

Brockmoor Site Report.

The phase 1 site report, including a desktop study and site walkover has been carried out on behalf of the company by Castings Technology International Consultants. This indicated the likely presence of metals persistent organics, sulphur compounds and oil at the site from historic and current activities, intrusive investigation was carried out by Johnson Pool and Bloomer in conjunction with Castings Technology International.

site report

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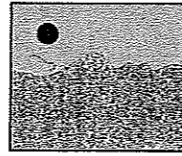
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SITE REPORT
For
BROCKMOOR FOUNDRY

For the attention of Mr R Harris

Brockmoor Foundry Company Ltd
Leys Road
Brierley Hill
West Midlands
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10 July 2003

Land Engineering • The Environment • Mining and Quarrying

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Established 1844 Also at: Cardiff, Glasgow, Wells and Northwich



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EXECUTIVE SUMMARY

Johnson Poole and Bloomer (JPB) have undertaken a Phase 2 intrusive investigation at the Brockmoor Foundry site, Leys Road, Brierley Hill. The purpose of the investigation being to determine the baseline conditions at the site and produce a Site Report in accordance with the requirements of the Pollution Prevention and Control (England and Wales) Regulations 2000 (PPC).

A Phase 1 desk study, complimented by an Environmental Audit Inspection, was carried out by Castings Technology International in March 2002 and subsequently revised in January 2003, prior to the intrusive phases of the investigation. This determined the site's history, topography, geology and hydrogeology, together with the identification of potential contamination.

The Phase 2 intrusive investigation comprised boreholes complimented by dynamic window sampling probes and trial pits. Samples of materials encountered were recovered for chemical analysis.

The results of both the current investigation and the earlier investigation revealed an irregular mantle of superficial deposits comprising Made Ground deposits, overlying Mudstone deposits. Groundwater was identified during the 1998 investigation at discreet locations in the northern area of the site, which it is considered represent 'perched' water levels within the infilled marl pit. In the southern area of the site all three of the recent boreholes encountered groundwater. The groundwater encountered was sampled and sent to a laboratory for chemical analysis. The results of these tests are shown in Appendix F of this report.





1 INTRODUCTION

1.1 This intrusive site investigation Site Report has been prepared on the instruction of Brockmoor Foundry Company Limited, under their order number D11936/RH. The work was based on the findings of the Phase 1 Site Condition Report, prepared by Castings Technology International in 2002.

1.2 The site is located in Leys Road, Brierley Hill and comprises two discreet areas (North Area and South Area) which comprise the 'stationary technical unit' for the purpose of the PPC permit. The location and layout of the site is shown on JPB Drawings DS008/01 and DS008/02. The purpose of the intrusive investigation was to obtain environmental baseline data, which characterises the contaminants present in the ground prior to the commencement of the PPC permit.

1.3 In carrying out this work, we have referred to the following reports:

- (i) Phase 1 Site Condition Report, reference 37104, January 2003 revision, prepared by Castings Technology International
- (ii) Preliminary Ground Investigation Report, reference NJS/CHE/LJH/96160-36, 1998, prepared by JPB.

1.4 Site works consisted of:

- Cable percussive boring undertaken within the period 24 February to 26 February 2003, by the specialist contractor, Soil Mechanics Ltd..
- Rotary Open Hole boring undertaken within the period 3 March 2003, by the specialist contractor, Soil Mechanics Ltd..
- Trial Pit excavation undertaken on 25 February 2003 by an Engineer from JPB.
- Dynamic Windowless Sampling undertaken on 24 February 2003, by the specialist contractor IETG Ltd..
- Chemical contamination testing of selected soil and water samples at the laboratories of Bodycote Materials Testing Ltd, scheduled during the period 25 February to 11 March 2003.

