PHASE I AND PHASE II GEOENVIRONMENTAL INVESTIGATION

ON
LAND OFF

WEST ROAD
POGMOOR
WEST YORKSHIRE

FOR

MR T SIMPSON & MR D LYCETT

MIXED USE DEVELOPMENT
WEST ROAD
SITE A.

Ashton Bennett

ENGINEERING GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS



70°

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JUNE 2007

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of the Ashton Bennett Consultancy group of companies

CONTENTS

1 INTRODUCTION

2 THE SITE
- 2.1 Site Location
- 2.2 Site Description

3 REPORT OBJECTIVE AND REPORT SCOPE
- 3.1 Report Objective
- 3.2 Report Scope

4 SITE HISTORY

5 POTENTIAL CONTAMINATION ON SITE

6 SITE GEOLOGY
- 6.1 Geology
- 6.2 Geological Faults
- 6.3 Engineering Geology

7 SITE HYDROLOGY AND HYDROGEOLOGY
- 7.1 Hydrology
- 7.2 Hydrogeology

8 QUARRYING AND MINING
- 8.1 Quarrying
- 8.2 Coal Mining

9 SOURCES OF CONTAMINATION TO SITE
- 9.1 Waste Disposal, Waste Treatment and Waste Transfer
- 9.2 Statutory Authorisations
- 9.3 Industrial Processes
- 9.4 Hazardous Substances
- 9.5 Contraventions
- 9.6 Discharge Consents
- 9.7 Radon
- 9.8 Potentially Contaminative Uses

10 PATHWAYS AND RECEPTORS

11 RESULTS OF PHASE II GROUND INVESTIGATION
- 11.1 Fieldwork
- 11.2 Ground Conditions
  - 11.2.1 General
  - 11.2.2 Made Ground
  - 11.2.3 Clay (weathered bedrock)
  - 11.2.4 Bedrock
- 11.3 Groundwater Conditions
- 11.4 Geotechnical Testing
- 11.5 Gas Conditions
- 11.6 Mining Conditions

12 ENVIRONMENTAL TEST RESULTS
12.1 Standards
12.2 Results of Environmental Tests on Soils
12.2.1 Soil Samples Tested
12.2.2 Metals that are Phytotoxic
12.2.3 Metals that are a Health Risk
12.2.4 Other Inorganic Contaminants
12.2.5 Organic Contaminants
12.2.6 Asbestos
12.3 Environmental Test Results on Groundwater
12.4 Summary

13 ENVIRONMENTAL RISK ASSESSMENT
13.1 Introduction
13.2 Sources of Contamination, Pathways and Receptors
13.2.1 Sources of Contamination
13.2.2 Pathways for Migration
13.2.3 Sensitive Receptors
13.3 Risk Assessment

14 RECOMMENDATIONS
14.1 Environmental Recommendations
14.2 Geotechnical Recommendations
14.3 Mining Recommendations

15 GENERAL REMARKS

16 REFERENCES

DRAWINGS

TSDL 2620/1	Site Location Plan
TSDL 2620/2	Site Plan
TSDL 2620/3	OS Plan 1850
TSDL 2620/4	OS Plan 1893
TSDL 2620/5	OS Plan 1906
TSDL 2620/6	OS Plan 1932
TSDL 2620/7	OS Plan 1938
TSDL 2620/8	OS Plan 1948
TSDL 2620/9	OS Plan 1956
TSDL 2620/10	OS Plan 1961
TSDL 2620/11	OS Plan 1966
TSDL 2620/12	OS Plan 1973
TSDL 2620/13	OS Plan 1979
TSDL 2620/14	OS Plan 1991
TSDL 2620/15	OS Plan 1993
TSDL 2620/16	Trial Pit and Borehole Location Plan

APPENDICES

APPENDIX A	Borehole and Trial Pit Logs
APPENDIX B	Geotechnical Test Results
APPENDIX C	Environmental Test Results
APPENDIX D	Gas and Groundwater Monitoring Results
APPENDIX E	Photographs
APPENDIX F	Coal Authority Report

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1: INTRODUCTION

This report describes the results of a Phase 1 Desk Study and Phase II Geoenvironmental Ground Investigation undertaken on land off West Road, Pogmoor, near Barnsley in South West Yorkshire in the UK. The work was commissioned by the clients Mr T Simpson and Mr D Lycett and was carried out by Ashton Bennett Consultancy.

The purpose of this Phase 1 Study was to collate and assess information on the site including geological, hydrogeological and mining information, archival maps and historical review to determine past use, a database review, environmental data on water and soil, and to undertake a site reconnaissance to enable a desk top assessment to determine the likely presence and areas of environmental concerns on the site and the presence of pathways of migration and potentially sensitive receptors.

The purpose of the Phase II intrusive investigation was to investigate the nature, depth and extent of any contamination on the site, by collection and testing of soil and water samples and to establish the presence of potential migration routes for contamination detected and to assess any environmental risk to sensitive receptors.

This report describes the research work carried out, presents the results of the desk study and ground investigation and makes recommendations regarding environmental risk for residential development and solutions to environmental risks and geotechnical and mining concerns to development of the site for residential use.

2: THE SITE

2.1 Site Location

The site comprises land situated to the southwest of West Road in Pogmoor near Barnsley in South Yorkshire. The site is accessed from West Road and lies at National Grid Reference 433010E 406520N at a height of around 135maOD at its highest elevation and 125m at its lowest elevation.

The site is bounded to the north by industrial premises fronting onto West Road with housing beyond. To the east the site is bounded by open land. To the west the site is bounded by industrial premises and a recreation field, housing and open land beyond. To the south the site is bounded by a railway line with industrial premises beyond.

The site is occupied by open land formerly used as a clay pit, brickworks, waste refuse destructor site and transport yard.

A site location plan is presented as Drg No TSDL 2620/1 and a site plan is presented as Drg No TSDL 2620/2.

2.2 Site Description

The site lies as open ground with rough grassland. Floor slabs and disused derelict buildings are present in the central northern area of the site and retain the land to the north which fronts onto West Road and is at a higher elevation. Access to the site is off West Road in the

northwest corner of the site as a sloping roadway leading to the main site which lies at a lower elevation than West Road. The eastern part of the northern boundary is formed by a steep banking covered in shrubbery. The eastern boundary is open to fields beyond. The southern boundary is covered in shrubbery with a fence dividing the site from railway land. The western boundary is formed by a broken fence between the site and recreation land and the northwestern area of the site lies at a higher elevation on a level area of land to the rear of an industrial estate fronting onto West Road.

3: REPORT OBJECTIVE AND REPORT SCOPE

3.1 Report Objective

The objective of the desk study is to determine the environmental nature of the site and to establish any environmental concerns and liabilities with particular reference to past contaminative uses of the site as far as is possible from historical and database review. Contaminative use is defined as "any use of land which may cause it to be contaminated by toxic substances" (Section 143 of the Environmental Protection Act 1990). The report undertaken is a Phase I Desk Study and Phase II Risk Assessment taking into account any potential contamination, the migration pathways and the presence of potentially sensitive receptors. Preliminary recommendations are also made for foundation design taking into account the geotechnical and mining situations on the site.

3.2 Report Scope

The information for this report is from sources recommended by the Institute of Civil Engineers (ICE), the Association of Geotechnical and Geoenvironmental Specialists (AGS), Construction Industry Research and Information Association (CIRIA) and the Department of the Environment Transport and the Regions (DETR). The report has been compiled in accordance with the latest ICE, DETR, Department of Environment, Food and Rural Affairs (DEFRA) and British Standard Draft Documents and British Standards, particularly BS10175:2001.

The scope of the report was to undertake a desk study and to undertake soft ground boring and trial pitting to collect soil and groundwater samples for environmental and geotechnical testing and to present a geoenvironmental and geotechnical report with recommendations based on the drilling and testing undertaken and to make recommendations for investigation of mining beneath the site.

In addition the scope of the investigation has used the extensive knowledge and experience of the staff of Ashton Bennett Consultancy to assess the data and ground conditions and to interpret the data and ground conditions encountered.

4: SITE HISTORY

The maps and plans detailed in Table 1 were inspected to assess the history of the site and its environs. In summary the site has been occupied by a clay pit and brickworks, a refuse destructor and a transport yard and is now open ground.

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TABLE 1
Historical Maps Inspected

DATE	DRG. NO.	MAP & SCALE	DESCRIPTION
1850	TSDL 2620/3	Yorks 274 1:10,560	This map indicates the site to be occupied by open land with a footpath along the northern boundary and an area defined for a future railway line to the south. The site was surrounded by open fields.
1893	TSDL 2620/4	Yorks 274.7 1:2500	This map indicates the site to be occupied by an old clay pit occupying the southwestern area of the site and with a pond in the central southern area of the site. Buildings are shown in the southwestern corner. The site is surrounded by open fields. A railway line forms the southern boundary to the site. Slackhills Colliery lies to the northeast of the site and a clay pit and brickworks is shown to the south of the site, south of the railway. Pogmoor village lies to the northwest. Old shafts are shown to the south of the railway line.
1906	TSDL 2620/5	Yorks 274.7 1:2500	This map annotates the site as Summer Lane Brickworks. Two large buildings are shown in the centre of the site with sidings running into the southeast corner from the main rail line. A pond lies in the central southern area of the site. Buildings are shown in the southwest corner of the site.
1932	TSDL 2620/6	Yorks 274.7 1:2500	This map indicates the site to be occupied by a Refuse Destructor (Barnsley Corporation) with one large building in the central western area of the site and with railway sidings to the main line. The annotation indicates the site has been filled in the south and eastern areas. A chimney is shown to the south of the main building with a line of possible houses in the southwest boundary of the site. The northwestern corner of the site remains at a higher ground level. A brickworks is shown to the north of the site, allotment gardens and open land lie to the east, a miners welfare recreation ground lies to the west and brickworks are shown to the south of the site. A Drift Mine annotated as Farm House Colliery is shown to the west of the site, west of the recreation ground.
1938	TSDL 2620/7	Yorks 274 NE 1:10,560	This map shows no change to the layout of the site or its immediate surroundings.
1948	TSDL 2620/8	Yorks 274 NE 1:10,560	This map shows no change to the layout of the site or its immediate surroundings.
1956	TSDL 2620/9	SE 30 NW 1:10,560	Farm House colliery is shown as disused. A large pond is shown in the clay pit to the south, and old brickworks, shafts and bedrock are shown to the south. The map shows no change to the layout of the site.
1961	TSDL 2620/10	SE 3206/3306 1:2500	This map indicates the site to comprise filled ground with one large building in the centre annotated as works. A chimney is still shown with works and brickyard cottages in the southwest corner.
1966	TSDL 2620/11	SE 30 NW 1:10,560	This map shows no change to the layout of the site or its immediate surroundings. A large pond lies to the north of the site in the old brickworks.
1973	TSDL 2620/12	SE 30 NW 1:10,000	This map shows no change to the layout of the site or its immediate surroundings, although the rail lines on the site had been removed by this date.
1979	TSDL 2620/13	SE 3206 NE 1:1250	This map shows no change to the layout of the site or its immediate surroundings.
1991	TSDL 2620/14	SE 3306 SW 1:1250	This map only indicates a small portion of the southern boundary of the site and indicates the presence of tanks.
1993	TSDL 2620/15	SE 30 NW 1:10,000	This map indicates one large building in the north of the site and open land over the remainder of the site.

5: POTENTIAL CONTAMINATION ON SITE

The site has been occupied by a clay pit, brickworks, railway sidings, refuse destructor and a transport depot and now lies as open ground.

The sources of potential contamination from the past and present uses of the site are those associated with the uses mentioned and may include:

Arsenic and sulphate in industrial/mine waste used for sidings
Hydrocarbons in fuel and oil for transport
Asbestos in pipe lagging, building materials and brake shoes
Unknown contamination in waste
Acids and alkalis
Methane and carbon dioxide gases from filled ground

This list does not imply that these potentially contaminating materials are present on the site and it is possible that other potentially contaminating materials not listed may be present. This list does not imply that these materials are on site in contaminating levels.

6: SITE GEOLOGY

6.1 Geology

The published British Geological Survey Map (BGS) shows the site to be underlain by mudstone, siltstones, sandstones and coal seams of the Carboniferous Pennine Middle Coal Measures Formation. Superficial deposits are not indicated to overlie the solid strata. The maps indicate the site to be immediately underlain by mudstone of the Coal Measures dipping to the northeast at shallow angles of 4 to 6 degrees to the horizontal.

The Kents Thin and Kents Thick Coal seams are shown to outcrop to the northeast of the site. The underlying Barnsley Rider Coal and Barnsley Coal are not shown to outcrop on the site but may underlie the site at shallow depth. Both the seams outcrop to the west of the site but have been downfaulted by a SW to NE trending geological fault immediately to the west of the site to lie at a greater depth beneath the site. A further geological fault trending NW to SE lies to the immediate south of the site. The extreme northern part of the site and northeastern boundary is annotated as a tip on the BGS maps and the railway to the south and land beyond is annotated as a colliery tip. Coal seams within this stratigraphic section of the Coal Measures are generally worked.

A borehole is shown on the BGS maps to lie to the east of the site at NGR 433245E 406500N, and a mine shaft is shown to lie to the immediate west of the site at NGR 433000E 406550N.

A full discussion of the coal seams underlying the site, and mining history of the site is presented in Section 8.2.

6.2 Geological Faults

The BGS map indicates the presence of one geological fault crossing to the immediate west of the site in a SW-NE direction and the presence of one large fault trending in a mainly northwest to southeast direction to the south of the site. It is possible that smaller faults sub parallel to

these may exist in the strata causing fissuring and fracturing to the rock. Due to the cessation of tectonic activity in the area, faulting is unlikely to detrimentally affect the site stability.

6.3 Engineering Geology

Any made ground present on the site is expected to be in a loose state of compaction. A comprehensive intrusive geotechnical ground investigation should be undertaken to assess suitable foundation strata before any new build construction is undertaken on the site.

It is possible that the made ground may be highly compressible and that the underlying clays may shrink and swell under varying moisture conditions and these possibilities need to be investigated before new construction.

7: SITE HYDROLOGY AND HYDROGEOLOGY

7.1 Hydrology

The rainfall over the area of the site will naturally drain in a southerly direction to the drain which flows west to east to the south of the site south of the railway line. There are no Environment Agency results for river quality in the drain.

The site is shown by the Environment Agency not to lie within a fluvial flood plain where there is a 1% chance of flooding each year. Properties within the indicative flood plain are at risk from flooding although the risk varies. The maps do not take account of local flood defences because they are built to varying standards. Further information can be sought at the Environment Agency Flood Line on 0845 988 1188.

7.2 Hydrogeology

Geological maps produced by the BGS at a scale of 1:10,560, indicate the site to be underlain by sandstones, mudstones and siltstones of the Carboniferous Coal Measures. Made up ground may be present and is a generally permeable stratum. The mudstone is relatively impermeable strata interbedded with more permeable sandstones, siltstones and coal seams.

The Environment Agency Groundwater Vulnerability map indicates the site to lie on an area of a minor aquifer. These are formations, which do not have a high primary permeability, and do not produce high quantities of water for abstraction, but are important for local supplies and base flows to rivers.

The minor aquifer is overlain by soils of intermediate to high leaching potential which readily transmit liquid discharges because they are shallow or susceptible to rapid flow directly to rock, gravel or groundwater, and are soils with little ability to attenuate diffuse source pollutants in which non absorbed diffuse source pollutants and liquid discharges have the potential to move rapidly to underlying strata or shallow groundwater. The minor aquifer comprises sandstone horizons within the Coal Measures strata. Care should be taken not to intrude into any aquifer and cause pollution to enter the aquifer.

Groundwater may be expected at shallow depths below ground level as perched water in any made up ground present beneath the site. Groundwater may also be encountered in the underlying sandstone bedrock. It is not expected that groundwater will be a concern to

redevelopment of the site and it is anticipated that it could be dealt with by sump pumping during and after heavy rainfall.

The Environment Agency holds no details of any water abstractions within 250m of the site. Four abstractions lie within 700m to 1000m of the site as detailed in Table 2. Due to the distance it is unlikely that the site is detrimentally affecting these water abstractions.

TABLE 2
Water Abstractions

Grid Reference	Name	Licence No	Location	Abstraction Use	Source
433700E 406100N	Yorkshire Water Plc	2/27/08/058	Not given	Unclassified	Groundwater
433700E 406060N	Sheldale Developments Ltd	2/27/08/133	43a Shaw Lane, Barnsley	Food and Drink Water bottling	Groundwater from spring
433700E 406000N	Sheldale Developments Ltd	2/27/08/10	Shaw Lane	Food and Drink	Groundwater from spring
433700E 406000N	Sheldale Water Ltd	2/27/08/10	Shaw Lane	Water bottling	Groundwater from well/spring

As the local groundwater may be utilised for abstraction from old unlicensed wells, it is important that it is protected from pollution. It is an offence to pollute the groundwater, whether or not it is used for abstraction. The site is unlikely to be detrimentally affecting the quality of the drain as it is now culverted.

8: QUARRYING AND MINING

8.1 Quarrying

The OS plans viewed indicate that clay extraction has taken place on the site. The British Geological Survey Mines and Quarries Survey 1998 does not indicate any existing quarries on or within 250m of the site. However this does not imply that local quarrying for stone has not taken place on or close to the site in the past. Excavation for clay for use in brickworks is known to have been undertaken on the site between 1893 (old clay pit) and possibly the 1930's.

8.2 Coal Mining

A Coal Mining Report obtained from The Coal Authority for the site, and based on their mine abandonment records since 1872 stated that the property is in the likely zone of influence from workings in six seams of coal at 30m to 370m depth and last worked in 1978. The property is not in the likely zone of influence of any present underground coal workings. 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 or has been granted. The Coal Authority holds no record of any notice of the risk of the land being affected by subsidence given under S.46 of the Coal Mining Subsidence Act 1991.

The Coal Authority has knowledge of one mine entry within or within 20m of the property. There is no record of what steps, if any, have been taken to treat the mine entry. There may be further mine entries of which the Coal Authority has no knowledge.

The report states that the site does not lie within the geographical boundary of an opencast site from which coal has been extracted by opencast methods, and is not within 800m of a boundary

of an opencast site for which a licence to extract coal by opencast methods is awaiting determination or has been granted. The property is in an area for which notices of entitlement to withdraw support were published in 1950, 1944, 1948, 1956 and 1944. The property is not in an area for which a notice has been given under Section 41 of the Coal Industry Act 1994 revoking the entitlement to withdraw support. The Coal Authority Report indicates that shallow mining has taken place beneath the site and is expected to be mining of the Barnsley Coal Seam. In addition there is one mine shaft which lies within 20m of the site.

The Coal Authority Report should be read in full and is reproduced in Appendix F.

It is recommended that the site is drilled to assess the depth and extent of shallow mining and it is recommended that the mine shaft is located and drilled to establish if it has been backfilled. It may not be backfilled to the Coal Authority requirements and following drilling, the shafts will require stabilisation and capping to Coal Authority requirements. Permission is required from the Coal Authority to drill the site to locate shallow mining and to drill the mine shaft.

Further information obtained by reference to original mine abandonment plans for the Barnsley Coal seam of 1878 indicate the coal extraction to have been 2.60m in thickness and confirmed the location of the shaft to be immediately west of the site boundary.

TABLE 3
Mining Beneath Site

Coal seam or sandstone	Depth in mbgl	Coal worked beneath site (Coal Authority records)
Barnsley Rider Coal		
Barnsley Rock Sandstone		
Barnsley Coal	<30	YES
Dunsil Coal		
Gawber Coal		
Swallow Wood Coal		
Haigh Moor Sandstone		
Top Haigh Moor Coal	80	
Low Haigh Moor Coal		
Lidgett Coal		
Joan Coal		
Tankersley Coal		
Flockton Thick Coal	174	YES
Fenton Coal	196	YES
Parkgate Rock Sandstone		
Parkgate Coal	240	YES
Thorncliffe Coal		
Silkstone Four Foot		
Silkstone Rock Sandstone		
Claywood Ironstone		
Silkstone Coal	320	YES
Black Band Coal		
Whinmoor Coal	370	YES

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9: SOURCES OF CONTAMINATION TO SITE

9.1 Waste Disposal, Waste Treatment and Waste Transfer

There are three registered landfill sites within 250m of the site for which licences are all cancelled or revoked.

There are seven historic landfills within 250m of the site as detailed in Table 4 and there are seven landfills recorded by Barnsley MBC within 250m of the site of unknown status.

The Environment Agency hold records of one licensed waste treatment and waste transfer site licensed by the Environment Agency under Part II of the Environmental Protection Act 1990 to treat keep or dispose of controlled waste within the site. This is licensed to D Lycett in Haulage Yard off West Road, Pogmoor for household, commercial and industrial transfer station.

As the site is a landfill and a large number of former landfills lie within 250m of the site, monitoring was undertaken in seven monitoring points on six occasions under varying atmospheric conditions following the site investigation and the results are presented in Section 11.5 and in Appendix D.

TABLE 4
Landfill Sites

Location	Licence Holder	Licence Reference	Location	Waste	Status
433200E 406500N	A F Budge (Contractors) Ltd	WD 20 B572 (WD2 B19)	West Road Pogmoor 83m east of site	Demolition rubble, excavation, rock, stone, concrete	Registered cancelled
433200E 406500N	Barnsley MBC	WD 2.B19	West Road Pogmoor 83m east of site	Demolition rubble, excavation, rock, stone, concrete	Registered cancelled
433300E 406500N	CRS Ltd Yorkshire Region	WD 20 B38	Summer Care Dairy Stocks Lane 183m east of site	Construction and demolition waste, excavated material, incinerator residues	Registered cancelled
4331394 406479N	A F Budge	EA HLD 04028	West Road Pogmoor 24m east of site	Inert and commercial waste	Historic
433037E 406434N	Polar Motors Pogmoor	EA HLD 04327 4400/(139)	North of Dodworth Road 34m south of site	Unknown	Historic
432858E 406500N	Not supplied	EA HLD 04325 4400/(34)	Recreation ground Pogmoor Road 44m west of site	Unknown	Historic
433154E 406525N	CRS Ltd Yorkshire Region	EA HLD 04329 4400/0459	Land west of Summer Lane Dairy 44m east of site	Industrial and commercial waste	Historic
433160E 406606N	Not supplied	EAHLD 04330 4400/B197	Allotment gardens Pogmoor 108m northeast of site	Unknown	Historic
432813E	Mr J Clayton	EAHLD	Quarry at Higher	Inert and commercial	Historic

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406401N		04324 6714400/(130	Spring Head Farm	waste	
432980E 406204N	Not supplied	EA HLD 04326 4400/(131)	Dodsworth Road 264m south of site	Unknown	Historic
433077E 406535N	Mr D Lycett	60564	Haulage Yard off West Road Pogmoor	Household, commercial and industrial transfer station	Issued April 1987
432926E 406515N	Barnsley MBC	134	On site	-	Recorded
433104E 406464N	Barnsley MBC	61	3m southeast of site	-	Recorded
433002E 406443N	Barnsley MBC	57	32m south of site	-	Recorded
433100E 406575N	Barnsley MBC	44	44m northeast of site	-	Recorded
433200E 406500N	Barnsley MBC	139	83m east of site	-	Recorded
432853E 406401N	Barnsley MBC	130	89m southwest of site	-	Recorded
432997E 406219N	Barnsley MBC	131	250m south of site	-	Recorded
433200E 406500N	A F Budge	WD20 B572 (WD2 B19)	West Road Pogmoor 83m east of site	Clean demolition rubble, excavation spoil, subsoil, rock, stone and concrete	Registered but lapsed or cancelled
433200E 406500N	Barnsley MBC	WD2 B19	West Road Pogmoor 83m east of site	Clean demolition rubble, excavation spoil, subsoil, rock, stone and concrete	Registered but lapsed or cancelled
433300E 406500N	CRS Ltd Yorkshire Region	WD20 B38	Summer Lane Dairy Stokes Lane 183m east of site	Construction/demolition waste, excavated natural materials and incinerator residues	Registered but lapsed or cancelled
433100E 406450N	D Lycett	WD20 B554 MOD3	Haulage Yard off West Road	Commercial waste, construction and demolition waste, excavation waste, soil, subsoil, packaging, paper, solid industrial and non hazardous waste	Operational small 10,000 to 25,000 tonnes a year
433050E 407005N	Barnsley Health Authority	WD20 B943	Barnsley District Hospital Gawber Road 397m north of site	Clinical, domestic black bag waste	Surrendered

9.2 Statutory Authorisations

Barnsley Metropolitan Borough Council confirmed that the site is listed on the Local Authority Potentially Contaminated Land Register.

