Table 4.1 : Historical Data Summary Sheet : Site Uses

Ref	Use/Feature	1877 OS	1898 OS	1909 OS	1936 OS	1949 BGP	1961 OS	1968 OS	1975 OS	1985 BGP	1997 SVI	August 2000 SVI
1	Gasholder (holder no. 2 1949 plan)		Crossing boundary of western holder compound	–	–	–	–	–	–	x	x	x
2	Former purifiers				Crossing boundary of western holder compound	–	–	–	–	x	x	x
3	Gasholder (holder no. 3, 1949 plan)	*	*	*	Western Transco compound	–	–	–	–	–	–	–
4	Gasholder (holder no. 4, 1949 plan)	*	*	*	*	Eastern Transco compound	–	–	–	–	–	–
5	Building (ex governor house)	*	*	*	*	Eastern Transco Compound	–	–	–	–	–	–
6	Building	*	*	*	*	*	*	*	*	Eastern Transco compound	–	–
7	Building	*	*	*	*	*	*	*	*	Eastern Transco compound	–	–

KEY	
?	Plan does not show this area or does not provide information
–	Feature still present
x	Feature demolished/no longer present
OS	Ordnance Survey Map
BGP	British Gas Plan
SVI	Site visit information
*	Feature not present

Notes:
1. Waste disposal activities may have occurred throughout the site especially during its early history.
2. Feature references correlate to Figure 3: Process activity locations.

Table 4.2 : Potential Contaminants : Site Uses

ACTIVITY	MATERIAL/ PROCESS (FORM)	REF NO./AREA	CONTAMINANT/HAZARD	EVIDENCE FROM CURRENT SITE INVESTIGATION
WASTE DISPOSAL	Foul lime pre (1900s) (solid).	Throughout site and possibly in base of Ref. No. 1.	Alkaline, toxic. Contaminated with cyanide and sulphate compounds.	None found
	Spent oxide (solid).	In and around purifiers (Ref. No. 2).	Highly acidic, toxic and flammable. Contaminated with complex cyanide compounds, thiocyanate, free cyanide, sulphate, sulphide, various organics i.e. coal tar and phenol. High calorific value, therefore can support combustion.	None found
	Acid tars from benzole refining (liquid/solid).	In and around purifiers (Ref. No. 2).	Acidic, toxic, carcinogenic.	None found
	Sludges from tar and ammoniacal liquor storage tank (sludge) in gas holders.	Throughout site and possibly in base of Ref. No. 1.	Toxic. Contaminated with organic compounds ie. coal tar and phenols, and ammonia.	PAH staining and pockets of tar within former holder bases (Refs. 1,5 and 6).
	Ash/clinker from retorts (solid).	Throughout site and possibly in base of Ref. No. 1.	Toxic. Contaminated with heavy metals.	Patches found within both parts of the Transco site.
	Asbestos from pipe insulation during decommissioning of works (solid/fibrous).	Throughout site and possibly in base of Ref. No. 1.	Toxic.	None found
	Condensate from gas mains (sludge/solid).	Throughout site and possibly in base of Ref. No. 1.	Toxic. Contaminated with organic tarry material.	None found

Table 4.2 : Potential Contaminants : Site Uses (cont.)

ACTIVITY	MATERIAL/ PROCESS (FORM)	REF NO./AREA	CONTAMINANT/HAZARD	EVIDENCE
STORAGE AREAS	Coal/coke storage.	-	Toxic, flammable. Residual solid fuel materials contaminated with heavy metals. Elevated calorific values, therefore can support combustion.	None found
PROCESS ACTIVITIES	Gas purification and oxide revivification (solid).	In and around purifiers (Ref. No. 2).	Spent oxide contamination (see above).	None found
	Ammonium sulphate production (solid).	-	Acidic, toxic. Sulphuric acid, inorganic contaminants i.e. cyanide and sulphate.	None found
STORAGE TANKS	Underground tank for tars and ammoniacal liquors (liquid/ sludge).	-	Toxic, carcinogenic. Tars usually contain a range of organic compounds including polycyclic aromatic hydrocarbons (PAH) and phenols. Ammoniacal liquors typically contaminated with sulphides, sulphates, cyanide, fixed and free ammonia.	None found
LEAKAGE FROM PIPEWORK	Tar, oil, liquor, gas condensate.	Possibly throughout the site.	Carcinogenic, toxic and flammable. Leakage of tars and oil into the ground surrounding pipes, due to poor integrity.	None found

5. PREVIOUS SITE INVESTIGATION

Introduction

5.1 There have been two previous site investigations at the Cramptons Road site. The first, by Travers Morgan in 1988 investigated a small area of land to the south east of the present site, now a residential area. The investigation comprised three trial pits excavated to a maximum depth of 3.3m. Harrison and Company then carried out an investigation (boundary survey) including the current Transco site in 1992. This investigation comprised excavation of 12 trial pits to assess the potential for soil contamination. A brief summary of this is provided below, and further details are present in the 1997 Desk study (Appendix A).

Ground Conditions

5.2 Within the Transco area up to 3m of made ground was encountered. This was generally composed of locally "relatively non-contaminated looking brown silty clays and orange brown silty sands, to mixed grey and brown clay and sand with concrete, bricks and wood". Excavations within the made ground were described as being accompanied by "organic/tar odours", with tar staining evident in some locations.

Chemical Analysis

5.3 Contamination levels within the Transco area were indicated as being at "relatively low levels within the majority of samples tested". The most contaminated area was noted to be within the western holder compound, where significant levels of inorganic and organic contamination were noted.

6. CURRENT SITE INVESTIGATION

Introduction

6.1 The desk study identified potential risks to shallow groundwater and the underlying aquifer (Folkestone Beds) from the potential presence of discrete deposits of contaminated material present within tanks or the fill material, particularly in the area of the former gas holders and purification areas. The scope of the investigation was outlined in WS Atkins correspondence to Mr Win Bowen of Lattice Property Holdings (WSA letter ref. A71430/MG.2000078/Dartford/C.004/eeh). The aims of the investigation were as follows:

- to determine the nature and extent of made ground across the site;
- to establish potential off-site migration of contamination;
- to investigate the former gas holder bases; and
- to determine groundwater levels and groundwater quality beneath the site (if practicable).

