on 25 Oct 2004.

The samples were given Lab numbers 040094302 - 040094327. Please quote these numbers should you have any queries about the enclosed test reports. Also enclosed are brief descriptions of the techniques employed to analyse these samples.

Where appropriate, all liquid and solid samples are retained for 10 working days from the report date. After that date the samples will be discarded.

If you wish to extend the period for which a sample is to be retained, please call 01709 841096. A cost of 20p per sample per container per day will apply for this extended storage service.

Should you have any queries about the enclosed report or if you have any comments to make about the service you have received, please contact the Customer Services Team at the address, telephone number or email address given above.

Yours sincerely

Vickie Webster
Customer Services

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0996
2330

ALcontrol Laboratories

Templeborough House, Mill Close,
Rotherham, S60 1BZ
Tel : 01709 841096
Fax : 01709 841079
customer.services@alcontrol.co.uk

Accredited Test Procedures

Method Ref.	Technique
R2.21	Colorimetric
R2.3.2	Colorimetric
R2.4.2	Colorimetric
R2.5	Colorimetric
R2.6.1	Colorimetric
R2.7.3	Colorimetric
R2.8.2	Colorimetric
R3.2/S3.2	Titrimetric
R3.3	Electrochemical
R3.4.1/A	Ion Selective Electrode
R3.5.1	Ion Selective Electrode
R3.6/S3.6.2	Ion Selective Electrode
R3.7.1	Gravimetric
R3.8	Gravimetric
R4.1/R4.2	Titrimetric
R5.1/S5.1	Electrochemical (dissolved oxygen probe)
R5.2/S5.2	Dichromate oxidation / colorimetric
R5.5	Ion Chromatography
R6.13	Colorimetric
R7.2	Infra-red spectrometry
R7.22	Gas chromatography - flame ionisation detector
R7.25	Gas chromatography - flame ionisation detector
R7.3.1	Gas chromatography - mass spectrometry
R7.4.1	Gas chromatography - mass spectrometry
R7.4.1	Gravimetric
R7.6	HPLC
R7.7	Gas chromatography - mass spectrometry
R7.9	Gas chromatography - mass spectrometry
R8B	Inductively coupled plasma
R9A	Atomic fluorescence spectrometry
R9B	Atomic fluorescense spectrometry
R11.1	Gravimetric
R11.2	Gravimetric
R11.3	Gravimetric
R11.7	Gravimetric
R12.1	Respiration inhibition
R12.2.1a	Nitrification inhibition
R12.3	Microtox

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ALcontrol Laboratories

Rotherham Laboratory : Templeborough House, Mill Close, Rotherham S60 1BZ (UKAS Lab No 0995/2300)
Bellshill Laboratory : 2 Mallard Way, Strathclyde Business Park, Bellshill ML4 3BF (UKAS Lab No. 0995/C)
Bradford Laboratory : George Street, Bradford,BD1 5PZ (UKAS Lab No 0996)
Telephone: 01709 841095 Fax 01709 841079 E-mail : customer.services@alcontrol.co.uk

Certificate of Analysis

Sample Received : 25/10/2004
Analysis Completed : 29/10/2004
Site Name : Park Street, Wombwell

Your PO No : 6177

Encia Group Ltd
Encia House
Audby Lane
Wetherby
West Yorkshire
LS22 7RD

Our Ref		040094302		040094303		040094304	
Your Ref		TP101 J1 0.25m		TP101 J2 0.70m		TP102 J1 0.25m	
Sampled On		25/10/2004		25/10/2004		25/10/2004	
	Method						
Arsenic (leachable)	R9B	18.8	ug/l				
Mercury (leachable)	R9A	<0.053	ug/l				
Boron (leachable)	R8B	96.1	ug/l				
Cadmium (leachable)	R8B	<0.2	ug/l				
Chromium (leachable)	R8B	<2	ug/l				
Copper (leachable)	R8B	5.35	ug/l				
Nickel (leachable)	R8B	<5	ug/l				
Lead (leachable)	R8B	<5	ug/l				
Zinc (leachable)	R8B	<10	ug/l				
Arsenic	R8B	9.38	mg/kg	< 5	mg/kg		
Cadmium	R8B	1.43	mg/kg	0.115	mg/kg		
Chromium	R8B	37.3	mg/kg	19.5	mg/kg		
Copper	R8B	61.2	mg/kg	13.8	mg/kg		
Mercury	R8B	0.366	mg/kg	0.308	mg/kg		
Nickel	R8B	21.3	mg/kg	34.8	mg/kg		
Lead	R8B	256	mg/kg	9.96	mg/kg		
Zinc	R8B	338	mg/kg	28.6	mg/kg		
Toluene	R7.9	36.8	ug/kg [DSB]	<50	ug/kg [DSB]	<50	ug/kg [DSB]
Ethyl Benzene	R7.9	36.3	ug/kg [DSB]	<50	ug/kg [DSB]	<50	ug/kg [DSB]
Benzene	R7.9	23.2	ug/kg [DSB]	<50	ug/kg [DSB]	<50	ug/kg [DSB]
1,3 & 1,4 Dimethylbenzene (m & p-Xylene)	R7.9	157	ug/kg [DSB]	<50	ug/kg [DSB]	<50	ug/kg [DSB]
1,2-Dimethylbenzene (o-Xylene)	R7.9	153	ug/kg [DSB]	<50	ug/kg [DSB]	<50	ug/kg [DSB]
Acenaphthene	R7.7	9.05	mg/kg	<0.37	mg/kg	<0.32	mg/kg
Acenaphthylene	R7.7	1.36	mg/kg	<0.37	mg/kg	1.09	mg/kg
Benzo (a) Anthracene	R7.7	9.68	mg/kg	<0.37	mg/kg	3.86	mg/kg
Chrysene	R7.7	9.20	mg/kg	<0.37	mg/kg	3.53	mg/kg
Dibenzo (a,h) Anthracene	R7.7	1.00	mg/kg	<0.37	mg/kg	0.467	mg/kg
Fluoranthene	R7.7	32.1	mg/kg	<0.37	mg/kg	11.7	mg/kg
Fluorene	R7.7	13.6	mg/kg	<0.37	mg/kg	<0.32	mg/kg
Phenanthrene	R7.7	42.5	mg/kg	<0.37	mg/kg	8.50	mg/kg
Pyrene	R7.7	31.8	mg/kg	<0.37	mg/kg	10.4	mg/kg
Benzo (a) Pyrene	R7.7	11.6	mg/kg	<0.37	mg/kg	4.68	mg/kg
Benzo (g,h,i) Perylene	R7.7	4.24	mg/kg	<0.37	mg/kg	1.98	mg/kg
Indeno (1,2,3-cd) pyrene	R7.7	4.06	mg/kg	<0.37	mg/kg	<0.32	mg/kg
Anthracene	R7.7	16.7	mg/kg	<0.37	mg/kg	2.19	mg/kg
Naphthalene	R7.7	9.95	mg/kg	<0.37	mg/kg	0.755	mg/kg
PAH Total (EPA 16)	R7.7	211.602	mg/kg	0.2664	mg/kg	57.4464	mg/kg
Diesel range organics (C10 - C26)	R7.25	9640	mg/kg	39.7	mg/kg	678	mg/kg

SDG Number : SDG04024267
Certificate ID : 76393

Approved by: Steve Scott (Operations Manager)
Reported : 29/10/2004 16:45:06

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Methods marked ' in this report are not in the UKAS Accreditation Schedule for our Laboratory. Methods marked S are subcontracted, those prefixed R are performed at the Rotherham Lab & those prefixed S are performed at the Bellshill Lab Comments, opinions & interpretations expressed herein are outside the scope of UKAS Accreditation. Details of the methods used and their performance characteristics are available on request. Unless otherwise stated, sampling was not carried out by ALcontrol Laboratories < = less than; > = greater than; DSB = dry solids basis.

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ALcontrol Laboratories

Rotherham Laboratory : Templeborough House, Mill Close Rotherham S60 1BZ (UKAS Lab No 0995/2300)
Bellshill Laboratory : 2 Mallard Way, Strathclyde Business Park, Bellshill ML4 3BF. (UKAS Lab No 0995/IC)
Bradford Laboratory : George Street, Bradford,BD1 5PZ (UKAS Lab No 0996)
Telephone. 01709 841096 Fax: 01709 841079 E-mail : customer.services@alcontrol.co.uk

Certificate of Analysis

Sample Received : 25/10/2004
Analysis Completed : 29/10/2004
Site Name : Park Street, Wombwell

Your PO No : 6177

Encia Group Ltd
Encia House
Audby Lane
Wetherby
West Yorkshire
LS22 7RD

Our Ref		040094302		040094303		040094304	
Your Ref		TP101 J1 0.25m		TP101 J2 0.70m		TP102 J1 0.25m	
Sampled On		25/10/2004		25/10/2004		25/10/2004	
	Method						
Lubricating oil range organics (C26 - C40)	R7.25	4190	mg/kg	31.7	mg/kg	768	mg/kg
Total petroleum hydrocarbons (C10 - C40)	R7.25	13800	mg/kg	71.5	mg/kg	1450	mg/kg
pH (leachate)	R3.6	10.1					
pH	R3.6	10.7		7.83			
Air Dried Solids	R1.1	95.00	%	87.60	%	83.80	%
Stones > 10mm	R1.1	19.00	%	0.00	%	0.00	%
Selenium (leachable)	R*9B	<0.75	ug/l				
Boron	R*8B	<100	mg/kg	<100	mg/kg		
Selenium	R*8B	0.41	mg/kg	<0.4	mg/kg		
Benzo (b&k) Fluoranthene	R*7.7	14.5	mg/kg	<0.37	mg/kg	7.91	mg/kg

Approved by: Steve Scott (Operations Manager)
Reported : 29/10/2004 16:45:06

SDG Number : SDG04024267
Certificate ID : 76393

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2300

*Methods marked * in this report are not in the UKAS Accreditation Schedule for our Laboratory. Methods marked $ are subcontracted, those prefixed R are performed at the Rotherham Lab & those prefixed S are performed at the Bellshill Lab. Comments, opinions & interpretations expressed herein are outside the scope of UKAS Accreditation. Details of the methods used and their performance characteristics are available on request. Unless otherwise stated, sampling was not carried out by ALcontrol Laboratories. < = less than, > = greater than; DSB = dry solids basis.*

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ALcontrol Laboratories

Rotherham Laboratory : Templeborough House, Mill Close, Rotherham. S60 1BZ (UKAS Lab No. 0995/2300)
Bellshill Laboratory : 2 Mallard Way, Strathclyde Business Park, Bellshill ML4 3BF. (UKAS Lab No. 0995/C)
Bradford Laboratory : George Street, Bradford,BD1 5PZ (UKAS Lab No. 0996)
Telephone: 01709 841096 Fax 01709 841079 E-mail : customer.services@alcontrol.co.uk

Certificate of Analysis

Sample Received : 25/10/2004
Analysis Completed : 29/10/2004
Site Name : Park Street, Wombwell

Your PO No : 6177

Encia Group Ltd
Encia House
Audby Lane
Wetherby
West Yorkshire
LS22 7RD

Our Ref		040094305		040094306		040094307	
Your Ref		TP104 J1 0.50m		TP104 J3 1.50m		TP105 J1 0.50m	
Sampled On		25/10/2004		25/10/2004		25/10/2004	
	Method						
Arsenic (leachable)	R9B					<0.75	ug/l
Mercury (leachable)	R9A					<0.053	ug/l
Boron (leachable)	R8B					<50	ug/l
Cadmium (leachable)	R8B					<0.2	ug/l
Chromium (leachable)	R8B					<2	ug/l
Copper (leachable)	R8B					<2	ug/l
Nickel (leachable)	R8B					<5	ug/l
Lead (leachable)	R8B					<5	ug/l
Zinc (leachable)	R8B					<10	ug/l
Arsenic	R8B					< 5	mg/kg
Cadmium	R8B					0.598	mg/kg
Chromium	R8B					8.01	mg/kg
Copper	R8B					31.2	mg/kg
Mercury	R8B					0.194	mg/kg
Nickel	R8B					5.81	mg/kg
Lead	R8B					30.2	mg/kg
Zinc	R8B					127	mg/kg
Toluene	R7.9	42.4	ug/kg (DSB)	<50	ug/kg (DSB)		
Ethyl Benzene	R7.9	<50	ug/kg (DSB)	<50	ug/kg (DSB)		
Benzene	R7.9	<50	ug/kg (DSB)	<50	ug/kg (DSB)		
1,3 & 1,4 Dimethylbenzene (m & p-Xylene)	R7.9	61.0	ug/kg (DSB)	<50	ug/kg (DSB)		
1,2-Dimethylbenzene (o-Xylene)	R7.9	56.7	ug/kg (DSB)	<50	ug/kg (DSB)		
Acenaphthene	R7.7	17.1	mg/kg	<0.34	mg/kg		
Acenaphthylene	R7.7	0.455	mg/kg	<0.34	mg/kg		
Benzo (a) Anthracene	R7.7	3.93	mg/kg	<0.34	mg/kg		
Chrysene	R7.7	4.35	mg/kg	<0.34	mg/kg		
Dibenzo (a,h) Anthracene	R7.7	0.35	mg/kg	<0.34	mg/kg		
Fluoranthene	R7.7	24.7	mg/kg	<0.34	mg/kg		
Fluorene	R7.7	12.0	mg/kg	<0.34	mg/kg		
Phenanthrene	R7.7	35.2	mg/kg	<0.34	mg/kg		
Pyrene	R7.7	25.8	mg/kg	<0.34	mg/kg		
Benzo (a) Pyrene	R7.7	3.81	mg/kg	<0.34	mg/kg		
Benzo (g,h,i) Perylene	R7.7	1.46	mg/kg	<0.34	mg/kg		
Indeno (1,2,3-cd) pyrene	R7.7	1.32	mg/kg	<0.34	mg/kg		
Anthracene	R7.7	12.5	mg/kg	<0.34	mg/kg		
Naphthalene	R7.7	9.21	mg/kg	<0.34	mg/kg		
PAH Total (EPA 16)	R7.7	158.312	mg/kg	0.5032	mg/kg		
Diesel range organics (C10 - C26)	R7.25	13000	mg/kg	95.9	mg/kg		

SDG Number : SDG04024267
Certificate ID : 76393

Approved by: Steve Scott (Operations Manager)
Reported : 29/10/2004 16:45:06

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ALcontrol Laboratories

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Bellshill Laboratory : 2 Mallard Way, Strathclyde Business Park, Bellshill ML4 3BF (UKAS Lab No 0995/C)
Bradford Laboratory : George Street, Bradford,BD1 5PZ (UKAS Lab No 0996)
Telephone 01709 841096 Fax 01709 841079 E-mail : customer.services@alcontrol.co.uk

Certificate of Analysis

Sample Received : 25/10/2004
Analysis Completed : 29/10/2004
Site Name : Park Street, Wombwell

Your PO No : 6177

Encia Group Ltd
Encia House
Audby Lane
Wetherby
West Yorkshire
LS22 7RD

Our Ref		040094305		040094306		040094307	
Your Ref		TP104 J1 0.50m		TP104 J3 1.50m		TP105 J1 0.50m	
Sampled On		25/10/2004		25/10/2004		25/10/2004	
	Method						
Lubricating oil range organics (C26 - C40)	R7.25	10200	mg/kg	107	mg/kg		
Total petroleum hydrocarbons (C10 - C40)	R7.25	23100	mg/kg	203	mg/kg		
pH (leachate)	R3.6					8.72	
pH	R3.6					9.25	
Air Dried Solids	R1.1	94.20	%	88.40	%	93.10	%
Stones > 10mm	R1.1	49.30	%	0.00	%	36.80	%
Selenium (leachable)	R*9B					<0.75	ug/l
Boron	R*8B					<100	mg/kg
Selenium	R*8B					<0.4	mg/kg
Benzo (b&k) Fluoranthene	R*7.7	6.08	mg/kg	<0.34	mg/kg		

Approved by: Steve Scott (Operations Manager)
Reported : 29/10/2004 16:45:06

SDG Number : SDG04024267
Certificate ID : 76393

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Bradford Laboratory George Street, Bradford,BD1 5PZ (UKAS Lab No 0996)
Telephone: 01709 841096 Fax: 01709 841079 E-mail : customer.services@alcontrol.co.uk

Certificate of Analysis

Sample Received : 25/10/2004
Analysis Completed : 29/10/2004
Site Name : Park Street, Wombwell

Your PO No : 6177

Encia Group Ltd
Encia House
Audby Lane
Wetherby
West Yorkshire
LS22 7RD

Our Ref		040094308		040094309		040094310	
Your Ref		TP106 D1 0.30m		TP106 D2 1.00m		TP107 J1 0.25m	
Sampled On		25/10/2004		25/10/2004		25/10/2004	
	Method						
Arsenic (leachable)	R9B	3.01	ug/l				
Mercury (leachable)	R9A	<0.053	ug/l				
Boron (leachable)	R8B	<50	ug/l				
Cadmium (leachable)	R8B	<0.2	ug/l				
Chromium (leachable)	R8B	<2	ug/l				
Copper (leachable)	R8B	4.36	ug/l				
Nickel (leachable)	R8B	<5	ug/l				
Lead (leachable)	R8B	<5	ug/l				
Zinc (leachable)	R8B	<10	ug/l				
Arsenic	R8B	16.8	mg/kg	< 5	mg/kg		
Cadmium	R8B	0.60	mg/kg	0.151	mg/kg		
Chromium	R8B	172	mg/kg	15.2	mg/kg		
Copper	R8B	79.6	mg/kg	5.19	mg/kg		
Mercury	R8B	0.363	mg/kg	0.246	mg/kg		
Nickel	R8B	32.7	mg/kg	21.9	mg/kg		
Lead	R8B	238	mg/kg	14.4	mg/kg		
Zinc	R8B	145	mg/kg	42.5	mg/kg		
Toluene	R7.9	<50	ug/kg [DSB]			<50	ug/kg [DSB]
Ethyl Benzene	R7.9	<50	ug/kg [DSB]			<50	ug/kg [DSB]
Benzene	R7.9	<50	ug/kg [DSB]			<50	ug/kg [DSB]
1,3 & 1,4 Dimethylbenzene (m & p-Xylene)	R7.9	<50	ug/kg [DSB]			<50	ug/kg [DSB]
1,2-Dimethylbenzene (o-Xylene)	R7.9	<50	ug/kg [DSB]			<50	ug/kg [DSB]
Acenaphthene	R7.7	0.397	mg/kg			4.84	mg/kg
Acenaphthylene	R7.7	<0.31	mg/kg			<0.3	mg/kg
Benzo (a) Anthracene	R7.7	0.775	mg/kg			7.61	mg/kg
Chrysene	R7.7	0.558	mg/kg			6.54	mg/kg
Dibenzo (a,h) Anthracene	R7.7	<0.31	mg/kg			0.69	mg/kg
Fluoranthene	R7.7	2.64	mg/kg			25.0	mg/kg
Fluorene	R7.7	0.459	mg/kg			5.93	mg/kg
Phenanthrene	R7.7	2.54	mg/kg			30.8	mg/kg
Pyrene	R7.7	3.13	mg/kg			23.2	mg/kg
Benzo (a) Pyrene	R7.7	1.10	mg/kg			7.99	mg/kg
Benzo (g,h,i) Perylene	R7.7	0.688	mg/kg			2.92	mg/kg
Indeno (1,2,3-cd) pyrene	R7.7	0.601	mg/kg			2.78	mg/kg
Anthracene	R7.7	0.88	mg/kg			11.2	mg/kg
Naphthalene	R7.7	0.397	mg/kg			<0.3	mg/kg
PAH Total (EPA 16)	R7.7	16.0022	mg/kg			140.328	mg/kg
Diesel range organics (C10 - C26)	R7.25	775	mg/kg			1540	mg/kg

SDG Number : SDG04024267
Certificate ID : 76393

Approved by: Steve Scott (Operations Manager)
Reported : 29/10/2004 16:45:06

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Bradford Laboratory : George Street, Bradford,BD1 5PZ (UKAS Lab No 0996)
Telephone: 01709 841096 Fax: 01709 841079 E-mail customer.services@alcontrol.co.uk

Certificate of Analysis

Sample Received : 25/10/2004
Analysis Completed : 29/10/2004
Site Name : Park Street, Wombwell

Your PO No : 6177

Encia Group Ltd
Encia House
Audby Lane
Wetherby
West Yorkshire
LS22 7RD

Our Ref		040094308		040094309		040094310	
Your Ref		TP106 D1 0.30m		TP106 D2 1.00m		TP107 J1 0.25m	
Sampled On		25/10/2004		25/10/2004		25/10/2004	
	Method						
Lubricating oil range organics (C26 - C40)	R7.25	738	mg/kg			732	mg/kg
Total petroleum hydrocarbons (C10 - C40)	R7.25	1510	mg/kg			2270	mg/kg
pH (leachate)	R3.6	8.05					
pH	R3.6	9.07		8.30			
Air Dried Solids	R1.1	90.10	%	90.30	%	87.30	%
Stones > 10mm	R1.1	36.40	%	0.00	%	23.50	%
Selenium (leachable)	R*9B	1.39	ug/l				
Boron	R*8B	<100	mg/kg	<100	mg/kg		
Selenium	R*8B	0.695	mg/kg	<0.4	mg/kg		
Benzo (b&k) Fluoranthene	R*7.7	1.65	mg/kg			10.5	mg/kg

Approved by: Steve Scott (Operations Manager)
Reported : 29/10/2004 16:45:06

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Analysis Completed : 29/10/2004
Site Name : Park Street, Wombwell