There are no sites registered by the Environment Agency under the Radioactive Substances Act 1993 to keep or use radioactive materials on or within 250m of the site. There is a registered site at Barnsley Hospital 445m northeast of the site but this is unlikely to detrimentally affect the site.

9.3 Industrial Processes

There is one recorded site authorised by the Environment Agency under Part 1 of the EPA 1990 to carry out processes subjected to Integrated Pollution Prevention and Control (IPPC) within 250m of the site. This is for Royston Lead Ltd under Permit No PO12640 and is for non ferrous metals, producing lead and alloys greater than 23%, lead (with copper) or 2% lead (without). This is effective. There are five recorded Local Authority Pollution Prevention and Controls as detailed in Table 5. These are unlikely to detrimentally affect the site.

TABLE 5
Local Authority Pollution Prevention and Controls

None	Location	Permit Reference	Description
S J Autowelding	West Road Pogmoor 7m north of site	Ppc/B/09	Waste oil burners less than 0.4 MW net rated thermal input
Polar Motor Co Ltd	Dodworth Road Pogmoor 77m SE of site	Ppc/B/37	Respraying of road vehicles
Intake 1	Pogmoor Road Barnsley 99m NW of site	Ppc/B/65	Petrol filling station
Crows Garage	Pogmoor Road Barnsley 101m NW of site	Ppc/B/06	Waste oil burners less than 0.4 MW net rated thermal input
Shell	Barnsley Motorway 246m SW of site	Epa/Petrol/2 1	Petrol filling station

9.4 Hazardous Substances

There are no records of sites regulated by the Health and Safety Executive (HSE) under the Control of Major Accident Hazards (COMAH) Regulations 1999 on or within 250m of the site.

There are no sites on or within 250m of the site which are subject to hazardous substances consents granted by the relevant Local Authority under the Planning (Hazardous Substances) Act 1990, or which are regulated by the Health and Safety Executive for storing specific dangerous substances under the NIHHS Regulation 1982.

9.5 Contraventions

The Environment Agency holds three records of pollution incidents to controlled waters within 250m of the site comprising de-icing chemicals polluting Old Slough Culvert as a minor incident, gas oil from textile industries to the rear of Polar Motors as a minor incident, and oils at road bridge with A628 for industrial premises.

These pollution incidents are not attributable to the site and are unlikely to have detrimentally affected the site.

9.6 Discharge Consents

The Environment Agency holds records of one authorisation issued by the Environment Agency to discharge to watercourses in accordance with the Water Resources Act 1991, within 250m of the site. This is for a discharge of sewage via a soakaway at 48 Farmhouse Lane, Pogmoor. This is unlikely to detrimentally affect the site.

9.7 Radon

Radon is a radioactive gas derived from naturally occurring uranium found in small quantities in soils and rock. The National Radiological Board recommends that where radon concentration exceeds the Action level of 200 Bqm^{-3} the householder should take measures to reduce it. According to the BGS the site within is in an area where basic radon protection measures are required in new buildings.

9.8 Potentially Contaminative Uses

The site has been used for the potentially contaminating use of a railway sidings, clay pit, brickworks, waste site and transport yard. Local industry includes precision engineers, electrical engineers, garage services, car dealers, commercial vehicle dealers, exhaust and shock absorber centres and printers, within 100m of the site. The nearest petrol filling station is 99m northwest of the site in Pogmoor Road. It is unlikely that contamination from these local industries could have detrimentally affected the site.

10: PATHWAYS AND RECEPTORS

It is unlikely that surface water could transport contamination into Old Slough Beck as the surface water is culverted.

The groundwater is unlikely to be a pathway as it classifies as a minor aquifer and lies beneath a cover of relatively permeable clay according to the geological maps. The Environment Agency hold no details of any water abstractions within 250m of the site and those which lie within 1000m are from springs and therefore unlikely to be detrimentally affected by the site. The site is not at risk of a flood transporting contamination.

Made ground on the site could assist in the leaching of contamination into underlying strata but as this is relatively impermeable mudstone it affords protection to underlying aquifers.

The site may have a residential use in the future and therefore flora may be a pathway for contamination as edible plants and vegetables may be grown on the site. No animals in the food chain are present on the site or likely to be present in the future.

According to the Countryside Commission the site does not lie within a National Park or area of Outstanding National Beauty. According to English Nature the site does not lie within a Special Protection Area, National Nature Reserve and it is not a Site of Special Scientific Interest or within a Special Area of Conservation, or RAMSAR site.

DEFRA records indicate that the site does not lie within a Nitrate Sensitive Area, or within an Environmentally Sensitive Area. The site lies within a Nitrite Vulnerable Zone. The site and

the immediate area around are not classified as land which is a potentially sensitive receptor to contamination.

There is light industrial and residential use and schools within 500m of the site, and there is livestock in adjacent fields which are possible sensitive receptors to contamination. Workmen on the site and future users of the site will also be sensitive receptors.

11: RESULTS OF PHASE II GROUND INVESTIGATION

11.1 *Fieldwork*

A ground investigation was undertaken on the site between May 17th and May 25th 2007 and comprised the excavation of fourteen trial pits by mechanical excavator and numbered TP1 to TP14 and the drilling of six percussive boreholes numbered BH1 to BH6 by means of a Dando shell and auger rig. A further two shell and auger boreholes BH7 and BH8 were sunk on the northwestern corner of the site on August 28th 2007. The trial pits were excavated to determine the depth of made ground and to assess the ground conditions and to collect soil samples for environmental testing. The boreholes were extended to depths of up to 7.50m bgl to assess ground conditions and to collect soil samples for environmental and geotechnical testing. The soil samples were sent to NAMAS accredited laboratories for testing for environmental nature and geotechnical properties.

Seven boreholes, BH1 to BH7 were fitted with standpipes following drilling to enable measurements of gas and groundwater levels. All trial pits were backfilled with arisings.

Borehole and Trial Pit logs are presented in Appendix A, Geotechnical Test Results are presented in Appendix B, Environmental Test Results are presented in Appendix C, Gas and Groundwater Monitoring Results in Appendix D, Photographs in Appendix E, and Coal Authority Mining Report in Appendix F. Locations of Boreholes and Trial Pits are presented on Drg No TSDL 2620/16.

11.2 *Ground Conditions*

11.2.1 General

The ground conditions were fairly similar across the site of made ground underlain by Coal Measures mudstones weathered in their upper portion to firm clay.

11.2.2 Made Ground

Made ground was encountered to depths of 1.00m to 7.00m bgl but was generally 1.00m to 3.00mbgl. Trial pits TP1, TP2 and TP3 at the eastern end of the site did not encounter the base of the made ground due to unstable trial pit sides and ingress of water. Trial Pits TP12 and TP13 on the southern boundary and central area of the site did not encounter the base of the made ground due to water ingress causing collapse of the made ground. In the boreholes BH2 to BH5 the made ground was proven to a depth of 3.30m to 4.40m bgl and in BH6 in the north of the site the made ground extended to 5.00mbgl and in BH1 in the eastern end of the site the made ground was proven to 7.00mbgl. Boreholes BH7 and BH8, sunk in the northwest corner of the site encountered made ground to 6.00m in BH7 and 4.50m in BH8.

The made ground generally comprised loose black ash and clinker with fragments of coal, gravel and cobbles of sandstone and reworked mudstone and often with brick fragments in the

upper made ground. In BH1 and TP1 compacted paper was encountered between 2.00m to 4.00mbgl. In TP6, TP9, TP10 and TP11 masses of broken and whole red bricks were encountered. In BH7 and BH8 the made ground comprised reworked clay with ash and brick and coal fragments and reworked clay with tiny coal fragments.

Standard Penetration Tests in the made ground gave N values of 0 to 23 but were generally 0 to 13 indicating the material to be in a very loose to loose state of compaction and unsuitable in its present state of compaction to place foundations for development.

11.2.3 Clay (weathered bedrock)

In Trial Pits TP7, TP8, TP9, TP10, TP11 and TP14 and in Boreholes BH1 and BH3 and BH7 and BH8 the bedrock was weathered to a firm to stiff yellow brown and grey silty clay often with lithorelics of mudstone. The clay was generally 0.20m to 0.90m in thickness and underlain by mudstone.

11.2.4 Bedrock

Bedrock comprised moderately to highly weathered weak mudstone of the Coal Measures. In the trial pits and boreholes bedrock was encountered at 1.00m to 7.20m bgl but generally at 3.00m to 5.00m bgl. Standard Penetration Tests in the mudstone gave N values of 20 to 29 and >50 indicating a weak bedrock.

TABLE 6
Ground Conditions

TP/BH No	MADE GROUND	BEDROCK	
	Concrete/clay/brick/ash	Bedrock weathered to Clay	Weak Weathered Mudstone
TP1	GL-4.00+		
TP2	GL-3.65+		
TP3	GL-1.20+		
TP4	GL-3.30		3.30-3.50
TP5	GL-3.00		3.00-3.30
TP6	GL-1.00		1.00-1.20
TP7	GL-1.20	1.20-2.10	
TP8	GL-2.70	2.70-3.00	
TP9	GL-1.60	1.60-1.80	
TP10	GL-1.80	1.80-2.20	
TP11	GL-1.60	1.60-1.80	
TP12	GL-3.20+		
TP13	GL-3.20+		
TP14	GL-1.50	1.50-2.00	
BH1	GL-7.00	7.00-7.20	7.20-7.50
BH2	GL-3.30		3.30-4.60
BH3	GL- 4.40	4.40-5.00	5.00-5.70
BH4	GL- 3.55		3.55-5.30
BH5	GL-3.80		3.80-4.05
BH6	GL-3.55		5.00-5.00
BH7	GL-6.00	6.00-6.30	6.30-6.65
BH8	GL-4.50	4.50-5.00	5.00-6.00

Ashton Bennett Consultancy
Engineering Geologists and Environmental Scientists

11.3 Groundwater Conditions

Five of the trial pits and two of the boreholes encountered groundwater at depths of 3.20m to 5.45mbgl. The site is generally dry to a depth of 3.00m bgl. During and after heavy rainfall small seepages may be encountered in the made ground where it overlies the less permeable mudstone.

It is not considered that special precautions will be required for groundwater control during construction at levels that cannot be dealt with by sump pumping. Water levels recorded in the standpipes to date varied from dry to 4.82m bgl but generally around 3.00m bgl and represents perched water within the made ground.

11.4 Geotechnical Testing

In situ shear strength tests were undertaken in selected boreholes to assess the engineering properties of the strata. Results indicated the made ground to be in a very loose to loose state of compaction, the clay to be of firm consistency and the bedrock to be weak to moderately strong.

TABLE 7
Standard Penetration Test N Values

Depth in mbgl	MADE GROUND	CLAY	MUDSTONE
GL-2.00	2,3,5,6, 9,10, 12, <50		
2.00-3.00	0,0,5,6,10,13,19,22		
3.00-4.00	1,2,4,4,7,10		20,29
4.00-5.00	4,23	6,27	24,>50,>50
5.00-6.00	5		>50,>50,>50,>50
6.00-7.00	0	29	>50
7.00-8.00			>50

Thirteen soil samples at depths varying from 1.55m to 7.00m in the natural strata were tested for plasticity. The results gave moisture contents varying from 7.6% to 33%, Liquid Limits of 33% to 67% and Plastic Limits of 19% to 30% and Plasticity Index of 13% to 39%. The results indicate that the clays are clays of intermediate to high plasticity and may swell and shrink under varying moisture conditions. The high plasticity clays were detected in TP5 at 3.30m, TP7 at 2.00m and TP8 at 2.70m and BH2 at 4.20m bgl, which were samples of mudstone or weathered mudstone.

Tests undertaken for soluble sulphate on five soil samples indicate results of 0.07g/l and 0.16g/l with pH values of 7.5 to 8.6.

11.5 Gas Conditions

Seven boreholes were fitted with standpipes following drilling to enable measurements of gas and groundwater. Boreholes BH1 to BH6 were monitored on six occasions throughout May and June 2007 and BH7 was monitored in September and October on six occasions under varying atmospheric conditions. Results are presented in Appendix D.

The monitoring has indicated low levels of oxygen in BH1 to BH4 and near normal levels in BH5 and BH6. Levels of carbon dioxide varied from nil to 12.30% but was generally above recommended levels for development without protection. Methane was only detected in BH1 at

1.70% on one occasion. Monitoring undertaken in BH7 indicated low levels of oxygen, no methane and levels of carbon dioxide varying from 2.00% to 6.20%. The results indicate that protection will be required in development against toxic gases.

11.6 Mining Conditions

The Barnsley Coal seam has been mined for a thickness of 3.00m at shallow depth (<30m) beneath the site. If voids remain in the mined ground the voids could over the years migrate by successive roof collapse and reach the ground surface causing ground settlement and structural damage to overlying structures. If sufficient competent strata overlies the voids then they will become choked before they reach the ground surface.

It is recommended that the site is drilled on a grid pattern in the areas of known mining and other areas underlain by the Barnsley Coal at shallow (<30m) depth to ascertain the condition of the mined ground, presence and thickness of voids and thickness of overlying competent strata.

There is one mine shaft recorded within 20m of the boundary. It is recommended that this shaft is drilled to ascertain the condition of any backfill and to assess its future stability. This will not be necessary if development will not encroach within influencing distance of the shaft.

12: ENVIRONMENTAL TEST RESULTS

12.1 Standards

There are no definitive legal standards for contaminated land in the United Kingdom, although the Government Department of the Environment in the late 1970's published guidance on a restricted number of contaminants. Further guidance was published in March 2002 as the Contaminated Land Exposure Assessment (CLEA) by the Department of Environment, Food and Rural Affairs (DEFRA). This guidance is due to be revised in 2007.

12.2 Results of Environmental Tests on Soils

12.2.1 Soil Samples Tested

Sixteen soil samples were tested to date for the presence of contamination and assessed against the standards described. The soil samples were collected from window sampler boreholes at depths varying from ground level to 3.30m bgl. Sixteen soils were tested for the DETR screen to check for contamination, two were tested for Total Petroleum Hydrocarbons (TPH) and speciated Polyaromatic Hydrocarbons (PAH) and eight for asbestos.

12.2.2 Metals that are Phytotoxic

Contaminants that are phytotoxic are not normally hazardous to health, but restrict plant growth.

Boron

The soil samples tested fell within the DETR guidelines for all uses of the site with the exception of results from TP1 at 1.00m and 3.00m and TP2 at 3.00m.

Copper
The soil samples tested fell within DETR guidelines for all uses of the site, with the exception of the results from six samples which fell between 162.5mg/kg to 709.1mg/kg against the recommended 130 mg/kg.

Nickel
The soil samples tested fell within CLEA soil guideline values for residential use of the site with the exception of results from TP5 and TP10 which slightly exceeded the acceptable level.

Zinc
The soil samples tested were found to lie within guidelines with the exception of four results from TP1, TP2, TP5 and TP14 which fell above guidelines.

The samples tested for phytotoxic contamination generally fell below the threshold level for contamination according to DETR guidelines, and fell within CLEA soil guideline values. The exceptions were five results for boron, two of nickel, six of copper and four of zinc.

These contaminants are phytotoxic and do not present a hazard to health the results and indicate that they are of small concern to future use of the site for residential purpose and are unlikely at the levels detected to reduce plant growth. However where elevated levels are detected it may be prudent to provide clean uncontaminated topsoil in proposed gardens and landscaped areas.

12.2.3 Metals that are a Health Risk

All heavy metals, for which test results are presented below, can be detrimental to health and should be prevented from reaching the food and drinking water system.

Arsenic
The results of tests for arsenic fell within the CLEA soil guideline values for use of the site for residential with the exception of results from six samples which exceeded the acceptable level of 20mg/kg. Levels were generally 27 to 71mg/kg with one higher level of 299.3mg/kg from TP10 at 0.20mbgl.

Cadmium
The soil samples tested generally fell within CLEA soil guideline values for residential use with the exception of results from TP2, TP5 and TP14.

Chromium
The soil samples tested all fell within CLEA soil guideline values for residential use.

Lead
The soil samples tested generally fell within CLEA soil guideline values for residential use. Three samples from TP2, TP5 and TP14 fell above acceptable levels for residential use.

Mercury
All the soil samples tested fell within CLEA soil guideline values for residential use.

Selenium
All of the soil samples tested fell within CLEA soil guideline values for residential use.

Cyanide
All the soil samples tested fell within the DETR Threshold for use of the site for gardens and/or parks playing fields and open space.

Thiocyanate
All the soil samples tested fell within DETR threshold for all uses of the site.

12.2.4 Other Inorganic Contaminants

Sulphide
The soil samples tested were all found to be within DETR threshold for sulphide.

Sulphate and pH
The levels of sulphate found in the soil samples tested indicated that the majority of results fall below DETR threshold levels and fall within the BRE Class 1 classification for design of underground concrete. However four results fell above 2000mg/kg from TP2 and TP5, TP12 and TP14 at levels of 4320 to 11,600mg/kg. These areas require special consideration for design of any underground concrete. pH levels in the soils were generally near neutral, varying from 7.60 to 9.00.

Sulphur
Two elevated levels of sulphur were detected in TP1 and TP12.

12.2.5 Organic Contaminants

Some organics may be particularly polluting in the environment, most notable of these are the polyaromatic hydrocarbons which can be carcinogenic. Organic pollutants produced from petroleum can pose environmental risk, the level of risk varying with particular pollutants. Organic pollutants cover a wide field and the testing undertaken on the site is intended to give indications only of any likely problem.

Phenol
Of the sixteen soil samples tested for phenol, all of the samples tested fell within the DETR threshold for residential use.

Polyaromatic Hydrocarbons (PAH)
Sixteen soil samples were tested for the presence of total PAH compounds. Four of the results fell within the Dutch Guidelines of 40mg/kg for PAHs with nine results falling above the guidelines at 99mg/kg to 1830mg/kg. All results fell within the DETR action level for PAHs for landscaped use of the site.

Total Petroleum Hydrocarbons (TPH)
Two soil samples from TP4 at 1.00m and TP5 at 0.50m were tested for Total Petroleum Hydrocarbons and gave results of 1350mg/kg and 306mg/kg respectively. The level detected in TP5 lies within acceptable guidelines for residential use. The level in TP4 should be further tested and remediated if necessary.

12.2.6 Asbestos

Tests for the presence of asbestos were undertaken on eight soil samples. All results gave no bulk fibres observed.

12.3 Environmental Test Results on Groundwater

Water samples were collected within perched groundwater in Trial Pits TP2 and TP4 and the full test results are presented in Appendix C. The results indicate the water samples to be uncontaminated by arsenic, boron, cadmium, chromium, copper, cyanide, lead, mercury, nickel, selenium, sulphide, thiocyanate, phenol and polyaromatic hydrocarbons.

Levels of sulphate were detected above the recommended 250mg/kg at 908mg/kg (TP4) to 1200mg/kg (TP2).

The results indicate that the site is unlikely to be contaminating the perched groundwater within the made ground and therefore unlikely to be contaminating any aquifers beneath the mudstone strata. Levels of sulphate indicate that special precautions should be considered for all underground concrete.

12.4 Summary

The potential for contamination on the site is from the use of the site for a clay pit with sidings, infilled land and as a transport depot with fuel storage tanks.

The results of the Phase II environmental ground investigation indicated that the site, where tested, was generally free from gross contamination. The site was found to be uncontaminated where tested by chromium, mercury, selenium, cyanide, thiocyanate, sulphide, phenol and asbestos.

Some contamination was detected of phytotoxic metals particularly in the area of TP1, TP2, TP5 and TP14. These metals do not detrimentally affect humans but can reduce plant growth and although the levels are not of concern to redevelopment of the site for residential use with plant uptake and landscaping, it would be prudent to place clean uncontaminated topsoil in proposed garden and landscaped areas.

Contamination by heavy metals included six elevated levels of arsenic, three of cadmium and three of lead in TP1, TP2, TP5, TP10, TP12 and TP14. These levels are a low risk if overlain by hard cover and need remediation/mitigating measures where they lie in areas of future landscaped ground or gardens.

Elevated levels of PAH were detected in nine samples and two elevated levels of sulphur were detected. Elevated hydrocarbons were detected in the central area of the site. It is recommended that these areas of contamination are remediated or that mitigating measures are used to prevent the contamination detrimentally affecting future residents or workmen on the site. Further testing may be required to delineate these areas.

Four test results for sulphate fell above the DETR threshold and are not of concern as long as they lie under hard cover. These results indicate that cementitious materials for underground

services, structures and foundations are classified as requiring special consideration for design and the appropriate mixes as described in BRE Special Digest 1 should be followed in accordance with the test results obtained. Perched groundwater was found to be uncontaminated with slightly elevated levels of sulphate.

13: ENVIRONMENTAL RISK ASSESSMENT

13.1 Introduction

Environmental risk considerations on the site have been assessed by adopting a site specific qualitative approach to identify the risk, if any, of environmental harm. In accordance with the DETR Draft Statutory Guidance on Contaminated Land the approach is by identifying a hazardous source and establishing possible links between the source via exposure pathways to a potential receptor.

The hazard is a contaminant or potentially polluting substance that is in, on or under the land and which has the potential to cause harm or to cause pollution to controlled waters. The receptor is a living organism or organisms, an ecological system or piece of property, which is being harmed, interfered with or polluted by the contaminant. The pollutant linkage is by means of the pathway which is one or more routes by or through which that receptor is being, or could be, exposed to, or affected by, that contaminant. Thus the presence of a hazard on a site does not necessarily mean that there are risks unless pathways and receptors are present and are receptive to being affected by that specific hazard or contaminant.

SOURCE *release of pollutant*	**PATHWAY** *route to receptor*	**RECEPTOR**
eg. oil spills	eg. permeable strata	eg. River

It is proposed to develop the site for residential use and the environmental risks have been assessed for this future use.

13.2 Sources of Contamination, Pathways and Receptors

13.2.1 Sources of Contamination

Sources of contamination were identified during the Phase II investigation and are associated with the past use of the site for railway sidings, a clay pit, brickworks and a waste site. Contamination detected includes arsenic and sulphate in ash from the waste destructor and for construction of rail lines, hydrocarbons from transport, cadmium and lead, PAHs and sulphur in the waste and sulphate. Elevated levels of carbon dioxide have been detected over part of the site. The testing undertaken is only a preliminary investigation and further assessment within garden areas are recommended once the layout and use of the site is confirmed.

13.2.2 Pathways for Migration

The potential pathways for carrying the detected contamination in air, water or through the ground were identified as the following with the considered level of risk.

1. *Ingestion of and/or skin contact with contamination in the soil.*
   The development is for residential use and it is anticipated that a large part of the site will be hard covered by buildings, roads and hard cover preventing ingestion/soil contact to occur. Where landscaped ground or gardens are planned then consideration needs to be given to establishing the level and extent of any contamination in these

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SOURCE *release of pollutant*	**PATHWAY** *route to receptor*	**RECEPTOR**
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The potential pathways for carrying the detected contamination *in air, water or through the* ground were identified as the following with the considered level of risk.