Site Investigation Methodology

6.2 The investigation work was undertaken during the period of 21st to 25th August 2000, comprising the installation of one groundwater monitoring borehole, three window samples and 2 trial pits. The borehole was installed by Environmental Sampling Ltd using a rotary hollow stem auger whilst working under the supervision of WS Atkins. 50mm UPVC monitoring standpipes were installed in the borehole, the construction details of which are provided in Appendix B. The excavations were sampled, photographed (see Appendix B) and logged by WS Atkins personnel in accordance with British Standard 5930 (Ref. 3). The ground investigation was carried out in accordance with BGPH guidance document "Guidance for Assessing and Managing Potential Contamination on Former Gasworks and Associated Sites. Version 2.4, May 1999" (Ref. 1).

Exploratory Hole Locations

6.3 Exploratory holes were targeted to obtain information relating to boundary conditions and the nature and extent of made ground across the site. The investigation was designed both to complement the earlier investigations (Appendix A) and to examine additional areas and features identified during the desk study. The groundwater quality within the aquifer below the site was also investigated. The rationale for the chosen locations of the exploratory holes is detailed in Table 6.1.

6.4 The location and levels of the boreholes and trial pits were surveyed as part of the topographical survey given in Figures 2a and 2b.

6.5 Live and redundant services were identified by a third party tracing contractor (Subscan Technology Ltd) prior to the commencement of the works. The electrical supply enters from the east. Medium and low pressure gas mains enter the site from the south running north west onto the holder station, and also from the east. Water and phone services enter the site from the east, all services are shown on Figure 4.

6.6 Water sampling and monitoring standpipes were installed into the borehole, The construction details are provided in Appendix B. Perched water was not encountered.

6.7 All trial pits and boreholes were logged, sampled and photographed by an experienced Environmental Scientist/Geologist in accordance with British Standard 5930 (1999). All excavation logs and selected photographs are displayed in Appendix B.

Table 6.1 : Site Investigation Locations

Location	Rationale for location	Actual Depth	Restrictions
BH 6	To detect groundwater quality in area of the operational gasholders (response zone 7-10mbgl) within the Folkestone Beds aquifer to determine potential for contamination migration off site.	10m bgl	None encountered.
TPs 19 & 20	To investigate general ground conditions and any potential contamination.	3.7 & 4m bgl respectively	None encountered.
WSs 1-3	To investigate general ground conditions and any potential contamination.	3-4m bgl	None encountered.

Sample Selection for Chemical Analysis

6.8 Soil samples were taken at one metre intervals with additional samples taken when a different stratum or specific evidence of contamination was encountered. The borehole was developed by purging three well volumes after the monitoring well was installed, and then a further three well volumes, prior to groundwater sampling on 25th August 2000. Immediately prior to sampling, field conditions for temperature, salinity and pH were determined.

6.9 The one water sample collected and 16 out of 23 soil samples recovered from the exploratory holes and excavations were selected for analysis on the following basis:

- all visually or olfactory contaminated soil samples were analysed for the current BGPH soils analytical suite (Table 6.2).
- generally, when visually contaminated soil was encountered, a sample from the underlying, relatively less contaminated soil was analysed to confirm the vertical extent of the contamination;
- a selection of less visually and olfactory contaminated soil samples, both from the made ground and from the natural ground, were analysed;
- five soil samples from a selection of geological strata were tested for total organic matter;
- two soil samples were scheduled for leachate testing; the resulting leachate was tested for the current BGPH analytical suite for leachates (Table 6.2);

- asbestos analysis was only scheduled if visually evident. In the event, no asbestos was encountered; and
- one groundwater sample was scheduled for the current BGPH analytical suite for waters (Table 6.2).

Sampling and Analysis

6.10 Analysis of samples was carried out by Alcontrol Geochem, a UKAS accredited and BGPH approved laboratory. The results are given in Appendix C. Samples of soil and water were tested for the analytical suites specified in Table 6.2. Laboratory analytical quality control blanks and standard reference material results are also provided and attached in Appendix E.

Table 6.2. : Analytical Suites

Package 1 - Soils (16 Samples)	
pH	Phenols - total
Moisture Content	Polycyclic Aromatic Hydrocarbons
Loss on ignition	(PAH) - total of 16 priority PAHs
Easily Liberateable Cyanide	Elemental Sulphur
Total Cyanide	Water Soluble Sulphate
Complex Cyanide	Water Soluble Chloride
Mercury	Exchangeable Ammonia
Arsenic	Selenium
Cadmium	Chromium
Lead	
Package 2 - Soils and Waters (as required)	
BTEX	
TPH (Total Petroleum Hydrocarbons)	
TOC (Total Organic Carbon)	
Package 3 - Waters (1 sample)	
pH	PAH - individual data for 16 priority pollutants
Electrical Conductivity	Sulphate
Total Ammonium	Sulphide
Total Cyanide	Metals
Free Cyanide	Total Organic Carbon
Total Phenols	Phenols
Package 4 - Leach Tests (2 samples)	
pH	
Electrical Conductivity	
Total Organic Carbon	
Easily Liberateable Cyanide	
Total Cyanide	
Total Phenols	
Ammonium	
Sulphate	
PAH - individual compounds only as appropriate	
Metals (as for waters)	
Assumed Sampling Rate	
Trial Pits/Trench locations – analyse - 4 x soil and 1 x water (if encountered) per location	
Boreholes - analyse - 6 x soil and 1 x water per location	

Water Level Monitoring

6.11 Water level monitoring was undertaken at the time of collection of groundwater sample on 25th August 2000. The results are presented in Appendix D.

Quality Assessment

Management, Design, Specification and Site Supervision

6.12 The site investigation was designed, specified and supervised by competent staff of WS Atkins Consultants Ltd (WSA), maintaining BSI EN ISO 9001: 1994 Registered status. Quality assured procedures for ensuring quality both in specification, procurement and in site supervision have been in place prior to and during the investigation.