Your PO No : 6177

Encia Group Ltd
Encia House
Audby Lane
Wetherby
West Yorkshire
LS22 7RD

Our Ref		040094311			040094312			040094313	
Your Ref		TP108 J3 2.70m			TP109 J1 0.30m			TP110 J1 0.25m	
Sampled On		25/10/2004			25/10/2004			25/10/2004	
	Method								
Arsenic (leachable)	R9B							3.94	ug/l
Mercury (leachable)	R9A							<0.053	ug/l
Boron (leachable)	R8B							64.7	ug/l
Cadmium (leachable)	R8B							<0.2	ug/l
Chromium (leachable)	R8B							<2	ug/l
Copper (leachable)	R8B							3.04	ug/l
Nickel (leachable)	R8B							6.95	ug/l
Lead (leachable)	R8B							<5	ug/l
Zinc (leachable)	R8B							11.5	ug/l
Arsenic	R8B							10.9	mg/kg
Cadmium	R8B							1.76	mg/kg
Chromium	R8B							50.1	mg/kg
Copper	R8B							108	mg/kg
Mercury	R8B							0.598	mg/kg
Nickel	R8B							34.9	mg/kg
Lead	R8B							825	mg/kg
Zinc	R8B							394	mg/kg
Toluene	R7.9	<50	ug/kg [DSB]		<50	ug/kg [DSB]		24.2	ug/kg [DSB]
Ethyl Benzene	R7.9	<50	ug/kg [DSB]		<50	ug/kg [DSB]		<50	ug/kg [DSB]
Benzene	R7.9	<50	ug/kg [DSB]		<50	ug/kg [DSB]		<50	ug/kg [DSB]
1,3 & 1,4 Dimethylbenzene (m & p-Xylene)	R7.9	<50	ug/kg [DSB]		58.4	ug/kg [DSB]		<50	ug/kg [DSB]
1,2-Dimethylbenzene (o-Xylene)	R7.9	<50	ug/kg [DSB]		54.5	ug/kg [DSB]		<50	ug/kg [DSB]
Acenaphthene	R7.7	<0.35	mg/kg		9.06	mg/kg		1.85	mg/kg
Acenaphthylene	R7.7	<0.35	mg/kg		4.00	mg/kg		<0.37	mg/kg
Benzo (a) Anthracene	R7.7	<0.35	mg/kg		28.7	mg/kg		12.6	mg/kg
Chrysene	R7.7	<0.35	mg/kg		34.1	mg/kg		13.3	mg/kg
Dibenzo (a,h) Anthracene	R7.7	<0.35	mg/kg		4.43	mg/kg		1.22	mg/kg
Fluoranthene	R7.7	<0.35	mg/kg		64.8	mg/kg		29.0	mg/kg
Fluorene	R7.7	<0.35	mg/kg		12.7	mg/kg		3.07	mg/kg
Phenanthrene	R7.7	<0.35	mg/kg		55.2	mg/kg		26.5	mg/kg
Pyrene	R7.7	<0.35	mg/kg		<0.37	mg/kg		28.8	mg/kg
Benzo (a) Pyrene	R7.7	<0.35	mg/kg		36.2	mg/kg		12.8	mg/kg
Benzo (g,h,i) Perylene	R7.7	<0.35	mg/kg		14.5	mg/kg		3.50	mg/kg
Indeno (1,2,3-cd) pyrene	R7.7	<0.35	mg/kg		14.6	mg/kg		3.58	mg/kg
Anthracene	R7.7	<0.35	mg/kg		20.3	mg/kg		7.75	mg/kg
Naphthalene	R7.7	<0.35	mg/kg		14.0	mg/kg		2.08	mg/kg
PAH Total (EPA 16)	R7.7	0.833	mg/kg		369.8076	mg/kg		164.058	mg/kg
Diesel range organics (C10 - C26)	R7.25	994	mg/kg		3060	mg/kg		3830	mg/kg

SDG Number : SDG04024267
Certificate ID : 76393

Approved by: Steve Scott (Operations Manager)
Reported : 29/10/2004 16:45:06

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Certificate of Analysis

Sample Received : 25/10/2004
Analysis Completed : 29/10/2004
Site Name : Park Street, Wombwell

Your PO No : 6177

Encia Group Ltd
Encia House
Audby Lane
Wetherby
West Yorkshire
LS22 7RD

Our Ref		040094311		040094312		040094313	
Your Ref		TP108 J3 2.70m		TP109 J1 0.30m		TP110 J1 0.25m	
Sampled On		25/10/2004		25/10/2004		25/10/2004	
	Method						
Lubricating oil range organics (C26 - C40)	R7.25	197	mg/kg	1010	mg/kg	4000	mg/kg
Total petroleum hydrocarbons (C10 - C40)	R7.25	1190	mg/kg	4070	mg/kg	7840	mg/kg
pH (leachate)	R3.6					7.57	
pH	R3.6					8.50	
Air Dried Solids	R1.1	86.70	%	90.80	%	88.80	%
Stones > 10mm	R1.1	0.00	%	21.90	%	28.70	%
Selenium (leachable)	R*9B					<0.75	ug/l
Boron	R*8B					<100	mg/kg
Selenium	R*8B					<0.4	mg/kg
Benzo (b&k) Fluoranthene	R*7.7	<0.35	mg/kg	56.9	mg/kg	17.8	mg/kg

SDG Number : SDG04024267
Certificate ID : 76393

Approved by: Steve Scott (Operations Manager)
Reported : 29/10/2004 16:45:06

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Certificate of Analysis

Sample Received : 25/10/2004
Analysis Completed : 29/10/2004
Site Name : Park Street, Wombwell

Your PO No : 6177

Encia Group Ltd
Encia House
Audby Lane
Wetherby
West Yorkshire
LS22 7RD

Our Ref		040094314		040094315		040094316	
Your Ref		TP110 J3 2.10m		WS101 D1 0.25m		WS102 J1 0.25m	
Sampled On		25/10/2004		25/10/2004		25/10/2004	
	Method						
Toluene	R7.9	<50	ug/kg [DSB]	<50	ug/kg [DSB]	23.5	ug/kg [DSB]
Ethyl Benzene	R7.9	<50	ug/kg [DSB]	<50	ug/kg [DSB]	<50	ug/kg [DSB]
Benzene	R7.9	<50	ug/kg [DSB]	<50	ug/kg [DSB]	<50	ug/kg [DSB]
1,3 & 1,4 Dimethylbenzene (m & p-Xylene)	R7.9	<50	ug/kg [DSB]	<50	ug/kg [DSB]	<50	ug/kg [DSB]
1,2-Dimethylbenzene (o-Xylene)	R7.9	<50	ug/kg [DSB]	<50	ug/kg [DSB]	<50	ug/kg [DSB]
Acenaphthene	R7.7	<0.36	mg/kg	<0.33	mg/kg	<0.35	mg/kg
Acenaphthylene	R7.7	*<0.36*	*mg/kg*	<0.33	*mg/kg*	*<0.35*	*mg/kg*
Benzo (a) Anthracene	R7.7	<0.36	mg/kg	<0.33	mg/kg	0.462	mg/kg
Chrysene	R7.7	*<0.36*	*mg/kg*	<0.33	*mg/kg*	*<0.35*	*mg/kg*
Dibenzo (a,h) Anthracene	R7.7	<0.36	mg/kg	<0.33	mg/kg	<0.35	mg/kg
Fluoranthene	R7.7	*<0.36*	*mg/kg*	0.436	*mg/kg*	1.34	*mg/kg*
Fluorene	R7.7	0.49	mg/kg	<0.33	mg/kg	0.399	mg/kg
Phenanthrene	R7.7	*0.684*	*mg/kg*	*0.568*	*mg/kg*	1.71	*mg/kg*
Pyrene	R7.7	<0.36	mg/kg	0.482	mg/kg	1.79	mg/kg
Benzo (a) Pyrene	R7.7	*<0.36*	*mg/kg*	<0.33	*mg/kg*	*0.945*	*mg/kg*
Benzo (g,h,i) Perylene	R7.7	<0.36	mg/kg	<0.33	mg/kg	0.756	mg/kg
Indeno (1,2,3-cd) pyrene	R7.7	*<0.36*	*mg/kg*	<0.33	*mg/kg*	*<0.35*	*mg/kg*
Anthracene	R7.7	0.382	mg/kg	<0.33	mg/kg	0.413	mg/kg
Naphthalene	R7.7	<0.36	mg/kg	<0.33	mg/kg	<0.35	mg/kg
PAH Total (EPA 16)	R7.7	1.972B	mg/kg	2.7984	mg/kg	9.989	mg/kg
Diesel range organics (C10 - C26)	R7.25	*1880*	mg/kg	*85.8*	*mg/kg*	*3720*	mg/kg
Lubricating oil range organics (C26 - C40)	R7.25	1450	mg/kg	121	mg/kg	1550	mg/kg
Total petroleum hydrocarbons (C10 - C40)	R7.25	3330	mg/kg	206	mg/kg	5260	mg/kg
Air Dried Solids	R1.1	86.50	%	87.50	%	84.90	%
Stones > 10mm	R1.1	0.00	%	*22.70*	%	12.30	%
Benzo (b&k) Fluoranthene	R*7.7	<0.36	mg/kg	0.389	mg/kg	1.36	mg/kg

Approved by: Steve Scott (Operations Manager)
Reported : 29/10/2004 16:45:06

SDG Number : SDG04024267
Certificate ID : 76393

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ALcontrol Laboratories

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Bellshill Laboratory : 2 Mallard Way, Strathclyde Business Park, Bellshill ML4 3BF (UKAS Lab No 0995/C)
Bradford Laboratory : George Street, Bradford,BD1 5PZ (UKAS Lab No 0996)
Telephone: 01709 841096 Fax 01709 841079 E-mail : customer.services@alcontrol.co.uk

Certificate of Analysis

Sample Received : 25/10/2004
Analysis Completed : 29/10/2004
Site Name : Park Street, Wombwell

Your PO No : 6177

Encia Group Ltd
Encia House
Audby Lane
Wetherby
West Yorkshire
LS22 7RD

Our Ref		040094317		040094318		040094319	
Your Ref		WS102 D2 0.80m		WS103 D2 0.80m		WS104 D2 1.00m	
Sampled On		25/10/2004		25/10/2004		25/10/2004	
	Method						
Toluene	R7.9	<50	ug/kg [DSB]	<50	ug/kg [DSB]	<50	ug/kg [DSB]
Ethyl Benzene	R7.9	<50	ug/kg [DSB]	<50	ug/kg [DSB]	<50	ug/kg [DSB]
Benzene	R7.9	<50	ug/kg [DSB]	<50	ug/kg [DSB]	<50	ug/kg [DSB]
1,3 & 1,4 Dimethylbenzene (m & p-Xylene)	R7.9	<50	ug/kg [DSB]	<50	ug/kg [DSB]	<50	ug/kg [DSB]
1,2-Dimethylbenzene (o-Xylene)	R7.9	<50	ug/kg [DSB]	<50	ug/kg [DSB]	<50	ug/kg [DSB]
Acenaphthene	R7.7	<0.3	mg/kg	<0.3	mg/kg	<0.38	mg/kg
Acenaphthylene	R7.7	<0.3	mg/kg	<0.3	mg/kg	<0.38	mg/kg
Benzo (a) Anthracene	R7.7	<0.3	mg/kg	<0.3	mg/kg	<0.38	mg/kg
Chrysene	R7.7	<0.3	mg/kg	<0.3	mg/kg	<0.38	mg/kg
Dibenzo (a,h) Anthracene	R7.7	<0.3	mg/kg	<0.3	mg/kg	<0.38	mg/kg
Fluoranthene	R7.7	<0.3	mg/kg	<0.3	mg/kg	0.60	mg/kg
Fluorene	R7.7	<0.3	mg/kg	<0.3	mg/kg	<0.38	mg/kg
Phenanthrene	R7.7	<0.3	mg/kg	<0.3	mg/kg	<0.38	mg/kg
Pyrene	R7.7	<0.3	mg/kg	<0.3	mg/kg	0.562	mg/kg
Benzo (a) Pyrene	R7.7	<0.3	mg/kg	<0.3	mg/kg	<0.38	mg/kg
Benzo (g,h,i) Perylene	R7.7	<0.3	mg/kg	<0.3	mg/kg	<0.38	mg/kg
Indeno (1,2,3-cd) pyrene	R7.7	<0.3	mg/kg	<0.3	mg/kg	<0.38	mg/kg
Anthracene	R7.7	<0.3	mg/kg	<0.3	mg/kg	<0.38	mg/kg
Naphthalene	R7.7	<0.3	mg/kg	<0.3	mg/kg	<0.38	mg/kg
PAH Total (EPA 16)	R7.7	0.126	mg/kg	0.306	mg/kg	2.4548	mg/kg
Diesel range organics (C10 - C26)	R7.25	47.0	mg/kg	40.0	mg/kg	46.7	mg/kg
Lubricating oil range organics (C26 - C40)	R7.25	67.2	mg/kg	53.9	mg/kg	49.3	mg/kg
Total petroleum hydrocarbons (C10 - C40)	R7.25	114	mg/kg	93.6	mg/kg	95.8	mg/kg
Air Dried Solids	R1.1	90.20	%	90.40	%	90.70	%
Stones > 10mm	R1.1	0.00	%	0.00	%	4.44	%
Benzo (b&k) Fluoranthene	R*7.7	<0.3	mg/kg	<0.3	mg/kg	<0.38	mg/kg

Approved by: Steve Scott (Operations Manager)
Reported : 29/10/2004 16:45:06

SDG Number : SDG04024267
Certificate ID : 76393

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Bradford Laboratory : George Street, Bradford,BD1 5PZ (UKAS Lab No 0996)
Telephone 01709 841096 Fax: 01709 841079 E-mail: customer.services@alcontrol.co.uk

Certificate of Analysis

Sample Received : 25/10/2004
Analysis Completed : 29/10/2004
Site Name : Park Street, Wombwell

Your PO No : 6177

Encia Group Ltd
Encia House
Audby Lane
Wetherby
West Yorkshire
LS22 7RD

Our Ref		040094320		040094321		040094322	
Your Ref		WS105 D1 0.25m		WS105 D2 0.60m		WS106 D1 0.50m	
Sampled On		25/10/2004		25/10/2004		25/10/2004	
	Method						
Arsenic (leachable)	R9B	3.74	ug/l				
Mercury (leachable)	R9A	<0.053	ug/l				
Boron (leachable)	R8B	<50	ug/l				
Cadmium (leachable)	R8B	<0.2	ug/l				
Chromium (leachable)	R8B	<2	ug/l				
Copper (leachable)	R8B	<2	ug/l				
Nickel (leachable)	R8B	<5	ug/l				
Lead (leachable)	R8B	<5	ug/l				
Zinc (leachable)	R8B	<10	ug/l				
Arsenic	R8B	6.35	mg/kg	< 5	mg/kg		
Cadmium	R8B	0.188	mg/kg	<0.1	mg/kg		
Chromium	R8B	78.6	mg/kg	18.3	mg/kg		
Copper	R8B	9.63	mg/kg	7.19	mg/kg		
Mercury	R8B	0.343	mg/kg	0.195	mg/kg		
Nickel	R8B	15.0	mg/kg	25.4	mg/kg		
Lead	R8B	15.0	mg/kg	14.2	mg/kg		
Zinc	R8B	31.4	mg/kg	37.9	mg/kg		
Toluene	R7.9					<50	ug/kg [DSB]
Ethyl Benzene	R7.9					<50	ug/kg [DSB]
Benzene	R7.9					<50	ug/kg [DSB]
1,3 & 1,4 Dimethylbenzene (m & p-Xylene)	R7.9					<50	ug/kg [DSB]
1,2-Dimethylbenzene (o-Xylene)	R7.9					<50	ug/kg [DSB]
Acenaphthene	R7.7					<0.29	mg/kg
Acenaphthylene	R7.7					<0.29	mg/kg
Benzo (a) Anthracene	R7.7					0.905	mg/kg
Chrysene	R7.7					<0.29	mg/kg
Dibenzo (a,h) Anthracene	R7.7					<0.29	mg/kg
Fluoranthene	R7.7					0.80	mg/kg
Fluorene	R7.7					<0.29	mg/kg
Phenanthrene	R7.7					0.371	mg/kg
Pyrene	R7.7					0.847	mg/kg
Benzo (a) Pyrene	R7.7					0.464	mg/kg
Benzo (g,h,i) Perylene	R7.7					<0.29	mg/kg
Indeno (1,2,3-cd) pyrene	R7.7					<0.29	mg/kg
Anthracene	R7.7					<0.29	mg/kg
Naphthalene	R7.7					<0.29	mg/kg
PAH Total (EPA 16)	R7.7					5.1098	mg/kg
Diesel range organics (C10 - C26)	R7.25					28.4	mg/kg

SDG Number : SDG04024267
Certificate ID : 76393

Approved by: Steve Scott (Operations Manager)
Reported : 29/10/2004 16:45:06

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Bradford Laboratory George Street, Bradford,BD1 5PZ (UKAS Lab No. 0996)
Telephone 01709 841096 Fax 01709 841079 E-mail : customer.services@alcontrol.co.uk

Certificate of Analysis

Sample Received : 25/10/2004
Analysis Completed : 29/10/2004
Site Name : Park Street, Wombwell

Your PO No : 6177

Encia Group Ltd
Encia House
Audby Lane
Wetherby
West Yorkshire
LS22 7RD

Our Ref		040094320		040094321		040094322	
Your Ref		WS105 D1 0.25m		WS105 D2 0.60m		WS106 D1 0.50m	
Sampled On		25/10/2004		25/10/2004		25/10/2004	
	Method						
Lubricating oil range organics (C26 - C40)	R7.25					36.5	mg/kg
Total petroleum hydrocarbons (C10 - C40)	R7.25					64.4	mg/kg
pH (leachate)	R3.6	8.91					
pH	R3.6	9.54		8.01			
Air Dried Solids	R1.1	90.20	%	90.70	%	88.50	%
Stones > 10mm	R1.1	1.93	%	0.00	%	40.60	%
Selenium (leachable)	R*9B	<0.75	ug/l				
Boron	R*8B	<100	mg/kg	<100	mg/kg		
Selenium	R*8B	<0.4	mg/kg	<0.4	mg/kg		
Benzo (b&k) Fluoranthene	R*7.7					0.696	mg/kg

Approved by: Steve Scott (Operations Manager)
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Telephone 01709 841095 Fax 01709 841079 E-mail : customer.services@alcontrol.co.uk

Certificate of Analysis

Sample Received : 25/10/2004
Analysis Completed : 29/10/2004
Site Name : Park Street, Wombwell

Your PO No : 6177

Encia Group Ltd
Encia House
Audby Lane
Wetherby
West Yorkshire
LS22 7RD

Our Ref		040094323		040094324		040094325	
Your Ref		WS106 J3 2.20m		WS107 D1 0.50m		WS107 J2 1.20m	
Sampled On		25/10/2004		25/10/2004		25/10/2004	
	Method						
Arsenic (leachable)	R9B			3.57	ug/l		
Mercury (leachable)	R9A			<0.053	ug/l		
Boron (leachable)	R8B			<50	ug/l		
Cadmium (leachable)	R8B			<0.2	ug/l		
Chromium (leachable)	R8B			<2	ug/l		
Copper (leachable)	R8B			<2	ug/l		
Nickel (leachable)	R8B			<5	ug/l		
Lead (leachable)	R8B			<5	ug/l		
Zinc (leachable)	R8B			<10	ug/l		
Arsenic	*R8B*			*< 5*	*mg/kg*		
Cadmium	R8B			0.101	mg/kg		
Chromium	R8B			21.2	mg/kg		
Copper	R8B			7.78	mg/kg		
Mercury	R8B			<0.15	mg/kg		
Nickel	R8B			12.8	mg/kg		
Lead	R8B			10.3	mg/kg		
Zinc	R8B			38.5	mg/kg		
Toluene	R7.9	1170	ug/kg [DSB]			<50	ug/kg [DSB]
Ethyl Benzene	R7.9	763	ug/kg [DSB]			<50	ug/kg [DSB]
Benzene	R7.9	296	ug/kg [DSB]			<50	ug/kg [DSB]
1,3 & 1,4 Dimethylbenzene (m & p-Xylene)	R7.9	7140	ug/kg [DSB]			<50	ug/kg [DSB]
1,2-Dimethylbenzene (o-Xylene)	R7.9	2610	ug/kg [DSB]			25.9	ug/kg [DSB]
Acenaphthene	R7.7	0.757	mg/kg			<0.37	mg/kg
Acenaphthylene	R7.7	<0.39	mg/kg			<0.37	mg/kg
Benzo (a) Anthracene	R7.7	<0.39	mg/kg			<0.37	mg/kg
Chrysene	R7.7	<0.39	mg/kg			<0.37	mg/kg
Dibenzo (a,h) Anthracene	*R7.7*	*<0.39*	*mg/kg*			*<0.37*	*mg/kg*
Fluoranthene	R7.7	<0.39	mg/kg			<0.37	mg/kg
Fluorene	R7.7	<0.39	mg/kg			<0.37	mg/kg
Phenanthrene	R7.7	2.41	mg/kg			<0.37	mg/kg
Pyrene	R7.7	0.85	mg/kg			0.533	mg/kg
Benzo (a) Pyrene	R7.7	<0.39	mg/kg			<0.37	mg/kg
Benzo (g,h,i) Perylene	R7.7	<0.39	mg/kg			<0.37	mg/kg
Indeno (1,2,3-cd) pyrene	R7.7	<0.39	mg/kg			<0.37	mg/kg
Anthracene	*R7.7*	*0.445*	*mg/kg*			*<0.37*	*mg/kg*
Naphthalene	R7.7	1.15	mg/kg			<0.37	mg/kg
PAH Total (EPA 16)	R7.7	*7.0902*	*mg/kg*			*1.6872*	*mg/kg*
Diesel range organics (C10 - C26)	R7.25	2460	mg/kg			1520	mg/kg