1. *Ingestion of and/or skin contact with contamination in the soil.*
   The development is for residential use and it is anticipated that a large part of the site will be hard covered by buildings, roads and hard cover preventing ingestion/soil contact to occur. Where landscaped ground or gardens are planned then consideration needs to be given to establishing the level and extent of any contamination in these

specific areas and sealing any contamination by the use of a clay seal and clean imported topsoil where required to reduce risk of harm to humans. Alternatively any hot spots of contamination detected could be remediated.

2. *Ingestion of contaminated in and uptake of contamination in plants/vegetables/animals in food chain.*
The site is for residential use and the landscaped ground and gardens may require sealing and the importation of clean topsoil where contamination is detected to reduce risk of harm to humans. Alternatively any hot spots of contamination could be remediated. It is unlikely that animals in the food chain will be present on the site now or in the future eliminating this pathway to humans.

3. *Ingestion of contaminated drinking water through leaching of contamination into groundwater flowing to underground aquifers/groundwater.*
The site is not in a source protection zone for potable water and no water abstractions are present within 700m of the site. It is not expected that any contamination detected will detrimentally affect groundwater as the aquifer is minor and protected by overlying mudstone.

4. *Inhalation of vapours produced by landfill/radon/hydrocarbons/organics.*
The site contains filled ground. The site lies within 250m of a landfill site which may detrimentally affect the site. It is necessary to provide radon protection in future development. Monitoring undertaken for toxic gases indicate that precautions will need to be incorporated in design for protection. Further advice will be given on necessary protection in a Remediation Statement.

5. *Inhalation of contaminated airborne dust.*
Asbestos was not detected in the soil. During construction dust should be kept o a minimum.

13.2.3 Sensitive Receptors

The potential sensitive receptors on the site, once the site is developed, are expected to include workers, possibly residents and other site users. Sensitive receptors off the site include controlled waters, abstraction wells, land and adjacent residents or site users. The risk of these receptors being detrimentally affected by the site is summarised in Table 8.

TABLE 8
Risk Assessment for Residential Use with plant uptake

Pathways	Receptors	Risk	Probability of Risk	Risk Reduction
Inhalation of vapours, methane and carbon dioxide and radon	Existing/future occupants of the site and workmen	Methane can be explosive in air. Carbon dioxide and other vapours can be asphyxiating Radon can damage health	Site was monitored for toxic gas Radon protection required	Use of appropriate protective membranes in development
Ingestion of and/or skin contact from contaminated soil	Existing/future occupants of the site and	Health defects and skin burns/disorders	Low where site is hard covered Medium if gardens	Risk can be reduced where hard covered and provided soil is

	workmen.		are provided	handled with PPE. Gardens may need sealing against contamination or hot spots remediated
Ingestion of contaminated drinking water	Local abstraction wells/drinking water	Health defects	Low no water abstractions	No abstraction to be undertaken from groundwater on site, all water to be from town supply
Transportation by surface and/or groundwater	Aquifers Old Sough	Prosecution if controlled waters are polluted	Low Becks are culverted and aquifer is partly protected by clay, perched groundwater tested as uncontaminated	None
Ingestion and uptake of contamination in plants/animals/ vegetables	Existing/future occupants of site	Health defects	Low where hard covered Medium where gardens/landscape areas are planned	Hard cover of site sealing of gardens or remediation of hot spots of contamination, clean topsoil
Inhalation of airborne dust	Existing/future occupants of the site	Health defects in lungs	Low to medium	Use PPE during construction, keep dust to a minimum

The assessment of the likelihood of receptors being affected detrimentally is that it is unlikely that the site is detrimentally affecting surface water due to the distance to the nearest controlled surface water which is culverted. The risk of the site affecting groundwater and water abstractions may be reduced to low as there are no water abstractions within 700m of the site, the mudstone encountered affords some protection to groundwater in the sandstone aquifer and the perched groundwater tested as uncontaminated.

It is considered unlikely that land adjacent to the site is being detrimentally affected by contamination on the site.

It is recommended that prior to any redevelopment of the site for residential use the extent of the identified contaminants are assessed to determine any areas for remediation of the ground prior to construction and to design mitigating measures such as sealing of future garden areas and design protection from toxic gases.

With regard to human health, it is considered unlikely that humans outside the site are being detrimentally affected. Humans who will be working on the site, particularly in groundwork may be affected if they do not take the appropriate Health and Safety precautions. Future residents of any redevelopment for housing may be detrimentally affected by the contamination detected if garden areas are not sealed or hot spots of contamination remediated.

13.3 Risk Assessment

The risks have been assessed purely on the desk study and intrusive investigation undertaken and on the assumption that the site will in the future be for residential use with plant uptake.

The risk of humans being significantly harmed is due to the presence of gardens/vegetable plots and children who may eat plants/soil. This risk can however be reduced by the removal of any hot spots of contamination detected or by sealing contamination where detected and the use of clean topsoil.

The risks for future residential use of the site with gardens are as follows:-

1. Contamination affecting residents through soil contact or edible plant/vegetable/grass contact.
2. Contamination affecting residents through toxic gases arising from the filled ground into confined spaces.

Overall the risk to sensitive receptors is low provided further investigation and testing is undertaken to delineate areas of contamination and provided that the remediation and mitigating measures recommended are undertaken. Site Specific Target Values for the site need to be determined to enable a Remediation Strategy to be designed and a Remediation Statement to be agreed with the Local Authority

14: RECOMMENDATIONS

14.1 Environmental Recommendations

Contamination was identified through a Phase II Ground Investigation. The investigation confirmed the site to be generally free from gross contamination, with some contamination detected in the eastern and southeastern part of the site and in the central area of the site. Contamination was not detected over large areas of the site.

The site is to be developed for residential houses with gardens and the contamination detected should be removed or replaced beneath hard cover or sealed to prevent risk to future residents. A large area of the site is expected to be hard covered by roads, access roadways, pavements, driveways and house footprints and as the contamination detected is generally low risk remediation of contamination will not be required in these areas. Where contamination has been detected in proposed garden areas the soil requires sealing with a low permeability clay ($1x10^{-9}$ m/sec) and importation of uncontaminated tested topsoil. It is unlikely that remediation or mitigating measures will be required in the southwestern area of the site.

As the layout of the site is unknown specific recommendations cannot be made however these would form part of a Remediation Statement following design of the residential layout. At this stage Site Specific Target Values would be derived from contaminants detected to assess the nature of remediation required and to design the remediation and mitigating measures for the site to be fit for purpose for redevelopment for residential use. Any remediation necessary will need to be validated by a chartered environmentalist to satisfy planners/future purchasers.

The ground was only tested in specific locations and undetected contamination could exist between investigative locations although it is considered low risk. It is recommended that personal protective equipment is worn by everyone undertaking excavation works within soil and/or groundwater on the site to safeguard health. Specialist advice should be sought if areas of unusual nature or odour are found on further excavation during the development of the site.

Special precautions are required for underground concrete foundations and services in accordance with the latest BRE Special Digest 1 recommendations and in accordance with the levels of sulphate detected.

Radon protection is required for the houses. Monitoring within seven boreholes to date indicates low levels of oxygen and elevated levels of carbon dioxide in boreholes BH1 to BH4 and BH7 and normal levels in BH5 and BH6. It is anticipated that special precautions will be required for development to proceed in the area of detected carbon dioxide. According to Card and Wilson (CIRIA Reports 14a and C659) the levels of carbon dioxide indicate the site to fall into the characteristic situations 2 and 3. Recommendations for these situations include at least a well constructed floor slab, a low permeability gas membrane and minimum penetration of the ground floor slab by services. Further details would form part of a Remediation Statement.

All material imported to the site must be sourced from a known supplier and must be certified as uncontaminated by a NAMAS accredited laboratory.

If any material is removed from site during construction it must be tested according to Environment Agency requirements and must be carried by a licensed carrier to a landfill licensed to accept the nature of the waste. It is the site owner's responsibility to ensure the waste is landfilled according to Government Regulations.

14.2 Geotechnical Recommendations

It is proposed to construct residential houses on the site. The made ground is in a very loose to loose state of compaction and is unsuitable material on which to place foundations in its present state of varying compaction without undue settlement and structural damage occurring to overlying properties. It is recommended that foundations therefore are extended below the made ground to found on the underlying mudstone where bearing pressures of 150kN/m2 can be accommodated with less than 25mm settlement. In the western and central areas of the site the made ground is generally less than 2.00m in thickness and conventional strip foundations placed 2.00m bgl on the mudstone may be used for foundations for low rise residential houses. In the eastern third of the site and in the northwestern corner of the site where it lies at a higher ground level the made ground extends to generally 3.00m bgl and to 7.00m bgl and piles will be required founded in the mudstone.

Specialist Contractors will advise on the length and bearing capacity of piles depending on the size and design of their own piles. As a general rule piles should be sunk into the mudstone to a depth equal to five times the diameter of the pile. It is recommended that levels of sulphate detected are taken into account for design of concrete for piles. It is recommended that at least six piles are tested for integrity and bearing capacity.

Excavations for trenches are expected to remain stable in the short term over most of the site with the exception of the eastern and extreme southern areas of the site where the ash was very loosely compacted. Any excavations below 3.00mbgl are expected to encounter groundwater

which may destabilise trench walls. All trenches below 1.20m will require support for entry by personnel.

Care should be taken not to allow rainwater to soften the clay/mudstone foundation strata before pouring concrete for foundations. Any softened material should be skimmed off before concrete foundations are constructed. It is not expected that groundwater will be encountered in excavations to 2.00m bgl however during and after heavy rainfall it is expected that groundwater in shallow excavations could be dealt with by sump pumping.

14.3 Mining Recommendations

It is recommended that a mining investigation is undertaken to assess the possible presence of voids existing in mined ground at shallow depth beneath the site and to assess the likelihood of any voids migrating to the ground surface and causing damage to future development on the site.

Further details should be obtained on the mine shaft to the west of the site if development is expected to lie within influencing distance of the shaft. The shaft should be drilled and capped to Coal Authority Specification if development lies within influencing distance of the shaft.

15: GENERAL REMARKS

This report truly reflects the conditions found during the desk study and intrusive investigation. Whilst the desk study and intrusive investigation were undertaken in a professional manner taking due regard of additional information which became available as a result of ongoing research the results portrayed only pertain to the information attained and it is possible that other undetected information and undetected ground and gas conditions and undetected contamination and undetected mining may exist. The desk study and intrusive investigation was only undertaken within the site boundaries and should not be used for interpretation purposes elsewhere. These conclusions are only a brief summary of the report, and it is recommended that the report is read in full to ensure that all recommendations have been understood.

This report is provided for the sole use of the clients (Mr T Simpson and Mr D Lycett) and no responsibility will be accepted by this Consultancy to any other parties who rely on this report entirely at their own risk. The copyright for this report is held by Ashton Bennett Consultancy and no reproduction of any part or all of the report can be undertaken or any other reproduction undertaken without the written approval of this Consultancy.

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BSc, CGeol, FGS, FIMMM, CEnv, MCIWEM, AIEMA, MIEnvSci.

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16: REFERENCES

1 Harris, M R, Herbert, S M, & Smith, M A. Remedial Treatment for Contaminated Lane Volume III – "Site Investigation & Assessment". CIRIA Report SP103. 1995.

2 Harris, M R & Herbert, S H. "Contaminated Land: Investigation, Assessment & Remediation". ICE Design & Practice Guide. 1994.

3 Department of the Environment. CLR Report No 1 "A Framework for Assessing the Impact of Contaminated Land on Groundwater and Surface Water". 1994.

4 Department of the Environment. CLR Report No 2 "Guidance on Preliminary Site Inspection of Contaminated Land". 1994.

5 Department of the Environment. (1994). CLR Report No 3 "Documentary Research on Industrial Sites".

6 Department of the Environment. (1994). CLR Report No 4 "Sampling Strategies for Contaminated Land".

7 DETR. CLR Report No 12. "A Quality Approach for Contaminated Land Consultancy". 1997.

8 Department of the Environment. Waste Management Paper No. 27. Landfill Gas: A Technical Memorandum and Control of Landfill Gas. 1992.

9 Department of the Environment. Waste Management Paper No 26A. (1994) Landfill Completion: A Technical Memorandum Providing Guidance on Assessing the Completion of Licensed Landfill Sites. Hugo, London.

10 Department of the Environment – Interdepartmental Committee on the Redevelopment of Contaminated Land (DETR) "Guidance on the Assessment and Redevelopment of Contaminated Land", DETR Guidance Note 59/83 (2nd Edition). 1987.

11 Building Research Establishment. BRE Special Digest I "Concrete in aggressive ground Part I Assessing the aggressive chemical environment. 2003.

12 British Standards Institution. Investigation of Potentially Contaminated Sites – Code of Practice. BS 10175:2001.

13 British Standards Institution. BS 5930, "Code of Practice for Site Investigation. 1999.

14 Environment Agency. R & D Publication 20. Methodology for the Derivation of Remedial Targets for Soil and Groundwater to Protect Water Resources. 1999.

15 Building Research Establishment. BRE Report. Radon:Guidance on Protective Measures for New Dwellings. 1992 rev.

16 British Geological Survey. BGS Technical Report WP/95/2. Radon and background radioactivity from natural sources: characteristics, extent and relevance to planning and development in Great Britain.

17 Department of the Environment – Interdepartmental Committee on the Redevelopment of Contaminated Land (DETR) "Asbestos on Contaminated Sites: DETR Guidance Note 64/85 (2nd Edition) 1990.

18 Environmental Protection Act 1990, Chapter 43. HMSO, London.

19 Alloway, B J and Ayers, D C (1993). Chemical Principals of Environmental Pollution. Blackie Academic and Professional, Glasgow.

20 Pollard, S and Guy J (2001). Risk Assessment for Environmental Professionals. CIWEM.

21 Wray D A The Mining in the Huddersfield District. Huddersfield Museum Handbook No V1.1929 pp 1-24.

22 Holmes D H Mining and Quarrying Industry in the Huddersfield District.

23 Urban Task Force (2000). A Standard Land Condition Record.

24 Syms P M (1994b) The Post Remediated Values of Contaminated Land. Paper presented at The Institution of Water and Environmental Management symposium on "Contaminated Land – from Liability to Asset", 7/8 February 1994, Birmingham.

25 Syms P M (1995a) Environmental Impairment: an approach to valuation. In proceedings of the RICS, "Cutting Edge 95", Research Conference, University of Aberdeen, Royal Institution of Chartered Surveyors, London.

26 Syms P M (1997) Contaminated Land: The Practice and Economics of Redevelopment. Blackwell Services Ltd, Oxford.

27 Hester, R E and Harrison R M (1997) Contaminated Land and its Remediation. Thomas Telford.

28 Institute of Petroleum (1993) Code of Practice for the Investigation and Mitigation of Possible Petroleum Based Land Contamination. Institute of Petroleum, London.

29 DETR (1995) A Guide to Risk Assessment and Risk Management for Environmental Protection. HMSO, London.

30 EC Groundwater Directive 80/68/EEC on the protection of groundwater against pollution caused by certain dangerous substances. Brussels 1979.

31 Towards an Urban Reconnaissance. Final Repair of the Urban Task Force. Chaired by Lord Rodgers at Riverside, London, (1999).

32 Terzarghi, K and Peck, R.B., Soil Mechanics in Engineering Practice, 2nd Edition. John Wiley, New York. (1967)

33 Tomlinson, M. J.(2001). Foundation Design and Construction. 7th Edition. Prentice Hall.

34 Stroud, M.A., The Standard Penetration Test in insensitive clays and soft rock. Proceedings of the European Symposium on Penetration Testing. 2, 367-375, (1975)

35 R and D Publications. SGV 1, 3, 4, 5, 7, 9 and 10, Tox 1, 3 ,4, 5, 6, 7, 8 and 10, CLR 8, 9 and 10. DEFRA and Environment Agency. WRC (2002).

36 Environmental Quality Objectives in the Netherlands 1994. Ministry of Housing, Spatial Planning and Environment. 1994.

37 Society of the Chemical Industry, Site Investigation and materials problems in Proceedings Conference on Reclamation of Contaminated Land, Eastbourne, October 1979.

38 UK Water Supply (Water Quality) Regulations 1989 and 2000.

39 WHO Guidelines Drinking Water Quality, Volume 2 Health Criteria and other supporting Information. Geneva 1984.

40 EC Council Directive 98/83/EC of 3rd November 1998 on the quality of water for human consumption. 1998.

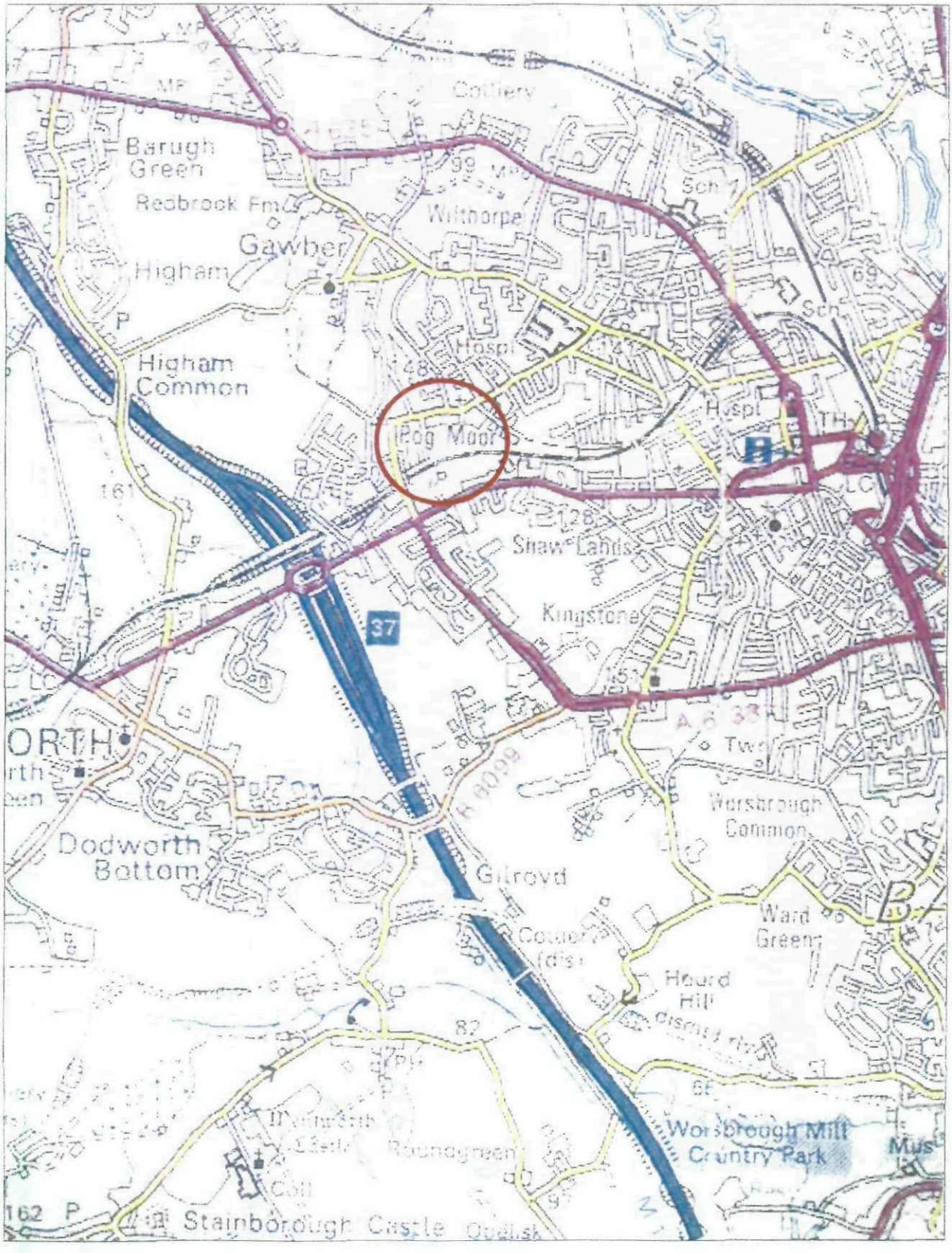
41 British Geological Survey. Geology of The Country around Barnsley. HMSO 1940.