Quality Assessment and Assurance

6.13 Continuous quality assessment was provided by site inspection and testing data throughout the duration of the site investigation. The Environmental Assessment Site Investigation Report in itself provides the final Quality Assessment and evidence of Quality Assurance of the site investigation.

Competent Contractors

6.14 The intrusive works were awarded to Quality Assured contractors, Environmental Sampling Ltd. (ESL), and methods used were in accordance with BG guidance (version 2.4) and approved by WSA. The implementation of the approved methods was controlled by ESL and continuously monitored by WSA.

Testing Regime

6.15 Samples were regularly collected during the site investigation and were appropriately stored, transported and tested after the site investigation.

Site Quality Control, Monitoring and Audit

6.16 The site investigation was supervised by competent staff working for the Engineer (WSA), and similarly for the Contractor (ESL).

7. SITE INVESTIGATION RESULTS

Physical Ground Conditions

Made ground

7.1 Made ground was encountered solely within the western holder compound, with depths ranging across the site from 0 to 2.6m bgl. The made ground generally comprised a dense brown clayey fine to medium sand with occasional builders rubble. BH6 and TPs 19 and 20, within the western holder compound, contained areas of hydrocarbon staining and odour.

Underground structures

Pipes

7.2 No pipes were exposed during the course of the investigative excavations.

Foundations

7.3 Concrete foundations exist on the surface within the western Transco compound. Brick and concrete foundations were encountered in TP 19 at a depth of 0.5m bgl.

Gas holders

7.4 The former gasholder base crossing the western boundary of the site was investigated during an investigation on the adjacent site. Information from this investigation indicates that the base does not extend any further than 5.5m bgl.

Former tanks

7.5 No former tanks were excavated during excavations within the site boundary.

Natural Strata

7.6 Within the site area, the top of the natural strata was encountered between ground level (WSs 2 and 3) and approximately 2.6m bgl (BH6). The natural strata generally comprised dense orange/brown slightly cemented fine to very fine sand, some clay was encountered (WS2, WS3 and BH6), and this is thought to be the beginnings of the Gault Clay. Some contamination was visually evident within the natural strata, notably in WS1, WS2, WS3 and BH6.

Groundwater

7.7 The groundwater extracted from the borehole was found to have a slight hydrocarbon odour. Levels were recorded on the 25th August 2000 and the site was revisited on 31st October 2000. The normalised groundwater levels were recorded. See Table 7.1 below and Appendix D for further details.

Table 7.1 Groundwater Level

Borehole	Groundwater Level (25/8/00)	Groundwater Level (31/10/00)
BH6	65.89m AOD	66.04m AOD

Perched Water

7.8 Perched water was not encountered on this site.

Gas Emissions

7.10 Gas monitoring was not undertaken during this investigation.

Laboratory Analytical Results

7.11 Laboratory data for soil chemistry, including leachate testing, are provided in Appendix C.

7.9 A sample of groundwater from the underlying chalk aquifer was analysed and the data are provided in Appendix C.

8 REFERENCES

1. Guidance for Assessing and Managing Potential Contamination on Former Gasworks and Associated Sites. BG plc Property Division, May 1999, Version 2.4.

2. SI Draft for Development. Code of Practice for the Identification of Potentially Contaminated Land and its Investigation. DD175 (1988), British Standards Institution (under revision).

3. British Standard 5930. Code of Practice for Site Investigation (Annex E) 1999.

4. Problems Arising from the Redevelopment of Gasworks and Similar Sites. Department of the Environment, 1987.

5. Interdepartmental Committee on the Redevelopment of Contaminated Land (ICRCL). Guidance on the assessment and redevelopment of contaminated land, Central Directorate on Environmental Protection, Department of the Environment, London, 1987 Second Edition, ICRCL 59/83.

6. Interdepartmental Committee on the Redevelopment of Contaminated Land (ICRCL). Notes on the redevelopment of gasworks sites, Central Directorate on Environmental Protection, Department of the Environment, London, 1986 Fifth Edition, ICRCL 18/79.

7. BRE Digest 363. Sulphate and acid resistance of concrete in the ground. Building Research Establishment, July 1991.

8. VROM (Dutch Ministry of Housing, Spatial planning and Environment), 4th February 2000, Circular on Target and Intervention Values for Soil Remediation, Annexes A-D; Doc. Ref. DBO/1999226863

