

Report No. 5848/1
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**GEOENVIRONMENTAL APPRAISAL
of land off
BURTON ROAD, BARNSELY**

**Prepared for
BEN BAILEY HOMES LTD**

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Burton Road, Barnsley – Ben Bailey Homes Ltd
Summary Of Geoenvironmental Issues

The site is located off Burton Road, Barnsley (centred at NGR SE 377 084) and consists of five parcels of land (Areas A to E) covering a total area of approximately 9.2 hectares (22.8 acres).

Encia Consulting Limited were commissioned by Ben Bailey Homes Ltd to carry out a preliminary investigation of the entire site and an intrusive investigation within areas A, B and D. The land is currently used for a variety of uses, which includes scrap yards, open fields, residential properties and a vehicle service garages. Area E historically contained a sewage works. It is understood that the site is to be redeveloped with traditional 2 storey domestic dwellings. Encia's geoenvironmental investigation included the excavation 32 trial pits, the drilling of 23 window sample holes and 9 probeholes.

The significant findings of our work are summarised in the Table below.

Issue	Remarks
Made Ground	<p>Area A - Two distinct areas of made ground have been identified- former landfill site (sand/demo rubble fill to 3.0m) in north and filled ground (ash/demo rubble fill to 2.7m) in the south. No made ground was encountered within the field in the east.</p> <p>Area B - Made ground was not encountered within this area.</p> <p>Area D - Made ground was encountered across this area and consisted of a concrete hardstand over granular fill underlain, by gravel and ash and clinker. The maximum depth encountered was 2.5m, the average depth was 1.2m.</p>
Natural Ground	<p>Natural ground across all areas comprised a firm brown clay (weathered mudstone) over mudstone bedrock, sandstone was encountered in the north west corner of the site.</p> <p>Depths to rock head varied between 1.5 and 3m across the site.</p>
Contamination	<p>Area A - Made ground within the south west of this area contains potentially combustible ash and clinker, elevated TPH and metals. Remediation within this area could comprise either removal of hotspots/screening of unsuitable elements/1000mm soil cover or complete removal of the made ground.</p> <p>Area B - No significant contamination was encountered within this area. No significant remediation is required within this area.</p> <p>Area D - Made ground within this area contains elevated TPH, metals and combustible materials (ash). Remediation could comprise complete removal of the contaminated made ground or ex-situ bioremediation of the contaminated fill with a soil cover of 500mm.</p>
Hazardous Gas	<p>There is one landfill site located within the north east of Area A. Barnsley Metropolitan Borough Council have records of two landfill sites within 250m of the site and the EA have records of four landfill sites within 250m of the site.</p> <p>The radon protective measures site report states that basic radon protection measures are required for new dwellings on this site.</p> <p>A comprehensive hazardous gas risk assessment will be issued in a supplementary letter report on completion of gas monitoring during March. In the meantime, based on the results obtained to date, it is considered likely that:</p> <ul style="list-style-type: none"> further monitoring will be required (at least 10 visits over 6 months, and possibly 12 over a year), and <p>gas protection measures will be of a higher specification than those required simply to provide protection against radon.</p>
Mining & Quarrying	<p>A Coal Authority Coal Mining Report states, "the site is within the likely zone of influence on the surface from workings in 7 seams at 150m to 560m depth, ground movement from the above mentioned coal workings should by now have ceased."</p> <p>The CA state that a subsidence claim was made within the north east of Area A.</p> <p>Geological plans show the Swinton Pottery Coal and Newhill Coal seam to lie below the Oaks Rock at approximately 20 to 35m bgl.</p> <p>Nine probeholes were drilled between 10 and 30m, a poor quality coal was encountered between 3.3 and 9.9m, the maximum seam thickness being 1.5m. No voids or brc ground were encountered. Based on the results of the rotary probing it is considered the site is not at risk from surface instability from shallow coal workings.</p>

Issue	Remarks
Preparatory Works	<p>Likely remedial/preparatory works will include:</p> <ul style="list-style-type: none"> • Removal of trees and other landscaping • Demolition of existing buildings • Processing demolition material for re-use • Remediation of contaminated soils • Re-profiling of current site level to create stable development platform. • Placement of cover layer beneath garden and landscaped areas.
Foundations	<p>Area A – Strip footings over the majority of this area, where contaminated soils are subject to remediation foundations could comprise either rafts on engineered fill or strip footings.</p> <p>Area B – Strip footings</p> <p>Area D – Dependant on the final remediation solution within this area, foundations will either comprise rafts on engineered fill or strip footings.</p>
Groundwater and Excavations	<p>Groundwater was encountered at depths between 2.5 and 3.0m within the trial pits.</p> <p>The groundwater was noted to rise within the probeholes. This could have an affect on drainage/foundation trenches. As a consequence an allowance for shoring/pumping would be advisable.</p> <p>The trial pits generally remained stable. Collapse of trial pits sides was noted in TPs 14 to 16 excavated in the loose foundry sand fill.</p>
Flooding & Drainage	<p>The EA indicate that the extreme north eastern tip of the site (Area E) is within the 1:100 year flood plain of Small Bridge Dike. The remaining areas of the site are outside the EA 1 in 100 year flood plain.</p> <p>A drainage feasibility study is being undertaken and will be reported separately.</p>
Highways	<p>For access roads and pavement areas constructed over re-engineered made ground it is considered that a CBR value of 5% should also be achievable.</p>
Regulators	<p>Report should be submitted to Local Authority & NHBC (if required).</p>
Further Work	<p>A quantitative Risk Assessment is required for Area D to define volumes of contaminated material requiring off site disposal or to determine clean up criteria.</p> <p>Intrusive investigations are required in Areas C and E when access becomes available.</p> <p>Asbestos survey</p>

Significant developer abnormalities at this site include:

- Demolition
- Remediation works possibly requiring large scale removal and disposal of material from Area D
- Site wide earthworks/reprofiling
- Provision of capping materials

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Appendix A - Drawings

5848/1	Site Location Plan
5848/2	Site Features Plan
5848/3	Exploratory Hole Location Plan
5848/4A to 4E	Preliminary Conceptual Site Models for Areas A to E
5848/5A, B & D	Revised Conceptual Site Models for Areas A, B and D
5848/6	Proposed Site Layout Plan showing Foundation Options
5848/7	Plan Showing Depths of Made Ground and Remedial Option Areas

Appendix B - Historical OS Plans

Appendix C - Correspondence/Information

From	To	Date	Content
Ben Bailey Homes	Encia	06/11/2003	Invitation
Encia	Ben Bailey Homes	12/11/2003	Proposal
BGS	Encia	12/11/2003	Radon Report
Coal Authority	Encia	18/11/2003	Coal mining Report
Environment Agency	Encia	27/11/2003	EA Search
SYMAS	Encia	27/11/2003	Coal mining Report
Barnsley MBC	Encia	07/01/2004	LA Search

Appendix D - Trial Pit Logs

Appendix E - Window Sample Logs

Appendix F - Probehole Logs

Appendix G - Chemical Laboratory Test Results

Appendix H - Geotechnical Laboratory Test Results

Appendix I - Photographs

FOREWORD

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

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

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

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

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

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

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

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

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

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

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

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

Correspondence regarding Encia's appointment, including the agreed scope of works, is included in an Appendix C.

**GEOENVIRONMENTAL APPRAISAL
of land off
BURTON ROAD, BARNSELEY**

1 INTRODUCTION

- 1.1 Encia Consulting Limited (Encia), were commissioned by Ben Bailey Homes Ltd (BBH) to carry out a geoenvironmental appraisal of land off Burton Road, Barnsley. It is understood BBH intend to acquire the site for a residential redevelopment and that this report is required to make an assessment of the site's suitability for this use.
- 1.2 BBH have supplied a proposed layout which shows the proposed development to comprise approximately 220 traditional 2 storey domestic dwellings with associated gardens, POS, adoptable roads and sewers. The layout is presented as Drawing 5848/6 in Appendix A.
- 1.3 The site is split into five separate parcels of land (Areas A to E) as shown in Drawing 5848/2. The preliminary investigation covers all five areas, whilst intrusive investigation was only undertaken in Areas A, B and D, due to access restrictions.
- 1.4 Correspondence regarding Encia's appointment, including the brief for this investigation, is included in Appendix C. The scope of works carried out is detailed in Encia's proposal letter dated 12th November 2003 and included:
- site walkover and inspection.
 - an assessment of the land use history.
 - determination of the site's environmental setting, with reference to published information and standard searches.
- 1.5 The following scope of works was undertaken within Areas A, B and D (only).
- An intrusive investigation, including trial pitting, window sampling and mine probing.
 - assessment of contamination risks (qualitative risk assessment), with respect to relevant targets in line with current legislation and best practice.
 - investigation of the geotechnical properties of the near surface deposits to enable foundation design.
 - provision of recommendations with respect to site preparatory and remedial works.
 - hazardous gas risk assessment.
- 1.6 Encia's intrusive investigation comprised the excavation of 32 trial pits and the drilling of 23 window sample holes. Schedules of contamination and geotechnical analysis have been carried out on samples retrieved from these exploratory holes.
- 1.7 The mining investigation comprised the drilling of 9 rotary probeholes to investigate the possibility of shallow mine workings below the site.
- 1.8 This report incorporates the findings of the investigation and provides an assessment and interpretation of this data with respect to the proposed housing development.

- 1.9 Notes outlining the general procedures adopted in geoenvironmental site investigation contracts are presented in the Foreword and should be read in conjunction with this report. The text of the report draws specific attention to any modification to these procedures and to any other special techniques employed.

2 SITE DESCRIPTION

2.1 Site Location

- 2.1.1 The site is located off Burton Road, Barnsley (centred at NGR SE 377 084) and consists of five parcels of land (Areas A to E) covering a total area of approximately 9.2 hectares (22.8 acres).
- 2.1.2 Each parcel of land is accessed off Burton Road, to the north of the site.

2.2 Topography and Site Features

- 2.2.1 The site location is shown on Drawing 5848/1 presented in Appendix A to this report. Site features referenced below are indicated on Drawing No. 5848/2, presented in Appendix A. A site walkover was undertaken on 11th November 2003.
- 2.2.2 The site is split into five areas of ownership. **Area A** is occupied by a vehicle servicing garage, two residential properties, vehicle storage yard, derelict nurseries and overgrown fields. **Area B** consists of overgrown fields and an area of concrete hardstand (demolished playground). **Area C** consists of small garage/car sales yard, residential house and an area of open ground. **Area D** is occupied by a scrap yard, which contains approximately 300 cars, large stockpiles of metal, a crusher, offices, above ground fuel tanks and a warehouse building. **Area E** consists of a scrap yard, 2 coal yards, car recovery yard, derelict concrete works and an area of overgrown ground.
- 2.2.3 Each site area is described separately below and is summarised in Table 1 below.

Table 1 – Summary of Site Areas

Site Area	Size/Hectares	Current Status
Area A (divided into 5 sub-areas)	3.4	Derelict Nursery, Overgrown Land, Car Garage, Open Yard, Landfill Site and Two Houses
Area B	1.8	Open fields/Overgrown Ground
Area C	0.2	Car Garage and House
Area D	2.1	Scrap Yard
Area E	1.5	Two Coal Yards. Scrap Yard, Car Storage, Skip Hire and Overgrown Land/Derelict Works

- 2.2.4 The site is surrounded by residential areas to the north and south and open agricultural land to the east and west. Large manufacturing premises are located to the north west of the site.

Area A

- 2.2.5 Area A covers an area of 3.4 hectares and is located within the west of the site.

- 2.2.6 Access to Area A is from Burton Road to the north, via an unmade road. The site access is shown on Plates 1 and 2 in Appendix D.
- 2.2.7 Burton Road is approximately 2 to 4m higher than the general site level, which has been locally raised within the vicinity of the site access. A small retaining wall (1.5m high) is located adjacent to the site access (see Plate 1 in Appendix D).
- 2.2.8 Ground levels within Area A tend to slope towards the south. There is a marked difference in level between the filled ground in sub-area A5 (up to approximately 2 to 3m) and the adjacent sub-area A3.
- 2.2.9 For ease of reference Area A can be divided into five sub-areas, A1 to A5. These sub-areas are highlighted on the Site Features Plan presented as Drawing 5848/2 in Appendix A.

Sub- Area A1

- 2.2.10 Sub-area A1 is located in the north east of Area A. A small paddock is located in the north of sub-area A1, which is used as grazing for a horse.
- 2.2.11 A vehicle-servicing garage, consisting of a small shed with a concrete floor and a small brick office, is located within the south of sub-area A1.
- 2.2.12 A small above ground diesel tank is located outside the servicing garage; no staining or other evidence of leakage was noted around the tank. A small retaining wall (1m high) is located outside the garage. The tank and retaining wall are shown on Plate 5 in Appendix D.
- 2.2.13 A small brick built bungalow is located adjacent to the garage; an area of concrete hardstand is located outside the bungalow.

Sub- Area A2

- 2.2.14 Sub-area A2 is located in the north east of Area A. A2 contains an area of filled ground (a licensed landfill site), which has apparently been filled with demolition rubble and foundry sand. The southern boundary of the landfill is marked by a 3m high bank of soil and rubble, as shown on Plate 4 in Appendix D.

Sub- Area A3

- 2.2.15 Sub-area A3 is located in the eastern half of Area A. A3 contains a derelict nursery, consisting of ruined glasshouses, small areas of hardstanding and an occupied 2 storey house. Several abandoned cars were also located within this sub-area. The derelict nurseries are shown on Plate 3 in Appendix D.

Sub- Area A4

- 2.2.16 Sub-area A4 is located in the east of Area A. A4 consists an overgrown fields, which have been used for horse grazing. The overgrown fields are shown on Plate 7 in Appendix D.

Sub- Area A5

2.2.17 Sub-area A5 is located to the south west of Area A. A4 consists of a large unsurfaced open space, which appears to be used for vehicle and material storage (see Plate 6 in Appendix D). A number of scrapped cars and wagons are located around the edges of sub area A5. Some surface oil staining was also noted where vehicles have been stored.

2.2.18 Sub-area A5 appears to have been filled, as it is higher than the ground to the east. Small stockpiles of sandy soil are located in the south of the area.

Area B

2.2.19 Area B covers an area of 1.76 hectares and predominantly comprises overgrown fields. Access to Area B is either from Area A or through a gate off Burton Road (shown on Plate 7 in Appendix D).

2.2.20 Several water filled ditches are located within the field; it was not apparent during the site walkover where these discharge to.

2.2.21 An area of bullrushes and long grass, indicating potentially wet ground conditions, is located within the north of Area B; unfortunately no access was available during the walkover. The wet ground is shown on plate 8 in Appendix D.

2.2.22 At the northern end of Area B an area of concrete hardstand marks the location of an old playground. The concrete base is shown on Plate 9 in Appendix D.

2.2.23 A sewer outfall into a small stream is located in the south east of Area B.

2.2.24 The ground slopes towards the south at an approximate gradient of 1:30.

Area C

2.2.25 Area C covers an area of 0.16 hectares and consists of a two storey residential house, a small car service garage and a small car sales area. Access to Area C is off Burton Road to the north. The car workshop and house are shown on Plate 10 in Appendix D.

2.2.26 Area C is essentially level in profile.

2.2.27 No obvious signs of ground contamination were noted during the walkover.

Area D

2.2.28 Area D covers an area of 2.13 hectares and consists of a large scrap yard. The site is accessed off Burton Road in the north of the site.

2.2.29 The far north of the scrap yard, adjacent to Burton Rd, comprises a tarmac car park. Two buildings are located within the north of the scrap yard; a single storey brick building forming the offices and staff rooms in the northwest and a steel clad portal framed building, used for servicing and vehicle storage, in the northeast.

2.2.30 Two above ground fuel tanks (ASTs) with associated fuel pumps are located in the northeast of Area D (see Plate 11 in Appendix D).

- 2.2.31 A weighbridge is located in the entrance to this site area. The depth of the pit beneath the weighbridge is not known.
- 2.2.32 The remainder of this site area is occupied by stockpiles of scrap cars and metal, where several mobile cranes and forklift trucks operate. Views of the scrap yard are shown on Plates 12 to 14 in Appendix D.
- 2.2.33 The surface of the scrap yard consists of concrete, which was stained with oil/fuel in many locations.
- 2.2.34 A surface water interceptor is located in the south of the site; this was being cleaned at the time of the walkover.
- 2.2.35 A soil bund is located within the south of the site.
- 2.2.36 The scrap yard is level in profile. Ground levels to the west (Area B) are approximately 1 to 2m lower than the scrap yard, apparently indicating that the ground within the scrap yard has been raised to create a level area.

Area E

- 2.2.37 Area E covers an area of approximately 1.76 hectares and is bounded by Burton Rd to the north and by Tumbling Lane to the west. The site is occupied by two coal yards, a non-ferrous scrap yard, a vehicle-recovery yard, overgrown ground and a derelict concrete yard.
- 2.2.38 The vehicle-recovery yard is located in the north of the area and consists of a small yard where several cars are stored. The car recovery yard is shown on Plate 18 in Appendix D.
- 2.2.39 The scrap yard is located to the south of the car yard and comprises two small sheds with stockpiles of non-ferrous metals. The surface of the yard is unmade. The scrap yard is shown on Plate 17 in Appendix D.
- 2.2.40 To the south of the scrap yard is a small coal supply depot, consisting of a portacabin and stockpiles of various grades of coal. Several skips were noted within the yard. The coal depot is shown on Plate 16 in Appendix D.
- 2.2.41 A derelict concrete works is located to the south of the above mentioned coal yard. This comprises an area of concrete hardstand surrounded by security fencing, which was not accessible at the time of the walkover. An electricity sub station and a pumping station are located in the south of Area E. The concrete yard is shown on Plate 20 in Appendix D.
- 2.2.42 Within the northeast of Area E is an area of overgrown ground, with bullrushes indicating potential waterlogging. The overgrown ground is shown on plate 15 in Appendix D.
- 2.2.43 A second coal yard, accessed directly off Burton Road, is located within the north of Area E. This coal yard comprises two portacabins and bunkers of coal, with a concrete hardstand surface. The coal yard is shown on Plate 19 in Appendix D.

2.3 Asbestos

- 2.3.1 Asbestos sheeting was noted within buildings in Areas A and D. It is recommended that an asbestos survey is undertaken within these areas.

2.4 Services

- 2.4.1 A 175mm diameter rising main is located in the south of the site (Areas A, B and D); this may require an easement or diversion to enable construction within the site. Yorkshire Water will need to be contacted with regard to development within the vicinity of the sewer.
- 2.4.2 A 900mm surface water sewer crosses from northwest to southeast through Areas A and B; this again may require an easement or diversion to enable construction, subject to approval from Yorkshire Water.
- 2.4.3 An electricity sub station and a pumping station are located in the south of Area E; Yorkshire Electric and Yorkshire Water will require an easement and access to these facilities. This could have an impact on any proposed development within the vicinity of this plant.

2.5 Japanese Knotweed

- 2.5.1 During the site walkover, we did not notice any Japanese Knotweed. However, we are **not** qualified ecologists and the absence of Knotweed cannot be guaranteed. Further advice could be sought from a qualified ecologist.

3 SITE HISTORY

- 3.1 In order to investigate the development history and previous land uses at the site and immediate surrounding land, site centred extracts of Ordnance Survey (OS) plans dating back to 1854 were examined. These are presented in Appendix B to this report.
- 3.2 Below is a summary of the salient points relating to the history of the site with respect to the proposed end use. It is not the intention of this report to describe in detail all the changes which have occurred on or adjacent to the site. Significant former uses/operations are highlighted in **bold** text for ease of reference, and relevant features are marked on Drawing 5848/2 in Appendix A.
- 3.3 The 1854 OS plan shows the site to be undeveloped; a **well** is shown in the north of Area B.
- 3.4 The 1893 OS Plan shows a railway line immediately to the west of Area A.
- 3.5 The 1:10,560 scale 1906 OS plan shows a working men's club within Area C. A **sewage works** is shown within Area E. A brick works and **quarry** are shown 30m north of Area E.
- 3.6 The 1931 OS plan shows the sewage works in Area E to consist of sludge beds, settling tanks, humus tanks and a filter bed. Further expansion of the adjacent brick works / quarry has taken place.
- 3.7 The 1955 plan shows several small buildings in Areas A and D, a colliery spoil heap is shown approximately 100m west of Area A.
- 3.8 The 1961 plan shows West Green Farm in the north east of Area A and a playground is shown in the north of Area B. Drains are shown along the edges of Areas A and B. Area C is described as West Green Working Men's Club. The sewage works is no longer shown in Area E.

- 3.9 The 1966 and 1969 plans show little change within the site areas.
- 3.10 The 1973 and 1978 plans show three buildings, a **scrap yard** and a **slag heap** within the western part of Area A. The working men's club is no longer shown in Area C. Area D is shown as a **scrap metal yard**. Area E is shown to consist of a **scrap metal yard**, a **refuse tip** and a **concrete works**. A landfill site (former quarry) is shown to the north of Area E.
- 3.11 The 2000 OS Plan shows the site generally as at the present day.
- 3.12 The review of historical plans indicates that several former industrial activities have been identified which could be expected to have caused ground contamination. These include the scrap metal yards within Areas A, D and E, sewage and concrete works in Area E and the slag heap in Area A.

4 ENVIRONMENTAL SETTING

4.1 Geology

- 4.1.1 In order to establish the geological setting of the site the following British Geological Survey (BGS) data have been examined:
- 1:50,000 scale BGS map, Sheet 87 Barnsley (solid and drift)
 - 1:10,000 scale BGS map, Sheet SE 30 NE
- 4.1.2 The 1:50,000-scale map shows a wedge of alluvium, associated with the Small Bridge Dike to the east, crossing through Area E and partially through Area D.
- 4.1.3 The site is shown to be underlain by the Oaks Rock sandstone in the northwest corner and undifferentiated Middle Coal Measures strata (mudstones and sandstones) across the remainder of the site.
- 4.1.4 The 1:50,000 plan shows an unnamed seam of coal between the Oaks Rock and Mansfield Marine Band which should, if present, outcrop within the middle of the site. The 1:10,000 plan shows the Swinton Pottery Coal (thin) and Newhill Coal (0.6 to 1.4m thickness) to lie below the Oaks Rock at approximately 20 to 35m bgl. The depth of the coal seams are summarised in Table 2 below.

Table 2 – Coal Seams below the site.

Coal Seam	Seam thickness	Depth from Surface
Unnamed Seam	Thin	0 to 10m
Swinton pottery Coal	Thin	30 to 50m
Newhill Coal	0.61 to 1.37	50 to 70m

- 4.1.5 A fault is shown to cross from east to west through the very north of the site, with the downthrow to the north.
- 4.1.6 The 1:10,000 plan shows made ground (colliery waste) within the southwest of the site and a further area of made ground in the north of Area A. A third area of made ground is shown within the centre Area E.

4.2 Mining and Quarrying

4.2.1 As part of this investigation a coal mining report has been commissioned from The Coal Authority (CA) and is copied to Appendix C. This states that *"the property is within the likely zone of influence from workings on 7 seams of coal at 150m to 560m depth, the last date of working being 1989"*. It also states that *"Ground movement from the above mentioned past coal workings should by now have ceased"*.

4.2.2 The Coal Authority report also states:

"The site is not affected by present underground mining. The property is not within a geographical area for which a licence to extract coal by underground methods has been granted. However, reserves of coal exist in the locality, which could be worked at some time in the future subject to feasibility, licenses and planning consents."

4.2.3 However, given the urban location of the site and the demise of the Yorkshire coalfield, this is considered unlikely.

4.2.4 There are no shafts or adits on or within 20m of the site.

4.2.5 The site is not within an area affected by subsidence or faulting. However, the coal mining report indicates that a subsidence claim has been made within Area A. The CA have no records of any request having been made to execute preventative works under S.33 of the Coal Mining Subsidence Act 1991.

4.2.6 Enquiries have also been made of the South Yorkshire Mining Advisory Service (SYMAS) regarding mining activities and the potential for mines gas in the area. The SYMAS report does not raise any significant issues that have not already been discussed. The SYMAS report is copied to Appendix C.

4.2.7 Review of the historical and geological maps has indicated the presence of at least two quarries within the vicinity of the site, as follows:

- A large (approximately 4 ha) quarry associated with the brick works to the north of Area E
- A small (approximately 0.2 ha) quarry in the mudstone to the south of Area D

4.2.8 The significance of these features is discussed further in Section 4.5, below.

4.3 Hydrogeology

4.3.1 Encia have obtained information from the Environment Agency, through the Landmark Information Group, with respect to:

- Hydrogeological conditions
- Licensed groundwater abstractions

4.3.2 In accordance with the Environment Agency (EA) *"Policy and Practice for the Protection of Groundwater"* the Middle Coal Measures underlying the site is classed as a minor aquifer. Minor aquifers are defined as:

"Fractured or potentially fractured rocks which do not have a high primary permeability, or other formations of variable permeability. Although these aquifers will seldom produce large quantities of water for abstractions, they are important both for local supplies and in supplying base flow to rivers".

4.3.3 According to Sheet 11 of the EA Groundwater vulnerability map, the soils at the site are classified as being of high leaching potential/urban. Soil information for urban areas is based on a worst case and in the absence of more detailed information it is therefore be assumed to be highly vulnerable to any potentially polluting activity.

4.3.4 According to the EA records there are no current groundwater abstractions within 1km of the site.

4.4 Hydrology

4.4.1 The EA indicate that no main watercourses are located within 500m of the site. The nearest watercourse is a small stream located along the southern boundary of the site.

4.4.2 Encia have obtained information, sourced from the EA and the Landmark Information Group, relating to:

- Licensed surface water abstractions
- Licensed discharge consents
- Recorded pollution incidents
- Flood risk

4.4.3 There are no current surface water abstractions within 1km of the site.

4.4.4 The EA indicate that four current discharge consents are located within a 500m radius of the site. Two are located within the site; one associated with the pumping station in the south of Area E for the discharge of storm water overflow into Small Bridge Dike and a second located in the north east of Area E, again for the discharge of storm water overflow into Small Bridge Dike.

4.4.5 There have been 37 pollution incidents to controlled waters within 1km of the site. These include 21 category 3 (minor) incidents, 14 category 2 (significant) and 2 category 1 (major) incidents. The nearest incident to the site, which was classified as a minor incident, occurred 10m south of Area B and involved crude sewage entering a watercourse in 1995.

4.4.6 The EA indicate that the extreme northeastern tip of the site is within the 1:100 year flood plain of Small Bridge Dike.

4.5 Landfill Search

4.5.1 Barnsley Metropolitan Borough Council (BMBC) and the EA have been contacted with regard to known landfilling within the vicinity of the site.

4.5.2 The EA and BMBC indicate that seven landfill sites are located within approximately 250m of the site. These are detailed in Table 3 below.

Table 3. Known Landfill Sites

Location	NGR (proximity to site)	Remarks	Source of data
Burton Road, (sub-area A2)	SE 377 084, (Within Area A)	Licensed to take brick/rubble construction/soil. Site closed	EA/BMBC
Cudworth Landfill, Burton Road	SE 378 086 (10m N of Area E)	Operated by Cleanaway Ltd, for clay, sub/topsoil, known to be producing landfill gas. Site closed	BMBC/ BGS
Bleach Farm Croft	SE 379 087 90m NE of Area E	Sand/solid no Haz/Construction/Demo Waste. Site Closed	EA/BMBC
Burton Road	SE 375 083 (180m W of Area A)	Conc/soil/dom waste/inert. Site closed	EA/BMBC
Bleach Farm Croft	SE 379 086 (150m NE of Area E)	Construction and Demo waste Closed	EA
Redfearn Glass	SE 375 086 (150m north west of Area A)	Soil/sand/Ex. Waste/Demo waste	EA
Cudworth Railway Station	(190m SE of Area B)	Inert/Demo/Construction Waste	EA

4.5.3 One landfill site (Burton Road) is located in Area A (sub-area A2) see section 2.2. This landfill is licensed to take inert material such as foundry sand and demolition rubble and it is understood that the license is still active.

4.5.4 The EA and BMDC searches are presented in Appendix C to this report.

4.6 Radon

4.6.1 A new two-tiered approach to radon gas risk assessment advocates a consideration of radon risk related to the underlying solid geology.

4.6.2 To ascertain whether the site is in a radon affected area as designated by the BRE, reference has been made to their report BR211 "Radon: Guidance on protective measures for new dwellings, 1999".

4.6.3 The above referenced report shows the site to be located in an area considered susceptible to radon emissions and where a geological assessment should be carried out.

4.6.4 A Radon Protective Measures Site Report (Standard) has been commissioned from the British Geological Survey and is copied to Appendix C. This report states that **basic** radon protective measures are required for all new dwellings at the site.

4.6.5 The above recommendation is based on the 1:250,000 scale data with a buffer zone of 500m to allow for potential inaccuracies in the position of boundaries. The report indicates the highest level of protection required within the search area and its buffer zone.

4.6.6 Basic radon gas protection measures are as outlined below:

- Use of 1200-gauge polyethylene DPM or DPC, with suspended concrete floors or ground bearing floor slabs
- Continuous membrane across cavity walls
- Cavity tray in external walls
- Fully sealed service entries/exits

4.6.7 A copy of the BGS Radon Report is presented in Appendix C to this report.

4.7 Other Issues

- 4.7.1 The information supplied by the Landmark Information Group indicates that there are no COMAH sites within 1km of the proposed development.

5 PRELIMINARY CONCEPTUAL SITE MODEL

- 5.1 In order to assess the significance of any *potential* contaminants, consideration is given to the site's environmental setting and proposed end use. Assessment of contaminated land is based on an evaluation of pollutant linkages (source-pathway-receptor). Contaminants within the near surface strata represent a potential source of pollution. The environment (e.g. groundwater and surface water), site workers and end users are potential receptors.
- 5.2 The historical plans show that potential contaminants could be linked to the past and present operations within the different site areas. These include a sewage works, scrap yards, a nursery, coal yards, landfill sites, vehicle servicing garages and a concrete works.
- 5.3 An assessment of potential contaminants associated with the former uses was undertaken with reference to CLR8 and the following DETR Industry Profiles:
- *Sewage Works and Sewage Farms*
 - *Waste Recycling and Treatment and disposal sites – Metal Recycling Sites*
 - *Road Vehicle Servicing and Repair- Garages and Filling stations*
 - *Road Vehicle Servicing and Repair- Transport and Haulage Centres*
- 5.4 Contaminants that may be encountered within the different site areas (A to E) could include:
- Metals - cadmium, copper, chromium, lead, mercury, nickel and zinc
 - Semi Metals - arsenic and sulphur
 - Inorganic chemicals - cyanide, nitrate, sulphate and sulphide
 - Asbestos
 - PAHs
 - Fuel oils
 - PCBs
 - Chlorinated Aliphatic/Aromatic compounds
- 5.5 Potential sources of ground contamination relating to the site are as follows:
- Sources:* upfilled/made ground
 surface spillages
 oil/fuel leaks
 possible asbestos containing materials
- Pathways:* dermal contact
 inhalation of contaminated particulates
 surface water drainage system
 miscellaneous underground service runs
 mobile groundwater regime
- Targets:* end users of the site (residents)
 construction workers (temporary or transient)
 groundwater
 surrounding environment

- 5.6 The above pollutant linkages are shown on conceptual site models which have been prepared separately for each site area and are presented as Drawing Numbers 5848/3A to E in Appendix A to this report. Clearly the conceptual models will be subject to modification in light of data arising from the proposed ground investigation.
- 5.7 Details of the ground investigation for Areas A, B and D, including an outline of the general objectives, are discussed in Section 6.1 below.

6 FIELDWORK (AREAS A, B & D)

6.1 Objectives

- 6.1.1 To determine the general nature of soils underlying the site, in particular the nature, distribution and thickness of made ground including the:

- nature, degree and extent of any contamination
- proportion of undesirable elements e.g. foundations etc

- 6.1.2 To investigate the possibility of shallow mineworkings below the site.

- 6.1.3 To install gas monitoring wells to enable a gas monitoring and assessment to be undertaken.

6.2 Scope of Works

- 6.2.1 Fieldwork was undertaken by Encia between 17th and 21st November 2003. A second phase of window sampling was undertaken in Area D on 12th January 2004.

- 6.2.2 32 trial pits (TPs 1 to 32), were excavated to a maximum depth of 3.3m using a JCB 3CX mechanical backhoe excavator with a 0.6m wide toothed bucket. Trial pit logs are presented in Appendix D of this report.

- 6.2.3 23 Window sample holes (WS 1 – 16 and WS10 to 107) were drilled to a maximum depth of 3.3m bgl. Window sample logs are presented in Appendix E of this report.

- 6.2.4 9 probeholes (PHs 1 to 9) were advanced using rotary open hole methods to a maximum depth of 30m. Probehole logs are presented in Appendix F to this report.

6.3 Description of Strata

- 6.3.1 The soils encountered during the investigation have been logged in general accordance with BS 5930: 1999 'Code of Practice for Site Investigations'. The descriptions and depth of strata encountered are presented on the trial pit, window sample hole and probehole logs in Appendices D to F, respectively, to this report.

- 6.3.2 Representative soil/fill samples were taken at regular intervals from the exploratory holes to assist in the identification of the ground and allow selected laboratory testing to be performed.

- 6.3.3 Relative densities of granular materials given on the trial pit and window sample hole logs are based on visual inspection only and do not relate to any specific bearing capacities.

6.4 Exploratory Hole Locations

- 6.4.1 Exploratory hole locations were selected by Encia to provide a representative view of the strata beneath the site.
- 6.4.2 Due to large parts of the site being operational, exploratory holes were positioned so as not to impact on the respective site operations and to ensure the safety of site operatives. Therefore this limited the ground investigation in some areas of the site, particularly Area D.
- 6.4.3 Window sampling was undertaken within Area D, as it results in minimal disturbance of surface hardstand. However, it should be noted that window sampling allows only a limited inspection of the ground (especially made ground with a significant proportion of coarse material).
- 6.4.4 Encia trial pit, window sample and probehole locations are shown on Drawing Number 5848/3 presented in Appendix A to this report.

6.5 Sampling

- 6.5.1 Soil samples were selected and taken by a representative of Encia during the site investigation works. Representative samples were taken of the strata encountered and recorded as such, the type of sample taken being dependent on the nature of the stratum and the purpose of the analysis.
- 6.5.2 Samples of soil for chemical testing were placed into 1 litre plastic tubs. Samples of liquid and soil for organic chemical testing were taken in brown glass one litre bottles and jars. These were delivered to the laboratory at the end of each day and stored at a temperature of approximately 4°C.
- 6.5.3 The distribution of samples taken are recorded on the trial pit and window sample logs presented in Appendix D and E respectively.
- 6.5.4 This ground investigation was undertaken in general accordance with Contaminated Land Research Report No. 4 "*Sampling strategies for contaminated land*" and the new Code of Practice BS10175:2001 "*Code of practice for the identification of potentially contaminated sites*".

7 GROUND CONDITIONS

7.1 General

- 7.1.1 A complete record of the strata encountered is given on the trial pit, window sample and probehole logs, which are presented in Appendices D to F to this report.

7.2 Made Ground

- 7.2.1 The depths of made ground encountered across the site are shown on Drawing 5848/7 in Appendix A.

Area A

- 7.2.2 Made ground was encountered across the whole of this area. Two distinct areas of made ground have been identified, namely a landfill site located in the north (sub-area A2) and an area of filled ground in the south (Sub-area A5).
- 7.2.3 With the landfill, sub-area A2, made ground comprised loose silty sand with much broken brick, concrete with rare wood, plastic and metal to a depth of approximately 3.0m. This material is in accordance with the landfill licence.
- 7.2.4 The second distinct area, sub-area A5, made ground comprises silty and clayey sand and gravel and demolition rubble. The maximum depth of fill material was encountered in the far south (TP 31 >2.3m), with the depth decreasing towards the north, to an average depth of 0.3m.
- 7.2.5 Outside of these areas made ground comprised a veneer of material to an average depth of 0.3m.
- 7.2.6 No made ground was encountered within the field (Sub-area A4) in the east of this area.

Area B

- 7.2.7 No significant volumes of made ground were encountered within this area.

Area D

- 7.2.8 Made ground was encountered across this area and consisted of a reinforced concrete hardstand (average depth 0.2m) over granular fill underlain, by gravel and ash and clinker. The maximum depth of made ground was 2.5m and the average depth across Area D was 1.2m.

7.3 Natural Ground

- 7.3.1 Natural ground across all areas comprised a firm to stiff brown clay (weathered mudstone) over mudstone bedrock, sandstone was encountered in the north west corner of the site.
- 7.3.2 Depths to rock head within the trial pits, where encountered, varied between 1.5 and 3m across the site. Rockhead was encountered within the probeholes between 1.2 and 3.1m bgl, this is in general accordance with the trial pits and window samples holes.
- 7.3.3 A shallow coal seam was encountered in TP19 (Area A) at a depth between 1.2 and 1.5m bgl. Within TP20 a carbonaceous mudstone with traces of coal was encountered between 1.5 and 1.8m bgl.
- 7.3.4 Hand vane tests were carried out where possible. The results of the shear vane testing indicated shear strengths of between 45 and 130kPa, i.e. firm to stiff clay.
- 7.3.5 Within TP12 desiccated (dry) brown clay was encountered between 0.6 and 2.6m bgl. This desiccation is taken to be due to the presence of trees and shrubs in this area.

7.4 Visual and olfactory evidence of organic contamination.

- 7.4.1 Organic contaminants, associated with fuel or solvent spills/leaks, are generally more mobile and hazardous than inorganic contaminants, such as those often associated with deposits of ash & clinker. Organic contaminants are usually readily identified in the field due to associated odours and/or oily sheens.
- 7.4.2 Localised olfactory evidence of fuel/oil contamination was noted within the top 1m of the filled ground in the south of Area A.
- 7.4.3 Visual and olfactory evidence of fuel/oil contamination was noted within filled ground between 0.6 and 1.0m within Area D.
- 7.4.4 No visual or olfactory evidence of contamination was noted with any of the trial pits within Area B.
- 7.4.5 Ash and clinker was encountered within both areas A and D, it is likely that this material will contain inorganic contamination, such as elevated lead and arsenic and could be combustible. In addition, within Area A demolition rubble and rusted metal parts were tipped with the ash and clinker, it is likely that contamination could be associated with these materials.

7.5 Groundwater

- 7.5.1 Water seepages were encountered within the trial pits between 2.0 and 3.0m within the weathered mudstone.
- 7.5.2 Groundwater was noted to rise within the probeholes, suggesting sub-artesian conditions with the overlying cohesive cover acting as a confining layer.
- 7.5.3 Monitoring wells were installed in four of the probeholes and two window sample hole. Relevant details are summarised in Table 4 below.

Table 4 - Monitoring wells

Exploratory Location	Response Zone	Typical standing water level m bgl
PH 1	1m to 10m	No data
PH 5	1m to 10m	1.44 - 0.85
PH 7	1m to 10m	Flooded
PH 8	1m to 10m	0.50
WS 10	1m to 3m	1.35 - 1.27
WS 16	0.7m to 2.7m	1.30 - 1.26

- 7.5.4 It should be borne in mind that groundwater levels vary with rainfall/season and that they could be higher/lower at other times of the year than those encountered during this investigation.

7.6 Stability

- 7.6.1 Stability was generally good within the trial pits, however, TPs 14 to 16 excavated in the north west of Area A (landfilled area), collapsed due to the loose sandy fill.

7.7 Revised Conceptual Ground Model

7.7.1 The Preliminary Conceptual Site Models for Areas A, B and D have been amended to produce Revised Conceptual Site Models, Drawings 5803/5A,B and D, presented in Appendix A, incorporating the findings of the ground investigation.

7.7.2 These amendments include the identified ground conditions, areas of contamination and revised pollutant linkages.

7.8 Mining

7.8.1 As detailed in Section 4.1, geological plans show the Swinton Pottery Coal and Newhill Coal seam to lie below the Oaks Rock at approximately 20 to 35m bgl.

7.8.2 The possibility that these seams could have been worked could not be discounted without a mining investigation. In addition larger scale geological plans show an unnamed coal seam outcropping across the centre of the site from east to west.

7.8.3 Nine rotary open hole probeholes were drilled to determine if the identified shallow coal seams below the site could have been worked in the past.

7.8.4 The ground conditions encountered within the probeholes are summarised in Table 5 below. The probehole logs are presented in Appendix F to this report.

Table 5. Summary of strata encountered by rotary drilling

Probehole No.	Depth to Rockhead /m	Depth to Coal /m	Thickness of Coal /mm (Seam)	Remarks
PH1	3.1	8.8	0.9	PH drilled to 11m, no voids, broken ground or loss of flush where encountered
PH2	2.2	8.5	1.2	Coal was parted with mudstone. PH drilled to 30m, no voids, broken ground or loss of flush where encountered
PH3	1.2	3.3	1.4	Coal was parted with mudstone. PH drilled to 10m, no voids, broken ground or loss of flush where encountered
PH4	1.4	-	-	No coal encountered
PH5	2.3	-	-	No coal encountered
PH6	2.3	-	-	No coal encountered
PH7	1.9	2.5	1.5	Coal was parted with mudstone. PH drilled to 10m, no voids, broken ground or loss of flush where encountered
PH8	2.0	-	-	No coal encountered
PH9	1.6	5.2	0.4	Coal was parted with mudstone. PH drilled to 10m, no voids, broken ground or loss of flush where encountered

7.8.5 One seam of coal was encountered at depths of between 3.3 and 9.9m, the maximum seam thickness being 1.20m. No voids or broken ground were encountered.

7.8.6 Coal was encountered in TP 19 (Area A) at a depth between 1.2 and 1.5m bgl. Within TP20 a carbonaceous mudstone with traces of coal was encountered between 1.5 and 1.8m bgl.

7.8.7 This coal is considered to be the unnamed seam as shown on the 1:50,000 BGS Plan.

7.8.8 Gas monitoring wells were installed in four of the probeholes.

8 HAZARDOUS GAS

8.1 Potential sources of hazardous gas include:

- close proximity of a closed landfill site (located 50m north of Area E)
- filled ground within the site (including a landfill located within Area A)
- potential mines gas from a shallow coal seam
- The Woolley Edge Rock, a possible source of mines gas

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

8.3 The Cudworth Landfill, Burton Road, which is located within 50m of Area E is known by BMBC to be producing landfill gas, they also indicate that this is migrating off site.

8.4 With reference to the proposed layout plan, Drawing 5848/6 copied in Appendix A, no development is shown within 50m of the landfill site.

8.5 If development were proposed for Area E, a 50m easement would sterilise an area of about 4000m² of land adjacent to the proposed development's northern boundary. However, this land would be suitable for gardens or as Public Open Space.

8.6 A comprehensive hazardous gas risk assessment will be issued in a supplementary letter report on completion of gas monitoring during March. In the meantime, based on the results obtained to date, it is considered likely that:

- further monitoring will be required (at least 10 visits over 6 months, and possibly 12 over a year), and
- gas protection measures will be of a higher specification than those required simply to provide protection against radon.

9 CONTAMINATION: ANALYSIS AND RESULTS

9.1 General

9.1.1 Areas A and D have current and past processes which are considered to have the potential to introduce ground contamination.

9.1.2 Localised visual and olfactory evidence of oil/fuel contamination was noted within the shallow made ground within Areas A and D.

- 9.1.3 These aforementioned sources are considered to have the potential to introduce localised ground contamination.
- 9.1.4 An assessment of potential contaminants associated with the former uses was undertaken with reference to CLR8 and the following DETR Industry Profiles;
- *Waste Recycling and Treatment and disposal sites – Metal Recycling Sites*
 - *Road Vehicle Servicing and Repair- Garages and Filling stations*
 - *Road Vehicle Servicing and Repair- Transport and Haulage Centres*
- 9.1.5 Contaminants that may be encountered within Areas A, B and D are could include:
- Metals, such as cadmium, lead and nickel
 - Semi metals and non metals, e.g. arsenic and boron
 - Oil and fuel hydrocarbons
 - PAHs
 - Asbestos
 - Phenols
 - PCBs
- 9.1.6 It should be noted that the list of contaminants listed in section 5.4 refers to areas A to E, the list detailed above refers only to Areas A, B and D.
- 9.1.7 Forty four samples of made and natural ground were analysed at a UKAS accredited laboratory, for a potential contaminant suite comprising:
- pH, water soluble boron, total metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium and zinc).*
- 9.1.8 Thirty eight samples of made and natural ground were analysed for leachable metals (*arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium and zinc*) to determine the mobility of the contaminants present.
- 9.1.9 Due to the presence of visual and olfactory evidence of fuel contamination and historical use of the site as scrap yards, thirty two samples of made and natural ground were tested for TPH by GC FID, this analytical technique detects hydrocarbons in the range C₁₀ to C₄₀ (diesel and lubricating oils).
- 9.1.10 In addition the eighteen soil samples were also tested for gasoline range organics (C₆ to C₉) and BTEX by GC-MS, (Benzene, Toluene, Ethyl benzene and Xylene), this analytical technique detects the more mobile aromatic hydrocarbons.
- 9.1.11 Fifteen samples of made ground for total PAH, phenols, sulphide and cyanide. In addition eight of the above samples were also tested for speciated PAH.
- 9.1.12 The made ground within the site contained a significant content of ash and/or clinker. The calorific value of nineteen samples with ash and clinker material was therefore determined.
- 9.1.13 Eleven samples of made ground were tested for asbestos fibres.
- 9.1.14 Eight samples of made ground from Area D were tested for PCBs, the results for which will be reported under a separate cover.

9.1.15 The soil/fill contamination test results are summarised on Tables 6 to 10 on pages 22 – 30.

9.1.16 Three samples of groundwater were also tested for a groundwater suite comprising PAH, TPH and total metals (*arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium and zinc*). The TPH results have not been received and will be reported as addendum to this report.

9.1.17 Four samples of surface water were collected from the small stream which flows along the southern boundary of the site, the surface water samples were tested for; total metals, PAH, phenol and TPH.

9.1.18 The ground/surface water test results are summarised on Table 11 on page 31.

9.1.19 Laboratory test certificates as received are presented in Appendix G to this report.

9.2 Current Guidance and Methodology

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

9.3 Soil/Fill Contamination Results

Standard Suite (Inorganic) Determinands

9.3.1 The analytical result certificates are presented in Appendix G to this report and are summarised in Table 6a to 6c on pages 21 - 23.

9.3.2 Of the 44 samples of made and natural ground analysed for the arsenic and total metals, 24 could be classified as contaminated because they contained one or more of the parameters at concentrations above relevant current UK guidance threshold values for an end use, which includes domestic gardens and any area where plants are to be grown (the most sensitive of the proposed end-uses).

9.3.3 Within **Area A** the most common contaminants were copper (11 samples), zinc (10), arsenic (9) and nickel (8). Also elevated lead, copper and cadmium were recorded. It is considered that the elevated inorganics are associated with the ash and clinker content within the made ground in this area.

- 9.3.4 Within **Area B** the most common contaminants were elevated arsenic (5 samples), zinc (3) and copper (2).
- 9.3.5 Within **Area D** the most common contaminants were arsenic (4 samples), copper and zinc (3), chromium, lead and nickel (2) and cadmium (1).
- 9.3.6 Leachability tests were conducted on thirteen samples and the results are summarised in Table 7a to 7c on pages 24 - 26. The concentrations of leachable contaminants detected in all but one of the samples were all found to be below the maximum permissible concentrations as defined in the Water Supply (Water Quality) Regulations 1989.
- 9.3.7 A slightly leachable nickel (WS8 0.2 to 1.0m) was encountered in one sample within Area D.

Combustibility

- 9.3.8 The calorific values of nineteen samples of made ground containing ash and clinker were determined in order to assess potential combustibility. The results are summarised in Table 8 on page 27.
- 9.3.9 Elevated calorific values were recorded in nine made ground samples from Area A and two elevated calorific values were recorded in ash and clinker from Area D.
- 9.3.10 One sample from Area A (TP2 - 0.3m) has been detected with a CV above the upper threshold limit of 10,000 kJ/kg.
- 9.3.11 The average calorific value of all the samples tested is approximately 6,000kJ/kg. The ash and clinker material must therefore be considered to be potentially combustible.

Asbestos

- 9.3.12 No asbestos fibres were detected in any of the 11 samples tested.

Organic (Fuel, oils) Determinands

- 9.3.13 Professional judgement and experience suggests that TPH concentrations in excess of 500mg/kg are often indicative of diesel or oil contamination and require consideration. With reference to Table 9 on page 28, twenty two samples yielded a concentration greater than 500mg/kg.
- 9.3.14 32 samples from Areas A and D were tested for TPH (Fuel/oil) contamination. Within **Area A**, eight samples of made and natural ground were contaminated by TPH. Within **Area D** fourteen samples of made ground were contaminated with elevated concentrations of TPH.
- 9.3.15 None of three natural ground samples were contaminated with TPH.
- 9.3.16 With reference to Table 10 on page 29, no elevated BTEX or GRO concentrations were detected within any of the eighteen samples from Areas A and D.
- 9.3.17 With reference to Table 6a and 6c on pages 21 and 23, elevated PAH contamination was detected in TP32 0.5m in Area A and WS11 0.2-0.8m in Area D.

Groundwater

9.3.18 With reference to Table 11 on page 31, it is apparent that the shallow groundwater below Area D is contaminated with arsenic, metals and PAH.

9.3.19 Groundwater from PH8, which is located close to the boundary between Areas B and D, contained a slightly elevated concentration of PAH.

Surface Water

9.3.20 Four surface water samples were collected from the small watercourse, which flows along the southern boundary of the site. Surface water sample locations are shown on Drawing 5848/3 in Appendix A. With reference to Table 11 on page 31, it is apparent that no significant metal contamination exists within the watercourse, with the exception of a slightly elevated chromium concentration in Sample 4.

9.3.21 With respect to organic contamination, elevated PAH contamination was present in all four surface water samples, whilst no elevated TPH or phenol concentrations were detected.