- 1.5 The investigation has been undertaken in accordance with JPB specifications, which themselves are based upon appropriate British Standards, Codes of Practice and working principles.
 - 1.6 The conclusions reached within this report are based on the conditions established at each of the sampling points. However, soil and rock conditions can vary and may differ between sampling points, affecting our interpretation. Additionally features may exist buried at depth and undetected by investigation.
 - 1.7 The conclusions reached in this report are necessarily restricted to those, which can be determined from the information consulted and may be subject to amendment in the light of additional information becoming available. The report should only be used by the named client in the intended context as stated above.
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2 SITE DESCRIPTION

- 2.1 Brockmoor Foundry occupies two areas (North and South) separated by the Stourbridge Canal and Leys Road. The North Area (approximately 1.8Ha in extent) is occupied by the main foundry production operations. The South Area (approximately 1.2Ha in extent) is occupied by finishing operations and offices.
- 2.2 The majority of the site is covered by buildings and concrete / tarmac hardstanding. The only area without an impermeable cover is the footprint of the infilled former quarry within the North Area.
- 2.3 The North Area is bounded by an arm of the Stourbridge Canal to the north, Cookley Street to the east, Leys Road to the south and Stourbridge Canal to the west. The South Area is bounded by Leys Road to the North, the Dudley Canal to the east, Moor Street to the south and other industrial buildings to the west.

2.4 Topography

The North Area has a significant change in level between the southern boundary (Leys Road) and the canal, which forms the northern boundary, of some 8m. The South Area is generally flat with only a gentle gradient from north to south.

2.5 Existing Structures and Services

2.5.1 The supplied information including drawings, which showed plans of the factory together with some information regarding the activities carried out in each building.

2.5.2 Each of the Areas is served by telecom, electricity, gas, site drainage and foul sewer systems.



3 GEOLOGY, HYDROLOGY AND HYDROGEOLOGY

- 3.1 Published information on the geology of the site had been based on Geological Survey Sheet 167 (1:63,360 scale) Solid and Drift and a previous investigation by JPB on the North Area during 1998. The following items summarise the information obtained on the natural strata, listing the geological formation successively with depth. Site investigations have also proved Made Ground to be present, the nature and extent of which is described in Section 6, together with the general ground conditions encountered.
- 3.2 The site is indicated to be underlain by the Etruria Formation, of Carboniferous age, which comprise red brown and purple Mudstones (known as 'Marls'). The Etruria Formation is underlain by Productive Coal Measures, also of Carboniferous age.
- 3.3 The presence of Made Ground has been proved on both the North and South Areas of the site.

3.4 Mining

- 3.4.1 The Review of Mining Instability in Great Britain (Ove Arup, 1990) study of the West Midlands Regional Report indicated that there is evidence that mining of coal, ironstone and fireclay took place within the vicinity of the site. Two collieries, Chapman Fields Colliery and Bank Colliery, worked coal seams in the vicinity of the site.
- 3.4.2 The Coal Authority report for the North Area indicates the area to be within the zone of influence on the surface from two seams of coal at approximately 110m to 160m depth, the last date of working being 1914. The report indicates that any ground movement associated with these workings should have ceased by now and the property is not within the zone of influence on the surface from any present workings. Reserves of coal exist in the vicinity of the site which could be worked in the future, subject to feasibility, licences and planning consent.



3.5 Hydrology

3.5.1 The nearest surface watercourse is the Stourbridge Canal, located immediately to the north of the site. In the document entitled "The Quality of Rivers and Canals in England and Wales" (1992), published by the National Rivers Authority, the Stourbridge Canal is attributed a water quality classification of C or Fair.

3.5.2 It is understood that there are no licensed surface water abstractions or discharges within 250 metres of the subject site. Site drainage from the North Area discharges into the Stourbridge Canal. There have been no recent recorded surface water pollution incidents within 250m of the site.

3.6 Hydrogeology

3.6.1 The underlying Productive Coal Measures is classified by the Environment Agency (formerly the National Rivers Authority) as a minor aquifer in their document "Policy and Practice for the Protection of Groundwater", 1994.

3.6.2 We understand that there are no licensed groundwater abstractions or recorded groundwater pollution incidents within 250 metres of the site. Nevertheless very limited groundwater abstraction resources may be present from fractured mudstones which may be able to support local abstractions.