9. Interim Guidance on the Disposal of 'Contaminated Soils', Environment Agency, 2nd Edition, 1/5/97.

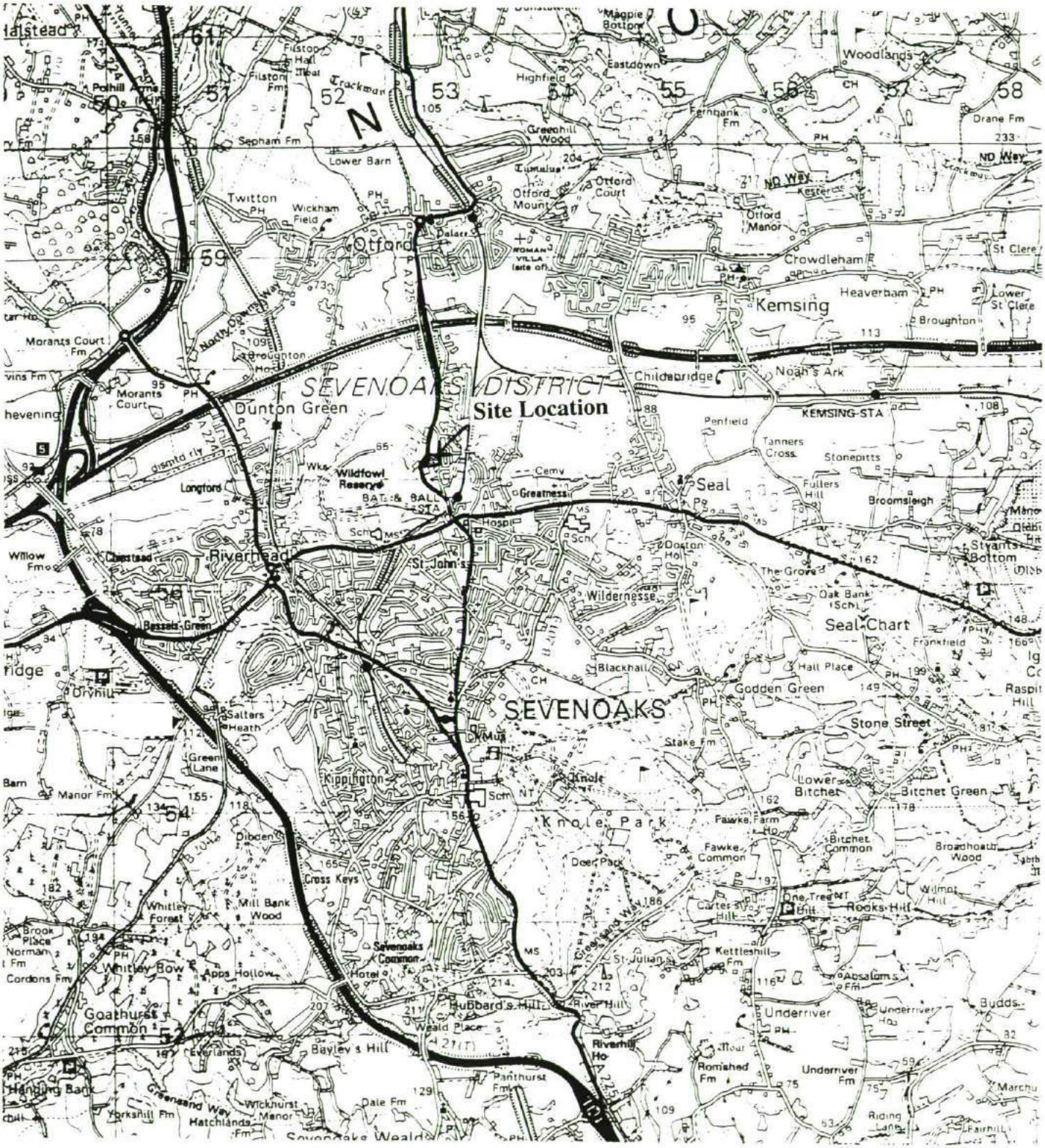
10. Protection of Workers and the General Public during the Development of Contaminated Land, HMSO, London, 1991.

11. A Guide to Safe Working Practices for Contaminated Sites. Prepared under contract to CIRIA by WS Atkins Environment, CIRIA, 1995.

12. Water Supply (Water Quality) Regulations 1989, HMSO, No. 1147.

Figures

N



WS Atkins Environment
a division of WS Atkins Consultants Ltd.
Woodcote Grove, Ashley Road.
Epsom, Surrey. KT18 5BW
Tel. (01372) 726140
Fax. (01372) 740055

Title

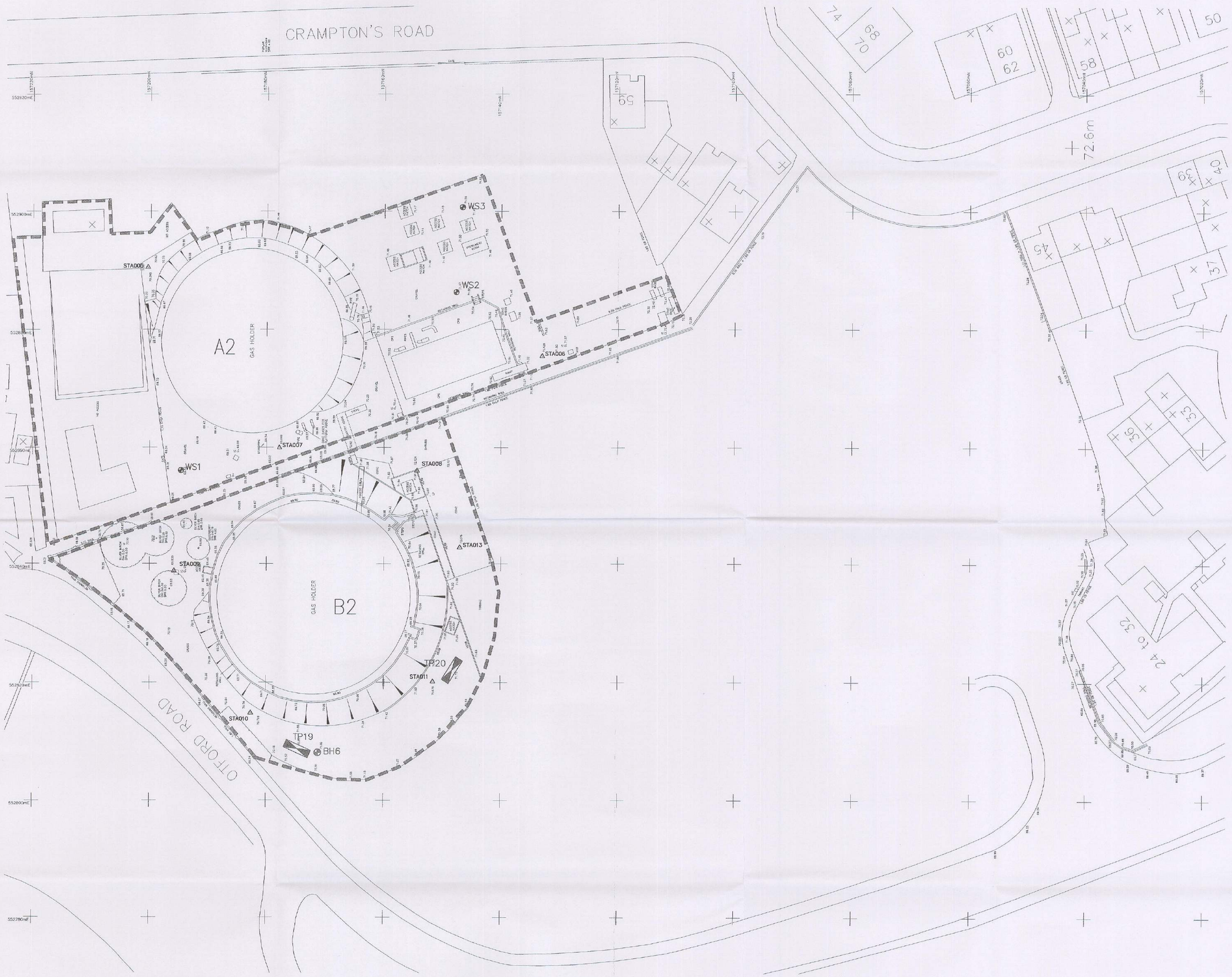
Lattice Property, Cramptons Road, Sevenoaks, Kent