42 British Geological Survey. Geology of the Country around Huddersfield and Halifax. HMSO 1930.

43 M.J. Tomlinson, Foundation Design and Construction. Seventh Edition. Prentice Hall (2001)

44 DETR Industry Profiles. Railway Land. 1995.

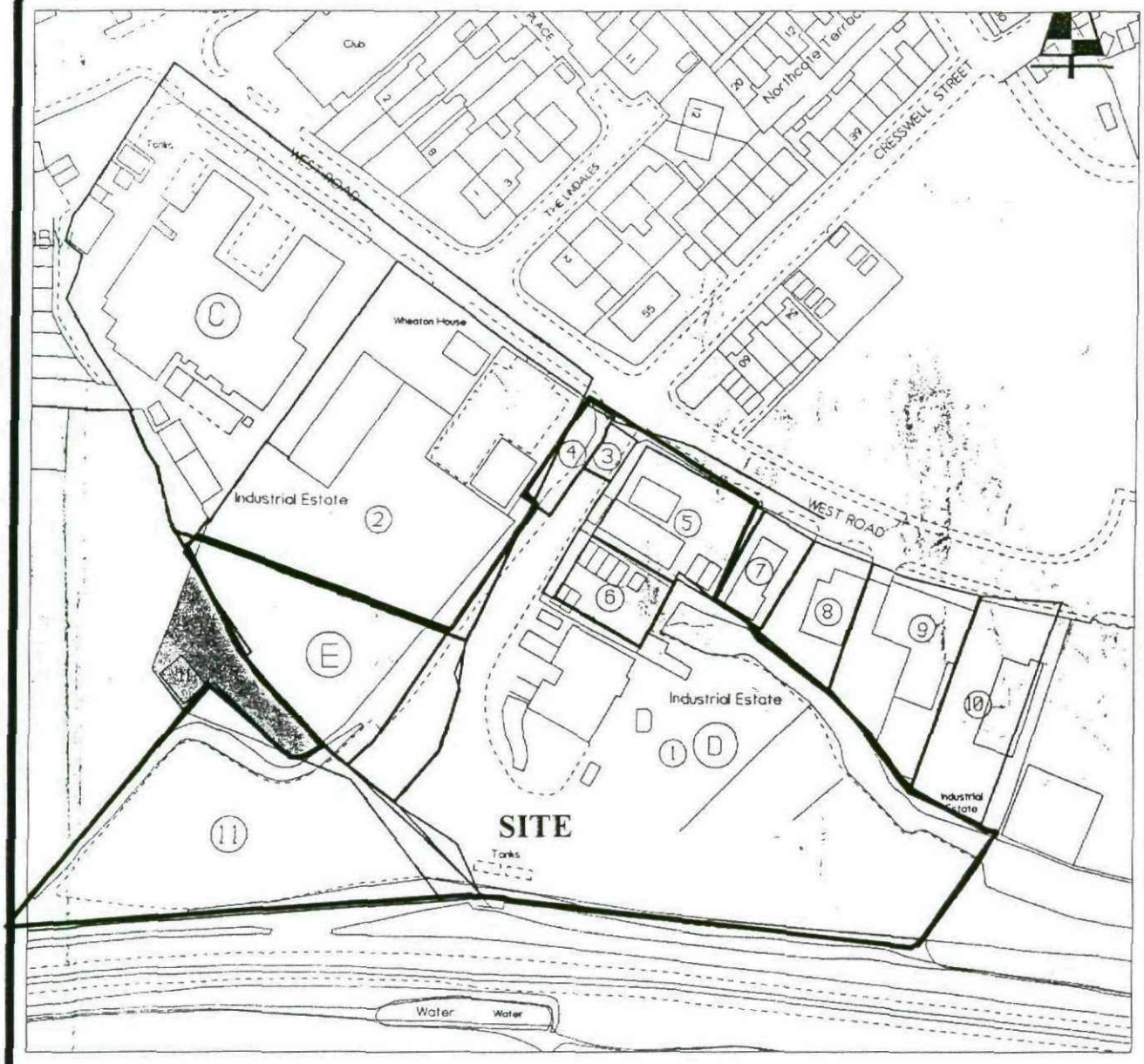
WEST ROAD, POGMOOR | SITE LOCATION PLAN



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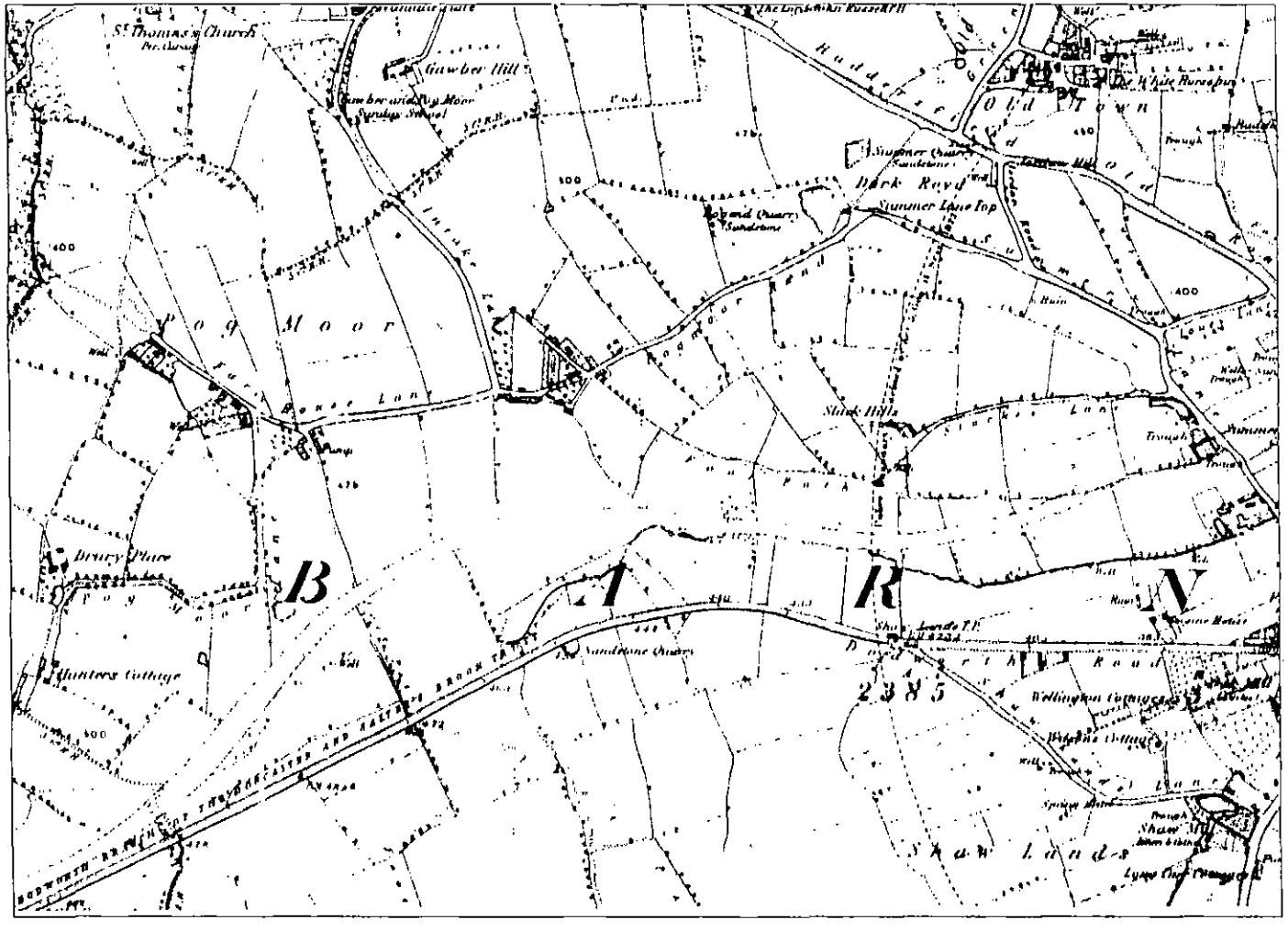
WEST ROAD, POGMOOR | SITE PLAN



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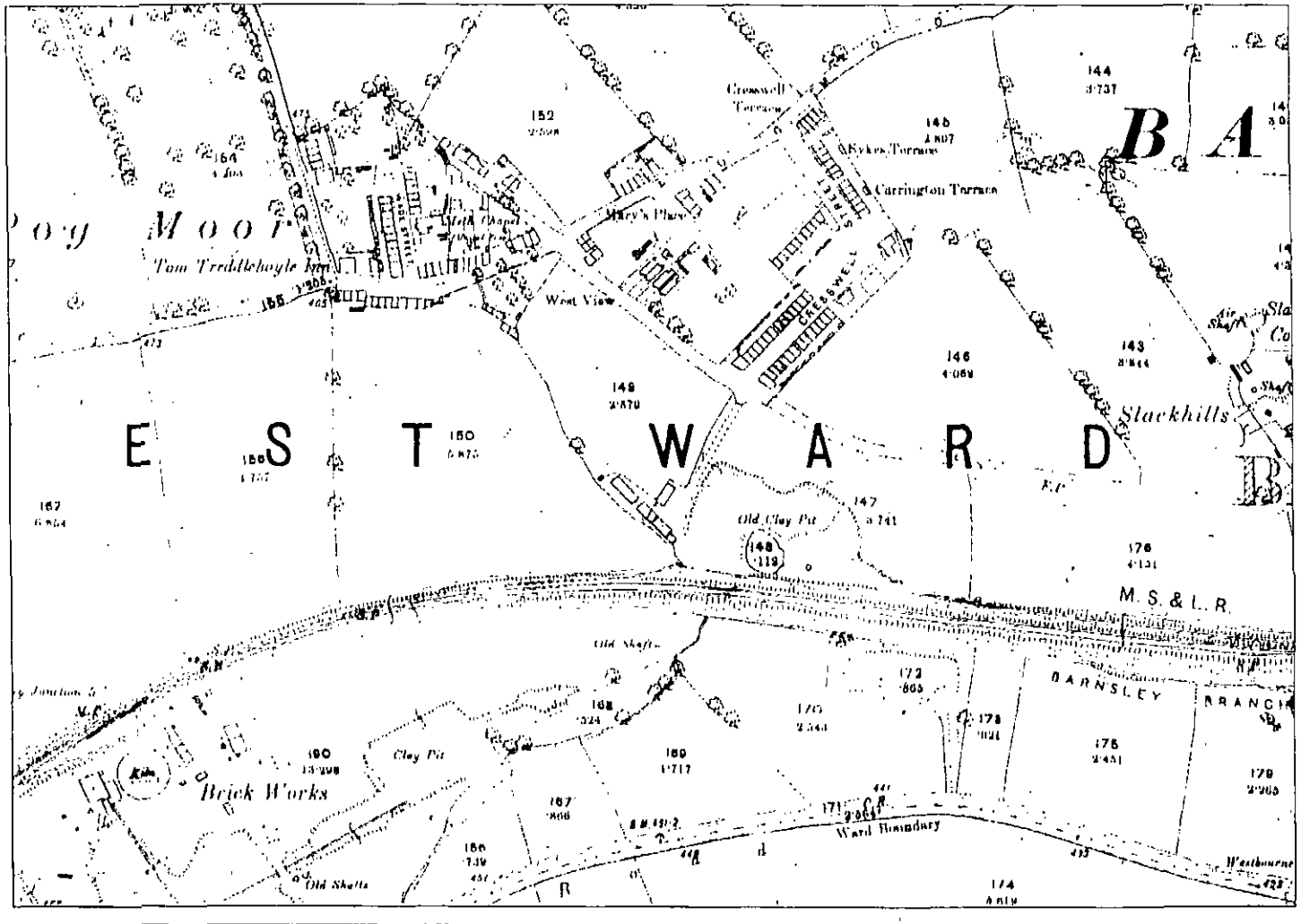
WEST ROAD, POGMOOR | OS PLAN 1850



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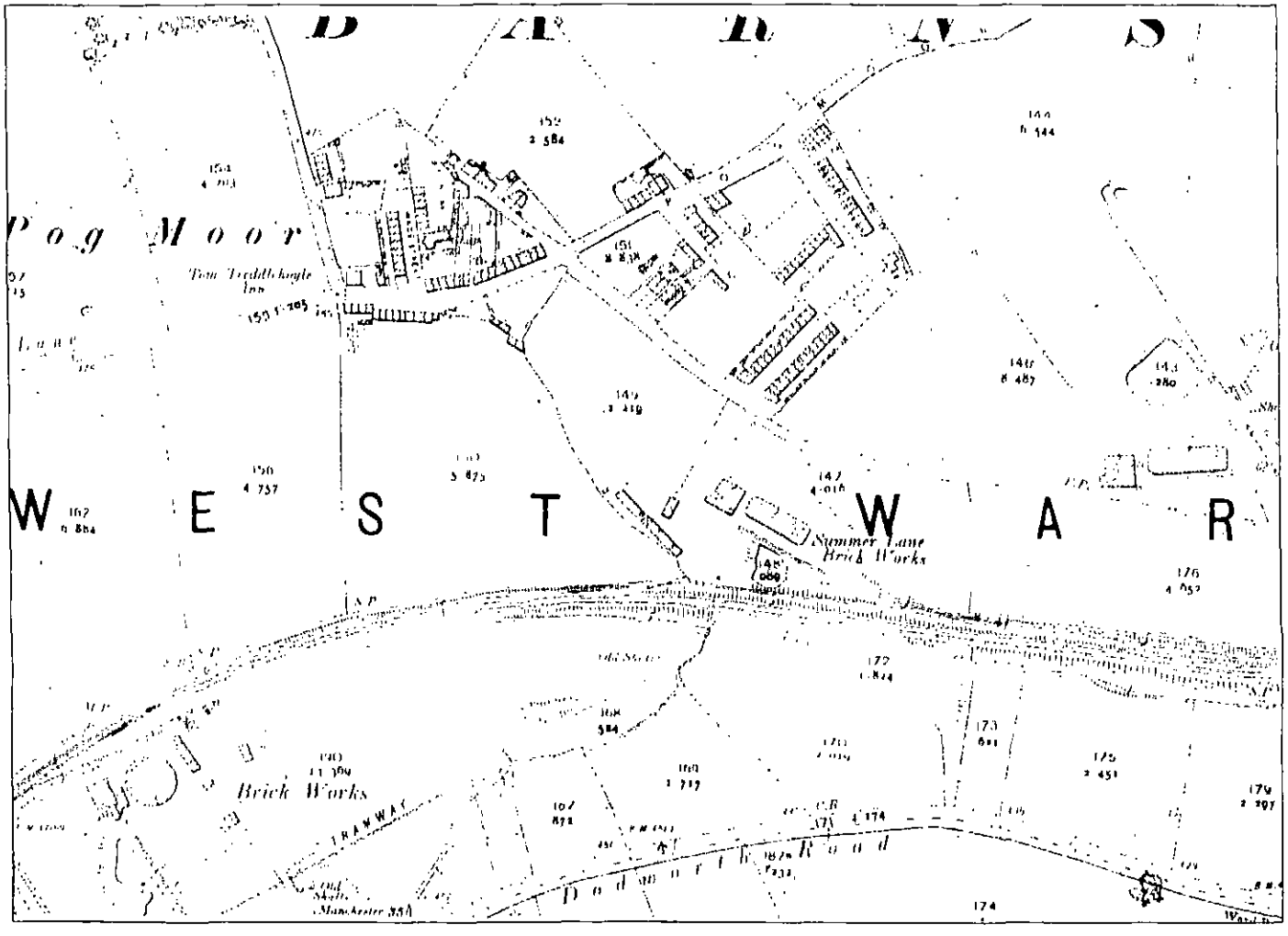
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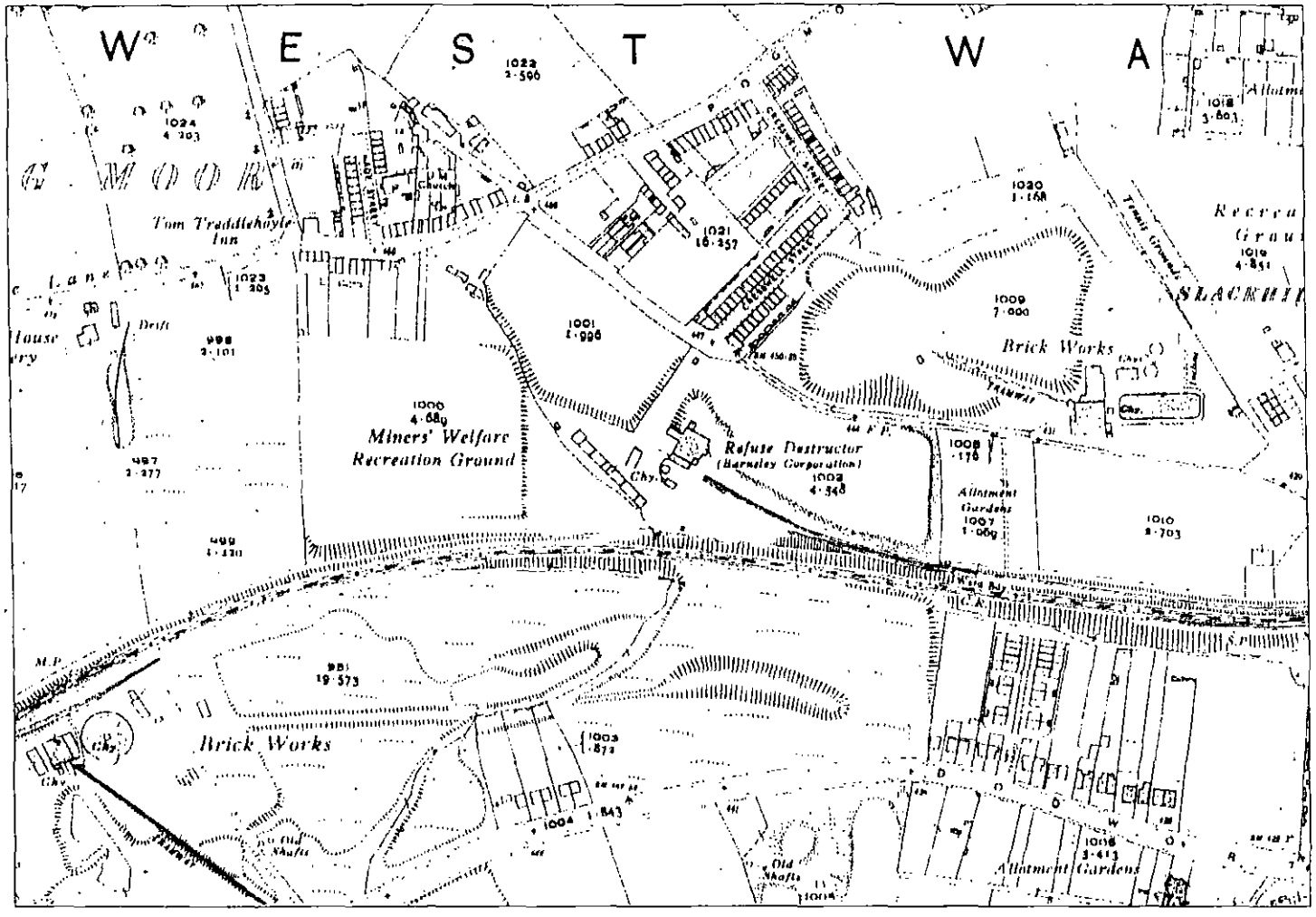
WEST ROAD, POGMOOR | OS PLAN 1906



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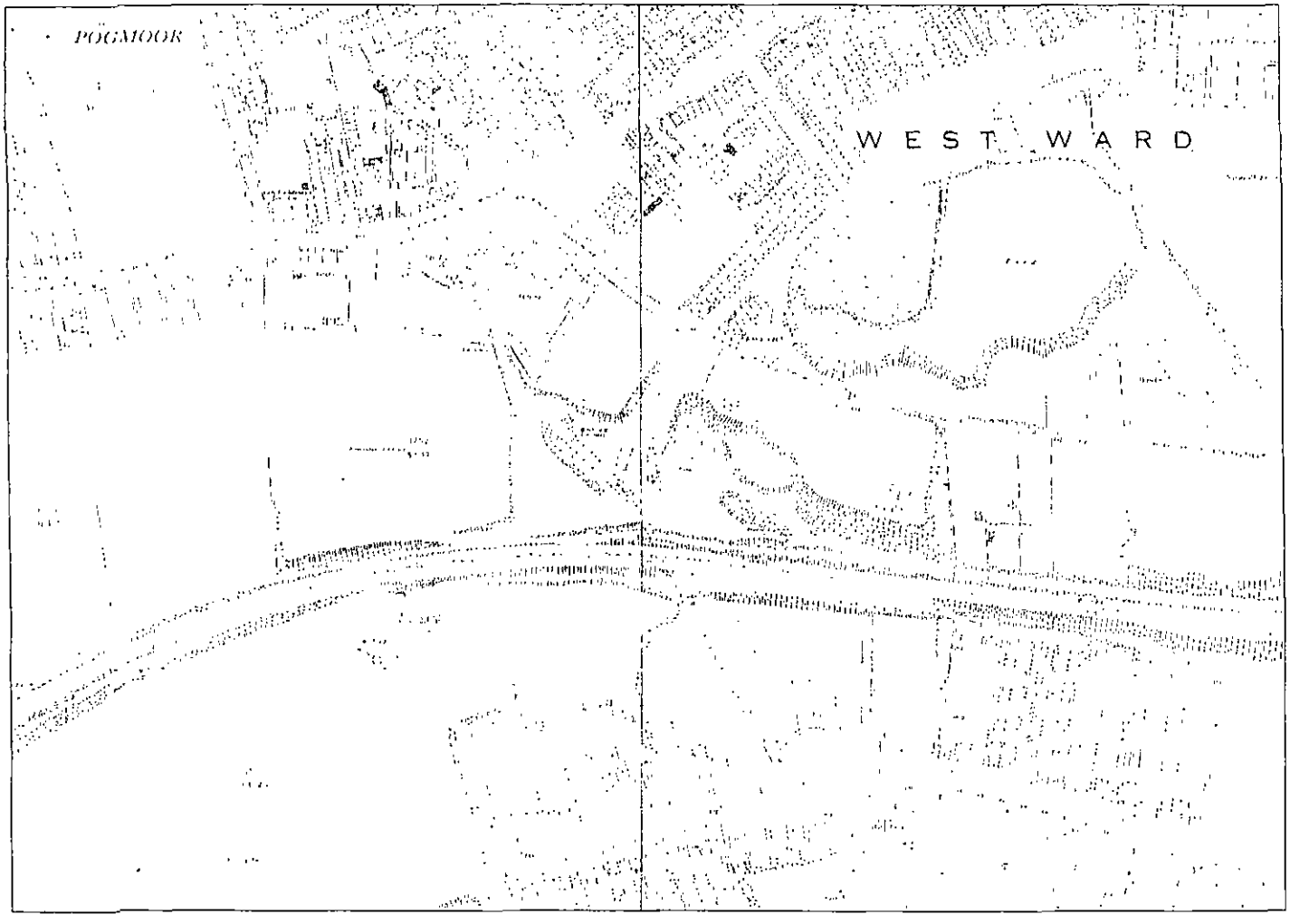
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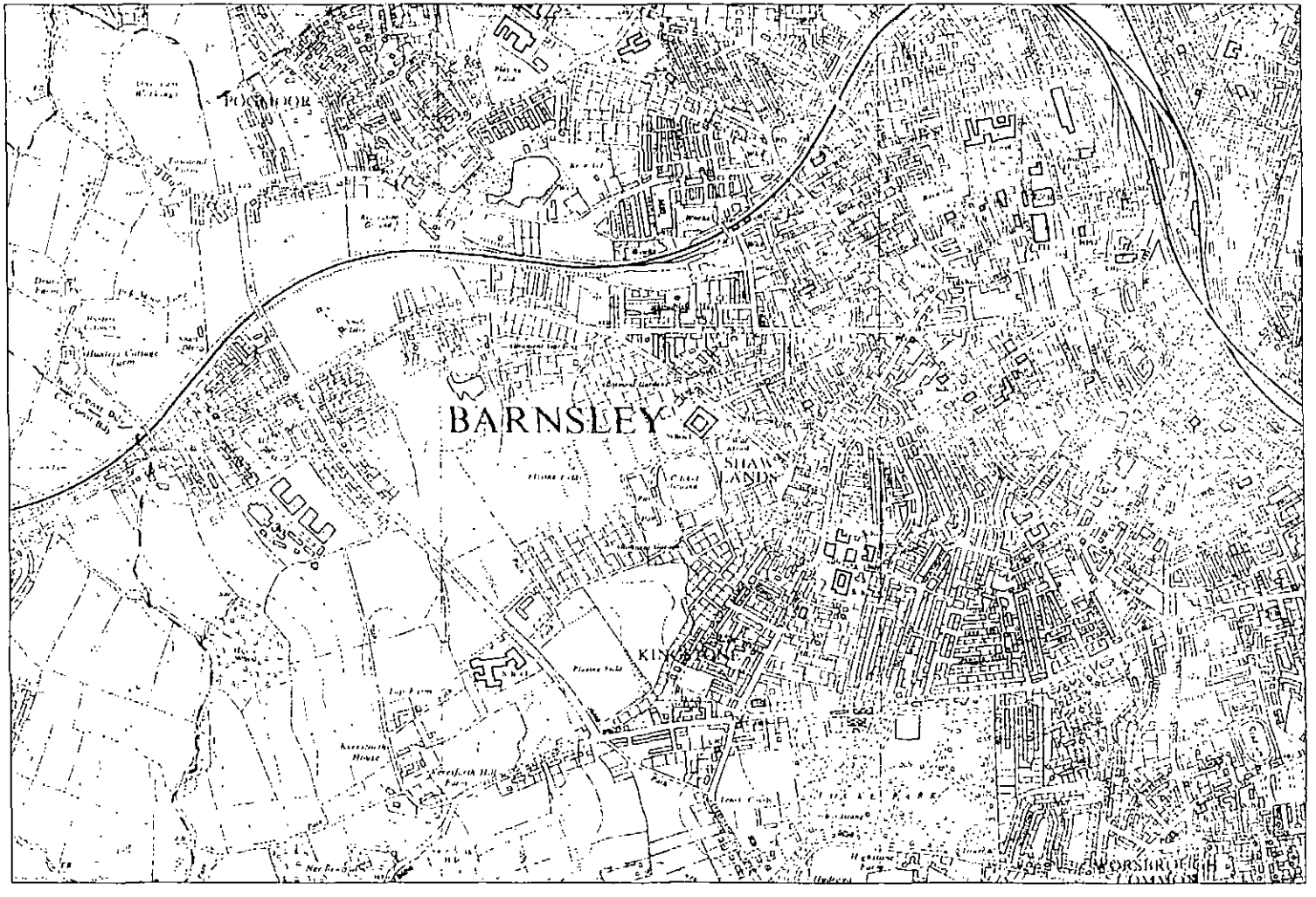
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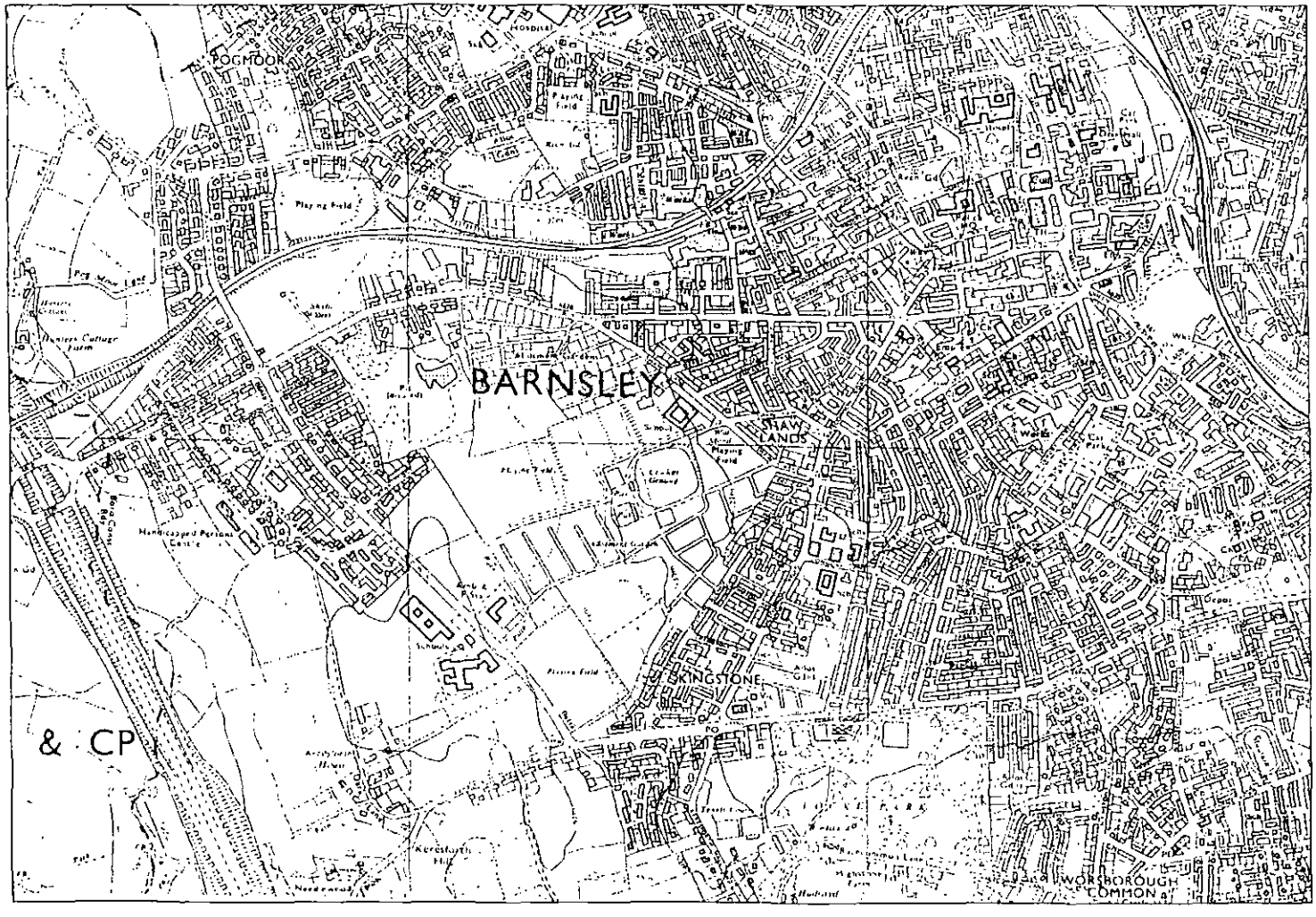
WEST ROAD, POGMOOR | OS PLAN 1966