Table 6a: Summary of Common Contaminants encountered in Ground at Burton Road, Barnsley (Area A)

			Contaminant Concentrations in mg/kg unless otherwise stated. Trigger Level Concentrations are Shown in Brackets and assume a residential with gardens end-use.													
Site Area	Sample Location and depth (m)	Material	pH [#]	As (20) ^{\$}	Cd (1, 2 or 8) ^{\$}	Cr (130) ^{\$}	Pb (450) ^{\$}	Hg (8) ^{\$}	Se (35) ^{\$}	B (3) [*]	Cu (130) [*]	Ni (50) ^{\$}	Zn (300) [*]	CN (20) ⁰	Phenol (40) ⁰	PAH (40) ⁰
A	TP1 0.5	MG: Rubble/Ash	7.9	-	-	-	-	-	-	-	-	-	-	-	-	-
A	TP1 1.5	MG: Rubble/Ash	8.3	-	-	-	-	-	-	-	-	-	-	-	-	-
A	TP2 0.3	MG: Ash and Clinker	7.6	44	-	-	-	-	-	-	168	58	-	-	-	-
A	TP2 0.8	MG: Ash and Clinker	7.4	48	-	-	-	-	-	-	210	61	-	-	-	-
A	TP3 0.1	MG: Silty Sand/Gravel	8.6	21	-	-	-	-	-	-	185	-	467	-	-	-
A	TP3 0.5	MG: Sandy Gravel	8.1	35	-	-	-	-	-	-	197	51	551	-	-	-
A	TP4 0.2	MG: Sandy Gravel	8.4	-	-	-	-	-	-	-	-	-	330	-	-	-
A	TP4 0.6	MG: Sandy Gravel	8.2	-	-	-	-	-	-	-	-	-	-	-	-	-
A	TP5 0.1	MG: Ash and Clinker	7.7	25	-	159	1100	-	-	-	404	80	5270	-	-	-
A	TP6 0.15	MG: Ash and Clinker	8.7	29	-	-	815	-	-	-	523	68	2090	-	-	-
A	TP7 0.25	MG: Ash and Clinker	8.7	24	-	-	-	-	-	-	302	54	507	-	-	-
A	TP8 0.1	MG: Silty Sand	10	-	-	584	542	-	-	-	204	-	1090	-	-	-
A	TP30 0.2	MG: Silty Sand	8.5	29	-	140	1360	-	-	-	672	72	3280	-	-	-
A	TP31 0.5	MG: Silty Sand	7.7	28	9	-	-	-	-	-	661	57	1230	-	-	-
A	TP32 0.5	MG: Silty Sand	8.6	-	-	-	557	-	-	-	265	-	794	-	-	197
A	WS1 0.25	MG: Silty Sand	8	-	-	-	-	-	-	-	-	-	-	-	-	-
A	TP30 0.6	CLAY	7.8	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Table 6b: Summary of Common Contaminants encountered in Ground at Burton Road, Barnsley (Area B)

			Contaminant Concentrations in mg/kg unless otherwise stated: Trigger Level Concentrations are Shown in Brackets and assume a residential with gardens end-use.										
Site Area	Sample Location and depth (m)	Material	pH [#]	As (20) ^{\$}	Cd (1, 2 or 8) ^{\$}	Cr (130) ^{\$}	Pb (450) ^{\$}	Hg (8) ^{\$}	Se (35) ^{\$}	B (3) [*]	Cu (130) [*]	Ni (50) ^{\$}	Zn (300) [*]
B	TP10 0.15	MG: Silty Sand	7.1	-	-	-	-	-	-	-	-	-	-
B	TP11 0.2	MG: Silty Sand	7.1	25	-	-	-	-	-	-	-	-	703
B	TP12 0.3	MG: Sandy Clay	7.1	-	-	-	-	-	-	-	-	-	-
B	TP13 0.5	MG: Silty Sand	8.7	-	-	-	-	-	-	-	144	-	455
B	TP14 0.5	MG: Silty Sand	8.2	-	-	-	-	-	-	-	-	-	-
B	TP15 1.5	MG: Sand	8.1	-	-	-	-	-	-	-	147	-	315
B	TP16 1.0	MG: Silty Sand	8.8	-	-	-	-	-	-	-	-	-	-
B	TP16 2.0	MG: Sand	10.6	-	-	-	-	-	-	-	-	-	-
B	TP17 0.15	MG: Silty Sand	7.2	22	-	-	-	-	-	-	-	-	-
B	TP20 0.1	MG: Ashy Silty Sand	7.8	-	-	-	-	-	-	-	-	-	-
B	TP25 0.1	MG: Silty Sand	6	-	-	-	-	-	-	-	-	-	-
B	TP9 0.1	Silty SAND (Topsoil)	7.2	24	-	-	-	-	-	-	-	-	-
B	TP18 0.1	Silty SAND (Topsoil)	7.2	26	-	-	-	-	-	-	-	-	-
B	TP21 0.1	Silty SAND (Topsoil)	5	23	-	-	-	-	-	-	-	-	-
B	TP23 0.1	Silty SAND (Topsoil)	5.6	-	-	-	-	-	-	-	-	-	-
B	TP24 0.1	Silty SAND (Topsoil)	5.4	-	-	-	-	-	-	-	-	-	-

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

Table 6c: Summary of Common Contaminants encountered in Ground at Burton Road, Barnsley (Area D)

			Contaminant Concentrations in mg/kg unless otherwise stated. Trigger Level Concentrations are Shown in Brackets and assume a residential with gardens end-use.													
Site Area	Sample Location and depth (m)	Material	pH [#]	As (20) ^{\$}	Cd (1, 2 or 8) ^{\$}	Cr (130) ^{\$}	Pb (450) ^{\$}	Hg (8) ^{\$}	Se (35) ^{\$}	B (3) [*]	Cu (130) [*]	Ni (50) ^{\$}	Zn (300) [*]	CN (20) ⁰	Phenol (40) ⁰	PAH (40) ⁰
D	WS4 0.6-0.9	MG: Ash and Clinker	10.5	-	-	-	-	-	-	-	-	-	-			
D	WS5 0.2-0.5	MG: Sandy Gravel (subbase)	10.3	26	-	-	-	-	-	-	-	-	-			
D	WS6 0.5-1.0	MG: Ash and Clinker	11.8	-	-	199	-	-	-	-	-	-	-			
D	WS8 0.2-1.0	MG: Ash and Clinker	9.3	28	9	-	1320	-	-	-	414	1960	1010			
D	WS9 1.1-2.0	MG: Ash and Clinker	9	-	-	-	-	-	-	-	-	-	-			
D	WS11 0.2-0.8	MG: Ash and Clinker	8.8	53	-	155	1350	-	-	-	453	164	1240	-	-	90
D	WS12 0.5-1.2	MG: Sandy Gravel	9.4	-	-	-	-	-	-	-	-	-	-			
D	WS13 0.2-0.5	MG: Sandy Gravel (subbase)	11.1	-	-	-	-	-	-	-	-	-	-			
D	WS14 0.4-0.8	MG: Sandy Gravel	10.4	25	-	-	-	-	-	-	418	-	470			
D	WS15 0.5-1.0	MG: Sandy Gravel	9.7	-	-	-	-	-	-	-	-	-	-			
D	WS3 0.6-1.0	Sandy GRAVEL	7.8	-	-	-	-	-	-	-	-	-	-	-	-	-
D	WS7 1.5-2.0	CLAY	7.6	-	-	-	-	-	-	-	-	-	-			

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

Table 7a - Summary of the Leachability Testing on samples from Burton Road, Barnsley (Area A)

Sample Location & depth	Material	Contaminant Concentration in µg/litre Unless Otherwise Shown										
		pH	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	Se	B
			(50)*	(5)*	(50)*	(3000)*	(50)*	(1)*	(50)*	(5,000)*	(10)*	(2000)*
TP1 - 0.50	MG: Rubble/Ash	8.8	-	-	-	-	-	-	-	-	-	-
TP1 - 1.50	MG: Rubble/Ash	7.3	-	-	-	-	-	-	-	-	-	-
TP2 - 0.30	MG: Ash and Clinker	6.8	-	-	-	-	-	-	-	-	-	-
TP3 - 0.10	MG: Silty Sand/Gravel	7.4	-	-	-	-	-	-	-	-	-	-
TP4 - 0.20	MG: Sandy Gravel	7.5	-	-	-	-	-	-	-	-	-	-
TP5 - 0.10	MG: Ash and Clinker	7.3	-	-	-	-	-	-	-	-	-	-
TP6 - 0.15	MG: Ash and Clinker	7.6	-	-	-	-	-	-	-	-	-	-
TP7 - 0.25	MG: Ash and Clinker	7.4	-	-	-	-	-	-	-	-	-	-
TP8 - 0.10	MG: Silty Sand	7.2	-	-	-	-	-	-	-	-	-	-
TP30 - 0.20	MG: Silty Sand	7.2	-	-	-	-	-	-	-	-	-	-
TP31 - 0.50	MG: Silty Sand	7.5	-	-	-	-	-	-	-	-	-	-
WS1 - 0.25	MG: Ash and Clinker	7.2	-	-	-	-	-	-	-	-	-	-

Key		Source of Guidance Trigger Level	
-	Parameter tested for but found not to be in excess of relevant trigger level concentration	*	Water Supply (Water Quality) Regulations 1989
	Parameter not tested for	o	The Surface Water Directive (75/440/EEC)

Table 7b - Summary of the Leachability Testing on samples from Burton Road, Barnsley (Area B)

Sample Location & depth	Material	Contaminant Concentration in µg/litre Unless Otherwise Shown										
		pH	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	Se	B
			(50)*	(5)*	(50)*	(3000)*	(50)*	(1)*	(50)*	(5,000)*	(10)*	(2000)*
TP10 - 0.15	MG: Silty Sand	7	-	-	-	-	-	-	-	-	-	-
TP11 - 0.20	MG: Silty Sand	7	-	-	-	-	-	-	-	-	-	-
TP12 - 0.30	MG: Silty Sand	6.1	-	-	-	-	-	-	-	-	-	-
TP13 - 0.50	MG: Silty Sand	6.9	-	-	-	-	-	-	-	-	-	-
TP14 - 0.50	MG: Silty Sand	7.5	-	-	-	-	-	-	-	-	-	-
TP15 - 1.50	MG: Sand	6.8	-	-	-	-	-	-	-	-	-	-
TP16 - 1.00	MG: Silty Sand	7.5	-	-	-	-	-	-	-	-	-	-
TP16 - 2.00	MG: Sand	9.8	-	-	-	-	-	-	-	-	-	-
TP17 - 0.15	MG: Silty Sand	6.8	-	-	-	-	-	-	-	-	-	-
TP20 - 0.10	MG: Ashy Silty Sand	7.3	-	-	-	-	-	-	-	-	-	-
TP9 - 0.10	Silty SAND (Topsoil)	6	-	-	-	-	-	-	-	-	-	-
TP18 - 0.10	Silty SAND (Topsoil)	6.6	-	-	-	-	-	-	-	-	-	-
TP23 - 0.10	Silty SAND (Topsoil)	5.3	-	-	-	-	-	-	-	-	-	-
TP25 - 0.10	Silty SAND (Topsoil)	6	-	-	-	-	-	-	-	-	-	-

Key		Source of Guidance Trigger Level	
-	Parameter tested for but found not to be in excess of relevant trigger level concentration	*	Water Supply (Water Quality) Regulations 1989
	Parameter not tested for	o	The Surface Water Directive (75/440/EEC)

Table 7c - Summary of the Leachability Testing on samples from Burton Road, Barnsley (Area D)

Sample Location & depth	Material	Contaminant Concentration in µg/litre Unless Otherwise Shown										
		pH	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	Se	B
			(50)*	(5)*	(50)*	(3000)*	(50)*	(1)*	(50)*	(5,000)*	(10)*	(2000)*
WS4 - 0.6-0.9	MG: Ash and Clinker	7.1	-	-	-	-	-	-	-	-	-	-
WS5 - 0.2-0.5	MG: Sandy Gravel (subbase)	7.4	-	-	-	-	-	-	-	-	-	-
WS6 - 0.5-1.0	MG: Ash and Clinker	8.2	-	-	-	-	-	-	-	-	-	-
WS8 - 0.2-1.0	MG: Ash and Clinker	7.1	-	-	-	-	-	-	134	-	-	-
WS9 - 1.1-2.0	MG: Ash and Clinker	7.8	-	-	-	-	-	-	-	-	-	-
WS11 - 0.2-0.8	MG: Ash and Clinker	7.3	-	-	-	-	-	-	-	-	-	-
WS13 - 0.2-0.5	MG: Sandy Gravel (subbase)	11.1	-	-	-	-	-	-	-	-	-	-
WS14 - 0.4-0.8	MG: Sandy Gravel	9.3	-	-	-	-	-	-	-	-	-	-
WS15 - 0.5-1.0	MG: Sandy Gravel	7.3	-	-	-	-	-	-	-	-	-	-
WS3 - 0.6-1.0	Sandy GRAVEL	7	-	-	-	-	-	-	-	-	-	-
WS7 - 1.5-2.0	CLAY	8	-	-	-	-	-	-	-	-	-	-

Key		Source of Guidance Trigger Level	
-	Parameter tested for but found not to be in excess of relevant trigger level concentration	*	Water Supply (Water Quality) Regulations 1989
	Parameter not tested for	o	The Surface Water Directive (75/440/EEC)

Table 8 - Summary of Calorific Value Results

Area of Site	Sample Location & Depth (m)	Material	CV
			2,000KJ/kg
A	TP1 - 0.5	MG: Rubble/Ash	9620
A	TP1 - 1.5	MG: Rubble/Ash	-
A	TP2 - 0.30	MG: Ash and Clinker	12800
A	TP2 - 0.80	MG: Ash and Clinker	9490
A	TP5 - 0.10	MG: Ash and Clinker	4860
A	TP6 - 0.15	MG: Ash and Clinker	3970
A	TP7 - 0.25	MG: Ash and Clinker	6930
A	TP30 - 0.2	MG: Silty Sand	5780
A	TP31 - 0.50	MG: Silty Sand	6430
A	TP32 - 0.5	MG: Silty Sand	-
A	TP20 - 0.10	MG: Ashy Silty Sand	4810
D	WS4 - 0.6-0.9	MG: Ash and Clinker	2600
D	WS5 - 0.2-0.5	MG: Ashy Gravel	3190
D	WS6 - 0.5-1.0	MG: Ash and Clinker	-
D	WS9 - 1.1-2.0	MG: Ash and Clinker	-
D	WS8 - 0.2-1.0	MG: Ash and Clinker	-

Key

- CV result did not exceed 2,000kJ/kg

Table 9
Summary of the degree and extent of hydrocarbon contamination in soil.

Site Area	Sample Location and Depth (m)	Material	TPH mg/kg (500) [#]	DRO mg/kg	LRO mg/kg	PAH mg/kg (40) ⁰
A	TP1 - 0.10	MG: Rubble/ash	774	272	502	
A	TP3 - 0.10	MG: Silty Sand/Gravel	729	298	431	-
A	TP4 - 0.20	MG: Sandy Gravel	5640	5180	462	-
A	TP4 - 0.60	MG: Sandy Gravel	1030	847	187	
A	TP6 - 0.15	MG; Ash and clinker	1080	503	580	
A	TP7 - 0.25	MG; Ash and clinker	-	-	-	-
A	TP8 - 0.10	MG: Silty Sand	15700	6040	9640	
A	TP30 - 0.20	MG: Silty Sand	4920	2170	2750	
A	TP32 - 0.50	MG; Ash and Clinker	5560	3040	2520	197
A	WS1 - 0.15	MG: Sandy Gravel	-	-	-	
A	WS2 - 0.20	MG: Sandy Gravel	-	-	-	
D	WS3 - 0.2 - 0.6	MG: Ash and Clinker	7580	3460	4120	
D	WS4 - 0.6 - 0.9	MG: Ash and Clinker	6500	2650	3850	
D	WS5 - 0.2 - 0.5	MG: Silty Sand (subbase)	13500	8670	4810	
D	WS6 - 0.5 - 1.0	MG: Ash and Clinker	1740	<20	1740	
D	WS7 - 0.6 - 1.5	MG: Ash and Clinker	2300	546	1750	
D	WS8 - 0.2 - 1.0	MG: Ash and Clinker	3640	1620	2020	
D	WS8 - 2.0 - 2.5	MG: Ash and Clinker	5550	3240	2310	
D	WS9 - 0.4 - 1.0	MG: Ash and Clinker	5060	1660	3400	
D	WS10 - 0.2 - 0.5	MG: Sandy Gravel	3080	1300	1780	
D	WS11 - 0.2 - 0.8	MG: Ash and Clinker	16200	10300	5920	90
D	WS12 - 0.2 - 0.6	MG: Ash and Clinker	-	-	-	
D	WS12 - 0.5 - 1.2	MG: Sandy Gravel	-	-	-	
D	WS13 - 0.5 - 1.0	MG: Sandy Gravel	-	-	-	
D	WS14 - 0.4 - 0.8	MG: Sandy Gravel	3330	1660	1670	
D	WS15 - 0.5 - 1.0	MG: Sandy Gravel	574	75	499	
D	WS16 - 0.15- 0.5	MG: Sandy Gravel	2240	385	1850	
D	WS16 - 0.5 - 1.4	MG: Sandy Gravel	1280	757	520	
D	WS101 - 0.2 - 0.9	MG: Ash and Clinker	awaited	awaited	awaited	385
D	WS102 - 0.9 - 1.0	MG: Ash and Clinker	awaited	awaited	awaited	592
D	WS103 - 0.4 - 0.7	MG: Ash and Clinker	awaited	awaited	awaited	981
D	WS104 - 0.5 - 0.9	MG: Ash and Clinker	awaited	awaited	awaited	179
D	WS105 - 0.2 - 0.8	MG: Ash and Clinker	awaited	awaited	awaited	72
D	WS106 - 0.2 - 0.7	MG: Ash and Clinker	awaited	awaited	awaited	46
D	WS107 - 0.5 - 1.5	MG: Sandy Gravel	awaited	awaited	awaited	-
A	WS1 - 0.50	CLAY	-	-	-	
D	WS3 - 0.6 - 1.0	Sandy GRAVEL	-	-	-	
D	WS4 - 1.0 - 2.0	CLAY	-	-	-	
D	WS101 - 1.1 - 1.5	CLAY	awaited	awaited	awaited	-
D	WS102 - 1.0 - 2.0	CLAY	awaited	awaited	awaited	-
D	WS103 - 1.5 - 2.0	CLAY	awaited	awaited	awaited	-
D	WS107 - 1.8 - 3.1	CLAY	awaited	awaited	awaited	-

Note: DRO + LRO = TPH

Key

☐ - Parameter tested for but found not to lie in excess of relevant trigger concentration.

Source of Guidance Trigger Level

⁰ Dutch E-3.c Intervention Level for Soil Remediation (1994)

[#] Professional Judgement of Encia

Table 10 - GRO and BTEX contamination in soil. (AREA D)

Sample Location and Depth (m)	Material	GRO	Benzene mg/kg	Toluene mg/kg	Ethyl Benzene mg/kg	Xylenes mg/kg
		(500) [#]	(1) ^o	(130) ^o	(50) ^o	(25) ^o
WS3 - 0.2-0.6	MG: Ash and Clinker	-	-	-	-	-
WS4 - 0.6-0.9	MG: Ash and Clinker	-	-	-	-	-
WS5 - 0.2-0.5	MG: Silty Sand (subbase)	-	-	-	-	-
WS6 - 0.5-1.0	MG: Ash and Clinker	-	-	-	-	-
WS7 - 0.6-1.5	MG: Ash and Clinker	-	-	-	-	-
WS8 - 0.2-1.0	MG: Ash and Clinker	-	-	-	-	-
WS8 - 2.0-2.5	MG: Ash and Clinker	-	-	-	-	-
WS9 - 0.4-1.0	MG: Ash and Clinker	-	-	-	-	-
WS10 - 0.2-0.5	MG: Sandy Gravel (subbase)	-	-	-	-	-
WS11 - 0.2-0.8	MG: Ash and Clinker	-	-	-	-	-
WS12 - 0.2-0.6	MG: Ash and Clinker	-	-	-	-	-
WS13 - 0.5-1.0	MG: Sandy Gravel	-	-	-	-	-
WS14 - 0.4-0.8	MG: Sandy Gravel	-	-	-	-	-
WS15 - 0.5-1.0	MG: Sandy Gravel	-	-	-	-	-
WS16 - 0.15-0.5	MG: Sandy Gravel	-	-	-	-	-
WS16 - 0.4-1.4	MG: Sandy Gravel	-	-	-	-	-
WS3 - 0.6-1.0	Sandy GRAVEL	-	-	-	-	-
WS4 - 1.0-2.0	CLAY	-	-	-	-	-

Key

Materials in upper case are natural in-situ soils.

-

 Parameter tested for but found not to lie in excess of relevant trigger concentration.
Source of Guidance Trigger Level

- ° Dutch E-3.c Intervention Level for Soil Remediation (1994)
- # Professional Judgement of Encia

TABLE 11 - Summary of Surface and Groundwater Contamination at Burton Road, Barnsley

General Site Area	Source	Sample Loc	Contaminant Concentrations in µg/l unless otherwise stated. Trigger Level Concentrations are Shown in Brackets												
			As	B	Cd	Cr	Cu	Pb	Hg	Ni	Zn	Se	PAH	TPH	Phenol
			(60) ⁰	(2,000)*	(6) ⁰	(50)*	(3,000)*	(75) ⁰	(1)*	(75) ⁰	(5,000)*	(10)*	(0.1) *	(600)#	(2,000) ⁰
B	Groundwater	PH 8										0.8	-		
D	Groundwater	WS101	281	-	46	759	-	2,570	-	905	10,100	13.7	2,236	awaited	
D	Groundwater	WS10	98	-	8	142	-	659	-	205	1,150	-	195	awaited	
D	Groundwater	WS16	247	-	37	775	-	1,630	-	856	3,320	-	144	awaited	
A	Surfacewater	SW 1	-	-	-	-	-	-	-	-	-	-	335	-	-
B	Surfacewater	SW 2	-	-	-	-	-	-	-	-	-	-	214	-	-
B	Surfacewater	SW 3	-	-	-	-	-	-	-	-	-	-	454	-	-
E	Surfacewater	SW 4	-	-	-	63.6	-	-	-	-	-	-	291	-	-

Key		Source of Guidance Trigger Level	
-	Parameter tested for but found not to be in excess of relevant trigger level concentration	*	UK Drinking Water Standards (1989), as amended in 2000
	Parameter not tested for	#	Dutch E-3c Intervention Level for mineral oil (1994)
		⁰	Dutch E-3c Intervention Levels for Soil Remediation (1994)

10 CONTAMINATION: RISK ASSESSMENT AND REMEDIATION

10.1 Qualitative Risk Assessment

Environmental Setting & End Use

10.1.1 In order to assess the significance of the contaminants encountered, consideration must be given to the site's environmental setting and the proposed end use.

10.1.2 The underlying Middle Coal Measures are classified as a minor aquifer. The nearest watercourse flows along the southern boundary of the site. Therefore, the environmental setting is considered to be of medium sensitivity.

10.1.3 With respect to human health, the proposed end use (residential) is sensitive. The transient risks to construction workers can be addressed by the adoption of appropriate health and safety measures see Section 11.4.

10.1.4 Conceptual ground models showing potential contamination sources and potential pollutant linkages to receptors have been developed for each of the site areas (A to E) (see Section 5) and are summarised on Drawing No 5848/4A to 4E in Appendix A.

10.1.5 It is apparent from the laboratory analysis that contamination exists within the made ground. However, the contamination is considered not to be leachable, see section 8.3.

10.1.6 In addition fuel/oil contamination was identified within the made ground in sub-area A5 and the majority of Area D, see section 8.3.

10.1.7 In addition the groundwater below Area D is contaminated with arsenic, metals and PAH.

10.1.8 Given that contamination exists it is considered that potential pollutant linkages could exist within the different site areas.

10.1.9 A revised conceptual ground model has been developed (see Section 7.7) for each of the site areas, which have been subject to this ground investigation (Areas A, B and D). The revised model shows potential pollutant linkages apparent within the site areas, these revised conceptual ground models are summarised on Drawing No 5803/5A, 5B and 5D in Appendix A.

Pollutant Linkages (Areas A, B and D)

10.1.10 As discussed in Section 8.2, assessment of contaminated land is based upon a simple assessment of pollutant linkages, referred to as the source→pathway→receptor model. This assessment considers the current or proposed usage of the site in terms of its suitability for use and environmental setting. This implies the use of risk assessment principles in order to evaluate the potential effects and concerns of contamination on a site-specific basis.

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

10.1.12 Potential contaminant sources include:

- Contamination within the made ground
- TPH (Fuel/oil) contamination with made ground
- Combustible ash and clinker

10.1.13 Potential contaminant pathways include:

- Ingestion
- Dermal contact
- Inhalation of contaminated particulates
- Surface water run-off, including existing drainage infrastructure
- Downward infiltration of leachable/mobile contaminants to groundwater

10.1.14 Potential contaminant receptors include:

- Current users of the site
- Construction workers
- Environment including ground and surface waters
- End users of the site

10.1.15 Leachability testing indicates that contamination within the made ground is generally not leachable. Therefore, the potential pollutant linkage between the contaminated made ground and groundwater is limited.

10.1.16 However, groundwater results from Area D indicate that the shallow groundwater within is contaminated with arsenic, metals and PAH. Therefore there is a pollutant linkage between the perched groundwater and groundwater within the natural ground.

10.1.17 There are plausible pathways between actual contaminant sources and potential receptors. Consequently, some remedial action will be required, either removal of the source or blockage of the pathway (see Section 9.2 below and Table 12 on page 35).

10.2 Remedial Options

10.2.1 The site can be split into three areas with respect to remedial works, these are outlined as follows;

- Area 1 - Areas affected by TPH/PAH contamination and combustible ashy fill
- Area 2 - Areas underlain by a veneer of made ground and/or minor contamination
- Area 3 - Areas underlain by natural ground and/or uncontaminated made ground

10.2.2 The three areas are shown on Drawing 5484/7 in Appendix A. The remedial options for each area are described below.

Area 1

10.2.3 Area 1 comprises the scrap yard (Site Area D) and sub-area A5 (Site Area A) as shown on the aforementioned drawing, these areas contain made ground which contains elevated TPH and PAH contamination. In addition the made ground contains ash and clinker, which has been shown to be potentially combustible.

10.2.4 Remediation proposals within Area 1 will be determined by:

- Site-specific target concentration derived by a Quantitative Risk assessment (QRA), with respect to both human health and controlled waters.
- Agreement of the Local Authority, with respect to both the proposed Remedial Strategy and the site-specific target concentration.

10.2.5 Clearly, leaving the gross organic contamination in-situ and untreated would be the cheapest option financially. However, based on a qualitative review of the data obtained to date, it is considered that a significant volume of grossly contaminated soil/fill will require removal or treatment.

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

10.2.7 Laboratory organics results have been compared with risk-derived Dutch intervention values, which are based on both human and eco-toxicological data (there is currently no UK guidance with respect to TPH concentrations). The Dutch guidance indicates a target trigger level of 50mg/kg for mineral oil (broadly equivalent to TPH) and an intervention level (DIV) of 5,000mg/kg.

10.2.8 It is apparent from inspection of Table 9, on page 29, that the majority of TPH results are between 1000 and 5000mg/kg. However, Encia typically give further consideration to results that are in excess of 500mg/kg, especially as in this case, where such results are relatively widespread.

10.2.9 The proposed preliminary target cut-off concentration of 500mg/kg is ten times lower than the Dutch intervention level and therefore considered appropriate.

10.2.10 A TPH concentration of 500mg/kg is considered conservative, and a higher "cut-off" concentration might be acceptable. However, adoption of a higher "cut-off" will require quantitative risk assessment (for which additional speciated TPH testing is required; testing is currently in progress).

10.2.11 Once site-specific target concentrations have been derived for all the relevant determinands, an appropriate remediation strategy can be formulated. In the meantime, the following remedial options can be considered.

a) Hot-spot removal (Area 1)

10.2.12 During the remedial works olfactory evidence backed up by on-site organics analysis, use of portable instruments (PID or FID), and laboratory testing is recommended to delineate the extent of material requiring treatment or removal and demonstrate that the remaining sidewall and base materials are "clean".

10.2.13 Analysis of at least 6 samples, for the determinands listed in Section 9.2.15 below, should be undertaken; results are required provide the receiving landfill with appropriate data in accordance with the Duty of Care Regulations, 1991. On receipt of the results, the material should be exported from site to a suitably licensed landfill facility.

10.2.14 In addition to the on-site testing, a minimum of 6 samples should be taken from excavation side-walls and base. These samples should also be tested for the determinands listed below.

10.2.15 All samples will be analysed for:

- Total Petroleum Hydrocarbons (TPH by GC-FID)
- Gasoline range organics (GRO), including quantification of BTEX (Benzene, Toluene, Ethyl-benzene and Xylenes), by GC-FID.
- Speciated PAH

10.2.16 Grossly contaminated soil/fill should be placed in temporary stockpiles on hardstand or visqueen, suitably covered and bunded.

10.2.17 Any material exported from site to landfill should be hauled by a registered waste carrier in accordance with the requirements of the Duty of Care Regulations, 1991 and where appropriate the Special Waste Regulations, 1996. A transfer note should be completed, signed and retained by the parties involved. The transfer note should include the volume of waste, the nature of the material and a statement of its chemical composition. Wagons that are to be used for the haulage of the contaminated material from the site should be sheeted to prevent the release of fugitive dust emissions.

10.2.18 Groundwater encountered during excavation of the grossly contaminated soil/fill should be collected in a sump and then passed through a series of oil/water separators to remove any oily contamination. Oils should be trapped on an absorbent medium that can be disposed of with the contaminated soil/fill. Treated water could be discharged to sewer subject to Water Authority consent.

10.2.19 From 16th July 2004, as a result of a 1999 EU Directive, landfill sites will only be able to accept one of the above waste types, i.e. mixing or "co-disposal" of wastes (within the same cell) will not be allowed. For example hazardous, contaminated soils cannot be landfilled with domestic waste, unless they have been subjected to a pre-treatment that renders them stable and non-reactive.

10.2.20 After July 16th, and for many months, possibly years, there is likely to be a shortage of landfill sites able to accept hazardous wastes. Clearly, this is likely to be reflected in gate prices (and haulage costs), which are anticipated to increase significantly (perhaps five-fold).

10.2.21 Consequently, the cost of off-site disposal to landfill for the hazardous soils identified by this investigation maybe prohibitive, and consideration should be given to Quantitative Risk Assessment to minimise the volume of material requiring remedial action, as previously mentioned. If there is still a significant volume of hazardous waste, alternative remedial strategies should be considered such as:

- Export to a remote treatment\transfer station.
- On-site treatment (bioremediation, soil washing or stabilisation).

10.2.22 Option 1 probably represents the most pragmatic and cost-effective solution, since it avoids delay to the build programme.

b) Ex-situ bioremediation (Area 1)

10.2.23 In line with current Government philosophy regarding sustainable development, the recommended remedial strategy would involve treatment rather than off-site disposal. Furthermore, it is likely that ex-situ bioremediation will also prove to be the most economic remedial solution for TPH contaminated fill.

10.2.24 Ex-situ bioremediation involves the excavation and stockpiling of contaminated soil/fill. The stockpiles are then rotated every few days to aerate the soil mass. Nutrients and fungal enzymes are regularly added to the aerated stockpile.

10.2.25 This technique can often achieve specified clean-up targets within 3 to 4 months, however, treatment times are dependent the soil-type and on the area available as well as the degree\nature of the contamination. It would be necessary to allocate a significant area (possibly up to 0.5 hectare) of site for treatment and this is likely to impact on the overall remediation programme.

- 10.2.26 The exploratory hole logs and laboratory results could be forwarded to bioremediation contractors in order that they can assess the feasibility of their techniques with respect to the site-specific data and provide realistic estimates with respect to cost and timescale.
- 10.2.27 The appointed contractor would require a Mobile Plant Licence and should be instructed to take full responsibility for his works, including noise\odour\dust\leachate control. The appointed contractor would also need to submit a site-specific working plan for regulatory approval in advance of the works. Clearly, this plan would need to consider the site's sensitive setting with respect to adjacent residential properties and ensure that unauthorised access was prevented.
- 10.2.28 Bioremediation cannot remove inorganic contaminants and therefore, the treated soil would almost certainly have to be placed beneath hardstand or "clean" subsoil cover. The treated material is likely to contain small amounts of humic matter (residual treatment additives) and therefore must be considered to have the potential to generate some hazardous gas. However, discussion with bioremediation contractors suggests that they are able to provide adequate reassurance that this is not a significant concern. In any case, the basic measures advocated in Section 8.5 will be more than sufficient to nullify any risk.
- 10.2.29 The volume of material requiring remediation is dependent on the target concentration. Which is currently being calculated as part of a Quantitative Risk Assessment.
- 10.2.30 During the remedial works olfactory evidence backed up by on-site organics analysis, use of portable instruments (PID or FID), and laboratory testing is recommended to delineate the extent of material requiring treatment or removal and demonstrate that the remaining sidewall and base materials are "clean".
- 10.2.31 Groundwater encountered during excavation of the grossly contaminated soil/fill should be collected in a sump and then passed through a series of oil/water separators to remove any oily contamination. Oils should be trapped on an absorbent medium that can be disposed of with the contaminated soil/fill. Treated water could be discharged to sewer subject to Water Authority consent.

Combustible Ashy Fill (Area 1)

- 10.2.32 Calorific values in excess of their lower threshold of 2,000 kJ/kg have been detected in the ash and clinker fill within sub-area A5 (south west of Area A). The average calorific value of all samples tested was approximately 6000kJ/kg with one result was in excess of the upper threshold limit of 10,000 kJ/kg. This material must therefore be considered to be potentially combustible.
- 10.2.33 Where combustible ashy fill is encountered it is recommended that 1000mm surface cover should be provided. The uppermost 700mm of cover should comprise at least 550mm of "clean" subsoil and 150mm topsoil. The lowermost 300mm must be inert (i.e. CV < 2MJ/kg), and essentially "clean", but could include the crushed product or made ground generated on site

Area 2

- 10.2.34 Area 2 is located in Sub-Areas A1, A2 and A4, as shown on Drawing 5848/7 in Appendix A. The made ground types is considered suitable for redistribution beneath concrete oversite or areas of hardstanding, where they would be satisfactorily isolated from end users.

10.2.35 Where residual made ground remains beneath garden and landscaped areas it is recommended that a 500mm thick surface cover of "clean" soil comprising 350mm subsoil and 150mm topsoil be placed over the made ground (i.e. not beneath hardstanding). This cover will block potential linkages between the contaminated fill and future end-users.

10.2.36 It is recommended that within sub-area A2 the made ground should be screened and sorted on site in order to remove unsuitable elements (including demolition waste) from the made ground. Unsuitable elements should be stockpiled for subsequent removal from site. Reusable material should be stockpiled separately and retained on site.

Area 3

10.2.37 Area 3 comprises the open fields (Area B) and sub-area A4, as shown on Drawing 5848/7 in Appendix A. Within Area 3 no significant contamination was encountered. The placement of 150mm deep topsoil cover is considered sufficient in this area of the site.

10.2.38 Subject to bioavailability testing, it is considered that the topsoil in this area is suitable for reuse.

10.2.39 Approval of the above recommendations should be sought from the appropriate regulatory authorities prior to commencement of site redevelopment.

Summary of Remedial options

10.2.40 Table 12 overleaf highlights each of the potential pollutant linkages, based upon the classic source→pathway→receptor model, and demonstrates that each can be satisfactorily addressed by appropriate remediation.

Table 12 ~ Summary of Potential Pollutant Linkages and the Appropriate Method of Mitigation

Receptor	Potential Risk	Mitigation
Human Health *	Uptake of contaminants by food plants grown in contaminated soil	Removal or remediation of organic contamination - Area 1 only Placement of capping layer over made ground in Areas 1 and 2 will remove potential pathway of contamination The presence of road pavements, plots and driveways will act a natural barrier in other parts of the site.
	Ingestion	As above
	Inhalation	As above
	Skin contact	As above
	Irradiation	N/A
	Fire and explosion	Placement of 1000mm inert, non-combustible cover over ash and clinker fill to remove any residual risk - Area 1 only.
Buildings	Fire and explosion	N/A
	Chemical attack on building materials and services	Concrete in accordance with BRE SD1, the Design Sulphate Class for the site is DS-1 with an ACEC Class of AC-1.
	Physical	N/A
Natural Environment	Phytotoxicity (prevention or inhibition of plant growth)	Made ground shown to contain phytotoxic contaminants. Placement of cover over made ground will remove the pathway of phytotoxic contaminants.
	Contamination of water resources	Removal or remediation of localised organic contamination
	Ecotoxicological effects	N/A

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

11 GEOTECHNICAL TESTING & ASSESSMENT

11.1 General

11.1.1 It is understood that the proposed development will comprise approximately 220 two storey houses. A sketch plot layout has been provided by BBH, which is presented as drawing 5848/6 in Appendix A. Any revision of this layout may necessitate modification to this report.

11.1.2 Sixteen samples of natural soil were delivered to a suitably accredited laboratory with a schedule of geotechnical testing drawn up by Encia. Testing was undertaken in order to enable recommendations with respect to foundation design.

11.1.3 The geotechnical laboratory test results are presented in Appendix H to this report.

11.1.4 The tests detailed below were undertaken in accordance with BS 1377:1990.

11.2 Atterberg Limits

11.2.1 The liquid and plastic limits of sixteen soil samples was determined using the cone penetrometer method and rolling thread test and have been compared against guidance given in the NHBC Standards, Chapter 4.2.

11.2.2 Plasticity indices were in the range of 15 to 55% indicating clays of low to very high plasticity. For the purposes of foundation design, it is recommended that all cohesive soils be regarded as being of **high** shrinkability.

11.3 Soluble Sulphate and pH

11.3.1 In accordance with BRE Special Digest 1 (SD1) "Concrete in aggressive ground. Part 1: Assessing the aggressive chemical environment" (2001), the site must be classified as "Brownfield" with a mobile groundwater regime.

11.3.2 The concentrations of sulphate in the aqueous natural soil extracts of sixteen samples of natural soil were determined using the gravimetric method.

11.3.3 The pH value of each sample was determined by the electrometric method.

11.3.4 The soil samples tested had pH values ranging from 5.1 to 7.7, indicative of slightly acid to slightly alkaline conditions.

11.3.5 The soil samples displayed levels of soluble sulphate (2:1 water/soil extract) ranging between 0.02 and 0.10 g/l.

11.3.6 Thus, in accordance with BRE SD1, the Design Sulphate Class for the site is DS-1 with an ACEC Class of AC-1.

11.4 Mining

11.4.1 Nine probeholes were drilled within the site, five probeholes encountered a seam of coal between 3.3 and 9.9m, the maximum seam thickness being 1.50m, as detailed in Section 7.8.

11.4.2 A poor quality shaley coal was encountered in TP 19 (Area A) at a depth between 1.2 and 1.5m bgl and a carbonaceous mudstone with traces of coal was encountered between 1.5 and 1.8m bgl. This is considered to be the same coal as encountered in the probeholes.

11.4.3 Given the thickness and quality of the coal encountered, the absence of voids and/or broken ground, the risk of surface instability arising from shallow mineworkings is not considered to be significant.

11.5 Foundations

General

11.5.1 To date the ground investigation has only been undertaken within Areas A, B and D. Foundation recommendations for Areas C and E are only based on anticipated ground conditions, full recommendations for these two areas can only be given following further ground investigation.

11.5.2 There are a number of technically feasible foundation solutions for two storey residential properties constructed within the site.

11.5.3 A detailed foundation schedule is beyond the scope of this report. Final choice of plot-specific foundation solutions will be determined by the Client, probably in conjunction with Encia and subject to NHBC/Building Control approval, after consideration of the:

- detailed remediation strategy adopted
- proposed final levels/regrade proposals
- detailed final plot layout
- line loads
- cost and programme implications

11.5.4 The foundation recommendations provided below assume that new properties will be of two storey construction and that line loads will not exceed 75kN/m run.

11.5.5 Made ground is not considered a suitable foundation material for any residential properties. Foundations should therefore be taken through these materials into underlying natural in-situ strata of adequate bearing capacity.

11.5.6 The natural ground at founding depth is considered to have a safe bearing capacity of approximately 100 kN/m².

11.5.7 Coal seams have been encountered at shallow depth (<3m) during the ground investigation. Consequently, some excavations for foundations, services etc. may come into contact with coal. Care should be taken not to unnecessarily overdeepen foundations, in order to minimise the chance of encountering coal.

11.5.8 Where foundation excavations do come into contact with coal, the foundation should be taken through the coal seam, into underlying natural in-situ strata of adequate bearing. The full thickness of coal should then be sealed with concrete to create a trench fill foundation.

11.5.9 To prevent the ingress of air, the mass concrete fill should be placed as soon as possible after exposing the seam.

11.5.10 As outlined above there are a number of foundation solution options for two storey residential properties constructed on this site and these are discussed below. The distribution of foundation types is shown on Drawing 5848/6 in appendix A and is summarised on Table 13 below.

Table 13 – Summary of Foundation Options

Site Area	Foundation Solution	Remarks
Sub-area A1	Strip Footings	Possible trench fill against site boundary
Sub-area A2	Rafts on engineered fill /piles	If made ground is removed it would be possible to use strip footings
Sub-area A3	Strip Footings	Possible trench fill against site boundary
Sub-area A4	Strip Footings	
Sub-area A4	Rafts on engineered fill/piles	
Area B	Strip Footings	
Area C	Rafts on engineered fill /piles	
Area D	Strip Footings	Subject to further ground investigation
Area E	Rafts on engineered fill /piles	Subject to further ground investigation

Strip Footings

- 11.5.11 Where made ground is less than 1m in depth it is considered that strip foundations could be adopted for all new properties.
- 11.5.12 With reference to the sketch plot layout presented as Drawing 5848/6, it is anticipated that 75% of the plots could be placed on strip footings; these plots are highlighted on the proposed layout plan.
- 11.5.13 The clays at founding depth are considered to be of **high shrinkability** in accordance with NHBC Standards, therefore a minimum footing depth of 1000mm will be necessary.
- 11.5.14 Founding depths are from original or finished ground level, whichever is the lower, to the underside of the footing.
- 11.5.15 Where properties are to be constructed within the influence of trees or hedges suspended floor slabs and suitable void will be required to allow for the shrink/swell characteristics of the soils. Additionally, foundations will require to be deepened near trees in accordance with NHBC Standards, Chapter 4.2. It is estimated that less than 25% of the site may be affected by trees.
- 11.5.16 Where over-deepened foundations are required, these should be stepped in accordance with NHBC Standards, Chapter 4.4.
- 11.5.17 Foundations will be required to be placed below a line drawn up at 45° from the base of any service or similar excavation.
- 11.5.18 Based on the results of the investigation it is considered unlikely that major groundwater flows will be encountered in shallow excavations.
- 11.5.19 In order to minimise softening and swelling of cohesive soils or loosening of granular soils, it is recommended that as soon as formation level is reached, it should be blinded. The blinding should consist of concrete with as low a water:cement ratio as possible.
- 11.5.20 Whilst strip footings generally represent a simple and inexpensive foundation solution, there are a number of potential disadvantages associated with their use on this site:
- a. The made ground contains elevated concentrations of some inorganic contaminants and up to a 1000mm thick cover of clean subsoil (see Section 11.3) has been recommended. This cover will increase footing depth.
 - b. Disposal of contaminated arisings will be required.
 - c. Foundation and drainage excavations may encounter significant obstructions resulting in significant overbreak.
 - d. Foundation and drainage excavations will almost certainly require shoring in made ground.
- 11.5.21 Items c) and d) could be resolved by turnover of the full thickness of made ground.

Rafts on Engineered Fill

- 11.5.22 Subject to the final choice of remediation and proposed ground levels raft foundations on engineered fill are a foundation option over deep made ground.
- 11.5.23 Consideration could be given to turnover (excavation, screening and replacement in engineered layers) of the full thickness of made ground. Turnover is considered an appropriate ground improvement solution since significant excavation of the made ground will be required in any case to remove the soil/fill grossly contaminated with hydrocarbons and relict foundations.

- 11.5.24 Because turnover enables inspection of the full thickness of fill, the developer and their prospective property purchasers, are provided with the reassurance that no significant hazard is left undetected. This is considered advantageous from a perception viewpoint. Furthermore, any potential for surface water infiltration, which would drive potential leaching of contaminants, should be reduced by compaction.
- 11.5.25 Screened and engineered fill should yield CBR values in excess of 2%, thereby reducing abnormalities associated with the construction of estate roads and car parking areas. Excavations through the engineered fill, for drainage etc and any piling will not encounter significant obstructions or grossly contaminated ground and should be stable with little overbreak.
- 11.5.26 Raft foundations could be adopted for the remaining plots shown on the Proposed Sketch Layout plan presented as Drawing 5848/6 in Appendix A.
- 11.5.27 Where rafts are within the influence of mature trees, the depth of crushed stone placed should be equal to 50% of the trench fill foundation depth determined in accordance with NHBC Chapter 4.2.
- 11.5.28 Demolition rubble could be processed on site (screened & crushed) to generate a suitable product for replacement in engineered layers.
- 11.5.29 Turnover of the full thickness of fill is considered an appropriate ground improvement solution to enable raft foundations to be adopted within areas of filled ground.
- 11.5.30 However, the suitability of fill for placement as engineered fill should be confirmed by field trials.
- 11.5.31 The field trials, should be carried out in accordance with an approved Specification. The field trial will enable estimation of an achievable safe bearing capacity, with a view to establishing new dwellings on raft foundations. It will also yield the following information:
- number of passes with the specified compaction plant
 - maximum and minimum layer thickness
 - acceptable moisture content range
- 11.5.32 The engineered fill should achieve at least 95% maximum dry density (as determined by laboratory compaction tests, using 2.5kg rammer), with air voids comprising less than 5%.
- 11.5.33 Raft design should be in accordance with NHBC Standards, Chapter 4.5. Granular sub-base product should be placed in accordance with Table 8/1 of the DTP Specification for Highway works (1993).
- 11.5.34 NHBC generally recommend that rafts be founded on a minimum 150mm thickness of DoT granular sub-base product. Granular sub-base should extend laterally for at least 0.5m beyond the raft. The base of the granular sub-base must be at least 600mm below original or finished level, whichever is the lower. At most reclaimed brownfield sites, original level is generally equivalent to the top of engineered fill.
- 11.5.35 Placement of blankets of a granular sub-base, directly on top of engineered fill would normally be acceptable immediately after placement of the final layer of fill. However, if placement is delayed, climatic factors can lead to a deterioration of the near surface fill.

11.5.36 Where the engineered fill is cohesive, rainfall, (softening) or sunshine (desiccation) may cause deterioration. Cohesive fill should therefore be "blinded" with granular sub-base within 48 hours of placement of the final layer of fill. Wherever this is not possible, it is recommended that a minimum 300mm depth of fill is excavated from beneath the plot footprint, prior to placement of the granular sub-base. Furthermore, it may be necessary to remove any desiccated material if the engineered fill is left exposed during a prolonged spell of dry weather.

11.5.37 Where the engineered fill is granular, deterioration may be caused by frost (unless the fill contains less than 10% fines). Granular fill should therefore be "blinded" with granular sub-base prior to frosty weather.

Piles

11.5.38 If the made ground is to be nominally compacted piles could be utilised as an alternative to raft foundations piles.

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

11.5.40 For piled foundations suspended floor slabs should be utilised.

11.6 Drainage

11.6.1 A drainage feasibility has been undertaken and has been reported under a separate cover.

11.7 Highways

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

11.7.2 Where made ground is less than 2m thick the following options are considered suitable.

- Excavation of the **full** thickness of made ground and replacement with suitable aggregate in accordance with Series 600 (Earthworks) of The Highways Agency (HA) "Specification for Highway Works" 1998.
- Excavation of the **full** thickness of made ground, screening, selection and replacement of **suitable** made ground materials in engineered layers in accordance with Series 600. Unsuitable materials include any soft or wet materials, biodegradables including topsoil, wood, peat or lignite, scrap metal, frozen material and material which, by virtue of its particle size or shape, cannot be properly and effectively compacted (e.g. oversize material or gravels which are tabular).

11.7.3 Where made ground is in excess of 2m thick, it is considered that the **upper 2m** of made ground should be removed and replaced in accordance with the above recommendations. However, the residual made ground materials in the base of the excavation should be inspected and (where necessary) any soft spots removed and replaced with suitable engineered fill.

11.7.4 Where the made ground is re-engineered it is considered that a CBR value of 5% should be achievable, however, this should be verified by plate load testing on site and confirmed with the adopting authority.

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

11.8 Development Constraints associated with Existing Services

11.8.1 A 175mm diameter rising main is located in the south of the site (Areas A, B and D) and a 900mm surface water sewer crosses from northwest to southeast through Areas A and B. These may require an easement or diversion to enable construction within the site. Yorkshire Water will need to be contacted with regard to development within the vicinity of the sewer.

11.8.2 An electricity sub station and a pumping station are located in the south of Area E; Yorkshire Electric and Yorkshire Water will require an easement and access to these facilities. This will have an impact on any proposed development in this area.

12 REDEVELOPMENT ISSUES

12.1 General

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

12.1.2 Final choice of a development strategy will be determined by the Client, probably in conjunction with Encia and a specialist Contractor(s), after consideration of cost and programme implications.

12.1.3 Once a specific strategy has been selected, Encia should be instructed to liaise with regulators prior to submitting a formal, detailed Remediation Strategy document for approval.

12.1.4 Experience of similar schemes suggests that there are likely to be two stages of regulatory liaison: (1) agreement "in principle" and (2) agreement of specific details. It should be noted that such liaison can take several months.

12.2 Preparation of a Remediation Strategy

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

12.2.2 A summary of the anticipated site remedial/preparatory works is presented below:

- Removal of trees and other landscaping
- Demolition of existing buildings
- Processing demolition material for re-use
- Remediation of contaminated soils
- Re-profiling of current site level to create stable development platform.

12.3 Demolition

12.3.1 Prior to redevelopment of the site, demolition and grubbing up of the concrete floor slabs, service ducts and relict foundations will be required. Demolition works should be undertaken in a safe, systematic and controlled manner. All operations should conform to the following regulations:

- HSE Guidance Note G529, Parts 1 to 4.
- BS6187; 2001, Code of Practice for Demolition

12.3.2 It is recommended that the demolition contractor be required to submit a "Method Statement" for approval detailing how they propose to carry out the works.

12.3.3 It is recommended that a full asbestos survey be carried out of the whole site prior to demolition.

12.3.4 It is strongly recommended that the demolition contractor should chase-out all significant buried structures, and survey-in the resultant excavations before making them safe by backfilling. At the very least, relevant features should be surveyed-in before "hiding" them beneath a veneer of rubble.

12.4 Health & Safety Issues

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

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

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

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

12.5 New Utilities

12.5.1 Some existing made ground will still be present on site, which may contain some contamination.

12.5.2 Although utility workers will only be exposed to the contaminated soil/fill for a relatively short time, the contaminants represent a risk and simple precautionary measures outlined in Section 12.4 above will be required.

12.5.3 In addition, the atmosphere in shored trenches in excess of 1.2m should be monitored for oxygen and hazardous gas (methane & carbon dioxide), using widely available portable instruments, prior to personnel entering such excavations. Monitoring should be continued whilst personnel are working in deep excavations.

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

12.5.5 Given that organic contamination is present within the ground beneath this site, it is considered likely that the Water Company will request the use of ductile iron mains, with plastic coated copper house connections. However, this should be confirmed by liaison with the Water Company.

13 SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

13.1 General

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

13.1.2 Nonetheless, useful data has been obtained and this investigation has resolved much of the uncertainty below ground, with a view to enabling unconditional offers for the site. Our investigation report should enable provision of budget costs for the necessary site preparatory and remedial works.

13.2 Hazardous Gas

13.2.1 Due to the close proximity of a closed landfill site, potential mines gas and filled ground, the risks associated with ground gas needs are being assessed. A gas risk assessment will be issued under a separate cover.

13.2.2 A comprehensive hazardous gas risk assessment will be issued in a supplementary letter report on completion of gas monitoring during March. In the meantime, based on the results obtained to date, it is considered likely that:

- further monitoring will be required (at least 10 visits over 6 months, and possibly 12 over a year), and
- gas protection measures will be of a higher specification than those required simply to provide protection against radon.

13.3 Mining

13.3.1 No coal workings were encountered below the site during the intrusive investigation. Based on these findings it is considered that the risk of surface instability arising from mine working is low.

13.4 Contamination and Remediation

13.4.1 A detailed assessment of the degree and extent of ground contamination has been provided at Section 9. A qualitative risk assessment and recommendations with regard to remediation of the contamination has also been provided at Section 10.

13.4.2 **Area A** – Made ground within the sub-area A5 contains potentially combustible ash and clinker, elevated TPH and metals. Remediation within this area could comprise either removal of hotspots/screening of unsuitable elements/1000mm soil cover **or** complete removal of the made ground.

13.4.3 **Area B** – No significant contamination was encountered within this area. No significant remediation is required within this area.

13.4.4 **Area D** – Made ground within this area contains elevated TPH, metals and combustible materials (ash). Remediation could comprise complete removal of the contaminated made ground **or** ex-situ bioremediation of the contaminated fill with a soil cover of 500mm.

13.4.5 If wider gross organic contamination is encountered during remediation/construction it is recommended that the ground affected should be removed from site prior to redevelopment.

13.4.6 The Local Authority should be consulted in order to obtain their views on the remedial options outlined.

13.5 Foundations

13.5.1 Foundation recommendations have been provided at Section 11.6.

13.5.2 **Area A** – Strip footings over the majority of this area, where contaminated soils are subject to remediation foundations could comprise either rafts on engineered fill or strip footings.

13.5.3 **Area B** – Strip footings

13.5.4 **Area D** – Dependant on the final remediation solution within this area, foundations will either comprise rafts on engineered fill or strip footings.

13.5.5 Alternatively, piled foundations could be employed over areas of deeper made ground.

13.6 Highways

13.6.1 Recommendations relating to highways have been provided at Sections 11.7.

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

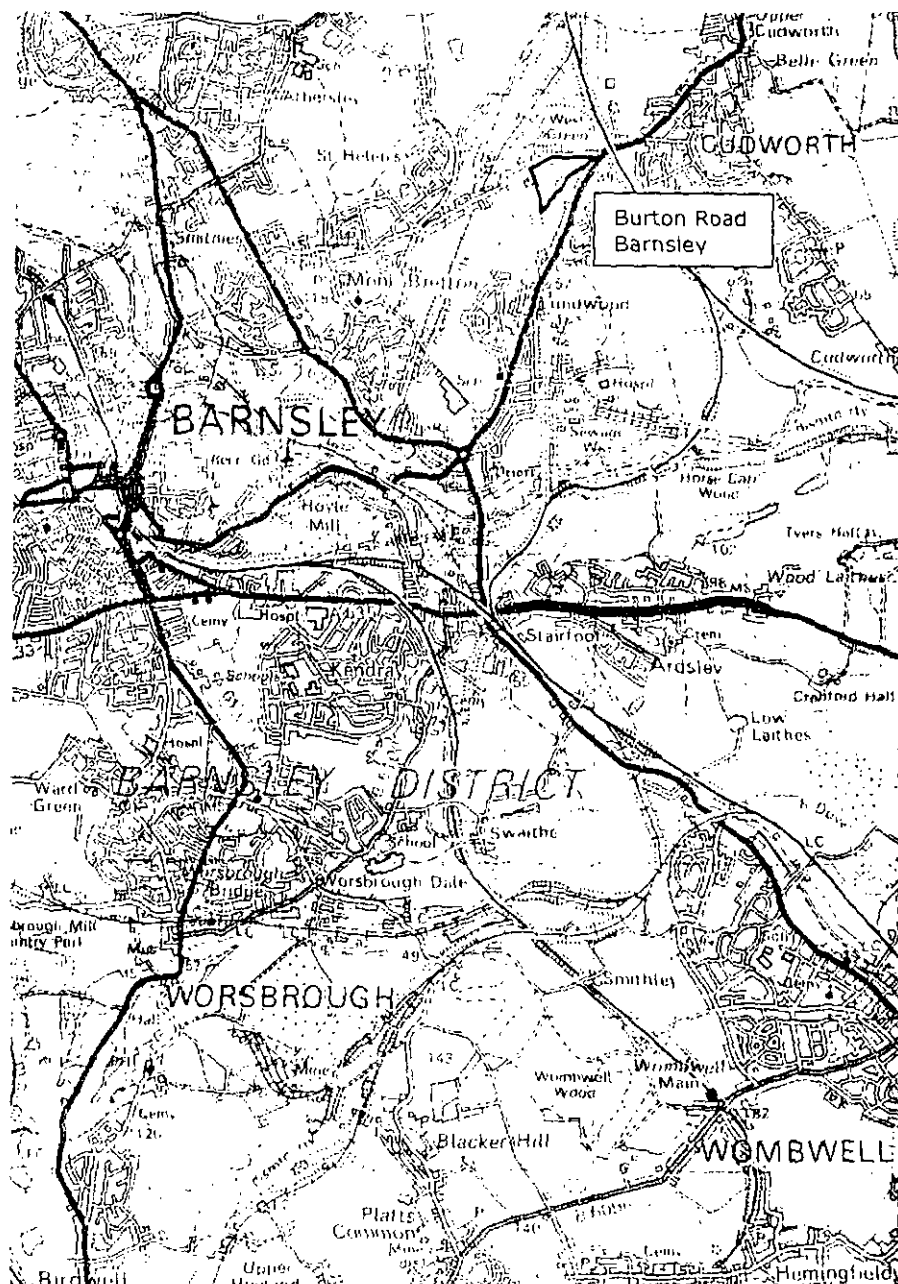
13.7 Further Work

13.7.1 A detailed quantitative risk assessment should be undertaken within Area D to assess the risk to human health and groundwater.