SITE LOCATION PLAN

Reference	Scale	
A71430	NTS	**Figure 1**


OTFORD ROAD
CRAMPTONS ROAD
24 to 32
36
33
37
45
39
66
72.6m
58
60
62
50
68
70
74
59
B2
A2
TP19
BH6
TP20
WS1
WS2
WS3
ST4001
ST4002
ST4003
ST4004
ST4005
ST4006
ST4007
ST4008
ST4009
ST4010
ST4011
ST4012
ST4013
ST4014
ST4015
ST4016
ST4017
ST4018
ST4019
ST4020
ST4021
ST4022
ST4023
ST4024
ST4025
ST4026
ST4027
ST4028
ST4029
ST4030
ST4031
ST4032
ST4033
ST4034
ST4035
ST4036
ST4037
ST4038
ST4039
ST4040

DO NOT SCALE



INDICATIVE ONLY

0 20m
Scale

WS Atkins

Topographical Abbreviations

A/N	Assumed North	MKR	Marker
BH	Borehole	MT	Mercury Telecom Cover
BO	Bollard	OHC	Overhead Cable
BT	British Telecom Cover	OHP	Overhead Pipe
BW	Barbed Wire Fence	ORDN	Ordnance Survey Bench Mark
BWK	Brickwork	P	Post
CATV	Cable TV Cover	PCM	Permanent Ground Marker
CB	Close Boarded Fence	PR	Post & Rail Fence
CCTV	Closed Circuit TV	PW	Post & Wire Fence
CHLK	Chalkline Fence	PWM	Post & Wire Mesh Fence
CHPL	Chestnut Paling Fence	RE	Rambling Eye
CL	Cover Level	RG	Road Gully
CM	Cable Marker	RN	Road Name
CP	Catch Pit	RS	Road Sign
CPL	Catch Pit Base Level	RW	Retaining Wall
DIA	Diameter	RWP	Rain Water Pipe
EK	Emp. Kerb	SAP	Sapling
DP	Down Pipe	SC	Stop Cock
EJB	Electricity Junction Box	SPR	Spread
EC	Electricity Cover	STA	Traverse Station
EP	Electricity Pole	SV	Stop Valve
FB	Farthing Rod	SVP	Soil Vent Pipe
FH	Fire Hydrant	SW	Storm Water
FIG	Figure Ground	TBM	Temporary Bench Mark
FW	Foul Water	TEM	Temporary Bench Mark
G	Gully	TFR	Telkom Finem Records
GV	Gas Valve	TJB	Telephone Junction Box
HT	Height	TPT	Trial Pit
IC	Inspection Cover	TL	Traffic Light
IL	Invert Level	TP	Telephone Pole
IR	Iron Railing Fence	UTL	Unable To Lift
KO	Kerb Outlet	UTI	Unable To Trace
LC	Lamp Column	WC	Water Cock
LG	Lamp Columns	WH	Water Key Hole
LP	Lamp Post	WM	Water Meter
MH	Manhole	WV	Water Valve

Legend

CT Cable TV	OHC Overhead Cable
C CCTV Cable	OHP Overhead Pipe
CO Comm Cable	S Surface Water Pipe
E Electricity Cable	T Telephone Cable
F Foul Water Pipe	U Unidentified Service
G Gas Pipe	W Water Pipe
H Heating Pipe	

BOREHOLE	EASTINGS	NORTHINGS	GROUND LEVEL	CELLAR LEVEL
BH 6	552898.000mE	157171.686mN	74.00	71.29
WINDOW SAMPLE				
WS 1	552855.559mE	157154.736mN	69.43	
WS 2	552886.260mE	157157.578mN	71.47	
WS 3	552900.539mE	157146.695mN	71.56	
TRIAL PIT				
TP 19	552809.687mE	157134.578mN	70.95	
TP 20	552822.029mE	157145.216mN	71.73	

KEY

- BH6 BOREHOLE
- WS2 WINDOW SAMPLE
- TP4 TRIAL PIT
- TT1 TRIAL TRENCH
- TRANSCO SITE BOUNDARIES (AREA A2 = 324.69m), (AREA B2 = 213.09m)

SITE CENTRE: 552850 E, 157120 N

SITE AREAS: AREA A2 = 3733.41m sq = 0.92Acres = 0.373Hectares; AREA B2 = 2767.93m sq = 0.68Acres = 0.277Hectares

Rev.	Description	By	Date	Chk'd	Auth

R.H.Box for client signatures when required

Complete to show purpose of each issue

Purpose of issue	Rev	Date	Authorised

WS Atkins Consultants Limited ©
Consulting Engineers,
Woodcote Grove,
Ashley Road,
Epsom, Surrey, England, KT18 5BW
Fax (01372) 740055
Tel. (01372) 726140

Client: LATTICE PROPERTY HOLDINGS

Project: LATTICE PROPERTY HOLDINGS
CRAMPTONS ROAD, SEVENOAKS

Title: TRANSCO SITE
TOPOGRAPHICAL SURVEY
(INCLUDING INVESTIGATION LOCATIONS)

Original Scale	Drawn	Checked	Authorised	
1:400	GW	MW		A1
	Date 20.04.01	Date 20.04.01	Date 6/5/01	

Drawing Number: A71430/GTG.200078/FIGURE 2b
Rev: 0

Job Dept. Sub Unique No.