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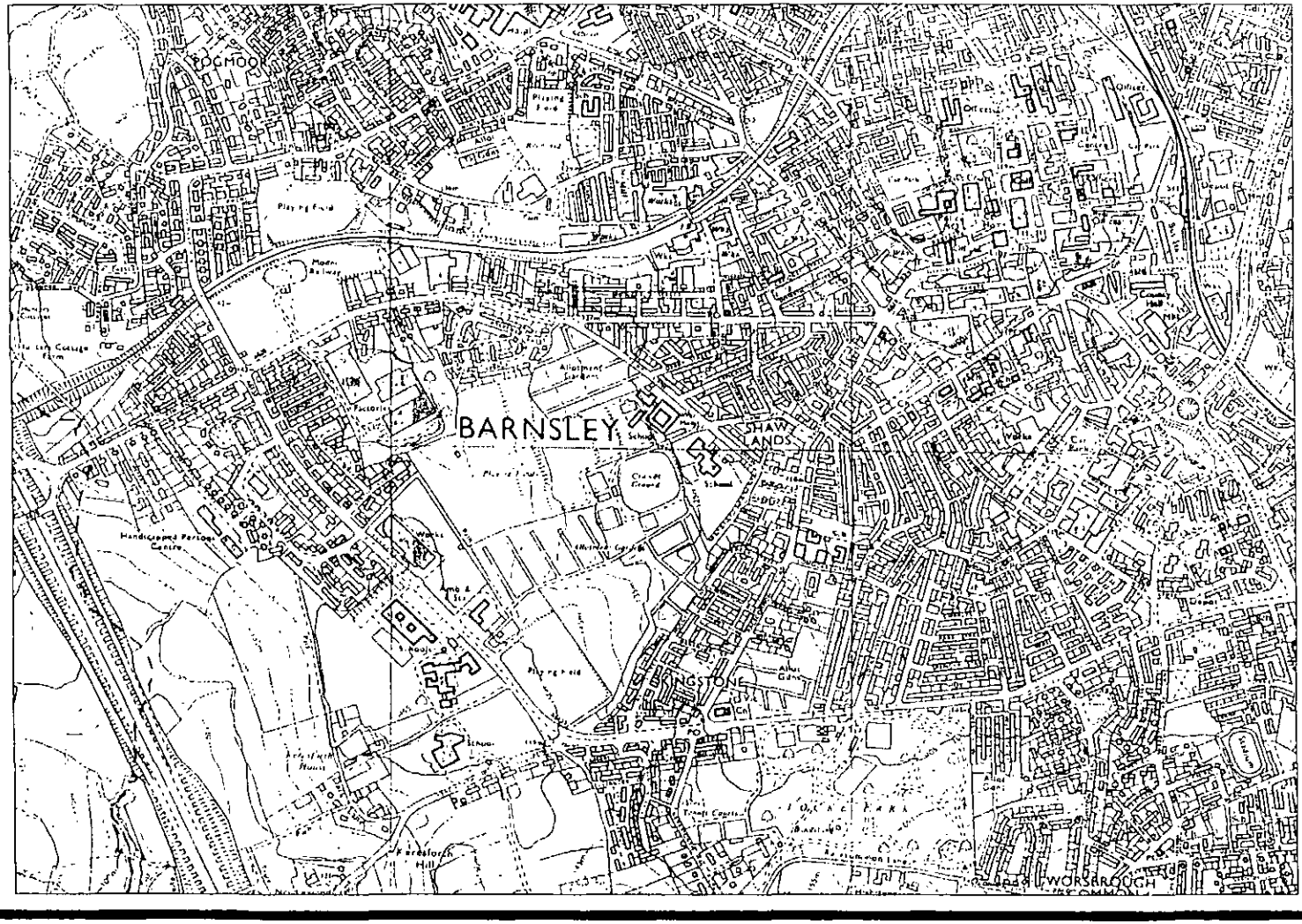
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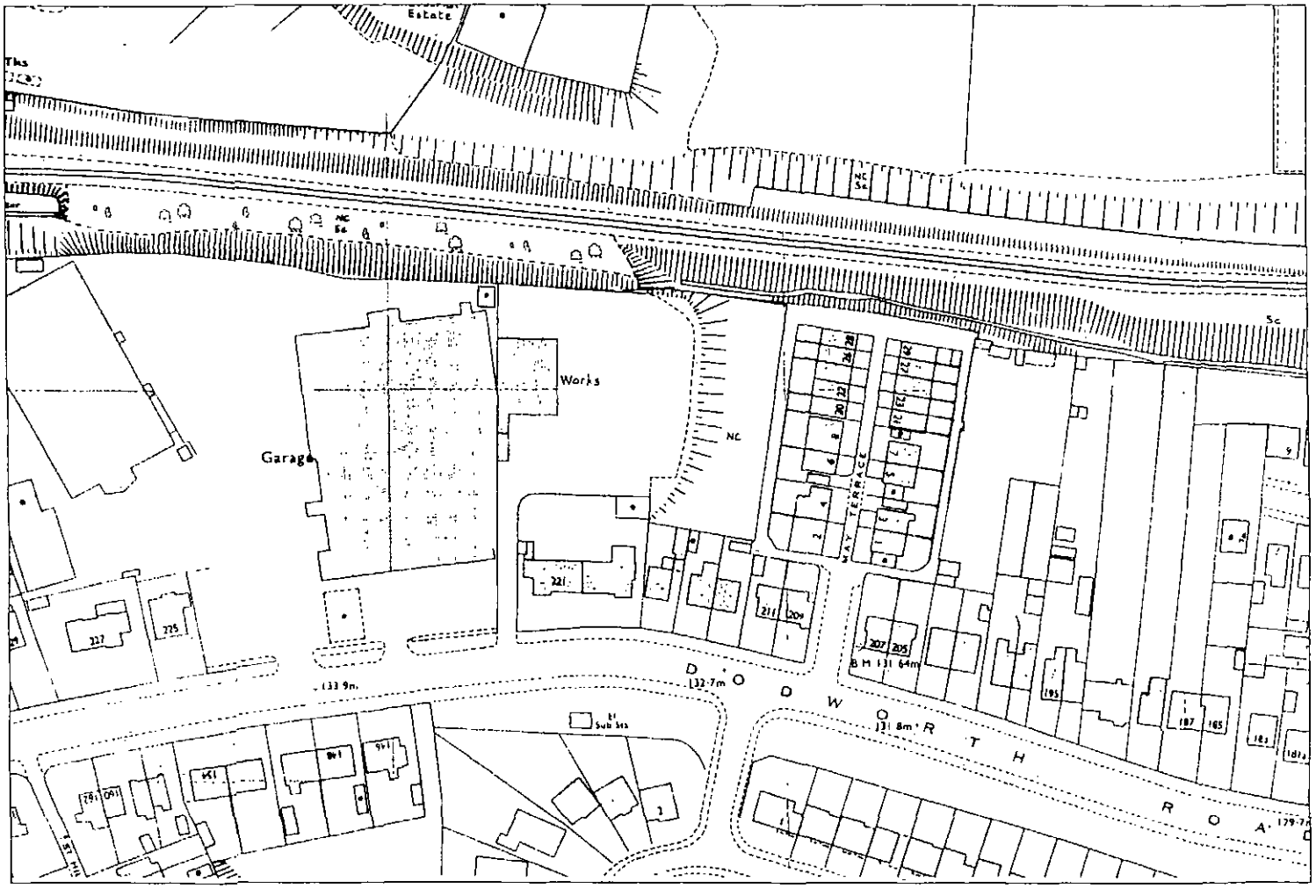
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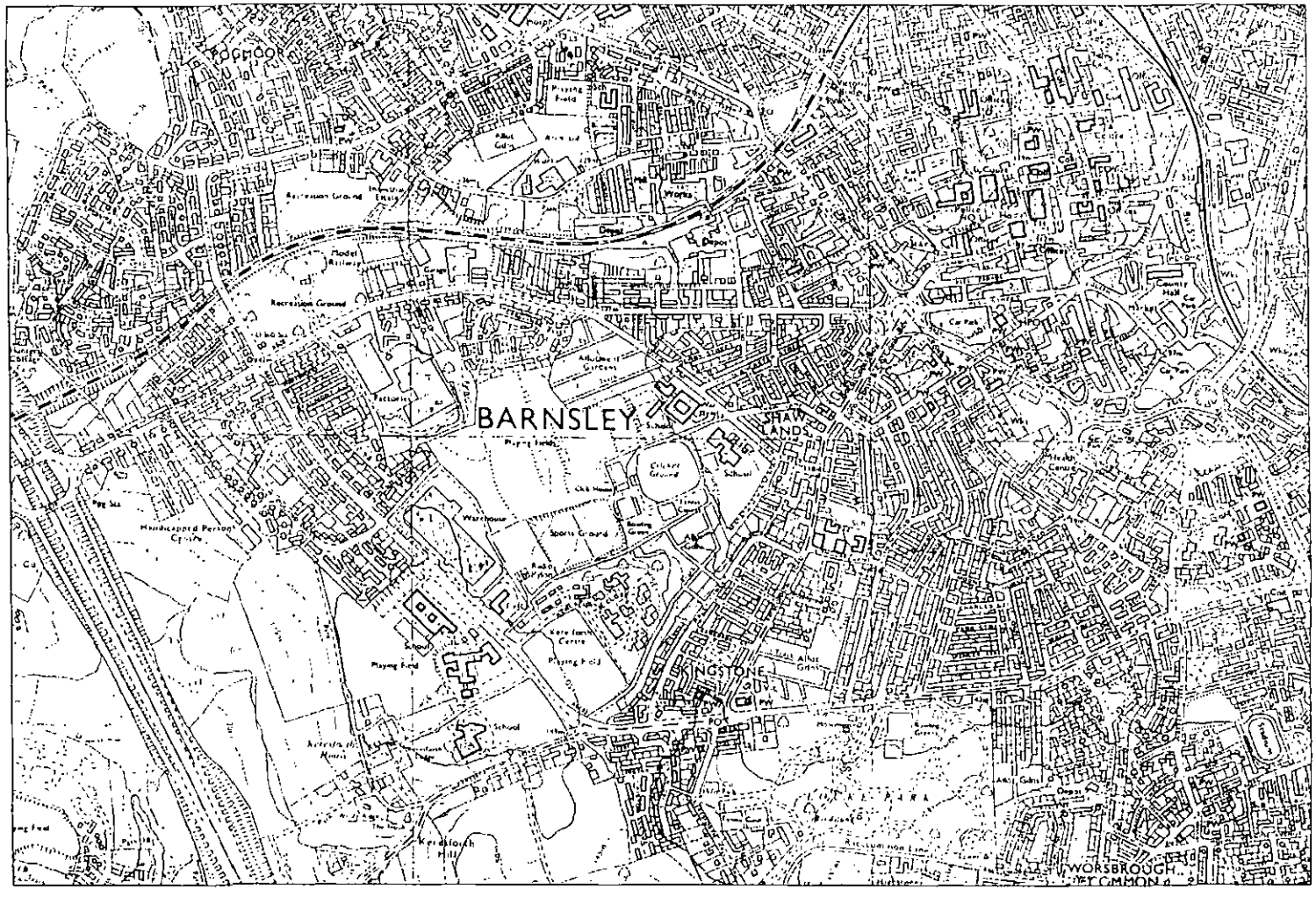
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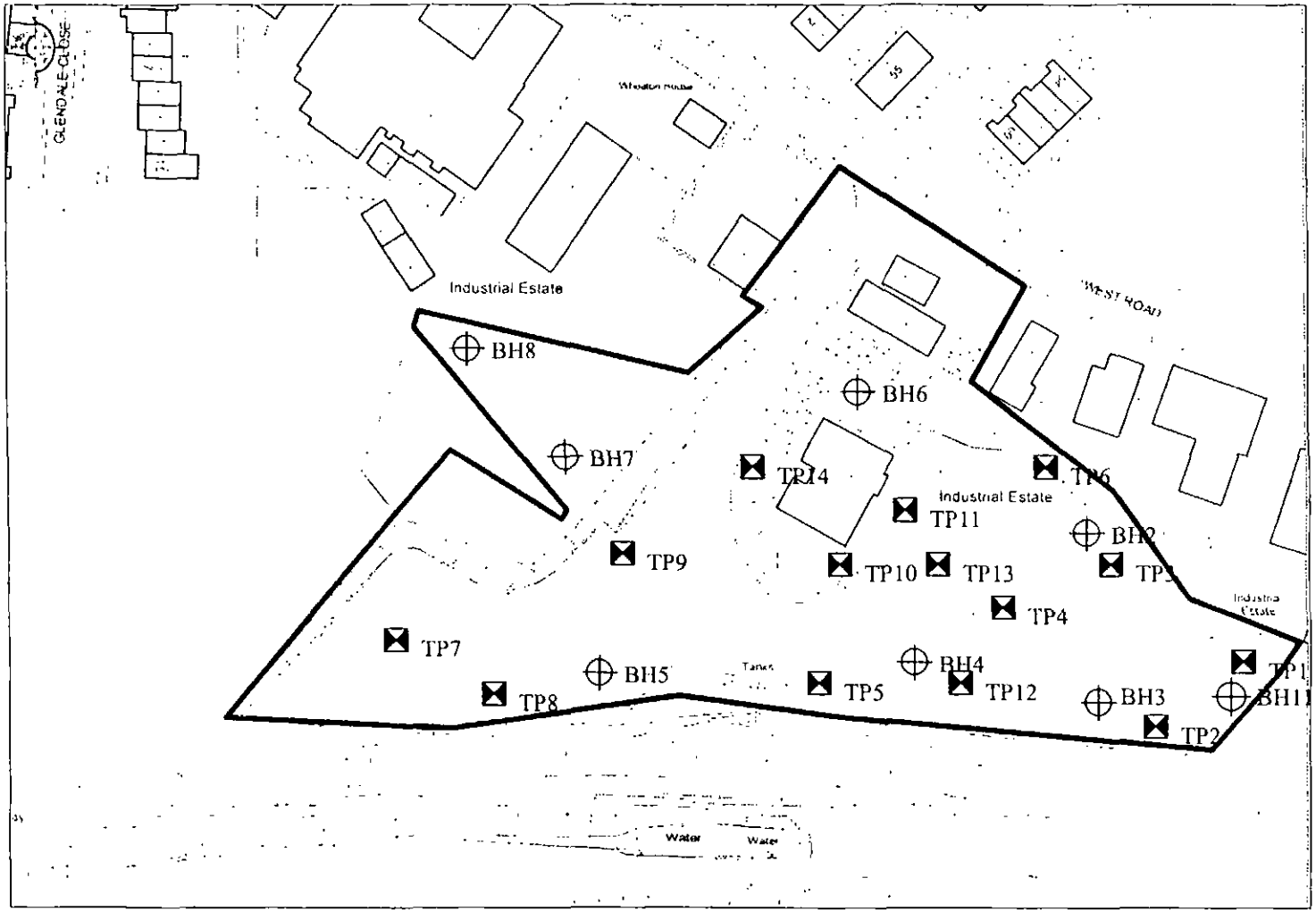


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WEST ROAD, POGMOOR

TRIAL PIT AND BOREHOLE LOCATION PLAN



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APPENDIX A

BOREHOLE AND TRIAL PIT LOGS

CLIENT:	Mr T Simpson and Mr D Lycett	**BOREHOLE LOG**	Borehole No: BH1
SITE NAME: West Road, Pogmoor	SITE LOCATION: Barnsley		
METHOD OF DRILLING: Shell and Auger	DIAMETER OF DRILL: 150mm	JOB NO: 2620	Sheet No: 2 of 2
DRILLING COMPANY: Wellhead Drilling Company	DATE: 22nd May 2007	NATIONAL GRID REFERENCE 433090E 406480N	OD LEVEL:

BORING		SAMPLES			TESTS		STRATA		DESCRIPTION OF STRATA
Date	Case	Water	Depth	Type	N	MC%	Depth (m)	Key	Description of Strata
23.05.07			5.45						Continued from sheet 1 in same stratum
		5.45	5.45	D					
			5.50-6.00	B			5.50		MADE GROUND - Loose wet black ash and clinker with gravel of sandstone, hardcore, brick and reworked mudstone with coal fragments.
			6.00-6.55	SPT	0*				
			6.55-7.00	SPT	34				
	7.00		7.00	D			7.00		
			7.00-7.50	SPT	>50		7.20		Firm to stiff yellow brown silty CLAY.
23.05.07			7.50	D			7.50		Weak to moderately strong grey MUDSTONE.
									BOREHOLE COMPLETED AT 7.50m bgl.

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DRILLING NOTES:

* Rods sank under own weight to 6.55m bgl N=0
Standpipe installed at 7.20m bgl.

CLIENT:	Mr T Simpson and Mr D Lycett	BOREHOLE LOG	Borehole No: BH2
SITE NAME: West Road, Pogmoor	SITE LOCATION: Barnsley		
METHOD OF DRILLING: Shell and Auger	DIAMETER OF DRILL: 150mm	JOB NO: 2620	Sheet No: 1 of 1
DRILLING COMPANY: Wellhead Drilling Company	DATE: 23rd May 2007	NATIONAL GRID REFERENCE 433069E 406512N	OD LEVEL:

BORING		SAMPLES			TESTS		STRATA		DESCRIPTION OF STRATA
Date	Case	Water	Depth	Type	N	MC%	Depth (m)	Key	Description of Strata
23.05.07			GL-1.00	B					MADE GROUND - Loose brown clayey topsoil with roots, black ash and clinker and brick fragments.
			1.40	D			1.40		
			1.55-2.00	SPT	10				MADE GROUND - Loose black ash and clinker with reqorked mudstone, brick fragments and red shale.
			2.00	D					
			2.20	D			2.20		
			2.55-3.00	SPT	19				MADE GROUND - Loose black ash and clinker with red shale and masses of brick, reworked mudstone and coal fragments.
			3.00	D					
			3.30	D			3.30		
			3.55-4.00	SPT	29				Very weak grey MUDSTONE/SHALE with coal partings.
			4.00	D					
			4.20	D			4.20		
			4.20-4.60	SPT	>50				Weak to mdoerately strong grey shaley MUDSTONE.
23.05.07		Dry	4.60	D			4.60		
									BOREHOLE COMPLETED AT 4.60m bgl.

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DRILLING NOTES:

CLIENT:	Mr T Simpson and Mr D Lycett	BOREHOLE LOG	Borehole No: BH3
SITE NAME: West Road, Pogmoor	SITE LOCATION: Barnsley		
METHOD OF DRILLING: Shell and Auger	DIAMETER OF DRILL: 150mm	JOB NO: 2620	Sheet No: 1 of 1
DRILLING COMPANY: Wellhead Drilling Company	DATE: 24th May 2007	NATIONAL GRID REFERENCE 433056E 406470N	OD LEVEL:

BORING		SAMPLES			TESTS		STRATA			DESCRIPTION OF STRATA
Date	Case	Water	Depth	Type	N	MC%	Depth (m)		Key	Description of Strata
24.05.07			GL-1.00	B						MADE GROUND -Loose topsoil with black ash and clinker and roots and stones, brick fragments and clay.
			1.50	D						
			1.55-1.70	SPT	>50			1.70		
			1.70	D						MADE GROUND - Loose black ash and clinker with brick fragments, reworked mudstone and coal fragments.
			2.00-2.55	B						
			2.55-3.00	SPT	10			2.55		MADE GROUND - Loose black ash and clinker with brick, reworked mudstone and coal fragments.
			3.00	D						
			3.50	D						
			3.55-4.00	SPT	4					
			4.00	D						
			4.40	D				4.40		
			4.55-5.00	SPT	27					Firm orange brown grey CLAY.
24.05.07		Dry	5.00	D				5.00		

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DRILLING NOTES:

CLIENT:	Mr T Simpson and Mr D Lycett	BOREHOLE LOG	Borehole No: BH3
SITE NAME: West Road, Pogmoor	SITE LOCATION: Barnsley		
METHOD OF DRILLING: Shell and Auger	DIAMETER OF DRILL: 150mm	JOB NO: 2620	Sheet No: 2 of 2
DRILLING COMPANY: Wellhead Drilling Company	DATE: 24th May 2007	NATIONAL GRID REFERENCE 433056E 406470N	OD LEVEL:

BORING		SAMPLES			TESTS		STRATA		DESCRIPTION OF STRATA
Date	Case	Water	Depth	Type	N	MC%	Depth (m)	Key	Description of Strata
24.05.07									Weak to very weak grey MUDSTONE.
			5.40-5.70	SPT	>50		5.40		Weak to moderately strong MUDSTONE with black shale partings.
24.05.07		Dry	5.70	D			5.70		
									BOREHOLE COMPLETED AT 5.70m bgl.