13.7.2 A full site investigation should be undertaken within Areas C and E to determine the presence of contamination risks and ground conditions for foundations.

13.7.3 Asbestos survey prior to demolition of buildings.

**APPENDIX A
DRAWINGS**



CLIENT
Ben Bailey Homes

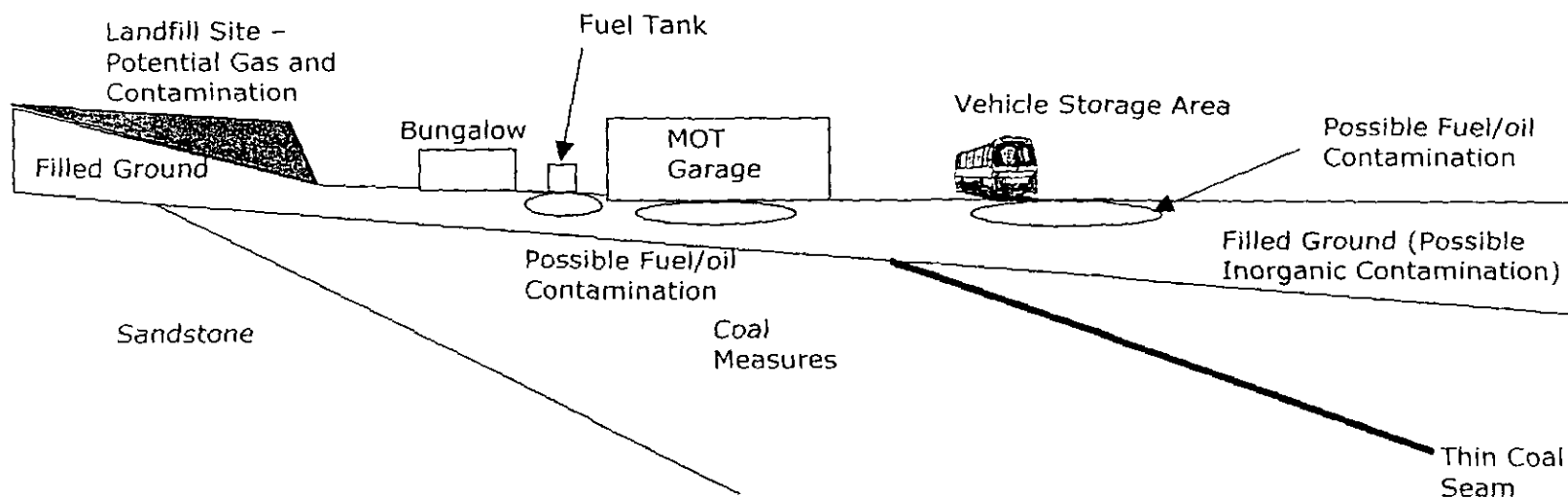
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Burton Road, Barnsley

DRAWING TITLE
Site Location Plan

DRAWN BY JWH	SIGNATURE	DATE 06/01/04	STATUS Final	
APPROVED RLM	SIGNATURE	DATE 06/01/04	SCALE 1:50,000	DRG NO. 5848/1

North

South



CLIENT

Ben Bailey Homes

JOB TITLE

Burton Road, Barnsley

DRAWING TITLE

Conceptual Site Model - Area A

STATUS

FINAL

DRAWN BY

JWH

SIGNATURE

DATE

06/01/04

APPROVED

RLM

SIGNATURE

DATE

06/01/04

SCALE

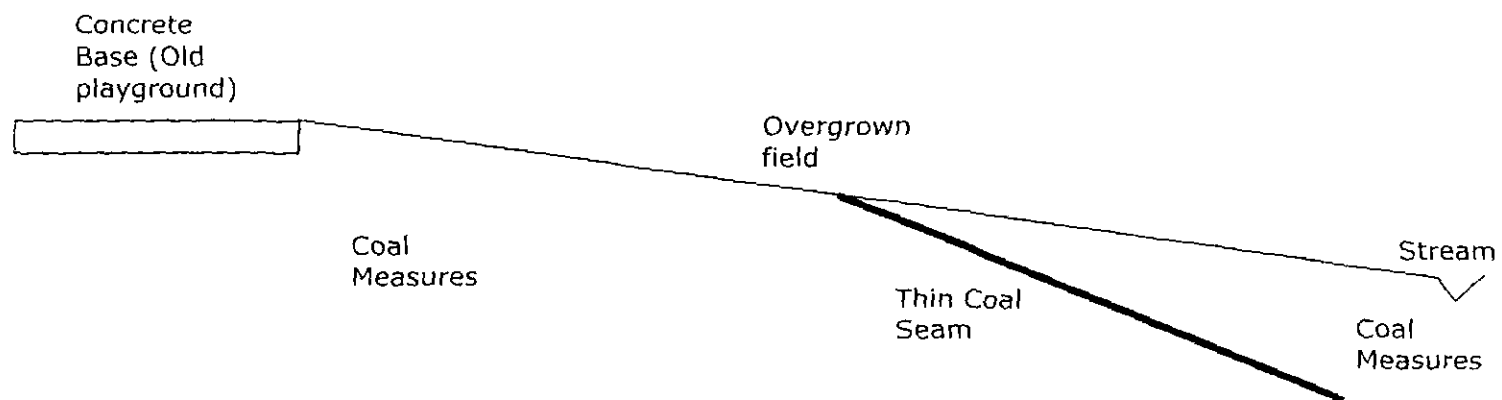
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DRG No.

5848/4A

North

South



CLIENT

Ben Bailey Homes

JOB TITLE

Burton Road, Barnsley

DRAWING TITLE

Conceptual Site Model – Area B

STATUS

FINAL

DRAWN BY

JWH

SIGNATURE

DATE

06/01/04

APPROVED

RLM

SIGNATURE

DATE

06/01/04

SCALE

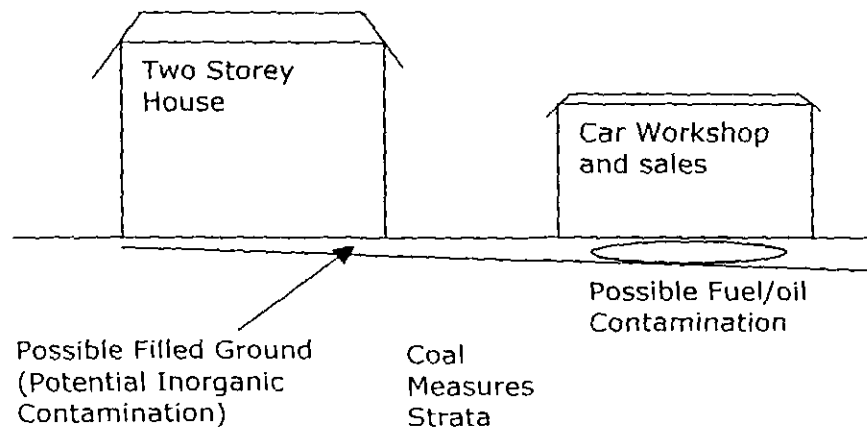
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DRG No.

5848/4B

North

South



CLIENT

Ben Bailey Homes

JOB TITLE

Burton Road, Barnsley

DRAWING TITLE

Conceptual Site Model – Area C

STATUS

FINAL

DRAWN BY

JWH

SIGNATURE

DATE

06/01/04

APPROVED

RLM

SIGNATURE

DATE

06/01/04

SCALE

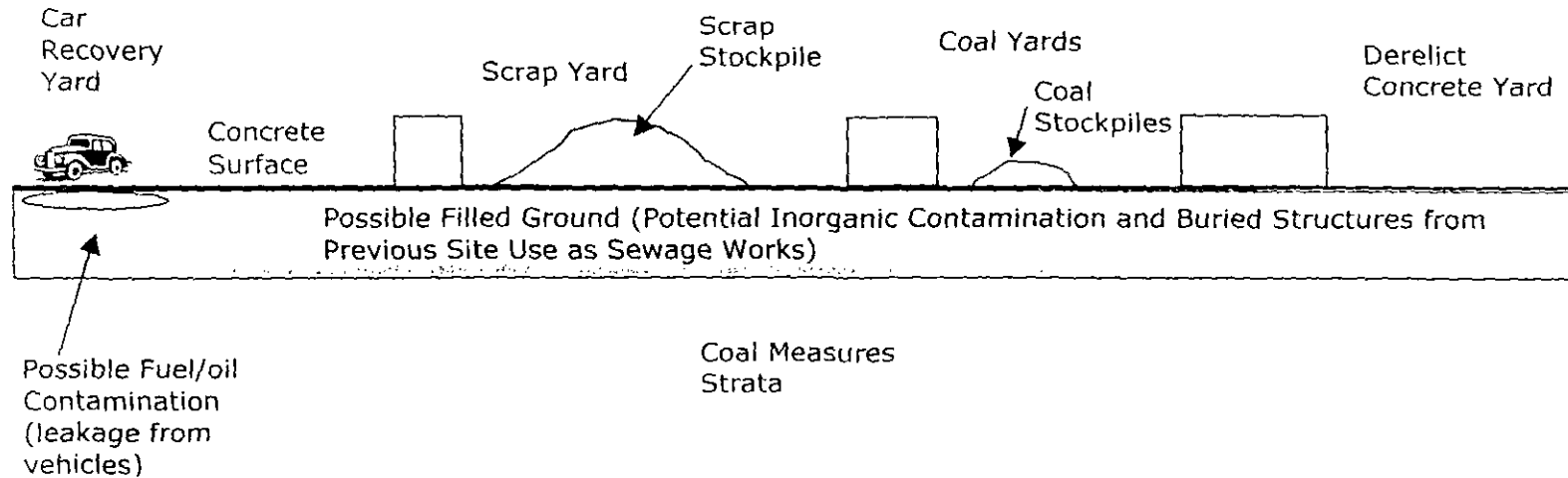
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5848/4C

North

South



CLIENT

Ben Bailey Homes

JOB TITLE

Burton Road, Barnsley

DRAWING TITLE

Conceptual Site Model – Area E

STATUS

FINAL

DRAWN BY

JWH

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DATE

06/01/04

APPROVED

RLM

SIGNATURE

DATE

06/01/04

SCALE

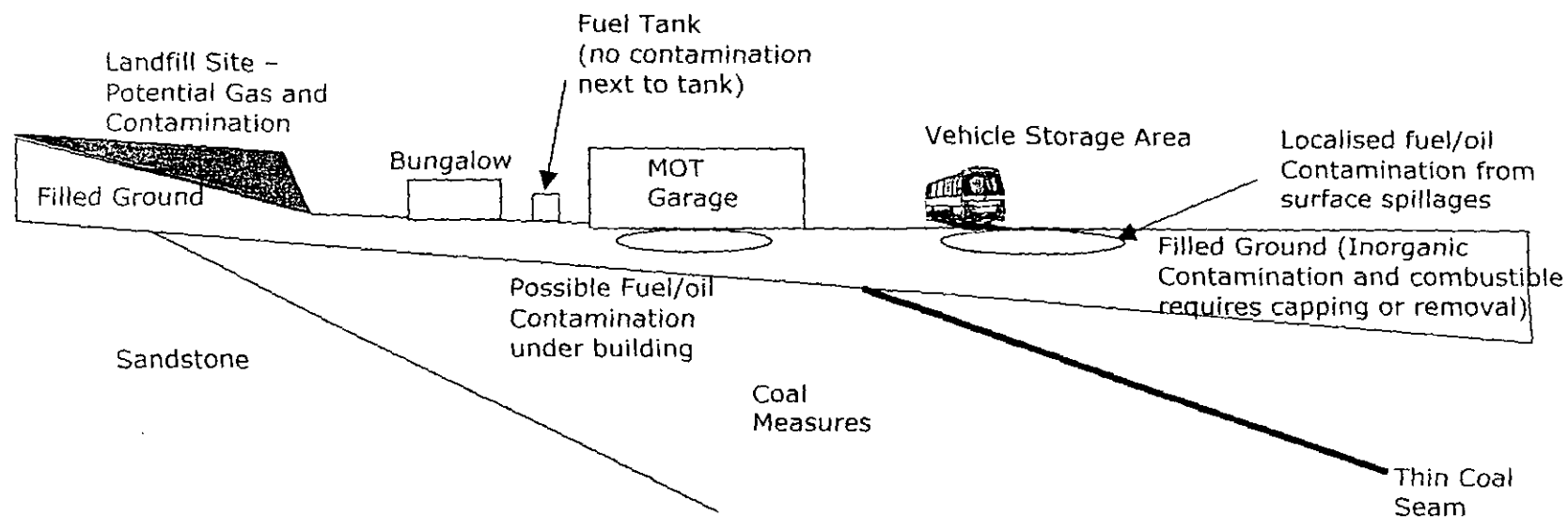
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DRG No.

5848/4E

North

South



CLIENT

Ben Bailey Homes

JOB TITLE

Burton Road, Barnsley

DRAWING TITLE

Revised Conceptual Site Model - Area A

STATUS

FINAL

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DATE

06/01/04

APPROVED

RLM

SIGNATURE

DATE

06/01/04

SCALE

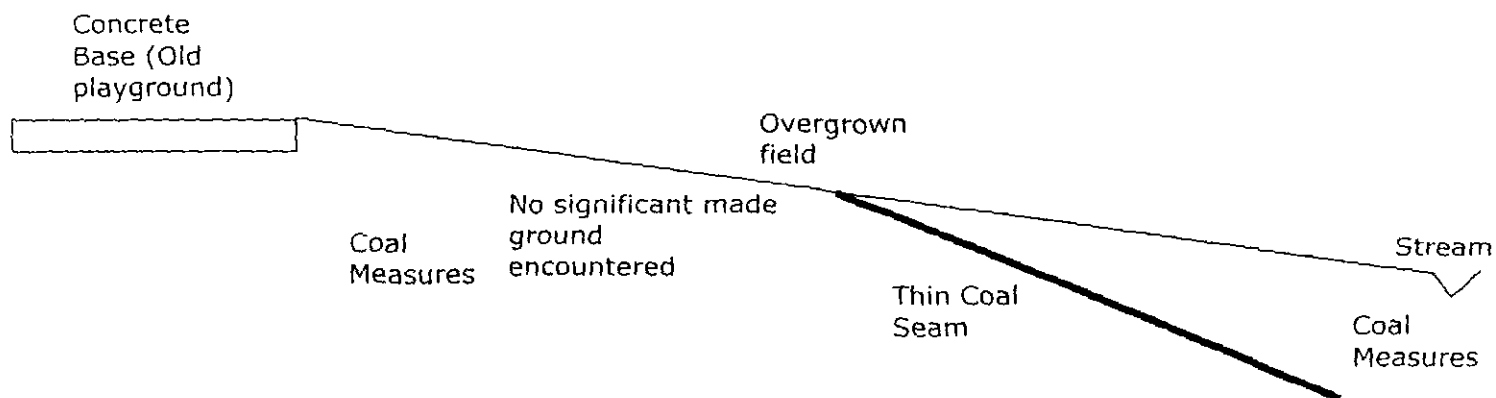
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5848/5A

North

South



CLIENT

Ben Bailey Homes

JOB TITLE

Burton Road, Barnsley

DRAWING TITLE

Revised Conceptual Site Model – Area B

STATUS

FINAL

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DATE

06/01/04

APPROVED

RLM

SIGNATURE

DATE

06/01/04

SCALE

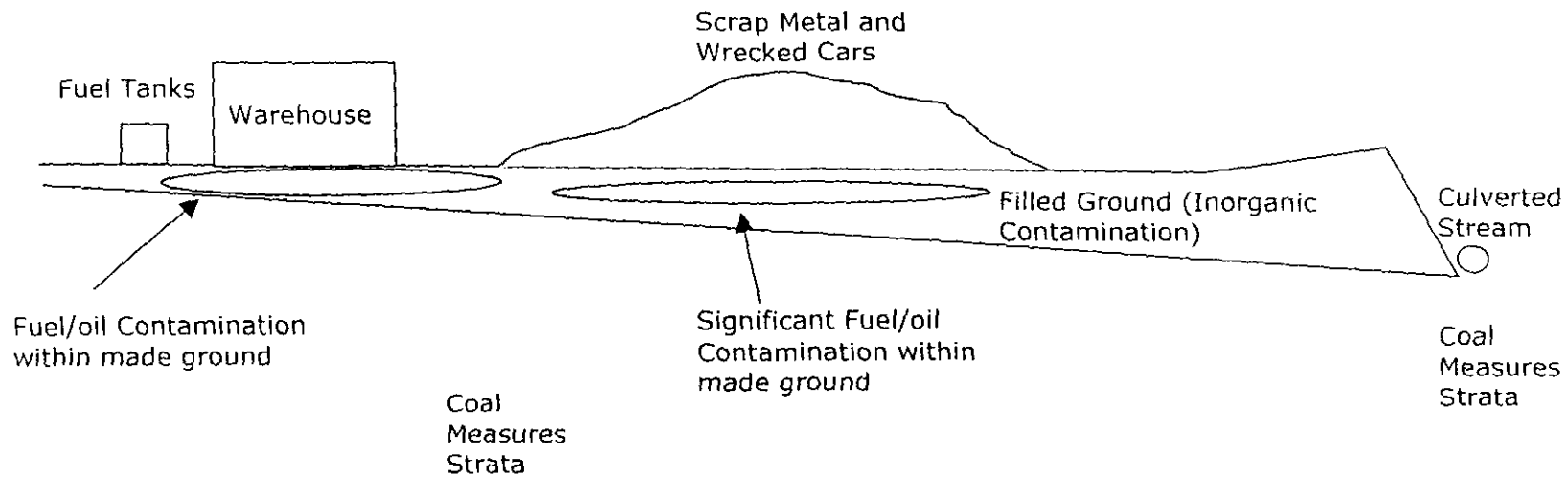
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DRG No.

5848/5B

North

South



CLIENT

Ben Bailey Homes

JOB TITLE

Burton Road, Barnsley

DRAWING TITLE

Revised Conceptual Site Model – Area D

STATUS

FINAL

DRAWN BY

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DATE

06/01/04

APPROVED

RLM

SIGNATURE

DATE

06/01/04

SCALE

NTS

DRG No.

5848/5D

APPENDIX B
HISTORICAL OS PLANS & ENVIROCHECK DATA

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(12-May 2007 11:40)

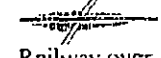
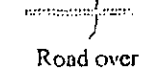
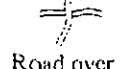
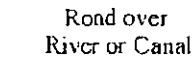
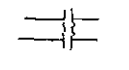
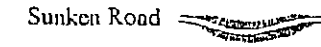
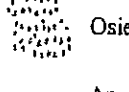
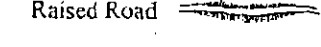
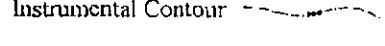
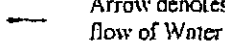
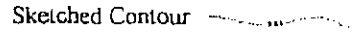
Customer Ref: Carl Crawford-Jones, 5848
ENCA GROUP LIMITED
ENCA HOUSE Audby Lane
WETHERBY
West Yorkshire LS22 7RD

SITE DETAILS Grid Reference 437790 408440

Burton Road

BARNLEY

Historical Map Legend

YORKSHIRE

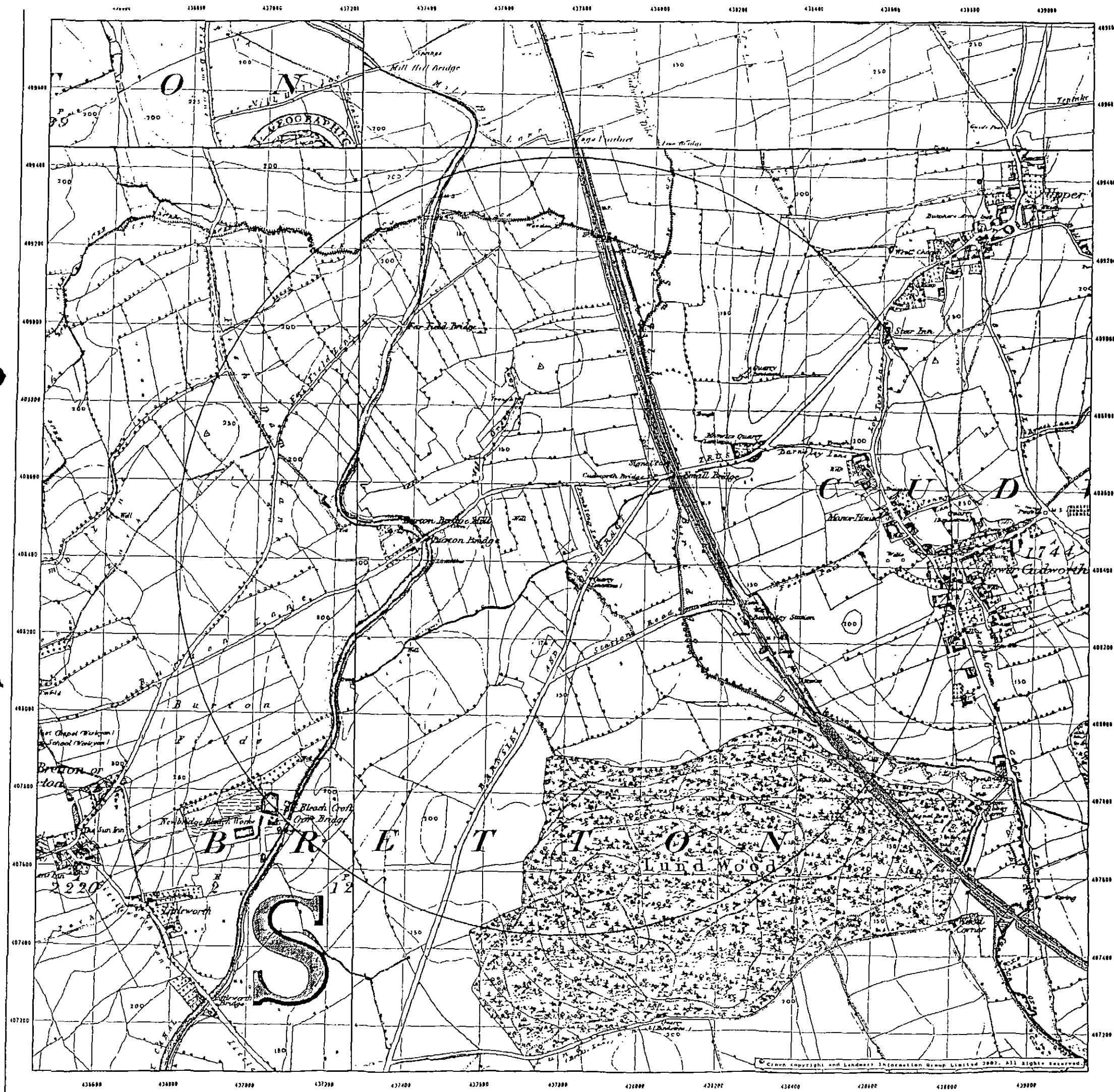
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854, the 1:25,000 scale was adopted for mapping urban areas; these maps were used to update the 1:50,000 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

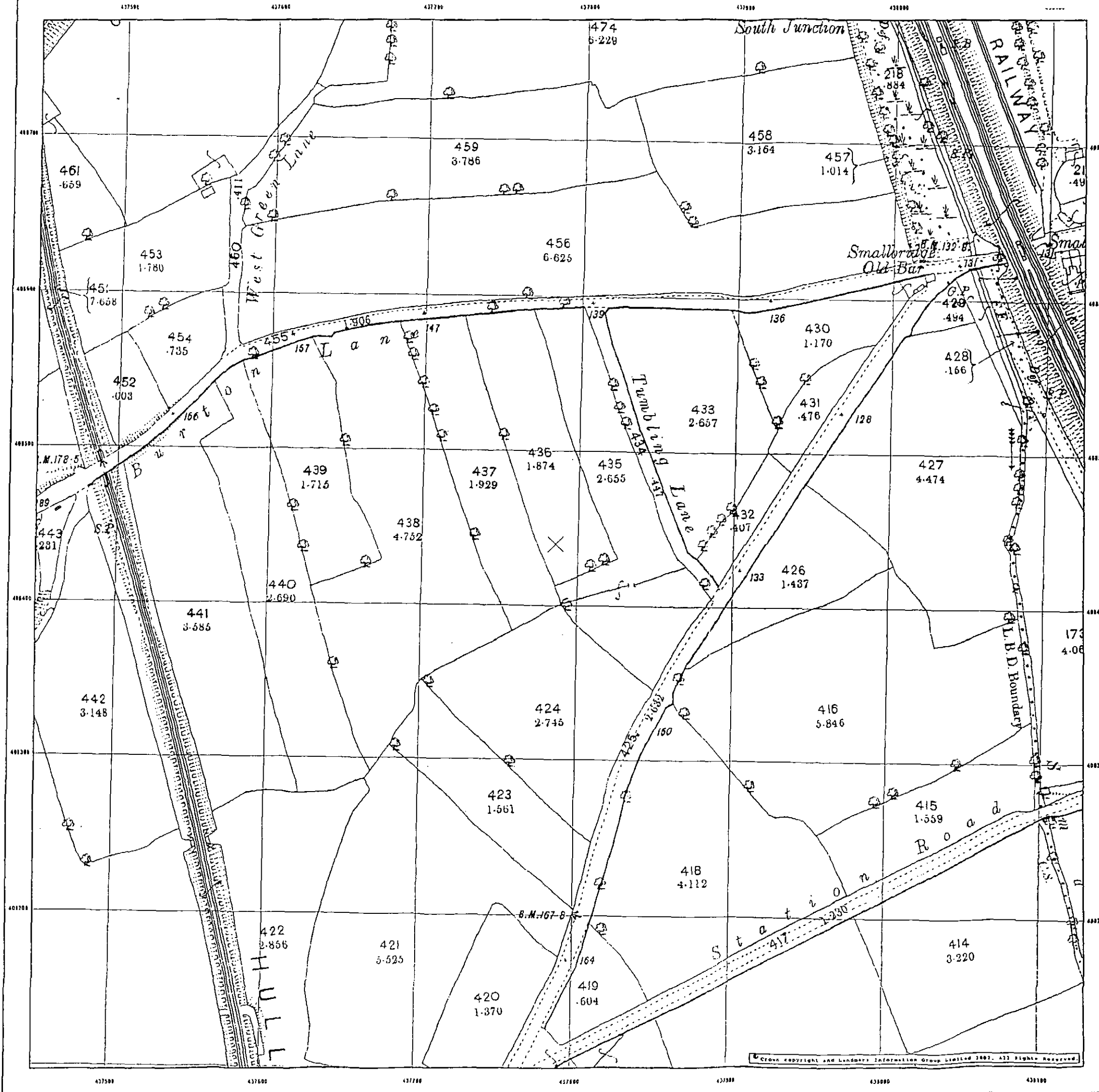
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Source map scale - 1:10,500

1854	1854
1855	1854

Date(s) of Publication





CLIENT DETAILS Envirocheck Order No. EC420312_1_1
Customer Ref: Carl Crawford-Jones, 5548
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WETHERBY
West Yorkshire LS22 7RD

SITE DETAILS Grid Reference 437790 408440
Burton Road
BARNLEY

Historical Map Legend

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

YORKSHIRE

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1856 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given on the right is often some years later than the surveyed date. Before 1939, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Source map scale - 1:2,500

1893

Date(s) of Publication



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Envirocheck Order No. EC420312_1_

Customer Ref: Carl Crawford-Jones, 5A4B

Заказ № 900-96

ENCIA GROUP LIMITED
ENCIA HOUSE Audby Lane
WETHERBY

West Yorkshire LS22 7RT

SITE DETAILS

Grid Reference	437790	408440
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Burton Road

BARNESLEY

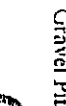
Historical Map Legend



Quantity



Gravel Pit



Other Pits



Rough Pasture



Marsh



Osiers

Arrow denotes
flow of water

Sketched Contour

YORKSHIRE

The historical maps shown were reproduced from maps previously sold at the scales adopted for England, Wales and Scotland in the 1840's. In 1931, the 1:2,240 scale was adopted for England, Wales and Scotland. The 1:2,240 scale was adopted for the reasons: (1) the 1:2,240 scale was used to update the 1:17,568 maps. The publication date given on the right therefore is the same year for the map than the surveyed date. Before 1931, all OS maps were based on the Cassini Projection, with large errors, surveys at a single county or group of counties, giving the significant inaccuracy in settling areas.

In the late 1940's, a Preliminary Edition was produced, which updated the 1:150,000 mapping from a number of sources. Its maps appear authentic, with all military camps and other strategic sites removed. These maps were built in accordance with the Molotov Grid. In 1979, the first 1:150,000 maps were produced using the Transverse Mercator Projection. The revision process continued well recently, with new editions appearing every 15 years or so for the urban areas.

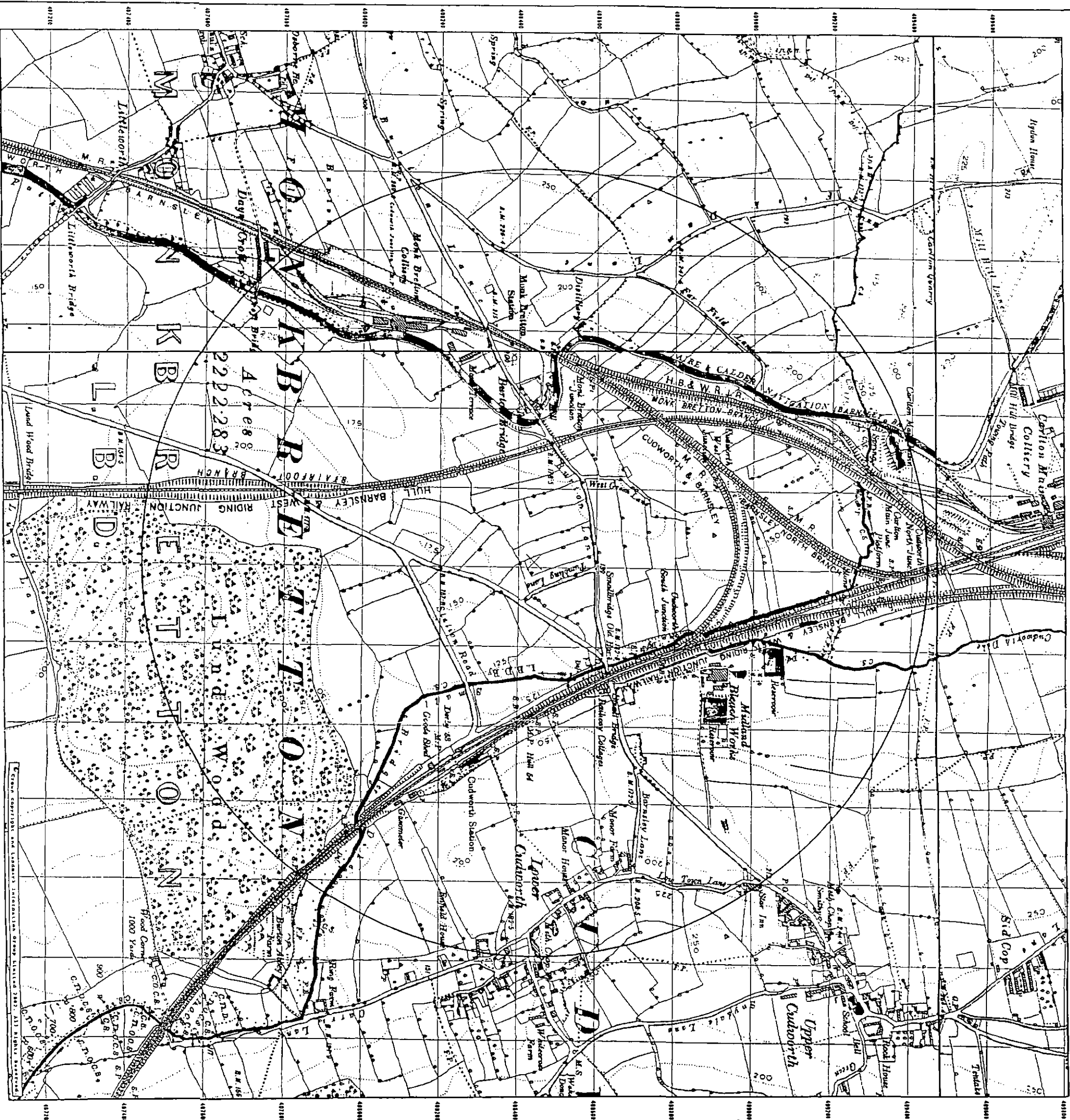
Date(s) of Publication



of5 Ordnance Survey



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CLIENT DETAILS Envirocheck Order No. EC420312_1_1

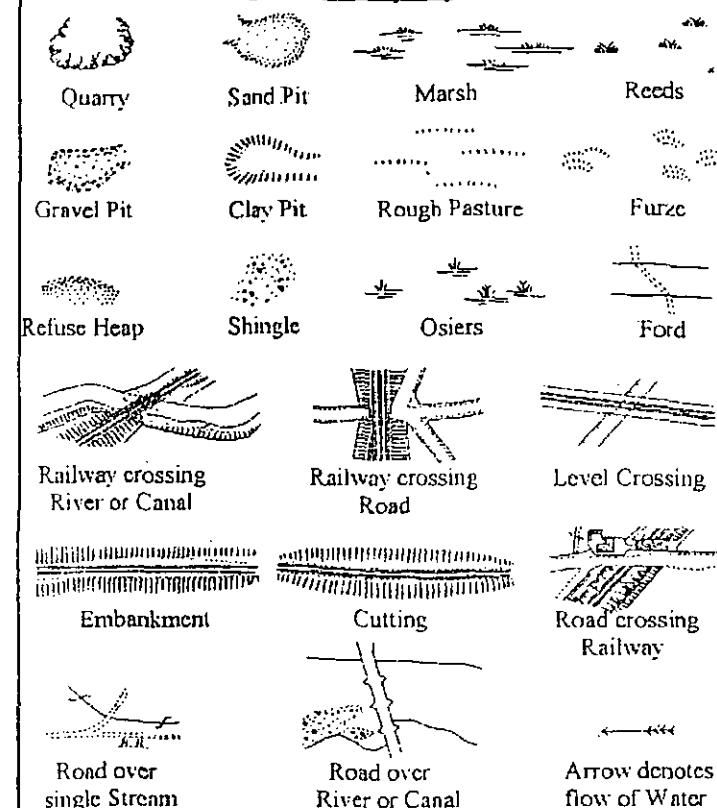
Customer Ref: Carl Crawford-Jones, 5848
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ENCA HOUSE Audby Lane
WETHERBY
West Yorkshire LS22 7RD

SITE DETAILS Grid Reference 437790 408440

Burton Road

BARNLEY

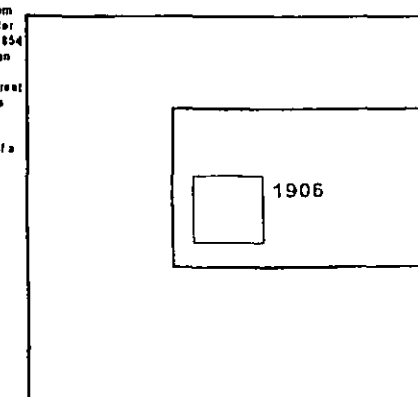
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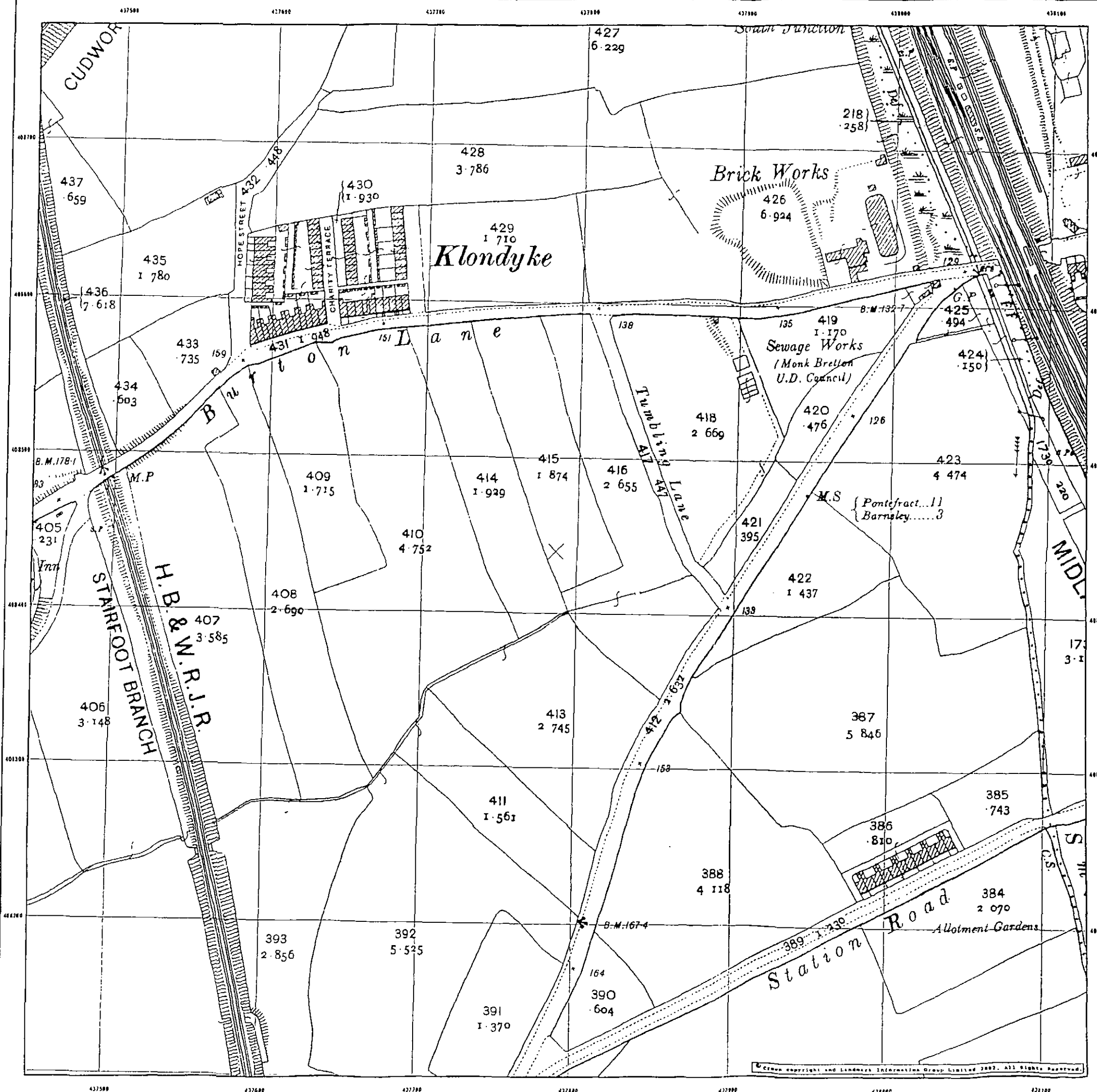
YORKSHIRE

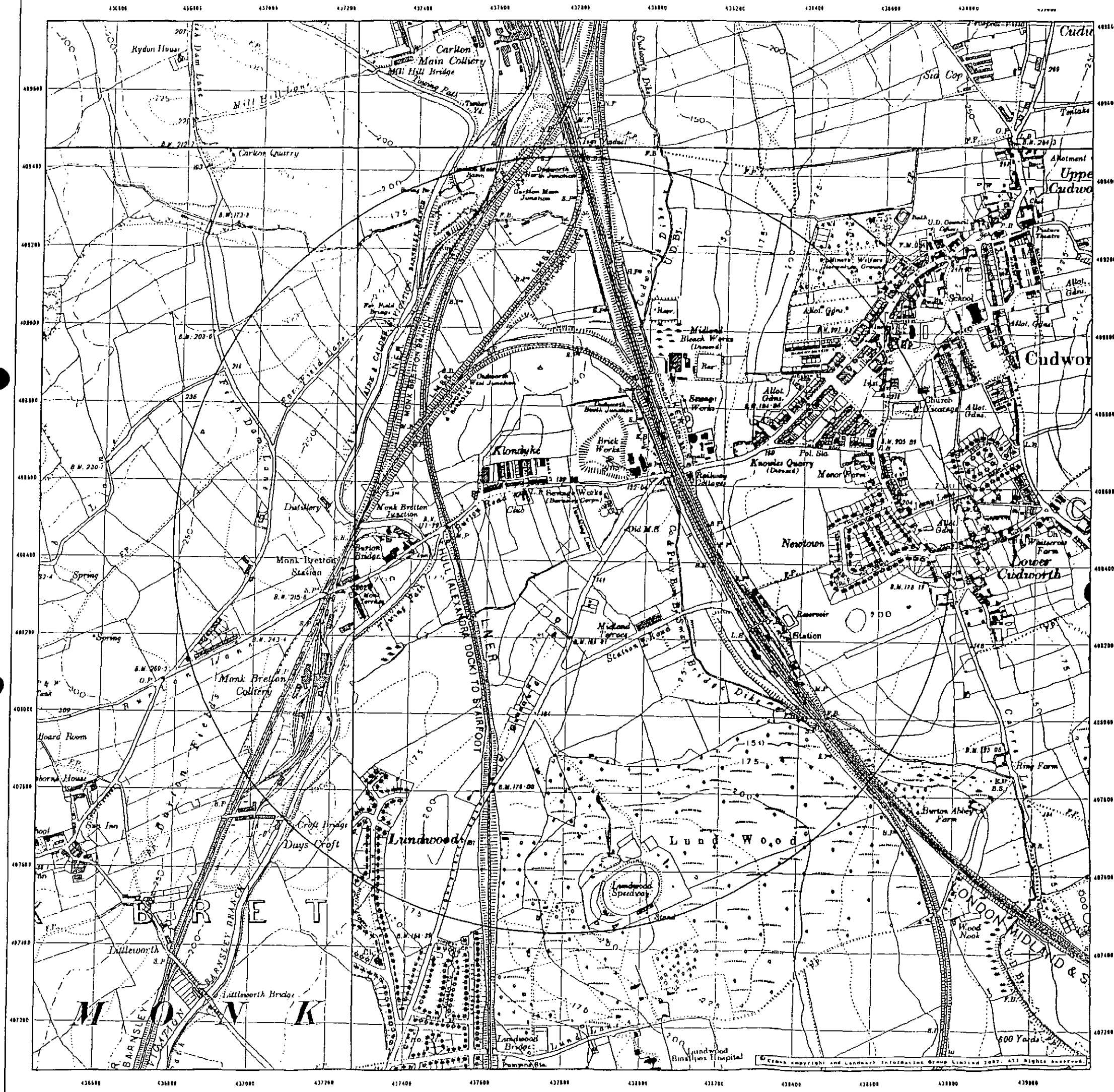
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1856 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published data given on the right is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Source map scale - 1:2,500



Date(s) of Publication





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 Customer Ref: Carl Crawford-Jones, 5848
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 ENCIA HOUSE Audby Lane
 WETHERBY
 West Yorkshire LS22 7RD

SITE DETAILS Grid Reference 437790 408440
 Burton Road
 BARNSELY

Historical Map Legend

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

YORKSHIRE

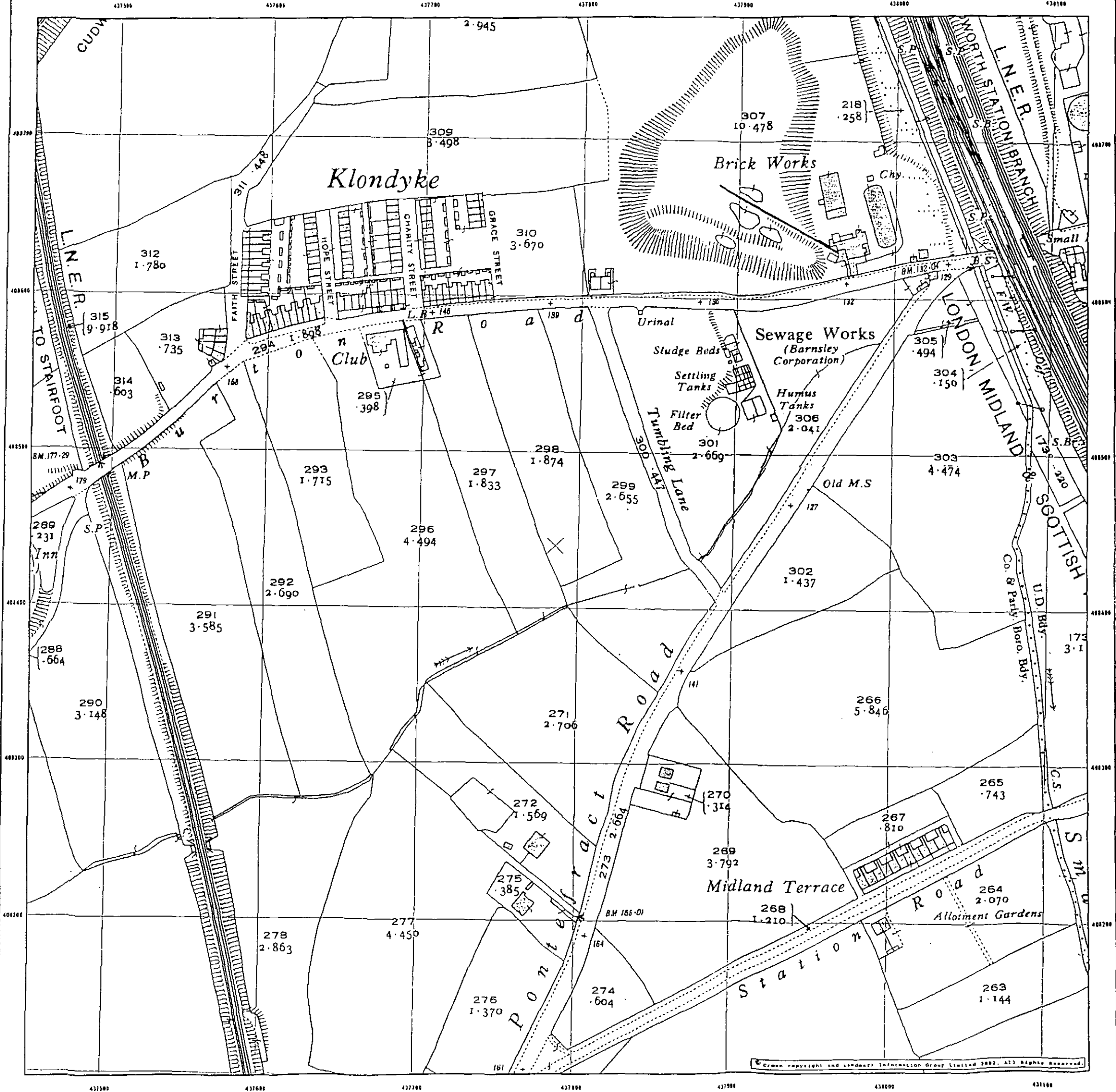
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:10,000 scale was adopted for mapping urban areas; these maps were used to update the 1:10,000 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1834, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

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

Source map scale - 1:10,000

1907	1907
1907	1906

Date(s) of Publication



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ENCIA GROUP LIMITED
ENCIA HOUSE Audley Lane
WETHERBY
West Yorkshire LS22 7RD

SITE DETAILS Grid Reference 437790 408440
Burton Road
EARNLEY

Historical Map Legend

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

YORKSHIRE

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1954 the 1:2,500 scale was adopted for mapping urban areas and by 1986 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given on the right is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Source map scale - 1:2,500

1931

Date(s) of Publication

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Envirocheck Order No. ECA20312.1.1
Customer Ref: Carl Crawford-Jones, 55446
ENCIA GROUP LIMITED
ENCIA HOUSE Andy Lane
WETHERBY
West Yorkshire LS22 7BD

SITE DETAILS
Grid Reference 437790 408440
Barnsley Road
BARNSELEY

Historical Map Legend

- | | | | |
|---------------|-----------------------------|--------------------------|--------------------|
| Quarry | Single | Railway over Road | Road over Railway |
| Gravel Pit | Sand Pit | Level Crossing | Railway over River |
| Other Pits | Road over Stream | Road over River or Canal | Road over Stream |
| Rough Pasture | Furze | Sunken Road | Raised Road |
| Marsh | Reeds | Instrumental Contour | Sketches Contour |
| Ostiers | Arrow denotes Flow of Water | | |

YORKSHIRE

The historical maps shown were reproduced from maps produced by the Ordnance Survey for the Ordnance Survey, which was founded in 1840. In 1840 the Ordnance Survey was responsible for mapping the whole of Great Britain and Ireland. The maps were produced by the Ordnance Survey, which was founded in 1840. The maps were produced by the Ordnance Survey, which was founded in 1840. The maps were produced by the Ordnance Survey, which was founded in 1840.

In the late 19th century, the Ordnance Survey was responsible for mapping the whole of Great Britain and Ireland. The maps were produced by the Ordnance Survey, which was founded in 1840. The maps were produced by the Ordnance Survey, which was founded in 1840. The maps were produced by the Ordnance Survey, which was founded in 1840.