Main section
Sub section
Detail
Initial issue signatures
Drg. No. & Latest Revision

Drawing Number A71430/GTG.200078/Figure 2b Rev. 0

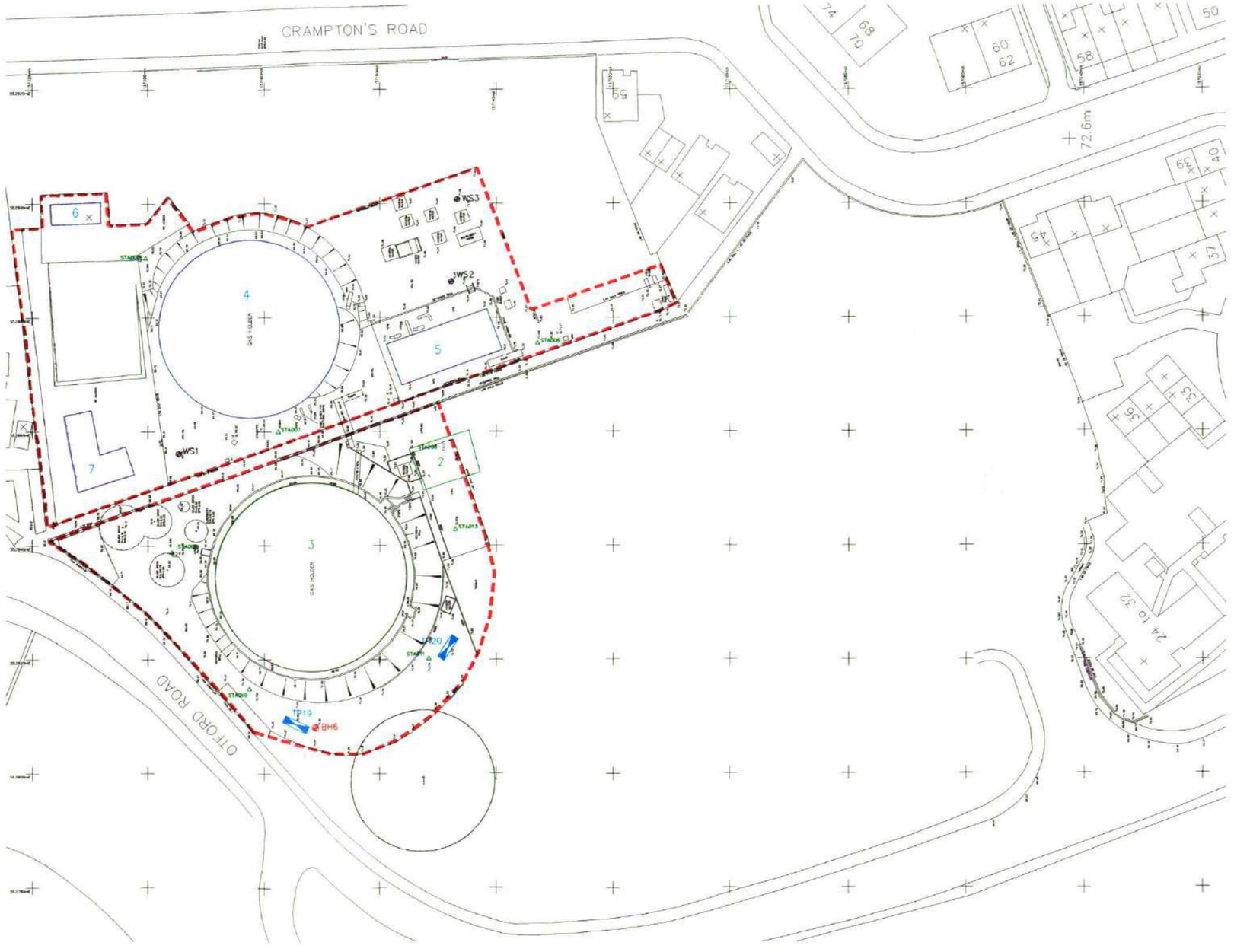
G:/2000/8/SLSENDAKS/DRAWINGS/TRANSCO/IND/FIG 2b.DWG

DO NOT SCALE

REF. NO	DESCRIPTION	FEATURE STATUS	DATES
1	GAS HOLDER *1	NO LONGER PRESENT	1898-1975
2	PURIFIERS	NO LONGER PRESENT	1936-1975
3	GAS HOLDER *2	PRESENT AND OPERATIONAL	1936-PRES
4	GAS HOLDER *3	PRESENT AND OPERATIONAL	1949-PRES
5	BUILDING (EX GOVERNOR HOUSE)	PRESENT	1949-PRES
6	BUILDING	PRESENT	1985-PRES
7	VALVE PIT	PRESENT	1985-PRES

*1 (HOLDER No. 2, 1949 PLAN)
*2 (HOLDER No. 3, 1949 PLAN)
*3 (HOLDER No. 4, 1949 PLAN)

INDICATIVE ONLY



0 20m
Scale

KEY
- BOREHOLE
- WINDOW SAMPLE
- TRIAL PIT
- TRIAL TRENCH
- TRANSCO SITE BOUNDARIES

WS/Atkins

Rev	Description	By	Date	Chk'd	Auth

Purpose of issue	Rev	Date	Authorised

WS Atkins Consultants Limited ©
Consulting Engineers,
Woodcote Grove,
Ashley Road,
Epsom, Surrey, England, KT18 5BW
Fax (01372) 740055
Tel. (01372) 726140

Client: LATTICE PROPERTY HOLDINGS

Project: LATTICE PROPERTY HOLDINGS
CRAMPTONS ROAD, SEVENOAKS

Title: TRANSCO SITE
HISTORICAL COMPOSITE PLAN
AND SITE SUB-AREAS
(INCLUDING INVESTIGATION LOCATIONS)