4 SITE CONCEPTUAL MODEL

- 4.1 The conceptual model derived during the Phase 1 Site Condition Report has been refined following this intrusive investigation. The information from the Phase 2 investigation has confirmed the hypotheses set in the earlier conceptual model, with a better definition of the near surface groundwater depth and flow direction. The conceptual model is presented graphically in pages 7 and 8 of Appendix I 'Phase 1 Site Condition Report'.
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5 SITE WORKS AND LABORATORY TESTING

- 5.1 Three boreholes were drilled by standard cable percussive boring techniques at 150mm diameter, to a maximum depth of 4.2m depth. Disturbed samples were taken at frequent intervals during boring in order to give a continuous record of strata encountered. All the cable percussive boreholes were terminated in the Etruria Formation. The borehole logs are included in Appendix B and their approximate positions and surface levels are indicated on JPB Drawing DS008/. The borehole locations were subsequently advanced by rotary open hole techniques to a maximum depth of 10m at each location.
- 5.2 Dynamic window sampling was used as a substitute for trial pitting within the buildings and in areas where excavation of trial pits was not possible. A JPB geologist logged the samples recovered, and the window sample logs are given in Appendix C. The sampling locations are shown on JPB Drawing DS008/.
- 5.3 Samples taken at three trial pit locations were used to investigate the near surface materials. The locations of these trial pits are shown on JPB Drawing DS008/03 and the logs are contained in Appendix D.
- 5.4 The design of the sampling strategy was formulated using information from the Phase 1 Site Condition Report.
- 5.5 Selected samples, taken from the sampling points, were analysed in the laboratory for the following suite of parameters in relation to potential contamination of the ground:-

Arsenic	Cadmium	Diesel Range Organics (DRO)
Chromium	pH	Gasoline Range Organics (GRO)
Copper	Lead	Water Soluble Sulphate
Nickel	Manganese	Iron
Zinc	Polycyclic Aromatic Hydrocarbons (PAH)	

The full results of the analyses are presented in Appendix E.



5.6 Immediate groundwater observations were made during the investigation and on completion 50mm diameter standpipes were installed in 3 boreholes as detailed in the borehole logs in Appendix B. Water level measurements were also taken together with samples of the groundwater, which were analysed for a range of heavy metals, PAH and TPH.

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6 RESULTS OF INVESTIGATION

6.1 Summary of Ground Conditions

6.1.1 Full descriptions of the materials encountered at the exploratory positions on this site, in accordance with the guidance given in BS5930, are presented on the records included in the Appendices. Reference should be made to these records for detailed information and a summary only of the ground conditions is given below.

6.1.2 The summary given below is based upon the results of the materials encountered in the exploratory holes.

6.1.3 The site generally has a surface covering of concrete hardstanding with subordinate areas of tarmacadam. Beneath the surface covering a mantle of variable Made Ground masks the weathered Etruria Formation deposits comprising principally mudstones.

6.1.3 Made Ground was present at all exploratory hole locations, to a maximum thickness of 4.0m (WS12). At many locations Made Ground comprised a band of brick hardcore, ash, clinker, burnt shale and ceramics.

6.4 Contamination Test Results

6.4.1 Analytical results of soil and water testing are shown in Appendices E and F.

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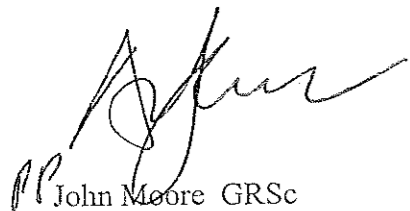
7 CONCLUSIONS

7.1 The purpose of the intrusive investigation undertaken in preparing this Site Report was to determine the nature of the ground conditions and provide an indication of the levels of contamination present at the site.

7.2 General

7.2.1 Whilst confident in the findings of our report we are unable to give an assurance that they will be accepted by other authorities without question. We therefore strongly advise that our report and associated matters are submitted to approving bodies and approval obtained or sought before detailed design, site works or other irrevocable action is embarked upon.