SDG Number : SDG04024267
Certificate ID : 76393

Approved by: Steve Scott (Operations Manager)
Reported : 29/10/2004 16:45:06

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Certificate of Analysis

Sample Received : 25/10/2004
Analysis Completed : 29/10/2004
Site Name : Park Street, Wombwell

Your PO No : 6177

Encia Group Ltd
Encia House
Audby Lane
Wetherby
West Yorkshire
LS22 7RD

Our Ref		040094323		040094324		040094325	
Your Ref		WS106 J3 2.20m		WS107 D1 0.50m		WS107 J2 1.20m	
Sampled On		25/10/2004		25/10/2004		25/10/2004	
	Method						
Lubricating oil range organics (C26 - C40)	R7.25	2330	mg/kg			2090	mg/kg
Total petroleum hydrocarbons (C10 - C40)	R7.25	4790	mg/kg			3620	mg/kg
pH (leachate)	R3.6			8.94			
pH	R3.6			8.90			
Air Dried Solids	R1.1	82.20	%	88.50	%	88.70	%
Stones > 10mm	R1.1	13.20	%	0.00	%	0.00	%
Selenium (leachable)	R*9B			<0.75	ug/l		
Boron	R*8B			107	mg/kg		
Selenium	R*8B			<0.4	mg/kg		
Benzo (b&k) Fluoranthene	R*7.7	<0.39	*mg/kg*			<0.37	*mg/kg*

Approved by: Steve Scott (Operations Manager)
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Certificate of Analysis

Sample Received : 25/10/2004
Analysis Completed : 29/10/2004
Site Name : Park Street, Wombwell

Your PO No : 6177

Encia Group Ltd
Encia House
Audby Lane
Wetherby
West Yorkshire
LS22 7RD

Our Ref		040094326		040094327		
Your Ref		WS108 D1 0.50m		WS108 J2 1.80m		
Sampled On		25/10/2004		25/10/2004		
	Method					
Arsenic (leachable)	R9B	6.80	ug/l			
Mercury (leachable)	R9A	<0.053	ug/l			
Boron (leachable)	R8B	<50	ug/l			
Cadmium (leachable)	R8B	<0.2	ug/l			
Chromium (leachable)	R8B	<2	ug/l			
Copper (leachable)	R8B	<2	ug/l			
Nickel (leachable)	R8B	<5	ug/l			
Lead (leachable)	R8B	<5	ug/l			
Zinc (leachable)	R8B	<10	ug/l			
Arsenic	R8B	5.94	mg/kg			
Cadmium	R8B	0.112	mg/kg			
Chromium	R8B	13.1	mg/kg			
Copper	R8B	6.21	mg/kg			
Mercury	R8B	0.312	mg/kg			
Nickel	R8B	14.3	mg/kg			
Lead	R8B	17.2	mg/kg			
Zinc	R8B	28.1	mg/kg			
Toluene	R7.9			<50	ug/kg [DSB]	
Ethyl Benzene	R7.9			<50	ug/kg [DSB]	
Benzene	R7.9			<50	ug/kg [DSB]	
1,3 & 1,4 Dimethylbenzene (m & p-Xylene)	R7.9			<50	ug/kg [DSB]	
1,2-Dimethylbenzene (o-Xylene)	R7.9			<50	ug/kg [DSB]	
Acenaphthene	R7.7			<0.4	mg/kg	
Acenaphthylene	R7.7			<0.4	mg/kg	
Benzo (a) Anthracene	R7.7			0.512	mg/kg	
Chrysene	R7.7			<0.4	mg/kg	
Dibenzo (a,h) Anthracene	R7.7			<0.4	mg/kg	
Fluoranthene	R7.7			<0.4	mg/kg	
Fluorene	R7.7			<0.4	mg/kg	
Phenanthrene	R7.7			0.672	mg/kg	
Pyrene	R7.7			0.44	mg/kg	
Benzo (a) Pyrene	R7.7			<0.4	mg/kg	
Benzo (g,h,i) Perylene	R7.7			<0.4	mg/kg	
Indeno (1,2,3-cd) pyrene	R7.7			<0.4	mg/kg	
Anthracene	R7.7			<0.4	mg/kg	
Naphthalene	R7.7			<0.4	mg/kg	
PAH Total (EPA 16)	R7.7			3.016	mg/kg	
Diesel range organics (C10 - C26)	R7.25			468	mg/kg	

Approved by: Steve Scott (Operations Manager)
Reported : 29/10/2004 16:45:06

SDG Number : SDG04024267
Certificate ID : 76393

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Bradford Laboratory : George Street, Bradford,BD1 5PZ (UKAS Lab No 0996)
Telephone: 01709 841096 Fax 01709 841079 E-mail : customer.services@alcontrol.co.uk

Certificate of Analysis

Sample Received : 25/10/2004
Analysis Completed : 29/10/2004
Site Name : Park Street, Wombwell

Your PO No : 6177

Encia Group Ltd
Encia House
Audby Lane
Wetherby
West Yorkshire
LS22 7RD

Our Ref		040094326		040094327		
Your Ref		WS108 D1 0.50m		WS108 J2 1.80m		
Sampled On		25/10/2004		25/10/2004		
	Method					
Lubricating oil range organics (C26 - C40)	R7.25			739	mg/kg	
Total petroleum hydrocarbons (C10 - C40)	R7.25			1210	mg/kg	
pH (leachate)	R3.6	8.73				
pH	R3.6	9.41				
Air Dried Solids	R1.1	88.70	%	90.40	%	
Stones > 10mm	R1.1	12.80	%	24.30	%	
Selenium (leachable)	R*9B	<0.75	ug/l			
Boron	R*8B	<100	mg/kg			
Selenium	R*8B	<0.4	mg/kg			
Benzo (b&k) Fluoranthene	R*7.7			<0.4	mg/kg	

SDG Number : SDG04024267
Certificate ID : 76393

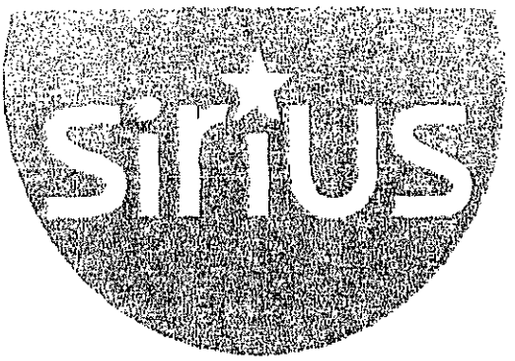
Approved by: Steve Scott (Operations Manager)
Reported : 29/10/2004 16:45:06

*Methods marked * in this report are not in the UKAS Accreditation Schedule for our Laboratory. Methods marked $ are subcontracted, those prefixed R are performed at the Rotherham Lab & those prefixed S are performed at the Bellshill Lab. Comments, opinions & interpretations expressed herein are outside the scope of UKAS Accreditation. Details of the methods used and their performance characteristics are available on request. Unless otherwise stated, sampling was not carried out by ALcontrol Laboratories. < = less than, > = greater than; DSB = dry solids basis*

0995
0996
2300

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APPENDIX J
SIRIUS FACTUAL DATA



APPENDIX C

EXPLORATORY HOLE RECORDS

BOREHOLE RECORD

BH No. R1
Sheet 1 of 2

Site: Wombwell

Contract No: C0204

Client: Shepherd Homes

Dates: 03/03/2004

Method: Rotary openhole boring using air flush.

Scale 1:50

Driller: Piletec

Logged By

SAMPLE DETAILS						Groundwater (Casing)	STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (Fl)		Description	Depth (m)	Level (mAOD)	Legend	Well
							MADE GROUND: Grey and brown clayey SAND and GRAVEL. Slight odour noted.				
							Grey, yellow, orange and brown SANDSTONE.	3.20			
							Continued next sheet				

Remarks and Water Observations

1. Groundwater strike encountered at 11.10m
2. Gas/groundwater monitoring well installed as shown.
3. Inspection pit hand excavated to 1.2m prior to boring

GL (m AOD) -

Easting: -

Northing: -

Fig. No. R1

BOREHOLE RECORD

BH No. R1
Sheet 2 of 2

Site: Wombwell
Contract No: C0204
Client: Shepherd Homes
Dates: 03/03/2004
Method: Rotary openhole boring using air flush
Scale 1:50
Driller: Piletec
Logged By:

SAMPLE DETAILS						STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend / Well
							Grey, yellow, orange and brown SANDSTONE.	11		
						▽		12		
								13		
								14		
								15		
								16		
							End of Borehole at 16.00 m	16.00		
								17		
								18		
								19		

Remarks and Water Observations

1 Groundwater strike encountered at 11.10m.
2 Gas/groundwater monitoring well installed as shown
3 Inspection pit hand excavated to 1.2m prior to boring

GL (m AOD) -
Easting: -
Northing: -

Fig No R1

BOREHOLE RECORD

BH No. R2

Site: Wombwell

Contract No.: C0204

Client: Shepherd Homes

Dates: 03/03/2004

Method: Rotary boring using air flush

Scale: 1:50

Driller: Pdalet

Logged By: DB

SAMPLE DETAILS

Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (Fl)	Groundwater (Casing)

STRATA RECORD

Description	Depth (m)	Level (mAOD)	Legend	Well
MADE GROUND Tarmac hardstanding.	0.15			
MADE GROUND Light brown SAND and GRAVEL of limestone (Hardcore)	0.40			
MADE GROUND: Grey and brown clayey SAND and GRAVEL. Gravel is fine to coarse, subangular including brick and concrete	1.00			
Grey, yellow, orange and brown SANDSTONE.				
Grey SANDSTONE.	9.00			

Continued next sheet

Remarks and Water Observations

1. Groundwater encountered at 7.0m
2. Gas/groundwater monitoring well installed as shown
3. Inspection pit hand excavated to 1.0m prior to boring

GL (m AOD) -

Easting: -

Northing: -

Fig. No. R2

BOREHOLE RECORD

BH No. R2
Sheet 2 of 2

Site Wombwell

Contract No. C0204

Client Shepherd Homes

Dates 03/03/2004

Method Rotary boring using air flush

Scale 1:50

Driller. Piletec

Logged By DB

SAMPLE DETAILS

Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)

STRATA RECORD

Description	Depth (m)	Level (mAOD)	Legend	Well
Grey SANDSTONE.	11			
	12			
End of Borehole at 12.50 m	12.50			
	13			
	14			
	15			
	16			
	17			
	18			
	19			

Remarks and Water Observations

1 Groundwater encountered at 7 0m
2 Gas/groundwater monitoring well installed as shown
3 Inspection pit hand excavated to 1 0m prior to boring

GL (m AOD) -
Easting: -
Northing: -

Fig. No R2

BOREHOLE RECORD

BH No. R3

Site Wombwell

Contract No. C0204

Client Shepherd Homes

Dates 04/03/2004

Method Rotary boring using air flush

Scale 1:50

Driller

Logged By DB

SAMPLE DETAILS

Type	Depth From - To (m)	TCR (%)	SCR (%)	ROD (%)	N (FI)

Groundwater (Casing)

STRATA RECORD

Description	Depth (m)	Level (mAOD)	Legend	Well
MADE GROUND Tarmac hardstanding.	0.20			
MADE GROUND: Black and brown SAND and GRAVEL. Sand is of ash. Gravel is fine to coarse, angular to subangular of sandstone, brick and clinker.	0.70			
Grey, yellow, orange and brown SANDSTONE.				

Continued next sheet

Remarks and Water Observations

1 Groundwater noted from approximately 2.0m
2 Gas/groundwater monitoring well installed as shown
3 Inspection pit hand excavated to 0.7m prior to boring

GL (m AOD) -

Easting: -

Northing: -

Fig. No. R3

BOREHOLE RECORD

BH No. R3
Sheet 2 of 2

Site. Wombwell

Contract No. C0204

Client. Shepherd Homes

Dates: 04/03/2004

Method. Rotary boring using air flush

Scale 1:50

Driller: Pictec

Logged By: DB

SAMPLE DETAILS

Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)

STRATA RECORD

Description	Depth (m)	Level (mAOD)	Legend	Well
Grey, yellow, orange and brown SANDSTONE				
	11			
	12			
	13			
	14			
End of Borehole at 15.00 m	15 15.00			
	16			
	17			
	18			
	19			

Remarks and Water Observations

1 Groundwater noted from approximately 2.0m
2 Gas/groundwater monitoring well installed as shown
3 Inspection pit hand excavated to 0.7m prior to boring

GL (m AOD) -

Easting: -

Northing: -

Fig. No. R3

BOREHOLE RECORD

BH No. R4
Sheet 1 of 3

Site: Wombwell

Contract No: C0204

Client: Shepherd Homes

Dates: 05/03/2004

Method: Rotary boring using air flush.

Scale 1:50

Driller: Pletec

Logged By: DB

SAMPLE DETAILS						Groundwater (Casing)	STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)		Description	Depth (m)	Level (mAOD)	Legend	Well
							MADE GROUND: Concrete hardstanding.	0.25			
							MADE GROUND: Grey and brown SAND and GRAVEL. Gravel is fine to coarse of sandstone and brick. Cobbles of brick noted.	0.60			
							Grey, yellow, orange and brown SANDSTONE.	1			
								2			
								3			
								4			
								5			
								6			
								7			
								8			
								9			

Continued next sheet

Remarks and Water Observations

1. Groundwater strike encountered at 17.0m.
2. Gas/groundwater monitoring well installed as shown.
3. Slight odour of hydrocarbons noted between 0.6 and 1.5m.
4. Inspection pit hand excavated to 0.60m prior to boring.

GL (m AOD) -

Easting: -

Northing: -

Fig. No. R4

BOREHOLE RECORD

BH No. R4

Site Wombwell

Contract No: C0204

Client Shepherd Homes

Dates: 05/03/2004

Method Rotary boring using air flush

Scale 1:50

Driller Pilatec

Logged By DB

SAMPLE DETAILS

Type	Depth From	Depth To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)

STRATA RECORD

Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend	Well
	Grey, yellow, orange and brown SANDSTONE.	11			
		12			
		13			
		14			
		15			
		16			
▽		17			
		18			
		19			

Continued next sheet

Remarks and Water Observations

1 Groundwater strike encountered at 17.0m
2 Gas/groundwater monitoring well installed as shown
3 Slight odour of hydrocarbons noted between 0.6 and 1.5m
4 Inspection pit hand excavated to 0.60m prior to boring

GL (m AOD) -

Easting: -

Northing: -

Fig No. R4

BOREHOLE RECORD

BH No. R4
Sheet 3 of 3

Site Wombwell

Contract No C0204

Client Shepherd Homes

Dates: 05/03/2004

Method. Rotary bonng using air flush.

Scale 1:50

Driller Pitetec

Logged By DB

SAMPLE DETAILS

Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)

Groundwater (Casing)

STRATA RECORD

Description	Depth (m)	Level (mAOD)	Legend	Well
Grey, yellow, orange and brown SANDSTONE	21			
End of Borehole at 21.70 m	21.70			
	22			
	23			
	24			
	25			
	26			
	27			
	28			
	29			

Remarks and Water Observations

1 Groundwater strike encountered at 17.0m
2 Gas/groundwater monitoring well installed as shown
3 Slight odour of hydrocarbons noted between 0.6 and 1.5m
4 Inspection pit hand excavated to 0.60m prior to boring

GL (m AOD)
-
Easting:
-
Northing:
-

Fig. No.
R4

BOREHOLE RECORD

BH No. C1
Sheet 1 of 1

Site: Wombwell

Contract No: C0204

Client: Shepherd Homes

Dates: 04/03/2004

Method: Rotary core using air flush.

Scale 1:50

Driller: Pilatec

Logged By: DB

SAMPLE DETAILS						Groundwater (Casing)	STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)		Description	Depth (m)	Level (mAOD)	Legend	Well
							MADE GROUND: Brown clayey SAND and GRAVEL. Cobbles of concrete and timber noted.				
							Grey, yellow, orange and brown SANDSTONE.	3.50			
							No odours detected.				
							Core recovery from 3.70m				
							End of Borehole at 6.50 m	6.50			

Remarks and Water Observations

1. Borehole backfilled with bentonite grout on completion.
2. Inspection pit hand excavated to 1.2m prior to boring

GL (m AOD) -

Easting: -

Northing: -

Fig. No. C1

BOREHOLE RECORD

BH No. C2

Sheet 1 of 1

Site Wombwell

Contract No C0204

Client. Shepherd Homes

Dates: 04/02/2004

Method: Rotary core using air flush

Scale 1:50

Driller Pietec

Logged By DB

SAMPLE DETAILS

Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)

STRATA RECORD

Description	Depth (m)	Level (mAOD)	Legend	Well
MADE GROUND: Brown and grey clayey SAND and GRAVEL of ash, brick, limestone, concrete, coal and tile.				
POSSIBLE MADE GROUND: Grey and brown gravelly SAND. Gravel is fine to coarse, subangular of sandstone. Odour of hydrocarbons noted.	0.50			
Grey, yellow, orange and brown SANDSTONE.	1.00			
No odours detected.				
Core recovery from 1.60m				
End of Borehole at 4.90 m	4.90			

Remarks and Water Observations

1 Borehole backfilled with bentonite grout on completion
2 Inspection pit hand excavated to m 1.0m prior to boring

GL (m AOD) -

Easting: -

Northing: -

Fig No. C2

BOREHOLE RECORD

BH No. CP1

Sheet 1 of 1

Site Wombwell

Contract No C0204

Client Shepherd Homes

Dates: 28/11/2003

Method Cable Percussive Boring

Scale 1:50

Driller

Logged By LM

SAMPLE DETAILS			Groundwater (Casing)	STRATA RECORD			
Type	Depth From - To(m)	N (cu)		Description	Depth (m)	Legend	Well
				MADE GROUND: Concrete			
B	0.30 - 0.80			MADE GROUND: Brown, slightly clayey SAND and GRAVEL. Gravel is fine to coarse subrounded of sandstone.	0.20		
D B	1.00 - 1.45 1.00 - 1.50	N=31 (6,8/8,7,8 ,8)	1	Very dense orange brown silty SAND and GRAVEL. Gravel is fine to coarse of sandstone. (Weathered Sandstone).	0.80		
	2.00 - 2.40	50 (5,9/10,23 ,17)	2				
				End of Borehole at 2.45 m	2.40		
			3				
			4				
			5				
			6				
			7				
			8				

Remarks and Water Observations

1. No groundwater encountered
2. Chiselling between 2.00 and 2.40 m for 1 hour
3. Strong hydrocarbon odour noted below 2.00m

Fig No

CP1

BOREHOLE RECORD

BH No. CP2

Sheet 1 of 1

Site Wombwell

Contract No C0204

Client Shepherd Homes

Dates

01/12/2003

Method Cable Percussive Boring

Scale 1:50

Driller

Logged By LM

SAMPLE DETAILS			Groundwater (Casing)	STRATA RECORD			
Type	Depth From - To(m)	N (cu)		Description	Depth (m)	Legend	Well
B	0.20 - 0.70			MADE GROUND Concrete	0.15		
				MADE GROUND. Soft grey brown sandy gravelly CLAY. Gravel is fine to coarse angular of limestone and sandstone.	0.70		
B D	1.00 - 1.50 1.00 - 1.45	N=23 (4,5/6,6,5 ,6)	1	Very weak orange brown very thinly bedded highly weathered SANDSTONE			
J	1.60 - 1.70						
B	2.00 - 2.50 2.00 - 2.45	N=50 (3,4/6,11, 17,16)	2				
				End of Borehole at 2.50 m	2.50		
			3				
			4				
			5				
			6				
			7				
			8				

Remarks and Water Observations

1 No groundwater encountered
2 chiselling between 2.00 and 2.40 m for 1 hour
3 Strong hydrocarbon odour from 1.6m

Fig. No.