Original Scale	Drawn	Checked	Authorised	
1:800	CW Date 20.04.01	MW Date 20.04.01	Date 18/5/01	A3

Drawing Number: A71430/GTG.200078/Figure 3
Rev: 0

Job Dept. Sub Unique No

Drawing Number A71430/GTG.200078/Figure 3 Rev. 0

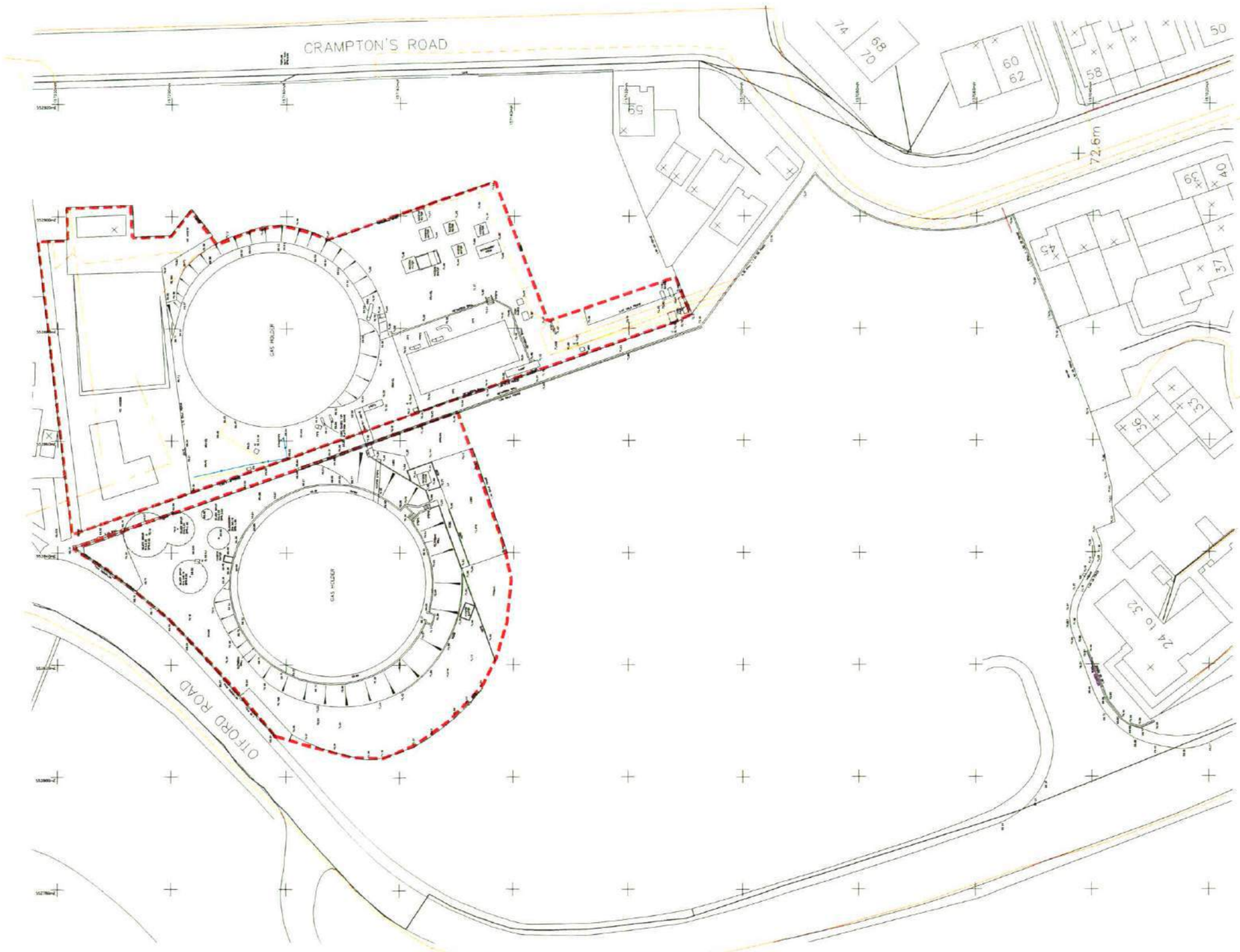
G:\200078\SITE\CAD\FIGURES\TRANSCO\ISO\TC_1.DWG

R.H.Box for client signatures when required

Complete to show purpose of each issue

Main section
Sub section
Detail
Initial issue signatures
Drg. No. & Latest Revision

DO NOT SCALE



INDICATIVE ONLY

KEY

- ELECTRICITY CABLES
- LP GAS MAINS
- MP GAS MAINS
- IP GAS MAINS
- TELEPHONE
- ON SITE WATER
- ON SITE GAS
- TRANSCO SITE BOUNDARIES

0 20m
Scale

WS Atkins

Rev.	Description	By	Date	Chk'd	Auth

Purpose of issue	Rev	Date	Authorised

WS Atkins Consultants Limited ©
Consulting Engineers,
Woodcote Grove,
Ashley Road,
Epsom, Surrey, England, Fax (01372) 740055
KT18 5BW Tel. (01372) 726140

Client
LATTICE PROPERTY HOLDINGS

Project
LATTICE PROPERTY HOLDINGS
CRAMPTONS ROAD, SEVENOAKS

Title
TRANSCO SITE
SITE SERVICES PLAN

Original Scale	Drawn	Checked	Authorised	
1:800	GW	MW		A3
	Date 20.04.01	Date 20.04.01	Date	

Drawing Number
A71430/GTG.200078/Figure 4

Rev
0

Drawing Number A71430/GTG.200078/Figure 4 Rev 0

G:/200078/SKETCHES/DRAWINGS/TRANSCO_REV/FIG 4.DWG

R.H.Box for client signatures when required

Complete to show purpose of each issue

Main section
Sub section
Detail
Initial issue signatures
Drg. No & Latest Revision

Job Dept Sub Unique No

Appendix A
Factual Exerts From Desk Study Report, Cramptons Road, Sevenoaks (Including Adjacent Lattice Site)