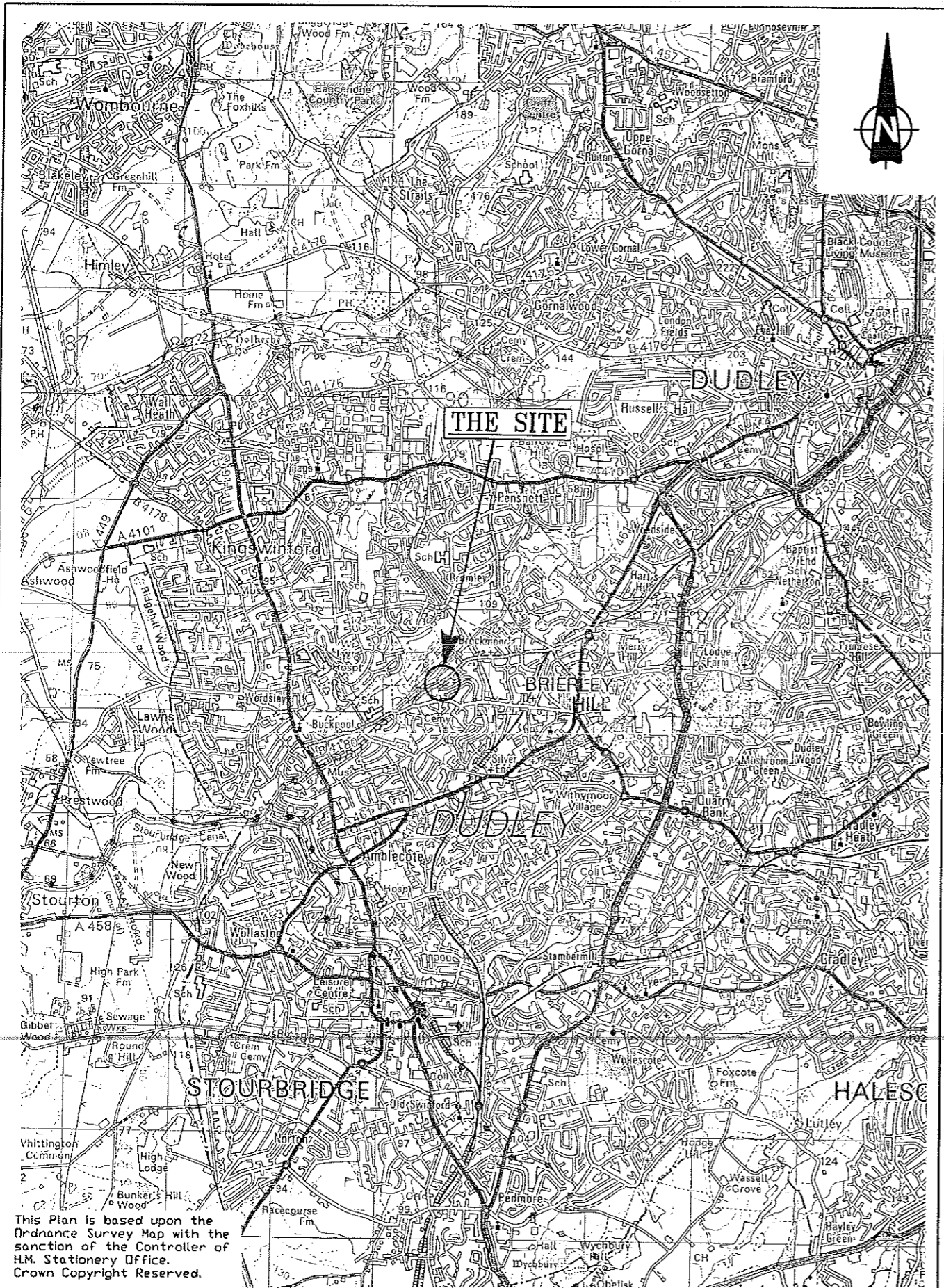
7.5.2 We trust that this report fulfils your present requirements, but if there is any matter about which you require elaboration, do not hesitate to contact the undersigned.