CP2

BOREHOLE RECORD

BH No. CP3

Sheet 1 of 1

Site Wombwell

Contract No C0204

Client: Shepherd Homes

Dates 27/11/2003

Method Cable Percussive Boring

Scale 1:50

Driller

Logged By LM

SAMPLE DETAILS			Groundwater (Casing)	STRATA RECORD		
Type	Depth From - To(m)	N (cu)		Description	Depth (m)	Legend / Well
		N=7 (4,3/2,1,2)		MADE GROUND Loose, brown silty SAND AND GRAVEL. Gravel is fine to coarse, subangular to angular of sandstone, brick, coal and concrete.		
B	0.50 - 1.00					
B	1.00 - 1.50		1	MADE GROUND Soft, becoming very soft below 2.00m, brown sandy gravelly CLAY, with some very clayey pockets of gravel. Gravel is fine to coarse, angular of sandstone, brick, limestone, coal, and mudstone with occasional wood fragments. some dark grey staining below 2.50m	1.00	
D	1.00 - 1.45					
D	2.00 - 2.45	3 (1,1)	2			
F	2.00 - 2.50					
J	2.50					
J	3.00	50 (1,1/0 for 0mm)	3			
D	3.00 - 3.45					
B	3.00 - 3.40				3.40	
				Very weak, light brown, stained black very clayey slightly weathered SANDSTONE.	3.50	
				End of Borehole at 3.50 m		
			4			
			5			
			6			
			7			
			8			

Remarks and Water Observations

1 Groundwater encountered at 3.4m, rising to 3.3 after 20 minutes
2 Chiselling at 3.4m for 1 hour
3 Borehole terminated on impenetrable sandstone
4 Strong hydrocarbon odour below 2.00m, becoming very strong below 2.5m

Fig No

CP3

BOREHOLE RECORD

BH No. CP4

Sheet 1 of 1

Site Wombwell

Contract No C0204

Client. Shepherd Homes

Dates

Method Cable Percussive Boring

26/11/2003

Scale 1:50

Other

Logged By LM

SAMPLE DETAILS

Type	Depth From - To(m)	N (cu)
B	0.20 - 0.70	
B	0.70 - 1.00	
B	1.00 - 1.50	N=27
D	1.00 1.45	(4,5/5,6,6 ,10)
D	1.75	
D	2.00 - 2.10	50 (25/50)

Groundwater (Casing)

STRATA RECORD

Description	Depth (m)
MADE GROUND Reinforced concrete.	0.15
MADE GROUND Light yellow silty SAND AND GRAVEL. Gravel is fine to coarse angular of limestone.	0.75
Medium dense orange-brown silty gravelly SAND Gravel is subrounded, fine to coarse of sandstone (weathered sandstone).	
Dense orange-brown silty gravelly SAND. Gravel is subrounded, fine to coarse of sandstone (weathered *sandstone).*	2.00 2.10

End of Borehole at 2.10 m

Legend

Well

Remarks and Water Observations

1 No groundwater encountered
2 Chiselling from 1.75 to 2.00m for 45 minutes

Fig. No

CP4

BOREHOLE RECORD

BH No. CP5

Sheet 1 of 1

Site Wombwell

Contract No C0204

Client Shepherd Homes

Dates 26/11/2003-27/11/2003

Method Cable Percussive Boring

Scale 1:50

Driller

Logged By LM

SAMPLE DETAILS

Type	Depth From - To(m)	N (cu)
B	0.20 - 0.60	
B	0.60 - 1.00	
B	1.00 - 1.50	N=25
D	1.00 - 1.45	(5,4/5,4,6 ,10)
D	1.70 - 1.80	
D	2.00	50 (25/50)

Groundwater (Casing)

STRATA RECORD

Description	Depth (m)	Legend	Wet
MADE GROUND Tarmac over reinforced concrete	0.15		
MADE GROUND loose brown silty gravelly SAND Gravel is fine to coarse angular of sandstone, limestone and concrete	0.60		
Medium dense, orange- brown SAND and GRAVEL. Gravel is fine to coarse, subrounded of sandstone. (Weathered sandstone)	1.00		
Medium dense orange-brown silty gravelly SAND. Gravel is fine to coarse subrounded of sandstone. (Weathered sandstone).	1.70		
Very weak, light brown, very thinly bedded slightly weathered clayey SANDSTONE.			
End of Borehole at 2.60 m	2.60		

Remarks and Water Observations

1 No groundwater encountered
2 Slight hydrocarbon odour noted between 0.15 and 0.6m
3 Borehole terminated on weathered sandstone

Fig. No.

CP5

BOREHOLE RECORD

BH No. CP5

Sheet 1 of 1

Site Wombwell

Contract No C0204

Client Shepherd Homes

Dates: 26/11/2003-27/11/2003

Method Cable Percussive Boring

Scale 1:50

Driller

Logged By LM

SAMPLE DETAILS

Type	Depth From - To(m)	N (cu)
B	0.20 - 0.60	
B	0.60 1.00	
B	1.00 - 1.50	N=25
D	1.00 1.45	(5,4/5,4,6 ,10)
D	1.70 1.80	
D	2.00	50 (25/50)

Groundwater (Casing)

STRATA RECORD

Description	Depth (m)
MADE GROUND: Tarmac over reinforced concrete.	0.15
MADE GROUND: *loose brown silty gravelly SAND. Gravel* is fine to coarse angular of sandstone, limestone and concrete.	0.60
Medium dense, orange- brown SAND and GRAVEL. Gravel is fine to coarse, subrounded of sandstone (Weathered sandstone)	1.00
Medium dense orange-brown silty gravelly SAND. Gravel is fine to coarse subrounded of sandstone (Weathered sandstone).	1.70
Very weak, light brown, very thinly bedded slightly weathered clayey SANDSTONE.	
End of Borehole at 2.60 m	2.60

Legend / Well

Remarks and Water Observations

1 No groundwater encountered
2 Slight hydrocarbon odour noted between 0.15 and 0.6m
3 Borehole terminated on weathered sandstone

Fig. No. CP5

WINDOW SAMPLING RECORD

BH No. WS4

Site: Wombwell

Contract No: C0204

Client: Shepherd Homes

Dates: 29/11/2003

Method: Competitor 130 dynamic sampling and probing rig.

Scale 1:25

Driller:

Logged By: LM

SAMPLE DETAILS			Groundwater	STRATA RECORD				
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	Level (mAOD)	Legend	Well
				MADE GROUND: Reinforced Concrete.				
				MADE GROUND: Void.	0.20	-0.20		
				MADE GROUND: Brown silty sandy GRAVEL. Gravel is angular fine to coarse of sandstone, brick, slag, burnt shale and concrete.	1.00	-1.00		
D	1.40m							
J	1.80m							
				Orange brown, becoming light brown below 2.4m, SAND and GRAVEL. Gravel is subangular of sandstone.(Weathered Sandstone).	1.90	-1.90		
D	2.50m							
				End of Window Sample at 3.00 m	3.00	-3.00		

Remarks and Water Observations

1. No groundwater encountered.
2. Window sample undertaken on suspended floor slab.

GL (mAOD) 0.00
Easting: 562196.00
Northing: 596534.00

Fig. No. WS4

WINDOW SAMPLING RECORD

BH No. WS5

Sheet 1 of 1

Site: Wombwell

Contract No: C0204

Client: Shepherd Homes

Dates: 29/11/2003

Method: *Competitor 130 dynamic sampling and probing rig*

Scale 1:25

Driller

Logged By LM

SAMPLE DETAILS Type	Depth From - To(m)	Vane Results kN/m²	Groundwater	STRATA RECORD Description	Depth (m)	Level (mAOD)	Legend	Well
				MADE GROUND: Reinforced concrete				
				MADE GROUND: Void.	0.20	-0.20		
				MADE GROUND: brown, very silty SAND and GRAVEL. Gravel is fine to coarse angular of sandstone, concrete and brick.	1.00	-1.00		
J	1.20m							
J	1.40m							
				Orange brown clayey SAND and GRAVEL, Gravel is fine to *coarse subrounded of sandstone (Weathered sandstone).*	1.60	-1.60		
J	1.80m							
D	2.00m							
				End of Window Sample at 3.00 m	3.00	-3.00		

Remarks and Water Observations

1 No groundwater encountered
2 Window sample undertaken on suspended floor slab.

GL (mAOD) 0.00
Easting: 571305.00
Northing: 589959.00

Fig. No. WS5

WINDOW SAMPLING RECORD

BH No. WS6

Sheet 1 of 1

Site: Wombwell

Contract No: C0204

Client: Shepherd Homes

Dates: 29/11/2003

Method: Competitor 130 dynamic sampling and probing rig.

Scale 1:25

Driller:

Logged By: LM

SAMPLE DETAILS			Groundwater	STRATA RECORD				
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	Level (mAOD)	Legend	Wel
				MADE GROUND: Concrete				
D	0.30m			MADE GROUND: Brown sandy gravelly SILT. Gravel is fine to coarse subrounded of sandstone.	0.20	-0.20		
				Orange brown slightly silty SAND and GRAVEL. Gravel is fine to coarse subrounded of sandstone. (Weathered sandstone).	0.50	-0.50		
D	1.50m							
D	2.30m							
				End of Window Sample at 2.50 m	2.50	-2.50		

Remarks and Water Observations

1. No groundwater encountered.

GL (mAOD) 0.00

Easting: 602896.00

Northing: 655165.00

Fig. No. WS6

WINDOW SAMPLING RECORD

BH No. WS7

Sheet 1 of 1

Site: Wombwell

Contract No: C0204

Client: Shepherd Homes

Dates: 29/11/2003

Method: Competitor 130 dynamic sampling and probing rig

Scale 1:25

Driller:

Logged By: LM

SAMPLE DETAILS			Groundwater	STRATA RECORD				
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	Level (mAOD)	Legend	Wel
				MADE GROUND: Concrete.				
					0.20	-0.20		
				MADE GROUND: Brown clayey very sandy GRAVEL. Gravel is fine to coarse angular of sandstone.				
D	0.50m							
					1.00	-1.00		
				Orange brown slightly silty SAND and GRAVEL. Gravel is fine to coarse subrounded of sandstone.				
D	1.50m							
					2.30	-2.30		
				End of Window Sample at 2.30 m				

Remarks and Water Observations

1. No groundwater encountered.

GL (mAOD) 0.00

Easting: 606562.00

Northing: 612754.00

Fig. No. WS7

WINDOW SAMPLING RECORD

BH No. WS8

Sheet 1 of 1

Site: Wombwell

Contract No: C0204

Client: Shepherd Homes

Dates: 27/11/2003

Method: Competitor 130 dynamic sampling and probing rig

Scale 1:25

Driller:

Logged By: LM

SAMPLE DETAILS			Groundwater	STRATA RECORD				
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	Level (mAOD)	Legend	Well
				MADE GROUND: Reinforced concrete	0.20	-0.20		
D	0.30m - 1.20			MADE GROUND: Orange SAND	0.30	-0.30		
				MADE GROUND: Light yellow silty SAND and GRAVEL. Gravel is fine to coarse angular of sandstone, brick and limestone.				
D	1.20m - 1.50			MADE GROUND: Brown slightly clayey SAND and GRAVEL. Gravel is fine to coarse angular of sandstone, brick and limestone.	1.20	-1.20		
D	1.50m - 2.00			Orange brown silty gravelly SAND. Gravel is fine to coarse subrounded of sandstone. (Weathered sandstone).	1.50	-1.50		
				End of Window Sample at 2.00 m	2.00	-2.00		

Remarks and Water Observations

1. No groundwater encountered

GL (mAOD) 0.00

Easting: 613014.00

Northing: 723803.00

Fig. No. WS8

WINDOW SAMPLING RECORD

BH No. WS9

Sheet 1 of 1

Site Wombwell

Contract No C0204

Client Shepherd Homes

Dates: 27/11/2003

Method *Competitor 130 dynamic sampling and probing rig*

Scale 1:25

Driller

Logged By J.M

SAMPLE DETAILS			Groundwater	STRATA RECORD				
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	Level (mAOD)	Legend	Well
				MADE GROUND Grey rubberised paint over concrete.				
D	0.20m - 1.15			MADE GROUND Light yellow silty SAND and GRAVEL Gravel is fine to coarse, angular of dolomite	0.20	-0.20		
	1.15m - 1.60			MADE GROUND: Soft brown very sandy gravelly CLAY, with pockets of sand and gravel. Gravel is fine to coarse, angular of sandstone, brick and tar.	1.15	-1.15		
D	1.60m - 2.00			Orange brown silty gravelly SAND. Gravel is fine to coarse subrounded of sandstone.	1.60	-1.60		
				End of Window Sample at 2.00 m	2.00	-2.00		

Remarks and Water Observations

1 No groundwater encountered

GL (mAOD) 0.00

Easting: 615525.00

Northing: 391991.00

Fig. No WS9

WINDOW SAMPLING RECORD

BH No. WS10

Sheet 1 of 1

Site Wombwell

Contract No C0204

Client Shepherd Homes

Dates 27/11/2003

Method Competitor 130 dynamic sampling and probing rig

Scale 1:25

Driller

Logged By LM

SAMPLE DETAILS Type	Depth From - To(m)	Vane Results kN/m²	Groundwater	STRATA RECORD Description	Depth (m)	Level (mAOD)	Legend	Well
				MADE GROUND Grey rubberised paint over reinforced concrete.	0.20	-0.20		
D	0.30m - 0.60			MADE GROUND. Orange SAND.	0.30	-0.30		
				MADE GROUND: Light yellow silty SAND and GRAVEL. Gravel is fine to coarse angular of limestone.				
D	0.60m - 1.00			Orange brown silty SAND and GRAVEL. Gravel is fine to coarse subrounded of sandstone	0.60	-0.60		
D	1.40m - 1.80							
				End of Window Sample at 1.80 m	1.80	-1.80		

Remarks and Water Observations

1 No groundwater encountered

GL (mAOD) 0.00

Easting: 632291.00

Northing: 714357.00

Fig No WS10

WINDOW SAMPLING RECORD

BH No. **WS11**

Sheet 1 of 1

Site: Wombwell

Contract No: C0204

Client: Shepherd Homes

Dates: 03/03/2004

Method: Premier tracked window sampler.

Scale 1:25

Driller: Intrasoil

Logged By: DB

SAMPLE DETAILS			Groundwater	STRATA RECORD				
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	Level (mAOD)	Legend	Well
D	0.10m - 0.50			MADE GROUND: Brown and grey clayey SAND and GRAVEL of ash, brick, limestone, concrete, coal and tile.				
J	0.50m - 0.90			POSSIBLE MADE GROUND: Grey and brown gravelly SAND. Gravel is fine to coarse, subangular of sandstone. Odour of hydrocarbons noted.	0.50			
D	1.00m - 1.10			Grey SANDSTONE recovered as fine to coarse subangular to angular sandy gravel.	1.00			
				End of Window Sample at 1.10 m	1.10			

Remarks and Water Observations

1. Window sample terminated on impenetrable bedrock at 1.10m.
2. No groundwater flows encountered.
3. Inspection pit hand excavated to 0.9m prior to boring.

GL (mAOD) -

Easting: -

Northing: -

Fig. No. WS11

WINDOW SAMPLING RECORD

BH No. WS12

Sheet 1 of 1

Site Wombwell

Contract No: C0204

Client Shepherd Homes

Dates: 03/03/2004

Method Premier tracked window sampler

Scale 1:25

Driller: Intesol

Logged By: DB

SAMPLE DETAILS			Groundwater	STRATA RECORD				
Type	Depth From	To(m)	Vane Results kN/m²		Description	Depth (m)	Level (mAOD)	Legend	Well
				MADE GROUND: Concrete and reinforcing.					
				MADE GROUND. Yellow brown gravelly SAND. Gravel is fine to coarse, subangular of sandstone and brick with occasional cobbles of sandstone.		0.30			
				MADE GROUND: Brown SAND and GRAVEL. Gravel is fine to coarse, subangular of sandstone with occasional coal and brick.		0.70			
				Soft brown sandy CLAY with occasional gravel of sandstone.		1.30			
				Grey brown SANDSTONE.		1.80			
				End of Window Sample at 1.80 m					

Remarks and Water Observations

1 Window sample terminated on impenetrable sandstone at 1.80m
2 No groundwater flows encountered.
3 Inspection pit hand excavated to 1.0m prior to boring

GL (mAOD) -

Easting: -

Northing: -

Fig. No. WS12

WINDOW SAMPLING RECORD

BH No. WS13

Sheet 1 of 1

Site: Wombwell

Contract No: C0204

Client: Shepherd Homes

Dates: 03/03/2004

Method: Premier tracked window sampler

Scale 1:25

Driller: Intrasoil

Logged By:

SAMPLE DETAILS			Groundwater	STRATA RECORD				
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	Level (mAOD)	Legend	Well
				MADE GROUND: Concrete hardstanding.				
D	0.30m - 0.90			MADE GROUND: Yellow brown and grey SAND and GRAVEL. Sand includes some ash. Gravel is fine to coarse, angular to *subangular of sandstone, concrete, brick and occasional* clinker.	0.30			
J	1.00m - 1.70			MADE GROUND: Brown clayey SAND and GRAVEL. Gravel is fine to coarse, subangular, sandstone, brick, concrete and *occasional clinker.*	1.00			
J	1.70m - 2.00			MADE GROUND: Dark grey clayey sandy GRAVEL. Gravel is fine to coarse, *subangular of sandstone and occasional concrete* and brick.	1.70			
				Grey SANDSTONE.	2.00			
				End of Window Sample at 2.00 m				

Remarks and Water Observations

1. Window sample terminated on impenetrable sandstone at 2.00m
2. *Slight groundwater seepage encountered at approximately 1.50m.*
3. Odour of hydrocarbons and black staining noted between 1.6 and 1.80m.
4. Inspection pit hand excavated to 1.0m prior to boring.

GL (mAOD) -

Easting: -

Northing: -

Fig. No. WS13

WINDOW SAMPLING RECORD

BH No. WS14

Sheet 1 of 1

Site Wombwell

Contract No: C0204

Client Shepherd Homes

Dates: 03/03/2004

Method Premier tracked window sampler

Scale 1:25

Driller Infosoil

Logged By

SAMPLE DETAILS			Groundwater	STRATA RECORD				
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	Level (mAOD)	Legend	Well
				MADE GROUND Tarmac hardstanding				
D	0.20m - 0.70			MADE GROUND: Yellow brown and grey gravelly SAND. Gravel is fine to coarse, subangular of limestone, sandstone and concrete (Traces of tarmac noted)	0.20			
D	0.80m - 1.30			Yellow brown weathered SANDSTONE. Recovered as fine to coarse subangular sandy gravel.	0.80			
	1.30m - 1.80							
				End of Window Sample at 1.80 m	1.80			

Remarks and Water Observations

1. Window sample terminated on impenetrable sandstone at 1.80m
2. No groundwater flows encountered during boring
3. Inspection pit hand excavated to 1.0m prior to boring

GL (mAOD) -

Easting: -

Northing: -

Fig. No. WS14

WINDOW SAMPLING RECORD

BH No. WS15

Sheet 1 of 1

Site: Wombwell

Contract No: C0204

Client: Shepherd Homes

Dates: 03/03/2004

Method: Premier tracked window sampler.

Scale 1:25

Driller: Inlosoil

Logged By: DB

SAMPLE DETAILS			Groundwater	STRATA RECORD				
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	Level (mAOD)	Legend	Well
D	0.20m - 0.80			MADE GROUND: Grey and brown SAND and GRAVEL. Gravel is fine to coarse, subangular of sandstone, brick and occasional concrete.				
D	0.80m - 1.00			Grey SANDSTONE, recovered as fine to coarse angular to subangular sandy gravel.	0.80			
				End of Window Sample at 1.00 m	1.00			

Remarks and Water Observations

1. Window sample terminated on impenetrable sandstone at 1.0m.
2. No groundwater flows encountered.
3. Inspection pit hand excavated to 0.8m prior to boring

GL (mAOD) -

Easting: -

Northing: -

Fig. No. WS15

WINDOW SAMPLING RECORD

BH No. WS16

Sheet 1 of 1

Site: Wombwell

Contract No: C0204

Client: Shepherd Homes

Dates: 03/03/2004

Method: Premier tracked window sampler

Scale 1:25

Driller: Infosoil

Logged By: DB

SAMPLE DETAILS			Groundwater	STRATA RECORD				
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	Level (mAOD)	Legend	Well
				MADE GROUND: Tarmac hardstanding.				
				MADE GROUND: Grey brown gravelly SAND. Sand includes ash. Gravel is fine to coarse, subangular of sandstone and occasional brick.	0.15			
				Grey SANDSTONE recovered as fine to coarse sandy gravel.	0.70			
				End of Window Sample at 1.00 m	1.00			

Remarks and Water Observations

1. Window sample terminated on impenetrable sandstone and 1.0m.
2. no groundwater flows encountered during boring.
3. Inspection pit hand excavated to 0.8m prior to boring.

GL (mAOD) -

Easting: -

Northing: -

Fig. No. WS16

TRIAL PIT RECORD

TP No. TP1

Sheet 1 of 1

Site : Wombwell

Contract No: C0204

Client : Shepherd Homes

Dates: 29/11/2003

Method : JCB 3CX with a 0.6m wide toothed bucket.

Scale 1:25

Logged By: LM

SAMPLE DETAILS			Groundwater	STRATA RECORD				
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	PID (ppm)	Legend	Well
				MADE GROUND: Light grey medium angular GRAVEL.				
					0.30			
J	0.40m			MADE GROUND: Soft brown gravelly CLAY with some cobbles. Gravel is fine to coarse angular of burnt shale, limestone brick, sandstone and coal.	0.40			
				End of Trial Pit at 0.40 m				

Remarks and Water Observations

1. No groundwater encounterec.
2. Trial pit very unstable.
3. Metal cover encountered at 0.4m over brick pit, trial pit terminated.

Fig. No. TP1

TRIAL PIT RECORD

TP No. TP3

Sheet 1 of 1

Site : Wombwell

Contract No: C0204

Client : Shepherd Homes

Dates: 29/11/2003

Method : JCB 3CX with a 0.6m wide toothed bucket.

Scale 1:25

Logged By: LM

SAMPLE DETAILS			Groundwater	STRATA RECORD				
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	PID (ppm)	Legend	Wel
				MADE GROUND: Grass over topsoil.	0.10			
J	0.50m			MADE GROUND: Loose, friable very silty sandy GRAVEL with occasional boulders and cobbles. Gravel is angular of brick, sandstone, concrete and limestone. Occasional pipe, hosing, foam and metal.		TP3		
J	1.50m							
				MADE GROUND: Very soft brown gravelly CLAY with some pockets of clayey sand and gravel, occasional cobbles and boulders. Gravel is angular of brick, sandstone, concrete and limestone. Occasional clay pipes, wood fragments and rubber.	2.10			
J	2.50m					TP3		
	3.00m							
				Orange-brown, stained grey and black (oily) moderately weak, very thinly bedded moderately weathered silty SANDSTONE.	3.30			
J	3.50m				3.50	TP3		
				End of Trial Pit at 3.50 m				

Remarks and Water Observations

1. No groundwater encountered.
2. Strong hydrocarbon odour noted below 2.9m.
3. Trial pit very unstable, becoming stable in natural ground.
4. Trial pit terminated on sandstone.