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Holmbridge, West Yorks HD9 2NH
Tel: 01484 689531 Fax: 01484 689932

DRILLING NOTES:

CLIENT:	Mr T Simpson and Mr D Lycett	BOREHOLE LOG	Borehole No: BH4
SITE NAME: West Road, Pogmoor	SITE LOCATION: Barnsley		
METHOD OF DRILLING: Shell and Auger	DIAMETER OF DRILL: 150mm	JOB NO: 2620	Sheet No: 1 of 2
DRILLING COMPANY: Wellhead Drilling Company	DATE: 23rd May 2007	NATIONAL GRID REFERENCE	OD LEVEL:

BORING		SAMPLES			TESTS		STRATA		DESCRIPTION OF STRATA
Date	Case	Water	Depth	Type	N	MC%	Depth (m)	Key	Description of Strata
23.05.07			0.40	D			0.60		MADE GROUND - Loose grey brown topsoil with roots and stones and brick fragements.
			0.80	D			1.70		MADE GROUND - Loose black ash and clinker with brick fragments and reworked clay and mudstone.
			1.55-2.00	SPT	5				
			2.00	D			2.00		MADE GROUND - Loose black ash and clinker with reworked clay and mudstone, brick fragments and coal.
			2.40	D					
			2.55-3.00	SPT	13				
			3.00	D					
			3.55-4.00	SPT	20		3.55		Weak to very weak grey MUDSTONE with black shale and coal partings.
			4.00	D					
			4.50	D			4.50		
			4.55-5.00	SPT	24				Weak to very weak grey MUDSTONE with shale and coal partings.
			5.00	D					Continued on sheet 2 in same stratum.

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DRILLING NOTES:

CLIENT:	Mr T Simpson and Mr D Lycett	BOREHOLE LOG	Borehole No: BH4
SITE NAME: West Road, Pogmoor	SITE LOCATION: Barnsley		
METHOD OF DRILLING: Shell and Auger	DIAMETER OF DRILL: 150mm	JOB NO: 2620	Sheet No: 2 of 2
DRILLING COMPANY: Wellhead Drilling Company	DATE: 23rd May 2007	NATIONAL GRID REFERENCE	OD LEVEL:

BORING		SAMPLES			TESTS		STRATA		DESCRIPTION OF STRATA
Date	Case	Water	Depth	Type	N	MC%	Depth (m)	Key	Description of Strata
23.05.07									*Continued from sheet 1 in same stratum.*
			5.30-5.55	SPT	>50		5.30		
			5.55	SPT					Weak grey MUDSTONE.
24.05.07		Dry	5.55	D			5.55		
									BOREHOLE COMPLETED AT 5.55m bgl.

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DRILLING NOTES:

CLIENT: Mr T Simpson and Mr D Lycett										BOREHOLE LOG	Borehole No: BH5
SITE NAME: West Road, Pogmoor								SITE LOCATION: Barnsley			
METHOD OF DRILLING: Shell and Auger								DIAMETER OF DRILL: 150mm		JOB NO: 2620	Sheet No: 1 of 1
DRILLING COMPANY: Wellhead Drilling Company								DATE: 24th May 2007		NATIONAL GRID REFERENCE 432990E 406490N	OD LEVEL:

BORING		SAMPLES			TESTS		STRATA		DESCRIPTION OF STRATA
Date	Case	Water	Depth	Type	N	MC%	Depth (m)	Key	Description of Strata
24.05.07			GL-1.00	B					MADE GROUND - Loose grey brown topsoil with stones and gravel, wood and house bricks.
			1.30	D			1.40		
24.05.07			1.55-2.00	SPT	9		1.50		MADE GROUND - Loose black ash and foundry slag.
25.05.07									MADE GROUND - Loose black ash and clinker with reworked mudstone and shale.
			2.00	D					
			2.55-3.00	SPT	0*				
			3.00						
			3.00-3.45	SPT	1				
			3.45	D					
			3.50-4.00	B			3.50		MADE GROUND - Loose ash, reworked shale and brick waste with clay.
							3.80		
25.05.07		Dry	4.00-4.05	SPT	>50		4.05		Weak grey MUDSTONE.
			4.05	D					**BOREHOLE COMPLETED AT 4.05m bgl.**

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DRILLING NOTES:

*Rods sank under own weight to 3.00m.

CLIENT:	Mr T Simpson & Mr D Lycett	BOREHOLE LOG	Borehole No: BH8
SITE NAME: West Road	SITE LOCATION: Pogmoor		
METHOD OF DRILLING: Shell and Auger	DIAMETER OF DRILL: 150mm	JOB NO: 2639	Sheet No: 1 of 2
DRILLING COMPANY: Wellhead Drilling Company	DATE: 28th August 2007	NATIONAL GRID REFERENCE	OD LEVEL:

BORING		SAMPLES			TESTS		STRATA			DESCRIPTION OF STRATA
Date	Case	Water	Depth	Type	N	MC%	Depth (m)		Key	Description of Strata
28.08.07			GL-1.00	B						MADE GROUND - Loose black ash and clinker with brick and concrete fragments and reworked clay.
			1.00	D			1	1.00		MADE GROUND - Loose black ash and clinker with reworked clay and mudstone and coal fragments.
			1.50	D						
			1.55-2.00	SPT	6			1.60		MADE GROUND - Loose black ash and clinker with reworked clay and brick and concrete fragments and reworked mudstone and coal fragments.
			2.50	D			2			
			2.55-3.00	SPT	22					
			3.30	D			3	3.30		MADE GROUND - Loose black ash and reworked clay.
			3.55-4.00	SPT	7					
	4.00							3.80		MADE GROUND - Dark green grey reworked clay with coal fragments.
			4.50	D			4	4.50		Firm friable orange brown CLAY.
			4.55-5.00	SPT	6					
28.08.07							5			

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DRILLING NOTES:

CLIENT:	Mr T Simpson & Mr D Lycett	BOREHOLE LOG	Borehole No: BH8
SITE NAME: West Road	SITE LOCATION: Pogmoor		
METHOD OF DRILLING: Shell and Auger	DIAMETER OF DRILL: 150mm	JOB NO: 2639	Sheet No: 2 of 2
DRILLING COMPANY: Wellhead Drilling Company	DATE: 28th August 2007	NATIONAL GRID REFERENCE	OD LEVEL:

BORING		SAMPLES			TESTS		STRATA		DESCRIPTION OF STRATA
Date	Case	Water	Depth	Type	N	MC%	Depth (m)	Key	Description of Strata
28.08.07			5.50 5.55- 6.00	D SPT	>50				Weak to very weak weathered orange brown grey MUDSTONE.
28.08.07		Dry					6.00		
									BOREHOLE COMPLETED AT 6.00m bgl.

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DRILLING NOTES:

CLIENT:	Mr T Simpson & Mr D Lycett	TRIAL PIT LOG	Trial Pit No. TP1
SITE NAME: West Road, Pogmoor	SITE LOCATION: Barnsley		
METHOD OF EXCAVATION: Mechanical Excavator	SIZE OF EXCAVATION:	JOB NO: 2620	Sheet No: 1 of 1
DRILLING COMPANY: -	DATE: 17th May 2007	NATIONAL GRID REFERENCE: 433093E 406482N	OD LEVEL:

TESTS		SAMPLES			STRATA		DESCRIPTION OF STRATA
MC%	Env.	Water	Depth	Type	Depth (m)	Legend	Description of Strata
			0.50	D	0.50		MADE GROUND - Loose brown grey topsoil with gravel and cobbles of sandstone.
			1.00	D	1		MADE GROUND - Loose brown grey sand and clay with gravel and cobbles of sandstone, fragments of brick and concrete.
			2.00	D	2 2.00		
			3.00	D	3 3.00		MADE GROUND - Loose gravel of coal and coal dust with some ash.
					4 4.00		MADE GROUND - Loose black ash and clinker with compacted and shredded paper.
					5		**TRIAL PIT COMPLETED AT 4.00m bgl.**

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NOTES:
Water encountered at 4.00m bgl.

CLIENT:	Mr T Simpson & Mr D Lycett	TRIAL PIT LOG	Trial Pit No.
SITE NAME: West Road, Pogmoor	SITE LOCATION: Barnsley		TP2
METHOD OF EXCAVATION: Mechanical Excavator	SIZE OF EXCAVATION:	JOB NO: 2620	Sheet No: 1 of 1
DRILLING COMPANY: -	DATE: 17th May 2007	NATIONAL GRID REFERENCE: 433069E 406477N	OD LEVEL:

TESTS		SAMPLES			STRATA		DESCRIPTION OF STRATA
MC%	Env.	Water	Depth	Type	Depth (m)	Legend	Description of Strata
							MADE GROUND - Loose brown grey topsoil with gravel and cobbles of sandstone.
			0.50	D	0.40		MADE GROUND - Loose brown grey sand and clay with gravel and cobbles of sandstone, fragments of brick and concrete and whole brick.
					2.00		MADE GROUND - Loose black ash and clinker.
			3.00	D			
		3.65			3.65		
							TRIAL PIT COMPLETED AT 3.65m bgl.

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NOTES:
Water encountered at 3.65m and settled at this level.

CLIENT:	Mr T Simpson & Mr D Lycett	TRIAL PIT LOG	Trial Pit No.
SITE NAME: West Road, Pogmoor	SITE LOCATION: Barnsley		TP3
METHOD OF EXCAVATION: Mechanical Excavator	SIZE OF EXCAVATION:	JOB NO: 2620	Sheet No: 1 of 1
DRILLING COMPANY: -	DATE: 17th May 2007	NATIONAL GRID REFERENCE: 433082E 406502N	OD LEVEL:

TESTS		SAMPLES			STRATA		DESCRIPTION OF STRATA
MC%	Env.	Water	Depth	Type	Depth (m)	Legend	Description of Strata
			0.30	D	0.40		MADE GROUND - Loose brown grey topsoil with gravel and cobbles of sandstone and reworked clay and whole and broken bricks.
		Dry	1.00	D	1.20		MADE GROUND - Loose brown grey clay and sand with gravel of cobbles of sandstone, brick and concrete, black ash and clinker.
							TRIAL PIT COMPLETED AT 1.20m bgl.

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NOTES:

CLIENT:	Mr T Simpson & Mr D Lycett	TRIAL PIT LOG	Trial Pit No.
SITE NAME: West Road, Pogmoor	SITE LOCATION: Barnsley		TP4
METHOD OF EXCAVATION: Mechanical Excavator	SIZE OF EXCAVATION:	JOB NO: 2620	Sheet No: 1 of 1
DRILLING COMPANY: -	DATE: 17th May 2007	NATIONAL GRID REFERENCE: 433063E 406501N	OD LEVEL:

TESTS		SAMPLES			STRATA		DESCRIPTION OF STRATA
MC%	Env.	Water	Depth	Type	Depth (m)	Legend	Description of Strata
			0.50	D	0.80		MADE GROUND - Loose topsoil with fragments of brick, concrete and black and and clinker.
			1.00	D	1.00		MADE GROUND - Loose fragments of stone and odour of hydrocarbons.
		3.30	3.30	W	3.30		MADE GROUND - Loose black ash and clinker with stones and gravel of sandstone and brick.
					3.50		Weak to very weak thinly laminated grey MUDSTONE/SHALE.
							TRIAL PIT COMPLETED AT 3.50m bgl.

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NOTES:

Water encountered at 3.30m bgl.
Water sample at 3.30m bgl.

CLIENT:	Mr T Simpson & Mr D Lycett	TRIAL PIT LOG	Trial Pit No. TP5
SITE NAME: West Road, Pogmoor	SITE LOCATION: Barnsley		
METHOD OF EXCAVATION: Mechanical Excavator	SIZE OF EXCAVATION:	JOB NO: 2620	Sheet No: 1 of 1
DRILLING COMPANY: -	DATE: 17th May 2007	NATIONAL GRID REFERENCE: 433019E 406484N	OD LEVEL:

TESTS		SAMPLES			STRATA		DESCRIPTION OF STRATA
MC%	Env	Water	Depth	Type	Depth (m)	Legend	Description of Strata
					0.40		MADE GROUND - Loose black ash and clinker with slight odour of hydrocarbons.
			0.50	D	0.60		MADE GROUND - Loose fragments, gravel and whole bricks.
					3.00		MADE GROUND - Loose black ash and clinker.
		Dry	3.30	D	3.30		Weak to very weak thinly laminated grey MUDSTONE/SHALE.
							BOREHOLE COMPLETED AT 3.30m bgl.

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NOTES:

CLIENT:	Mr T Simpson & Mr D Lycett	TRIAL PIT LOG	Trial Pit No.
SITE NAME: West Road, Pogmoor	SITE LOCATION: Barnsley		TP6
METHOD OF EXCAVATION: Mechanical Excavator	SIZE OF EXCAVATION:	JOB NO: 2620	Sheet No: 1 of 1
DRILLING COMPANY: -	DATE: 17th May 2007	NATIONAL GRID REFERENCE: 433048E 406516N	OD LEVEL:

TESTS		SAMPLES			STRATA		DESCRIPTION OF STRATA
MC%	Env.	Water	Depth	Type	Depth (m)	Legend	Description of Strata
					0.20		MADE GROUND - Loose topsoil with brick fragments and ash and clinker.
					0.40		MADE GROUND - Loose red brick dust and gravel.
			0.50	D	0.60		MADE GROUND - Loose black ash and clinker.
					1.00		MADE GROUND - Loose red brick gravel and whole bricks.
		Dry			1.20		Weak to very weak thinly laminated grey MUDSTONE/SHALE.
							TRIAL PIT COMPLETED AT 1.20m bgl.

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NOTES:

CLIENT:	Mr T Simpson & Mr D Lycett	TRIAL PIT LOG	Trial Pit No.
SITE NAME: West Road, Pogmoor	SITE LOCATION: Barnsley		TP7
METHOD OF EXCAVATION: Mechanical Excavator	SIZE OF EXCAVATION:	JOB NO: 2620	Sheet No: 1 of 1
DRILLING COMPANY: -	DATE: 17th May 2007	NATIONAL GRID REFERENCE: 432942E 406487N	OD LEVEL:

TESTS		SAMPLES			STRATA		DESCRIPTION OF STRATA
MC%	Env.	Water	Depth	Type	Depth (m)	Legend	Description of Strata
			0.10	D	0.40		MADE GROUND - Loose brown grey clayey topsoil with gravel and cobbles of brick and sandstone.
					1.20		MADE GROUND - Loose black ash and clinker.
		Dry	2.00	D	2.10		Firm becoming stiff yellow brown and grey silty CLAY.
							TRIAL PIT COMPLETED AT 2.10m bgl.

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NOTES:

CLIENT:	Mr T Simpson & Mr D Lycett	TRIAL PIT LOG	Trial Pit No. TP8
SITE NAME: West Road, Pogmoor	SITE LOCATION: Barnsley		
METHOD OF EXCAVATION: Mechanical Excavator	SIZE OF EXCAVATION:	JOB NO: 2620	Sheet No: 1 of 1
DRILLING COMPANY: -	DATE: 17th May 2007	NATIONAL GRID REFERENCE: 432962E 406483N	OD LEVEL:

TESTS		SAMPLES			STRATA		DESCRIPTION OF STRATA
MC%	Env.	Water	Depth	Type	Depth (m)	Legend	Description of Strata
			0.30	D	0.80		MADE GROUND - Loose black ash and clinker, red brick dust and gravel, clay and topsoil.
			1.50	D	2.70		MADE GROUND - Black ash and clinker with gravel of sandstone and reworked clay.
		Dry	2.70	D	3.00		Firm to stiff yellow grey silty CLAY.
							TRIAL PIT COMPLETED AT 3.00m bgl.

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NOTES:

CLIENT:	Mr T Simpson & Mr D Lycett	TRIAL PIT LOG	Trial Pit No.
SITE NAME: West Road, Pogmoor	SITE LOCATION: Barnsley		TP9
METHOD OF EXCAVATION: Mechanical Excavator	SIZE OF EXCAVATION:	JOB NO: 2620	Sheet No: 1 of 1
DRILLING COMPANY: -	DATE: 17th May 2007	NATIONAL GRID REFERENCE: 432985E 406504N	OD LEVEL:

TESTS		SAMPLES			STRATA		DESCRIPTION OF STRATA
MC%	Env.	Water	Depth	Type	Depth (m)	Legend	Description of Strata
					0.20		MADE GROUND - Loose brown grey topsoil with gravel of brick and concrete.
					0.40		MADE GROUND - Loose black ash and clinker with brick dust.
					0.60		MADE GROUND - A brick wall with loose gravel and whole and broken bricks.
			0.90	D	1		MADE GROUND - Black ash and clinker with brick fragments.
			1.60	D	1.60		
		Dry			1.80		Firm to stiff yellow brown and grey silty CLAY.
					2		**TRIAL PIT COMPLETED AT 1.80m bgl.**
					3		
					4		
					5		

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NOTES:

CLIENT:	Mr T Simpson & Mr D Lycett	TRIAL PIT LOG	Trial Pit No.
SITE NAME: West Road, Pogmoor	SITE LOCATION: Barnsley		TP10
METHOD OF EXCAVATION: Mechanical Excavator	SIZE OF EXCAVATION:	JOB NO: 2620	Sheet No: 1 of 1
DRILLING COMPANY: -	DATE: 17th May 2007	NATIONAL GRID REFERENCE: 433021E 406507N	OD LEVEL:

TESTS		SAMPLES			STRATA			DESCRIPTION OF STRATA
MC%	Env.	Water	Depth	Type	Depth (m)		Legend	Description of Strata
			0.20	D		0.50		MADE GROUND - Loose black ash and clinker with topsoil and brick fragments.
					1	1.50		MADE GROUND - Loose black ash and clinker with masses of red bricks.
			1.80	D		1.80		MADE GROUND - Loose black ash and clinker with masses of red bricks and reworked clay.
		Dry			2	2.20	- - - - -	Firm to stiff yellow brown and grey silty CLAY.
					3			**TRIAL PIT COMPELTED AT 2.20m bgl.**
					4			
					5			

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NOTES:

CLIENT:	Mr T Simpson & Mr D Lycett	TRIAL PIT LOG	Trial Pit No. TP11
SITE NAME: West Road, Pogmoor	SITE LOCATION: Barnsley		
METHOD OF EXCAVATION: Mechanical Excavator	SIZE OF EXCAVATION:	JOB NO: 2620	Sheet No: 1 of 1
DRILLING COMPANY: -	DATE: 17th May 2007	NATIONAL GRID REFERENCE: 433038E 406524N	OD LEVEL:

TESTS		SAMPLES			STRATA		DESCRIPTION OF STRATA
MC%	Env.	Water	Depth	Type	Depth (m)	Legend	Description of Strata
			0.50	D	0.50		MADE GROUND - Loose black ash and clinker with topsoil and gravel of sandstone.
			1.20	D	1.60		MADE GROUND - Loose black ash and clinker with masses of red bricks.
		Dry			1.80		Firm to stiff yellow brown CLAY.
							TRIAL PIT COMPLETED AT 1.80m bgl.

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NOTES:

CLIENT:	Mr T Simpson & Mr D Lycett			TRIAL PIT LOG	Trial Pit No. TP12
SITE NAME: West Road, Pogmoor		SITE LOCATION: Barnsley			
METHOD OF EXCAVATION: Mechanical Excavator		SIZE OF EXCAVATION:		JOB NO: 2620	Sheet No: 1 of 1
DRILLING COMPANY: -		DATE: 17th May 2007		NATIONAL GRID REFERENCE:	OD LEVEL:

TESTS		SAMPLES			STRATA		DESCRIPTION OF STRATA
MC%	Env.	Water	Depth	Type	Depth (m)	Legend	Description of Strata
							MADE GROUND - Loose black ash and clinker with brick fragments, reworked clay and gravel.
			3.00	D			
		3.20			3.20		
							TRIAL PIT COMPLETED AT 3.20m bgl.

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NOTES:

Water entry at 3.20m prevented further excavation.

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APPENDIX B

GEOTECHNICAL TEST RESULTS

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with clauses 3.2,4.3,4.4,5.3,5.4,7.2,8.2,8.3 of BS1377:Part 2:1990

Hole Reference	Sample No	Sample Type	Depth m	Moisture Content %	Bulk Density Mg/m^3	Dry Density Mg/m^3	Particle Density Mg/m^3	Liquid Limit %	Plastic Limit %	Plasticity Index %	% <425um	Description of Sample
BH 01	1	D	7.00	23				40	20	20	82	Grey slightly sandy slightly gravelly CLAY
BH 02	1	D	4.20	14				59	25	34	52	Grey slightly sandy slightly gravelly CLAY
BH 03	1	D	7.40	10				39	19	20	89	Grey slightly sandy slightly gravelly CLAY
BH 04	1	D	5.20	7.6				42	21	21	80	Grey slightly sandy slightly gravelly CLAY
TP 05	1	D	3.30	16				58	25	33	65	Grey slightly sandy slightly gravelly CLAY
TP 07	1	D	2.00	27				61	27	34	100	Brown slightly sandy CLAY
TP 08	1	D	2.70	30				67	28	39	79	Brown slightly sandy slightly gravelly CLAY

Approved Signatories: M. ATHORNE, M. DOLBY, T. CLIFFORD.