1938	1938
1938	1938

Date(s) of Publication

CLIENT DETAILS Envirocheck Order No. EC420312_1_1

CUSTOMER Ref: Carl Crawford-Jones, 5848
 ENCIA GROUP LIMITED
 ENCIA HOUSE Audby Lane
 WETHERBY
 West Yorkshire LS22 7RD

SITE DETAILS Grid Reference 437790 408440

Burton Road

BARNLEY

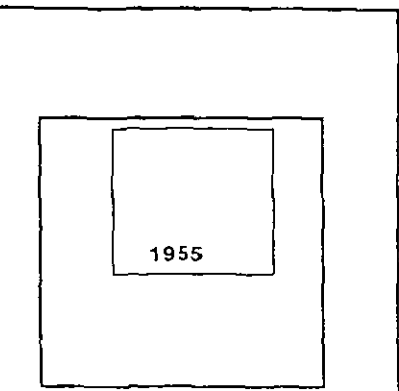
Historical Map Legend			
	Chalk Pit, Clay Pit, or Quarry		Non-coniferous Trees
	Gravel Pit		Coniferous Trees
	Sand Pit		Scrub
	Disused Pit or Quarry		Lake, Loch or Pond
	Refuse or Slag Heap		Pylon
			Electricity
			Pole
			Transmission Line
			Marsh
			Heath
			Rough Grassland
			Reeds
			Saltings
	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

ORDNANCE SURVEY PLAN

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

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

Source map scale: 1:10,560



Date(s) of Publication





CLIENT DETAILS

Envirocheck Order No. EC420312_1_1

Customer Ref: Ceri Crawford-Jones, 5848
 ENCIA GROUP LIMITED
 ENCIA HOUSE Audby Lane
 WETHERBY
 West Yorkshire LS22 7RD

SITE DETAILS

Grid Reference 437790 408440

Burton Road

BARNLEY

Historical Map Legend

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

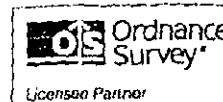
ORDNANCE SURVEY PLAN

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1856 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given on the right is often some years later than the surveyed date. Before 1911, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Source map scale - 1:1,250

1961	1961	1977
1961	1961	1977

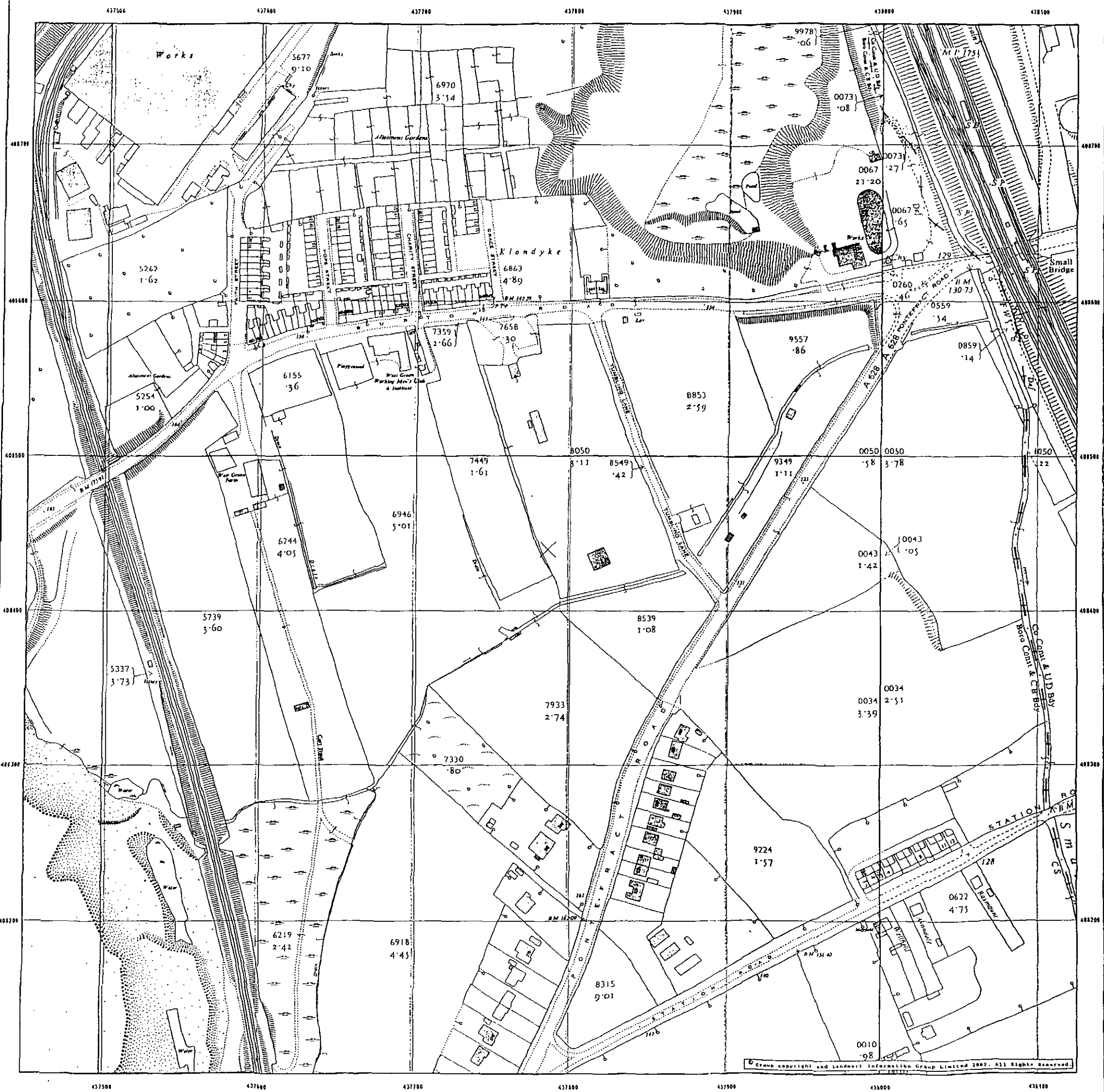
Date(s) of Publication



License Partner



Information Group



CLIENT DETAILS Envirocheck Order No. EC420312_1_1
Customer Ref: Carl Crawford-Jones, 5848
ENCLIA GROUP LIMITED
ENCLIA HOUSE Audby Lane
WETHERBY
West Yorkshire LS22 7RD

SITE DETAILS Grid Reference 437790 408440
Burton Road
BARNLEY

Historical Map Legend

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

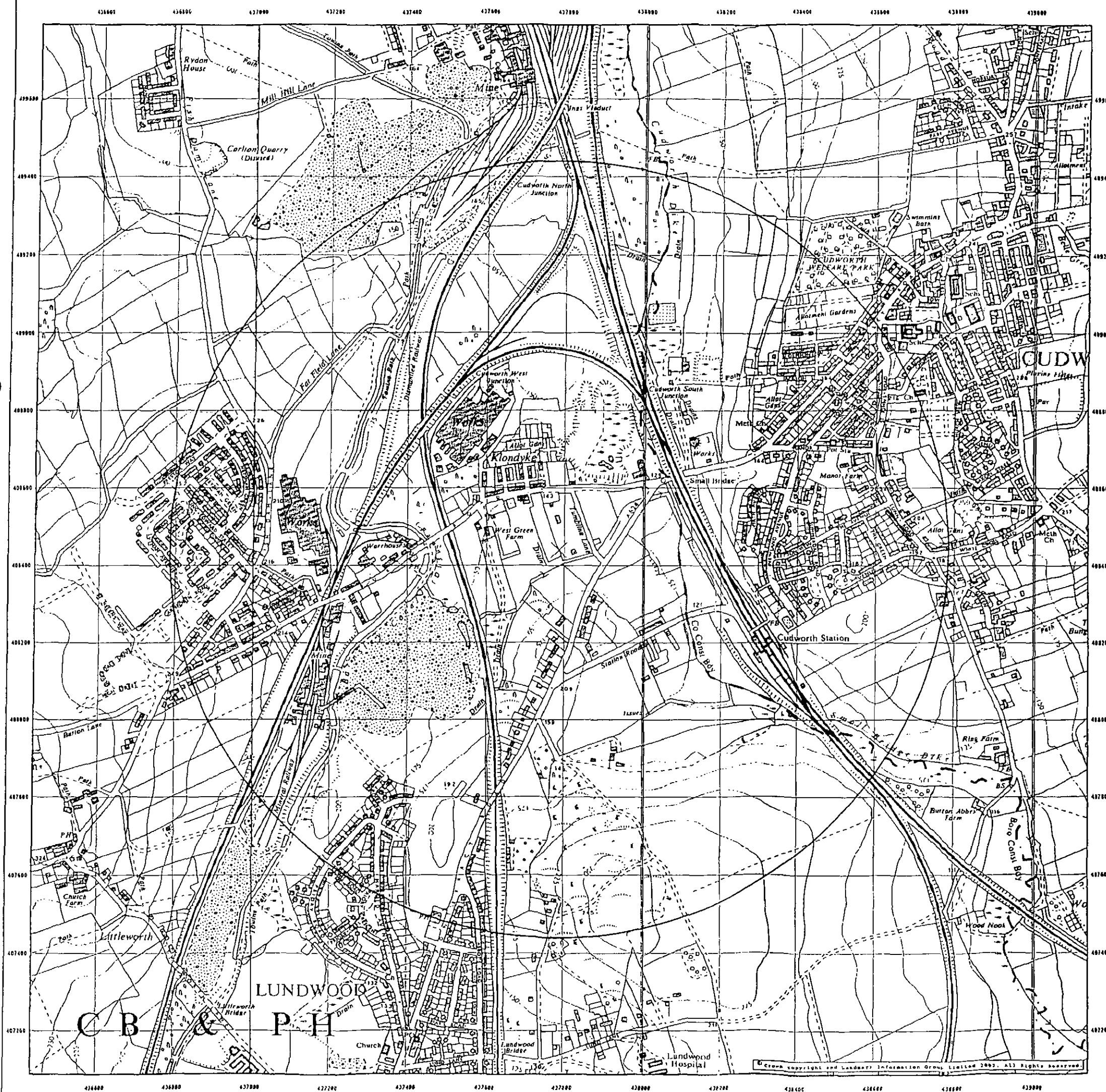
ORDNANCE SURVEY PLAN

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given on the right is often some years later than the surveyed date. Before 1934, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Source map scale - 1:2,500

1962	1962
------	------

Date(s) of Publication



CLIENT DETAILS Envirocheck Order No. EC420312_1_1
(13 Nov 2002 17:45)

Customer Ref: Carl Crawford-Jones, 5848
ENCLIA GROUP LIMITED
ENCLIA HOUSE Audby Lane
WETHERBY
West Yorkshire LS22 7RD

SITE DETAILS Grid Reference 437790 408440

Burton Road
BARNSELY

Historical Map Legend

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

ORDNANCE SURVEY PLAN

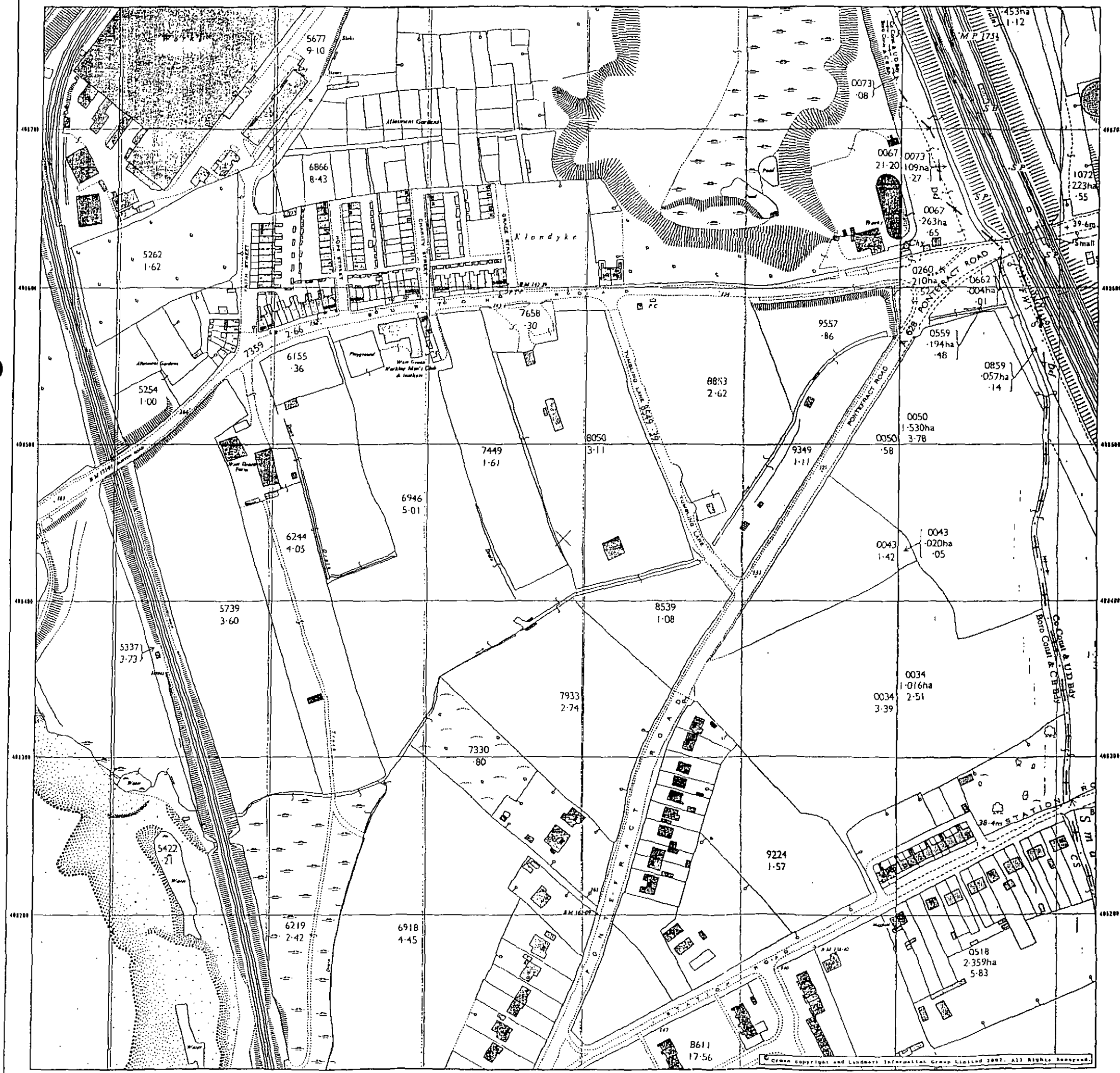
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:50,000 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1933, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

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

Source map scale - 1:10,560

1966

Date(s) of Publication



Envirocheck
A Landmark product

CLIENT DETAILS

Envirocheck Order No. EC420312_1_1
(13-Nov-2003 13:34)

Customer Ref: Carl Crawford-Jones, 5848

ENCLIA GROUP LIMITED
ENCLIA HOUSE Audby Lane
WETHERBY
West Yorkshire LS22 7RD

SITE DETAILS

Grid Reference 437790 408440

Burton Road

BARNSELY

Historical Map Legend

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

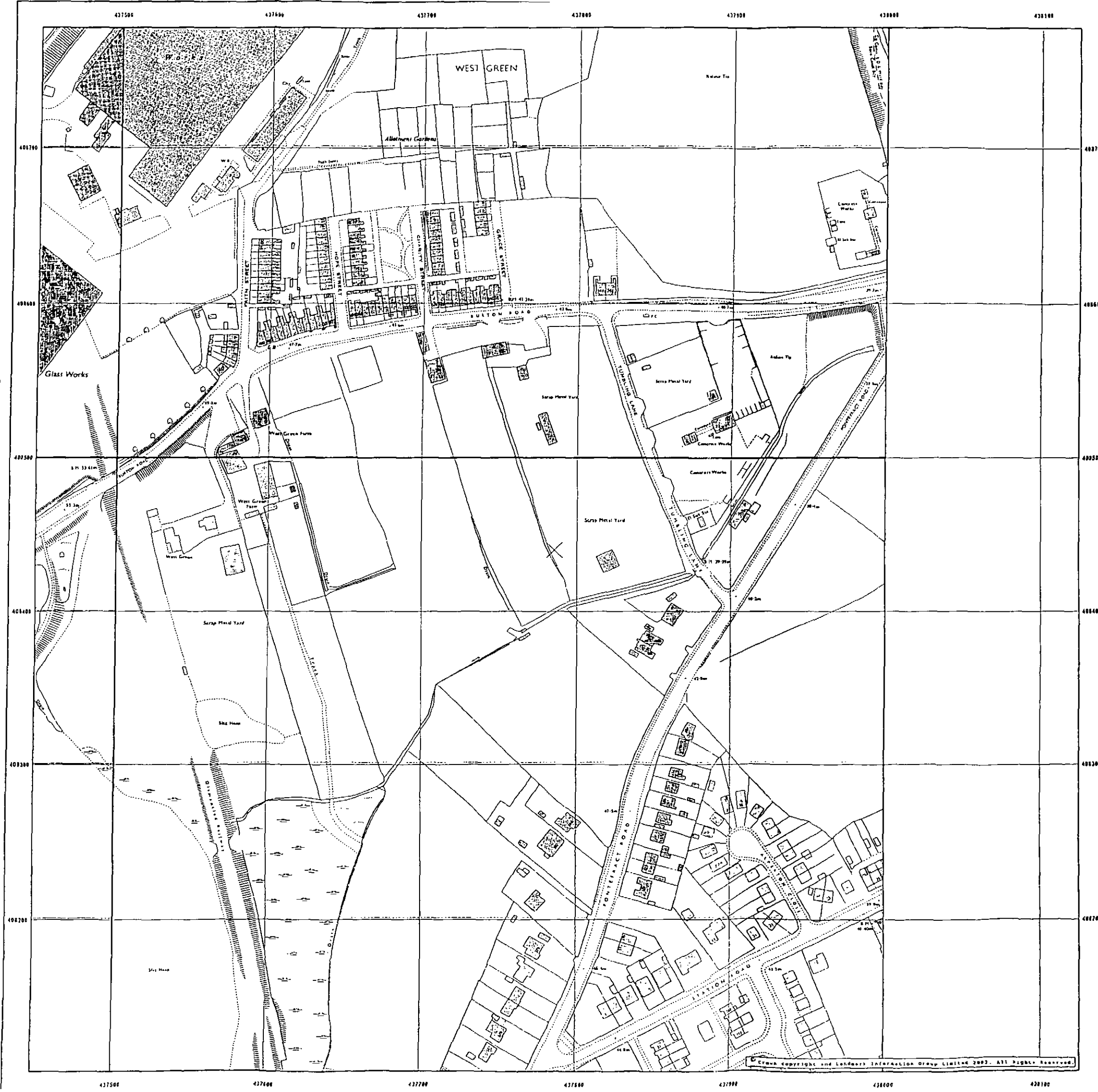
ORDNANCE SURVEY PLAN

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given on the right is often some years later than the surveyed date. Before 1931, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Source map scale - 1:2,500

1969 1970

Date(s) of Publication



CLIENT DETAILS Envirocheck Order No. EC420312_1_1
 Customer Ref: Carl Crawford-Jones, 5848
 ENCIA GROUP LIMITED
 ENCIA HOUSE Audby Lane
 WETHERBY
 West Yorkshire LS22 7RD

SITE DETAILS Grid Reference 437790 408440
 Burton Road
 BARNSELY

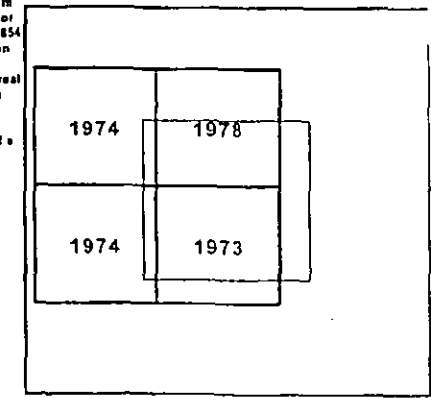
Historical Map Legend

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

ORDNANCE SURVEY PLAN

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what was considered to be the cultivated parts of Great Britain. The published date given on the right is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Source map scale - 1:1,250



Date(s) of Publication



CLIENT DETAILS Envirocheck Order No. EC420312_1_1

Customer Ref: Carl Crawford-Jones, 5848
ENCIA GROUP LIMITED
ENCIA HOUSE Audby Lane
WETHERBY
West Yorkshire LS22 7RD

SITE DETAILS Grid Reference 437790 408440

Burton Road

BARNSELY

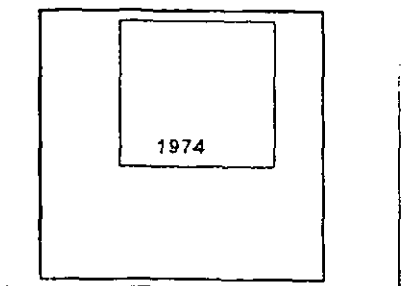
Historical Map Legend			
	Chalk Pit, Clay Pit, or Quarry		Non-coniferous Trees
	Gravel Pit		Coniferous Trees
	Sand Pit		Scrub
	Disused Pit or Quarry		Lake, Loch or Pond
	Refuse or Slag Heap		Pylon
			Electricity Transmission Line
			Marsh
			Shingle
			Sand
			Cutting
			Embankment
			Standard Gauge Multiple Track
			Standard Gauge Single Track
			Siding, Tramway or Mineral Line
			Narrow Gauge

ORDNANCE SURVEY PLAN

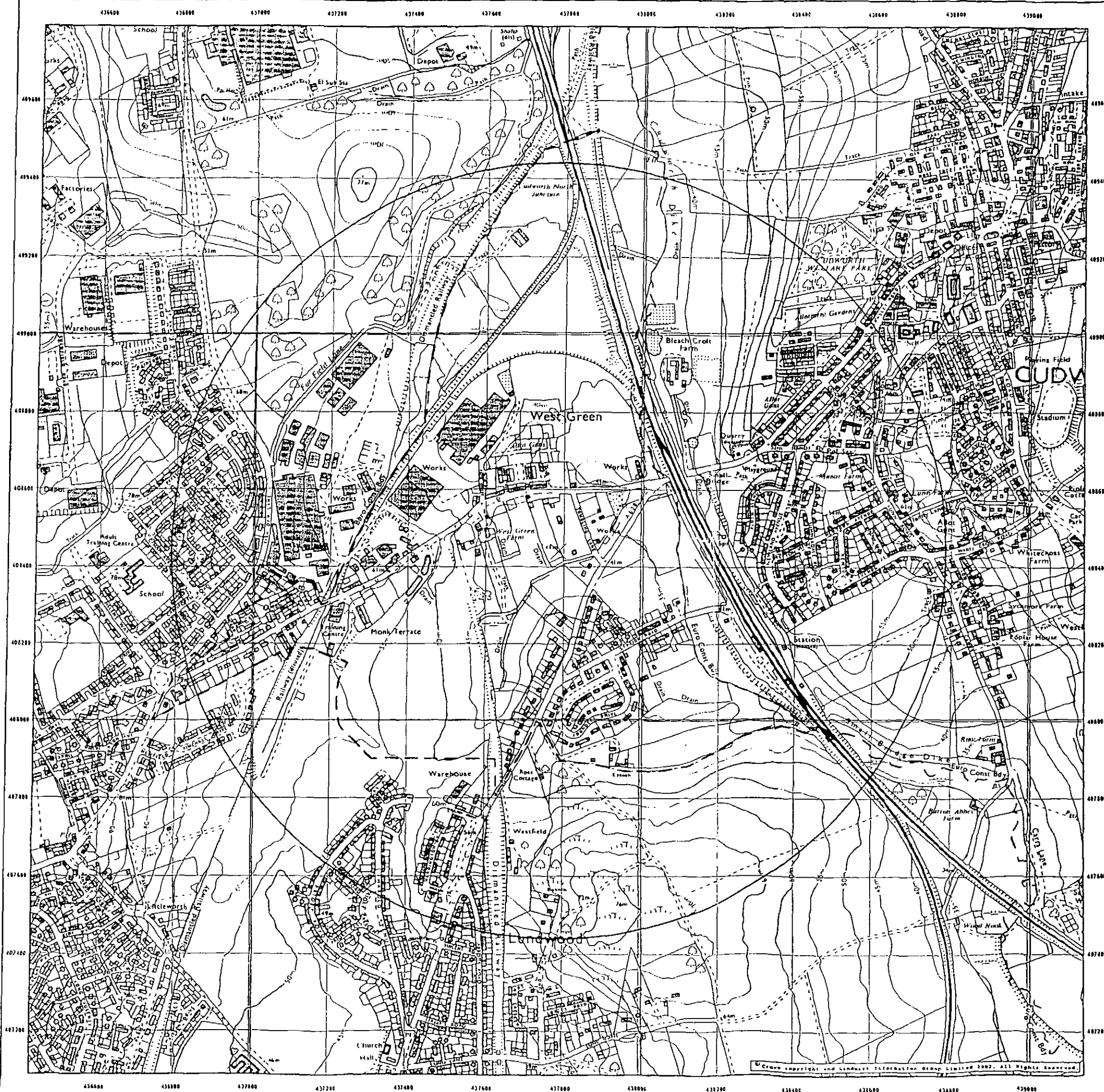
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right (therefore is often some years later than the surveyed date). Before 1932, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unaltered - with all military camps and other strategic sites removed. These maps were initially overlaid with the National Grid. In 1978, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Source map scale - 1:10,000



Date(s) of Publication





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A Landmark[®] product

CLIENT DETAILS

Envirocheck Order No. EC420312_1_1
(12-Mar-2002 17:45)

Customer Ref: Ceri Crawford-Jones, 5848
 ENCIA GROUP LIMITED
 ENCIA HOUSE Audby Lane
 WETHERBY
 West Yorkshire LS22 7RD

SITE DETAILS

Grid Reference 437790 408440

Burn Road

BARNSELY

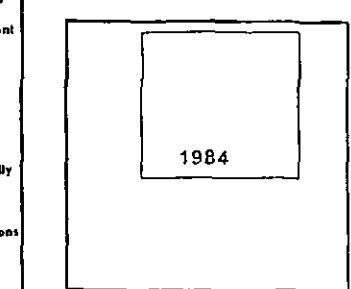
Historical Map Legend

ORDNANCE SURVEY PLAN

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1954 the 1:25,000 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1931, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

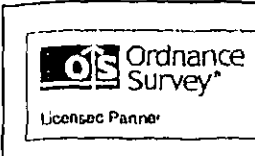
In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unaltered - with all military camps and other strategic sites removed. These maps were initially overlaid with the National Grid. In 1970, the first 1:10,000 maps were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

Source map scale - 1:10,000



1984

Date(s) of Publication



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 Information Group

CLIENT DETAILS

Envirocheck Order No. EC420312_1_1

Customer Ref: Ceri Crawford-Jones, 5848
 ENCIA GROUP LIMITED
 ENCIA HOUSE Audby Lane
 WETHERBY
 West Yorkshire LS22 7RD

SITE DETAILS

Grid Reference 437790 408440

Burton Road

BARNLEY

Historical Map Legend

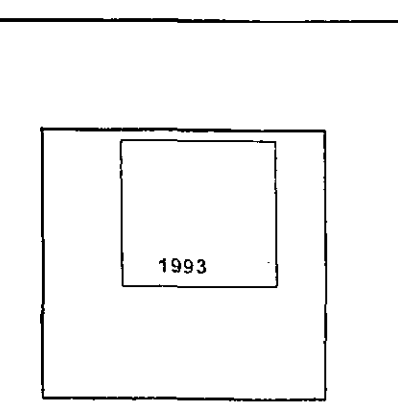
- | | | |
|--------------------------------------|-------------------------------------|------------------------------------|
| Chalk Pit,
Clay Pit,
or Quarry | Non-coniferous
Trees | Bracken |
| Gravel Pit | Coniferous
Trees | Heath |
| Sand Pit | Scrub | Rough
Grassland |
| Disused Pit
or Quarry |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

ORDNANCE SURVEY PLAN

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:50,000 scale was adopted for mapping urban areas; these maps were used to update the 1:50,000 maps. The published date gives the date of the original map on which the map was based. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

In the late 1940's, a Provisional Edition was produced, which updated the 1:50,000 mapping from a number of sources. The maps appear unmodified - with all military camps and other strategic sites removed. These maps were initially overlaid with the National Grid. In 1978, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Source map scale - 1:10,000



Date(s) of Publication





CLIENT DETAILS Envirocheck Order No. EC420312_1_1
Customer Ref: Carl Crawford-Jones, 5848
ENCLIA GROUP LIMITED
ENCLIA HOUSE Audby Lane
WETHERBY
West Yorkshire LS22 7RD

SITE DETAILS Grid Reference 437790 408440
Burton Road
BARNSELY

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

ORDNANCE SURVEY PLAN

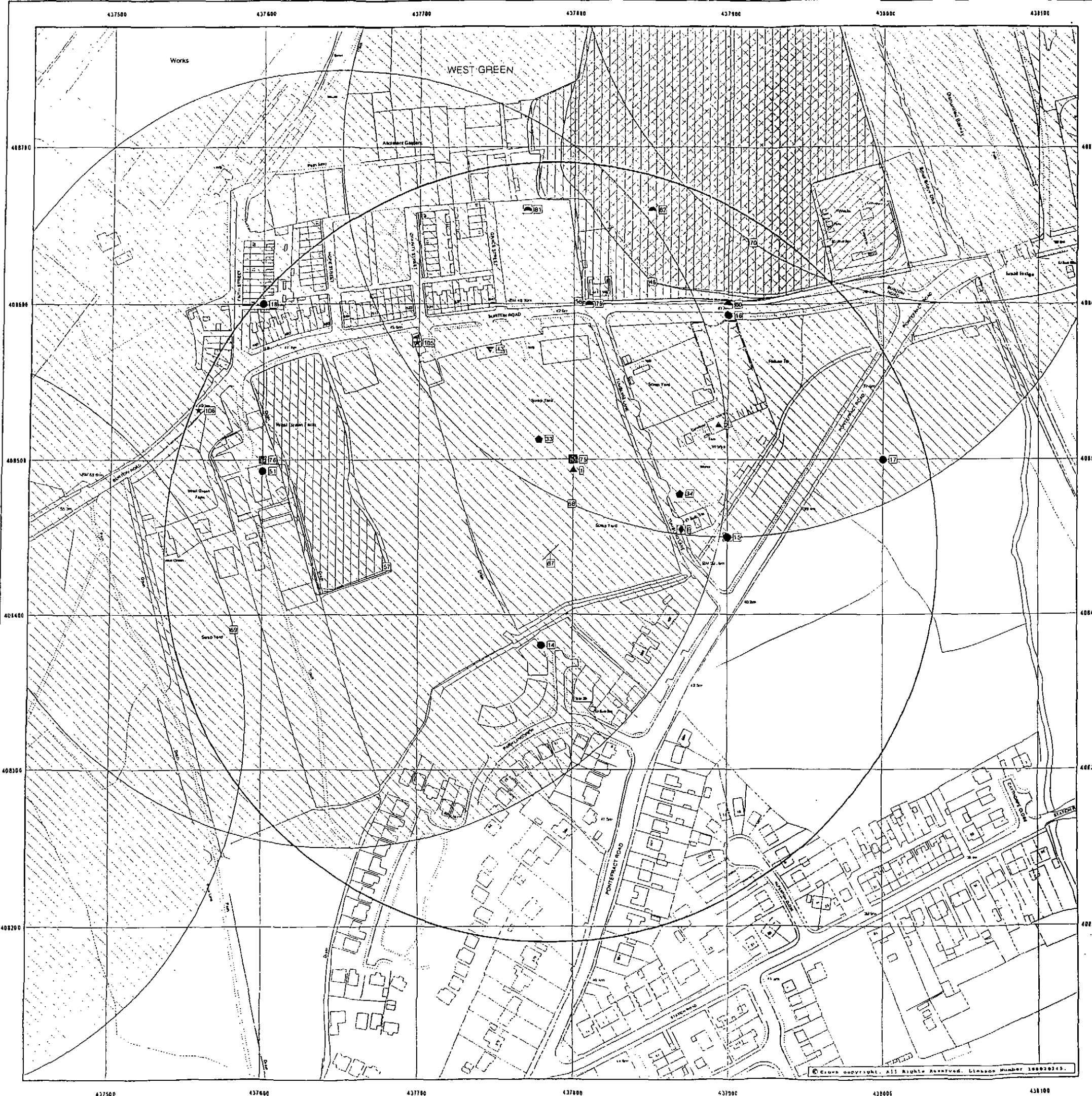
The historical maps shown were produced from the Ordnance Survey's 1:50,000 colour raster mapping. These maps are derived from Landplan® which replaced the old 1:50,000 maps originally published in 1978.

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

Source map scale: 1:50,000

2000

Date(s) of Publication





A Landmark product

CLIENT DETAILS Envirocheck Order No. EC420312_1_1

Customer Ref: Carl Crawford-Jones, 5841
ENCLIA GROUP LIMITED
ENCLIA HOUSE Audby Lane
WETHERBY
West Yorkshire LS22 7RD

SITE DETAILS Grid Reference 437790 408440

Burton Road

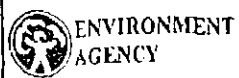
BARNSELY

KEY TO THE LEGEND DATABASE

General	Waste
○ Specified Site	▼ Point Location of BGS Recorded Landfill Site
× Bearing Reference Point	▨ BGS Recorded Landfill Site
○ Buffer (250m)	▲ Integrated Pollution Control Registered Waste Site
□ Reference Number	▨ Licensed Waste Management Facilities (Landfill Boundary)
□ Several of Type at Location	● Licensed Waste Management Facility (Location)
- Pylon	■ Point Location of Local Authority Recorded Landfill Site
— Overhead Transmission Line	▨ Local Authority Recorded Landfill Site
	▨ Registered Landfill Site
	■ Point Location of Registered Waste Transfer Site
	▨ Registered Waste Transfer Site
	■ Point Location of Registered Waste Treatment or Disposal Site
	▨ Registered Waste Treatment or Disposal Site

Agency and Hydrological	Hazardous Substances
▲ Air Pollution Control	✕ COMAH Site
▼ Air Pollution Control Enforcement	✕ Explosive Site
● Point Location of Contaminated Land Register Entry or Notice	✕ NIHS Site
▨ Contaminated Land Register Entry or Notice	✕ Planning Hazardous Substance Consent
◆ Discharge Consent	✕ Planning Hazardous Substance Enforcement
▲ Enforcement Or Prohibition Notice	
▲ Integrated Pollution Control	
■ Integrated Pollution Prevention Control	
● Pollution Incident to Controlled Waters	
◆ Substantiated Pollution Incident Register	
▼ Prosecution Relating to Authorised Processes	
◆ Prosecution Relating to Controlled Waters	
◆ Red List Discharge Consent	
▲ Registered Radioactive Substance	
— River Network or Water Feature	
✕ River Quality Sampling Point	
◆ Water Abstraction	

Geological	Industrial Land Use
● BGS Borehole	★ Contemporary Trade Directory Entry
▼ BGS Recorded Mineral Site	★ Fuel Station Entry



ENVIRONMENT AGENCY



British Geological Survey



Ordnance Survey

Value Added Reseller

Produced by Landmark Information Group Limited. Tel: 01922 441707 Fax: 01922 441706

CLIENT DETAILS Envirocheck Order No. EC420312_1_1

Customer Ref: Carl Crawford-Jones, 5848
 ENCIA GROUP LIMITED
 ENCIA HOUSE Audby Lane
 WETHERBY
 West Yorkshire LS22 7RD

SITE DETAILS Grid Reference 437790 408440

Burton Road

BARNSELY

KEY TO THE LEGEND DATABASE

General

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

Waste

- ▼ Point Location of BGS Recorded Landfill Site
- ▨ BGS Recorded Landfill Site
- ▲ Integrated Pollution Control Registered Waste Site
- ▨ Licensed Waste Management Facilities (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Point Location of Local Authority Recorded Landfill Site
- ▨ Local Authority Recorded Landfill Site
- ▨ Registered Landfill Site

Agency and Hydrological

- ▲ Air Pollution Control
- ▼ Air Pollution Control Enforcement
- Point Location of Contaminated Land Register Entry or Notice
- ▨ Contaminated Land Register Entry or Notice
- ◆ Discharge Consent
- ▲ Enforcement Or Prohibition Notice
- ▲ Integrated Pollution Control
- Integrated Pollution Prevention Control
- Pollution Incident to Controlled Waters
- Substantiated Pollution Incident Register
- ▼ Prosecution Relating to Authorised Processes
- ◆ Prosecution Relating to Controlled Waters
- ◆ Red List Discharge Consent
- ▲ Registered Radioactive Substance
- ✚ River Quality Sampling Point
- ◆ Water Abstraction
- Point Location of Registered Waste Transfer Site
- ▨ Registered Waste Transfer Site
- Point Location of Registered Waste Treatment or Disposal Site
- ▨ Registered Waste Treatment or Disposal Site

Hazardous Substances

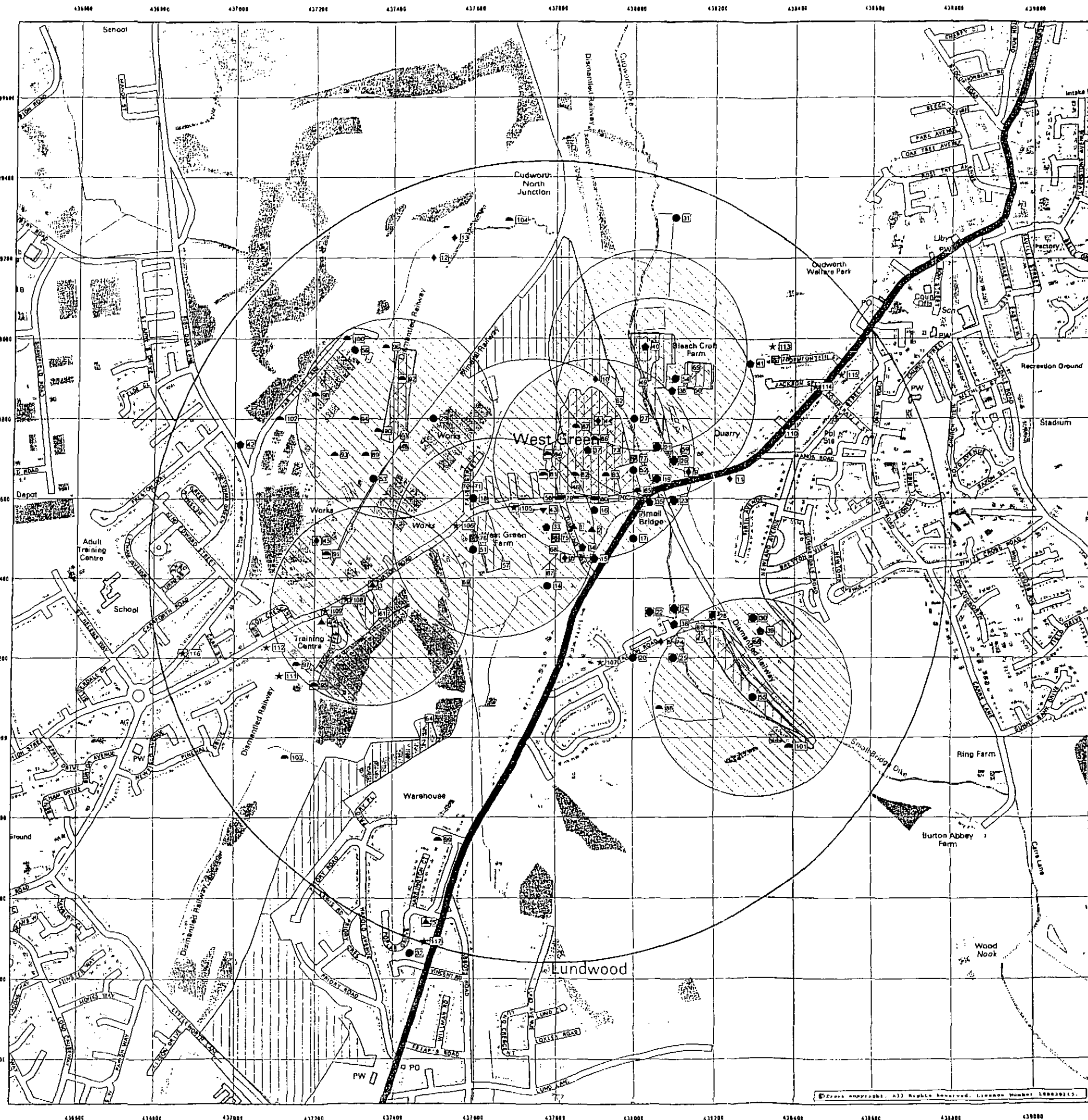
- ✚ COMAH Site
- ✚ Explosive Site
- ✚ NIHS Site
- ✚ Planning Hazardous Substance Consent
- ✚ Planning Hazardous Substance Enforcement

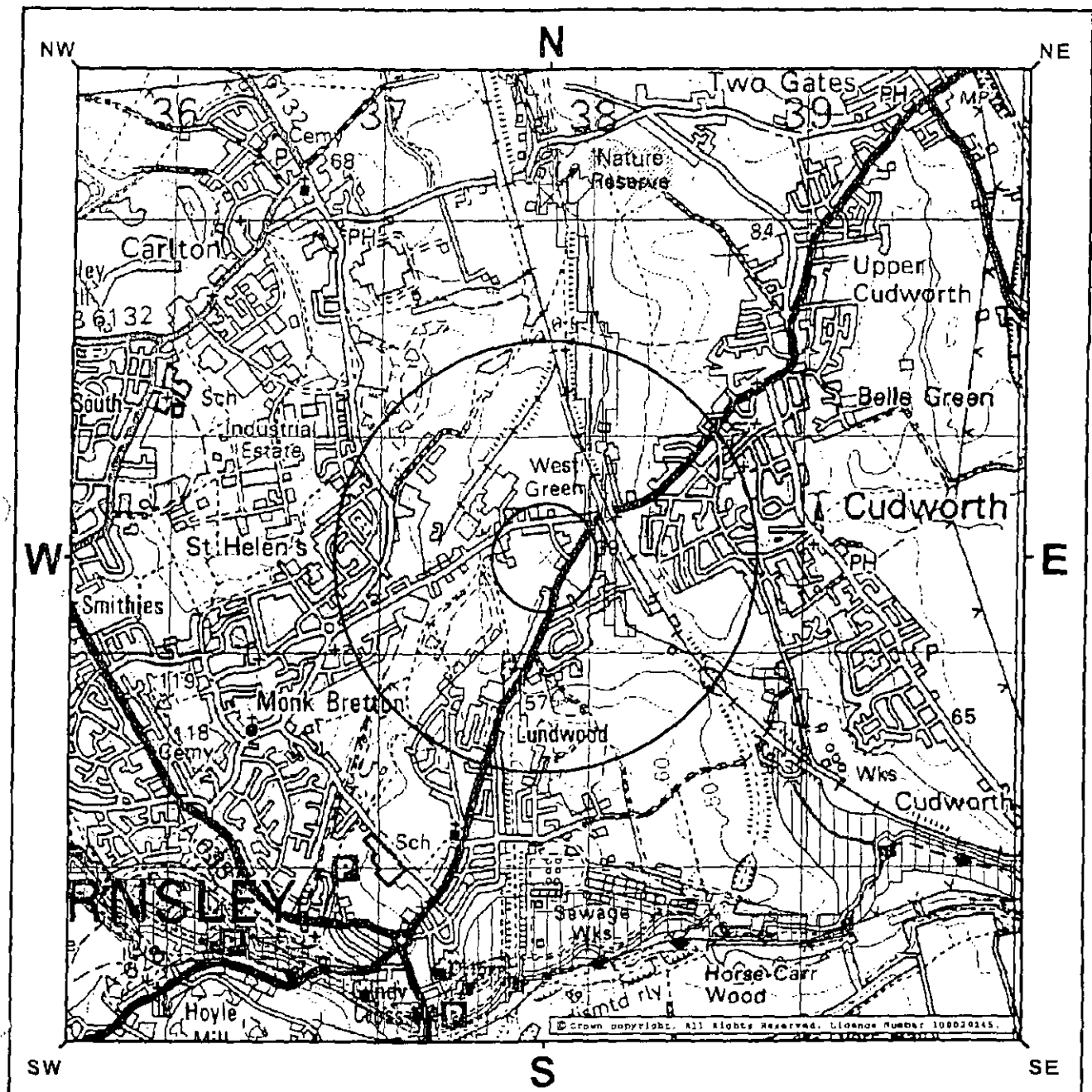
Geological

- BGS Borehole
- ▼ BGS Recorded Mineral Site

Industrial Land Use

- ★ Contemporary Trade Directory Entry
- ★ Fuel Station Entry





KEY

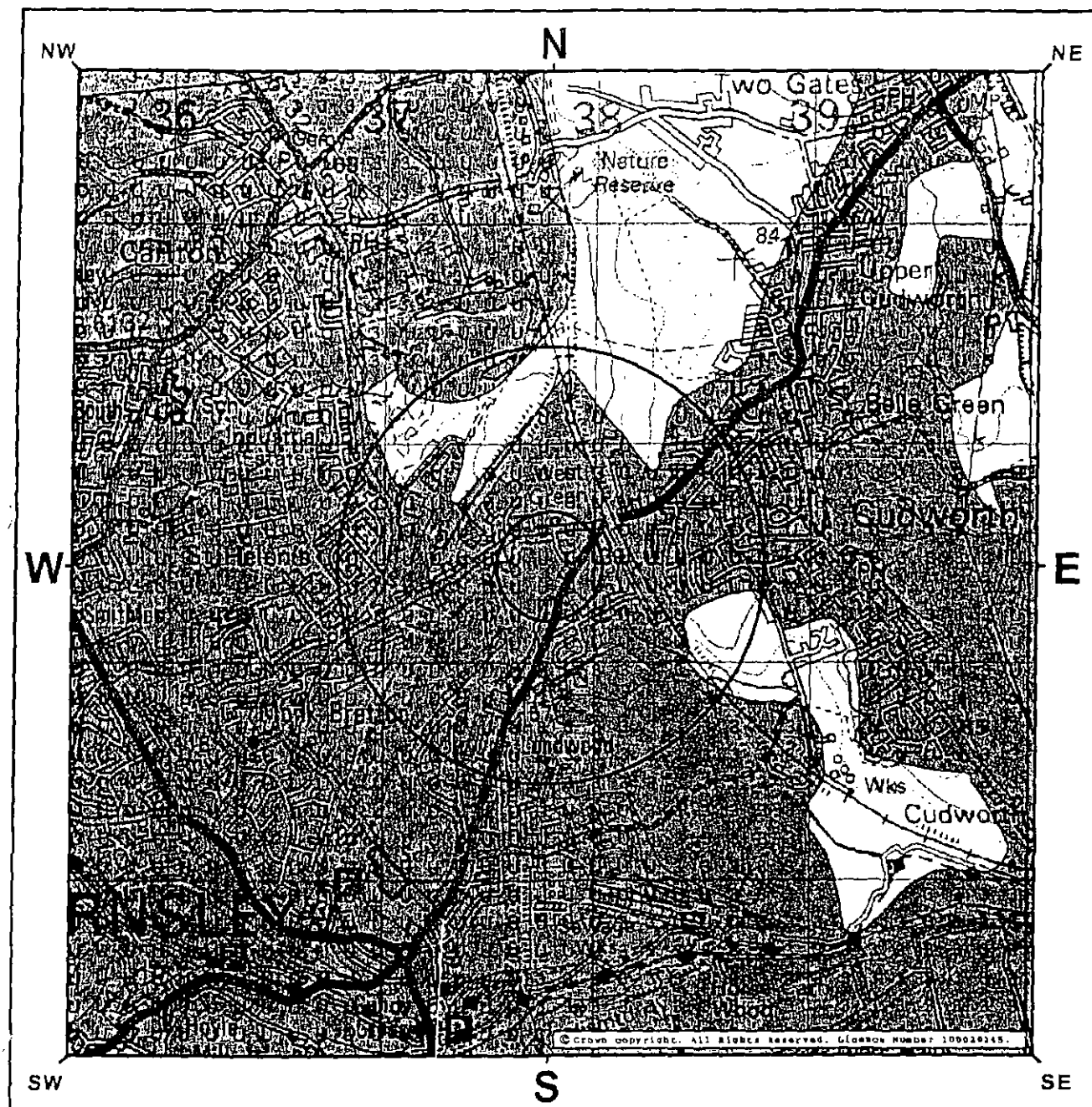
General

- Specified Site
- × Bearing Reference Point
- Buffer

Agency & Hydrological

Environment Agency Indicative Floodplain

- ▨ Indicative Fluvial Floodplain
- ▨ Indicative Tidal Floodplain



KEY

General

- ◻ Specified Site
- ✕ Bearing Reference Point
- ◻ Buffer

Groundwater Vulnerability

Geological Classes

Major Aquifer
(High Permeable)

Minor Aquifer
(Variable Permeable)

Non Aquifer
(Negligibly Permeable)

Soil Classes

High (H) 1, 2, 3, U

Intermediate (I) 1, 2

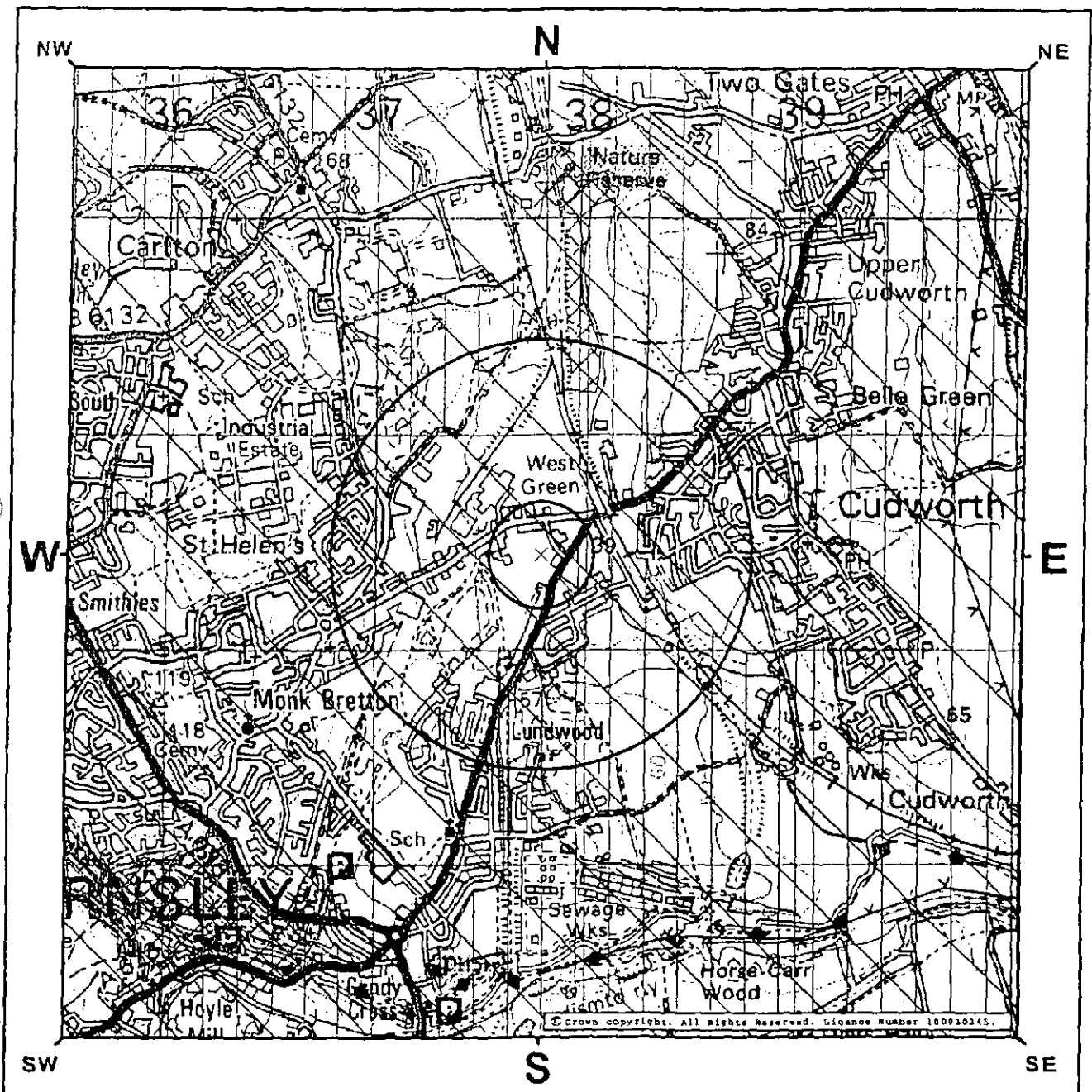
Low

High (H) 1, 2, 3, U

Intermediate (I) 1, 2

Low

◻ Drift Deposit



KEY

General

○ Specified Site

× Bearing Reference Point

○ Buffer

□ Environmentally Sensitive Area

□ Forest Park

□ Local Nature Reserve

□ Nitrate Sensitive Area

□ Nitrate Vulnerable Zone

□ Ramsar Site

Sensitive Land Uses

□ Area of Adopted Green Belt

□ Area of Unadopted Green Belt

□ Area of Outstanding Natural Beauty

□ Marine Nature Reserve

□ National Nature Reserve

□ National Park

□ National Scenic Area

□ Site of Special Scientific Interest

□ Special Area of Conservation

□ Special Protection Area

APPENDIX C
CORRESPONDENCE/INFORMATION

Ben Bailey
HOMES
STYLED for LIFE

Elizabeth House, Cliff Street, Mexborough,
South Yorkshire. S64 9HQ
Telephone: 01709 586261 Fax: 01709 570006
www.ben-bailey.co.uk

Our Ref: CEH/appraisal/westgreen

6 November 2003

ENCIA
Encia House
Audby Lane
Wetherby
LS22 7RD
For the attention of Mr R Meredith

16475.
RECEIVED 07 NOV 2003

Dear Richard

Re: Land at Burton Road, West Green, Barnsley

Please find attached details for the above site, for which we require a proposal from yourselves to carry out a full ground investigation.

The site varies from the usual, in that part of the site requires a full investigation, and the remainder requires only a Desk Study, at this stage. The attached OS based plan is coloured red and blue and is divided into the separate ownerships. The full investigation is to be carried out on the land coloured red (ie marked A and B), and the Desk Study applies to the blue land (marked C, D and E) on the plan.

For your information, Site A is currently used as a scrap yard. Site B is mostly unused scrub-land. A colour ariel photo is enclosed.

Further to our telephone conversation, we have promised the owner of Site A that we can be on-site commencing the work middle of week commencing 10 November 2003. In the first instance we look forward to receiving your proposal and quote.

If you require any further information, please do not hesitate to contact me.

Yours sincerely



Claire Hudson
Senior Land & Planning Executive

Encs

5848/JWH

12th November 2003

Ms C Hudson
Ben Bailey Homes
Elizabeth House
Cliff Street
Mexborough
South Yorkshire
S64 9HQ

Dear Claire

Burton Road, Barnsley

Further to your recent invitation, please find attached our proposal for undertaking a drainage feasibility study and site investigation on the above land.

With reference to your letter dated 6th November and recent telephone conversations, we understand that you require a desk study for the full site area and a ground investigation in areas A, B and D. The drainage feasibility will address the site areas separately.

Representatives of Encia visited the site on 10th November to carry out a preliminary inspection of site access and drainage conditions. The site consists of two parcels, divided by Tumbling Lane. The land is used for a variety of uses, which includes two scrap yards, a redundant works, MOT garage, rough grassland, refuse tip and residential properties.

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

Nonetheless, useful data will be obtained at this time and we will certainly aim to resolve as much uncertainty relating to ground as possible, in order to enable you to make an unconditional offer for the site.

Brief examination of the relevant geological map suggests the site is directly underlain by Oaks Rock sandstone in the north west corner and undifferentiated coal measures (mudstone and sandstones) across the remainder of the site. The Swinton Pottery Coal and Newhill Coal seam are estimated to lie below the Oaks Rock at approximately 20 to 35m bgl. It is possible that workings in the coal could affect surface stability and this requires investigation.