Fig. No. TP3

TRIAL PIT RECORD

TP No. TP4

Sheet 1 of 1

Site : Wombwell

Contract No: C0204

Client : Shepherd Homes

Dates: 01/12/2003

Method : JCB 3CX with a 0.6m wide toothed bucket.

Scale 1:25

Logged By: LM

SAMPLE DETAILS Type	Depth From - To(m)	Vane Results kN/m²	Groundwater	STRATA RECORD Description	Depth (m)	PID (ppm)	Legend	Well
				MADE GROUND; Tarmac	0.05			
				MADE GROUND; Reinforced concrete	0.15			
D	0.40m			*MADE GROUND; Dense grey and dark grey silty SAND and GRAVEL with some cobbles and occasional boulders. Gravel is fine to coarse angular of limestone, concrete, clinker and coal.*		TP4		
				Stiff, friable, slightly sandy slightly gravelly CLAY. Gravel is fine to medium, angular of coal and sandstone.	0.60			
D	0.80m					TP4		
				End of Trial Pit at 1.00 m	1.00			

Remarks and Water Observations

1.No groundwater encountered 2.Trial pit stable.
3.Slight hydrocarbon odour.

Fig. No.

TP4

TRIAL PIT RECORD

TP No. TP5

Sheet 1 of 1

Site Wombwell

Contract No C0204

Client Shepherd Homes

Dates 28/11/2003

Method : JCB 3CX with a 0 6m wide toothed bucket

Scale 1:25

Logged By

SAMPLE DETAILS			Groundwater	STRATA RECORD				
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	PID (ppm)	Legend	Well
				MADE GROUND: loose brown silty TOPSOIL	0.10			
D	0.70m			Moderately weak orange brown very thinly bedded moderately weathered, becoming moderately strong slightly weathered below 1.9m, SANDSTONE (Recovered as slightly silty sand and gravel with many cobbles)		TP5		
				End of Trial Pit at 2.00 m	2.00			

Remarks and Water Observations

1 No groundwater encountered
2 Trial pit stable

Fig. No

TP5

TRIAL PIT RECORD

TP No. TP6

Sheet 1 of 1

Site : Wombwell

Contract No: C0204

Client : Shepherd Homes

Dates: 01/12/2003

Method : JCB 3CX with a 0.6m wide toothed bucket.

Scale 1:25

Logged By: LM

SAMPLE DETAILS			Groundwater	STRATA RECORD				
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	PID (ppm)	Legend	Well
				MADE GROUND: Tarmac	0.05			
D J	0.40m			MADE GROUND: Brown slightly silty SAND and GRAVEL with many cobbles and occasional boulders. Gravel is fine to coarse angular of brick, concrete, sandstone and clinker		TP6		
D	1.00m			MADE GROUND: Firm dark grey sandy gravelly SILT. Gravel is fine to coarse angular of coal and brick.	0.80	TP6		
D	1.30m			Very weak, becoming moderately strong below 1.9m, orange brown becoming pale and slightly weathered below 1.3m, very thinly bedded to thickly laminated highly weathered SANDSTONE. (Recovered as slightly silty sand and gravel with some cobbles, with many cobbles towards base).	1.10	TP6		
B	2.00m							
				End of Trial Pit at 2.70 m	2.70			

Remarks and Water Observations

1. Slight groundwater seepage at 0.2m
2. Trial pit stable.
3. Slight hydrocarbon odour from 0.8 to 1.1m.

Fig. No. TP6

TRIAL PIT RECORD

TP No. TP7

Sheet 1 of 1

Site Wombwell

Contract No C0204

Client Shepherd Homes

Dates 01/12/2003

Method JCB 3CX with a 0.6m wide toothed bucket

Scale 1:25

Logged By LM

SAMPLE DETAILS			Groundwater	STRATA RECORD				
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	PID	Legend	Wet
				MADE GROUND: Reinforced concrete				
				MADE GROUND. Loose yellow SAND and GRAVEL. Gravel is fine to coarse subangular of limestone.	0.20 0.30			
				MADE GROUND. Firm dark grey sandy gravelly SILT. Gravel is fine to coarse angular of coal and brick	0.50			
				Very weak orange brown very thinly bedded to thickly laminated highly weathered SANDSTONE (Recovered as slightly silty sand and gravel with some cobbles, with many cobbles towards base) at 2.7m becoming slightly weathered.				
D	1.50m					TP7		
				End of Trial Pit at 1.90 m	1.90			

Remarks and Water Observations

1 Trial pit stable
3 Slight hydrocarbon odour between 0.3 and 0.5m

Fig. No

TP7

TRIAL PIT RECORD

TP No. TP8

Sheet 1 of 1

Site : Wombwell

Contract No: C0204

Client : Shepherd Homes

Dates: 01/12/2003

Method : JCB 3CX with a 0.6m wide toothed bucket.

Scale 1:25

Logged By: LM

SAMPLE DETAILS			Groundwater	STRATA RECORD				
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	PID (ppm)	Legend	Well
				MADE GROUND; Tarmac	0.10			
				MADE GROUND; Light yellow silty SAND and GRAVEL. Gravel is fine to coarse subangular of limestone.	0.20			
D J	0.50m			MADE GROUND; Dark grey brown slightly clayey SAND and GRAVEL. Gravel is fine to coarse angular of *limestone, sandstone,* brick, coal and clinker.				
				MADE GROUND; Brown clayey sandy GRAVEL. Gravel is fine to coarse angular of sandstone, brick and clinker.	0.60			
D	1.00m							
				Very weak orange brown very *thinly bedded to* thickly laminated highly weathered SANDSTONE. (Recovered as slightly silty sand and gravel with some cobbles, with many cobbles towards base). At 2.0m becoming pale, slightly weathered, moderately strong.	1.20			
D	1.50m							
				End of Trial Pit at 2.20 m	2.20			

Remarks and Water Observations

1. *Trial pit stable.*
2. Slight hydrocarbon odour between 0.2 and 0.6m.

Fig. No. TP8

TRIAL PIT RECORD

TP No. TP9

Sheet 1 of 1

Site Wombwell

Contract No C0204

Client Shepherd Homes

Dates 28/11/2003

Method JCB 3CX with a 0.6m wide toothed bucket

Scale 1:25

Logged By: LM

SAMPLE DETAILS			Groundwater	STRATA RECORD				
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	PID (ppm)	Legend	Well
D	0.10m			MADE GROUND. Tarmac	0.05			
				MADE GROUND. Loose yellow silty SAND and GRAVEL. Gravel is fine to coarse angular of limestone.	0.20			
J	0.50m			MADE GROUND. Dense grey silty SAND and GRAVEL. Gravel is fine to coarse angular of limestone, sandstone and concrete.		TP9		
				MADE GROUND. Medium dense clayey SAND and GRAVEL, with some cobbles and occasional boulders. Gravel is fine to coarse angular of sandstone, brick, mudstone, and shale.	0.60			
J	1.00m					TP9		
J	1.50m			Orange brown silty SAND and GRAVEL with some cobbles. Gravel is fine to coarse angular of sandstone. (Weathered sandstone)	1.40	TP9		
				Orange-brown stained completely grey and black. Moderately weak, very thinly bedded moderately weathered SANDSTONE.	2.10			
J	2.50m					TP9		
				End of Trial Pit at 2.70 m	2.70			

Remarks and Water Observations

1 No groundwater encountered
2 Strong hydrocarbon odour noted between 0.2 and 2.7
3 Trial pit is slightly unstable in made ground, becoming stable in natural ground

Fig No

TP9

TRIAL PIT RECORD

TP No. **TP10**
Sheet 1 of 1

Site : Wombwell

Contract No: C0204

Client : Shepherd Homes

Dates: 01/12/2003

Method : JCB 3CX with a 0.6m wide toothed bucket.

Scale 1:25

Logged By: LM

SAMPLE DETAILS			Groundwater	STRATA RECORD				
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	PID (ppm)	Legend	Well
D	0.00m - 0.30m			MADE GROUND; Tarmac	0.05			
J	0.30m			MADE GROUND; Very soft grey brown sandy gravelly CLAY, *with frequent pockets of very clayey sandy gravel. Gravel is fine to coarse angular of* sandstone, burnt shale and concrete.	0.50			
D J	1.30m			MADE GROUND; Loose brown clayey sandy GRAVEL. Gravel is fine to coarse angular of sandstone,with brick and clinker.				
				Very weak orange brown very thinly bedded to thickly laminated highly weathered SANDSTONE, becoming pale, slightly weathered, and moderately strong below 2.4m. (Recovered as slightly silty sand and gravel with some cobbles, with many cobbles towards base)	1.80			
				End of Trial Pit at 2.60 m	2.60			

Remarks and Water Observations

1. Slight groundwater seepage at 0.2m.
2. Trial pit stable.
3. Slight hydrocarbon odour between 0.05 and 1.8m.

Fig. No.

TP10

TRIAL PIT RECORD

TP No. TP11

Sheet 1 of 1

Site Wombwell

Contract No. C0204

Client Shepherd Homes

Dates: 01/12/2003

Method . JCB 3CX with a 0 6m wide toothed bucket

Scale 1:25

Logged By LM

SAMPLE DETAILS Type	Depth From - To(m)	Vane Results kN/m²	Groundwater	STRATA RECORD Description	Depth (m)	PID (ppm)	Legend	Well
				MADE GROUND: Concrete				
				MADE GROUND, Light yellow silty SAND and GRAVEL Gravel is fine to coarse subangular of limestone	0.20			
D	0.50m			MADE GROUND; Firm dark grey stained friable sandy gravelly CLAY Gravel is fine to coarse angular *including brick and sandstone.*	0 40	TP11		
D	0 70m			Very weak orange brown very thinly bedded to thickly laminated highly weathered SANDSTONE, becoming pale, slightly weathered, moderately strongat 1.4m. (Recovered as slightly silty sand and gravel with some cobbles, with many cobbles towards base).	0 60	TP11		
				End of Trial Pit at 1.60 m	1.60			

Remarks and Water Observations

1 Trial pit unstable in made ground, becoming stable in natural ground
2 Slight hydrocarbon odour betwen 0 4 and 0.6m

Fig. No.

TP11

TRIAL PIT RECORD

TP No. TP12

Sheet 1 of 1

Site : Wombwell

Contract No C0204

Client Shepherd Homes

Dates: 01/12/2003

Method JCB 3CX with a 0.6m wide toothed bucket

Scale 1:25

Logged By LM

SAMPLE DETAILS			Groundwater	STRATA RECORD				
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	PID (ppm)	Legend	Well
				MADE GROUND, Reinforced concrete				
				MADE GROUND; Light yellow silty SAND and GRAVEL of *limestone.*	0.20 0.30			
D	0.50m			MADE GROUND; Brown slightly clayey SAND and GRAVEL. *Gravel is fine to coarse angular including* sandstone, brick, clinker, glass. Occasional cobbles and boulders of dressed sandstone.	0.60	TP12		
D	1.50m			*Very weak orange brown very thinly bedded to* thickly laminated highly weathered SANDSTONE, becoming pale, slightly weathered, and moderately strong at 1.6m. (Recovered as slightly silty sand and gravel with some cobbles, with many cobbles towards base).		TP12		
				End of Trial Pit at 1.70 m	1.70			

Remarks and Water Observations

1 No groundwater encountered.
2 Trial pit unstable in made ground, becoming stable in natural ground

Fig No. TP12

TRIAL PIT RECORD

TP No. TP13

Sheet 1 of 1

Site: Wombwell

Contract No: C0204

Client: Shepherd Homes

Dates: 01/12/2003

Method: JCB 3CX with a 0.6m wide toothed bucket

Scale 1:25

Logged By: LM

SAMPLE DETAILS			Groundwater	STRATA RECORD				
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	PID (ppm)	Legend	Well
				MADE GROUND. Reinforced concrete	0.10			
D	0.20m			MADE GROUND, Light yellow silty SAND and GRAVEL. Gravel is fine to coarse subangular of limestone	0.30			
D	0.70m			MADE GROUND. Brown, very clayey SAND and GRAVEL Gravel is fine to coarse angular including sandstone, brick, clinker, glass Occasional cobbles and boulders of dressed sandstone.	0.75	TP13		
D	1.00m			Very weak orange brown, becoming pale, slightly weathered, moderately strong below 1.4m, very thinly bedded to thickly laminated highly weathered SANDSTONE. (Recovered as slightly silty sand and *gravel with some cobbles, with many cobbles towards* base)		TP13		
B	1.30m							
				End of Trial Pit at 1.60 m	1.60			

Remarks and Waler Observations

1.*No groundwater encountered*
2 Trial pit unstable in made ground, becoming stable in natural ground

Fig. No

TP13

TRIAL PIT RECORD

TP No. TP14

Sheet 1 of 1

Site Wombwell

Contract No. C0204

Client : Shepherd Homes

Dates. 01/12/2003

Method . JCB 3CX with a 0 6m wide toothed bucket

Scale 1:25

Logged By: LM

SAMPLE DETAILS

Type	Depth From - To(m)	Vane Results kN/m²
U J	0.30m	
D J	1.50m	

Groundwater

STRATA RECORD

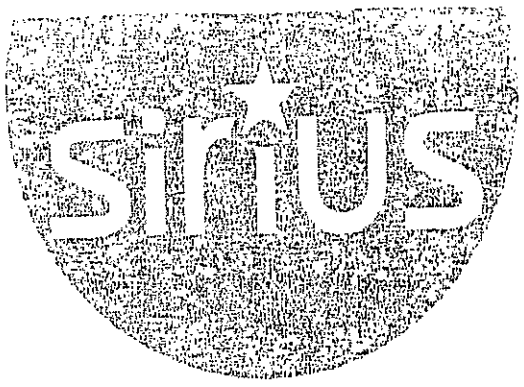
Description	Depth (m)	PID (ppm)	Legend	Well
MADE GROUND, Concrete	0.10			
MADE GROUND, Grey slightly silty SAND and GRAVEL Gravel is fine to coarse angular to rounded including sandstone, burnt shale, clinker and coal		TP14		
Very weak orange brown very thinly bedded, becoming pale, slightly weathered, moderately strong below 1.7m, to thickly laminated moderately weathered SANDSTONE (Recovered as slightly silty very sandy gravel and cobbles, with many cobbles towards base).	0.60			
		TP14		
End of Trial Pit at 1.80 m	1.66			

Remarks and Water Observations

1 Trial pit unstable in made ground becoming stable in natural ground
2 Slight hydrocarbon odour

Fig. No

TP14



APPENDIX D

LABORATORY TEST RESULTS

DERWENTSIDE ENVIRONMENTAL TESTING SERVICES

2139

CERTIFICATE OF ANALYSIS

Certificate Number : 10648

Client Reference : C0204

22 December 2003

Our Reference : 10648

Clients Name : Sirius Geotechnical & Environmental
Clients Address: Russel House
Suite 2, Mill Road
Langley Moor
Durham
DH7 8HJ

Contract Title : Wombwell

Description : Thirty five soil samples and twelve leachate samples prepared from soils

Date Received : 5 December 2003

Test Procedures : Identified by Prefix DETSn , Details available upon request.

Notes : # Denotes analysis carried out by an approved sub-contractor

* Denotes test not included in laboratory scope of accreditation

Observations and Interpretations are Outside the UKAS Accreditation Scope

Approved By:

Authorised Signatories R Bennett Director/Technical Manager; R Brown Laboratory Manager; S Wilson Quality Manager

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material received by the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total Arsenic (mg/kg As) DETS 042	Total Cadmium (mg/kg Cd) DETS 042	Total Chromium (mg/kg Cr) DETS 042	Total Lead (mg/kg Pb) DETS 042	Total Mercury (mg/kg Hg) DETS 015	Total Selenium (mg/kg Se) DETS 042	Total Copper (mg/kg Cu) DETS 042	Total Nickel (mg/kg Ni) DETS 042	Total Zinc (mg/kg Zn) DETS 042	Water Soluble Boron (B) (mg/kg) DETS 020
BH 1	2.00-2.40		J	10648/1										
BH 3	2.50		J	10648/2										
BH 3	3.00		J	10648/3										
BH 3	3.00-3.45		D	10648/4										
BH 5	0.20-0.60		B	10648/5										
BH 5	0.60-1.00		B	10648/6										
BH 5	1.70-1.80		D	10648/7										
TP 3	0.50		J	10648/8	10	<0.2	44	77	<0.3	<0.3	56	16	300	1.7
TP 3	2.50		J	10648/9	10	0.2	90	130	<0.3	<0.3	77	17	250	1.5
TP 3	3.50		J	10648/10	6	<0.2	23	14000	0.7	<0.3	13	10	39	0.6
TP 4	0.40		D	10648/11	5	<0.2	41	32	<0.3	0.4	22	8	29	1.1
TP 4	0.80		D	10648/12	7	<0.2	22	27	0.3	<0.3	12	13	43	1.2
TP 5	0.70		D	10648/13	4	<0.2	17	16	0.4	<0.3	12	18	50	0.8
TP 6	0.40		J	10648/14	4	<0.2	19	28	0.5	<0.3	15	13	50	1.2
TP 6	1.00		J	10648/15	19	0.6	46	200	0.4	<0.3	46	20	230	4.2
TP 6	1.30		D	10648/16	3	<0.2	15	11	0.4	<0.3	8	23	55	0.9
TP 7	0.15		D	10648/17										
TP 9	0.50		J	10648/18	3	0.2	14	54	0.5	<0.3	93	13	370	1.1
TP 9	1.00		J	10648/19										
TP 9	1.50		J	10648/20	4	<0.2	15	9	0.5	<0.3	9	19	36	0.7

Approved By:
Date: 22.12.03

Client Reference: C0204

Laboratory Reference: 10648

DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total Cyanide (mg/kg CN) DETS 021	Elemental Sulphur * (mg/kg S) DETS 049	Sulphide (mg/kg S^{2-}) DETS 024	Sulphate content (% SO_3) DETS 004	Sulphate content (% SO_4) DETS 004	Sulphate content on 2:1 aqueous extract (g/l SO_3) DETS 004	Sulphate content on 2:1 aqueous extract (g/l SO_4) DETS 004	pH Value DETS 008	Total Phenols (mg/kg) DETS 023	Toluene Extractable Matter (mg/kg) DETS 029
BH 1	2.00-2.40		J	10648/1										
BH 3	2.50		J	10648/2										
BH 3	3.00		J	10648/3										
BH 3	3.00-3.45		D	10648/4										
BH 5	0.20-0.60		B	10648/5										
BH 5	0.60-1.00		B	10648/6										
BH 5	1.70-1.80		D	10648/7										
TP 3	0.50		J	10648/8	<1	<0.5	67	0.10	0.12	0.15	0.18	8.8	3.0	1600
TP 3	2.50		J	10648/9	<1	<0.5	270	0.12	0.14	0.16	0.19	9.6	3.9	9900
TP 3	3.50		J	10648/10	<1	52	59	0.16	0.19	0.19	0.23	7.5	0.9	1400
TP 4	0.40		D	10648/11	<1	<0.5	1000	0.18	0.22	0.07	0.08	12.0	1.0	2400
TP 4	0.80		D	10648/12	<1	<0.5	12	0.04	0.05	0.08	0.10	8.9	0.4	300
TP 5	0.70		D	10648/13	<1	<0.5	40	0.05	0.06	0.16	0.19	7.1	1.1	140
TP 6	0.40		J	10648/14	<1	8.9	<10	0.06	0.07	0.10	0.12	7.8	1.4	190
TP 6	1.00		J	10648/15	<1	32	130	0.06	0.07	0.13	0.16	7.5	3.0	1300
TP 6	1.30		D	10648/16	<1	<0.5	20	0.03	0.04	0.09	0.11	7.7	0.3	230
TP 7	0.15		D	10648/17										
TP 9	0.50		J	10648/18	<1	<0.5	130	0.08	0.10	0.13	0.16	9.5	0.7	4800
TP 9	1.00		J	10648/19										
TP 9	1.50		J	10648/20	<1	<0.5	<10	0.14	0.17	0.10	0.12	8.1	0.6	<40

Approved By:
Date: 22-12-03

Client Reference: C0204

Laboratory Reference: 10648

WOMBWELL

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total PAH (mg/kg) DETS 050	Gasoline Range Organics * (mg/kg) DETS 062	Diesel Range Organics (mg/kg) DETS 062	Mineral Range Organics (mg/kg) DETS 062	Total Petroleum Hydrocarbons (mg/kg) DETS 052	Benzene * (mg/kg) DETS 062	Toluene * (mg/kg) DETS 062	Ethyl-benzene * (mg/kg) DETS 062	m-xylene * (mg/kg) DETS 062	p-xylene * (mg/kg) DETS 062	o-xylene * (mg/kg) DETS 062
BH 1	2.00-2.40		J	10648/1		<20	430	<20	430	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
BH 3	2.50		J	10648/2		<20	2200	1700	3900	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
BH 3	3.00		J	10648/3		<20	4500	4300	8800	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
BH 3	3.00-3.45		D	10648/4		<20	2200	3100	5300	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
BH 5	0.20-0.60		B	10648/5		<20	620	1800	2400	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
BH 5	0.60-1.00		B	10648/6		<20	110	1200	1300	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
BH 5	1.70-1.80		D	10648/7		<20	77	730	810	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
TP 3	0.50		J	10648/8	140				970						
TP 3	2.50		J	10648/9	73	<20	650	730	1400	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
TP 3	3.50		J	10648/10	42	<20	1300	440	1700	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
TP 4	0.40		D	10648/11	<5				<20						
TP 4	0.60		D	10648/12	<5				<20						
TP 5	0.70		D	10648/13	<5				<20						
TP 6	0.40		J	10648/14	<5				<20						
TP 6	1.00		J	10648/15	<5	<20	32	<20	32	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
TP 6	1.30		D	10648/16	<5	<20	38	<20	38	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
TP 7	0.15		D	10648/17		<20	<20	<20	<20	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
TP 9	0.50		J	10648/18	110				2400						
TP 9	1.00		J	10648/19		<20	140	900	1000	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
TP 9	1.50		J	10648/20	<5	<20	<20	49	56	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