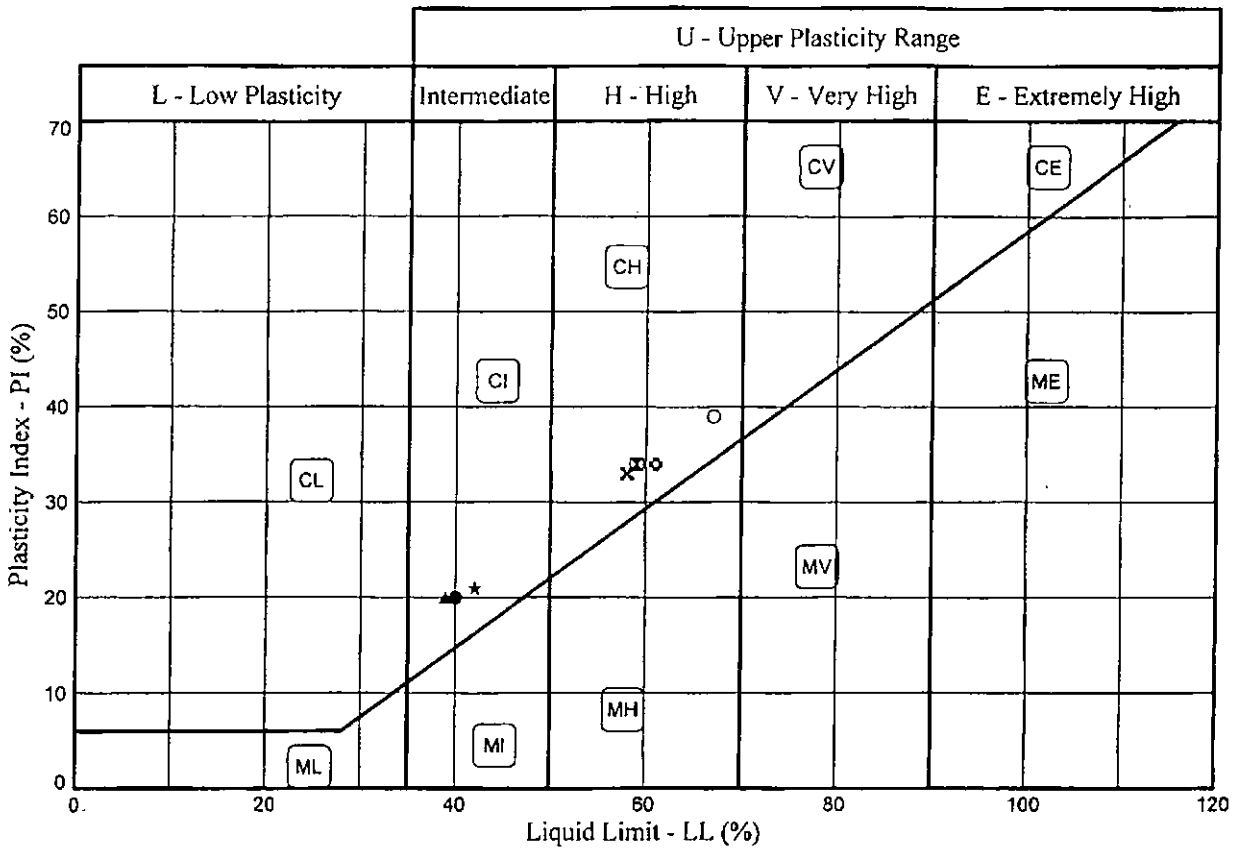
STRUCTURAL SOILS
The Potteries, Pottery Street
Castleford
West Yorkshire
WF10 1NJ

Compiled By	Date	Checked By	Date	Job No
M. MAnn	28.06.07	T Clifford	28/6/7	780028

Contract: Pogmoor

PLASTICITY CHART - PI Vs LL

In accordance with clause 42.3 of BS5930:1981
Testing in accordance with clauses 3.2,4.3,4.4,5.3,5.4 of BS1377:Part 2:1990



Sample Identification				MC	LL	PL	PI	<425um	Specimen Description
HoleID	Sample		Depth	%	%	%	%	%	
BH 01	1	D	7.00	23	40	20	20	82	Grey slightly sandy slightly gravelly CLAY
BH 02	1	D	4.20	14	59	25	34	52	Grey slightly sandy slightly gravelly CLAY
BH 03	1	D	7.40	10	39	19	20	89	Grey slightly sandy slightly gravelly CLAY
BH 04	1	D	5.20	7.6	42	21	21	80	Grey slightly sandy slightly gravelly CLAY
TP 05	1	D	3.30	16	58	25	33	65	Grey slightly sandy slightly gravelly CLAY
TP 07	1	D	2.00	27	61	27	34	100	Brown slightly sandy CLAY
TP 08	1	D	2.70	30	67	28	39	79	Brown slightly sandy slightly gravelly CLAY

* Non-standard test

Approved Signatories: M. ATHORNE, M. DOLBY, T. CLIFFORD.

STRUCTURAL SOILS
The Potteries, Pottery Street
Castleford
West Yorkshire
WF10 1NJ

Compiled By	Date	Checked By	Date
M. Athorne	28/06/07	T. Clifford	28/6/7

Contract	Job No
Pogmoor	780028

AGS

STRUCTURAL_SOILS_V6_02_2007_10_30.GLB - ALINE | 780028 - LAB - POGMOOR.GPJ - STRUCTURAL_SOILS_V6_02.GDT | 28/06/07 - 15:49

SUMMARY OF CHEMICAL ANALYSES

In accordance with clauses 5, 9 of BS1377:Part 3:1990.

Hole Reference	Sample No	Sample Type	Depth m	Sulphate (SO_3) Content #			Chloride Content		pH Value	Percent Passing 2 mm %	Description
				Acid Soluble Sulphate as % SO_4	Aqueous Extract as g/l SO_4+	Ground-water as g/l SO_4	Soluble Chloride as % Cl	Ground-water as g/l Cl			
BH 01	1	D	7.00		0.12				8.6	100	Grey slightly sandy slightly gravelly CLAY
BH 02	1	D	4.20		0.16				8.3	100	Grey slightly sandy slightly gravelly CLAY

NOTES : + In 2:1 water:soil extract
Calculated as SO_3 to BS1377:Part 3:1990, reported as SO_4 ($SO_4 = SO_3 \times 1.2$)
All chemical tests were undertaken by an external laboratory.
SO_4 results for soil are for material <2mm

Approved Signatories: M. ATHORNE, M. DOLBY, T. CLIFFORD.

STRUCTURAL SOILS
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Castleford
West Yorkshire
WF10 1NJ

Compiled By	Date	Checked By	Date	Job No
M. Athorne	28.06.07		28/6/7	780028

Contract: **Pogmoor**

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APPENDIX C

ENVIRONMENTAL TEST RESULTS

ENVIRONMENTAL TEST RESULTS - SOIL
CLASSIFICATION OF CONTAMINATION

BH/TP No.	Depth m	Arsenic mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/kg	Cyanide mg/kg	Lead mg/kg	Mercury mg/kg	Nickel mg/kg	pH Units	PAH mg/kg	Phenol mg/kg	Selenium mg/kg	Sulphate mg/kg	Sulphide mg/kg	Sulphur mg/kg	Thiocyanate mg/kg	Zinc mg/kg
TP1	1	16.5	3.7	0.82	19.1	71.4	<0.5	137.8	0.41	22.5	8.1	475	<0.5	0.93	1900	120	3000	<0.2	968.4
TP1	3	62.9	9.9	0.45	23.8	213.6	<0.5	330.9	0.82	41.2	7.6	499	0.5	1.46	1840	1	8930	0.3	278.4
TP2	3	71.9	4	1.53	55.5	709.1	<0.5	1145	0.59	49.8	7.9	394	<0.5	1.58	11600	13	<50	0.2	1680
TP5	0.5	61.1	2.6	13.54	88.4	677.9	<0.5	1455	3.05	111.9	8.8	308	<0.5	2.87	3550	1	4890	0.4	2080
TP5	3.3	3.1	1.6	0.17	22.4	39.7	<0.5	36	<0.1	45.9	8.3	<10	<0.5	<0.5	222	<0.5	340	0.5	132.8
TP8	0.3	15.7	1.2	0.4	21	55.3	<0.5	159.5	0.17	20.5	8.4	99	<0.5	1.17	1820	26	1160	<0.2	164.1
TP8	2.7	3.1	2	<0.1	24.5	17.8	<0.5	20.2	<0.1	15.7	7.8	<10	<0.5	0.65	772	<0.5	240	<0.2	64.3
TP9	0.4	19.2	2.1	0.14	18.2	60	<0.5	34.3	<0.1	34.4	8.5	394	<0.5	0.56	1430	4	2270	<0.2	40.4
TP10	0.2	299.3	3	0.63	33.9	162.5	<0.5	213.3	0.28	69.3	8.4	457	<0.5	3.1	2000	29	2450	<0.2	107.8
TP11	1.2	5.8	0.9	0.12	13.4	41.5	<0.5	27.5	<0.1	45.7	8.6	17	0.7	0.79	323	5	360	<0.2	69.2
TP12	3	63.8	2.5	0.98	28.5	220.5	<0.5	371.3	0.37	48.9	8	741	<0.5	1.75	9370	42	6370	0.2	425
TP13	2	9.3	1	0.13	19.1	44.5	<0.5	38.6	<0.1	44.8	8.2	11	<0.5	<0.5	347	2	660	<0.2	100.3
TP14	0.5	27.7	2.8	2.19	39.5	533.5	<0.5	513.3	0.57	42.7	8.9	1830	<0.5	1.79	4320	166	4640	0.5	1080

Uncontaminated	7	10	13	10	13	11	13
Guideline value	6	3	0	3	0	2	0

ENVIRONMENTAL TEST RESULTS - SOIL
CLASSIFICATION OF CONTAMINATION

Sample No.	Depth m	Arsenic mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/kg	Cyanide mg/kg	Lead mg/kg	Mercury mg/kg	Nickel mg/kg	pH Units	PAH mg/kg	Phenol mg/kg	Selenium mg/kg	Sulphate mg/kg	Sulphide mg/kg	Sulphur mg/kg	Thiocyanate mg/kg	Zinc mg/kg
Sample 1	1.5	7.6	1.2	0.21	13.6	31.2	<0.5	104.6	0.14	13	9	1080	<0.5	<0.5	1040	60.6	810	<2.0	168.6
Sample 2	1	8.3	1.1	<0.1	18.5	18.2	<0.5	25.8	<0.1	23	9	147	<0.5	<0.5	543	4.4	480	<2.0	72.9
Sample 2	2.5	5.9	0.6	0.27	22.8	20.3	<0.5	48.2	<0.1	16.9	9	79	<0.5	<0.5	1180	26.9	760	<2.0	49.1

Uncontaminated	3		3	3			3	3	3				3						
Guideline value	0		0	0			0	0	0				0						

Our Ref: EFS/072343 (Ver.)
Your Ref: 2 20

June 2007

TES Bretby
PO Box 00
Bretby Business Park
Ashby Road
Burton-on-Trent
Staffordshire
DE 0 D

Telephone: 0 2 3 4400
Facsimile: 0 2 3 4422

Ms F Bennett
Ashton Bennett Consultancy
Unit
Clarence Mill
Woodhead Road
Holmbridge
Holmfirth
HD 2NE

For the attention of Ms F Bennett

Dear Ms Bennett

SOLID Sample Analysis - Pogmoor

Samples from the above site have been analysed in accordance ith the schedule supplied.
The sample details and the results of analyses for these samples are given in the appended report.

An invoice for this ork ill follo under a separate cover.

Where appropriate the samples ill be kept until 03/07/07 hen they ill be discarded. Please call 0 2 3 4 00 for an extension of this date.
Please be a are that from January 2003 our policy for the retention of paper based laboratory records and analysis reports ill be 3 years.

The ork as carried out in accordance ith Environmental Services Group Standard Terms and Conditions of Contract.

If I can be of any further assistance please do not hesitate to contact me.

Yours sincerely

for TES Bretby

J Elstub
Pro ect Co-ordinator
0 2 3 4 00

TES Bretby is a trading name of Environmental Services Group Limited.
Registered office: Askern Road Carcroft Doncaster South Yorkshire DN DG
Registered No: 2 0 0

TES Bretby

TEST REPORT
SOLID SAMPLE ANALYSIS

UKAS TESTING
1252

TES Report No. EFS/072343

Ashton Bennett Consultancy
Unit
Clarence Mill
Woodhead Road
Holmbridge
Holmfirth
HD 2NE

Site: Pogmoor

The samples described in this report ere logged for analysis by TES Bretby on 22-May-2007.
The analysis as completed by: 0 -Jun-2007

Tests here the accreditation is set to N or No and any individual data items marked ith a * are not U AS accredited
Any opinions or interpretations expressed herein are outside the scope of any U AS accreditation held by TES Bretby Laboratories.

The follo ing tables are contained in this report:

Table Main Analysis Results (Pages 2 to 3)
GC-FID Chromatograms (Pages 4 to)
Table of Report Notes (Page)

On behalf of
TES Bretby :
J Elstub

Pro ect Co-ordinator

Date of Issue: 0 -Jun-2007

Tests marked ^ have been subcontracted to another laboratory.

TES Bretby accepts no responsibility for any sampling not carried out by our personnel.

Units :		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pH Units			
Method Codes :		ICPACIDS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	PAHSCUV	TPHFIDUS	WSLM3			
Method Reporting Limits :		10	0.5	0.1	0.5	0.5	0.5	0.10	0.5	0.5	3.0	10	10.0				
UKAS Accredited :		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes			
TES ID Number CU	Client Sample Description	SO4-- (acid sol)	Arsenic (MS)	Cadmium (MS)	Chromium (MS)	Copper (MS)	Lead (MS)	Mercury (MS)	Nickel (MS)	Selenium (MS)	Zinc (MS)	PAH (screening)	TPH by GCFID (AR)	pH units			
0713681	TP1 1.0	1900	16.5	0.82	19.1	71.4	137.8	0.41	22.5	0.93	968.4	475		8.1			
0713682	TP1 3.0	1840	62.9	0.45	23.8	213.6	330.9	0.82	41.2	1.46	278.4	499		7.6			
0713683	TP2 0.5																
0713684	TP2 3.0	11600	71.9	1.53	55.5	709.1	1144.8	0.59	49.8	1.58	1680	394		7.9			
0713685	TP3 0.3																
0713686	TP4 0.5																
0713687	TP4 1.0												1350				
0713688	TP5 0.5	3550	61.1	13.54	88.4	677.9	1454.5	3.05	111.9	2.87	2080	308	306	8.8			
0713689	TP5 3.3	222	3.1	0.17	22.4	39.7	36	<0.1	45.9	<0.5	132.8	<10		8.3			
0713690	TP7 0.1																
0713691	TP8 0.3	1820	15.7	0.4	21	55.3	159.5	0.17	20.5	1.17	164.1	99		8.4			
0713692	TP8 2.7	772	3.1	<0.1	24.5	17.8	20.2	<0.1	15.7	0.65	64.3	<10		7.8			
0713693	TP9 0.4	1430	19.2	0.14	18.2	60	34.3	<0.1	34.4	0.56	40.4	394		8.5			
0713694	TP10 0.2	2000	299.3	0.63	33.9	162.5	213.3	0.28	69.3	3.1	107.8	457		8.4			
0713695	TP11 1.2	323	5.8	0.12	13.4	41.5	27.5	<0.1	45.7	0.79	69.2	17		8.6			
0713696	TP12 3.0	9370	63.8	0.98	28.5	220.5	371.3	0.37	48.9	1.75	425	741		8.0			
0713697	TP13 2.0	347	9.3	0.13	19.1	44.5	38.8	<0.1	44.8	<0.5	100.3	11		8.2			
0713698	TP14 0.5	4320	27.7	2.19	39.5	533.5	513.3	0.57	42.7	1.79	1080	1830		8.9			

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Client Name	Ashton Bennett Consultancy
Contact	Ms F Bennett

Pogmoor

Soils Sample Analysis

Date Printed	05-Jun-07
Report Number	EFS/072343
Table Number	1

TES Bretby

Units :		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		mg/kg	%								
Method Codes :		ICPBOR	KONECN	KONENS	Konescn	KONETCNTS	KONETCNTS	SEN9	SFAPI	TSBRE1								
Method Reporting Limits :		0.5	0.5	0.1	0.2	0.5	0.5		0.5	0.005								
UKAS Accredited :		no	no	no	no	no	no	no	no	no								
TES ID Number CU	Client Sample Description	Boron (H20 Soluble)	Cyanide (Free):	Chromium vi:	Thiocyanate:	Cyanide (Total):	Sulphide:	Asbestos (screening)	Phenol Index	Total Sulphur:								
0713681	TP1 1.0	3.7	<0.5	<0.1	<0.2	0.5	120		<0.5	0.300								
0713682	TP1 3.0	9.9	<0.5	<0.1	0.3	<0.5	1.0		0.5	0.893								
0713683	TP2 0.5							NBFO										
0713684	TP2 3.0	4.0	<0.5	0.4	0.2	1.0	13.0		<0.5	<0.005								
0713685	TP3 0.3							NBFO										
0713686	TP4 0.5							NBFO										
0713687	TP4 1.0																	
0713688	TP5 0.5	2.8	<0.5	<0.1	0.4	0.7	1.0		<0.5	0.489								
0713689	TP5 3.3	1.6	<0.5	<0.1	0.5	<0.5	<0.5		<0.5	0.034								
0713690	TP7 0.1							NBFO										
0713691	TP8 0.3	1.2	<0.5	<0.1	<0.2	0.8	26		<0.5	0.116								
0713692	TP8 2.7	2.0	<0.5	<0.1	<0.2	2.0	<0.5		<0.5	0.024								
0713693	TP9 0.4	2.1	<0.5	<0.1	<0.2	2.0	4.0		<0.5	0.227								
0713694	TP10 0.2	3.0	<0.5	<0.1	<0.2	0.7	29	NBFO	<0.5	0.245								
0713695	TP11 1.2	0.9	<0.5	<0.1	<0.2	<0.5	5.0		0.7	0.036								
0713696	TP12 3.0	2.5	<0.5	<0.1	0.2	1.0	42		<0.5	0.637								
0713697	TP13 2.0	1.0	<0.5	<0.1	<0.2	<0.5	2.0		<0.5	0.066								
0713698	TP14 0.5	2.8	<0.5	<0.1	0.5	2.0	168	NBFO	<0.5	0.464								

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Contact	Ms F Bennett

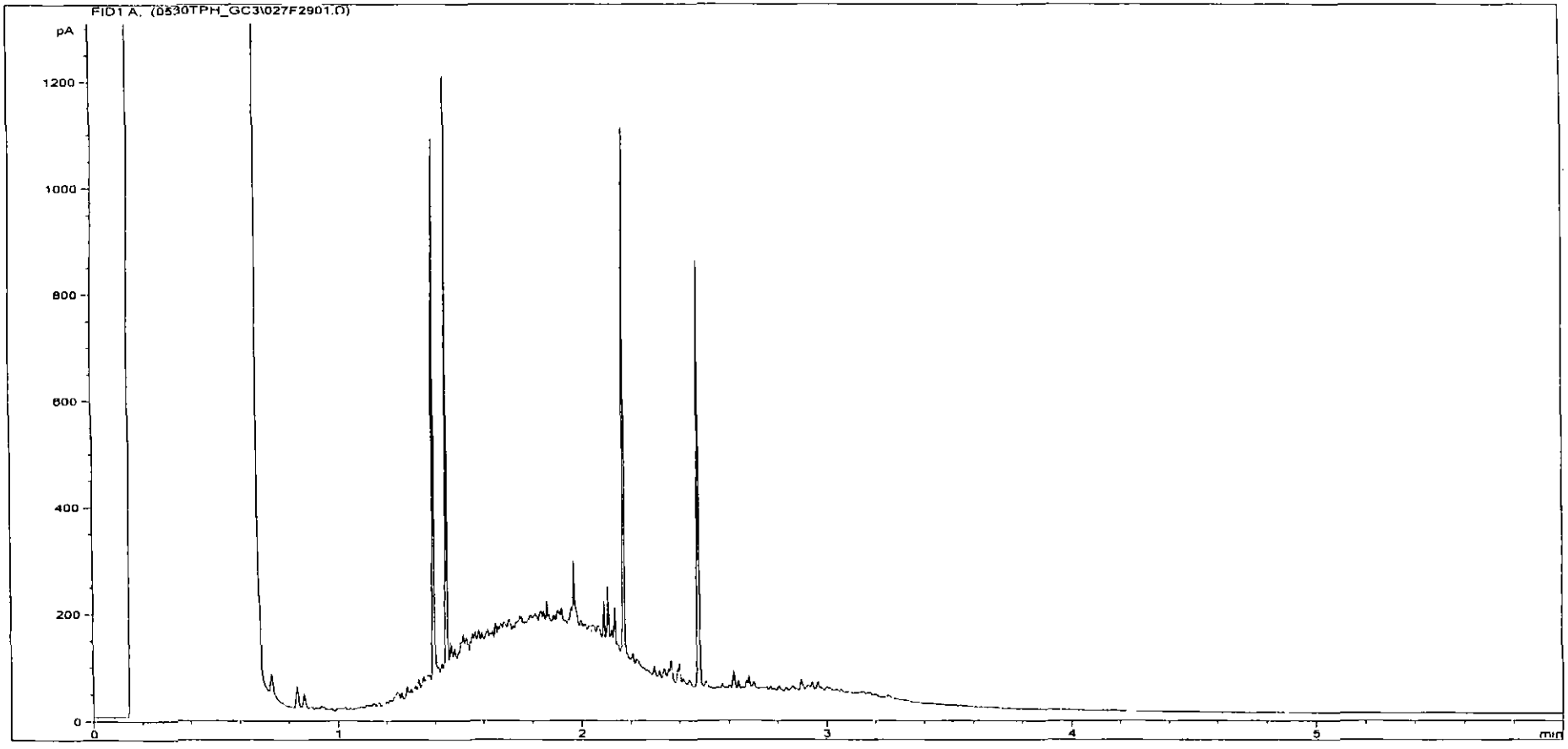
Pogmoor

Soils Sample Analysis

Date Printed	05-Jun-07
Report Number	EFS/072343
Table Number	1

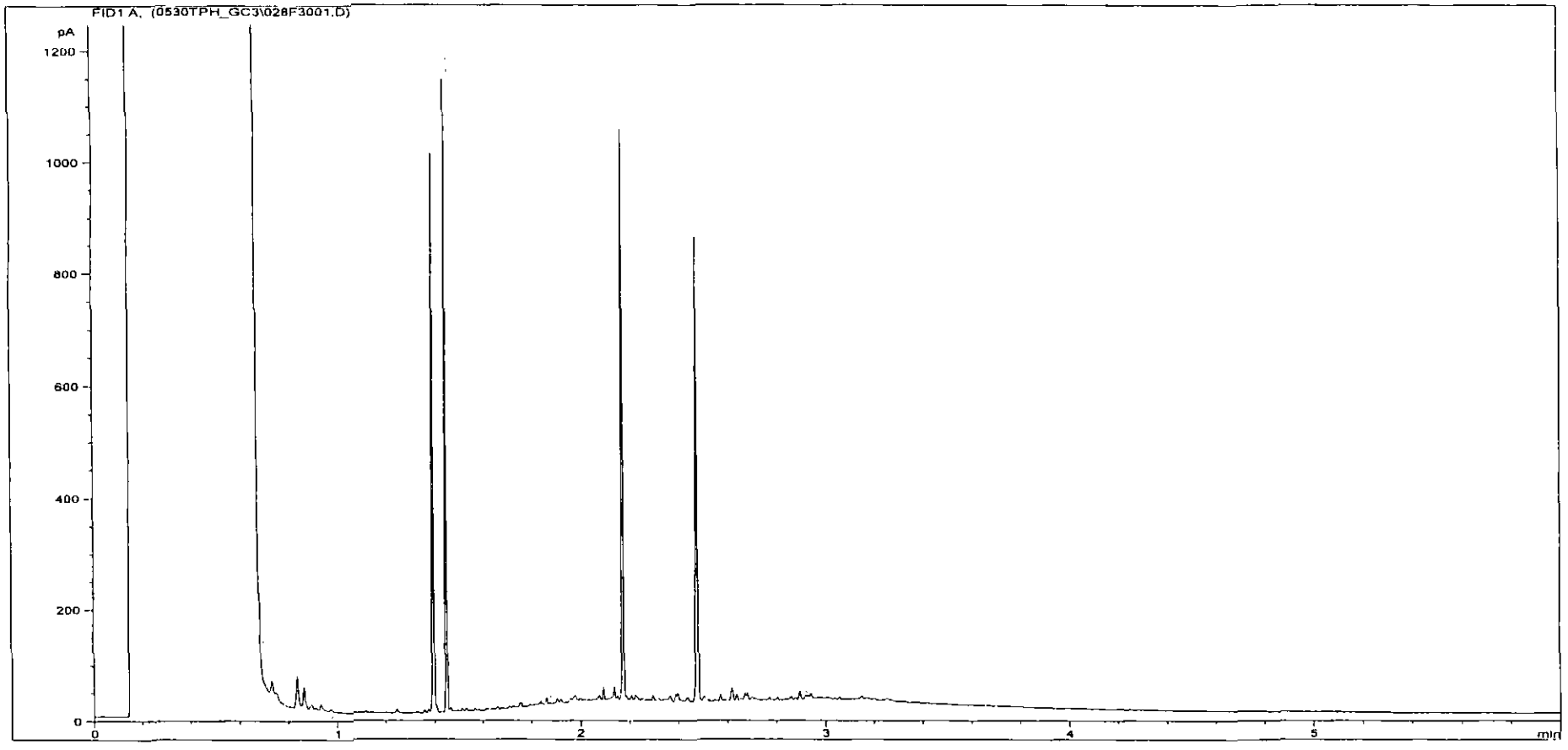
TES Bretby

Petroleum Hydrocarbons (C8 to C40) by GC/FID



Sample ID:	CL0713687	**Job Number:**	S07_2343
Multiplier:	8	**Client:**	Ashton Bennett Consultancy
Dilution:	1	**Site:**	Pogmoor
Acquisition Method:	MAX_RUNF.M	**Client Sample Ref:**	TP4 1.0
Acquisition Date/Time:	30-May-07		
Datafile:	E:\GC\TES\DATA\Y2007\0530TPH_GC3\027F2901.D		

Petroleum Hydrocarbons (C8 to C40) by GC/FID



Sample ID:	CL0713688	**Job Number:**	S07_2343
Multiplier:	8	**Client:**	Ashton Bennett Consultancy
Dilution:	1	**Site:**	Pogmoor
Acquisition Method:	MAX_RUNF.M	**Client Sample Ref:**	TP5 0.5
Acquisition Date/Time:	30-May-07		
Datafile:	E:\GC\TES\DATA\Y2007\0530TPH_GC3\028F3001.D		

Report Notes

Soil/Solid analysis specific:
Results expressed as mg/kg on an air dried basis unless stated other ise
S04 analysis not conducted in accordance ith BS 377 unless other ise stated
Water Soluble Sulphate on 2: ater:soil extract
AR denotes analysis conducted on the As Received sample
BTE analysis expressed as ug/kg As Received
Phenol HPLC results expressed as mg/kg As Received

Water analysis specific:
Results expressed as mg/l unless stated other ise

Oil analysis specific:
Results expressed as mg/kg unless stated other ise
S.G. expressed as g/cm^3 °C

Filter analysis specific:
Results expressed as mg on filter unless stated other ise

VOC analysis specific:
Explanatory notes for data flagging
U undetected above reporting limit
J concentration at instrument as belo lo est calibration standard
E concentration at instrument as above top calibration standard
B compound as detected in method blank

Gas (Tedlar bag) analysis specific:
Results expressed as ug/l unless stated other ise

Air (Carbon tube) analysis specific:
Results expressed as ug on tube unless stated other ise

Asbestos analysis specific:
CH denotes Chrysotile
CR denotes Crocidolite
AM denotes Amosite
NADIS denotes No Asbestos Detected in Sample
NBFO denotes No Bulk fibres Observed

General notes:
^ this analysis as subcontracted to another laboratory
$ Within laboratory tolerances
$$ unable to analyse due to nature of sample
¥ Results for guidance only possible interference
& Blank corrected
I.S insufficient sample for analysis
Intf Unable to analyse due to interferences
N.D Not determined
N.R Not recorded
N.Det Not detected
Req Analysis Requested see attached sheets for results
Þ Raised detection limit due to nature of sample
* denotes the accreditation has been removed by the laboratory for this result only

END OF REPORT

TEST REPORT
WATER SAMPLE ANALYSIS

1252

TES Report No. EXR/072677

Ashton Bennett Consultancy
Unit 9
Clarence Mill
Woodhead Road
Holmbridge
Holmfirth
HD9 2NE

Site: Pogmoor

The 2 samples described in this report were logged for analysis by TES Bretby on 22-May-2007.
The analysis was completed by: 05-Jun-2007

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited
Any opinions or interpretations expressed herein are outside the scope of any UKAS accreditation held by TES Bretby Laboratories.