Barnsley MBC indicate that landfill site, which is producing methane gas, is located within 250m of the site, in addition to the refuse tip shown in the north east of the site. Therefore we have allowed for the drilling of boreholes, installation of monitoring wells and a gas risk assessment.

Our investigation proposal allows for the following works:

Drainage Feasibility: We will obtain all drainage records and comments from Yorkshire Water regarding disposal of foul and surface water flows; liaise with the Local Authority regarding drainage provisions; provide recommendations on proposed points of

connection, requirements for pumping stations onsite balancing etc; a site walkover to assess constraints. Comments will also be made on the requirements for Flood Risk and drainage impact assessments.

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

Fieldwork (Areas A, B and D): At this stage we have allowed for four day's trial pitting and one days window sampling. All trial pits and boreholes will be supervised and logged by an experienced engineering geologist.

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

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

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

We have allowed for the drilling of 6 rotary probeholes to check for the presence, thickness and quality of coal at shallow depth. This drilling should be sufficient to determine whether a significant seam is present and likely to pose a significant risk to surface stability. However, if a potential risk is perceived to exist, further probeholes will be required to delineate the extent of workings in order to obtain fixed price quotations for the necessary consolidation works. The probeholes will be installed with gas monitoring wells.

Due to the close proximity of landfill sites we have allowed for 6 gas monitoring visits over three months.

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

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

Reporting & Timescales: In order to provide you with sufficient information to enable assessment of abnormal costs at the earliest opportunity, we will issue a concise **overview** report within 3 days of fieldwork completion.

On completion of the desk study we will issue a preliminary investigation report for the entire site.

On completion of the fieldwork and laboratory testing a **comprehensive** bound, factual and interpretative report will be issued for Areas A, B and D. This will contain detailed engineering records, laboratory test results, copies of all relevant correspondence and drawings of the site. The report will include qualitative risk assessment with respect to both controlled waters and human health. The report will also provide technically feasible options for redevelopment of the site with housing, including consideration of foundation types and treatment\removal of contamination.

Allowing for receipt of statutory search information, the preliminary investigation will require up to 3 weeks and fieldwork would take 5 days. Our comprehensive geoenvironmental appraisal report (1 bound & 1 loose copy) will be issued within 4 weeks of fieldwork completion.

Copies of the final report could be issued to the relevant regulatory authorities on receipt of written instruction from yourselves.

Invoicing: The attached proposal provides a breakdown of the costs associated with this project. This breakdown is for information only and the proposal can be regarded as a fixed price offer of £22,916.50 + VAT. Variation will only occur in the event that a given item is not undertaken or that substantial additional works are recommended, in which case we will inform you immediately, provide costs for the required works, and seek your prior consent. We will submit our invoice for this project with the final report.

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

Underground Services: Utility plans are required in order to protect operatives from the hazards associated with striking buried services and avoid potentially substantial disruption\repair costs. Therefore copies of any utility plans, relating to underground services within the site that you are able to forward prior to the proposed fieldworks, would be appreciated. Alternatively, we will obtain the necessary plans (to include electricity, gas, water, drainage & telecom) direct from each of the utility companies and our proposal includes a rate only item for this work.

We will make every effort not to damage any services (including review of utility plans and use of a CAT detector). However, Encia cannot accept liability for damage to any underground services that are not accurately marked on statutory utility company plans.

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

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

Yours sincerely

Richard Meredith
ENCIA CONSULTING LIMITED

Enc

Radon (RPM) Report - Standard

Report prepared for:

RECEIVED 13 NOV 2003

18525.

Ceri Crawford-Jones
Encia Consulting Ltd.
Encia House
Audby Lane
Wetherby
LS22 7RD

Radon Protective Measures Site Report – Standard

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

Client's Reference:

19649/5848/11RLM

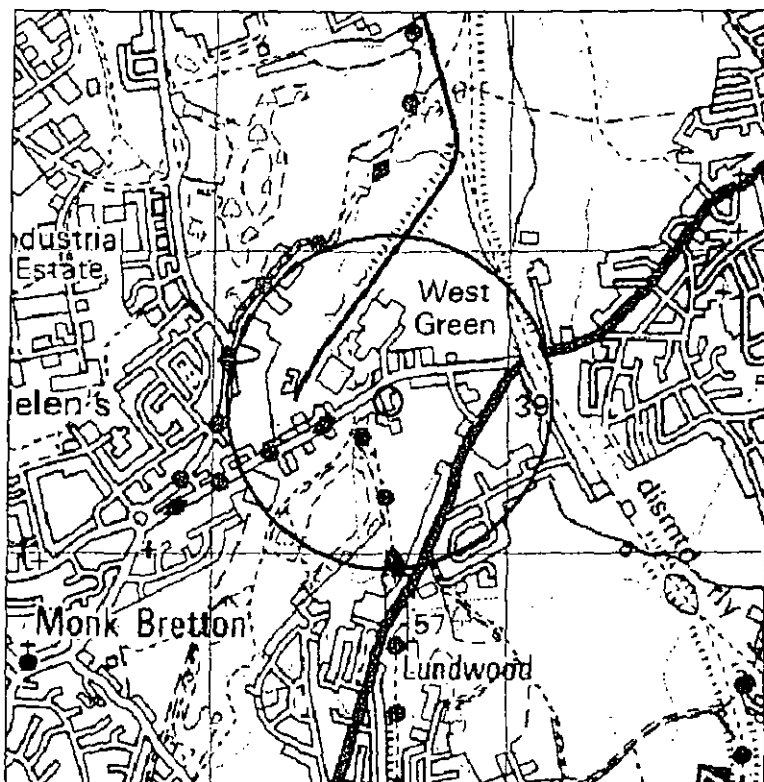


Radon (RPM) Report - Standard

Section 1: Location and extent of report area

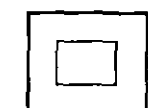
Area centred at: 437600,408500

Radius of site area: 50 metres



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

KEY:



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

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

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

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Section 2: Requirement for radon protective measures

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

Stage 1

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

Stage 2

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

Result

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

Section 3: Geological units within the search area

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

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

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

1:250,000 data

- 1. MIDDLE COAL MEASURES (FORMATION)(SANDSTONE 3D00); No drift
- 2. MIDDLE COAL MEASURES (FORMATION)(ARGILLACEOUS ROCKS,

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UNDIFFERENTIATED); No drift

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Section 4: Determining the level of radon protection.

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

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

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

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

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

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

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

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

Radon (RPM) Report - Standard

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

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

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

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

The Radon follow-up reports can be ordered from:-

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

Section 6: What is radon ?

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

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

Radon (RPM) Report - Standard

Section 7: Radon in workplaces

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

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

Section 8: Radon in existing dwellings

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

Radon - A Householder's Guide

Radon - You Can Test for it

Radon - A Guide for Homebuyers and Sellers

Radon - A Guide to Reducing Levels in Your Home

Information in the booklets is also available on the DEFRA website at:

<http://www.defra.gov.uk/environment/radioactivity/radon/index.htm>

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

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

Radon (RPM) Report - Standard

Section 9: Terms & Conditions

General

This report is supplied in accordance with the GeoReports Terms & Conditions available on the BGS website at www.bgs.ac.uk/georeports and also available from the BGS Central Enquiries Desk at the below address.

Important notes about this report

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

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Report issued by: BGS Enquiries Service

For further information, please contact:

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

RADON PROTECTIVE MEASURES STANDARD REPORT RECEIPT

REPORT PREPARED FOR:

Ceri Crawford-Jones
Encia Consulting Ltd.
Encia House
Audby Lane
Wetherby
LS22 7RD

CLIENT REFERENCE:

19649/5848/11RLM

CHARGES:

COST: £35.74
VAT: £6.26

TOTAL PAYABLE
£42.00

CHEQUE NUMBER: 011003***PAYMENT RECEIVED WITH THANKS***

VAT REGISTRATION No. 618 3673 25

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

The
**COAL
AUTHORITY**

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

ENCIA CONSULTING LTD.
ENCIA CONSULTING LTD.
ENCIA HOUSE,
AUDBY LANE,
WETHERBY,
WEST YORKSHIRE,
LS22 7RD

This matter is being dealt with by Darren Moody

Our Ref: 521672-03

Your Ref: 19648/5848/1/RLM

Electronic Ref:

Date: 13 November 2003

RECEIVED 18 NOV 2003
18551

Dear Sir,

Coal Mining Report
BURTON ROAD, BARNSELY, SOUTH YORKSHIRE

I refer to the enquiry dated 07th November 2003, received 12th November 2003, in connection with the above.

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

Past Underground Mining

The property is within the likely zone of influence on the surface from workings in 7 seams of coal at 150m to 560m depth, the last date of working being 1989.

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

Present Underground Mining

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

Future Underground Mining

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

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

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

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

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

Shafts and Adits

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

Surface Geology

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

Past Opencast Mining

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

Present Opencast Mining

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

Future Opencast Mining

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

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

Subsidence

Claim(s) within, or intersecting, the property boundary that do not match the property address are shown on the attached plan.

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

Withdrawal of Support

The property lies within a geographical area in respect of which notices of entitlement to withdraw support were published in 1954, 1947, 1986.

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

Working Facilities Orders

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

Payments to Owners of Former Copyhold Land

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

Additional Remarks

— —
— —

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

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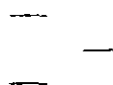
We acknowledge the receipt of your remittance in payment of our fee.

Yours faithfully



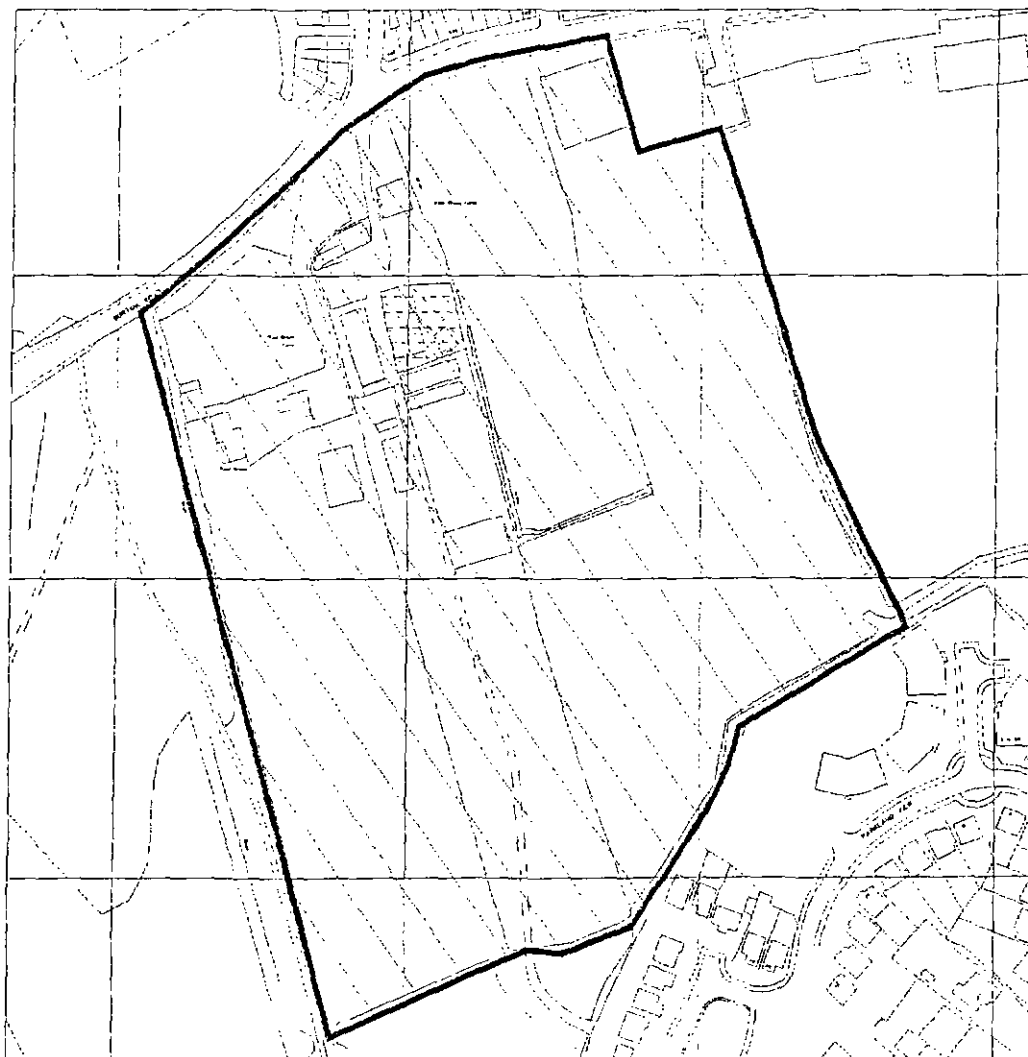
Albert Schofield

Director of Mining Information and Services



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—



Crown Copyright. Quoted scale is approximate.

SCALE: 1:2500

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

● ; APPROXIMATE POSITION OF ENQUIRY BOUNDARY SHOWN



APPROXIMATE POSITION OF CLAIM BOUNDARIES SHOWN



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—
—

Our Ref: NCCC/2504/03
Your Ref:



ENVIRONMENT
AGENCY

Date: 27 November 2003 **RECEIVED 28 NOV 2003** 18637

Encia Consulting Ltd
Encia House
Audby Lane
Wetherby
LS22 7RD

Dear Sir or Madam

Re: BURTON ROAD, BARNSELY, SOUTH YORKSHIRE

We are pleased to attach your property search report for the above property. You can use this report in accordance with the conditions of use shown overleaf.

You may require additional information if any of your property search answers have shown a positive response. Our initial charge for providing additional information is £50 (with no VAT). This can be paid by either cheque or postal order made payable to 'The Environment Agency'. There may be a further charge, in addition to the initial £50, if the work involved in producing additional information takes us longer than anticipated. In such cases we contact our customer with the details of the additional costs and to ask if they want to continue or amend their enquiry.

If you do write to us requesting additional information, please also include this letter and your initial £50 payment. Your request for additional information, this letter and your payment should be sent to:

The Environment Agency
National Customer Contact Centre
PO Box 544
Rotherham
S60 1BY

If you would like assistance with our property search service, please call our National Customer Contact Team on 08702 420199.

Yours Faithfully

**National Customer
Contact Team**

The Environment Agency
National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY
Tel: 08702 420199 Fax: 01709 312820

www.environment-agency.gov.uk/propertysearch

Property Search Request Service: Background Notes and Conditions

Please read these background notes carefully

About the request

You can only request information for one parcel of land at a time, as defined in Rule 2(2) of the Local Land Charges Rules 1977.

You should send us your request on form ENQP1 with as much information as is needed to clearly identify the site or property, for example:

- The full postal address.
- The Ordnance Survey national grid reference for the property

How to make a request

You can send your request by post enclosing your cheque. You can also make a request by telephone. If you do so you must make payment with a credit or debit card.

Conditions attached to the data we send you

We will send you data after appropriate searches of our databases. We believe this data will be in accordance with the information at present available to the Agency. Except where it is established that the Agency has acted negligently, all liability, whether based in contract or in tort, is excluded. Any liability for negligence by the Agency is limited to the person by or on whose behalf these enquiries are made.

The data we send you have not been prepared to meet your or anyone else's individual requirements and it is therefore your responsibility to ensure that the information meets your needs. In particular you should check whether you need to ask for other environmental information either from the Agency or from other sources.

The data we give you are dependent on the accuracy and completeness of the information you have sent us in the request.

Contract Formation and Cancellation

When you send us this form with the due fee we will treat this as an "offer" in legal terms and our confirmation of the request will form a binding legal agreement. If the information you supply does not indicate on our records an actual property location in England or Wales we will give you an opportunity to substitute a different location or to cancel the request. Subject to the above unless we agree otherwise in writing you will not be able under Regulation 10 of the Distance Selling Regulations to cancel this request after we have confirmed the request and commenced to produce a report for you in accordance with your instructions.

Data quality

We cannot guarantee the completeness or accuracy of data deriving from predecessor bodies to the Agency.

Intellectual property rights

All intellectual property rights in the data supplied to you, whether owned by the Agency (Agency Data) or third parties, will continue to be owned by the respective parties.

Third Party Data

Use of third party data, including copying, must be limited to statutory rights.

Your right to use Agency Data

Nothing in these notes will in any way restrict your statutory or any other rights of access to the data.

You may use or make copies of Agency Data for your own private use or for use within your business, but your right to supply the data (or anything derived from the data) to others is only as set out below

Use by Professional Advisers

If you are a solicitor or other professional adviser you may give a single copy of the Report to your client provided that you also ensure that the copy of these notes and conditions provided with the Report is not removed.

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- Statutory provision which the Act, Regulation or Order has replaced.
- Amendment or re-enactment of the Act, Regulation or Order.

Contact Address: Environment Agency, PO Box 544, Rotherham, S60 1BY, telephone 08702 420199.



**ENVIRONMENT
AGENCY**

Property Search

**BEN BAILEY HOMES DEV
BURTON ROAD
BARNLEY
SOUTH YORKSHIRE
BARNLEY**

0.50km radial search around

**National Grid Reference:
437721, 408496**

**OS Grid Reference:
SE3772108496**

Date: 27 November 2003

**An Environment Agency Service
Our Ref: 200311270000783101
NLIS Ref: 1CH_TERA-433175
Your Ref: 2504**



Introduction

The Environment Agency is the leading public organisation for protecting and enhancing the environment in England and Wales. We regulate industry and inspect industrial sites to protect the environment and people from pollution and environmental risks to health, maintain essential flood defences, water resources and river structures and monitor and assess the environment.

This bespoke report has been compiled from the data gathered from our activities. It provides potential house purchasers with the necessary environmental information for more informed decision making regarding the property in question.

Further Information

Sometimes, you may require the Environment Agency to provide information beyond that contained in this report. We may have to charge for this service to cover costs, but we will always let you know in advance how much it will be.

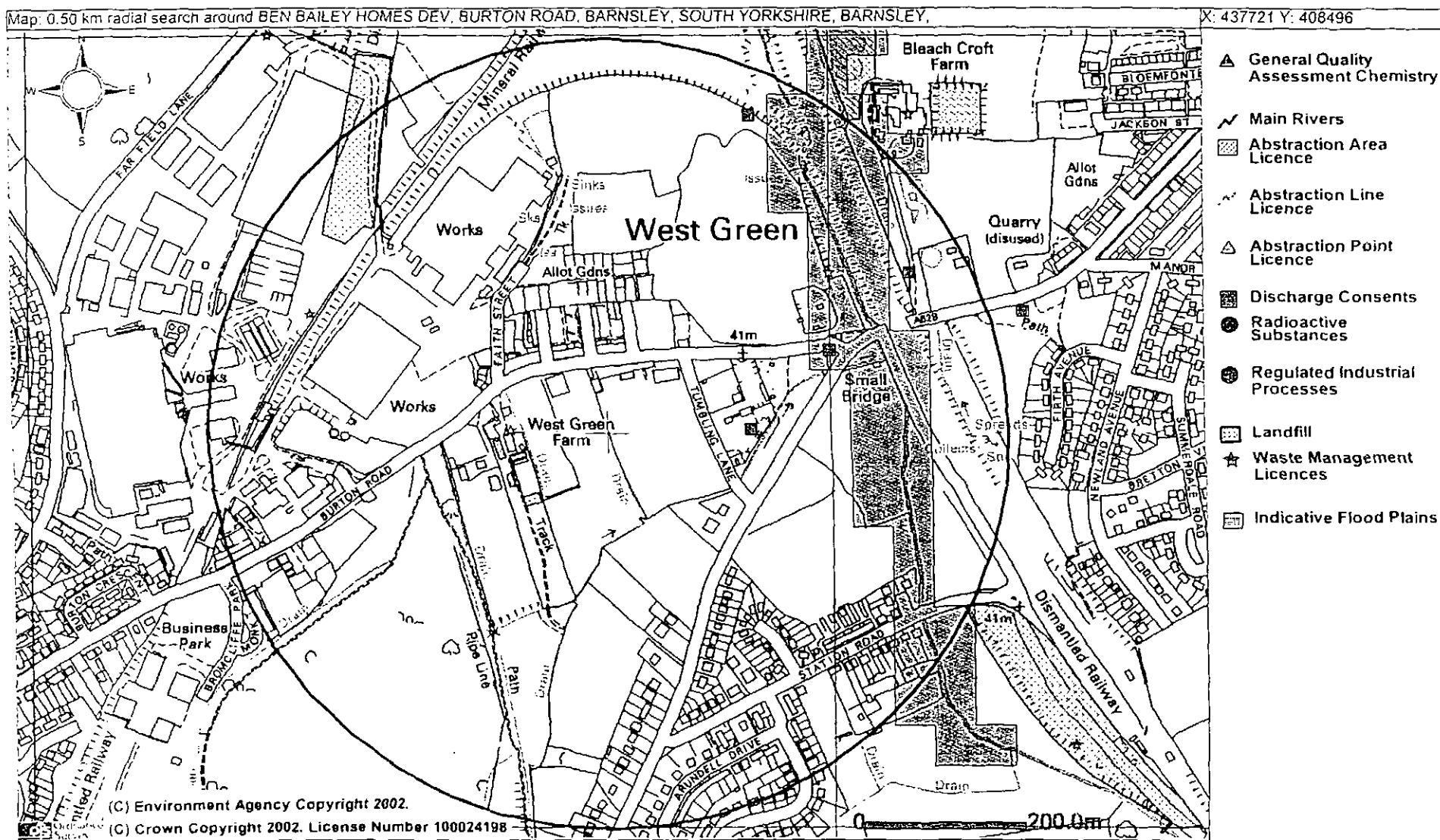
You may also want to refer to the Public Registers of environmental information held at Environment Agency offices. These may provide more information on any waste management licences, industrial permits and authorisations and water discharge consents and abstraction licences referred to in this report.

For both of the above, please contact us on 08702 42 01 99.

For further information on flooding, call our Floodline service (0845 988 1188) or go to:-

www.environment-agency.gov.uk/floodline

Other organisations that also hold relevant information are referred to where appropriate in this report.



Question	Answer	Comments
1. Is the property on or within 500 metres of a floodplain as indicated on the Agency's Indicative Floodplain maps?	Yes	<p>What is a floodplain?</p> <p>A floodplain is the natural overspill area when a river rises above its banks, or when high tides or stormy seas cause low-lying coastal areas to flood.</p> <p>What is the likelihood of flooding?</p> <p>Being in a floodplain does not mean that a home or business will be flooded. Flood forecasting is not an exact science and our maps only give an indication of the areas at risk. They indicate the extent of flooding for a one in one hundred (1%) chance of flooding each year from a river, and a one in two hundred (0.5%) chance of flooding each year from the sea and tidal estuaries, or the highest known flood level. Our maps are periodically revised to incorporate up-to-date information.</p> <p>Our maps do not take account of flood defences, which protect many areas; flood defences do not remove the risk of flooding but they do reduce it. They are built to withstand a certain level of flood but can fail in extreme weather conditions. Defences are built according to local needs.</p> <p>If your home or business is in or at the edge of a floodplain, you should be aware of the warning system and know how to prepare for flooding. Call our Floodline (0845 988 1188) to receive a free pack on what to do before, during and after a flood and for information about the flood warning service.</p>
2. Is there an Agency waste management licence in force for operation of a landfill site, waste treatment centre, waste transfer station or similar waste disposal facility on or within 500 metres of the property?	Yes	<p>Under the Environment Protection Act 1990, the Environment Agency regulates the storage and treatment of waste to make sure that waste disposal operations do not pollute the environment or endanger human health. Anyone involved in waste disposal must be licensed by the Agency to do so. Those not adhering to the conditions of their licence are liable to prosecution. New occupiers of licensed properties must ensure that the licence is transferred before undertaking any of the licensed activities.</p>
3. Does the property lie within 500 metres of a currently licensed landfill site boundary?	Yes	<p>What is a landfill site?</p> <p>A landfill site is a place where waste is taken and compacted. Most landfill sites take just earth, soil and construction and demolition waste. Some are licensed to accept household, industrial and commercial waste, and a small number are licensed to accept "special" waste, such as corrosive materials. Landfills which take both household, industrial and commercial and special waste are called co-disposal sites. When they are full of waste, landfill sites are capped, covered with earth and the land put back into use.</p> <p>Are landfills polluting?</p>

Most landfills take only inert or building wastes and have no effect on the environment. Sites that take biodegradable waste produce a flammable gas ("methane") - which may also contribute to climate change and a liquid ("leachate") which has the potential to pollute rivers and groundwater. Such pollution can be prevented by careful siting and engineering. This may include lining the base of the site, installing pumps and systems to deal with any leachate and systems to collect and burn any landfill gas produced.

Can landfills cause other problems?

Waste is usually delivered to landfills by lorries. Heavy earth-moving equipment also works on site. Nuisance can arise from excessive noise from the site plant, dust thrown up by vehicles crossing the site, odours from decomposing waste, litter blowing off the site and large numbers of birds (mainly gulls) or flies.

However, the Environment Agency issues licences to control site operations and carries out regular site inspections to ensure that nuisance is kept to a minimum.

4. Is there an Agency authorisation or permit in force for the operation of an industrial process on or within 500 metres of the property?

No

Under the Environment Protection Act 1990 and the Pollution Prevention and Control Act 1999 (and regulations), the Environment Agency has a duty to protect the environment from pollution from certain prescribed industrial processes. Industries which present the greatest risk to the environment are subject to systems of control by which the Agency authorises certain processes or permits certain installations to minimise the harmful effects of substances released into the environment.

It is a criminal offence to carry out any of these processes or operate such installations except under and in accordance with an authorisation or permit.

5. Is there an Agency registration to hold radioactive materials (on premises or for mobile plant) or authorisation for disposal or accumulation of radioactive waste in force on or within 500 metres of the property?

No

Radioactive material arises in connection with the generation of electricity from nuclear power, but also from medicine, research and other industries which make use of them.

Under the Radioactive Substances Act 1993, the Agency registers radioactive sources and issues authorisations to regulate how radioactive waste is disposed of from nuclear sites, hospitals and other establishments.

There is a natural background radioactivity to which we are all exposed. Exposure from nuclear facilities is less than 0.1% of average exposure and is well within the recommended safety limit.

6. Is there an Agency consent in force to discharge effluent from this property or within 500 metres of the property?

Yes

The Environment Agency has a duty to protect controlled waters from pollution. Controlled waters include watercourses, lakes, canals, coastal waters and groundwater.

		<p>The formal consent of the Agency is required for many discharges into controlled waters. Exceptions currently include some discharges of small volumes of sewage effluent from septic tank soakaways in areas where there is a low risk to groundwater.</p> <p>Where a consent has been issued, this can be transferred. To do this, the new holder must inform the Agency within 21 days of the change.</p> <p>If you are in any doubt about whether a discharge from a property or premise requires consent, please contact us.</p>
7. Is there an Agency water abstraction licence in force for the property, or within 500 metres of the property? (point licence):	No	<p>Questions 7, 8 and 9 all relate to similar information. At the moment, the Environment Agency holds these different types of licences as different "layers" of information. Until we further develop our systems, we have to some extent duplicate our answers in this report to ensure you receive the fullest information possible.</p> <p>Point licences allow abstraction only at a point specified on the licence.</p> <p>Under the Water Resources Act 1991, the Environment Agency is required to keep a sustainable balance between how we use water and the effect that such use might have on river and wetland habitats.</p> <p>People wishing to abstract water from the watercourse or to in any way obstruct it (dam, weir, culvert) must have a licence issued by the Environment Agency to do so. Interfering with the watercourse in any way without a licence risks prosecution. Please contact us for further advice.</p>
8. Is there an Agency water abstraction licence in force for the property, or within 500 metres of the property? (linear licence):	No	<p>Linear licences allow abstraction along a line specified on the licence.</p>
9. Is there an Agency water abstraction licence in force for the property, or within 500 metres of the property? (area licence):	No	<p>Area licences allow abstraction within an area specified on the licence.</p>
10. Is any watercourse on, abutting, or within 500 metres of the property designated as a main river?	No	<p>What is a "main river"?</p> <p>Main river refers to specific watercourses upon which the Environment Agency is directly empowered to act. The Agency also has a duty to supervise all matters relating to flood defences. As the Agency's records are limited primarily to main rivers, there may be a watercourse of a different category on or abutting this property. If so, the following notes apply.</p> <p>In the absence of any express agreement to the contrary, any responsibilities for maintenance or repair</p>

of the watercourse and any structure affecting the channel rests with the riparian owner (the owner of land adjoining any watercourse). The local authority has certain statutory powers to carry out maintenance or repairs but it does not have to do so.

Internal Drainage Boards

In some areas streams may come under the jurisdiction of Internal Drainage Boards. They have to give written consent to certain work in, over or under the channel of the watercourse, or on the banks, or within the distance from the channel specified in the byelaws. They have a statutory power to carry out maintenance and repairs but are not under any duty to do so.

Land Drainage Act 1991

This Act protects the flow of all watercourses. The written consent of the Agency (or if applicable, the Internal Drainage Board) is needed for the construction or alteration of any weir, dam, culvert, or the construction of anything within the channel which may interfere with or obstruct the flow in any way.

Further details are available in the Agency booklet "Living On The Edge" which is available free, together with the relevant flood defence Byelaws for your location, from your local Agency office.

11. Is there information on the designated quality of any watercourse on, abutting, or within 500 metres of the property as defined by the Agency's Chemistry General Quality Assessment?

No

The Scheme

The General Quality Assessment (GQA) scheme provides a national method for measuring water quality in rivers and canals. It enables the Environment Agency, and others, to assess and monitor the state of water quality. The chemical GQA relates to the most common types of organic pollution from sewage treatment works, agriculture and industry.

12. Is the property situated within a Groundwater Source Protection Zone as defined by the Agency?

No

What is groundwater?

Groundwater is the water stored in underground rocks and strata. It provides one-third of all our drinking water and maintains the flow in many of our rivers. It is often an extremely high quality source of water but is very vulnerable to pollution - leaks of oil, fuel or chemicals on the soil may seep into groundwater and cause pollution which is extremely expensive or impossible to clean up.

Source Protection Zones (SPZs)

These zones identify areas of concern around water wells and springs used for public drinking water supply. Based on the time of travel for any pollutant entering the groundwater to reach the water well they provide a basis for protecting our drinking water.

13. Is there information about groundwater vulnerability in

Yes

Groundwater vulnerability maps provide an indication of the ease with which groundwater in a particular area

the area of the property?

could become polluted by contaminants spilt on the surface of the ground.

The maps are an aid to allowing better informed judgements on the location of new developments, avoiding potentially polluting activities in high vulnerability areas, while giving greater leeway for development in low vulnerability areas.

These maps cover the whole of England and Wales and are therefore at a small scale (1:100,000). Therefore, any project with a potential impact on ground or surface water will require site specific investigations to ascertain its acceptability or otherwise.

Conditions

1. The Agency will supply a report compiled from its property search database. This database is regularly updated with data that has been gathered together from throughout the Agency.
2. Except where it is established that the Agency has acted negligently, all liability, whether based in contract or in tort, is excluded. Any liability for negligence by the Agency is limited to the person by or on whose behalf these enquiries are made.
3. The data the Agency supply have not been prepared to meet your or anyone else's individual requirements and it is therefore your responsibility to ensure that the information meets your needs. In particular you should check whether you need to ask the Agency or other persons for other environmental information.
4. The data supplied are dependent on the accuracy and completeness of the information you have sent in the request.
5. When you request a report and pay the due fee this will be treated as an "offer" in legal terms and confirmation of the request will form a binding legal agreement. Unless agreed otherwise in writing, you will not be able under Regulation 10 of the Distance Selling Regulations to cancel this request after confirmation of the request and commencement of work to produce a report for you in accordance with your instructions.
6. The Agency cannot guarantee the completeness or accuracy of data deriving from predecessor bodies to the Agency.
7. All intellectual property rights in the report supplied to you, whether owned by the Agency (Agency Data) or third parties, (Third Party Data) will continue to be owned by the respective parties.
8. Use of Third Party Data, including copying, must be limited to statutory rights.
9. Nothing in these notes will in any way restrict your statutory or any other rights to use Agency Data. You may use or make copies of Agency Data for your own private use or for use within your business, but your right to supply this data (or anything derived from this data) to others is only as set out below.
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**ENVIRONMENT
AGENCY**

Please return completed form with cheque to:

Environment Agency, PO Box 544, Rotherham, S60 1BY

Requests can also be made by credit card by phoning:
08702 420199

1. About You

Please give the following details (the report will be posted to this address)

Company Name
Contact name
YOUR REF
Address
Postcode
Phone
Fax
Email

Please tick how you would like to receive your report:

Post ☐ Email ☐

2. About the Site or Property

Please give us as much information as possible to identify the location:

Address
Postcode

Ordnance Survey national grid reference for the site (if known).

4. Charges

You have to pay us a fee for processing your request. Please send a cheque with this form or we cannot process it.

Make the cheque payable to 'Environment Agency'. The fee per search is £40 plus VAT (£47).

Property Search Request Service

3. Information Requested From Us

We will answer all the following questions:

- 1 Is the property on, or within 500 metres of the floodplain as indicated on the Agency's Indicative Floodplain maps?
- 2 Is there an Agency waste management licence in force for operation of a landfill site, waste treatment centre, waste transfer station or similar waste disposal facility on or within 500 metres of the property?
- 3 Does the property lie within 500 metres of a currently licensed landfill site boundary?
- 4 Is there an Agency authorisation or permit in force for the operation of an industrial process on or within 500 metres of the property?
- 5 Is there an Agency registration to hold radioactive materials (on premises or for mobile plant) or authorisation for disposal or accumulation of radioactive waste in force on or within 500 metres of the property?
- 6 Is there an Agency consent in force to discharge effluent from this property or within 500 metres of the property?
- 7 Is there an Agency water abstraction licence in force for the property, or within 500 metres of the property? (point licence)
- 8 Is there an Agency water abstraction licence in force for the property, or within 500 metres of the property? (linear licence)
- 9 Is there an Agency water abstraction licence in force for the property, or within 500 metres of the property? (area licence)
- 10 Is any watercourse on, abutting, or within 500 metres of the property designated as a main river?
- 11 Is there information on the designated quality of any watercourse on, abutting, or within 500 metres of the property as defined by the Environment Agency's Chemistry General Quality Assessment?
- 12 Is the property situated within a Groundwater Source Protection Zone as defined by the Agency?
- 13 Is there information about groundwater vulnerability in the area of the property?

5. Declaration

I certify that the information in this request is correct to the best of my knowledge. I have read the notes and conditions that came with this form.

Name	Date
Signature	

Property Search Request Service: Background Notes and Conditions

Please read these background notes and the whole form carefully before you start to fill it in.

About the request

You can only request information for one parcel of land at a time, as defined in Rule 2(2) of the Local Land Charges Rules 1977.

You should send us your request on form ENQP1 with as much information as is needed to clearly identify the site or property, for example:

The full postal address.

The Ordnance Survey national grid reference for the property

How to make a request

You can send your request by post enclosing your cheque. You can also make a request by telephone. If you do so you must make payment with a credit or debit card.

Conditions attached to the data we send you

We will send you data after appropriate searches of our databases. We believe this data will be in accordance with the information at present available to the Agency. Except where it is established that the Agency has acted negligently, all liability, whether based in contract or in tort, is excluded. Any liability for negligence by the Agency is limited to the person by or on whose behalf these enquiries are made.

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The data we give you are dependent on the accuracy and completeness of the information you have sent us in the request.

Contract Formation and Cancellation

When you send us this form with the due fee we will treat it as an "offer" in legal terms and our confirmation of the request will form a binding legal agreement. If the information you supply does not indicate on our records an actual property location in England or Wales we will give you an opportunity to substitute a different location or to cancel the request. Subject to the above unless we agree otherwise in writing you will not be able under Regulation 10 of the Distance Selling Regulations to cancel this request after we have confirmed the request and commenced to produce a report for you in accordance with your instructions.

Data quality

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Contact Address: Environment Agency, PO Box 544, Rotherham, S60 1BY, telephone 08702 420199.



BARNLSLEY

Metropolitan Borough Council

Planning & Transportation Service

Assistant Director, Ruth Middleton BA (Hons), MRTPI, Dip Surv

South Yorkshire Mining Advisory Service

RECEIVED 27 NOV 2003
18625

Mining Advisory Manager: C. P. Naylor, CEng., MIMM.,

Central Offices, Kendray Street, Barnsley, S70 2TN

Tel: (01226) 772685 Fax: (01226) 772688

Email: SYMAS@barnsley.gov.uk

My Ref: RCH//SML/29M/2

Your Ref: 5848

Date: 21st November, 2003

Enquiries to: Mr. R. C. Hunter

Dial Direct: (01226) 772687

ENCIA Consulting Ltd.,
Encia House,
Audby Lane,
Wetherby,
West Yorkshire.
LS22 7RD

FOR THE ATTENTION OF MR. JOHN HARRISON

Dear Sir,

LAND OFF BURTON ROAD, WEST GREEN, MONK BRETTON, BARNLSLEY

Further to your fax request of the 10th November, 2003, in respect of the above, please find enclosed a mineral report and plans which outline the mining and geological information.

This report is based on and limited to the records in the possession of SYMAS at the time the enquiry is answered.

Yours faithfully,

C. P. Naylor

C. P. Naylor,
Mining Advisory Manager.

Enc.



SOUTH YORKSHIRE MINING ADVISORY SERVICE

MINERAL REPORT

CONFIDENTIAL

Date: 21/11/2003

Ref: RCH/SML/29M/2

LAND OFF BURTON ROAD, WEST GREEN, MONK BRETTON, BARNSELEY

SITUATION

The land under consideration is shown edged orange on the attached plan no. 29M/2A.

GEOLOGY

Records show the site to be located mainly on shales and mudstones of the Middle Coal Measures, with the Oaks Rock Sandstone being present under the north-west part of the land.

The surface position of a geological fault is conjectured to cross just inside the northern boundary, as marked on the attached drawing no. 29M/2A.

MINING INFORMATION

In the past the following coal seams have been extracted in the area:

<u>Seam</u>	<u>Depth (m)</u>	<u>Thickness (mm)</u>	<u>Timing</u>
Winter	170	770	1955
Low Beamshaw	200	1000	1949
Kents Thick	235	950	1962
Barnsley	300	2740	Ab 1942
Top Fenton	525	1500	1989

All subsidence movement from these workings will have ceased over 10 years ago and as the site lies remote from the active coalfield should not be affected in the future.

FORMER LAND USE

The relevant Ordnance Survey Sheet 275/1 (1906 and 1931 Editions) have been checked and show that the area to the west of Tumbling Lane to be open land with no past industrial usage affecting the land.

The triangular shaped piece of land to the east of Tumbling Lane is shown to contain a 'Sewage Works'.

To the north of the Sewage Works a 'Brick Works/Quarry' is shown on the 1931 Edition plan (see attached plan no. 29M/2B).

MINERAL REPORT

Also, the West Green Working Men's Club & Institute and West Green Farm buildings are shown on the National Grid Sheet SE 3708 (1960 Edition).

Ordnance Survey Geological Sheet SE 30 NE indicates an area of 'made ground' on the former sewage works site, the thickness and composition are unknown. Also some mine spoil material is shown to be spread in the west (see drawing 29M/2A), which probably occurred during the Monk Bretton Colliery tip reclamation works.

LANDFILL
SITES

A Category 4 Site (No. 163) lies within the land and a Category 1 Site (No. 18) is located to the north of Burton Road in the former brick works quarry, near the north-eastern boundary of the land (see plan no. 29M/2A).

CONCLUSIONS

1. The site is currently stable from the deep mining subsidence aspect and will remain so in future years.
2. However, a geological fault is conjectured to cross the surface at the north end of the site from Tumbling Lane to opposite Faith Street. Once fault movement is initiated by underground mineworkings it can recur at anytime in the future.

Any future development should be avoided in this area if possible, or flexible construction/strengthening of foundations used where any weak, faulty ground is found.

3. Similarly, fissuring in the sandstone underlying the north-west part of the site, may have been opened out by past mining operations. Therefore, foundations would need to be suitably strengthened where any fractured/weak ground is encountered.
4. Due to the presence of geological faulting, possibly fissured sandstone and Landfill Site No. 163, along with some colliery spoil and the nearby Monk Bretton Colliery Shafts (disused), it is advised that the usual gas monitoring precautions are followed for any works/developments in this part of the site.
5. A Category 1 Landfill Site No. 18 also lies adjacent to the site, which is infill of the former brickworks quarry (see plan 29M/2C).

This is a site which is known to be producing landfill gas and from which landfill gas is migrating.

MINERAL REPORT

6. Part of the site, east of Tumbling Lane, was formerly occupied by a sewage works with associated settling/humus tanks and filter/sludge beds. These locations will need checking for possible land contamination.

In this vicinity the geological plan indicates an area overlain by newer alluvial deposits of unknown thickness. It is recommended that an investigation be undertaken to determine whether the installations of the former sewage works provide a constraint to development and to determine the extent and thickness and composition of the superficial deposit/made ground.

7. A similar investigation will be needed to examine the depth and nature/bearing capacity of the fill material contained in the part covered by Landfill Site No. 163 towards the western end of the land.

C. P. Naylor

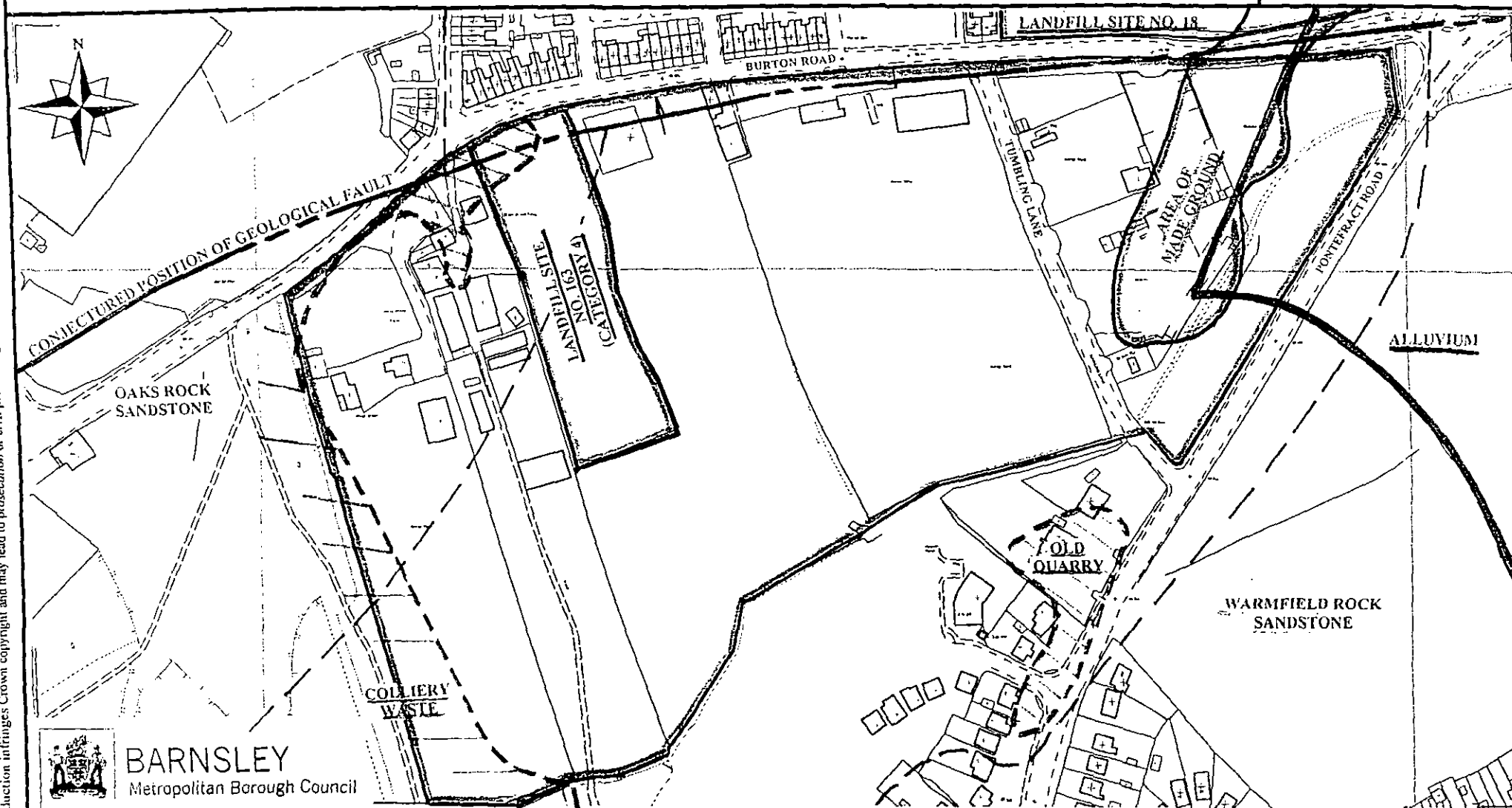
C. P. Naylor,
Mining Advisory Manager.

DRAWING TITLE

DRAWING NO.

LAND OFF BURTON ROAD, WEST GREEN, MONK BRETTON, BARNSELY

29 M / 2A



BARNSELEY
Metropolitan Borough Council

SCALE
1 / 2500

DATE
24 / 11 / 03

SOUTH YORKSHIRE MINING

ADVISORY SERVICE

10.5 REFERENCE

SE 3708

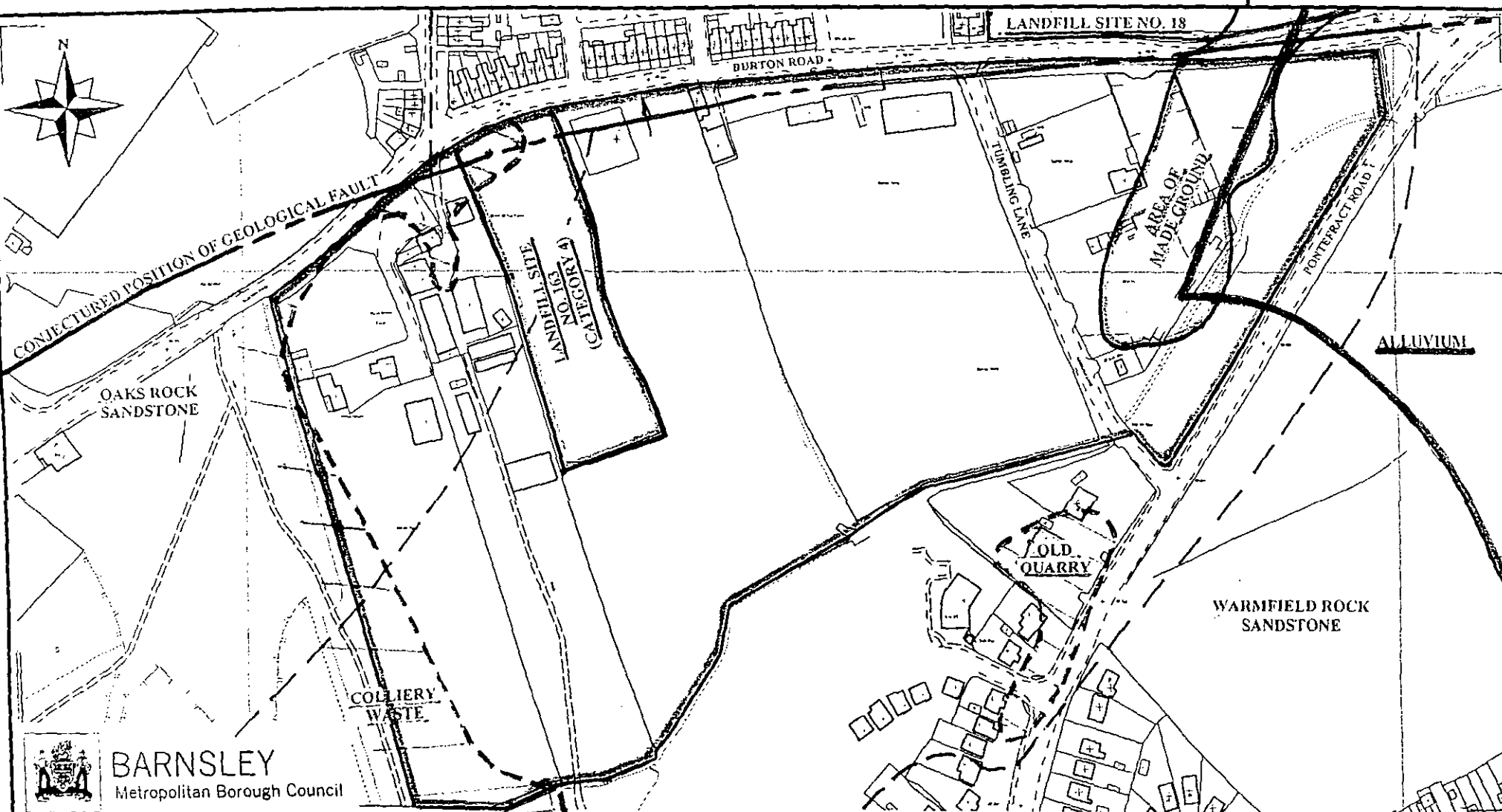
C. P. NAYLOR C.ENG M.I.M.M
MINING ADVISORY MANAGER

DRAWING TITLE

DRAWING NO.

LAND OFF BURTON ROAD, WEST GREEN, MONK BRETTON, BARNSELY

29 M / 2A



SCALE

1/2500

DATE

24/11/03

SOUTH YORKSHIRE MINING

O.S. REFERENCE

SE 3708

DRAWN BY

SML

CHECKED BY

RCH

ADVISORY SERVICE

C. P. NAYLOR C.ENG M.I.M.M.
MINING ADVISORY MANAGER

SCALE
1 / 2500

BARNESLEY
Metropolitan Borough Council

**SOUTH YORKSHIRE MINING
ADVISORY SERVICE**

U.S. REFERENCE

SE 3708 - 1960 EDITION

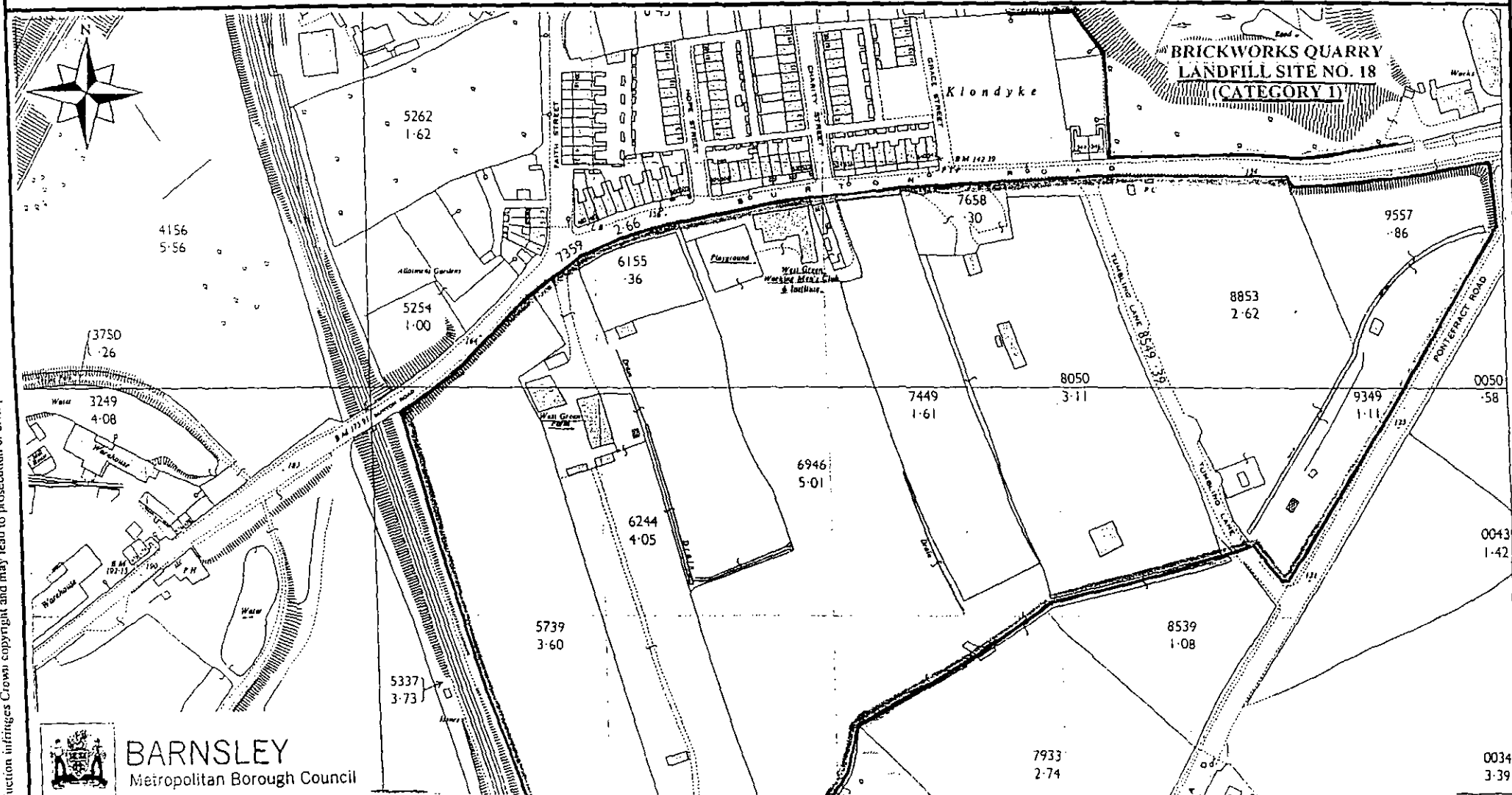
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DRAWING TITLE

DRAWING NO.