Approved By:

Date: 22.12.05

Client Reference: C0204

Laboratory Reference: 10648

DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total Arsenic (mg/kg As) DETS 042	Total Cadmium (mg/kg Cd) DETS 042	Total Chromium (mg/kg Cr) DETS 042	Total Lead (mg/kg Pb) DETS 042	Total Mercury (mg/kg Hg) DETS 015	Total Selenium (mg/kg Se) DETS 042	Total Copper (mg/kg Cu) DETS 042	Total Nickel (mg/kg Ni) DETS 042	Total Zinc (mg/kg Zn) DETS 042	Water Soluble Boron (B) (mg/kg) DETS 020
TP 9	2.50		J	10648/21										
TP 11	0.50		D	10648/22										
TP 11	0.70		D	10648/23										
TP 12	0.50		D	10648/24	3	<0.2	11	29	0.5	<0.3	13	12	62	0.8
TP 12	1.50		D	10648/25	5	0.2	19	6	0.4	<0.3	10	21	28	1.0
TP 13	0.70		D	10648/26	5	0.2	42	71	0.6	<0.3	16	14	63	1.0
TP 13	1.00		D	10648/27	4	1.3	26	12	0.5	<0.3	13	29	39	0.8
TP 14	0.30		J	10648/28	2	<0.2	17	9	0.4	<0.3	10	4	50	1.0
TP 14	1.50		J	10648/29	2	<0.2	14	5	<0.3	<0.3	6	16	24	0.7
WS 5	1.40		D	10648/30	8	<0.2	29	14	<0.3	2.5	18	7	24	3.2
WS 5	2.00		D	10648/31	8	<0.2	16	13	<0.3	<0.3	15	14	29	1.1
WS 6	0.30		D	10648/32	4	<0.2	23	20	<0.3	<0.3	11	11	42	1.1
WS 6	1.50		D	10648/33	3	<0.2	17	9	<0.3	<0.3	7	18	41	0.7
WS 8	0.30-1.20		D	10648/34	<1	<0.2	5	13	<0.3	<0.3	4	3	33	1.0
WS 8	1.50-2.00		D	10648/35	3	<0.2	13	13	<0.3	<0.3	9	15	44	0.9

Approved By:
Date: 22.12.05

Client Reference: C0204

Laboratory Reference: 10648

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total Cyanide (mg/kg CN) DETS 021	Elemental Sulphur * (mg/kg S) DETS 049	Sulphide (mg/kg S^{2-}) DETS 024	Sulphate content ($\%$ SO_3) DETS 004	Sulphate content ($\%$ SO_4) DETS 004	Sulphate content on 2:1 aqueous extract (g/l SO_3) DETS 004	Sulphate content on 2:1 aqueous extract (g/l SO_4) DETS 004	pH Value DETS 008	Total Phenols (mg/kg) DETS 023	Toluene Extractable Matter (mg/kg) DETS 029
TP 9	2.50		J	10648/21										
TP 11	0.50		D	10648/22										
TP 11	0.70		D	10648/23										
TP 12	0.50		D	10648/24	<1	<0.5	67	0.09	0.11	0.12	0.14	9.9	0.9	40
TP 12	1.50		D	10648/25	<1	<0.5	<10	0.04	0.05	0.13	0.16	8.1	<0.2	<40
TP 13	0.70		D	10648/26	<1	<0.5	52	0.05	0.06	0.16	0.19	9.2	1.1	490
TP 13	1.00		D	10648/27	<1	<0.5	<10	0.03	0.04	0.15	0.18	7.6	0.3	<40
TP 14	0.30		J	10648/28	<1	<0.5	36	0.05	0.06	0.14	0.17	8.5	0.8	2800
TP 14	1.50		J	10648/29	<1	<0.5	<10	0.03	0.04	0.14	0.17	7.9	0.4	<40
WS 5	1.40		D	10648/30	<1	<0.5	1900	0.99	1.19	1.51	1.81	10.4	2.3	5000
WS 5	2.00		D	10648/31	<1	<0.5	12	0.03	0.04	0.19	0.23	8.1	0.3	160
WS 6	0.30		D	10648/32	<1	<0.5	99	0.04	0.05	0.24	0.29	4.9	1.1	<40
WS 6	1.50		D	10648/33	<1	<0.5	<10	0.04	0.05	0.19	0.23	5.4	<0.2	<40
WS 8	0.30-1.20		D	10648/34	<1	<0.5	16	0.17	0.20	0.15	0.18	8.9	<0.2	<40
WS 8	1.50-2.00		D	10648/35	<1	<0.5	12	0.05	0.06	0.08	0.10	6.5	0.4	70

Approved By:
Date: 22.12.03

Client Reference: C0204

Laboratory Reference: 10648

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total PAH (mg/kg)	Gasoline Range Organics * (mg/kg)	Diesel Range Organics (mg/kg)	Mineral Range Organics (mg/kg)	Total Petroleum Hydrocarbons (mg/kg)	Benzene * (mg/kg)	Toluene * (mg/kg)	Ethyl-benzene * (mg/kg)	m-xylene * (mg/kg)	p-xylene * (mg/kg)	o-xylene * (mg/kg)
					DETS 050	DETS 062	DETS 062	DETS 062	DETS 062	DETS 062	DETS 062	DETS 062	DETS 062	DETS 062	DETS 062
TP 9	2.50		J	10648/21		<20	1800	310	2100	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
TP 11	0.50		D	10648/22		<20	2800	1100	4000	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
TP 11	0.70		D	10648/23		<20	140	<20	140	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
TP 12	0.50		D	10648/24	<5				<20						
TP 12	1.50		D	10648/25	<5				<20						
TP 13	0.70		D	10648/26	7				36						
TP 13	1.00		D	10648/27	<5				<20						
TP 14	0.30		J	10648/28	1200	<20	8200	780	9000	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
TP 14	1.50		J	10648/29	<5	<20	<20	<20	<20	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
WS 5	1.40		D	10648/30	1300				3100						
WS 5	2.00		D	10648/31	<5				1700						
WS 6	0.30		D	10648/32	<5				180						
WS 6	1.50		D	10648/33	<5				140						
WS 8	0.30-1.20		D	10648/34	<5				<20						
WS 8	1.50-2.00		D	10648/35	<5				88						

Approved By:
Date: 22-12-03

Client Reference: C0204

Laboratory Reference: 10648

WOMBWELL

Summary of Chemical Analyses on Soil Samples

	Total Arsenic (mg/kg As) DETS 042	Total Cadmium (mg/kg Cd) DETS 042	Total Chromium (mg/kg Cr) DETS 042	Total Lead (mg/kg Pb) DETS 042	Total Mercury (mg/kg Hg) DETS 015	Total Selenium (mg/kg Se) DETS 042	Total Copper (mg/kg Cu) DETS 042	Total Nickel (mg/kg Ni) DETS 042	Total Zinc (mg/kg Zn) DETS 042	Water Soluble Boron (B) (mg/kg) DETS 020	Total Cyanide (mg/kg CN) DETS 021
Date Analysed	16/12/2003	16/12/2003	16/12/2003	16/12/2003	16/12/2003	16/12/2003	16/12/2003	16/12/2003	16/12/2003	15/12/2003	15/12/2003

	Free Cyanide (mg/kg CN) DETS 021	Elemental Sulphur * (mg/kg S) DETS 049	Sulphide (mg/kg S^{2-}) DETS 024	Sulphate content ($\%\ SO_3$) DETS 004	Sulphate content ($\%\ SO_4$) DETS 004	Sulphate content on 2:1 aqueous extract ($g/l\ SO_3$) DETS 004	Sulphate content on 2:1 aqueous extract ($g/l\ SO_4$) DETS 004	pH Value DETS 008	Total Phenols (mg/kg) DETS 023	Toluene Extractable Matter (mg/kg) DETS 029	Total PAH (mg/kg) DETS 050
Date Analysed	15/12/2003	11/12/2003	12/12/2003	15/12/2003		15/12/2003		16/12/2003	16/12/2003	19/12/2003	16/12/2003

	Gasoline Range Organics * (mg/kg) DETS 062	Diesel Range Organics (mg/kg) DETS 062	Mineral Range Organics (mg/kg) DETS 062	Total Petroleum Hydrocarbons (mg/kg) DETS 052	Benzene * (mg/kg) DETS 062	Toluene * (mg/kg) DETS 062	Ethyl-benzene * (mg/kg) DETS 062	m-xylene * (mg/kg) DETS 062	p-xylene * (mg/kg) DETS 062	o-xylene * (mg/kg) DETS 062
Date Analysed	16/12/2003	16/12/2003	16/12/2003	16/12/2003	19/12/2003	19/12/2003	19/12/2003	19/12/2003	19/12/2003	19/12/2003

Approved By:
Date: 22.12.03

Client Reference: C0204

Laboratory Reference: 10648

Summary of Chemical Analyses on Leachate Samples Prepared from Soils

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Arsenic (µg/l As) DETS 042	Cadmium (µg/l Cd) DETS 042	Chromium (µg/l Cr) DETS 042	Lead (µg/l Pb) DETS 042	Mercury (µg/l Hg) DETS 015	Selenium (µg/l Se) DETS 017	Copper (µg/l Cu) DETS 042	Nickel (µg/l Ni) DETS 042	Zinc (µg/l Zn) DETS 042	Boron (µg/l B) DETS 020
TP 3	0.50		L	10648/8	2	<1	<10	20	<0.2	<3	17	<10	140	150
TP 3	2.50		L	10648/9	1	<1	<10	<10	<0.2	<3	2	<10	31	140
TP 4	0.40		L	10648/11	<1	<1	<10	<10	<0.2	<3	2	<10	4	<100
TP 5	0.70		L	10648/13	1	<1	30	<10	<0.2	<3	14	<10	98	<100
TP 6	0.40		L	10648/14	10	<1	10	170	<0.2	<3	59	<10	27	120
TP 9	0.50		L	10648/18	2	<1	<10	<10	<0.2	<3	9	<10	17	<100
TP 9	1.00		L	10648/19										
TP 11	0.50		L	10648/22										
TP 11	0.70		L	10648/23										
TP 12	0.50		L	10648/24	<1	<1	<10	<10	<0.2	<3	2	<10	4	<100
TP 12	1.50		L	10648/25										
TP 13	0.70		L	10648/26	1	<1	<10	<10	<0.2	<3	8	<10	32	110
TP 14	0.30		L	10648/28	1	<1	<10	<10	<0.2	<3	5	<10	37	110
WS 5	1.40		L	10648/30	<1	<1	<10	<10	<0.2	<3	2	<10	2	100
WS 6	0.30		L	10648/32	<1	<1	<10	<10	<0.2	<3	<1	<10	10	<100
WS 8	0.30-1.20		L	10648/34	<1	<1	<10	<10	<0.2	<3	<1	<10	<1	<100

Approved By:
Date: 22-12-03

Client Reference: C0204

Laboratory Reference: 10648

Summary of Chemical Analyses on Leachate Samples Prepared from Soils

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total Cyanide (µg/l CN) DETS 021	Elemental Sulphur * (µg/l S) DETS 049	Sulphide (µg/l S^{2-}) DETS 024	Sulphate content (mg/l SO_3) DETS 004	Sulphate content (mg/l SO_4) DETS 004	pH Value DETS 008	Total Phenols # (µg/l)	Toluene Extractable Matter (µg/l) DETS 029	Total PAH # (µg/l)	Total Petroleum Hydrocarbons (µg/l) DETS 052
TP 3	0.50		L	10648/8	<20	<60	<500	250	300	6.7	<0.5	<1000	0.2	<100
TP 3	2.50		L	10648/9	<20	<60	<500	40	48	6.5	<0.5	<1000	1.4	<100
TP 4	0.40		L	10648/11	<20	<60	<500	40	48	10.5	1.8	<1000	<0.2	<100
TP 5	0.70		L	10648/13	<20	<60	<500	340	408	7.9	<0.5	<1000	<0.2	<100
TP 6	0.40		L	10648/14	<20	<60	<500	310	372	7.0	<0.5	<1000	0.2	
TP 9	0.50		L	10648/18	<20	<60	<500	40	48	7.7	<0.5	<1000	0.4	<100
TP 9	1.00		L	10648/19										<100
TP 11	0.50		L	10648/22										<100
TP 11	0.70		L	10648/23										<100
TP 12	0.50		L	10648/24	<20	<60	<500	30	36	10.5	0.2	<1000	1.0	<100
TP 12	1.50		L	10648/25										<100
TP 13	0.70		L	10648/26	<20	<60	<500	50	60	6.6	1.2	<1000	0.3	<100
TP 14	0.30		L	10648/28	<20	<60	<500	40	48	8.3	7.5	<1000	2.7	<100
WS 5	1.40		L	10648/30	<20	<60	<500	210	252	6.5	1.6	<1000	<0.2	<100
WS 6	0.30		L	10648/32	<20	<60	<500	40	48	5.5	1.1	<1000	0.2	<100
WS 8	0.30-1.20		L	10648/34	<20	<60	<500	40	48	6.9	0.7	<1000	<0.2	<100

Approved By:
Date: 22-12-03

Client Reference: C0204

Laboratory Reference: 10648

Summary of Chemical Analyses on Leachates Prepared from Soil Samples

	Arsenic	Cadmium	Chromium	Lead	Mercury	Selenium	Copper	Nickel	Zinc	Boron
	(µg/l As)	(µg/l Cd)	(µg/l Cr)	(µg/l Pb)	(µg/l Hg)	(µg/l Se)	(µg/l Cu)	(µg/l Ni)	(µg/l Zn)	(µg/l B)
	DETS 042	DETS 042	DETS 042	DETS 042	DETS 015	DETS 017	DETS 042	DETS 042	DETS 042	DETS 020
Date Analysed	11/12/2003	16/12/2003	16/12/2003	16/12/2003	12/12/2003	12/12/2003	16/12/2003	16/12/2003	16/12/2003	16/12/2003

	Total Cyanide (µg/l CN) DETS 021	Free Cyanide (µg/l CN) DETS 021	Elemental Sulphur * (µg/l S) DETS 049	Sulphide (µg/l S^{2-}) DETS 024	Sulphate content (mg/l SO_3) DETS 004	Sulphate content (mg/l SO_4) DETS 004	pH Value DETS 008	Total Phenols # (µg/l)	Toluene Extractable Matter (µg/l) DETS 029	Total PAH # (µg/l)	Total Petroleum Hydrocarbons (µg/l) DETS 052
Date Analysed	15/12/2003	15/12/2003	16/12/2003	16/12/2003	15/12/2003		11/12/2003	16/12/2003	19/12/2003	16/12/2003	11/12/2003

Approved By:

Date: 22.12.03

Client Reference: C0204

Laboratory Reference: 10648

VOC's - Soils

DETS/87810
Wombwell C0204
Your Reference:- 10648
Your Order:- P021451

CAS Number:			448091	448092	448093	448094	448095	448096
Sample Ref			13/TP5	16/TP6	17/TP7	19/TP9	20/TP9	21/TP9
Detname	Method	Units	0.70m	1.50m	1.00m	1.00m	1.50m	2.50m
vinyl chloride	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
11-dichloroethene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
dichloromethane	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
trans-12-dichloroethene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
11-dichloroethane	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
2,2-dichloropropane	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
cis-12-dichloroethene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
bromochloromethane	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
chloroform	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
111-trichloroethane	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
carbon tetrachloride	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,1-dichloropropene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
benzene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
12-dichloroethane	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
trichloroethylene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
12-dichloropropane	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
dibromomethane	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
bromodichloromethane	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
trans-13-dichloropropene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
toluene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
cis-13-dichloropropene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
112-trichloroethane	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
tetrachloroethylene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
13-dichloropropane	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
dibromochloromethane	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
12-dibromoethane	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
chlorobenzene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1112-tetrachloroethane	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
ethylbenzene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
mp-xylene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
o-xylene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
styrene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
bromoform	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
isopropylbenzene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
bromobenzene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
123-trichloropropane	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1122-tetrachloroethane	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
n-propylbenzene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
2-chlorotoluene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
4-chlorotoluene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
135-trimethylbenzene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
tert-butylbenzene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
sec-butylbenzene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
13-dichlorobenzene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
14-dichlorobenzene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
p-isopropyltoluene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
12-dichlorobenzene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Key
I/S - Insufficient Sample

VOC's - Soils

DETS/87810
Wombwell C0204
Your Reference:- 10648
Your Order:- P021451

CAS Number:			448091	448092	448093	448094	448095	448096
Sample Ref			15/TP5	16/TP6	17/TP7	19/TP9	20/TP9	21/TP9
Detname	Method	Units	0.70m	1.50m	1.00m	1.00m	1.50m	2.50m
n-butylbenzene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
12-dibromo3chloropropane	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
135-trichlorobenzene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
124-trichlorobenzene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
124-trimethylbenzene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
hexachlorobutadiene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
123-trichlorobenzene	327	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Key
I/S - Insufficient Sample

VOC's - Soils

DETS/87810
Wombwell C0204
Your Reference:- 10648
Your Order.- P021451

CAS Number:			448097	448098
Sample Ref			28/TP14	29/TP14
Detname	Method	Units	0.30m	1.50m
vinyl chloride	327	mg/kg	< 0.10	< 0.10
11-dichloroethene	327	mg/kg	< 0.10	< 0.10
dichloromethane	327	mg/kg	< 0.10	< 0.10
trans-12-dichloroethene	327	mg/kg	< 0.10	< 0.10
11-dichloroethane	327	mg/kg	< 0.10	< 0.10
2,2-dichloropropane	327	mg/kg	< 0.10	< 0.10
cis-12-dichloroethene	327	mg/kg	< 0.10	< 0.10
bromochloromethane	327	mg/kg	< 0.10	< 0.10
chloroform	327	mg/kg	< 0.10	< 0.10
111-trichloroethane	327	mg/kg	< 0.10	< 0.10
carbon tetrachloride	327	mg/kg	< 0.10	< 0.10
1,1-dichloropropene	327	mg/kg	< 0.10	< 0.10
benzene	327	mg/kg	< 0.10	< 0.10
12-dichloroethane	327	mg/kg	< 0.10	< 0.10
trichloroethylene	327	mg/kg	< 0.10	< 0.10
12-dichloropropane	327	mg/kg	< 0.10	< 0.10
dibromomethane	327	mg/kg	< 0.10	< 0.10
bromodichloromethane	327	mg/kg	< 0.10	< 0.10
trans-13-dichloropropene	327	mg/kg	< 0.10	< 0.10
toluene	327	mg/kg	< 0.10	< 0.10
cis-13-dichloropropene	327	mg/kg	< 0.10	< 0.10
112-trichloroethane	327	mg/kg	< 0.10	< 0.10
tetrachloroethylene	327	mg/kg	< 0.10	< 0.10
13-dichloropropane	327	mg/kg	< 0.10	< 0.10
dibromochloromethane	327	mg/kg	< 0.10	< 0.10
12-dibromoethane	327	mg/kg	< 0.10	< 0.10
chlorobenzene	327	mg/kg	< 0.10	< 0.10
1112-tetrachloroethane	327	mg/kg	< 0.10	< 0.10
ethylbenzene	327	mg/kg	< 0.10	< 0.10
mp-xylene	327	mg/kg	< 0.10	< 0.10
o-xylene	327	mg/kg	0.3	< 0.10
styrene	327	mg/kg	< 0.10	< 0.10
bromoform	327	mg/kg	< 0.10	< 0.10
isopropylbenzene	327	mg/kg	< 0.10	< 0.10
bromobenzene	327	mg/kg	< 0.10	< 0.10
123-trichloropropane	327	mg/kg	< 0.10	< 0.10
1122-tetrachloroethane	327	mg/kg	< 0.10	< 0.10
n-propylbenzene	327	mg/kg	< 0.10	< 0.10
2-chlorotoluene	327	mg/kg	< 0.10	< 0.10
4-chlorotoluene	327	mg/kg	< 0.10	< 0.10
135-trimethylbenzene	327	mg/kg	0.4	< 0.10
tert-butylbenzene	327	mg/kg	< 0.10	< 0.10
sec-butylbenzene	327	mg/kg	< 0.10	< 0.10
13-dichlorobenzene	327	mg/kg	< 0.10	< 0.10
14-dichlorobenzene	327	mg/kg	< 0.10	< 0.10
p-isopropyltoluene	327	mg/kg	0.1	< 0.10
12-dichlorobenzene	327	mg/kg	< 0.10	< 0.10