John Moore GRSc
Principal Environmental Scientist



Duncan Powers
Environmental Engineer



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Checked <i>[Signature]</i>	Project Brockmoor Foundry, Leys Road, Brierley Hill		
Approved <i>[Signature]</i>	Date 09/07/03	Scale 1:50,000	Drawing DS008/20/01

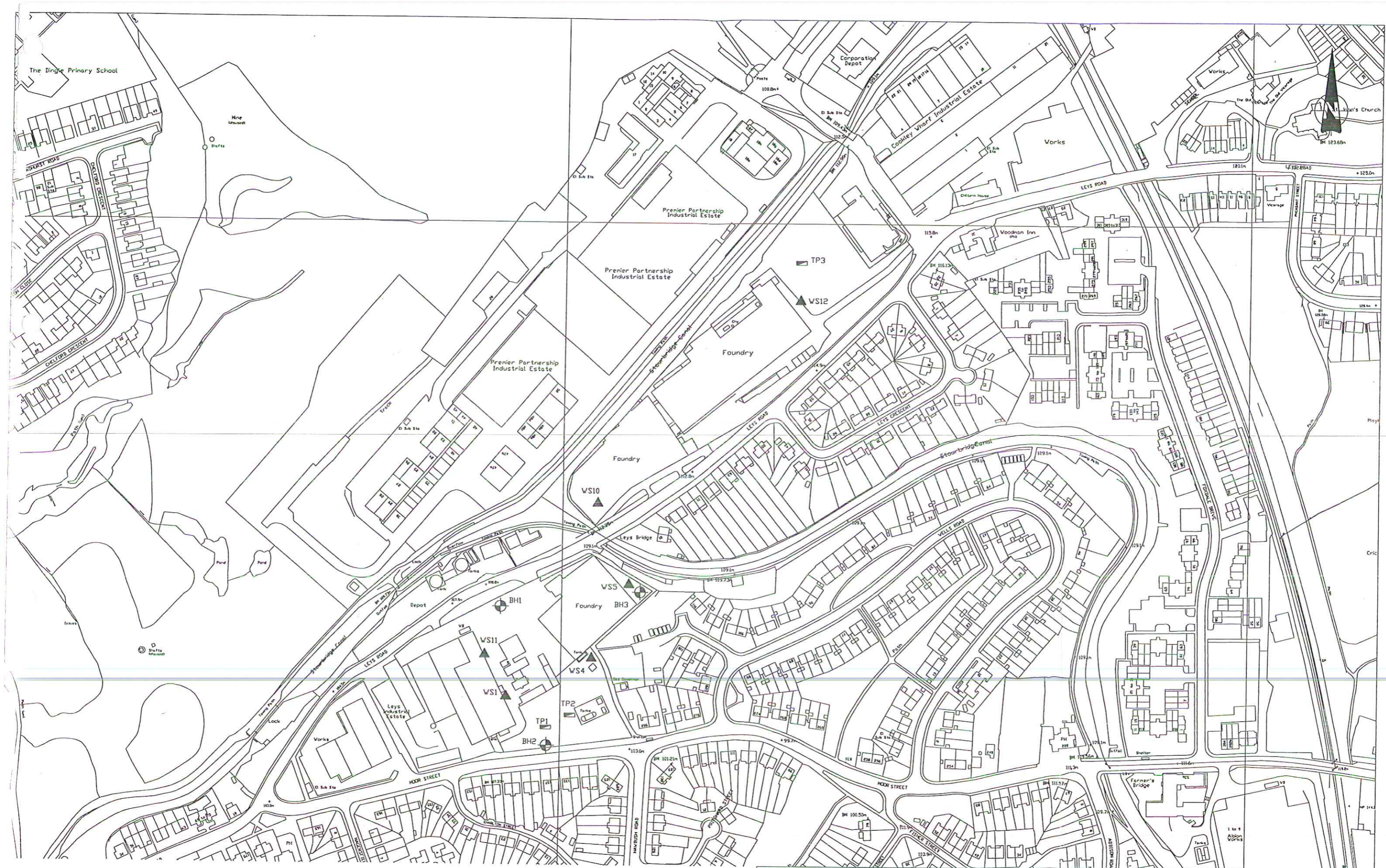


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KEY

— SITE BOUNDARIES

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	Checked	[Signature]	Project	Brockmoor Foundry, Leys Road, Brierley Hill		
	Approved	[Signature]	Date	13/01/03	Scale	