LAND OFF BURTON ROAD, WEST GREEN, MONK BRETTON, BARNSELY

29M / 2B



BARNSELY
Metropolitan Borough Council

SCALE

1/2500

DATE

24/11/03

DRAWN BY

SML

CHECKED BY

RCH

SOUTH YORKSHIRE MINING
ADVISORY SERVICE

O.S. REFERENCE

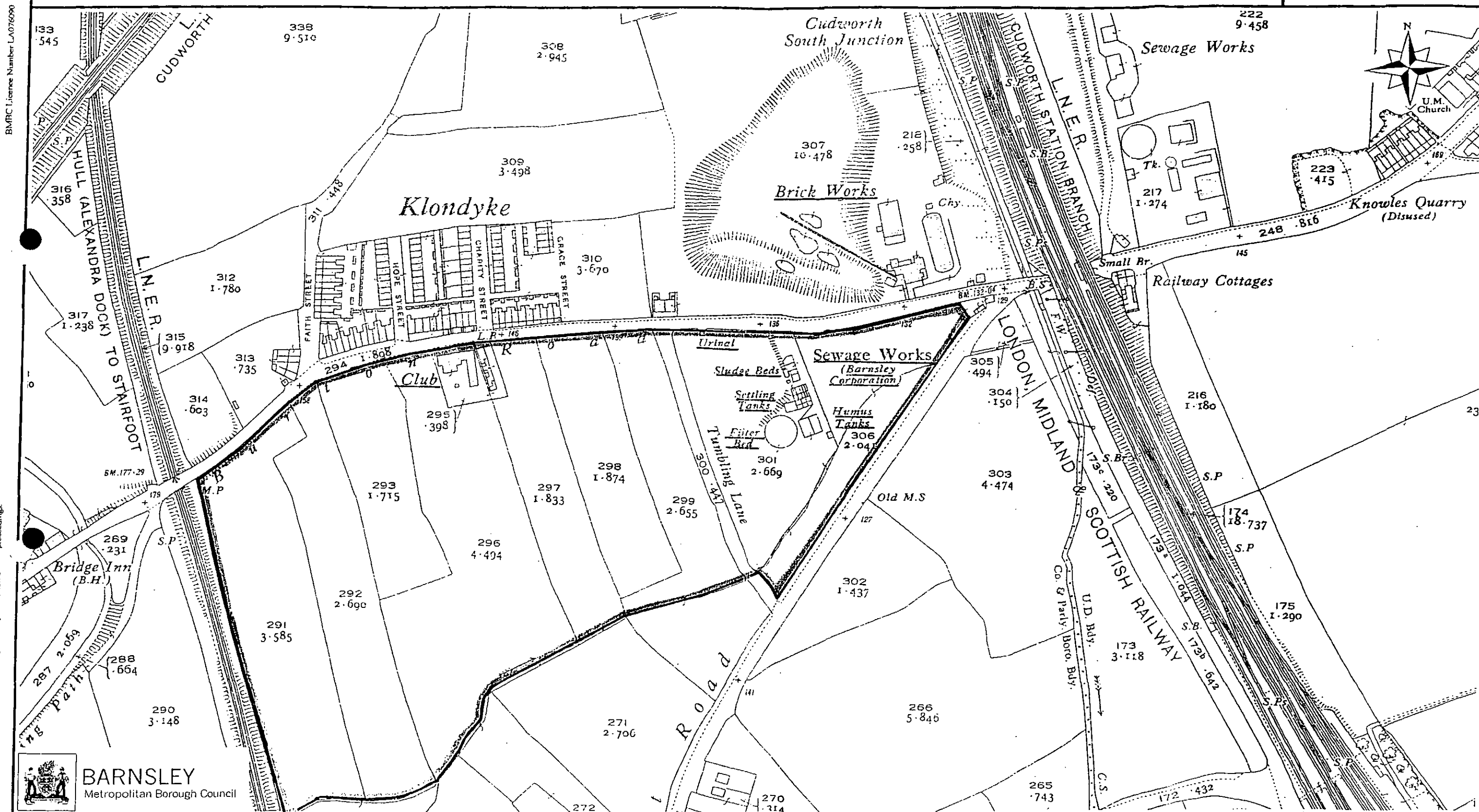
SE 3708 - 1960 EDITION

C. P. NAYLOR C.ENG M.I.M.M.
MINING ADVISORY MANAGER

LAND OFF BURTON ROAD, WEST GREEN, MONK BRETTON, BARNSELY

29 M / 2 C

B.M.F.C. Licence Number LA076090



BARNSELY
Metropolitan Borough Council

SCALE

1/2500

DATE

24/11/03

DRAWN BY

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CHECKED BY

RCH

SOUTH YORKSHIRE MINING

ADVISORY SERVICE

O.S. REFERENCE

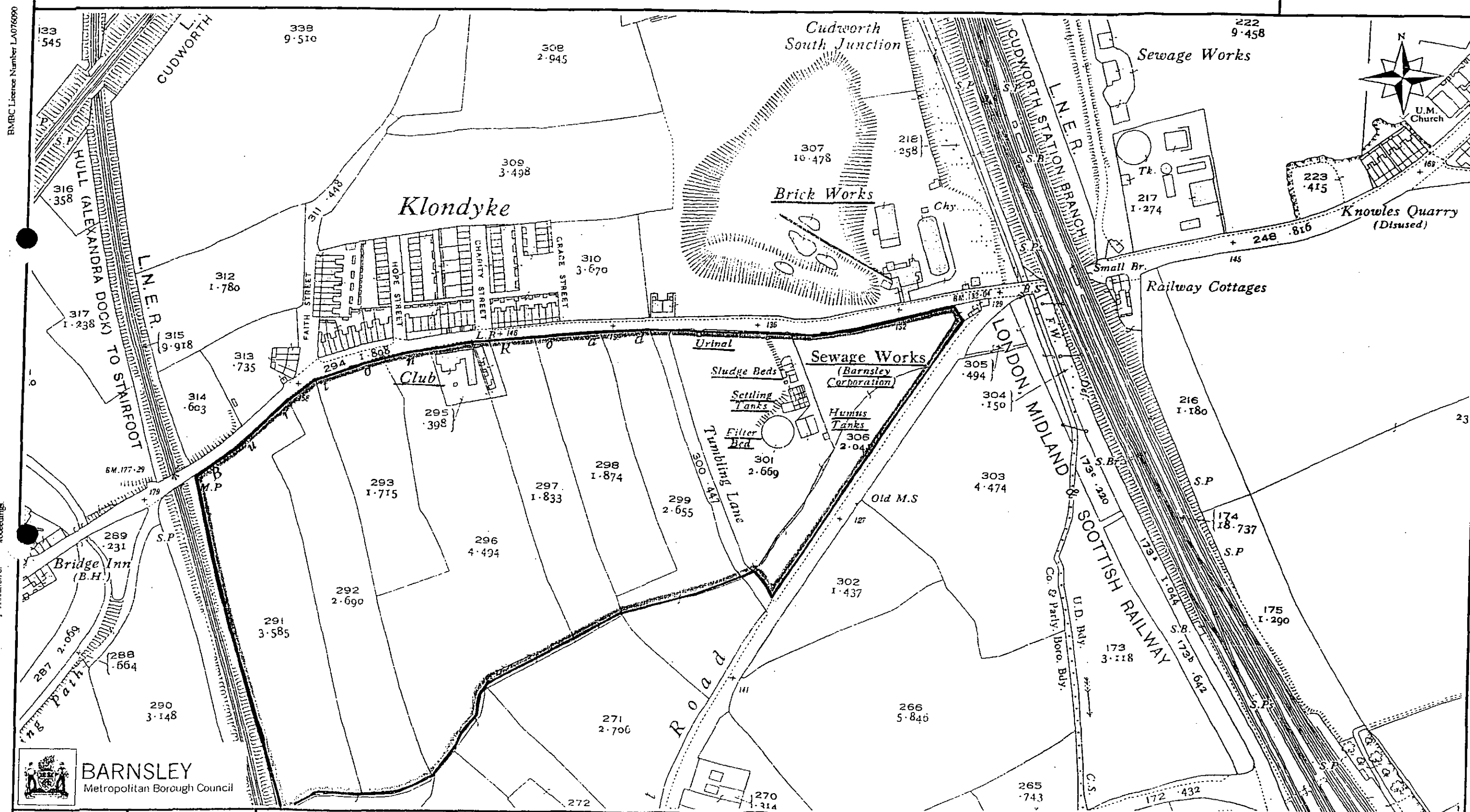
COUNTY SERIES
275 / 1 - 1932 EDITION

C. P. NAYLOR C.ENG. M.I.M.M.
MINING ADVISORY MANAGER

LAND OFF BURTON ROAD, WEST GREEN, MONK BRETTON, BARNSELY

29 M / 2C

B.M.B.C. Licence Number LA076090



BARNSELY
Metropolitan Borough Council

SCALE
1/2500

DATE
24/11/03

DRAWN BY
SML

CHECKED BY
RCH

**SOUTH YORKSHIRE MINING
ADVISORY SERVICE**

O.S. REFERENCE
COUNTY SERIES
275/1 - 1932 EDITION

C. P. NAYLOR C.ENG M.I.M.M.
MINING ADVISORY MANAGER



BARNSELEY

Metropolitan Borough Council

Environmental Health and Trading Standards

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

My Ref: JSC/104127

Your Ref: 5848/05

Date: 07 January 2004

Enquiries To: Mr J Scott

Dial Direct: (01226) 772456

Fax: (01226) 775699

Dear Sir

Re: Burton Road, Barnsley

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

Landfill Sites

There are four closed landfills within 250m of the above site, the details of which are listed below (see attached map)

Landfill Site Ref: - 18

Address - Burton Road, Monk Bretton, Barnsley

Waste Disposal Licence - WD2 B3

Site Operator - Redland Purle (Cleanaway Ltd)

Landfill Material - Domestic, Industrial and Commercial Wastes

Landfill Commenced - Pre 1974

Landfill Completed - 1977

This is classified as Category 1, meaning this is a site known to be producing landfill gas and from which it has migrated.

Landfill Site Ref: - 43

Address - Bleach Croft Farm, Cudworth, Barnsley

Waste Disposal Licence - WD20 B330 and WD20 B815

Site Operator - Mr R Armstrong

Landfill Material - Construction, Demolition and Excavation Waste

Landfill Commenced - Nov 1987

Landfill Completed - 1994

This is classified as Category 4, meaning the Waste Disposal Site Licence indicates the site has been licensed to accept material that would not be expected to give rise to landfill gas in substantial quantities.

Mr J Harrison
ENCIA
Encia House
Audby Lane
Wetherby
LS22 7RD

Landfill Site Ref: - 163

Address - Land adjacent to West Green Farm, Burton Road, Monk Bretton

Waste Disposal Licence - Exempt

Site Operator - Mr D Higgs

Landfill Material - Excavation, Demolition and Subsoil Waste

Landfill Commenced - Nov 1996

This is classified as Category 4, meaning the Waste Disposal Site Licence indicates the site has been licensed to accept material that would not be expected to give rise to landfill gas in substantial quantities.

Landfill Site Ref: - 88

Address - Land adjacent to West Green Farm, Burton Road, Monk Bretton

Waste Disposal Licence - WD20 B390

Operator - EJ Lidster

Landfill Material - Excavation Waste

Landfill Commenced - Nov 1996

This is classified as Category 2, as insufficient information is known about the site to provide an adequate response on the extent to which landfill gas may be present.

Historical Land Use

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

From the current records, compiled for Part IIA of the Environmental Protection Act 1990, we have information of previous uses of the above site that may have caused contamination to occur. Due to the large scale of the site, there is a variety of uses over the last century, the details of which are listed below;

1900s - Sewage Works

1910s - Sewage Works

1920s - Sewage Works

1990s - Scrapyards, Cement Works, Coal Merchants and an Electricity Sub Station.

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

Environmental Protection Act 1990 - Authorised Processes

There are no Part A or Part B authorised processes being operated at the above site, or within 250m of the site boundary.

Nuisances

We have received complaints regarding potential nuisances from this site, but nothing has been proved to serve a notice.

Reported Incidents

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

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

I must also inform you that the Council make a charge for supplying this information and you will be invoiced accordingly in due course. This charge will be £125 + VAT.

Should you wish to discuss this correspondence further, please don't hesitate to contact me; you may also contact the Unit Manager, Mr Ken Eastwood, on (01226) 772482.

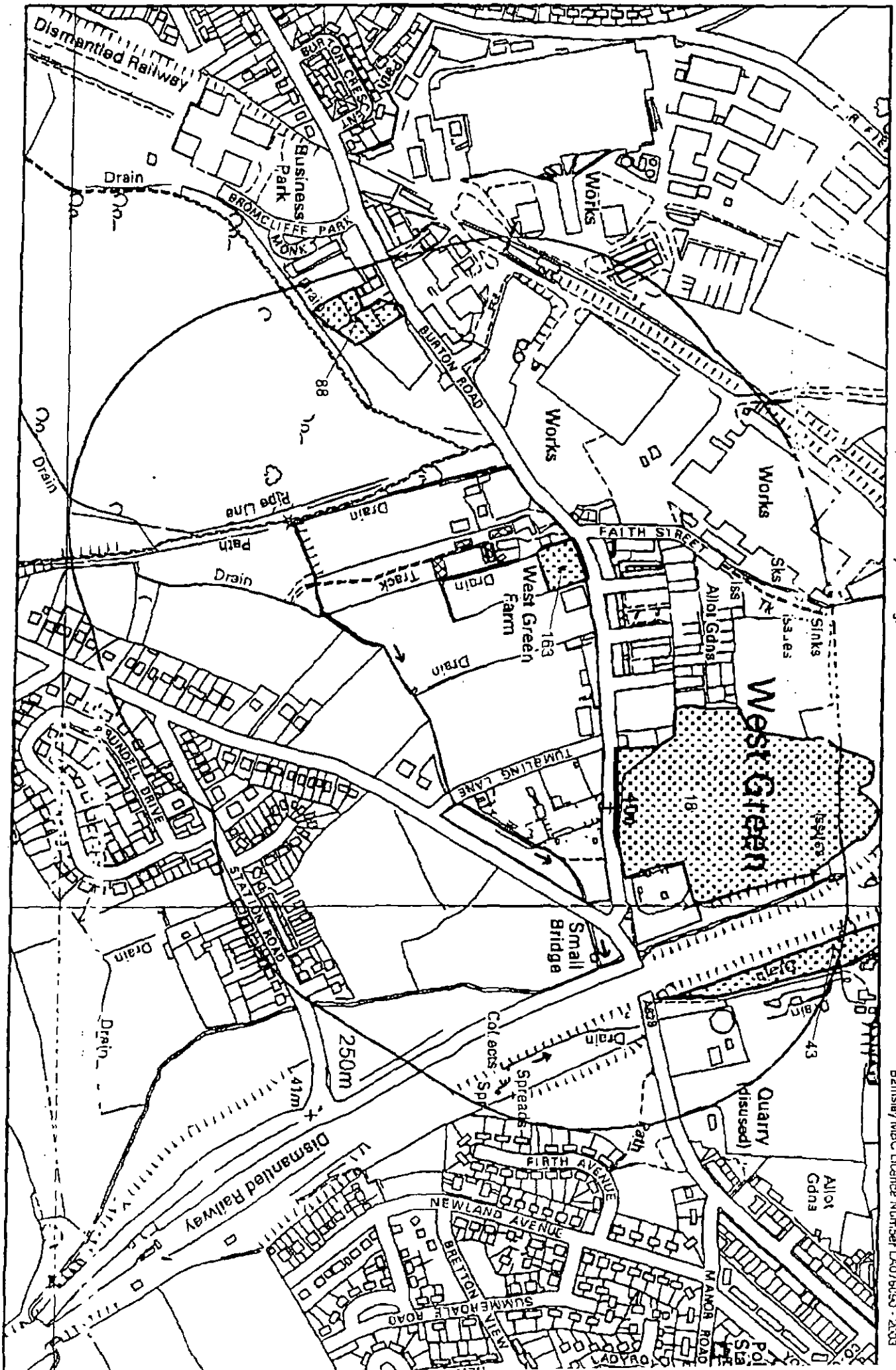
Yours faithfully,



John Scott
Contaminated Land Officer

Layout width 267mm

BARNSELEY MBC - Planning and Transportation Service
 Assistant Director: Ruth Middleton, BA(Hons), Surv, MRTPL
 Central Offices, Kendray Street, Barnsley S70 1JL
 Tel: 01226 775699



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Barnsley MBC Licence Number LA076050 - 2003

NORTH

APPENDIX D
TRIAL PIT LOGS

TRIAL PIT LOG

CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP1

DATE 17/11/2003

Co-ords

Sheet 1 of 1

Ground Level 42.8mAOD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.10		MADE GROUND: ? Medium dense damp greyish brown silty and sandy fine to coarse subangular to subrounded gravel of brick, sandstone, ash and clinker, rare wood, metal, rags and plastic. (RUBBLE/ASH)				
2D	0.50						
3D	0.80						
4D	1.50						
				1.90	40.90		
5D	2.10	V = 50 kPa	Firm moist orange brown CLAY (WEATHERED COAL MEASURES)				
6D	2.30						
			End of trial pit at 2.60 m	2.60	40.20		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit remained stable during excavation. 3. Groundwater was not apparent during excavation. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods				Logged by	JOB	FIGURE	
JCB 3CX with 0.6m wide tooth bucket.				JWH	5848		

TRIAL PIT LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP2

DATE 17/11/2003

Co-ords

Sheet 1 of 1

Ground Level 44.0m AOD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.10		MADE GROUND: ? Soft moist brown sandy clay with much gravel of brick and sandstone. (COHESIVE MADE GROUND)	0.20	43.80		
2D	0.30		MADE GROUND: ? Medium dense damp dark grey silty sand of ash, clinker, with rare glass and sandstone cobbles. (ASH & CLINKER)				
3D	0.80						
4D	1.70		Firm moist orange brown CLAY (WEATHERED COAL MEASURES)	1.60	42.40		
5D	2.00	V = 60 kPa					
			End of trial pit at 2.30 m	2.30	41.70		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit remained stable during excavation. 3. Groundwater was not apparent during excavation. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods				Logged by		JOB	FIGURE
JCB 3CX with 0.6m wide tooth bucket.				JWH		5848	

TRIAL PIT LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP3

DATE 17/11/2003

Co-ords

Sheet 1 of 1

Ground Level 43.6mAOD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.10		MADE GROUND: ? Dense damp silty and sandy fine to coarse subangular gravel, with broken brick, slate, some rare metal and plastic.	0.15	43.45		
2D	0.30		MADE GROUND: ? Dense damp dark grey sandy fine to coarse gravel of sandstone				
3D	0.50						
			Wood and metal at 0.75m	0.80	42.80		
4D	1.00		MADE GROUND: ? Firm moist orange brown clay with occasional gravel of mudstone.				
			Firm moist orange brown mottled grey CLAY	1.10	42.50		
5D	1.50	V = 65 kPa					
			Firm moist orange brown mottled grey CLAY with rare fine subangular gravel of mudstone and fibrous plant remains.	2.20	41.40		
			Moderately weak brown thinly laminaed MUDSTONE.	2.50	41.10		
			End of trial pit at 2.70 m	2.70	40.90		

Remarks

1. Prior to excavation a Cable Avoidance Tool survey was carried out.
2. The sides of the trial pit remained stable during excavation.
3. Groundwater encountered below 2.5m.
4. On completion the trial pit was backfilled with materials arising.
5. No visual or olfactory evidence of oil/fuel contamination

Equipment/Methods

JCB 3CX with 0.6m wide tooth bucket.

Logged by

JWH

JOB

5848

FIGURE

TRIAL PIT LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP4

DATE 17/11/2003

Co-ords

Sheet 1 of 1

Ground Level 43.0m AOD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.20		MADE GROUND: ? Medium dense greyish brown and dark grey sandy fine coarse gravel of sandstone, brick, occasional concrete, rare wood, glass and metal				
	0.60		Diesel odour between 0.05 and 0.5m				
3D	1.00		Firm moist orange brown CLAY	0.90	42.10		
4D	1.50	V = 60 kPa					
			Firm moist reddish brown mottled grey CLAY with rare fine subangular gravel of mudstone.	2.20	40.80		
			Firm moist orange brown mottled grey CLAY with much fine subangular gravel of mudstone	2.70	40.30		
			End of trial pit at 3.30 m	3.30	39.70		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit remained stable during excavation. 3. Groundwater was not apparent during excavation. 4. On completion the trial pit was backfilled with materials arising. 5. Visual and olfactory evidence of oil/fuel contamination between 0.05 and 0.5m.							
Equipment/Methods JCB 3CX with 0.6m wide tooth bucket.				Logged by JWH	JOB 5848	FIGURE	

TRIAL PIT LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP5

DATE 17/11/2003

Co-ords

Sheet 1 of 1

Ground Level 43.9mAOD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.10		MADE GROUND: ? Medium dense damp dark grey silty sand of ash, clinker, some occasional glass and broken brick				
2D	0.25		Firm moist grey CLAY with much fine to medium gravel of mudstone	0.30	43.55		
			Firm moist orange brown CLAY				
3D	0.80						
4D	1.20	V = 70 kPa					
				2.10	41.75		
			Moderately weak brown thinly laminated MUDSTONE.	2.20	41.65		
			End of trial pit at 2.50 m	2.50	41.35		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit remained stable during excavation. 3. Groundwater was not apparent during excavation. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods JCB 3CX with 0.6m wide tooth bucket.				Logged by JWH	JOB 5848	FIGURE	

TRIAL PIT LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP6

DATE 17/11/2003

Co-ords

Sheet 1 of 1

Ground Level 44.4m AOD

Scale 1:25

sample no & type	depth (m)	m-situ test	description	depth (m)	level (m)	ground water	legend
10	0.15		MADE GROUND: ? Medium dense damp dark grey silty sand of ash, clinker, some occasional glass and broken brick				
			Firm moist grey CLAY with much fine to medium gravel of mudstone	0.30	44.10		
20	1.10	V = 70 kPa					
			Moderately weak grey thinly laminated MUDSTONE.	1.90	42.50		
			End of trial pit at 2.50 m	2.50	41.90		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit remained stable during excavation. 3. Groundwater was not apparent during excavation. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods				Logged by	JOB	FIGURE	
JCB 3CX with 0.6m wide tooth bucket.				JWH	5848		

TRIAL PIT LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP7

DATE 17/11/2003

Co-ords

Sheet 1 of 1

Ground Level 43.8mAOD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.25		MADE GROUND: ? Medium dense damp dark grey silty sand of ash, clinker, some occasional glass and broken brick				
				0.50	43.30		
			MADE GROUND: ? Cemented Slag	0.60	43.20		
2D	0.80		Firm moist orange brown CLAY				
				0.90	42.90		
3D	1.30	V = 65 kPa	Firm moist grey CLAY with much fine to medium gravel of mudstone				
				2.20	41.60		
			Moderately weak grey thinly laminated MUDSTONE.				
				2.60	41.20		
			End of trial pit at 2.60 m				
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit remained stable during excavation. 3. Groundwater was not apparent during excavation. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods				Logged by		JOB	FIGURE
JCB 3CX with 0.6m wide tooth bucket.				JWH		5848	

TRIAL PIT LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

DATE 17/11/2003

Co-ords

TP8

Sheet 1 of 1

Ground Level 46.0mAOD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
10	0.10		MADE GROUND: ? Medium dense damp greyish brown silty sand with a little ash and clinker	0.15	45.85		
			Firm moist orange brown CLAY				
20	1.10	V = 55 kPa					
			Moderately weak grey thinly laminated MUDSTONE.	1.80	44.20		
			End of trial pit at 2.10 m	2.10	43.90		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit remained stable during excavation. 3. Groundwater was not apparent during excavation. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods				Logged by		JOB	FIGURE
JCB 3CX with 0.6m wide tooth bucket.				JWH		5848	

TRIAL PIT LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

DATE 18/11/2003

Co-ords

TP9

Sheet 1 of 1

Ground Level 42.2mAOD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.10		? Medium dense damp brown silty SAND with occasional subrounded to subangular fine gravel.	0.20	41.95		
			Firm moist orange brown CLAY SILE				
2D	1.00	V = 100 kPa					
3D	1.50			1.70	40.45		
			Firm moist grey CLAY with much fine to medium subangular gravel of mudstone	2.20	39.95		
			Moderately weak grey thinly laminated MUDSTONE.				
			End of trial pit at 3.20 m	3.20	38.95		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit remained stable during excavation. 3. Groundwater encountered below 2.3m. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods JCB 3CX with 0.6m wide tooth bucket.				Logged by JWH		JOB 5848	FIGURE

TRIAL PIT LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP10

DATE 18/11/2003

Co-ords

Sheet 1 of 1

Ground Level 42.0mAGD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.15	V = 50 kPa	MADE GROUND: ? Medium dense damp brown silty with occasional subrounded to subangular fine gravel and broken brick.				
			Firm moist orange brown CLAY	0.25	41.75		
			Firm moist orange brown mottled grey CLAY with thin laminations of coal.	0.70	41.30		
2D	1.20	V = 50 kPa					
			Moderately weak grey thinly laminated MUDSTONE.	1.90	40.10		
			Moderately weak brown thinly laminated MUDSTONE.	2.60	39.40		
			End of trial pit at 3.00 m	3.00	39.00		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit remained stable during excavation. 3. Groundwater encountered below 2.6m. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods				Logged by		JOB	FIGURE
JCB 3CX with 0.6m wide tooth bucket.				JWH		5848	

TRIAL PIT LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP11

DATE 18/11/2003

Co-ords

Sheet 1 of 1

Ground Level 42.6mAOD

Scale 1:25

sample no & type	depth (m)	In-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.20		MADE GROUND: ? Medium dense damp brown silty with occasional subrounded to subangular fine gravel and broken brick, gravel and wood sleeper				
			Firm moist orange brown CLAY	0.40	42.20		
2D	1.00						
		V = 60 kPa					
3D	1.50						
			Firm moist grey sandy CLAY with rare remains of plants.	1.70	40.90		
			Moderately weak grey thinly laminated MUDSTONE.	2.30	40.30		
			End of trial pit at 3.10 m	3.10	39.50		

Remarks

1. Prior to excavation a Cable Avoidance Tool survey was carried out.
2. The sides of the trial pit remained stable during excavation.
3. Groundwater encountered below 2.9m.
4. On completion the trial pit was backfilled with materials arising.
5. No visual or olfactory evidence of oil/fuel contamination

Equipment/Methods

JCB 3CX with 0.6m wide tooth bucket.

Logged by

JWH

JOB

5848

FIGURE

TRIAL PIT LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP12

DATE 18/11/2003

Co-ords

Sheet 1 of 1

Ground Level 43.2mAOD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.30		MADE GROUND: ? Medium dense damp brown silty with occasional subrounded to subangular fine gravel and broken brick.	0.10	43.10		
			MADE GROUND: ? Firm moist brown sandy clay with brick, metal, plastic and wood.				
			Firm becoming stiff dry orange brown CLAY	0.60	42.60		
2D	1.00						
		V = 80 kPa					
3D	1.50		Tree roots to 1.5m				
			Moderately weak grey thinly laminated MUDSTONE.	2.60	40.60		
			End of trial pit at 3.20 m	3.20	40.00		
<p>Remarks</p> <ol style="list-style-type: none"> 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit remained stable during excavation. 3. Groundwater was not apparent during excavation. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination 							
Equipment/Methods				Logged by		JOB	FIGURE
JCB 3CX with 0.6m wide tooth bucket.				JWH		5848	

TRIAL PIT LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP13

DATE 18/11/2003

Co-ords

Sheet 1 of 1

Ground Level 43.4mAOD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.50		MADE GROUND: ? Medium dense damp brown silty with occasional subrounded to subangular fine gravel and broken brick, plastic, pottery, wood and glass				
2D	1.10	V = 65 kPa	Firm moist orange brown CLAY	1.00	42.40		
3D	1.50						
			Moderately weak grey thinly laminated MUDSTONE.	2.30	41.10		
			End of trial pit at 3.30 m	3.30	40.10		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit remained stable during excavation. 3. Groundwater was not apparent during excavation. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods JCB 3CX with 0.6m wide tooth bucket.				Logged by JWH	JOB 5848	FIGURE	

TRIAL PIT LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP14

DATE 18/11/2003

Co-ords

Sheet 1 of 1

Ground Level 46.0mAOD

Scale 1:25

sample no & type	depth (m)	In-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.50		MADE GROUND: ? Loose damp brown fine silty sand with much brick, concrete, wood and rare rusted metal, glass, cloth and plastic.				
2D	1.50						
		V = 50 kPa	Firm moist orange mottled grey brown CLAY	3.00	43.00		
			End of trial pit at 3.30 m	3.30	42.70		

Remarks

1. Prior to excavation a Cable Avoidance Tool survey was carried out.
2. The sides of the trial pit were unstable during excavation.
3. Groundwater was not apparent during excavation.
4. On completion the trial pit was backfilled with materials arising.
5. No visual or olfactory evidence of oil/fuel contamination

Equipment/Methods

JCB 3CX with 0.6m wide tooth bucket.

Logged by

JWH

JOB

5848

FIGURE

TRIAL PIT LOG

CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP15

DATE 18/11/2003

Co-ords

Sheet 1 of 1

Ground Level 46.3mAOD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.50		MADE GROUND: ? Loose damp greyish brown fine sand with occasional brick, wood and rare rusted metal.				
2D	1.50						
3D	2.60		Firm moist orange mottled grey brown CLAY	2.50	43.80		
			End of trial pit at 3.00 m	3.00	43.30		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit were unstable during excavation. 3. Groundwater was not apparent during excavation. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods				Logged by		JOB	FIGURE
JCB 3CX with 0.6m wide tooth bucket.				JWH		5848	

TRIAL PIT LOG

CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP16

DATE 18/11/2003

Co-ords

Sheet 1 of 1

Ground Level 47.2mAOD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	1.00		MADE GROUND: ? Loose damp greyish brown silty sand with gravel of red shale, brick, concrete, wire mesh, some rare glass and plastic.				
2D	2.00		MADE GROUND: ? Loose dry brown fine sand.	1.80	45.40		
3D	3.20		Firm moist orange mottled grey brown CLAY	3.10	44.10		
			End of trial pit at 3.30 m	3.30	43.90		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit were unstable during excavation. 3. Groundwater was not apparent during excavation. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods JCB 3CX with 0.5m wide tooth bucket.				Logged by JWH	JOB 5848	FIGURE	

TRIAL PIT LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP17

DATE 18/11/2003

Co-ords

Sheet 1 of 1

Ground Level 42.3m AOD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.15		MADE GROUND: ? Medium dense damp brown silty with occasional subrounded to subangular fine gravel and broken brick.				
			Firm moist orange brown CLAY	0.30	42.00		
		V = 45 kPa					
		V = 50 kPa					
2D	1.30						
			Firm moist grey sandy CLAY with rare remains of plants.	2.00	40.30		
3D	2.20						
			Moderately weak grey thinly laminated MUDSTONE.	2.70	39.60		
			End of trial pit at 3.30 m	3.30	39.00		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit remained stable during excavation. 3. Groundwater was not apparent during excavation. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods JCB 3CX with 0.6m wide tooth bucket.				Logged by JWH	JOB 5848	FIGURE	

TRIAL PIT LOG

CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP18

DATE 18/11/2003

Co-ords

Sheet 1 of 1

Ground Level 41.4mAOD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.10		? Medium dense damp brown silty SAND with occasional subrounded to subangular fine gravel.	0.20	41.20		
			Firm moist orange brown CLAY				
		V = 55 kPa					
2D	1.20						
			Firm moist grey CLAY with some gravel of mudstone and rare remains of plants.	2.20	39.20		
			Moderately weak grey thinly laminated MUDSTONE.	2.60	38.80		
			End of trial pit at 3.00 m	3.00	38.40		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit remained stable during excavation. 3. Groundwater was not apparent during excavation. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods JCB 3CX with 0.6m wide tooth bucket.				Logged by JWH		JOB 5848	FIGURE

TRIAL PIT LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP19

DATE 18/11/2003

Co-ords

Sheet 1 of 1

Ground Level 42.1mAOD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
0	0.00		? Medium dense damp brown silty SAND with occasional subrounded to subangular fine gravel.	0.20	41.90		
			Firm becoming stiff moist orange brown CLAY				
		V = 90 kPa					
			Very weak thinly laminated COAL	1.20	40.90		
			Firm moist brown CLAY with much fine gravel of mudstone	1.50	40.60		
			Moderately weak grey thinly laminated MUDSTONE.	2.30	39.80		
			End of trial pit at 2.90 m	2.90	39.20		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit remained stable during excavation. 3. Groundwater was not apparent during excavation. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods JCB 3CX with 0.6m wide tooth bucket.				Logged by JWH		JOB 5848	FIGURE

EN CIA
CONSULTING LIMITED

TP20

Sheet 1 of 1

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.10		MADE GROUND: ? Medium dense damp brown silty sand with occasional subrounded to subangular fine gravel and with much ash and clinker	0.20	41.10		
2D	0.30		Firm becoming stiff moist orange brown CLAY				
		V = 75 kPa					
3D	1.20			1.50	39.80		
			? Very weak black carbonaceous MUDSTONE with traces of coal	1.80	39.50		
			Firm moist orange brown CLAY with much fine gravel of mudstone	2.10	39.20		
			Moderately weak grey thinly laminated MUDSTONE.				
			End of trial pit at 3.20 m	3.20	38.10		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit remained stable during excavation. 3. Groundwater was not apparent during excavation. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods JCB 3CX with 0.6m wide tooth bucket.				Logged by JWH	JOB 5848	FIGURE	

TRIAL PIT LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP21

DATE 19/11/2003

Co-ords

Sheet 1 of 1

Ground Level 40.4mAOD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.10		? Medium dense damp brown silty SAND with occasional subrounded to subangular fine gravel.	0.20	40.20		
			Firm becoming stiff moist orange brown CLAY				
		V = 70 kPa					
2D	1.20						
		V = 90 kPa					
			Firm moist orange brown CLAY with much fine gravel of mudstone	1.70	38.70		
			End of trial pit at 2.50 m	2.50	37.90		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit remained stable during excavation. 3. Groundwater was not apparent during excavation. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods JCB 3CX with 0.6m wide tooth bucket.				Logged by JWH	JOB 5848	FIGURE	

EN CIA
CONSULTING LIMITED

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Sheet 1 of 1

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.10		? Medium dense damp brown silty SAND with occasional subrounded to subangular fine gravel.	0.15	39.65		
			Firm becoming stiff moist orange brown CLAY				
2D	1.00	V = 65 kPa					
			Firm moist orange brown CLAY with much fine gravel of mudstone	1.30	38.50		
			End of trial pit at 2.90 m	2.90	36.90		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit remained stable during excavation. 3. Groundwater was not apparent during excavation. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods JCB 3CX with 0.6m wide tooth bucket.				Logged by JWH	JOB 5848	FIGURE	

TRIAL PIT LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP23

DATE 19/11/2003

Co-ords

Sheet 1 of 1

Ground Level 39.6mAOD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.10		? Medium dense damp brown silty SAND with occasional subrounded to subangular fine gravel.	0.15	39.45		
			Firm becoming stiff moist orange brown CLAY				
		V = 130 kPa					
2D	1.40						
			Firm moist orange brown CLAY with much fine gravel of mudstone	1.70	37.90		
			Moderately weak grey thinly laminated MUDSTONE.	2.70	36.90		
			End of trial pit at 3.20 m	3.20	36.40		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit remained stable during excavation. 3. Groundwater was not apparent during excavation. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods JCB 3CX with 0.6m wide tooth bucket.				Logged by JWH		JOB 5848	FIGURE

TRIAL PIT LOG

CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP24

DATE 19/11/2003

Co-ords

Sheet 1 of 1

Ground Level 40.4mAOD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.10		? Medium dense damp brown silty SAND with occasional subrounded to subangular fine gravel.	0.15	40.25		
			Firm moist orange brown CLAY with occasional gravel of sandstone.				
			Field drain at 0.4m				
			Sandstone boulder (0.1x0.4x0.3m) at 0.8				
2D	1.50						
				2.20	38.20		
			Firm moist grey CLAY with some gravel of mudstone and rare remains of plants.				
				2.70	37.70		
			? Moderately weak grey thinly laminated MUDSTONE with thin bands of sandstone				
				3.30	37.10		
			End of trial pit at 3.30 m				
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit remained stable during excavation. 3. Groundwater was not apparent during excavation. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods JCB 3CX with 0.6m wide looth bucket.				Logged by JWH	JOB 5848	FIGURE	

TRIAL PIT LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP25

DATE 19/11/2003

Co-ords

Sheet 1 of 1

Ground Level 41.0mAOD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.10		? Medium dense damp brown silty SAND with occasional subrounded to subangular fine gravel.	0.10	40.90		
			Firm moist orange brown CLAY with occasional gravel of sandstone.				
2D	1.00	V = 60 kPa					
			Firm moist grey CLAY with some gravel of mudstone.	1.50	39.50		
3D	1.70			1.90	39.10		
			? Moderately weak dark grey thinly laminated MUDSTONE				
			End of trial pit at 2.50 m	2.50	38.50		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit remained stable during excavation. 3. Groundwater was not apparent during excavation. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods JCB 3CX with 0.6m wide tooth bucket.				Logged by JWH		JOB 5848	FIGURE

TRIAL PIT LOG

CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP26

DATE 19/11/2003

Co-ords

Sheet 1 of 1

Ground Level 40.6mAOD

Scale 1:25

sample no & type	depth (m)	In-situ test	description	depth (m)	level (m)	ground water	legend
0	0.00		? Medium dense damp brown silty SAND with occasional subrounded to subangular fine gravel.				
			Firm moist orange brown CLAY	0.20	40.40		
		V = 60 kPa					
		V = 65 kPa					
			Soft to firm moist dark grey CLAYwith fine gravel of shale.	1.40	39.20		
			? Moderatley weak dark grey thinly laminated SHALE.	1.70	38.90		
			? Moderately weak dark grey thinly laminated MUDSTONE	2.30	38.30		
			End of trial pit at 2.50 m	2.50	38.10		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit were stable during excavation. 3. Groundwater was encountered below 2.3m. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods JCB 3CX with 0.6m wide tooth bucket.				Logged by JWH	JOB 5848	FIGURE	

TRIAL PIT LOG

CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP27

DATE 19/11/2003

Co-ords

Sheet 1 of 1

Ground Level 40.8mAOD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.05		? Medium dense damp brown silty SAND with occasional subrounded to subangular fine gravel.	0.10	40.70		
			Firm moist orange brown CLAY with occasional gravel of sandstone.				
2D	1.00	V = 55 kPa					
			Firm moist dark grey CLAY with fine gravel of mudstone.	1.40	39.40		
			? Moderately strong dark grey thinly laminated MUDSTONE	1.80	39.00		
			End of trial pit at 2.70 m	2.70	38.10		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit were stable during excavation. 3. Groundwater was encountered below 2.1m. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods JCB 3CX with 0.6m wide tooth bucket.				Logged by JWH		JOB 5848	FIGURE

TRIAL PIT LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

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DATE 19/11/2003

Co-ords

Sheet 1 of 1

Ground Level 41.6mAOD

Scale 1:25

sample no & type	depth (m)	In-situ test	description	depth (m)	level (m)	ground water	legend
0	0.00		? Medium dense damp brown silty SAND with occasional subrounded to subangular fine gravel.	0.20	41.40		
		V = 60 kPa	Firm moist orange brown CLAY with occasional gravel of sandstone.	1.30	40.30		
			Firm moist dark grey CLAY with fine gravel of mudstone.	2.20	39.40		
			? Moderately strong dark grey thinly laminated MUDSTONE	2.90	38.70		
			End of trial pit at 2.90 m				
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit were stable during excavation. 3. Groundwater was encountered below 2.5m. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods JCB 3CX with 0.6m wide tooth bucket.				Logged by JWH		JOB 5848	FIGURE

TRIAL PIT LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP29

DATE 19/11/2003

Co-ords

Sheet 1 of 1

Ground Level 41.6mAOD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	1.00	V = 55 kPa	? Medium dense damp brown silty SAND with occasional subrounded to subangular fine gravel.	0.20	41.40		
			Firm moist orange brown sandy CLAY with occasional fine to medium gravel of sandstone.				
			Firm moist dark grey CLAY with fine gravel of mudstone.	1.30	40.30		
			? Moderately strong dark grey thinly laminated MUDSTONE	1.90	39.70		
			End of trial pit at 2.70 m	2.70	38.90		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit were stable during excavation. 3. Groundwater was encountered below 2.3m. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods				Logged by		JOB	FIGURE
JCB 3CX with 0.6m wide tooth bucket.				JWH		5848	

TRIAL PIT LOG

CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP30

DATE 19/11/2003

Co-ords

Sheet 1 of 1

Ground Level 43.8mAOD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.20		MADE GROUND: ? Medium dense damp dark grey silty sand of ash, coal, metal, wood, some rare rubber, glass and plastic.				
2D	0.60		Firm becoming stiff moist orange brown CLAY	0.50	43.25		
3D	1.10	V = 90 kPa	Firm moist dark grey CLAY with fine gravel of mudstone.	1.40	42.35		
			? Moderately weak dark grey thinly laminated MUDSTONE	1.90	41.85		
			End of trial pit at 3.20 m	3.20	40.55		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit remained stable during excavation. 3. Groundwater was not apparent during excavation. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods JCB 3CX with 0.6m wide tooth bucket.				Logged by JWH	JOB 5848	FIGURE	

TRIAL PIT LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP31

DATE 19/11/2003

Co-ords

Sheet 1 of 1

Ground Level 43.3mAOD

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.50		MADE GROUND: ? Loose damp greyish brown silty sand with gravel of red shale, brick, concrete, wire mesh, some rare glass and plastic.				
2D	1.00						
			End of trial pit at 2.30 m	2.30	41.00		
<p>Remarks</p> <ol style="list-style-type: none"> 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit remained stable during excavation. 3. Groundwater was not apparent during excavation. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination 							
Equipment/Methods				Logged by		JOB	FIGURE
JCB 3CX with 0.6m wide tooth bucket.				JWH		5848	

TRIAL PIT LOG

CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

TP32

DATE 19/11/2003

Co-ords

Sheet 1 of 1

Ground Level 43.3mAOD

Scale 1:25

sample no & type	depth (m)	In-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.50		MADE GROUND: ? Loose damp greyish brown silty sand with gravel of red shale, brick, concrete, wire mesh, some rare glass and plastic.				
2D	1.00						
3D	1.70	V = 60 kPa	Firm moist orange brown CLAY	1.50	41.80		
			? Moderately weak dark grey thinly laminated MUDSTONE	2.70	40.60		
			End of trial pit at 3.20 m	3.20	40.10		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. The sides of the trial pit remained stable during excavation. 3. Groundwater was not apparent during excavation. 4. On completion the trial pit was backfilled with materials arising. 5. No visual or olfactory evidence of oil/fuel contamination							
Equipment/Methods JCB 3CX with 0.6m wide tooth bucket.				Logged by JWH	JOB 5848	FIGURE	

APPENDIX E
WINDOW SAMPLE LOGS

WINDOW SAMPLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

WS1

DATE 20 Nov 03

Co-ords

Sheet 1 of 1

Ground Level 44.7mAOD

Scale 1:50

sample no & type	depth (m)	In-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.15		MADE GROUND: ? Dense damp grey sandy fine to coarse subangular gravel.	0.10	44.60		
2D	0.25			0.20	44.50		
3D	0.50		MADE GROUND: ? Dense damp dark grey silty sand of ash and clinker	0.30	44.40		
			MADE GROUND: ? Soft moist grey clay with a little fine subangular gravel				
			? Firm moist orange brown CLAY with a little subangular gravel of mudstone.				
			? Moderately weak greyish brown thinly laminated MUDSTONE	1.70	43.00		
			End of window sample hole at 3.00 m	3.00	41.70		

Remarks

1. Prior to excavation a Cable Avoidance Tool survey was carried out.
2. Groundwater was not apparent during excavation.
3. On completion the window sample holelet was backfilled with materials arising.
4. Slight olfactory evidence of oil/fuel contamination between 0.0 and 0.2m.

Equipment/Methods

Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.

Logged by

JWH

JOB

5848

FIGURE

WINDOW SAMPLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

WS2

DATE 20 Nov 03

Co-ords

Sheet 1 of 1

Ground Level 45.1mAOD

Scale 1:50

sample no & type	depth (m)	In-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.15		MADE GROUND: ? Dense damp grey sandy fine to coarse subangular gravel.	0.30	44.80		
2D	0.40		? Firm moist orange brown CLAY with a little subangular gravel of mudstone.				
			? Moderately weak greyish brown thinly laminated MUDSTONE	2.00	43.10		
			End of window sample hole at 2.20 m	2.20	42.90		
Remarks 1. Prior to excavation a Cable Avoidance Tool survey was carried out. 2. Groundwater was not apparent during excavation. 3. On completion the window sample hole was backfilled with materials arising. 4. No visual or olfactory evidence of oil/fuel contamination.							
Equipment/Methods Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.				Logged by JWH		JOB 5848	FIGURE

WINDOW SAMPLE LOG

CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

WS3

DATE 20 Nov 03

Co-ords

Sheet 1 of 1

Ground Level 42.4mAOD

Scale 1:50

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1)	0.20-0.60		MADE GROUND: Reinforced concrete. (Hardstand)	0.20	42.20		
2D	0.60-1.00		MADE GROUND: Dark brown black sandy fine to coarse angular gravel. Gravel mostly fragments of stone, ash and clinker. (Ash & Clinker) Possible slight odour of hydrocarbons between 0.2 and 0.6m	0.60	41.80		
			Dense orange brown sandy fine to coarse angular gravel. Gravel mostly mudstone lithorelicts). (Weathered Mudstone)	1.00	41.40		
			Stiff orange brown and grey CLAY.	2.00	40.40		
			End of window sample hole at 2.00 m				
Remarks 1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. The concrete hardstand was cored using 100mm core barrel.							
Equipment/Methods Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.				Logged by	JOB	FIGURE	
				OGO	5848		

WINDOW SAMPLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

WS4

DATE 20 Nov 03

Co-ords

Sheet 1 of 1

Ground Level 42.6mAOD

Scale 1:50

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.20-0.60		MADE GROUND: Reinforced concrete. (Hardstand)	0.20	42.40		
2J	0.60-0.90		MADE GROUND: Grey brown sandy fine to coarse angular gravel. (Sub-base)	0.60	42.00		
3D	1.00-2.00		MADE GROUND: Dark brown black sandy fine to coarse angular gravel. Gravel mostly fragments of stone, ash and clinker. (Ash & Clinker) Possible slight odour of hydrocarbons between 0.6 and 0.9m	0.90 1.00	41.70 41.60		
			Stiff dark grey sandy CLAY.				
			Stiff orange brown and grey CLAY.	2.30	40.30		
			Dark grey and brown clayey fine to coarse angular gravel. Gravel mostly mudstone lithorelicts. (Weathered Mudstone)	2.90	39.70		
			End of window sample hole at 2.90 m				
Remarks 1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. The concrete hardstand was cored using 100mm core barrel.							
Equipment/Methods Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.				Logged by OGO	JOB 5848	FIGURE	

WINDOW SAMPLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

WS5

DATE 21 Nov 03

Co-ords

Sheet 1 of 1

Ground Level 41.4mAOD

Scale 1:50

sample no & type		depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.20-0.50			MADE GROUND: Reinforced concrete. (Hardstand)	0.20	41.20		
				MADE GROUND: Grey sandy fine to coarse angular gravel. (Sub-base)	0.40	41.00		
				MADE GROUND: Dark brown black sandy fine to coarse angular gravel. Gravel mostly fragments of stone, ash, clinker and brick. (Ash & Clinker)	0.50	40.90		
				MADE GROUND: Brown gravelly sand. Gravel mostly fine to medium stone and brick fragments. <i>End of window sample hole at 0.70 m</i>	0.70	40.70		
Remarks 1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. The concrete hardstand was cored using 100mm core barrel.								
Equipment/Methods Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.					Logged by OGO		JOB 5848	FIGURE

WINDOW SAMPLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

WS6

DATE 20 Nov 03

Co-ords

Sheet 1 of 1

Ground Level 40.8mAOD

Scale 1:50

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.20-0.50		MADE GROUND: Reinforced concrete. (Hardstand)	0.20	40.60		
2D	0.50-1.00		MADE GROUND: Pink grey sandy fine to coarse angular gravel. (Sub-base)	0.50	40.30		
			MADE GROUND: Dark brown black sandy fine to coarse angular gravel. Gravel mostly fragments of stone, ash, clinker and brick. (Ash & Clinker)	1.50	39.30		
			End of window sample hole at 1.50 m				
Remarks 1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. The concrete hardstand was cored using 100mm core barrel.							
Equipment/Methods Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.				Logged by	JOB	FIGURE	
				OGO	5848		

WINDOW SAMPLE LOG

CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

WS 7

DATE 20 Nov 03

Co-ords

Sheet 1 of 1

Ground Level 41.2mAOD

Scale 1:50

			Ground Level	41.2mAGL	Scale 1:50			
sample no & type	depth (m)	in-situ test	description		depth (m)	level (m)	ground water	legend
1D	0.60-1.50		MADE GROUND: Reinforced concrete. (Hardstand)		0.20	40.95		
			MADE GROUND: Pink grey sandy fine to coarse angular gravel. (Sub-base)		0.60	40.55		
	MADE GROUND: Dark brown black sandy fine to coarse angular gravel. Gravel mostly fragments of stone, ash, clinker and brick. (Ash & Clinker)		1.50	39.65				
	Stiff brown and grey CLAY.		2.00	39.15				
			End of window sample hole at 1.50 m					
Remarks								
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.								
2. The concrete hardstand was cored using 100mm core barrel.								
Equipment/Methods					Logged by	JOB	FIGURE	
Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.					OGO	5848		

WINDOW SAMPLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

WS9

DATE 21 Nov 03

Co-ords

Sheet 1 of 1

Ground Level 41.2mAOD

Scale 1:50

sample no & type	depth (m)	In-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.40-1.00		DE GROUND: Reinforced concrete. (rdstand)	0.20	41.00		
			DE GROUND: Grey brown sandy fine to coarse angular gravel. (sub-base)	0.40	40.80		
2D	1.0-2.00		DE GROUND: Dark brown black sandy fine to coarse angular gravel. Gravel mostly fragments of stone, ash, ker and brick. (ch & Clinker)	1.10	40.10		
			DE GROUND: Brown gravelly sand. Gravel mostly fine to medium stone and brick fragments.	2.00	39.20		
3D	2.00-3.00		Soft brown and grey CLAY.				
			End of window sample hole at 3.00 m	3.00	38.20		

- Remarks
- 1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
 - 2. The concrete hardstand was cored using 100mm core barrel.

Equipment/Methods Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.	Logged by OGO	JOB 5848	FIGURE
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WINDOW SAMPLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

WS10

DATE 21 Nov 03

Co-ords

Sheet 1 of 1

Ground Level

Scale 1:50

sample no & type	depth (m)	in-situ test	description		depth (m)	level (m)	ground water	legend
1D	0.40-1.00		M	DE GROUND: Reinforced concrete. (rdstand)	0.20			
			M	DE GROUND: Grey brown sandy fine to coarse angular gravel. (b-base)	0.40			
2D	1.10-2.00		M	DE GROUND: Dark brown black sandy fine to coarse angular gravel. Gravel mostly fragments of stone, ash, clinker and brick. (h & Clinker)	1.10			
3D	2.00-3.00		M	DE GROUND: Brown gravelly sand. Gravel mostly fine to medium stone and brick fragments.	2.00			
			S	f brown and grey CLAY.	2.00			
			End of window sample hole at 3.00 m		3.00			
Remarks								
1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. The concrete hardstand was cored using 100mm core barrel.								
Equipment/Methods Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.					Logged by OGO		JOB 5848	FIGURE

WINDOW SAMPLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

WS11

DATE 21 Nov 03

Co-ords

Sheet 1 of 1

Ground Level 40.4mAOD

Scale 1:50

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.20-0.80		MADE GROUND: Reinforced concrete. (Hardstand)	0.20	40.20		
			MADE GROUND: Dark brown black sandy fine to coarse angular gravel. Gravel mostly fragments of stone, ash, clinker and brick with occasional metal, timber, plastic, rubber and glass fragments. (Ash & Clinker)	0.80	39.60		
			End of window sample hole at 0.80 m				

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. The concrete hardstand was cored using 100mm core barrel.

Equipment/Methods

Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.

Logged by

OGO

JOB

5848

FIGURE

WINDOW SAMPLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

WS12

DATE 21 Nov 03

Co-ords

Sheet 1 of 1

Ground Level 40.1mAOD

Scale 1:50

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.20-0.50		MADE GROUND: Reinforced concrete. (Hardstand)	0.20	39.90		
2D	0.50-1.20		MADE GROUND: Dark brown black sandy fine to coarse angular gravel. Gravel mostly fragments of stone, ash, clinker and brick. (Ash & Clinker)	0.50	39.60		
			MADE GROUND: Brown sandy fine to coarse angular to subrounded gravel. Gravel mostly stone with trace coal. End of window sample hole at 1.20 m	1.20	38.90		

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. The concrete hardstand was cored using 100mm core barrel.