Key
I/S - Insufficient Sample

VOC's - Soils

DETS/87810
Wombwell C0204
Your Reference:- 10648
Your Order:- P021451

CAS Number:			448097	448098
Sample Ref			28/TP14	29/TP14
Detname	Method	Units	0.30m	1.50m
n-butylbenzene	327	mg/kg	< 0.10	< 0.10
12-dibromo3chloropropane	327	mg/kg	< 0.10	< 0.10
135-trichlorobenzene	327	mg/kg	< 0.10	< 0.10
124-trichlorobenzene	327	mg/kg	< 0.10	< 0.10
124-trimethylbenzene	327	mg/kg	< 0.10	< 0.10
hexachlorobutadiene	327	mg/kg	< 0.10	< 0.10
123-trichlorobenzene	327	mg/kg	< 0.10	< 0.10

Key
I/S - Insufficient Sample

SVOC's - Soils

DETS/87810
Wombwell C0204
Your Reference - 10648
Your Order - P021451

CAS Number			448091	448092	448093	448094	448095	448096
Sample Ref			13/TP5	16/TP6	17/TP7	19/TP9	20/TP9	21/TP9
Detname	Method	Units	0.70m	1.50m	1.00m	1.00m	1.50m	2.50m
phenol	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
aniline	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-picoline	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-chlorophenol	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
13-dichlorobenzene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
14-dichlorobenzene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
benzyl alcohol	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
12-dichlorobenzene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-methylphenol	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
bis(2chloroisopropyl)eth	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-methylphenol	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
acetophenone	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-nitrosodi-n-propylamin	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
hexachloroethane	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
nitrobenzene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-nitrosopiperidine	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
isophorone	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-nitrophenol	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
benzoic acid	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
24-dimethylphenol	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
bis(2chloroethoxy)methan	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
bis(2-chloroethyl)ether	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
24-dichlorophenol	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
124-trichlorobenzene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
naphthalene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-chloroaniline	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
26-dichlorophenol	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
hexachlorobutadiene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-nitrosodibutylamine	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-chloro-3-methylphenol	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-methylnaphthalene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1245-tetrachlorobenzene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
hexachlorocyclopentadien	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
246-trichlorophenol	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
245-trichlorophenol	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-chloronaphthalene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-nitroaniline	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
24-dinitrotoluene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
acenaphthylene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
3-nitroaniline	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
acenaphthene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-nitrophenol	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
dibenzofuran	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
26-dinitrotoluene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
24-dinitrophenol	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
12-diphenylhydrazine	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1-naphthylamine	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Key
I/S - Insufficient Sample

SVOC's - Soils

DETS/87810
Wombwell C0204
Your Reference.- 10648
Your Order - P021451

CAS Number.			448091	448092	448093	448094	448095	448096
Sample Ref			13/TP5	16/TP6	17/TP7	19/TP9	20/TP9	21/TP9
Detname	Method	Units	0.70m	1.50m	1.00m	1.00m	1.50m	2.50m
2-naphthylamine	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2346-tetrachlorophenol	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
di[illegible]hyl phthalate	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
[illegible]rophenylphentlether	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
fluorene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
[illegible]troaniline	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-methyl-46-dinitropheno	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
diphenylamine	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-nitrosodiphenylamine	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
phenacetin	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4bromophenylphenyl ether	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
hexachlorobenzene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-aminobiphenyl	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
pentachlorophenol	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
phenanthrene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
anthracene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
di-n-butyl phthalate	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
fluoranthene	325	mg/kg	< 1.0	< 1.0	< 1.0	1	< 1.0	< 1.0
benzidine	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
pyrene	325	mg/kg	< 1.0	< 1.0	< 1.0	1.1	< 1.0	< 1.0
dimethylaminoazobenzene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
butyl benzyl phthalate	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
33-dichlorobenzidine	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
benzo(a)anthracene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
[illegible]ysene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
[illegible]zethylhexyl)phthalal	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
di-n-octyl phthalate	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
enzo(b)fluoranthene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
enzo(k)fluoranthene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
7,12-dimethylbenz(a)anth	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
benzo(a)pyrene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
3-methylcholanthrene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
indeno(123cd)pyrene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
dibenzo(ah)anthracene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
benzo(ghi)perylene	325	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Key
I/S - Insufficient Sample

SVOC's - Soils

DETS/87810
Wombwell C0204
Your Reference:- 10648
Your Order:- P021451

CAS Number:			448097	448098
Sample Ref			28/TP14	29/TP14
Detname	Method	Units	0.30m	1.50m
phenol	325	mg/kg	< 1.0	< 1.0
analine	325	mg/kg	< 1.0	< 1.0
2-picoline	325	mg/kg	< 1.0	< 1.0
2-chlorophenol	325	mg/kg	< 1.0	< 1.0
13-dichlorobenzene	325	mg/kg	< 1.0	< 1.0
14-dichlorobenzene	325	mg/kg	< 1.0	< 1.0
benzyl alcohol	325	mg/kg	< 1.0	< 1.0
12-dichlorobenzene	325	mg/kg	< 1.0	< 1.0
2-methylphenol	325	mg/kg	< 1.0	< 1.0
bis(2chloroisopropyl)eth	325	mg/kg	< 1.0	< 1.0
4-methylphenol	325	mg/kg	< 1.0	< 1.0
acetophenone	325	mg/kg	< 1.0	< 1.0
n-nitrosodi-n-propylamin	325	mg/kg	< 1.0	< 1.0
hexachloroethane	325	mg/kg	< 1.0	< 1.0
nitrobenzene	325	mg/kg	< 1.0	< 1.0
n-nitrosopiperidine	325	mg/kg	< 1.0	< 1.0
isophorone	325	mg/kg	< 1.0	< 1.0
2-nitrophenol	325	mg/kg	< 1.0	< 1.0
benzoic acid	325	mg/kg	< 1.0	< 1.0
24-dimethylphenol	325	mg/kg	< 1.0	< 1.0
bis(2chloroethoxy)methan	325	mg/kg	< 1.0	< 1.0
bis(2-chloroethyl)ether	325	mg/kg	< 1.0	< 1.0
24-dichlorophenol	325	mg/kg	< 1.0	< 1.0
124-trichlorobenzene	325	mg/kg	< 1.0	< 1.0
naphthalene	325	mg/kg	< 1.0	< 1.0
4-chloroaniline	325	mg/kg	< 1.0	< 1.0
26-dichlorophenol	325	mg/kg	< 1.0	< 1.0
hexachlorobutadiene	325	mg/kg	< 1.0	< 1.0
n-nitrosodibutylamine	325	mg/kg	< 1.0	< 1.0
4-chloro-3-methylphenol	325	mg/kg	< 1.0	< 1.0
2-methylnaphthalene	325	mg/kg	< 1.0	< 1.0
1245-tetrachlorobenzene	325	mg/kg	< 1.0	< 1.0
hexachlorocyclopentadien	325	mg/kg	< 1.0	< 1.0
246-trichlorophenol	325	mg/kg	< 1.0	< 1.0
245-trichlorophenol	325	mg/kg	< 1.0	< 1.0
2-chloronaphthalene	325	mg/kg	< 1.0	< 1.0
2-nitroaniline	325	mg/kg	< 1.0	< 1.0
24-dinitrotoluene	325	mg/kg	< 1.0	< 1.0
acenaphthylene	325	mg/kg	< 1.0	< 1.0
3-nitroaniline	325	mg/kg	< 1.0	< 1.0
acenaphthene	325	mg/kg	< 1.0	< 1.0
4-nitrophenol	325	mg/kg	< 1.0	< 1.0
dibenzofuran	325	mg/kg	< 1.0	< 1.0
26-dinitrotoluene	325	mg/kg	< 1.0	< 1.0
24-dinitrophenol	325	mg/kg	< 1.0	< 1.0
12-diphenylhydrazine	325	mg/kg	< 1.0	< 1.0
1-naphthylamine	325	mg/kg	< 1.0	< 1.0

Key
I/S - Insufficient Sample

SVOC's - Soils

DETS/87810
Wombwell C0204
Your Reference:- 10648
Your Order:- P021451

CAS Number:			448097	448098
Sample Ref			28/TP14	29/TP14
Detname	Method	Units	0.30m	1.50m
2-naphthylamine	325	mg/kg	< 1.0	< 1.0
2346-tetrachlorophenol	325	mg/kg	< 1.0	< 1.0
diethyl phthalate	325	mg/kg	< 1.0	< 1.0
4chlorophenylphentlether	325	mg/kg	< 1.0	< 1.0
fluorene	325	mg/kg	< 1.0	< 1.0
4-nitroaniline	325	mg/kg	< 1.0	< 1.0
2-methyl-46-dinitropheno	325	mg/kg	< 1.0	< 1.0
diphenylamine	325	mg/kg	< 1.0	< 1.0
n-nitrosodiphenylamine	325	mg/kg	< 1.0	< 1.0
phenacetin	325	mg/kg	< 1.0	< 1.0
4bromophenylphenyl ether	325	mg/kg	< 1.0	< 1.0
hexachlorobenzene	325	mg/kg	< 1.0	< 1.0
4-aminobiphenyl	325	mg/kg	< 1.0	< 1.0
pentachlorophenol	325	mg/kg	< 1.0	< 1.0
phenanthrene	325	mg/kg	< 1.0	< 1.0
anthracene	325	mg/kg	< 1.0	< 1.0
di-n-butyl phthalate	325	mg/kg	< 1.0	< 1.0
fluoranthene	325	mg/kg	< 1.0	< 1.0
benzidine	325	mg/kg	< 1.0	< 1.0
pyrene	325	mg/kg	< 1.0	< 1.0
dimethylaminoazobenzene	325	mg/kg	< 1.0	< 1.0
butyl benzyl phthalate	325	mg/kg	< 1.0	< 1.0
33-dichlorobenzidine	325	mg/kg	< 1.0	< 1.0
benzo(a)anthracene	325	mg/kg	< 1.0	< 1.0
chrysene	325	mg/kg	< 1.0	< 1.0
bis(2ethylhexyl)phthalat	325	mg/kg	< 1.0	< 1.0
di-n-octyl phthalate	325	mg/kg	< 1.0	< 1.0
benzo(b)fluoranthene	325	mg/kg	< 1.0	< 1.0
benzo(k)fluoranthene	325	mg/kg	< 1.0	< 1.0
7,12-dimethylbenz(a)anth	325	mg/kg	< 1.0	< 1.0
benzo(a)pyrene	325	mg/kg	< 1.0	< 1.0
3-methylcholanthrene	325	mg/kg	< 1.0	< 1.0
indeno(123cd)pyrene	325	mg/kg	< 1.0	< 1.0
dibenzo(ah)anthracene	325	mg/kg	< 1.0	< 1.0
benzo(ghi)perylene	325	mg/kg	< 1.0	< 1.0

Key
I/S - Insufficient Sample

BULK ANALYSIS REPORT:

Date Samples Received: 10 December 2003

Project Ref. No:	Report No:	Office Code:
742	3056	CON

Comments, observations and opinions are outside the UKAS Accreditation scope

0244

Customer Address Details	Derwentside Environmental Testing Services Ltd	Tel No	01207 582333
	Unit 2A/2B	Fax Number	01207 582444
	Park Road Industrial Estate	Order Number	21452
	Consett, Co Durham DH8 5PY	Contact:	Richard Bennett

ANALYTICAL PROCEDURE

Fibres found in the sample or small portions of the sample were mounted on glass slides in specific refractive index liquids and examined using polarised light and dispersion staining microscopy. Fibres were identified by comparison of their optical properties with those of standard asbestos materials and published data. MIS Limited accepts responsibility only for results obtained from samples received. No responsibility is accepted for errors which may have arisen during the sampling or transportation of the samples. Re: Artex Samples - analysis is carried out to MDHS 77, however we would recommend that SEM (Scanning Electron Microscopy) analysis be used for this type of analysis.

RESULT KEY:	ASBESTOS	NON ASBESTOS	ESTIMATED CONTENT**
	Crocidolite (Blue Asbestos)	MMMF (Man Made Mineral Fibres)	Major (>10%)
	Amosite (Brown Asbestos)	NOF (Natural Organic Fibres)	Minor (1 - 10%)
	Chrysotile (White Asbestos)	MMOF (Man Made Organic Fibres)	Trace (<1%)

Sampled By As Received	Analysed By: D. E. Bullerwell	Date Analysed: 10/12/03

Lab Code	Analyst Code	Sample Details/Location	Material	Result	Amount	Condition
10231	N/A	10648-8, TP3, 0.50, Soil Wombwell CO204	Soil	NOF	Trace	As Received
10232	N/A	10648-22, TP11, 0.50, Soil Wombwell CO204	Soil	NOF	Trace	As Received
10233	N/A	10648-24, TP12, 0.50, Soil Wombwell CO204	Soil	NOF	Trace	As Received
10234	N/A	10648-30, WS5, 1.40, Soil Wombwell CO204	Soil	NOF	Trace	As Received

COMMENTS*

No asbestos fibres were found to be present in the above sample(s)

LABORATORY SIGNATURE: AUTHORISED SIGNATURE

** Comments, observations and opinions are outside of the UKAS Accreditation Scope.*

** The quantative assessment % of asbestos content made by the analyst is a non-accredited element of the testing.

Unit 2, Walling Street Industrial Estate, Leadgate, Consett, Co. Durham. DH8 6TA
Tel: (01207) 500463/Fax: 590240, E-mail: Info@mis-environmental.co.uk

MIS Ltd ENVIRONMENTAL

DERWENTSIDE ENVIRONMENTAL TESTING SERVICES

INFORMATION
ACTION
01 APR 2004
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FILE

UKAS TESTING
2139

CERTIFICATE OF ANALYSIS

Certificate Number : 11635-1

Client Reference :	C0204	31 March 2004
Our Reference :	11635-1	
Clients Name :	Sirius Geotechnical & Environmental	
Clients Address:	Russell House Suite 2, Mill Road Langley Moor Durham DH7 8HJ	
Contract Title :	Wombwell	
Description :	Thirteen soil samples and two leachate samples prepared from soils	
Date Received :	11 March 2004	
Test Procedures :	Identified by Prefix DETSn , Details available upon request.	
Notes :	# Denotes analysis carried out by an approved sub-contractor * Denotes test not included in laboratory scope of accreditation	
	Observations and Interpretations are Outside the UKAS Accreditation Scope	
	This report supersedes 11635	

Approved By:

Authorised Signatories			
R Bennett	R Brown	S Wilson	
Director/Technical Manager	Laboratory Manager	Quality Manager	Page 1 of 11 Pages

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material received by the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

WOMBWELL

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total Arsenic (mg/kg As) DETS 042	Total Cadmium (mg/kg Cd) DETS 042	Total Chromium (mg/kg Cr) DETS 042	Total Lead (mg/kg Pb) DETS 042	Total Mercury (mg/kg Hg) DETS 015	Total Selenium (mg/kg Se) DETS 042	Total Copper (mg/kg Cu) DETS 042	Total Nickel (mg/kg Ni) DETS 042	Total Zinc (mg/kg Zn) DETS 042	Water Soluble Boron (B) (mg/kg) DETS 020
WS12	0.80-1.30		D	11635/3	7	<0.2	28	7	<0.3	<0.3	1	6	14	0.6
WS13	0.30-0.90		D	11635/5	10	<0.2	40	14	<0.3	<0.3	8	6	31	1.0
WS13	1.00-1.70		J	11635/6	8	<0.2	37	11	<0.3	<0.3	9	6	26	1.0
WS14	0.20-0.70		D	11635/8	8	0.3	8	21	<0.3	<0.3	4	<1	46	1.1
WS14	0.80-1.30		D	11635/9	7	<0.2	24	2	<0.3	<0.3	6	13	26	0.7
WS 14	1.30-1.40		D	11635/10										
WS 15	0.80-1.00		D	11635/11										
WS 16	0.70-1.00		D	11635/12										
WS 16	0.20-0.70		D	11635/13										

Approved By:
Date:

Client Reference: C0204

Laboratory Reference: 11635-1

WOMBWELL

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Toluene Extractable Matter (mg/kg) DETS 029	Total PAH (mg/kg) DETS 050	Fraction Organic Carbon % Dry Mass DETS 033
WS12	0.80-1.30		D	11635/3	<40	<5	
WS13	0.30-0.90		D	11635/5	70	<5	
WS13	1.00-1.70		J	11635/6	120	21	
WS14	0.20-0.70		D	11635/8	6600	<5	0.9
WS14	0.80-1.30		D	11635/9	200	5	0.8
WS 14	1.30-1.40		D	11635/10			
WS 15	0.80-1.00		D	11635/11			0.5
WS 16	0.70-1.00		D	11635/12			1.0
WS 16	0.20-0.70		D	11635/13			1.3

Approved By:
Date: 31.3.04

Client Reference: C0204

Laboratory Reference: 11635-1

Speciated Polyaromatic Hydrocarbon Analysis on Soils Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Naphthalene * (!)	Acenaphthene * (!)	Acenaphthylene * (!)	Fluorene * (!)	Phenanthrene * (!)	Anthracene * (!)	Fluoranthene * (!)	Pyrene * (!)	Benz (a) anthracene * (!)
					Milligrams per Kilogram (mg/kg)								
WS11	0.50-0.90		J	11635/1	<0.2	1.7	3.5	5.1	7.8	<0.2	7.2	6.6	<0.2
WS12	1.40-1.80		D	11635/4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
WS13	1.00-1.70		J	11635/6	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	10	11	<0.2

Approved By: [signature]
Date: 31.3.04

Client Reference:C0204

Laboratory Reference:11635-1

Specified Polyaromatic Hydrocarbon Analysis on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Chrysene * (U)	Benz (b) fluoranthene * (U)	Benz (k) fluoranthene * (U)	Benz (a) pyrene * (U)	Dibenz (ah) anthracene (U)	Indeno (123cd) pyrene * (U)	Benzo (ghi) perylene * (U)	Total PAH * (U)
					Milligrams per Kilogram (mg/kg)							
WS11	0.50-0.90		J	11635/1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	32
WS12	1.40-1.80		D	11635/4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<5
WS13	1.00-1.70		J	11635/6	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	21

Approved By:
Date: 31.3.04

Client Reference: C0204

Laboratory Reference: 11635-1

DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

WOMBWELL

Summary of Chemical Analyses on Soil Samples

	Total Arsenic (mg/kg As) DETS 042	Total Cadmium (mg/kg Cd) DETS 042	Total Chromium (mg/kg Cr) DETS 042	Total Lead (mg/kg Pb) DETS 042	Total Mercury (mg/kg Hg) DETS 015	Total Selenium (mg/kg Se) DETS 042	Total Copper (mg/kg Cu) DETS 042	Total Nickel (mg/kg Ni) DETS 042	Total Zinc (mg/kg Zn) DETS 042	Water Soluble Boron (B) (mg/kg) DETS 020
Date Analysed	18/03/2004	18/03/2004	18/03/2004	18/03/2004	17/03/2004	18/03/2004	18/03/2004	18/03/2004	18/03/2004	19/03/2004

	Total Cyanide (mg/kg CN) DETS 021	*Free* Cyanide (mg/kg CN) DETS 021	*Elemental* Sulphur * (mg/kg S) DETS 049	*Sulphide* (mg/kg S^{2-}) DETS 024	*Sulphate content* (% SO_3) DETS 004	*Sulphate content* (% SO_4) DETS 004	*Sulphate content* on 2:1 aqueous extract (g/l SO_3) DETS 004	*Sulphate content* on 2:1 aqueous extract (g/l SO_4) DETS 004	*pH* Value DETS 008	*Total* Phenols (mg/kg) DETS 023
Date Analysed	18/03/2004	18/03/2004	16/03/2004	18/03/2004	18/03/2004		26/03/2004		18/03/2004	17/03/2004

	Toluene Extractable Matter (mg/kg) DETS 029	Total/Speciated PAH (mg/kg) DETS 050
Date Analysed	12/03/2004	17/03/2004

Approved By:
Date: 31.3.04

Client Reference: C0204

Laboratory Reference: 11635-1

Summary of Chemical Analyses ou Leachate Samples Prepared from Soils

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Arsenic (µg/l As) DETS 042	Cadmium (µg/l Cd) DETS 042	Chromium (µg/l Cr) DETS 042	Lead (µg/l Pb) DETS 042	Mercury (µg/l Hg) DETS 015	Selenium (µg/l Se) DETS 017	Copper (µg/l Cu) DETS 042	Nickel (µg/l Ni) DETS 042	Zinc (µg/l Zn) DETS 042	Boron (µg/l B) DETS 020
WS12	0.80-1.30		L	11635/3	<1	1	20	20	0.3	<3	22	10	63	<100
WS14	0.20-0.70		L	11635/8	<1	1	10	10	1.0	<3	18	<10	68	120

Approved By:
Date: 31.3.04

Client Reference: C0204

Laboratory Reference: 11635-1

Summary of Chemical Analyses on Leachate Samples Prepared from Soils

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total Cyanide (µg/l CN) DETS 021	Free Cyanide (µg/l CN) DETS 021	Elemental Sulphur * (µg/l S) DETS 049	Sulphide ($\mu g/l\ S^{2-}$) DETS 024	Sulphate content ($mg/l\ SO_3$) DETS 055	Sulphate content ($mg/l\ SO_4$) DETS 055	pH Value DETS 008	Total Phenols * (µg/l) DETS 054	Total PAH # (µg/l)
WS12	0.80-1.30		L	11635/3	<20	<20	<60	<500	<10	<10	7.0	<0.5	<0.2
WS14	0.20-0.70		L	11635/8	<20	<20	<60	<500	10	12	7.0	<0.5	0.4

Approved By:

Date: 31.3.04

Client Reference: C0204

Laboratory Reference: 11635-1

	Arsenic	Cadmium	Chromium	Lead	Mercury	Selenium	Copper	Nickel	Zinc	Boron
	(µg/l As)	(µg/l Cd)	(µg/l Cr)	(µg/l Pb)	(µg/l Hg)	(µg/l Se)	(µg/l Cu)	(µg/l Ni)	(µg/l Zn)	(µg/l B)
	DETS 042	DETS 042	DETS 042	DETS 042	DETS 015	DETS 017	DETS 042	DETS 042	DETS 042	DETS 020
Date Analysed	16/03/2004	17/03/2004	17/03/2004	17/03/2004	16/03/2004	17/03/2004	17/03/2004	17/03/2004	17/03/2004	19/03/2004

	Total Cyanide (µg/l CN) DETS 021	Free Cyanide (µg/l CN) DETS 021	Elemental Sulphur * (µg/l S) DETS 049	Sulphide (µg/l S^{2-}) DETS 024	Sulphate content * (mg/l SO_3) DETS 055	(mg/l SO_4) DETS 055	pH Value DETS 008	Total Phenols * (µg/l) DETS 054	Total PAH # (µg/l)
Date Analysed	18/03/2004	18/03/2004	16/03/2004	18/03/2004	19/03/2004		18/03/2004	24/03/2004	23/03/2004

Approved By: RB
Date: 31.3.04

Client Reference: C0204

Laboratory Reference: 11635-1

19 March 2004

Ms K Hirst
Derwentside Environmental Testing Services Limited
Unit 2A/2B
Park Road Industrial Estate
Consett
Co. Durham
DH8 5PY

Test Report : DETS/92129

Dear Ms Hirst

Please find enclosed the results of the analysis carried out on the samples submitted from Wombwell C0204 on Friday, March 12, 2004.