The following tables are contained in this report:

Table 1 Main Analysis Results (Pages 2 to 3)
Table of PAH (MS-SIM) (50) Results (Pages 4 to 5)
Table of Report Notes (Page 6)

On behalf of
TES Bretby :
J Elstub

Project Co-ordinator

Date of Issue: 05-Jun-2007

Tests marked '^' have been subcontracted to another laboratory.

TES Bretby accepts no responsibility for any sampling not carried out by our personnel.

Units :				mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Method Codes :			WSLM3	ICPWATER	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPWATER	ICPMSW	ICPMSW	KONENS	KONENS	ISESW24	KONECNT
Method Reporting Limits :				0.06	0.001	0.001	0.0001	0.001	0.001	0.002	0.001	0.05	0.0001	0.001	0.1	0.01	0.2	0.01
UKAS Accredited :			yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no
TES ID Number EX/	Client Sample Description	Sample Date	pH units	Total Sulphur as SO4 (Dissolved)	Nickel as Ni (Dissolved)	Chromium as Cr (Dissolved)	Cadmium as Cd (Dissolved)	Copper as Cu (Dissolved)	Lead as Pb (Dissolved)	Zinc as Zn (Dissolved)	Arsenic as As (Dissolved)	Boron as B (Dissolved)	Mercury as Hg (Dissolved)	Selenium as Se (Dissolved)	Thiocyanate as SCN	Chromium VI as Cr	Sulphide (Free) as S	Cyanide (Total) as CN
0713000	TP2	17-May-07	7.2	1200	0.008	0.005	<0.0001	0.004	<0.001	0.032	0.007	0.68	<0.0001	0.002	0.1	<0.01	<0.2	<0.01
0713001	TP4	17-May-07	6.7	908	0.014	0.004	0.0004	0.007	<0.001	0.614	0.003	0.43	<0.0001	0.003	0.1	<0.01	<0.2	0.05

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Client Name	Ashton Bennett Consultancy
Contact	Ms F Bennett

Pogmoor

Water Sample Analysis

Date Printed	05-Jun-07
Report Number	EXR/072677
Table Number	1

TES Bretby

Units :		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pH Units				
Method Codes :		ICPACIDS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	PAHSCUV	WSLM3				
Method Reporting Limits :		20	0.5	0.1	0.5	0.5	0.5	0.10	0.5	0.5	3.0	10					
UKAS Accredited :		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes				
TES ID Number CL/	Client Sample Description	SO4- (acid sol)	Arsenic (MS)	Cadmium (MS)	Chromium (MS)	Copper (MS)	Lead (MS)	Mercury (MS)	Nickel (MS)	Selenium (MS)	Zinc (MS)	PAH (screening)	pH units				
0724433	Sample 1 1.0																
0724432	Sample 1 1.5	1040	7.6	0.21	13.6	31.2	104.6	0.14	13.0	<0.5	168.6	1080	9.0				
0724434	Sample 2 1.0	543	8.3	<0.1	18.5	18.2	25.8	<0.1	23	<0.5	72.9	147	9.0				
0724435	Sample 2 1.5																
0724436	Sample 2 2.5	1180	5.9	0.27	22.8	20.3	48.2	<0.1	16.9	<0.5	49.1	79	9.0				

TES Bretby

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Client Name	Ashton Bennett Consultancy
Contact	Ms F Bennett

Soils Sample Analysis

Pogmoor

Date Printed	12-Sep-07
Report Number	EFS/074038
Table Number	1

TES Bretby

Units :		mg/kg	mg/kg	mg/kg		mg/kg	mg/kg	mg/kg	mg/kg	%								
Method Codes :		ICPBOR	KONENS	KONETCNTS	SEN9	SFAPI	SFAPI	SFAPI	SFAPI	TSBRE1								
Method Reporting Limits :		0.5	0.1	0.5		0.5	0.5	0.5	2	0.005								
UKAS Accredited :		no	no	no	no	no	no	no	no	no								
TES ID Number CU	Client Sample Description	Boron (H20 Soluble)	Chromium vi:	Sulphide:	Asbestos (screening)	Cyanide(Free) (AR)	Cyanide(Total) (AR)	Phenol Index.(AR)	Thiocyanate(SCN)(AR)	Total Sulphur.								
0724433	Sample 1 1.0				NBFO													
0724432	Sample 1 1.5	1.2	<0.1	60.6		<0.5	<0.5	<0.5	<2.0	0.081								
0724434	Sample 2 1.0	1.1	<0.1	4.4		<0.5	<0.5	<0.5	<2.0	0.048								
0724435	Sample 2 1.5				NBFO													
0724436	Sample 2 2.5	0.6	<0.1	26.9		<0.5	<0.5	<0.5	<2.0	0.076								

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Client Name	Ashton Bennett Consultancy
Contact	Ms F Bennett

Pogmoor

Soils Sample Analysis

Date Printed	12-Sep-07
Report Number	EFS/074038
Table Number	1

TES Bretby

Report Notes

Soil/Solid analysis specific:
Results expressed as mg/kg on an air dried basis unless stated otherwise
S04 analysis not conducted in accordance with BS1377 unless otherwise stated
Water Soluble Sulphate on 2:1 water:soil extract
AR denotes analysis conducted on the As Received sample

Water analysis specific:
Results expressed as mg/l unless stated otherwise

Oil analysis specific:
Results expressed as mg/kg unless stated otherwise
S.G. expressed as g/cm^3@ 15°C

Filter analysis specific:
Results expressed as mg on filter unless stated otherwise

VOC analysis specific:
Explanatory notes for data flagging
U = undetected above reporting limit
J = concentration at instrument was below lowest calibration standard
E = concentration at instrument was above top calibration standard
B = compound was detected in method blank

Gas (Tedlar bag) analysis specific:
Results expressed as ug/l unless stated otherwise

Air (Carbon tube) analysis specific:
Results expressed as ug on tube unless stated otherwise

Asbestos analysis specific:
CH denotes Chrysotile
CR denotes Crocidolite
AM denotes Amosite
NADIS denotes No Asbestos Detected in Sample
NBFO denotes No Bulk fibres Observed

General notes:
^ this analysis was subcontracted to another laboratory
$ Within laboratory tolerances
$$ unable to analyse due to nature of sample
¥ Results for guidance only, possible interference
& Blank corrected
I.S insufficient sample for analysis
Intf *Unable to analyse due to interferences*
N.D Not determined
N.R Not recorded
N.Det Not detected
Req Analysis Requested, see attached sheets for results
Þ Raised detection limit due to nature of sample
* denotes that all accreditation has been removed by the laboratory for this result.
‡ denotes that Mcerts accreditation has been removed by the laboratory for this result.
Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected.

If you require further details of the circumstances leading to the removal of the accreditation from any data item please do not hesitate to contact the laboratory

END OF REPORT

Ashton Bennett

Consultancy

Engineering Geologists and Environmental Scientists

APPENDIX D

GAS AND GROUNDWATER MONITORING RESULTS

Client: Mr T Simpson & Mr D Lycett
Site: West Road, Pogmoor

GAS MONITORING SURVEY RESULTS

Date	Borehole No.	Meter Readings: % O_2 Oxygen Normal 20.9%	% CO_2 Carbon Dioxide Asphyxiation >1.5%	% CH_4 Methane: % L.E.L.	% CH_4 Methane: % Total Gas Explosive 5 to 15% Flammable >15%	Atmospheric Pressure in m bars	Flow Rate l/hr	Ground Water Level mbgl
06/06/2007	1	1.00	11.80		1.70	1006	Nil	4.23
	2	2.90	12.30		0.00		Nil	3.48
	3	14.80	1.30		0.00		Nil	Dry
	4						Nil	
	5	2.90	12.30		0.00		Nil	3.78
	6	20.30	0.00		0.00		Nil	Dry
13/06/2007	1	5.40	8.20		0.60	989	Nil	4.28
	2	3.00	11.10		0.00		Nil	3.51
	3	14.50	1.70		0.00		Nil	Dry
	4	11.00	8.00		0.00		Nil	3.76
	5	20.00	0.50		0.00		Nil	3.78
	6	20.70	0.00		0.00		Nil	Dry
15/06/2007	1	5.50	9.90		0.00	989	Nil	3.28
	2	5.50	9.60		0.00		Nil	2.66
	3	9.90	2.50		0.00		Nil	3.18
	4	14.30	5.90		0.00		Nil	2.65
	5	20.00	0.30		0.00		Nil	3.79
	6	17.90	0.00		0.00		Nil	3.70
28/06/2007	1	18.30	2.80		0.00	988	Nil	3.16
	2	14.60	7.00		0.00		Nil	2.34
	3	12.20	2.70		0.00		Nil	3.17
	4	16.50	4.10		0.00		Nil	2.34
	5	20.60	0.10		0.00		Nil	3.78
	6	20.20	0.20		0.00		Nil	4.72
05/07/2007	1	15.00	3.80		0.00	991	Nil	3.19
	2	15.70	3.30		0.00		Nil	2.58
	3	8.80	3.50		0.00		Nil	3.22
	4	11.80	5.30		0.00		Nil	2.67
	5	19.90	0.20		0.00		Nil	3.85
	6	20.10	0.10		0.00		Nil	4.72

Ashton Bennett Consultancy
Unit 9, Clarence Mill
Woodhead Road, Holmbridge
Holmfirth
HD9 2NE
Tel: 01484 689531 Fax: 01484 689932

Equipment used

GA 2000
GMI LANDSURVEYOR II
CROWCON TRIPLE PLUS
THERMO-ELECTRON

Client: Mr T Simpson & Mr D Lycett
Site: West Road, Pogmoor

GAS MONITORING SURVEY RESULTS

Date	Borehole No.	Meter Readings				Atmospheric Pressure in m bars	Flow Rate l/hr	Ground Water Level mbgl
		% O_2 Oxygen Normal 20.9%	% CO_2 Carbon Dioxide Asphyxiation >1.5%	% CH_4 Methane % L. E. L.	% CH_4 Methane % Total Gas Explosive 5 to 15% Flammable >15%			
10/07/2007	1	17.10	3.00		0.00	994	Nil	3.30
	2	10.70	7.60		0.00		Nil	2.69
	3	17.80	2.60		0.00		Nil	3.28
	4	15.10	3.10		0.00		Nil	2.82
	5	19.50	0.30		0.00		Nil	3.84
	6	20.20	0.00		0.00		Nil	4.82
05/09/2007	7	13.50	2.00		0.00	1011	Nil	5.20
20/09/2007	7	5.90	6.20		0.00	994	Nil	5.24
27/09/2007	7	9.80	4.60		0.00	1002	Nil	5.22
04/10/2007	7	9.00	5.30		0.00	1003	Nil	5.34
08/10/2007	7	13.30	3.10		0.00	1009	Nil	5.35
16/10/2007	7	9.70	4.20		0.00	983	Nil	5.21

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Equipment used

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Ashton Bennett
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APPENDIX E

PHOTOGRAPHS

WEST ROAD, POGMOOR



TP1.



TP2.



TP3.



TP4.



Cover to culvert.



Location of former fuel tanks and TP5.

WEST ROAD, POGMOOR



TP5.



View looking north across the site.



TP5.



Stockpile TP5.



TP6.



TP6.

WEST ROAD, POGMOOR



View looking north across site and location of TP6 adjacent to mechanical excavator.



View looking east along location of site and TP5 in foreground.



TP7.



View looking west across site to recreation field.



View looking east from western extremity of site.



View looking east to location of TP8.

WEST ROAD, POGMOOR



View looking northeast across site.



View looking south across railway line.



TP8.



TP9.



TP10.



View of former buildings.

WEST ROAD, POGMOOR



View of former buildings.



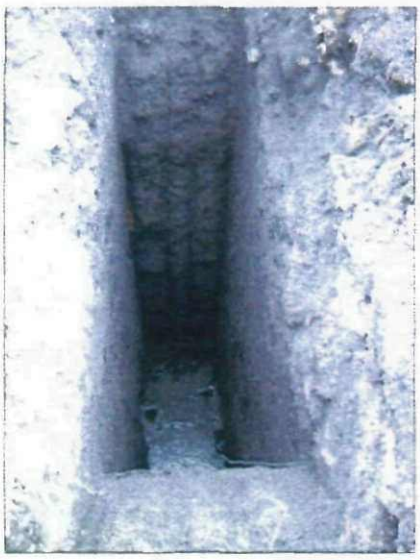
View of waste area adjacent to buildings.



View of former buildings.



TP11.



TP12.



TP13.

WEST ROAD, POGMOOR



View of TP13 looking west.



TP14.



TP14

Ashton Bennett

Consultancy

Engineering Geologists and Environmental Scientists

APPENDIX F

COAL AUTHORITY REPORT

The Coal Authority

Issued by:
The Coal Authority, Mining Reports Office, 200 Lichfield Lane, Berry Hill, Mansfield, Nottinghamshire NG18 4RG
On-Line Service: www.coalminingreports.co.uk - Phone: 0845 762 6848 - DX 716176 MANSFIELD 5

ASHTON BENNETT CONSULTANCY,
FIELD END LANE,
HOLMBRIDGE,
HOLMFIRTH,
WEST YORKSHIRE,
HD9 2NH

Person dealing with this matter:	**Darren Moody**
Our reference:	***00064469-07***
Your reference:	WEST ROAD
Electronic Ref:	
RRUID:	007:00018616610001
Date of your enquiry:	**14 May 2007**
Date we received your enquiry:	**14 May 2007**
Date of issue:	**25 June 2007**

This report is for the property described in the address below and the attached plan.

Coal and Brine Report

Site At, West Road, Pogmoor, Barnsley, South Yorkshire

This report is based on and limited to the records held by, the Coal Authority, and the Cheshire Brine *Subsidence Compensation Board's records, at the time we answer the search.*

Coal mining	Yes
Brine extraction	No

Information from the Coal Authority

Underground Coal Mining

Past

The property is in the likely zone of influence from workings in 6 seams of coal at 30m to 370m depth, and last worked in 1978.

Any ground movement from these coal workings should have stopped by now.

Present

The property is not in the likely zone of influence of any present underground coal workings.

Future

The property is not in an area for which the Coal Authority is determining whether to grant a licence to remove coal using underground methods.

The property is not in an area for which a licence has been granted to remove coal using underground methods.

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The property is not in an area that is likely to be affected at the surface from any planned future workings.

However reserves of coal exist in the local area which could be worked at some time in the future.

No notice of the risk of the land being affected by subsidence has been given under section 46 of the Coal Mining Subsidence Act 1991.

Mine entries

Within, or within 20 metres of, the boundary of the property there is 1 mine entry, the approximate position of which is shown on the attached plan.

There is no record of what steps, if any, have been taken to treat the mine entry.

Records may be incomplete. Consequently, there may exist in the local area mine entries of which the Coal Authority has no knowledge.

Coal-mining geology

At the surface, there are no known faults or other lines of weakness due to coal mining that have made the property unstable.

Opencast Coal Mining

Past

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

Present

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

Future

The property is not within 800 metres of the boundary of an opencast site for which the Coal Authority is determining whether to grant a licence to remove coal by opencast methods.

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

Coal-mining subsidence

The Coal Authority has not received a damage notice or claim for the property since 1 January 1984. There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority has not received a request to carry out preventive work before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

Mine gas

There is no record of a mine gas emission requiring action by the Coal Authority within the boundary of the property.

Hazards related to coal mining

The property has not been subject to remedial works, by or on behalf of the Authority, under its Emergency Surface Hazard Call Out procedures.

Withdrawal of Support

The property is in an area for which notices of entitlement to withdraw support were published in 1950,1944,1948,1956,1944.

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The property is not in an area for which a notice has been given under section 41 of the Coal Industry Act 1994, revoking the entitlement to withdraw support.

Working Facilities Orders

The property is not in an area for which an Order has been 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 in an area for which a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Comments on Coal Authority information

Where development proposals are being considered, technical advice should be obtained before beginning work on site. All proposals should apply good engineering practice developed for mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or mines of coal without the permission of the Coal Authority.

Information from the Cheshire Brine Subsidence Compensation Board

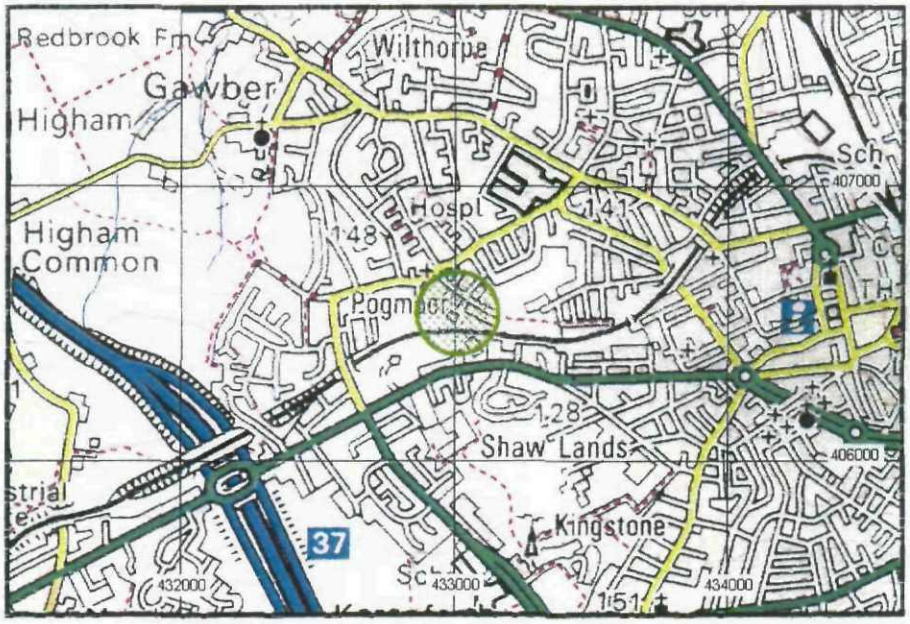
The property lies outside the Cheshire Brine Compensation District.

Additional remarks

This report is prepared in accordance with the Law Society's Guidance Notes 2006, the User Guide 2006 and the Coal Authority and Cheshire Brine Board's Terms and Conditions 2006. The report is compliant with Home Information Pack requirements.

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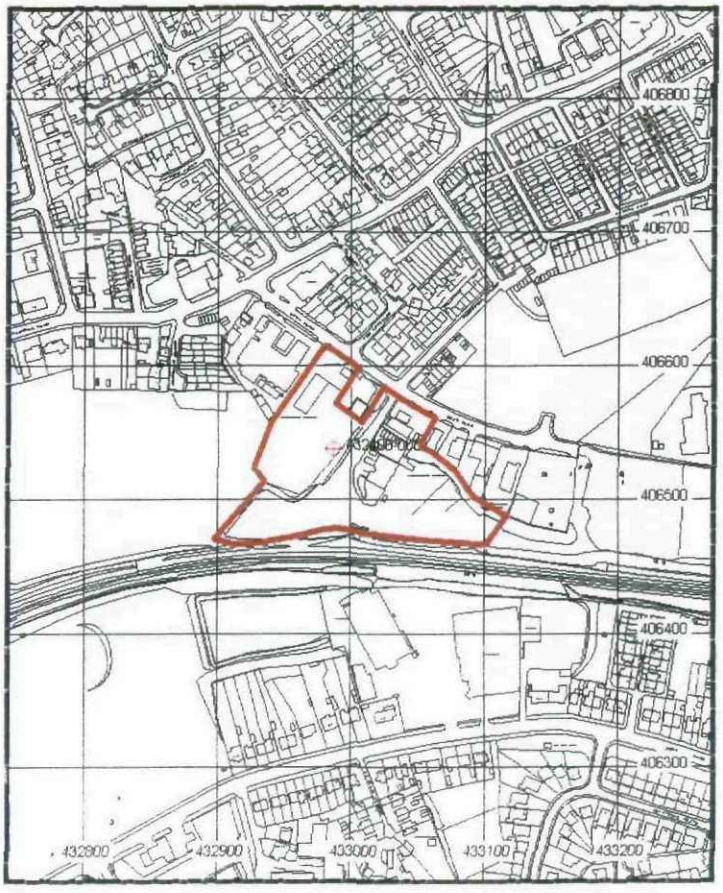
Location map



Approximate position of property

Enquiry boundary

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Key

Approximate position of enquiry boundary shown

Disused Adit or Mineshaft

Mapping sourced from Ordnance Survey