Equipment/Methods

Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.

Logged by

OGO

JOB

5848

FIGURE

WINDOW SAMPLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

WS13

DATE 20 Nov 03

Co-ords

Sheet 1 of 1

Ground Level 40.1mAOD

Scale 1:50

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.20-0.50		MADE GROUND: Reinforced concrete. (Hardstand)	0.20	39.90		
2D	0.50-1.00		MADE GROUND: Grey sandy fine to coarse angular gravel. (Sub-base)	0.50	39.60		
3D	1.00-1.30		MADE GROUND: Brown very sandy fine to coarse angular to subrounded gravel. Gravel is mostly stone with some ash and clinker.	1.00	39.10		
			MADE GROUND: Dark brown black sandy fine to coarse angular gravel. Gravel mostly fragments of stone, ash, clinker and brick with occasional metal fragments. <i>End of window sample hole at 1.30 m</i>	1.30	38.80		

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. The concrete hardstand was cored using 100mm core barrel.

Equipment/Methods

Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.

Logged by

OGO

JOB

5848

FIGURE

WINDOW SAMPLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

WS14

DATE 21 Nov 03

Co-ords

Sheet 1 of 1

Ground Level 40.6mAOD

Scale 1:50

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.40-0.80		MADE GROUND: Reinforced concrete. (Hardstand)	0.20	40.40		
			MADE GROUND: Grey sandy fine to coarse angular gravel. (Sub-base)	0.40	40.20		
			MADE GROUND: Brown and dark brown sandy fine to coarse angular gravel. Gravel mostly fragments of stone with some ash, clinker and brick. End of window sample hole at 0.80 m	0.80	39.80		

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. The concrete hardstand was cored using 100mm core barrel.

Equipment/Methods

Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.

Logged by

OGO

JOB

5848

FIGURE

WINDOW SAMPLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

WS15

DATE 20 Nov 03

Co-ords

Sheet 1 of 1

Ground Level 40.9mAOD

Scale 1:50

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1D	0.50-1.00		MADE GROUND: Reinforced concrete. (Hardstand)	0.20	40.70		
			MADE GROUND: Pink grey sandy fine to coarse angular gravel. (Sub-base)	0.50	40.40		
			MADE GROUND: Dark brown black sandy fine to coarse angular gravel. Gravel mostly fragments of stone, ash, clinker and brick.	1.00	39.90		
			No Sample Recovery				
			Stiff brown grey CLAY.	2.20	38.70		
			End of window sample hole at 3.00 m	3.00	37.90		

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. The concrete hardstand was cored using 100mm core barrel.

Equipment/Methods

Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.

Logged by

OGO

JOB

5848

FIGURE

WINDOW SAMPLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

DATE 21 Nov 03

Co-ords

WS16

Sheet 1 of 1

Ground Level 41.9mAOD

Scale 1:50

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1J	0.15-0.50		M DE GROUND: Tarmac. (rdstand)	0.15	41.75		
2J	0.50-1.40		M DE GROUND: Brown very sandy fine to coarse angular to s rounded gravel. Gravel is mostly stone with some ash a clinker.	0.50	41.40		
3	1.40-2.70		M DE GROUND: Orange brown sandy fine to coarse angular t rounded gravel. Gravel mostly stone with occasional c ker.	1.40	40.50		
			S f dark grey sandy CLAY	1.90	40.00		
			S f orange brown and grey CLAY	2.70	39.20		
			End of window sample hole at 2.70 m				

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. The concrete hardstand was cored using 100mm core barrel.

Equipment/Methods

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

Logged by

OGO

JOB

5848

FIGURE

WINDOW SAMPLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

WS101

DATE 12 Jan 04

Co-ords

Sheet 1 of 1

Ground Level

Scale 1:50

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1J	0.20-0.90		MADE GROUND: Reinforced concrete hardstand.	0.20			
			MADE GROUND: Brown black sandy fine to coarse angular gravel of ash and clinker with some brick. (ASH & CLINKER) 0.2-0.9m: Some visual and olfactory evidence of hydrocarbon contamination.	0.90			
2J	1.10-1.50		Brown sandy CLAY with some fine to coarse angular to subrounded gravel				
			Brown sandy fine to coarse angular and subrounded GRAVEL.	2.90			
			End of window sample hole at 3.30 m	3.30			

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. Groundwater was not apparent during drilling.
3. Window sample refused penetration at 3.3m.
4. Piezometer pipe installed from GL to 3.0m, response zone from 1.5m.

Equipment/Methods

Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.

Logged by

JOB

FIGURE

OGO

5848

WINDOW SAMPLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

WS102

DATE 12 Jan 04

Co-ords

Sheet 1 of 1

Ground Level

Scale 1:50

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1J	0.50-1.00		MADE GROUND: Reinforced concrete hardstand.	0.20			
			MADE GROUND: Brown black sandy fine to coarse angular gravel of ash and clinker with some brick. (ASH & CLINKER)	1.00			
2J	1.00-2.00		Brown sandy CLAY with some fine to coarse angular to subrounded gravel	1.50			
			Brown sandy CLAY.	2.40			
			End of window sample hole at 2.40 m				

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. Groundwater was not apparent during drilling.
3. Window sample refused penetration at 2.4m

Equipment/Methods

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

Logged by

OGO

JOB

5848

FIGURE

WINDOW SAMPLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

WS103

DATE 12 Jan 04

Co-ords

Sheet 1 of 1

Ground Level

Scale 1:50

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1)	0.40-0.70		MADE GROUND: Reinforced concrete hardstand.	0.20			
			MADE GROUND: Brown black sandy fine to coarse angular gravel of ash and clinker with some brick. (ASH & CLINKER) 0.2-0.7m: Slight to moderate odour of diesel.	0.70			
2.	1.50-2.00		MADE GROUND: Pale grey sandy fine to coarse angular gravel. (WEAK MIX CONCRETE)				
			Brown sandy CLAY.	1.70			
			End of window sample hole at 2.00 m	2.00			

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. Groundwater was not apparent during drilling.

Equipment/Methods

Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.

Logged by

JOB

FIGURE

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CONSULTING LIMITED

WS104

Sheet 1 of 1

Scale 1:50

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1J	0.50-0.90		MADE GROUND: Reinforced concrete hardstand.				
			MADE GROUND: Brown black sandy fine to coarse angular gravel of ash and clinker with some brick. (ASH & CLINKER)	0.20			
			End of window sample hole at 0.90 m	0.90			
<p>Remarks</p> <p>1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.</p> <p>2. Groundwater was not apparent during drilling.</p> <p>3. Window sample refused penetration at 0.9m</p>							
<p>Equipment/Methods</p> <p>Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.</p>				<p>Logged by</p> <p>OGO</p>		<p>JOB</p> <p>5848</p>	<p>FIGURE</p>

WINDOW SAMPLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

WS105

DATE 12 Jan 04

Co-ords

Sheet 1 of 1

Ground Level

Scale 1:50

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
13	0.20-0.80		<p>MADE GROUND: Reinforced concrete hardstand.</p> <p>MADE GROUND: Brown black sandy fine to coarse angular gravel of ash and clinker with some brick. (ASH & CLINKER) 0.2-0.4m: Irrescent staining indicating possible hydrocarbon contamination; no odour detected.</p> <p>MADE GROUND: Pale grey sandy fine to coarse angular gravel. (WEAK MIX CONCRETE)</p> <p>MADE GROUND: Brown black sandy fine to coarse angular gravel of ash and clinker with some brick.</p> <p>End of window sample hole at 0.80 m</p>	0.20 0.40 0.60 0.80			
<p>Remarks</p> <p>1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.</p> <p>2. Groundwater was not apparent during drilling.</p> <p>3. Window sample refused penetration at 0.8m</p>							
<p>Equipment/Methods</p> <p>Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.</p>				Logged by	JOB	FIGURE	
				OGO	5848		

WINDOW SAMPLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

WS106

DATE 12 Jan 04

Co-ords

Sheet 1 of 1

Ground Level

Scale 1:50

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1J	0.20-0.70		MADE GROUND: Reinforced concrete hardstand.	0.20			
			MADE GROUND: Brown black sandy fine to coarse angular gravel of ash and clinker with some brick. (ASH & CLINKER)	0.70			
			End of window sample hole at 0.70 m				

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. Groundwater was not apparent during drilling.
3. Window sample refused penetration at 0.7m

Equipment/Methods

Window sample hole advanced by percussive methods using 120mm and 90mm sampling rods.

Logged by

OGO

JOB

5848

FIGURE

WINDOW SAMPLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

WS107

DATE 12 Jan 04

Co-ords

Sheet 1 of 1

Ground Level

Scale 1:50

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
1)	0.50-1.50		MADE GROUND: Reinforced concrete hardstand.	0.20			
			MADE GROUND: grey sandy fine to coarse angular gravel. (SUB-BASE)	0.50			
			MADE GROUND: Brown sandy gravel with fragments of brick and stone.				
2)	1.80-3.10			1.80			
			Grey brown sandy CLAY with some fine to coarse angular gravel.				
			Black completely weathered dusty COAL.	2.90			
			Grey brown sandy CLAY with some fine to coarse angular gravel.	3.00			
			End of window sample hole at 3.10 m	3.10			

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. Groundwater was not apparent during drilling.
3. Window sample refused penetration at 3.1m
4. Piezometer pipe installed from GL to 3.0m, response zone from 1.5m.

Equipment/Methods

Window sample hole advanced by percussive methods using 120mm and 50mm sampling rods.

Logged by

OGO

JOB

5848

FIGURE

APPENDIX F
PROBEHOLE LOGS

PROBEHOLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

PH1

DATE 21/11/2003 to

Co-ords -

Sheet 1 of 1

21/11/2003

Ground Level -

Scale 1:100

sample no & type	depth (m)	casing depth (m)	well/ backfill	description	depth (m)	level (m)	ground water	legend
				MADE GROUND: Brown sandy gravel fill				
				Grey MUDSTONE	3.10			
				COAL with bands of mudstone	8.80			
				Grey MUDSTONE	9.90			
				End of probehole at 11.00 m	11.00			

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. Groundwater was encountered below 5m.
3. Gas monitoring well installed.

Equipment/Methods

Solmec 400 tracked drilling rig equipped with 100mm tri-cone bit and air flush.

Logged by

JWH

JOB

5848

FIGURE

PROBEHOLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

PH2

DATE 21/11/2003 to

Co-ords -

Sheet 1 of 2

21/11/2003

Ground Level -

Scale 1:100

sample no & type	depth (m)	casing depth (m)	well/ backfill	description	depth (m)	level (m)	ground water	legend
				MADE GROUND: Brown sandy gravel fill				
				Grey MUDSTONE	2.20			
				COAL with bands of mudstone	8.50			
				Grey MUDSTONE	9.70			
Continued on next sheet								

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. Groundwater was encountered below 5m.

Equipment/Methods

Solmec 400 tracked drilling rig equipped with 100mm tri-cone bit and air flush.

Logged by

JWH

JOB

5848

FIGURE

PROBEHOLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

PH2

DATE 21/11/2003 to

Co-ords -

Sheet 2 of 2

21/11/2003

Ground Level -

Scale 1:100

sample no & type	depth (m)	casing depth (m)	well/ backfill	description	depth (m)	level (m)	ground water	legend
				Grey MUDSTONE				
					25.30			
				Brown SANDSTONE with bands of siltstone				
					30.00			
				End of probehole at 30.00 m				

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. Groundwater was encountered below 5m.

Equipment/Methods
Soimec 400 tracked drilling rig equipped with 100mm tri-cone bit and air flush.

Logged by

JWH

JOB

5848

FIGURE

PROBEHOLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

PH3

DATE 21/11/2003 to

Co-ords -

Sheet 1 of 1

21/11/2003

Ground Level -

Scale 1:100

sample no & type	depth (m)	casing depth (m)	well/ backfill	description	depth (m)	level (m)	ground water	legend
				MADE GROUND: Brown sandy gravel fill				
				Brown MUDSTONE	1.20			
				Grey MUDSTONE	3.10			
				COAL with bands of mudstone	3.30			
				Grey MUDSTONE	4.70			
				End of probehole at 10.00 m	10.00			

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. Groundwater was encountered below 5m.

Equipment/Methods

Solmec 400 tracked drilling rig equipped with 100mm tri-cone bit and air flush.

Logged by

JWH

JOB

5848

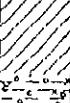
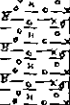
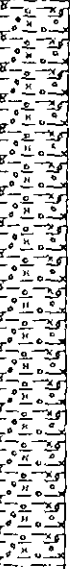
FIGURE

EN CIA
CONSULTING LIMITED

PH4

Sheet 1 of 1

Scale 1:100

sample no & type	depth (m)	casing depth (m)	well/ backfill	description	depth (m)	level (m)	ground water	legend
				Brown CLAY				
				Brown MUDDSTONE	1.40			
				Grey MUDDSTONE.	2.60			
				End of probehole at 10.00 m	10.00			
Remarks 1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was encountered below 5m.								
Equipment/Methods Solmec 400 tracked drilling rig equipped with 100mm tri-cone bit and air flush.					Logged by JWH		JOB 5848	FIGURE

PROBEHOLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

PH5

DATE 21/11/2003 to

Co-ords -

Sheet 1 of 1

21/11/2003

Ground Level -

Scale 1:100

sample no & type	depth (m)	casing depth (m)	well/ backfill	description	depth (m)	level (m)	ground water	legend
				Brown CLAY				
				Brown MUDSTONE	2.30			
				Grey MUDSTONE with some bands of sandstone.	4.70			
				End of probehole at 10.00 m	10.00			

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out.
2. Groundwater was not encountered.
3. Gas monitoring well installed.

Equipment/Methods

Solmec 400 tracked drilling rig equipped with 100mm tri-cone bit and air flush.

Logged by

JWH

JOB

5848

FIGURE

PROBEHOLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

PH6

DATE 21/11/2003 to

Co-ords -

Sheet 1 of 1

21/11/2003

Ground Level -

Scale 1:100

sample no & type	depth (m)	casing depth (m)	well/ backfill	description	depth (m)	level (m)	ground water	legend
				MADE GROUND: Brown sandy gravel fill				
				Grey SANDSTONE	2.30			
				End of probehole at 10.00 m	10.00			
Remarks 1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was encountered below 5m.								
Equipment/Methods Solmec 400 tracked drilling rig equipped with 100mm tri-cone bit and air flush.					Logged by	JOB	FIGURE	
					JWH	5848		

PROBEHOLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

PH7

DATE 21/11/2003 to

Co-ords -

Sheet 1 of 1

21/11/2003

Ground Level -

Scale 1:100

sample no & type	depth (m)	casing depth (m)	well/ backfill	description	depth (m)	level (m)	ground water	legend
				Brown CLAY				
				Brown MUDSTONE	1.90			
				COAL with bands of mudstone	2.50			
				Grey MUDSTONE	4.00			
				End of probehole at 10.00 m	10.00			
Remarks 1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not encountered. 3. Gas monitoring well installed.								
Equipment/Methods Solmec 400 tracked drilling rig equipped with 100mm tri-cone bit and air flush.					Logged by	JOB	FIGURE	
					JWH	5848		

PROBEHOLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

PH8

DATE 21/11/2003 to

Co-ords -

Sheet 1 of 1

21/11/2003

Ground Level -

Scale 1:100

sample no & type	depth (m)	casing depth (m)	well/ backfill	description	depth (m)	level (m)	ground water	legend
				Brown CLAY				
				Grey MUDSTONE	2.00			
				End of probehole at 10.00 m	10.00			
Remarks 1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not encountered. 3. Gas monitoring well installed.								
Equipment/Methods Solmec 400 tracked drilling rig equipped with 100mm tri-cone bit and air flush.					Logged by JWH	JOB 5848	FIGURE	

PROBEHOLE LOG



CLIENT Ben Bailey Homes Limited

SITE Burton Road, Barnsley

PH9

DATE 21/11/2003 to

Co-ords -

Sheet 1 of 1

21/11/2003

Ground Level -

Scale 1:100

sample no & type	depth (m)	casing depth (m)	well/ backfill	description	depth (m)	level (m)	ground water	legend
				Brown CLAY				
				Brown MUDSTONE	1.60			
				COAL with bands of mudstone	5.20			
				Grey MUDSTONE	5.60			
				End of probehole at 10.00 m	10.00			
Remarks 1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not encountered.								
Equipment/Methods Solmec 400 tracked drilling rig equipped with 100mm tri-cone bit and air flush.					Logged by	JOB	FIGURE	
					JWH	5848		

APPENDIX G
CHEMICAL LABORATORY RESULTS

18528

RECEIVED 02 JAN 200

Templeborough House, Mill Close,
Rotherham, S60 1B2
Tel: (01709) 841096
Fax: (01709) 841079
customer.services@alcontrol.co.uk

Certificate ID : 49464487/S/0/1

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

23rd December 2003

Dear Sir/Madam

Site??

What did schedule/order state?

Please find enclosed the test reports for the samples received on 9th December 2003.

The samples were given Lab numbers 49464487 - 49464545. Please quote these numbers should you have any queries about the enclosed test reports. Also enclosed are brief descriptions of the techniques employed to analyse these samples.

Where appropriate, liquid samples are retained for 10 working days from the report date, soils are kept for 20 working days. After that date the samples will be discarded.

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

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

Yours sincerely,

J. Mearns

Customer Services



Environmental Laboratory - Templeborough House
Accredited Test Procedures

<u>Method Ref.</u>	<u>Technique</u>
R2.3.2	Colorimetric
R2.4.2	Colorimetric
R2.5.1	Colorimetric
R2.7.3	Colorimetric
R2.8.2	Colorimetric
R2.21.2	Colorimetric
R3.2	Titrimetric
R3.3	Electrochemical
R3.4.1/A	Ion selective electrode
R3.5.1	Ion selective electrode
R3.6	Ion selective electrode
R3.7.1	Gravimetric
R3.8	Gravimetric
R4.1	Titrimetric
R5.1	Electrochemical (dissolved oxygen probe)
R5.2	Dichromate oxidation / colorimetric
R5.5	Ion chromatography
R6.13.2	Colorimetric
R7.2	Infra-red spectrometry
R7.4.1	Gravimetric
R7.7	Gas chromatography - mass spectrometry
R7.9	Gas chromatography - mass spectrometry
R7.12.1	Chemical oxidation / infra-red spectrometry
R7.22	Gas chromatography - flame ionisation detector
R7.25	Gas chromatography - flame ionisation detector
R7.30	Gas chromatography - mass spectrometry
R7.40	Gas chromatography - mass spectrometry
R8B	Inductively coupled plasma
R9A	Atomic fluorescence spectrometry
R9B	Atomic fluorescence spectrometry
R11.1	Gravimetric
R11.2	Gravimetric
R11.3	Gravimetric
R11.7	Gravimetric
R12.1	Respiration inhibition
R12.2.1a	Nitrification inhibition
R12.3	Microtox



ALcontrol Laboratories

Certificate of Analysis

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Bradford Laboratory: George Street, Bradford. BD1 5PZ.

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Encia Group Ltd
Encia House
Audby Lane
Wetherby
LS22 7RD

Receipt Date: 09/12/03

Report Date: 23/12/03

Water Analysis

Laboratory Number			49464487	49464488	49464489	49464490
Sampling Date			12/04/03	12/04/03	12/04/03	12/04/03
Sample Point			WS1 1D 0.15	WS1 3D 0.50	WS2 1D 0.20	WS3 1D 0.20-0.60
Method Code	Units	Determinands				
R3.6	-	pH (soil)				
R11.3	%	Solids air dried	86.7	85.5	88.9	89.1
R11.1	%	Total Solids				
R11.1	%	Total Ash Solids (DSB)				
R11.7	%	Stones greater than 10mm	51.7	0	0	43.9
R3.6	-	pH (filtered)				
R2.5.1	mg/kg	Cyanide (total) (DSB)				
R*	kJ/kg	Calorific value				
R2.21.2	mg/kg	Phenol monohydric (DSB)				
R*	mg/kg	Sulphide (DSB)				
R9B	ug/l	Arsenic (leach)				
R8B	mg/l	Cadmium (leach)				
R8B	mg/l	Chromium (leach)				
R8B	mg/l	Lead (leach)				
R9A	ug/l	Mercury (leach)				
R9B	ug/l	Selenium (Leach)				
R8B	mg/l	Copper (leach)				
R8B	mg/l	Nickel (leach)				
R8B	mg/l	Zinc (leach)				
R8B	mg/l	Boron (leach)				
R8B	mg/kg	Arsenic (soil)				
R8B	mg/kg	Cadmium (soil)				
R8B	mg/kg	Chromium (soil)				
R8B	mg/kg	Lead (soil)				
R8B	mg/kg	Mercury (soil)				
R8B	mg/kg	Selenium (soil)				
R8B	mg/kg	Copper (soil)				
R8B	mg/kg	Nickel (soil)				
R*8B	mg/kg	Zinc (soil)				
R8B	mg/kg	Boron (soil)				
R7.25	mg/kg	Total Petroleum hydro-c	299	116	236	7580
R7.25	mg/kg	Diesel Range Organics	233	116	108	3460
R7.25	mg/kg	Lubricating Range Org	66.4	< 20.0	128	4120
R*	mg/kg	Gasoline Range Organics				< 5.0
R*	mg/kg	Sulphur (Elemental) (DSB)				
R7.22	mg/kg	PAH Total				
*\$	p/a	Asbestos fibres				

Asbestos Fibres Key

0-No asbestos detected

1-Chrysotile (white asbestos)

2-Amosite (brown asbestos)

3-Crocidolite (blue asbestos)

4-Chrysotile and Amosite

5-Chrysotile and Crocidolite

Steve Scott, Operations Manager

Ref: N4487-45-5845375 Page 1 of 15

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LS22 7RD

Receipt Date: 09/12/03

Report Date: 23/12/03

Water Analysis

Laboratory Number			49464491	49464492	49464493
Sampling Date			12/04/03	12/04/03	12/04/03
Sample Point			WS3 2D 0.60-1.00	WS4 2J 0.60-0.90	WS4 3D 1.00-2.00
Method Code	Units	Determinands			
R3.6	-	pH (soil)	7.8	10.5	
R11.3	%	Solids air dried	89.8	93.7	83.9
R11.1	%	Total Solids	87.5	90.8	
R11.1	%	Total Ash Solids (DSB)	94.4	80.8	
R11.7	%	Stones greater than 10mm	54.4	44.4	0
R3.6	-	pH (filtered)	7	7.1	
R2.5.1	mg/kg	Cyanide (total) (DSB)	< 0.50		
R*	kJ/kg	Calorific value	< 100	2600	
R2.21.2	mg/kg	Phenol monohydric (DSB)	< 1.50		
R*	mg/kg	Sulphide (DSB)	1.7		
R9B	ug/l	Arsenic (leach)	< 0.8	< 0.8	
R8B	mg/l	Cadmium (leach)	< 0.0002	< 0.0002	
R8B	mg/l	Chromium (leach)	< 0.002	< 0.002	
R8B	mg/l	Lead (leach)	< 0.005	< 0.005	
R9A	ug/l	Mercury (leach)	0.1	< 0.05	
R9B	ug/l	Selenium (Leach)	< 0.8	0.8	
R8B	mg/l	Copper (leach)	0.004	0.002	
R8B	mg/l	Nickel (leach)	< 0.005	< 0.005	
R8B	mg/l	Zinc (leach)	< 0.01	< 0.01	
R8B	mg/l	Boron (leach)	< 0.05	0.08	
R8B	mg/kg	Arsenic (soil)	10	4.84	
R8B	mg/kg	Cadmium (soil)	0.35	1.77	
R8B	mg/kg	Chromium (soil)	35	64.7	
R8B	mg/kg	Lead (soil)	40.4	278	
R8B	mg/kg	Mercury (soil)	0.12	1.55	
R8B	mg/kg	Selenium (soil)	0.85	1.99	
R8B	mg/kg	Copper (soil)	25.3	36.6	
R8B	mg/kg	Nickel (soil)	41.8	21.7	
R*8B	mg/kg	Zinc (soil)	119	118	
R8B	mg/kg	Boron (soil)	< 100	< 100	
R7.25	mg/kg	Total Petroleum hydro-c	198	6500	92.3
R7.25	mg/kg	Diesel Range Organics	108	2650	26.6
R7.25	mg/kg	Lubricating Range Org	90.3	3850	65.7
R*	mg/kg	Gasoline Range Organics	< 5.0	< 5.0	< 5.0
R*	mg/kg	Sulphur (Elemental) (DSB)	< 500		
R7.22	mg/kg	PAH Total	36.8		
*\$	p/a	Asbestos fibres	0		

Asbestos Fibres Key

- 0-No asbestos detected
- 1-Chrysotile (white asbestos)
- 2-Amosite (brown asbestos)
- 3-Crocidolite (blue asbestos)
- 4-Chrysotile and Amosite
- 5-Chrysotile and Crocidolite

Steve Scoll, Operations Manager

Ref: N4487 45 5845376 Page 2 of 16

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Encia House
Audby Lane
Wetherby
LS22 7RD

Receipt Date: 09/12/03

Report Date: 23/12/03

Water Analysis

Laboratory Number			49464494	49464495	49464496
Sampling Date			12/04/03	12/04/03	12/04/03
Sample Point			WS16 1J 0.15-0.50	WS16 2J 0.40-1.40	WS6 2D 0.50-1.00
Method Code	Units	Determinands			
R3.6	-	pH (soil)			11.8
R11.3	%	Solids air dried	92.8	91.1	92.7
R11.1	%	Total Solids			92.8
R11.1	%	Total Ash Solids (DSB)			94.5
R11.7	%	Stones greater than 10mm	57.6	23.6	23.5
R3.6	-	pH (filtered)			8.2
R2.5.1	mg/kg	Cyanide(total) (DSB)			
R*	kJ/kg	Calorific value			1890
R2.21.2	mg/kg	Phenol monohydric (DSB)			
R*	mg/kg	Sulphide (DSB)			
R9B	ug/l	Arsenic (leach)			< 0.8
R8B	mg/l	Cadmium(leach)			< 0.0002
R8B	mg/l	Chromium(leach)			< 0.002
R8B	mg/l	Lead(leach)			< 0.005
R9A	ug/l	Mercury (leach)			< 0.05
R9B	ug/l	Selenium (Leach)			< 0.8
R8B	mg/l	Copper(leach)			< 0.002
R8B	mg/l	Nickel(leach)			< 0.005
R8B	mg/l	Zinc (leach)			< 0.01
R8B	mg/l	Boron (leach)			< 0.05
R8B	mg/kg	Arsenic (soil)			2.73
R8B	mg/kg	Cadmium (soil)			0.35
R8B	mg/kg	Chromium (soil)			199
R8B	mg/kg	Lead (soil)			326
R8B	mg/kg	Mercury (soil)			0.15
R8B	mg/kg	Selenium (soil)			1.17
R8B	mg/kg	Copper (soil)			8.82
R8B	mg/kg	Nickel (soil)			13.3
R*8B	mg/kg	Zinc (soil)			150
R8B	mg/kg	Boron (soil)			< 100
R7.25	mg/kg	Total Petroleum hydro-c	2240	1280	1740
R7.25	mg/kg	Diesel Range Organics	385	757	< 20.0
R7.25	mg/kg	Lubricating Range Org	1850	520	1740
R*	mg/kg	Gasoline Range Organics	< 5.0	< 5.0	< 5.0
R*	mg/kg	Sulphur (Elemental) (DSB)			
R7.22	mg/kg	PAH Total			
*\$	p/a	Asbestos fibres			

Asbestos Fibres Key

- 0-No asbestos detected
- 1-Chrysotile (white asbestos)
- 2-Amosite (brown asbestos)
- 3-Crocidolite (blue asbestos)
- 4-Chrysotile and Amosite
- 5-Chrysotile and Crocidolite

Steve Scott, Operations Manager

Ref: N4487.45 5845375 Page 3 of 15

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Encia House
Audby Lane
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Receipt Date: 09/12/03

Report Date: 23/12/03

Water Analysis

Laboratory Number			49464497	49464498	49464499
Sampling Date			12/04/03	12/04/03	12/04/03
Sample Point			WS7 1D 0.60-1.50	WS8 1D 0.20-1.00	WS8 2J 2.00-2.50
Method Code	Units	Determinands			
R3.6	-	pH (soil)		9.3	
R11.3	%	Solids air dried	85	91.4	83.9
R11.1	%	Total Solids		85.9	
R11.1	%	Total Ash Solids (DSB)		94.5	
R11.7	%	Stones greater than 10mm	32.3	70.4	69.6
R3.6	-	pH (filtered)		7.1	
R2.5.1	mg/kg	Cyanide(total) (DSB)			
R*	kJ/kg	Calorific value		954	
R2.21.2	mg/kg	Phenol monohydric (DSB)			
R*	mg/kg	Sulphide (DSB)			
R9B	ug/l	Arsenic (leach)		< 0.8	
R8B	mg/l	Cadmium(leach)		0.0003	
R8B	mg/l	Chromium(leach)		< 0.002	
R8B	mg/l	Lead(leach)		< 0.005	
R9A	ug/l	Mercury (leach)		< 0.05	
R9B	ug/l	Selenium (Leach)		< 0.8	
R8B	mg/l	Copper(leach)		0.025	
R8B	mg/l	Nickel(leach)		0.134	
R8B	mg/l	Zinc (leach)		< 0.01	
R8B	mg/l	Boron (leach)		0.18	
R8B	mg/kg	Arsenic (soil)		28.4	
R8B	mg/kg	Cadmium (soil)		9.09	
R8B	mg/kg	Chromium (soil)		128	
R8B	mg/kg	Lead (soil)		1320	
R8B	mg/kg	Mercury (soil)		0.54	
R8B	mg/kg	Selenium (soil)		4.98	
R8B	mg/kg	Copper (soil)		414	
R8B	mg/kg	Nickel (soil)		196	
R*8B	mg/kg	Zinc (soil)		1010	
R8B	mg/kg	Boron (soil)		< 100	
R7.25	mg/kg	Total Petroleum hydro-c	2300	3640	5550
R7.25	mg/kg	Diesel Range Organics	546	1620	3240
R7.25	mg/kg	Lubricating Range Org	1750	2020	2310
R*	mg/kg	Gasoline Range Organics	< 5.0	< 5.0	< 5.0
R*	mg/kg	Sulphur (Elemental) (DSB)			
R7.22	mg/kg	PAH Total			
*\$	p/a	Asbestos fibres			

Asbestos Fibres Key

0-No asbestos detected

1-Chrysotile (white asbestos)

2-Amosite (brown asbestos)

3-Crocidolite (blue asbestos)

4-Chrysotile and Amosite

5-Chrysotile and Crocidolite

[Signature]

Steve Scott, Operations Manager

Ref: N4487-45-5845375 Page 4 of 15

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Receipt Date: 09/12/03

Report Date: 23/12/03

Water Analysis

Laboratory Number			49464500	49464501	49464502
Sampling Date			12/04/03	12/04/03	12/04/03
Sample Point			WS11 1D 0.20-0.80	WS12 1D 0.20-0.60	WS12 2D 0.50-1.20
Method Code	Units	Determinands			
R3.6	-	pH (soil)	8.8		9.4
R11.3	%	Solids air dried	88.2	90.7	91
R11.1	%	Total Solids			
R11.1	%	Total Ash Solids (DSB)			
R11.7	%	Stones greater than 10mm	46.6	53.7	62.1
R3.6	-	pH (filtered)	7.3		
R2.5.1	mg/kg	Cyanide(total) (DSB)	9.3		
R*	kJ/kg	Calorific value			
R2.21.2	mg/kg	Phenol monohydric (DSB)	< 1.50		
R*	mg/kg	Sulphide (DSB)	14.5		
R9B	ug/l	Arsenic (leach)	1.3		
R8B	mg/l	Cadmium(leach)	< 0.0002		
R8B	mg/l	Chromium(leach)	< 0.002		
R8B	mg/l	Lead(leach)	< 0.005		
R9A	ug/l	Mercury (leach)	< 0.05		
R9B	ug/l	Selenium (Leach)	< 0.8		
R8B	mg/l	Copper(leach)	< 0.002		
R8B	mg/l	Nickel(leach)	< 0.005		
R8B	mg/l	Zinc (leach)	< 0.01		
R8B	mg/l	Boron (leach)	0.39		
R8B	mg/kg	Arsenic (soil)	52.6		3.96
R8B	mg/kg	Cadmium (soil)	4.9		0.21
R8B	mg/kg	Chromium (soil)	155		10
R8B	mg/kg	Lead (soil)	1350		24.9
R8B	mg/kg	Mercury (soil)	1.98		0.27
R8B	mg/kg	Selenium (soil)	2.99		< 0.40
R8B	mg/kg	Copper (soil)	453		11.5
R8B	mg/kg	Nickel (soil)	164		15.3
R*8B	mg/kg	Zinc (soil)	1240		55.2
R8B	mg/kg	Boron (soil)	< 100		< 100
R7.25	mg/kg	Total Petroleum hydro-c	16200	340	297
R7.25	mg/kg	Diesel Range Organics	10300	216	180
R7.25	mg/kg	Lubricating Range Org	5920	124	117
R*	mg/kg	Gasoline Range Organics	< 5.0	< 5.0	
R*	mg/kg	Sulphur (Elemental) (DSB)	< 500		
R7.22	mg/kg	PAH Total	90.3		
*\$	p/a	Asbestos fibres	0		

Asbestos Fibres Key

0-No asbestos detected

1-Chrysotile (white asbestos)

2-Amosite (brown asbestos)

3-Crocidolite (blue asbestos)

4-Chrysotile and Amosite

5-Chrysotile and Crocidolite

Steve Scott, Operations Manager

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Receipt Date: 09/12/03

Report Date: 23/12/03

Water Analysis

Laboratory Number			49464503	49464504	49464505
Sampling Date			12/04/03	12/04/03	12/04/03
Sample Point			WS13 2D 0.50-1.00	WS14 1D 0.40-0.80	WS5 1D 0.20-0.50
Method Code	Units	Determinands			
R3.6	-	pH (soil)		10.4	10.3
R11.3	%	Solids air dried	89.6	87.7	94.3
R11.1	%	Total Solids			92.1
R11.1	%	Total Ash Solids (DSB)			90.5
R11.7	%	Stones greater than 10mm	44.1	44.1	25.5
R3.6	-	pH (filtered)		9.3	7.4
R2.5.1	mg/kg	Cyanide(total) (DSB)			
R*	kJ/kg	Calorific value			3190
R2.21.2	mg/kg	Phenol monohydric (DSB)			
R*	mg/kg	Sulphide (DSB)			
R9B	ug/l	Arsenic (leach)		12.6	2.5
R8B	mg/l	Cadmium(leach)		< 0.0002	< 0.0002
R8B	mg/l	Chromium(leach)		< 0.002	< 0.002
R8B	mg/l	Lead(leach)		< 0.005	< 0.005
R9A	ug/l	Mercury (leach)		0.08	< 0.05
R9B	ug/l	Selenium (Leach)		< 0.8	< 0.8
R8B	mg/l	Copper(leach)		0.029	0.003
R8B	mg/l	Nickel(leach)		0.007	< 0.005
R8B	mg/l	Zinc (leach)		< 0.01	< 0.01
R8B	mg/l	Boron (leach)		0.14	0.08
R8B	mg/kg	Arsenic (soil)		24.8	26.2
R8B	mg/kg	Cadmium (soil)		3.48	1.93
R8B	mg/kg	Chromium (soil)		59	46.9
R8B	mg/kg	Lead (soil)		382	318
R8B	mg/kg	Mercury (soil)		1.73	0.86
R8B	mg/kg	Selenium (soil)		1.47	2.14
R8B	mg/kg	Copper (soil)		418	63.9
R8B	mg/kg	Nickel (soil)		49.4	39.9
R*8B	mg/kg	Zinc (soil)		470	167
R8B	mg/kg	Boron (soil)		< 100	< 100
R7.25	mg/kg	Total Petroleum hydro-c	206	3330	13500
R7.25	mg/kg	Diesel Range Organics	133	1660	8670
R7.25	mg/kg	Lubricating Range Org	72.7	1670	4810
R*	mg/kg	Gasoline Range Organics	< 5.0	< 5.0	< 5.0
R*	mg/kg	Sulphur (Elemental) (DSB)			
R7.22	mg/kg	PAH Total			
*\$	p/a	Asbestos fibres			

Asbestos Fibres Key

- 0-No asbestos detected
- 1-Chrysotile (white asbestos)
- 2-Amosite (brown asbestos)
- 3-Crocidolite (blue asbestos)
- 4-Chrysotile and Amosite
- 5-Chrysotile and Crocidolite

[Signature]

Steve Scott, Operations Manager

Ref: N4487-45-5845375 Page 6 of 15

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Encia House
Audby Lane
Wetherby
LS22 7RD

Receipt Date: 09/12/03

Report Date: 23/12/03

Water Analysis

Laboratory Number			49464506	49464507	49464508	49464509
Sampling Date			12/04/03	12/04/03	12/04/03	12/04/03
Sample Point			WS9 1D 0.40-1.00	WS10 1D 0.20-0.50	WS15 1D 0.50-1.00	TP1 1D 0.10
Method Code	Units	Determinands				
R3.6	-	pH (soil)			9.7	
R11.3	%	Solids air dried	92	89.1	91.6	88.2
R11.1	%	Total Solids				
R11.1	%	Total Ash Solids (DSB)				
R11.7	%	Stones greater than 10mm	40.5	42.5	33.3	48.6
R3.6	-	pH (filtered)			7.3	
R2.5.1	mg/kg	Cyanide(total) (DSB)				
R*	kJ/kg	Calorific value				
R2.21.2	mg/kg	Phenol monohydric (DSB)				
R*	mg/kg	Sulphide (DSB)				
R9B	ug/l	Arsenic (leach)			1.2	
R8B	mg/l	Cadmium(leach)			< 0.0002	
R8B	mg/l	Chromium(leach)			< 0.002	
R8B	mg/l	Lead(leach)			< 0.005	
R9A	ug/l	Mercury (leach)			< 0.05	
R9B	ug/l	Selenium (Leach)			1.3	
R8B	mg/l	Copper(leach)			< 0.002	
R8B	mg/l	Nickel(leach)			< 0.005	
R8B	mg/l	Zinc (leach)			< 0.01	
R8B	mg/l	Boron (leach)			0.09	
R8B	mg/kg	Arsenic (soil)			7.45	
R8B	mg/kg	Cadmium (soil)			0.21	
R8B	mg/kg	Chromium (soil)			12.9	
R8B	mg/kg	Lead (soil)			31.9	
R8B	mg/kg	Mercury (soil)			0.14	
R8B	mg/kg	Selenium (soil)			0.68	
R8B	mg/kg	Copper (soil)			11.8	
R8B	mg/kg	Nickel (soil)			20.5	
R*8B	mg/kg	Zinc (soil)			61.7	
R8B	mg/kg	Boron (soil)			< 100	
R7.25	mg/kg	Total Petroleum hydro-c	5060	3080	574	774
R7.25	mg/kg	Diesel Range Organics	1660	1300	75.4	272
R7.25	mg/kg	Lubricating Range Org	3400	1780	499	502
R*	mg/kg	Gasoline Range Organics	< 5.0	< 5.0	< 5.0	
R*	mg/kg	Sulphur (Elemental) (DSB)				
R7.22	mg/kg	PAH Total				
*\$	p/a	Asbestos fibres				

Asbestos Fibres Key

0-No asbestos detected

1-Chrysotile (white asbestos)

2-Amosite (brown asbestos)

3-Crocidolite (blue asbestos)

4-Chrysotile and Amosite

5-Chrysotile and Crocidolite

Steve Scott, Operations Manager

Ref: N4487-45 5845375 Page 7 of 15

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Bradford Laboratory: George Street, Bradford. BD1 5PZ.

Telephone: 0845 1 200 400 Fax: 01709 841079 E-Mail: customer.services@alcontrol.co.uk

Encia Group Ltd

Encia House

Audby Lane

Wetherby

LS22 7RD

Receipt Date: 09/12/03

Report Date: 23/12/03

Water Analysis

Laboratory Number			49464510	49464511	49464512	49464513	49464514
Sampling Date			12/04/03	12/04/03	12/04/03	12/04/03	12/04/03
Sample Point			TP3 1D 0.10	TP4 1D 0.20	TP4 2D 0.60	TP6 1D 0.15	TP7 1D 0.25
Method Code	Units	Determinands					
R3.6	-	pH (soil)	8.6	8.4	8.2	8.7	8.7
R11.3	%	Solids air dried	91.2	86.3	86.6	89.1	89.7
R11.1	%	Total Solids				85.8	83.3
R11.1	%	Total Ash Solids (DSB)				86.7	79.1
R11.7	%	Stones greater than 10mm	62.7	34.7	47.9	56.1	52.8
R3.6	-	pH (filtered)	7.4	7.5		7.6	7.4
R2.5.1	mg/kg	Cyanide (total) (DSB)	< 0.50	< 0.50			< 0.50
R*	kJ/kg	Calorific value				3970	6930
R2.21.2	mg/kg	Phenol monohydric (DSB)	< 1.50	< 1.50			< 1.50
R*	mg/kg	Sulphide (DSB)	7.6	17.6			67.8
R9B	ug/l	Arsenic (leach)	1.6	< 0.8		1.3	1.4
R8B	mg/l	Cadmium (leach)	< 0.0002	< 0.0002		< 0.0002	< 0.0002
R8B	mg/l	Chromium (leach)	0.002	< 0.002		0.007	0.002
R8B	mg/l	Lead (leach)	< 0.005	< 0.005		< 0.005	< 0.005
R9A	ug/l	Mercury (leach)	< 0.05	< 0.05		< 0.05	< 0.05
R9B	ug/l	Selenium (Leach)	< 0.8	< 0.8		< 0.8	< 0.8
R8B	mg/l	Copper (leach)	0.005	0.002		0.005	0.009
R8B	mg/l	Nickel (leach)	< 0.005	< 0.005		< 0.005	< 0.005
R8B	mg/l	Zinc (leach)	< 0.01	< 0.01		< 0.01	< 0.01
R8B	mg/l	Boron (leach)	0.06	0.07		0.05	< 0.05
R8B	mg/kg	Arsenic (soil)	20.5	18.8	15.5	29.4	23.8
R8B	mg/kg	Cadmium (soil)	1.92	1.06	0.87	4.8	2.18
R8B	mg/kg	Chromium (soil)	53.6	33.6	23.2	150	72.7
R8B	mg/kg	Lead (soil)	200	183	129	815	270
R8B	mg/kg	Mercury (soil)	0.21	0.29	0.45	0.24	0.24
R8B	mg/kg	Selenium (soil)	1.03	1.18	0.55	1.39	1.87
R8B	mg/kg	Copper (soil)	185	120	70.9	523	302
R8B	mg/kg	Nickel (soil)	44.7	30.2	26.6	68.1	53.6
R*8B	mg/kg	Zinc (soil)	467	330	291	2090	507
R8B	mg/kg	Boron (soil)	< 100	< 100	< 100	< 100	< 100
R7.25	mg/kg	Total Petroleum hydro-c	729	5640	1030	1080	426
R7.25	mg/kg	Diesel Range Organics	298	5180	847	503	368
R7.25	mg/kg	Lubricating Range Org	431	462	187	580	57.5
R*	mg/kg	Gasoline Range Organics					
R*	mg/kg	Sulphur (Elemental) (DSB)	< 500	510			< 500
R7.22	mg/kg	PAH Total	51.9	19.2			23.7
*\$	p/a	Asbestos fibres	0				0

Asbestos Fibres Key

0-No asbestos detected

1-Chrysotile (white asbestos)

2-Amosite (brown asbestos)

3-Crocidolite (blue asbestos)

4-Chrysotile and Amosite

5-Chrysotile and Crocidolite

Steve Scott, Operations Manager

Ref: N4487-45 5845375 Page 8 of 15

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Telephone: 0845 1 200 400 Fax: 01709 841079 E-Mail: customer.services@alcontrol.co.uk

Encia Group Ltd

Encia House

Audby Lane

Wetherby

LS22 7RD

Receipt Date: 09/12/03

Report Date: 23/12/03

Water Analysis

Laboratory Number			49464515	49464516	49464517	49464518
Sampling Date			12/04/03	12/04/03	12/04/03	12/04/03
Sample Point			TP8 1D 0.10	TP30 1D 0.20	TP32 1D 0.50	WS1 2D 0.25
Method Code	Units	Determinands				
R3.6	-	pH (soil)	10	8.5	8.6	8
R11.3	%	Solids air dried	78.9	87.9	90.4	82.2
R11.1	%	Total Solids		82.4	84.5	
R11.1	%	Total Ash Solids (DSB)		80.5	88.6	
R11.7	%	Stones greater than 10mm	40.5	49.2	58.4	29.3
R2.6	-	pH (filtered)	7.2	7.2	7.5	7.2
R2.5.1	mg/kg	Cyanide(total) (DSB)			< 0.50	
R*	kJ/kg	Calorific value		5780	1500	
R2.21.2	mg/kg	Phenol monohydric (DSB)			< 1.50	
R*	mg/kg	Sulphide (DSB)			26.5	
R9B	ug/l	Arsenic (leach)	2.2	< 0.8	< 0.8	0.9
R8B	mg/l	Cadmium(leach)	< 0.0002	< 0.0002	< 0.0002	< 0.0002
R8B	mg/l	Chromium(leach)	0.004	< 0.002	< 0.002	< 0.002
R8B	mg/l	Lead(leach)	< 0.005	< 0.005	< 0.005	< 0.005
R9A	ug/l	Mercury (leach)	< 0.05	< 0.05	< 0.05	< 0.05
R9B	ug/l	Selenium (Leach)	< 0.8	< 0.8	< 0.8	< 0.8
R8B	mg/l	Copper(leach)	0.011	0.004	0.004	< 0.002
R8B	mg/l	Nickel(leach)	< 0.005	< 0.005	< 0.005	< 0.005
R8B	mg/l	Zinc (leach)	< 0.01	< 0.01	< 0.01	< 0.01
R8B	mg/l	Boron (leach)	< 0.05	0.06	0.09	< 0.05
R8B	mg/kg	Arsenic (soil)	16.4	28.5	11.5	13.9
R8B	mg/kg	Cadmium (soil)	2.65	6.02	2.88	0.58
R8B	mg/kg	Chromium (soil)	584	140	34.5	20.9
R8B	mg/kg	Lead (soil)	542	1360	557	75.8
R8B	mg/kg	Mercury (soil)	0.79	0.24	0.17	0.12
R8B	mg/kg	Selenium (soil)	1.89	1.75	1.12	0.59
R8B	mg/kg	Copper (soil)	204	672	265	36.8
R8B	mg/kg	Nickel (soil)	46.5	72.1	30.1	18.8
R*8B	mg/kg	Zinc (soil)	1090	3280	794	173
R8B	mg/kg	Boron (soil)	< 100	< 100	< 100	< 100
R7.25	mg/kg	Total Petroleum hydro-c	15700	4920	5560	
R7.25	mg/kg	Diesel Range Organics	6040	2170	3040	
R7.25	mg/kg	Lubricating Range Org	9640	2750	2520	
R*	mg/kg	Gasoline Range Organics				
R*	mg/kg	Sulphur (Elemental) (DSB)			< 500	
R7.22	mg/kg	PAH Total			197	
*\$	p/a	Asbestos fibres			0	

Asbestos Fibres Key

0-No asbestos detected

1-Chrysotile (white asbestos)

2-Amosite (brown asbestos)

3-Crocidolite (blue asbestos)

4-Chrysotile and Amosite

5-Chrysotile and Crocidolite

Steve Scott, Operations Manager

Ref: N4487.45 5845375 Page 9 of 15

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ALcontrol Laboratories

Certificate of Analysis

Rotherham Laboratory: Templeborough House, Mill Close, Rotherham. S60 1BZ.
Bradford Laboratory: George Street, Bradford. BD1 5PZ
Telephone: 0845 1 200 400 Fax: 01709 841079 E-Mail: customer.services@alcontrol.co.uk

Encia Group Ltd
Encia House
Audby Lane
Wetherby
LS22 7RD

Receipt Date: 09/12/03
Report Date: 23/12/03

Water Analysis

Laboratory Number			49464519	49464520	49464521	49464522
Sampling Date			12/04/03	12/04/03	12/04/03	12/04/03
Sample Point			WS7 2D 1.50-2.00	WS9 2D 1.10-2.00	WS13 2D 0.20-0.50	TP1 2D 0.50
Method Code	Units	Determinands				
R3.6	-	pH (soil)	7.6	9	11.1	7.9
R11.3	%	Solids air dried	84.8	85.7	89.5	82
R11.1	%	Total Solids	83.9	85.4		82.5
R11.1	%	Total Ash Solids (DSB)	95.1	95.1		85.9
R11.7	%	Stones greater than 10mm	0	6.2	62.5	29.8
R3.6	-	pH (filtered)	8	7.8	11.1	8.8
R2.5.1	mg/kg	Cyanide (total) (DSB)				< 0.50
R*	kJ/kg	Calorific value	< 100	< 100		9620
R2.21.2	mg/kg	Phenol monohydric (DSB)				< 1.50
R*	mg/kg	Sulphide (DSB)				4.5
R9B	ug/l	Arsenic (leach)	< 0.8	< 0.8	< 0.8	< 0.8
R8B	mg/l	Cadmium (leach)	< 0.0002	< 0.0002	< 0.0002	< 0.0002
R8B	mg/l	Chromium (leach)	< 0.002	< 0.002	0.002	< 0.002
R8B	mg/l	Lead (leach)	< 0.005	< 0.005	< 0.005	< 0.005
R9A	ug/l	Mercury (leach)	< 0.05	< 0.05	< 0.05	< 0.05
R9B	ug/l	Selenium (Leach)	< 0.8	< 0.8	< 0.8	< 0.8
R8B	mg/l	Copper (leach)	< 0.002	< 0.002	0.003	0.003
R8B	mg/l	Nickel (leach)	< 0.005	< 0.005	< 0.005	< 0.005
R8B	mg/l	Zinc (leach)	< 0.01	< 0.01	< 0.01	< 0.01
R8B	mg/l	Boron (leach)	< 0.05	< 0.05	< 0.05	0.08
R8B	mg/kg	Arsenic (soil)	4.57	7.36	3.91	27.7
R8B	mg/kg	Cadmium (soil)	0.23	0.31	0.42	0.71
R8B	mg/kg	Chromium (soil)	22	30.3	15	30.5
R8B	mg/kg	Lead (soil)	12.1	37.3	28.7	109
R8B	mg/kg	Mercury (soil)	0.12	0.14	0.18	0.19
R8B	mg/kg	Selenium (soil)	< 0.40	0.49	< 0.40	0.85
R8B	mg/kg	Copper (soil)	14.8	18.2	13.3	144
R8B	mg/kg	Nickel (soil)	31.6	24.5	11.8	39.3
R*8B	mg/kg	Zinc (soil)	48.7	51.6	36.2	171
R8B	mg/kg	Boron (soil)	< 100	< 100	< 100	< 100
R7.25	mg/kg	Total Petroleum hydro-c				
R7.25	mg/kg	Diesel Range Organics				
R7.25	mg/kg	Lubricating Range Org				
R*	mg/kg	Gasoline Range Organics				
R*	mg/kg	Sulphur (Elemental) (DSB)				< 500
R7.22	mg/kg	PAH Total				39
*\$	p/a	Asbestos fibres				0

Asbestos Fibres Key

- 0-No asbestos detected
- 1-Chrysotile (white asbestos)
- 2-Amosite (brown asbestos)
- 3-Crocidolite (blue asbestos)
- 4-Chrysotile and Amosite
- 5-Chrysotile and Crocidolite

[Signature]

Steve Scott, Operations Manager

Ref: N4487-46-5846375 Page 10 of 15

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Telephone: 0845 1 200 400 Fax: 01709 841079 E-Mail: customer.services@alcontrol.co.uk