I trust you will find these satisfactory but should you have any queries please contact customer services.

Yours sincerely

P J Morley
AUTHORISED SIGNATORY

Determinations marked * in this certificate are not included in the UKAS accreditation schedule for our laboratory. Opinions and interpretations expressed herein, and marked #, are outside the scope of UKAS accreditation. Determinations marked $ were subcontracted. Unless otherwise stated, CAS Ltd was not responsible for sampling. Information about methods and performance characteristics of the determinations are available on request. Unless otherwise agreed, as received soils will be disposed of after 30 days; dried soils after 30 days and waters/leachates after 10 days from the issue of the final report. Soil analysis is carried out on air-dried and ground test portion of the sample.

Soil Analysis

DETS/92129
Wombwell C0204
Your Reference:- 11635
Your Order:- PO21671

CAS Number:			481228	481229	481230	481231
Sample Ref			1/WS11	2/WS11	4/WS12	6/WS13
Detname	Method	Units	0.50m	1.00m	1.40m	1.00m
>>TPH RISK ASSESSMENT<<						
>C6 to C8*	317R	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0
>C8 to C10*	317R	mg/kg	6.1	< 1.0	< 1.0	1.5
>C10 to C12*	317R	mg/kg	18	< 1.0	< 1.0	1.7
>C12 to C16*	317R	mg/kg	88	5.2	3.1	6.4
>C16 to C21*	317R	mg/kg	150	22	5.6	17
>C21 TO C40*	317R	mg/kg	350	67	50	160
Total TPH*	317R	mg/kg	610*	94	59	180
>C6 to C8*	317R	mg/kg	< 1.0	N/S	N/S	N/S
>C8 to C10*	317R	mg/kg	4.9	N/S	N/S	N/S
>C10 to C12*	317R	mg/kg	15	N/S	N/S	N/S
>C12 to C16*	317R	mg/kg	57	N/S	N/S	N/S
>C16 to C21*	317R	mg/kg	87	N/S	N/S	N/S
>C21 TO C40*	317R	mg/kg	140	N/S	N/S	N/S
Total Aliphatic*	317R	mg/kg	300	N/S	N/S	N/S
>C5 to C7*	317R	mg/kg	< 1.0	N/S	N/S	N/S
>C7 to C8*	317R	mg/kg	< 1.0	N/S	N/S	N/S
>C8 to C10*	317R	mg/kg	< 1.0	N/S	N/S	N/S
>C10 to C12*	317R	mg/kg	2.6	N/S	N/S	N/S
>C12 to C16*	317R	mg/kg	23	N/S	N/S	N/S
>C16 to C21*	317R	mg/kg	54	N/S	N/S	N/S
>C21 TO C40*	317R	mg/kg	140	N/S	N/S	N/S
Total Aromatic*	317R	mg/kg	220	N/S	N/S	N/S
>> BTEX SUITE <<						
benzene	301	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10
toluene	301	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10
ethylbenzene	301	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10
mp-xylene	301	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10
o-xylene	301	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10

Key
N/S - Not Scheduled
I/S - Insufficient Sample

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Soil Analysis

DETS/92129
Wombwell C0204
Your Reference:- 11635
Your Order:- PO21671

CAS Number:			481232	481233
Sample Ref			7/WS13	10/WS14
Detname	Method	Units	1.70m	1.30m
>>TPH RISK ASSESSMENT<<				
>C6 to C8*	317R	mg/kg	42	< 1.0
>C8 to C10*	317R	mg/kg	160	< 1.0
>C10 to C12*	317R	mg/kg	440	< 1.0
>C12 to C16*	317R	mg/kg	1500	2
>C16 to C21*	317R	mg/kg	1500	6.5
>C21 TO C40*	317R	mg/kg	6500	67
Total TPH*	317R	mg/kg	10000	76
>C6 to C8*	317R	mg/kg	31	N/S
>C8 to C10*	317R	mg/kg	100	N/S
>C10 to C12*	317R	mg/kg	320	N/S
>C12 to C16*	317R	mg/kg	1000	N/S
>C16 to C21*	317R	mg/kg	990	N/S
>C21 TO C40*	317R	mg/kg	5400	N/S
Total Aliphatic*	317R	mg/kg	7800	N/S
>C5 to C7*	317R	mg/kg	< 1.0	N/S
>C7 to C8*	317R	mg/kg	< 1.0	N/S
>C8 to C10*	317R	mg/kg	40	N/S
>C10 to C12*	317R	mg/kg	90	N/S
>C12 to C16*	317R	mg/kg	340	N/S
>C16 to C21*	317R	mg/kg	390	N/S
>C21 TO C40*	317R	mg/kg	1000	N/S
Total Aromatic*	317R	mg/kg	1900	N/S
>> BTEX SUITE <<				
benzene	301	mg/kg	< 0.10	< 0.10
toluene	301	mg/kg	< 0.10	< 0.10
ethylbenzene	301	mg/kg	< 0.10	< 0.10
mp-xylene	301	mg/kg	0.44	< 0.10
o-xylene	301	mg/kg	< 0.10	< 0.10

Key
N/S - Not Scheduled
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1 April 2004

Ms H Corker
Sirius Geotechnical & Environmental
Russel House
Suite 2
Mill Road
Langley Moor
Durham
DH78 HJ

Test Report : SIRD/92936

Dear Ms Corker

Please find enclosed the results of the analysis carried out on the samples submitted from Wombwell on Friday, March 26, 2004.

I trust you will find these satisfactory but should you have any queries please contact customer services.

Yours sincerely

P J Morley
AUTHORISED SIGNATORY

UKAS TESTING 1510

Business of the Year Winner 2002

Determinations marked * in this certificate are not included in the UKAS accreditation schedule for our laboratory. Opinions and interpretations expressed herein, and marked #, are outside the scope of UKAS accreditation. Determinations marked $ were subcontracted. Unless otherwise stated, CAS Ltd was not responsible for sampling. Information about methods and performance characteristics of the determinations are available on request. Unless otherwise agreed, as received soils will be disposed of after 30 days; dried soils after 30 days and waters/leachates after 10 days from the issue of the final report. Soil analysis is carried out on air-dried and ground test portion of the sample.

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Water Analysis

SIRD/92936
Wombwell
Your Reference:- C0204
Your Order:-

CAS Number:			487115	487116	487117	487118	
Sample Ref			R1	R2	R3	R4	
Detname	Method	Units	2.21m	2.82m	2.59m	12.19m	
Arsenic (Soluble)*	25C	µg/l	< 10	< 10	< 10	< 10	
Boron (Soluble)	53	mg/l	0.11	0.07	0.1	< 0.05	
Cadmium (Soluble)	53	µg/l	< 5.0	< 5.0	< 5.0	< 5.0	
Chromium (Soluble)	53	µg/l	< 10	< 10	< 10	< 10	
Copper (Soluble)	53	µg/l	< 10	< 10	< 10	< 10	
Lead (Soluble)	53	µg/l	< 10	< 10	< 10	< 10	
Mercury (Soluble)*	25C	µg/l	< 1.0	< 1.0	< 1.0	< 1.0	
Nickel (Soluble)	53	µg/l	< 10	< 10	< 10	< 10	
Selenium (Soluble)*	25C	µg/l	< 2.0	< 2.0	< 2.0	< 2.0	
Zinc (Soluble)	53	µg/l	11	12	< 10	< 10	
Cyanide (Total)*	14A	mg/l	< 0.05	< 0.05	< 0.05	< 0.05	
Phenols (Total)	32	mg/l	< 0.10	< 0.10	< 0.10	< 0.10	
Sulphate as SO3	60	g/l	0.11	0.1	< 0.10	0.15	
Ammonia as N	60	mg/l	0.22	0.24	0.57	3.8	
COD (filtered) as O2	11	mg/l	< 10	< 10	12	16	
pH	31	pH units	7.1	7.1	7	7	
>> TPH SUITE <<							
TPH by GC (>C6 - C10)*	TPHW2	µg/l	< 100	< 100	< 100	< 100	
TPH by GC (>C10 - C20)*	TPHW2	µg/l	< 100	< 100	110	< 100	
TPH by GC (>C20 - C40)*	TPHW2	µg/l	< 100	< 100	< 100	< 100	
TPH by GC (>C6 - C40)*	TPHW2	µg/l	< 100	< 100	110	< 100	
>>TPH RISK ASSESSMENT<<							
>C6 to C8*	317WR	µg/l	< 5.0	< 5.0	< 5.0	< 5.0	
>C8 to C10*	317WR	µg/l	5.2	< 5.0	8.2	< 5.0	3.00
>C10 to C12*	317WR	µg/l	8.8	< 5.0	21	< 5.0	7.00
>C12 to C16*	317WR	µg/l	64	< 5.0	100	8	41.00
>C16 to C21*	317WR	µg/l	42	< 8.0	70	< 8.0	28.00
>C21 TO C40*	317WR	µg/l	50	< 22	34	< 22	21.00
Total TPH*	317WR	µg/l	170	< 50	230	< 50	100
>> BTEX SUITE <<							
benzene*	BTEXW1	µg/l	< 10	< 10	< 10	< 10	
toluene*	BTEXW1	µg/l	< 10	< 10	< 10	< 10	
ethylbenzene*	BTEXW1	µg/l	< 10	< 10	< 10	< 10	
mp-xylene*	BTEXW1	µg/l	< 10	< 10	< 10	< 10	
o-xylene*	BTEXW1	µg/l	< 10	< 10	< 10	< 10	
>> PAH SUITE <<							
naphthalene*	PAHW1	µg/l	< 2.00	< 2.00	< 2.00	< 2.00	
acenaphthylene*	PAHW1	µg/l	< 2.00	< 2.00	< 2.00	< 2.00	
acenaphthene*	PAHW1	µg/l	< 2.00	< 2.00	< 2.00	< 2.00	
fluorene*	PAHW1	µg/l	< 2.00	< 2.00	< 2.00	< 2.00	

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Water Analysis

SIRD/92936
Wombwell
Your Reference:- C0204
Your Order:-

CAS Number:			487115	487116	487117	487118
Sample Ref			R1	R2	R3	R4
Detname	Method	Units	2.21m	2.82m	2.59m	12.19m
phenanthrene*	PAHW1	µg/l	< 2.00	< 2.00	< 2.00	< 2.00
anthracene*	PAHW1	µg/l	< 2.00	< 2.00	< 2.00	< 2.00
fluoranthene*	PAHW1	µg/l	< 2.00	< 2.00	< 2.00	< 2.00
pyrene*	PAHW1	µg/l	< 2.00	< 2.00	< 2.00	< 2.00
benzo(a)anthracene*	PAHW1	µg/l	< 2.00	< 2.00	< 2.00	< 2.00
chrysene*	PAHW1	µg/l	< 2.00	< 2.00	< 2.00	< 2.00
benzo(b)fluoranthene*	PAHW1	µg/l	< 2.00	< 2.00	< 2.00	< 2.00
benzo(k)fluoranthene*	PAHW1	µg/l	< 2.00	< 2.00	< 2.00	< 2.00
benzo(a)pyrene*	PAHW1	µg/l	< 2.00	< 2.00	< 2.00	< 2.00
dibenzo(ah)anthracene*	PAHW1	µg/l	< 2.00	< 2.00	< 2.00	< 2.00
benzo(ghi)perylene*	PAHW1	µg/l	< 2.00	< 2.00	< 2.00	< 2.00
indeno(123cd)pyrene*	PAHW1	µg/l	< 2.00	< 2.00	< 2.00	< 2.00
PAH (Total)*	PAHW1	µg/l	< 20.00	< 20.00	< 20.00	< 20.00

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APPENDIX F

GAS AND GROUNDWATER MONITORING

MONITORING RESULTS

Client: Shepherd Homes
Site: Park Street, Wombwell
Date: 09/03/04

Job No: C0204
Sheet: 1 of 1

Ambient concentration (% Volume): CH_4 ND CO_2 ND

O_2 20.6

Monitoring Point		Gas Concentration							Gas Emission Rate	Remarks
		Highest			Steady			(Lowest)		Bottom of Gas well
Ref	GWL	CH_4		CO_2	CH_4		CO_2	O_2		
	(m) bgl	% lel	% v/v	(%)	% lel	% v/v	(%)	(%)	litre/hr	
R1	2.21	ND	ND	0.3	ND	ND	0.3	19.2	0.1	14.06
R2	2.82	ND	ND	0.1	ND	ND	0.1	20.5	0.8	12.60
R3	2.59	ND	ND	ND	ND	ND	ND	21.1	0.3	14.90
R4	12.19	ND	ND	0.1	ND	ND	0.1	20.3	0.8	21.95

Barometric Pressure: Start 1026, Finish 1026
Barometric Pressure Trend: Stable
Weather: Cloudy, sunny
Ground: Dry

Monitoring Equipment: LMSx
Date of Last Calibration: 10/03/04
Operator MW

Key	Remarks
ND - None Detected NR - Not Recorded POS - Positive Flow NEG - Negative Flow	Groundwater samples were taken from Boreholes R1,R2,R3 and R4 after purging 72 litres from R1, 60 litres from R2, 75 litres from R3 and 60 litres from R4. A diesel odour was noted from the groundwater in Boreholes R1, R2 and R3. Flecks of oil were noted on the surface of Groundwater sampled from Borehole R1.

Checked: Approved:

SIRIUS
GEOTECHNICAL & ENVIRONMENTAL

MONITORING RESULTS

Client: Shepherd Homes
Site: Park Street, Wombwell
Date: 10/12/03

Job No: C0204
Sheet: 1 of 1

Ambient concentration (% Volume): CH_4 ND CO_2 ND

O_2 21.0

Monitoring Point		Gas Concentration							Gas Emission Rate	Remarks
		Highest			Steady			(Lowest)		Bottom of Gas well
Ref	GWL	CH_4		CO_2	CH_4		CO_2	O_2		
	(m) bgl	% lel	% v/v	(%)	% lel	% v/v	(%)	(%)	litre/hr	
CP1	Dry	ND	ND	6.1	ND	ND	6.1	4.0	ND	2.34
CP2	Dry	ND	ND	2.3	ND	ND	2.3	15.4	ND	2.40
CP3	Dry	ND	ND	1.1	ND	ND	1.1	19.7	ND	3.19
CP4	Dry	ND	ND	0.2	ND	ND	0.2	20.1	ND	1.97
CP5	Dry	ND	ND	0.8	ND	ND	0.8	20.1	ND	2.00
WS10	Dry	ND	ND	0.6	ND	ND	0.6	20.1	ND	1.82

Barometric Pressure: Start 1012, Finish 1012
Barometric Pressure Trend: Stable
Weather: Sunny
Ground: Frost

Monitoring Equipment: GA94
Date of Last Calibration: 20/12/03
Operator MW

Key	Remarks
ND - None Detected NR - Not Recorded POS - Positive Flow NEG - Negative Flow	PID Readings: CP1 1.1ppm, CP2 0.2ppm, CP3 0.2ppm, CP4 0.6ppm, CP5 1.0 ppm, WS10 ND.

Checked: HC Approved: [illegible]

SIRIUS
GEOTECHNICAL & ENVIRONMENTAL

MONITORING RESULTS

Client: Shepherd Homes
Site: Park Street, Wombwell
Date: 19/12/03

Job No: C0204
Sheet: 1 of 1

Ambient concentration (% Volume): CH_4 ND CO_2 ND

O_2 20.6

Monitoring Point		Gas Concentration							Gas Emission Rate	Remarks
		Highest			Steady			(Lowest)		Bottom of Gas well
Ref	GWL	CH_4		CO_2	CH_4		CO_2	O_2		
	(m) bgl	% lel	% v/v	(%)	% lel	% v/v	(%)	(%)	litre/hr	
CP1	Dry	ND	ND	6.2	ND	ND	6.2	3.3	0.2	2.34
CP2	Dry	ND	ND	2.4	ND	ND	2.4	16.4	ND	2.40
CP3	Dry	ND	ND	0.9	ND	ND	0.9	20.2	0.1	3.19
CP4	Dry	ND	ND	0.3	ND	ND	0.3	20.1	ND	1.97
CP5	Dry	ND	ND	0.6	ND	ND	0.6	20.2	ND	2.00
WS10	Dry	ND	ND	0.6	ND	ND	0.6	20.2	ND	1.82

Barometric Pressure: Start 1007, Finish 1007
Barometric Pressure Trend: Stable
Weather: Overcast, drizzle
Ground: Wet

Monitoring Equipment: LMSx
Date of Last Calibration: 15/12/03
Operator MW

Key	Remarks
ND - None Detected NR - Not Recorded POS - Positive Flow NEG - Negative Flow	PID Readings: CP1 ND, CP2 1.1ppm, CP3 0.2ppm, CP4 0.3ppm, CP5 0.4ppm, WS10 0.2ppm.

Checked: HC Approved: RST

SIRIUS
GEOTECHNICAL & ENVIRONMENTAL

ONITORING RESULTS

nt: Shepherd Homes
: Park Street, Wombwell
e: 06/01/04

Job No: C0204
Sheet: 1 of 1

ient concentration (% Volume): CH_4 ND CO_2 ND
O_2 20.6

nitoring nt	Gas Concentration							Gas Emission Rate	Remarks
	Highest			Steady			(Lowest)		Bottom of Gas well
	GWL	CH_4		CO_2	CH_4		CO_2	O_2		
	(m) bgl	% lel	% v/v	(%)	% lel	% v/v	(%)	(%)	litre/hr	
	Dry	ND	ND	6.7	ND	ND	6.7	6.3	ND	2.34
2	Dry	ND	ND	ND	ND	ND	ND	20.6	ND	2.40
3	Dry	ND	ND	0.5	ND	ND	0.5	20.0	0.1	3.19
4	Dry	ND	ND	0.4	ND	ND	0.4	20.1	ND	1.97
5	Dry	ND	ND	ND	ND	ND	ND	20.6	ND	2.00
S10	NR	NR	NR	NR	NR	NR	NR	NR	NR	1.82

Barometric Pressure:	Start 0989 Finish 0989	Monitoring Equipment:	LMSx
Barometric Pressure Trend:	Stable	Date of Last Calibration:	06/01/04
Weather:	Cloudy, showers	Operator	MW
Ground:	Wet		

Key	Remarks
ND - None Detected NR - Not Recorded POS - Positive Flow NEG - Negative Flow	PID Readings: CP1 ND, CP2 0.5ppm, CP3 0.2ppm, CP4 0.4ppm, CP5 0.7ppm, WS10 NR. Unable to gain access to WS10.

Checked: HC Approved: RT

SIRIUS
GEOTECHNICAL & ENVIRONMENTAL

MONITORING RESULTS

Client: Shepherd Homes
Site: Park Street, Wombwell
Date: 16/01/04

Job No: C0204
Sheet: 1 of 1

Ambient concentration (% Volume): CH_4 ND CO_2 ND O_2 20.6

Monitoring Point		Gas Concentration							Gas Emission Rate	Remarks
		Highest			Steady			(Lowest)		Bottom of Gas well
Ref	GWL	CH_4		CO_2	CH_4		CO_2	O_2		
	(m) bgl	% lel	% v/v	(%)	% lel	% v/v	(%)	(%)	litre/hr	
CP1	Dry	ND	ND	5.6	ND	ND	5.6	7.6	-0.6	2.34
CP2	Dry	ND	ND	4.9	ND	ND	4.9	4.5	ND	2.40
CP3	Dry	ND	ND	0.3	ND	ND	0.3	20.4	ND	3.19
CP4	Dry	ND	ND	0.5	ND	ND	0.5	20.1	ND	1.97
CP5	Dry	ND	ND	0.8	ND	ND	0.8	20.1	-0.5	2.00
WS10	Dry	ND	ND	ND	ND	ND	ND	20.6	ND	1.82

Barometric Pressure: Start 0977, Finish 0977
Barometric Pressure Trend: Stable
Weather: Overcast, showers
Ground: Wet

Monitoring Equipment: LMSx
Date of Last Calibration: 06/01/04
Operator MW

Key	Remarks
ND - None Detected NR - Not Recorded POS - Positive Flow NEG - Negative Flow	

Checked: HC Approved: PSS

SIRIUS
GEOTECHNICAL & ENVIRONMENTAL