- KEY**
-  SITE BOUNDARIES
 -  TRIAL PIT
 -  BORE HOLE
 -  WINDOW SAMPLE

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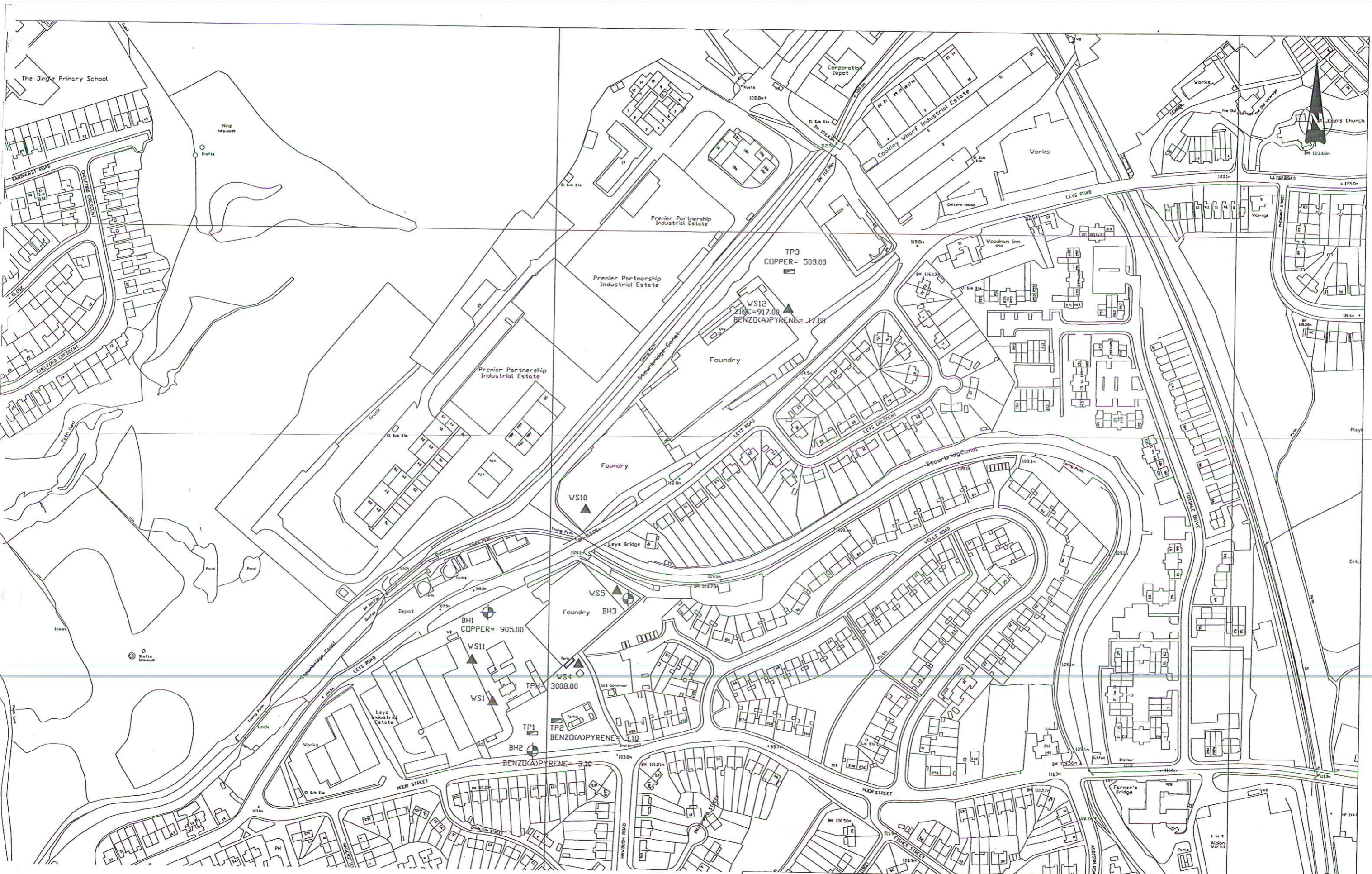


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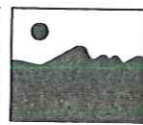



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Drawing DS008/20/03

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 -  WINDOW SAMPLE

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	Approved 	Date 13/01/03	Scale 1: 2500