Encia Group Ltd
Encia House
Audby Lane
Wetherby
LS22 7RD

Receipt Date: 09/12/03
Report Date: 23/12/03

Water Analysis

			Laboratory Number	49464523	49464524	49464525	49464526	49464527
			Sampling Date	12/04/03	12/04/03	12/04/03	12/04/03	12/04/03
			Sample Point	TP1 4D 1.50	TP2 2D 0.30	TP2 3D 0.80	TP3 3D 0.50	TP5 1D 0.10
Method Code	Units	Determinands						
R3.6	-	pH (soil)		8.3	7.6	7.4	8.1	7.7
R11.3	%	Solids air dried		88.1	81.5	84	89.1	86.9
R11.1	%	Total Solids		86.8	80.6	78.8		80.4
R11.1	%	Total Ash Solids (DSB)		95.6	81.3	76		83.1
R11.7	%	Stones greater than 10mm		0	13.6	39.1	41.6	39.5
R3.6	-	pH (filtered)		7.3	6.8			7.3
R2.5.1	mg/kg	Cyanide(total) (DSB)		< 0.50	< 0.50			< 0.50
R*	kJ/kg	Calorific value		< 100	12800	9490		4860
R2.21.2	mg/kg	Phenol monohydric (DSB)		< 1.50	< 1.50			< 1.50
R*	mg/kg	Sulphide (DSB)		< 1.0	6.1			5.9
R9B	ug/l	Arsenic (leach)		< 0.8	< 0.8			< 0.8
R8B	mg/l	Cadmium(leach)		< 0.0002	< 0.0002			< 0.0002
R8B	mg/l	Chromium(leach)		< 0.002	< 0.002			0.004
R8B	mg/l	Lead(leach)		< 0.005	< 0.005			< 0.005
R9A	ug/l	Mercury (leach)		< 0.05	< 0.05			< 0.05
R9B	ug/l	Selenium (Leach)		1	0.9			< 0.8
R8B	mg/l	Copper(leach)		< 0.002	< 0.002			< 0.002
R8B	mg/l	Nickel(leach)		< 0.005	< 0.005			< 0.005
R8B	mg/l	Zinc (leach)		< 0.01	< 0.01			< 0.01
R8B	mg/l	Boron (leach)		< 0.05	0.07			< 0.05
R8B	mg/kg	Arsenic (soil)		7.26	43.9	47.5	35.2	25.2
R8B	mg/kg	Cadmium (soil)		0.08	0.52	0.41	1.49	6.41
R8B	mg/kg	Chromium (soil)		15.6	29.2	34.9	40.8	159
R8B	mg/kg	Lead (soil)		11	82	86.8	247	1100
R8B	mg/kg	Mercury (soil)		0.14	0.29	0.21	0.19	0.16
R8B	mg/kg	Selenium (soil)		< 0.40	1.74	1.8	1.33	1.94
R8B	mg/kg	Copper (soil)		19	168	210	197	404
R8B	mg/kg	Nickel (soil)		16.5	57.9	61	50.5	80.3
R*8B	mg/kg	Zinc (soil)		31.1	105	130	551	5270
R8B	mg/kg	Boron (soil)		< 100	< 100	< 100	< 100	< 100
R7.25	mg/kg	Total Petroleum hydro-c						
R7.25	mg/kg	Diesel Range Organics						
R7.25	mg/kg	Lubricating Range Org						
R*	mg/kg	Gasoline Range Organics						
R*	mg/kg	Sulphur (Elemental) (DSB)		< 500	< 500			< 500
R7.22	mg/kg	PAH Total		< 5.00	39.9			< 5.00
*\$	p/a	Asbestos fibres		0				0

Asbestos Fibres Key

- 0-No asbestos detected
- 1-Chrysotile (white asbestos)
- 2-Amosite (brown asbestos)
- 3-Crocidolite (blue asbestos)
- 4-Chrysotile and Amosite
- 5-Chrysotile and Crocidolite

[Signature]

Steve Scott, Operations Manager

Ref: N4487-45 5845375 Page 11 of 15

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Encia Group Ltd

Encia House

Audby Lane

Wetherby

LS22 7RD

Receipt Date: 09/12/03

Report Date: 23/12/03

Water Analysis

Laboratory Number			49464528	49464529	49464530	49464531	49464532
Sampling Date			12/04/03	12/04/03	12/04/03	12/04/03	12/04/03
Sample Point			TP9 1D 0.10	TP10 1D 0.15	TP11 1D 0.20	TP12 1D 0.30	TP13 1D 0.50
Method Code	Units	Determinands					
R3.6	-	pH (soil)	7.2	7.1	7.1	7.1	8.7
R11.3	%	Solids air dried	87.2	86.2	86.4	88.6	87.9
R11.1	%	Total Solids					
R11.1	%	Total Ash Solids (DSB)					
R11.7	%	Stones greater than 10mm	0	0	19.3	0	70.2
R3.6	-	pH (filtered)	6	7	7	6.1	6.9
R2.5.1	mg/kg	Cyanide (total) (DSB)					
R*	kJ/kg	Calorific value					
R2.21.2	mg/kg	Phenol monohydric (DSB)					
R*	mg/kg	Sulphide (DSB)					
R9B	ug/l	Arsenic (leach)	2.8	1.9	10.4	< 0.8	< 0.8
R8B	mg/l	Cadmium (leach)	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
R8B	mg/l	Chromium (leach)	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
R8B	mg/l	Lead (leach)	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
R9A	ug/l	Mercury (leach)	0.1	< 0.05	< 0.05	< 0.05	< 0.05
R9B	ug/l	Selenium (Leach)	< 0.8	< 0.8	< 0.8	1.1	< 0.8
R8B	mg/l	Copper (leach)	0.006	0.003	0.01	< 0.002	0.007
R8B	mg/l	Nickel (leach)	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
R8B	mg/l	Zinc (leach)	< 0.01	< 0.01	0.01	< 0.01	< 0.01
R8B	mg/l	Boron (leach)	< 0.05	< 0.05	< 0.05	< 0.05	0.21
R8B	mg/kg	Arsenic (soil)	24.3	4.64	25	2.82	9.78
R8B	mg/kg	Cadmium (soil)	0.51	0.15	1.05	0.23	0.99
R8B	mg/kg	Chromium (soil)	25.4	11.8	25.7	30	88.9
R8B	mg/kg	Lead (soil)	81.8	19.4	138	17.8	256
R8B	mg/kg	Mercury (soil)	0.19	< 0.10	0.35	0.1	0.36
R8B	mg/kg	Selenium (soil)	0.75	0.6	1.28	0.44	1.08
R8B	mg/kg	Copper (soil)	47.9	57	95.9	21.9	144
R8B	mg/kg	Nickel (soil)	25.5	44.2	35.8	45.5	38.9
R*8B	mg/kg	Zinc (soil)	189	36.7	703	95.4	455
R8B	mg/kg	Boron (soil)	< 100	< 100	< 100	< 100	< 100
R7.25	mg/kg	Total Petroleum hydro-c					
R7.25	mg/kg	Diesel Range Organics					
R7.25	mg/kg	Lubricating Range Org					
R*	mg/kg	Gasoline Range Organics					
R*	mg/kg	Sulphur (Elemental) (DSB)					
R7.22	mg/kg	PAH Total					
*\$	p/a	Asbestos fibres					

Asbestos Fibres Key

0-No asbestos detected

1-Chrysotile (white asbestos)

2-Amosite (brown asbestos)

3-Crocidolite (blue asbestos)

4-Chrysotile and Amosite

5-Chrysotile and Crocidolite

Steve Scott, Operations Manager

Ref: N4487-45 5845375 Page 12 of 15

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Telephone: 0845 1 200 400 Fax: 01709 841079 E-Mail: customer.services@alcontrol.co.uk

Encia Group Ltd

Encia House

Audby Lane

Wetherby

LS22 7RD

Receipt Date: 09/12/03

Report Date: 23/12/03

Water Analysis

Laboratory Number			49464533	49464534	49464535	49464536	49464537
Sampling Date			12/04/03	12/04/03	12/04/03	12/04/03	12/04/03
Sample Point			TP14 1D 0.50	TP15 2D 1.50	TP16 1D 1.00	TP16 2D 2.00	TP17 1D 0.15
Method Code	Units	Determinands					
R3.6	-	pH (soil)	8.2	8.1	8.8	10.6	7.2
R11.3	%	Solids air dried	96.5	87.9	88.9	96	71.9
R11.1	%	Total Solids					
R11.1	%	Total Ash Solids (DSB)					
R11.7	%	Stones greater than 10mm	19.8	33	50.6	19.6	0
R3.6	-	pH (filtered)	7.5	6.8	7.5	9.8	6.8
R2.5.1	mg/kg	Cyanide(total) (DSB)					
R*	kJ/kg	Calorific value					
R2.21.2	mg/kg	Phenol monohydric (DSB)					
R*	mg/kg	Sulphide (DSB)					
R9B	ug/l	Arsenic (leach)	4	1.7	2.3	22.4	1.1
R8B	mg/l	Cadmium(leach)	< 0.0002	< 0.0002	< 0.0002	0.0002	< 0.0002
R8B	mg/l	Chromium(leach)	< 0.002	< 0.002	< 0.002	0.007	< 0.002
R8B	mg/l	Lead(leach)	< 0.005	< 0.005	< 0.005	0.017	< 0.005
R9A	ug/l	Mercury (leach)	< 0.05	< 0.05	< 0.05	0.12	< 0.05
R9B	ug/l	Selenium (Leach)	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
R8B	mg/l	Copper(leach)	0.004	0.006	< 0.002	0.059	0.003
R8B	mg/l	Nickel(leach)	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
R8B	mg/l	Zinc (leach)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
R8B	mg/l	Boron (leach)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
R8B	mg/kg	Arsenic (soil)	2.25	12.5	13.3	3.03	21.5
R8B	mg/kg	Cadmium (soil)	0.18	1.28	0.65	0.27	0.5
R8B	mg/kg	Chromium (soil)	15	43.8	31.9	22	34.9
R8B	mg/kg	Lead (soil)	30.7	130	41.7	22.8	78.5
R8B	mg/kg	Mercury (soil)	< 0.10	0.2	0.11	0.13	0.25
R8B	mg/kg	Selenium (soil)	< 0.40	0.44	< 0.40	< 0.40	1.03
R8B	mg/kg	Copper (soil)	18.6	147	37.6	21.8	32.1
R8B	mg/kg	Nickel (soil)	7.78	29.1	22.4	9.4	35
R*8B	mg/kg	Zinc (soil)	35.8	315	87.4	37.4	88.1
R8B	mg/kg	Boron (soil)	< 100	< 100	< 100	< 100	< 100
R7.25	mg/kg	Total Petroleum hydro-c					
R7.25	mg/kg	Diesel Range Organics					
R7.25	mg/kg	Lubricating Range Org					
R*	mg/kg	Gasoline Range Organics					
R*	mg/kg	Sulphur (Elemental) (DSB)					
R7.22	mg/kg	PAH Total					
*\$	p/a	Asbestos fibres		0	0		

Asbestos Fibres Key

0-No asbestos detected

1-Chrysotile (white asbestos)

2-Amosite (brown asbestos)

3-Crocidolite (blue asbestos)

4-Chrysotile and Amosite

5-Chrysotile and Crocidolite

Steve Scott, Operations Manager

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Bradford Laboratory: George Street, Bradford. BD1 5P2.

Telephone: 0845 1 200 400 Fax: 01709 841079 E-Mail: customer.services@alcontrol.co.uk.

Encia Group Ltd

Encia House

Audby Lane

Wetherby

LS22 7RD

Receipt Date: 09/12/03

Report Date: 23/12/03

Water Analysis

Laboratory Number			49464538	49464539	49464540	49464541	49464542
Sampling Date			12/04/03	12/04/03	12/04/03	12/04/03	12/04/03
Sample Point			TP18 1D 0.10	TP20 1D 0.10	TP21 1D 0.10	TP23 1D 0.10	TP24 1D 0.10
Method Code	Units	Determinands					
R3.6	-	pH (soil)	7.2	7.8	5	5.6	5.4
R11.3	%	Solids air dried	80.3	84.2	81.5	80.8	76.8
R11.1	%	Total Solids		80.1			
R11.1	%	Total Ash Solids (DSB)		79.9			
R11.7	%	Stones greater than 10mm	0	33.1	0	0	0
R3.6	-	pH (filtered)	6.6	7.3		5.3	
R2.5.1	mg/kg	Cyanide (total) (DSB)					
R*	kJ/kg	Calorific value		4810			
R2.21.2	mg/kg	Phenol monohydric (DSB)					
R*	mg/kg	Sulphide (DSB)					
R9B	ug/l	Arsenic (leach)	5.5	10.5		1.4	
R8B	mg/l	Cadmium (leach)	< 0.0002	< 0.0002		< 0.0002	
R8B	mg/l	Chromium (leach)	< 0.002	< 0.002		< 0.002	
R8B	mg/l	Lead (leach)	0.013	< 0.005		< 0.005	
R9A	ug/l	Mercury (leach)	< 0.05	< 0.05		< 0.05	
R9B	ug/l	Selenium (Leach)	< 0.8	< 0.8		< 0.8	
R8B	mg/l	Copper (leach)	0.009	0.003		0.002	
R8B	mg/l	Nickel (leach)	< 0.005	< 0.005		< 0.005	
R8B	mg/l	Zinc (leach)	0.02	< 0.01		< 0.01	
R8B	mg/l	Boron (leach)	< 0.05	< 0.05		< 0.05	
R8B	mg/kg	Arsenic (soil)	26.1	12.9	22.8	17.8	14.9
R8B	mg/kg	Cadmium (soil)	0.72	0.39	0.49	0.53	0.56
R8B	mg/kg	Chromium (soil)	25.5	20	35.1	27.3	24.7
R8B	mg/kg	Lead (soil)	103	65.7	77	58.5	48.3
R8B	mg/kg	Mercury (soil)	0.22	0.12	0.28	0.2	0.14
R8B	mg/kg	Selenium (soil)	0.86	0.77	0.94	0.79	0.45
R8B	mg/kg	Copper (soil)	49.8	87.1	33.3	22	18.6
R8B	mg/kg	Nickel (soil)	32.1	38.3	26.8	25.5	28.2
R*8B	mg/kg	Zinc (soil)	116	64.8	90.5	84.3	78.3
R8B	mg/kg	Boron (soil)	< 100	< 100	< 100	< 100	< 100
R7.25	mg/kg	Total Petroleum hydro-c					
R7.25	mg/kg	Diesel Range Organics					
R7.25	mg/kg	Lubricating Range Org					
R*	mg/kg	Gasoline Range Organics					
R*	mg/kg	Sulphur (Elemental) (DSB)					
R7.22	mg/kg	PAH Total					
*\$	p/a	Asbestos fibres					

Asbestos Fibres Key

0-No asbestos detected

1-Chrysotile (white asbestos)

2-Amosite (brown asbestos)

3-Crocidolite (blue asbestos)

4-Chrysotile and Amosite

5-Chrysotile and Crocidolite

Steve Scott, Operations Manager

Ref: N4487.45.5845375 Page 14 of 15

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Telephone: 0845 1 200 400 Fax: 01709 841079 E-Mail: customer.services@alcontrol.co.uk

Encia Group Ltd
Encia House
Audby Lane
Wetherby
LS22 7RD

Receipt Date: 09/12/03

Report Date: 23/12/03

Water Analysis

			Laboratory Number	49464543	49464544	49464545
			Sampling Date	12/04/03	12/04/03	12/04/03
			Sample Point	TP25 1D 0.10	TP30 2D 0.60	TP31 1D 0.50
Method Code	Units	Determinands				
R3.6	-	pH (soil)		6	7.8	7.7
R11.3	%	Solids air dried		83.4	83.8	87.6
R11.1	%	Total Solids				82.5
R11.1	%	Total Ash Solids (DSB)				84.9
R11.7	%	Stones greater than 10mm		0	0	60.3
R3.6	-	pH (filtered)		6		7.2
R2.5.1	mg/kg	Cyanide(total) (DSB)				< 0.50
R*	kJ/kg	Calorific value				6430
R2.21.2	mg/kg	Phenol monohydric (DSB)				< 1.50
R*	mg/kg	Sulphide (DSB)				250
R9B	ug/l	Arsenic (leach)		1.2		1.4
R8B	mg/l	Cadmium(leach)		< 0.0002		0.0003
R8B	mg/l	Chromium(leach)		< 0.002		< 0.002
R8B	mg/l	Lead(leach)		< 0.005		< 0.005
R9A	ug/l	Mercury (leach)		< 0.05		< 0.05
R9B	ug/l	Selenium (Leach)		< 0.8		< 0.8
R8B	mg/l	Copper(leach)		0.005		0.002
R8B	mg/l	Nickel(leach)		< 0.005		< 0.005
R8B	mg/l	Zinc (leach)		< 0.01		0.01
R8B	mg/l	Boron (leach)		< 0.05		0.08
R8B	mg/kg	Arsenic (soil)		17.9	12.9	24.7
R8B	mg/kg	Cadmium (soil)		0.56	0.15	9.41
R8B	mg/kg	Chromium (soil)		28.5	31.2	65.5
R8B	mg/kg	Lead (soil)		50.9	25.9	321
R8B	mg/kg	Mercury (soil)		0.18	0.11	0.53
R8B	mg/kg	Selenium (soil)		0.71	0.46	1.37
R8B	mg/kg	Copper (soil)		17.3	27.1	661
R8B	mg/kg	Nickel (soil)		27.9	25.8	57.4
R*8B	mg/kg	Zinc (soil)		81.1	70.3	1230
R8B	mg/kg	Boron (soil)		< 100	< 100	< 100
R7.25	mg/kg	Total Petroleum hydro-c				
R7.25	mg/kg	Diesel Range Organics				
R7.25	mg/kg	Lubricating Range Org				
R*	mg/kg	Gasoline Range Organics				
R*	mg/kg	Sulphur (Elemental) (DSB)				2190
R7.22	mg/kg	PAH Total				34.8
*\$	p/a	Asbestos fibres				0

Asbestos Fibres Key

- 0-No asbestos detected
- 1-Chrysotile (white asbestos)
- 2-Amosite (brown asbestos)
- 3-Crocidolite (blue asbestos)
- 4-Chrysotile and Amosite
- 5-Chrysotile and Crocidolite

Steve Scott, Operations Manager

Ref: N4487.45.5845375 Page 15 of 15

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Telephone: 0845 1 200 400 Fax: 01709 841079 E-Mail: customer.services@alcontrol.co.uk

Job Reference: S848

Site Name: Burton Road, Barnsley

Receipt Date: 09/12/03

Report Date: 23/12/03

Encia Group Ltd

Encia House

Audby Lane

Wetherby

LS22 7RD

Volatile Organics

			Laboratory Number	49464490	49464491	49464492	49464493	49464494
			Sampling Date	12/04/03	12/04/03	12/04/03	12/04/03	12/04/03
			Sample Point	WS3 1D 0.20-0.60	WS3 2D 0.60-1.00	WS4 2J 0.60-0.90	WS4 3D 1.00-2.00	WS16 1J 0.15-0.50
Method Code	Units	Determinands						
R7.9	ug/kg	Benzene (DSB)		< 22	< 22	< 21	< 24	< 22
R7.9	ug/kg	Toluene (DSB)		< 22	< 22	< 21	< 24	< 22
R7.9	ug/kg	Ethyl benzene (DSB)		< 22	< 22	< 21	< 24	< 22
R7.9	ug/kg	m,p-Xylene (DSB)		34	< 22	< 21	< 24	< 22
R7.9	ug/kg	o-Xylene (DSB)		< 22	< 22	< 21	< 24	< 22

Steve Scott, Operations Manager

Ref: V4490-08 5785199 Page 1 of 4

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Job Reference: S848

Site Name: Burton Road, Barnsley

Receipt Date: 09/12/03

Report Date: 23/12/03

Encia Group Ltd

Encia House

Audby Lane

Wetherby

LS22 7RD

Volatile Organics

			Laboratory Number	49464495	49464496	49464497	49464498	49464499
			Sampling Date	12/04/03	12/04/03	12/04/03	12/04/03	12/04/03
			Sample Point	WS16 2J 0.40-1.40	WS6 2D 0.50-1.00	WS7 1D 0.60-1.50	WS6 1D 0.20-1.00	WS8 2J 2.00-2.50
Method Code	Units	Determinands						
R7.9	ug/kg	Benzene (DSB)		< 22	< 22	< 24	< 22	< 24
R7.9	ug/kg	Toluene (DSB)		< 22	< 22	< 24	< 22	< 24
R7.9	ug/kg	Ethyl benzene (DSB)		< 22	< 22	< 24	< 22	< 24
R7.9	ug/kg	m,p-Xylene (DSB)		< 22	< 22	< 24	< 22	< 24
R7.9	ug/kg	o-Xylene (DSB)		< 22	< 22	< 24	< 22	< 24

Steve Scott, Operations Manager

Ref: V4490-08 5785199. Page 2 of 4

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Job Reference: S848

Site Name: Burton Road, Barnsley

Receipt Date: 09/12/03

Report Date: 23/12/03

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Audby Lane

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LS22 7RD

Volatile Organics

			Laboratory Number	49464500	49464501	49464503	49464504	49464505
			Sampling Date	12/04/03	12/04/03	12/04/03	12/04/03	12/04/03
			Sample Point	WS11 1D 0.20-0.80	WS12 1D 0.20-0.60	WS13 2D 0.50-1.00	WS14 1D 0.40-0.80	WS5 1D 0.20-0.50
Method Code	Units	Determinands						
R7.9	ug/kg	Benzene (DSB)		< 23	< 22	< 22	< 23	< 21
R7.9	ug/kg	Toluene (DSB)		49	< 22	< 22	< 23	< 21
R7.9	ug/kg	Ethyl benzene (DSB)		< 23	< 22	< 22	< 23	< 21
R7.9	ug/kg	m,p-Xylene (DSB)		53	< 22	< 22	< 23	< 21
R7.9	ug/kg	o-Xylene (DSB)		39	< 22	< 22	< 23	< 21

Steve Scott, Operations Manager

Ref: V4490-08 5785199. Page 3 of 4

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Bradford Laboratory: George Street, Bradford. BD1 5PZ.

Telephone: 0845 1 200 400 Fax: 01709 841079 E-Mail: customer.services@alcontrol.co.uk

Job Reference: S848

Site Name: Burton Road, Barnsley

Receipt Date: 09/12/03

Report Date: 23/12/03

Encia Group Ltd

Encia House

Audby Lane

Wetherby

LS22 7RD

Volatile Organics

			Laboratory Number	49464506	49464507	49464508
			Sampling Date	12/04/03	12/04/03	12/04/03
			Sample Point	WS9 1D 0.40-1.00	WS10 1D 0.20-0.50	WS15 1D 0.50-1.00
Method Code	Units	Determinands				
R7.9	ug/kg	Benzene (DSB)	< 22	< 22	< 22	< 22
R7.9	ug/kg	Toluene (DSB)	< 22	< 22	< 22	< 22
R7.9	ug/kg	Ethyl benzene (DSB)	< 22	< 22	< 22	< 22
R7.9	ug/kg	m,p-Xylene (DSB)	< 22	< 22	< 22	< 22
R7.9	ug/kg	o-Xylene (DSB)	< 22	< 22	< 22	< 22

Steve Scott, Operations Manager

Ref: V4490-08 5785199. Page 4 of 4

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0896
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ALcontrol Laboratories

Handwritten signature and date: 19/02/04

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

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

25/02/2004

Dear Mr J Harrison

Your Ref and Description : 5848

Site Name : Burton Road, Barnsley

SDG Number : SDG04002763

Please find enclosed the test reports for the samples received on 06 Feb 2004.

The samples were given Lab numbers 040011095 - 040011099. Please quote these numbers should you have any queries about the enclosed test reports. Also enclosed are brief descriptions of the techniques employed to analyse these samples.

Where appropriate, liquid samples are retained for 10 working days from the report date, soils are kept for 20 working days. After that date the samples will be discarded.

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

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

Yours sincerely

Handwritten signature of Samantha Duke

Samantha Duke
Customer Services



ALcontrol Laboratories

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

Accredited Test Procedures

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



ALcontrol Laboratories

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Bradford Laboratory George Street, Bradford, BD1 5PZ
Telephone 01709 841096 Fax 01709 841079 E-mail customer.services@alcontrol.co.uk

Certificate ID : 16159
SDG Number: SDG04002763

Certificate of Analysis

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

Sample Date: 06 February 2004

Sample Received : 06 February 2004

Analysis Completed : 16 February 2004

Laboratory Number : 040011099

Your PO No.: None Supplied

Site Name : Burton Road, Barnsley

Sample : Stream 4

Determination	Result	Units	Method
Phenol (total monohydric)	<0.15	mg/l	R2.21
Chloride	73.5	mg/l	R2.4.2
pH	6.82		R3.6
Sulphate	279	mg/l	R5.5
PAH (FID screen)	0.291	mg/l	R7.22
Diesel range organics (C10 - C26)	<0.125	mg/l	R7.25
Lubricating oil range organics (C26 - C40)	<0.125	mg/l	R7.25
Total petroleum hydrocarbons (C10 - C40)	<0.25	mg/l	R7.25
Arsenic (total)	<0.01	mg/l	R8B
Boron (total)	0.192	mg/l	R8B
Cadmium (total)	<0.005	mg/l	R8B
Cobalt (total)	0.0636	mg/l	R8B
Copper (total)	<0.01	mg/l	R8B
Lead (total)	<0.03	mg/l	R8B
Nickel (total)	<0.01	mg/l	R8B
Zinc (total)	<0.02	mg/l	R8B
Mercury (total)	<0.053	ug/l	R9A
Selenium (total)	2.21	ug/l	R9B

Approved by: Steve Scott (Operations Manager)
25/02/2004

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Certificate ID : 16158
SDG Number: SDG04002763

Certificate of Analysis

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

Sample Date: 06 February 2004

Sample Received : 06 February 2004

Analysis Completed : 23 February 2004

Laboratory Number : 040011098

Your PO No.: None Supplied
Site Name: Burton Road, Barnsley
Sample: Stream 3

Determination	Result	Units	Method
Phenol (Total monohydric)	<0.15	mg/l	R2.21
Chloride	76.8	mg/l	R2.4.2
pH	7.42		R3.6
Sulphate	252	mg/l	R5.5
PAH (FID screen)	0.454	mg/l	R7.22
Diesel range organics (C10 - C26)	0.165	mg/l	R7.25
Lubricating oil range organics (C26 - C40)	0.0702	mg/l	R7.25
Total petroleum hydrocarbons (C10 - C40)	0.236	mg/l	R7.25
Arsenic (total)	<0.01	mg/l	R8B
Boron (total)	0.202	mg/l	R8B
Cadmium (total)	<0.005	mg/l	R8B
Chromium (total)	<0.01	mg/l	R8B
Copper (total)	<0.01	mg/l	R8B
Lead (total)	<0.03	mg/l	R8B
Nickel (total)	<0.01	mg/l	R8B
Zinc (total)	<0.02	mg/l	R8B
Mercury (total)	<0.053	ug/l	R9A
Selenium (total)	<0.75	ug/l	R9B

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25/02/2004

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Certificate ID : 16156
SDG Number: SDG04002763

Certificate of Analysis

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

Sample Date: 06 February 2004

Sample Received : 06 February 2004

Analysis Completed : 23 February 2004

Laboratory Number : 040011096

Your P() No.: None Supplied
Site Name : Burton Road, Barnsley
Sample : Stream 1

Determination	Result	Units	Method
Phenol (total monohydric)	<0.15	mg/l	R2.21
Chloride	58.2	mg/l	R2.4.2
pH	7.39		R3.6
Sulphate	396	mg/l	R5.5
PAH (FID screen)	0.335	mg/l	R7.22
Diesel range organics (C10 - C26)	<0.05	mg/l	R7.25
Lubricating oil range organics (C26 - C40)	<0.05	mg/l	R7.25
Total petroleum hydrocarbons (C10 - C40)	<0.1	mg/l	R7.25
Arsenic (total)	<0.01	mg/l	R8B
Boron (total)	0.221	mg/l	R8B
Calcium (total)	<0.005	mg/l	R8B
Cadmium (total)	<0.01	mg/l	R8B
Copper (total)	<0.01	mg/l	R8B
Lead (total)	<0.03	mg/l	R8B
Nickel (total)	<0.01	mg/l	R8B
Zinc (total)	<0.02	mg/l	R8B
Mercury (total)	<0.053	ug/l	R9A
Selenium (total)	<0.75	ug/l	R9B

Steve Scott

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25/02/2004

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Certificate ID : 16155
SDG Number: SDG04002763

Certificate of Analysis

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

Sample Date: 06 February 2004

Sample Received : 06 February 2004

Analysis Completed : 25 February 2004

Laboratory Number : 040011095

Your PC No.: None Supplied
Site Name : Burton Road, Barnsley
Sample : Probehole 8

Determination	Result	Units	Method
TPH (Aliphatic/Aromatic Split)	10.0	ug/l	*S
Benzo (a) Pyrene	<0.5	ug/l	R*7.7
Benzo (b&k) Fluoranthene	<0.5	ug/l	R*7.7
Benzo (g,h,i) Perylene	<0.5	ug/l	R*7.7
PAH (sum of EPA 16)	<7.5	ug/l	R*7.7
Diesel range organics (C10 - C26)	0.105	mg/l	R7.25
Lubricating oil range organics (C26 - C40)	0.0658	mg/l	R7.25
Total petroleum hydrocarbons (C10 - C40)	0.171	mg/l	R7.25
Acenaphthene	<0.5	ug/l	R7.7
Acenaphthylene	<0.5	ug/l	R7.7
Acenaphthene	<0.5	ug/l	R7.7
Benzo (a) Anthracene	<0.5	ug/l	R7.7
Chrysene	<0.5	ug/l	R7.7
Dibenzo (a,h) Anthracene	<0.5	ug/l	R7.7
Fluoranthene	0.838	ug/l	R7.7
Fluorene	<0.5	ug/l	R7.7
Indeno (1,2,3-cd) pyrene	<0.5	ug/l	R7.7
Naphthalene	<0.5	ug/l	R7.7
Phenanthrene	<0.5	ug/l	R7.7
Pyrene	0.774	ug/l	R7.7

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Certificate ID : 16155
SDG Number: SDG04002763

Certificate of Analysis

Customer : Encia Group Ltd
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Audby Lane
Wetherby
West Yorkshire
LS22 7RD

Sample Date: 06 February 2004

Sample Received : 06 February 2004

Analysis Completed : 25 February 2004

Laboratory Number : 040011095

Your PO No.: None Supplied
Site Name : Burton Road, Barnsley
Sample : Probehole 8

Determination	Result	Units	Method
---------------	--------	-------	--------

Approved by: Steve Scott (Operations Manager)
25/02/2004

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APPENDIX H
GEOTECHNICAL LABORATORY RESULTS

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Trial Pit Number	Sample Number	Depth m	Description of Sample
1		2.10	Brown mottled grey and orange slightly sandy very silty CLAY.
3		1.50	Dark grey highly weathered MUDSTONE.
6		1.10	Dark grey highly weathered MUDSTONE.
7		1.30	Grey highly weathered MUDSTONE.
8		1.10	Brown mottled grey highly weathered MUDSTONE.
9		1.00	Grey mottled orange slightly sandy very silty CLAY.
17		1.30	Brown mottled grey slightly sandy very silty CLAY.
18		1.20	Grey slightly gravelly slightly sandy very silty CLAY.
21		1.20	Orangish brown mottled grey very silty CLAY.
22		1.00	Dark brown highly weathered MUDSTONE.
23		1.40	Grey mottled brown highly weathered MUDSTONE.
24		1.50	Grey mottled orange slightly sandy very silty CLAY.
25		1.00	Brown highly weathered MUDSTONE.

Butterley
Geotechnical

Compiled by	Date	Checked by	Date	Approved by	Date
<i>[Signature]</i>	17/12/03	<i>[Signature]</i>	17/12/03	<i>[Signature]</i>	17/12/03
BURTON ROAD, BARNSELY.					Contract No NL240142
					Client Ref: 5848

SUMMARY OF SOIL CLASSIFICATION TESTS

(B.S. 1377 : PART 2 : 1990)

Trial Pit Number	Sample Number	Depth m	Moisture Content % Clause 3.2	Bulk Density Mg/m ³ Clause 7.2	Dry Density Mg/m ³ Clause 7.2	Particle Density Mg/m ³ Clause 8.	Liquid Limit % Clause 4.3/4.4	Plastic Limit % Clause 5.	Plasticity Index % Clause 6.	% Passing .425mm	Remarks
1		2.10	13				41	19	22	100	Intermediate plasticity CI.
3		1.50	18				44	23	21	100	Intermediate plasticity CI.
6		1.10	20				52	25	27	100	High plasticity CH.
7		1.30	16				46	26	20	100	Intermediate plasticity CI.
8		1.10	22				40	22	18	90	Intermediate plasticity CI.
9		1.00	20				44	23	21	100	Intermediate plasticity CI.
17		1.30	23				39	20	19	100	Intermediate plasticity CI.
18		1.20	19				48	21	27	92	Intermediate plasticity CI.
21		1.20	35				85	30	55	100	Very high plasticity CV.
22		1.00	23				53	28	25	93	High plasticity CH.
23		1.40	21				53	25	28	100	High plasticity CH.
24		1.50	20				34	19	15	100	Low plasticity CL.
25		1.00	20				46	23	23	100	Intermediate plasticity CI.

SYMBOLS : NP : Non Plastic

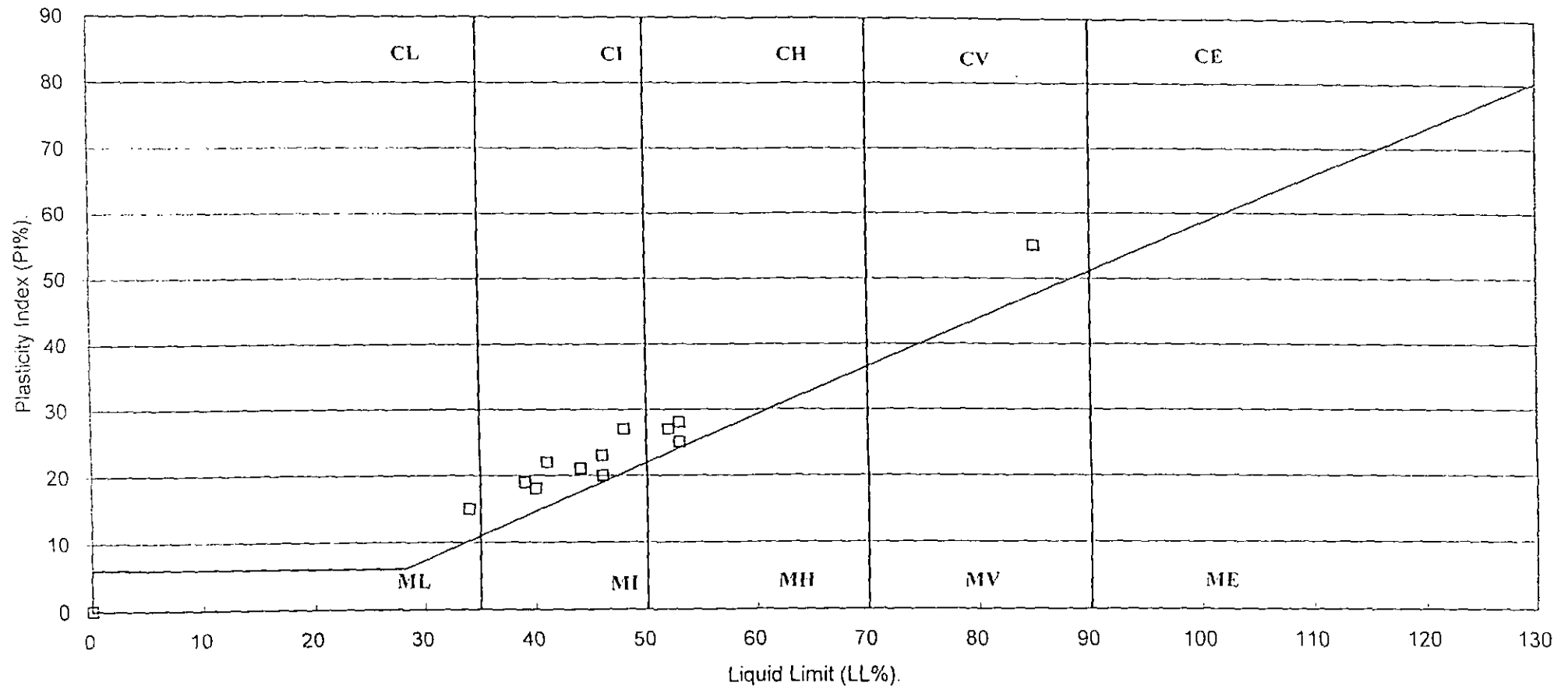
* : Liquid Limit and Plastic Limit Wet Sieved.

Sheet 1 of 2.

	Compiled by	Date	Checked by	Date	Approved by	Date
	<i>[Signature]</i>	17/12/03	<i>[Signature]</i>	17/12/03	<i>[Signature]</i>	17/12/03
	BURTON ROAD, BARNSELY.					Contract No NL240142
					Client Ref:	5848

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(B.S.5930 : 1999)



Butterley
Geotechnical

Compiled by

[Signature]

Date

17/12/03

Checked by

[Signature]

Date

17/12/03

Approved by

[Signature]

Date

17/12/03

BURTON ROAD, BARNSELY.

Contract No NL240142

Client Ref: 5848

South Kirkby, Pontefract, WF9 3AP.

Summary of Chemical Analyses

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Sulphate Content Soil SO ₃ (SO ₄) % Dry mass DETS 004	Sulphate Content * 2:1 Water:Soil Extract SO ₃ (SO ₄) g/l DETS 055	Sulphate Content Groundwater SO ₃ (SO ₄) g/l DETS 004	Total Sulphur * (S) %Dry mass DETS 064	Chloride Content * 2:1 Water/Soil Extract (Cl) g/l DETS 055	Magnesium * 2:1 Water/Soil Extract (Mg) g/l DETS 042	Nitrate 2:1 Water/Soil Extract (NO ₃) g/l DETS 055	pH Value DETS 008
TP 1	2.10	5	D	10719/1		0.08 (0.10)			<0.01	<0.01	<0.01	7.7
TP 3	1.50	5	D	10719/2		0.02 (0.02)			<0.01	<0.01	<0.01	7.6
TP 6	1.10	2	D	10719/3		0.05 (0.06)			<0.01	<0.01	<0.01	7.4
TP 7	1.30	3	D	10719/4		0.03 (0.04)			<0.01	<0.01	<0.01	7.3
TP 8	1.10	2	D	10719/5		0.04 (0.05)			<0.01	<0.01	<0.01	6.0
TP 9	1.00	2	D	10719/6		0.05 (0.06)			<0.01	<0.01	<0.01	6.8
TP 17	1.30	2	D	10719/7		0.06 (0.07)			0.01	<0.01	<0.01	7
TP 18	1.20	2	D	10719/8		0.02 (0.02)			<0.01	<0.01	<0.01	6.8
TP 21	1.20	2	D	10719/9		0.05 (0.06)			0.01	<0.01	<0.01	5.1
TP 22	1.00	2	D	10719/10		0.03 (0.04)			0.02	<0.01	<0.01	6.2
TP 23	1.40	2	D	10719/11		0.04 (0.05)			0.02	<0.01	<0.01	7.3
TP 24	1.50	2	D	10719/12		0.03 (0.04)			<0.01	<0.01	<0.01	7.2
TP 25	1.00	2	D	10719/13		0.03 (0.04)			<0.01	<0.01	<0.01	7.1
WS 9	2.00-3.00	3	D	10719/14		0.03 (0.04)			<0.01	<0.01	<0.01	7.2
WS 10	1.70-3.00	3	D	10719/15		0.06 (0.07)			0.02	<0.01	<0.01	7.3
WS 16	1.40-2.70	3	D	10719/16		0.04 (0.05)			<0.01	<0.01	<0.01	7.1

Approved By:

Date:


 22/12/02

Client Reference: NL240142

Laboratory Reference: 10719

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

[illegible]

Sheet 2 of 2.



Compiled by	Date	Checked by	Date	Approved by	Date

SUMMARY OF SOIL CLASSIFICATION TESTS

(B.S. 1377 : PART 2 : 1990)

[illegible]

SYMBOLS : NP : Non Plastic

* : Liquid Limit and Plastic Limit Wet Sieved.

Sheet 1 of 2.



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Date _____

Checked by

Date _____

Approved by

Date _____

Solvent

171.2 (0)

Kl

17/12/07

Alh

17/12/07

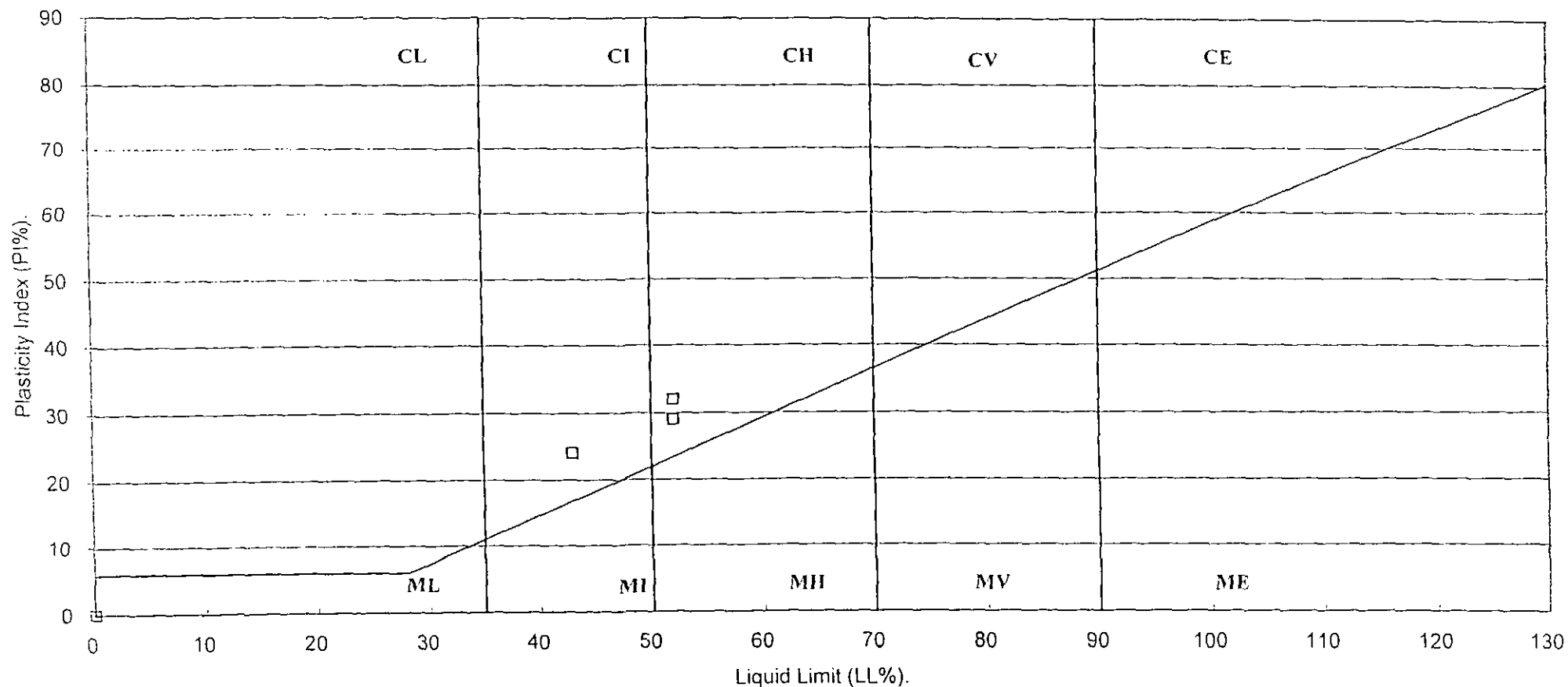
BURTON ROAD, BARNSELY.

Contract No NL240142

Client Ref:

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(B.S.5930 : 1999)



Compiled by	Date	Checked by	Date	Approved by	Date
<i>[Signature]</i>	17/12/03	<i>[Signature]</i>	17/12/03	<i>[Signature]</i>	17/12/03
BURTON ROAD, BARNSELY.					Contract No NL240142
					Client Ref: 5848

South Kirkby, Pontefract, WF9 3AP.

**APPENDIX I
PHOTOGRAPHS**



Plate 1 - View away from entrance of Area A, note filled ground and retaining wall.



Plate 2 - Access road for Area A, Burton Road to right of picture.



Plate 3 – Derelict nurseries within Area A.



Plate 4 – Filled Ground (Landfill) within north east of Area A



Plate 5 - Above ground fuel tank within Area A.



Plate 6 - Vehicle storage yard within south of Area A.



Plate 7 - Overgrown fields in Area's A and B



Plate 8 - Overgrown field (not accessible) in Area B.



Plate 9 – Former playground in Area B, Area C, cars sales and house in background.



Plate 10 – Car sales, workshop and house in Area C.

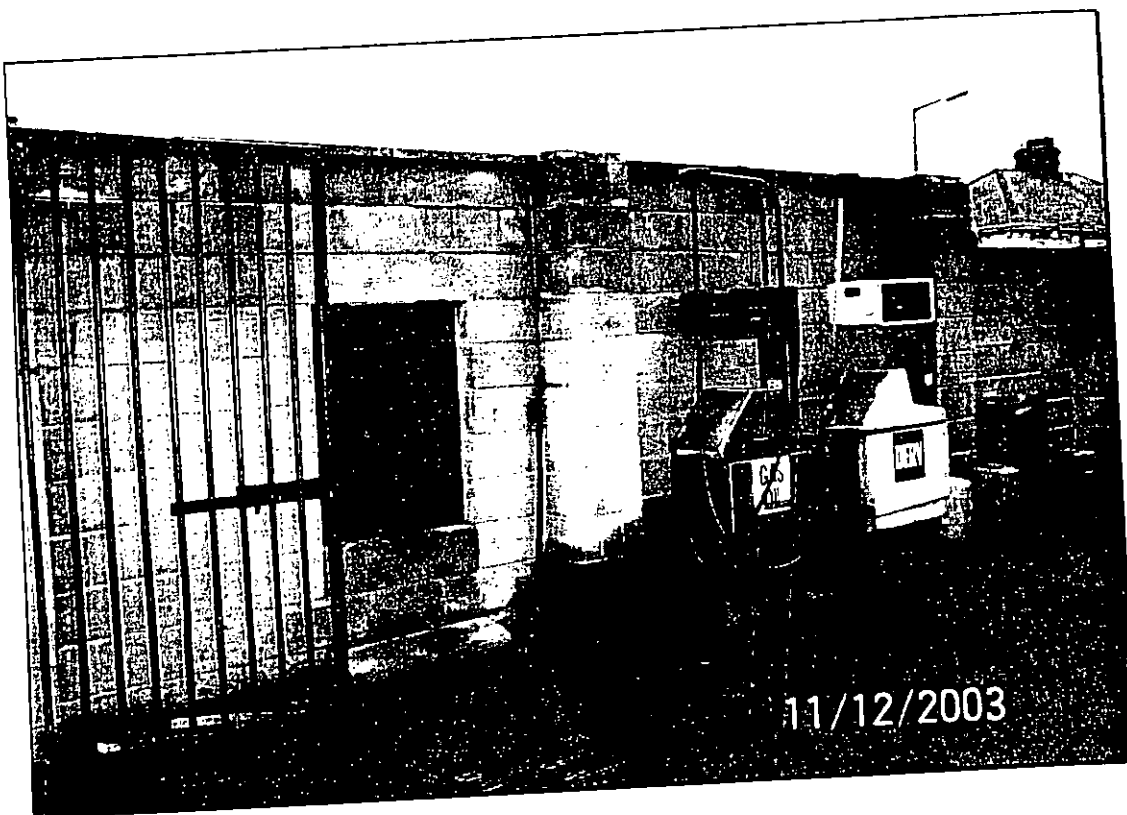


Plate 11 – Above ground fuel tanks in Area D.



Plate 12 – Scrap yard in Area D.



Plate 13 - Aerial view of scrap yard in Area D.



Plate 14 - Wrecked cars in Area D.

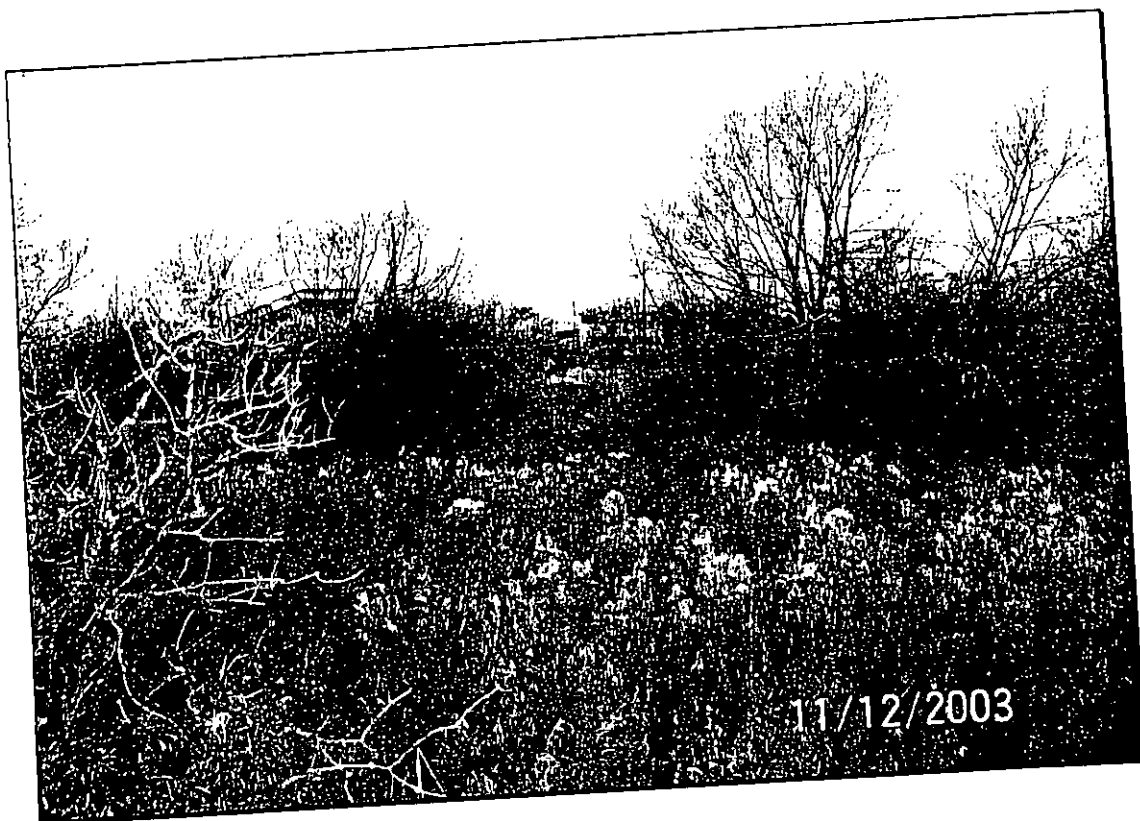


Plate 15 - Overgrown ground in Area E.



Plate 16 - Small coal yard in Area E.



Plate 17 - Small scrap yard in Area E.



Plate 18 - Car storage yard in Area E.



Plate 19 - Coal Yard within north of Area E.

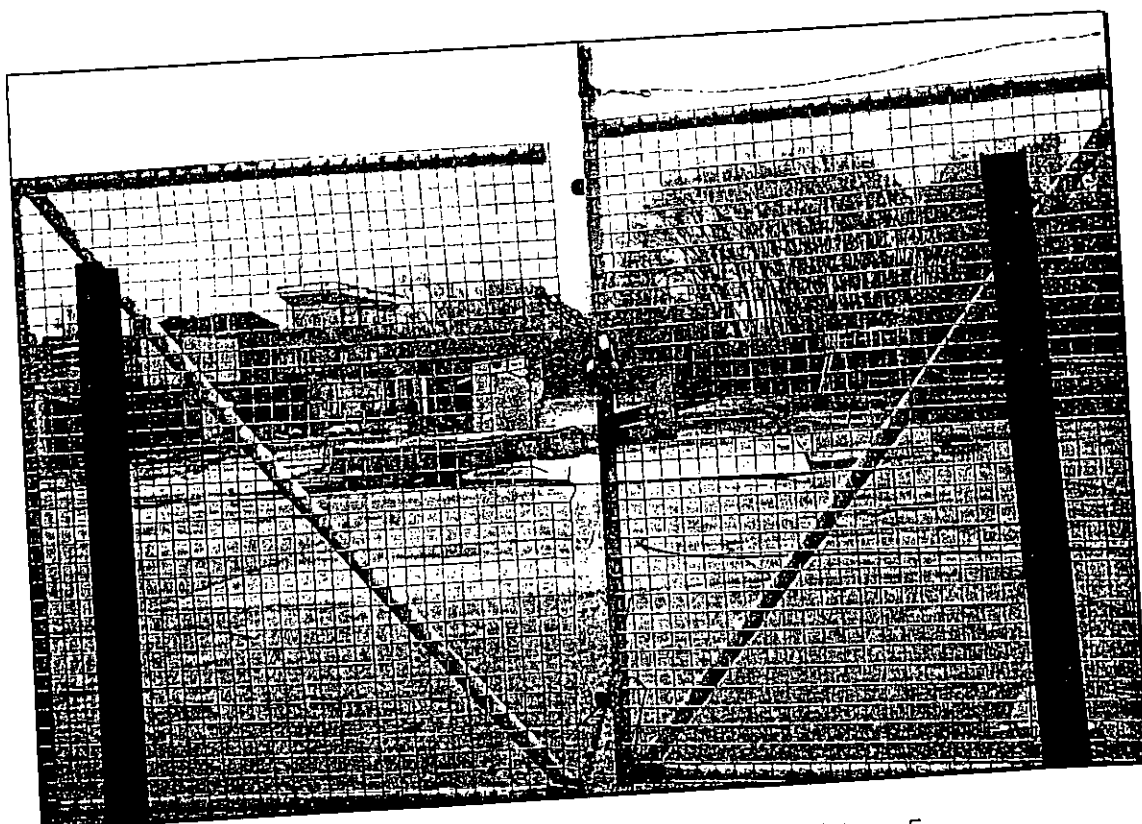


Plate 20 - Derelict concrete yard in south of Area E.