Contents of Appendix A

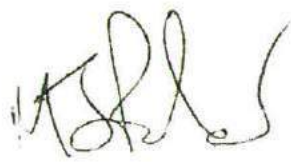
Relevant sections only of the Stanger desk study have been included within this appendix. The sections that are included are as follows:

- The Site Area (pages 6-8)
- Geology, Hydrology and Hydrogeology (pages 8-9);
- Historical development (pages 9-11 and associated historical maps);
- Summary of Previous Site Investigation (page 12);
- Sources of Information;
- Landmark Environmental Setting Information
- Logs and data from Harrison & Company boundary survey, 1992

Stanger Science & Environment
Louisa House 92-93 Edward Street
Birmingham B1 2RE
Telephone (0121) 233 8881
Fax (0121) 233 8899

Desk Study of a BG plc Property at Cramptons Road, Sevenoaks, (Mentor Number 11090)

Prepared by



M. J. Poland

Approved by

M. J. Southall

Prepared for BG plc Property Division
Aviary Court
Wade Road
Basingstoke
Hants
RG24 8GZ

December 1997

Our ref 550/0229/97
Your ref WB229/amr
Document ref 8440/BGAST7/jz

Executive summary

Current Site Status	The site is currently occupied an operational Transco station in the north of the site including two gasholders. The southern half of the site is occupied by three retail warehouses with associated car parking and loading bay areas.
Site History	An gasworks was located on site from at least 1877, production buildings were predominantly located in the south and east part of Area 3 with gasholders located in the north. The site was redeveloped in 1970s.
Geology	The site is underlain by The Folkestone Beds (sands) which may be overlain in the northern part of the site by a thin deposit of Gault Clay. Previous site investigation highlight the presence of Made Ground locally up to 3m below ground level.
Hydrogeology	The Folkestone Beds are a major aquifer from which water is abstracted locally. A water borehole did supply the site but has since been sealed. Water abstraction is undertaken approximately 500m east of the site from the Hythe Beds.
Hydrology	Area 3 is 95% hardstanding or buildings, minimal surface infiltration, Area 1 and 2 infiltration within gravel areas. Wildfowl Reserve west of the site surface water probably in hydraulic continuity with groundwater beneath the site.
Site Investigation	Four boreholes and twenty trial pits, including water and gas monitoring standpipes

This sheet is intended as a summary only of the assessment of the site in relation to ground contamination. It does not provide a definitive engineering analysis.

Contents

1.4 Report Content

This report contains the results of the components of work as listed in section 1.3. Firstly it gives a description of the site location and current site layout and then gives an outline of the geological, hydrogeological and hydrological aspects of the site. The report also reviews historical maps and plans to attempt to locate areas where contamination is most likely to be present. Based on these findings, an assessment has been made on the potential environmental liabilities that may arise due to on site activities.

A site investigation is proposed which would provide information for a risk assessment to more accurately define liabilities. The site investigation would enable an assessment to be made for the need and scope for remedial works.

2 The Site Area

2.1 Site Location and Description

The site is located on Cramptons Road, Sevenoaks, Kent, TN14 5DY at National Grid Reference TQ 528 571 at an approximate elevation of 70m AOD(Figure 1). For the purpose of this report, the site has been sub-divided into three smaller areas which are accessed from Cramptons Road or the A225 (Otford Road). The site is generally level and covers an area of approximately 3 acres. The boundary of the site is approximately 550m in length.

A site visit was undertaken on 10th June 1997, photographs are presented at Appendix B and a site layout plan as Figure 2.

Area 1 is located to the east and north east of the site is accessed via Cramptons Road and is partly occupied by an operational Transco Facility (plate 1). This part of the site is generally surrounded by a wire mesh and concrete post fence topped with barbed wire. The Transco area contains surface and subsurface plant, tanks of ethylene glycol and a gas holder surrounded by gravel and occasional paved areas. Several small brick and prefabricated buildings are noted (plate 2). In the southern part of the area is a fenced area of land with a storage container, the southern boundary of this compound consists of a wooden fence (plate 3). Immediately to the south of this area is a parcel of land, which forms part of the site as defined by BG plc, on which is located three modern residential properties with gardens. To the west of the operational area and north of the main gate is fenced gravel covered compound containing a brick building with patchy grass, trees and surrounding shrubs (plate 4). This area is used by Gas Force, access to the operational areas is through this compound. Hardstandings including built areas cover approximately 25% of the area. Much of the Transco plant is surrounded by loose gravel with other areas composed of soil with rough grass and shrubs.

Area 2 lies to the west of Area 1 and is separated by an alley which divides both Areas 2 and 3 from Area 1. This area is surrounded by a wire mesh and concrete post fence topped with barbed wire and is accessed via a footbridge which connects the Transco area to the east with Area 2 (plate 5). Area 2 is likewise an operational Transco area containing a large circular gas holder covering approximately 30% of the area and surrounded by gravel and a small earth mound to the south and west of the holder.

Area 3 lies to the south and south west of Areas 1 and 2 and is accessed via Otford Road. The area is raised approximately 1.5m above Otford Road and contains three adjoining brick and steel framed warehouse style retail units occupied by 'Do-it-All'. 'Electrical Discount Store' and 'Carpet Right' (plate 6). This area of the site is surrounded on the north eastern and southern boundaries by a two metre high wooden fence and has open access. A small grassed area sloping to Otford Road defines the western boundary of the site. The northern boundary with Area 2 is defined by a wire and concrete post fence topped with barbed wire. The retail units which cover approximately a third of the surface area of this part of the site are surrounded by a tarmacadam carparking area to the front and an area of concrete hardstanding to the rear where a loading bay is located (plate 7). Including the built areas, hardstanding covers approximately 95% of the surface in Area 3, 5% by the grass bank on the western periphery of the area.

No visual evidence of contamination was noted during the site visit.

2.2 Site Surrounds

The site is surrounded on the eastern side by Cramptons Road beyond which lies residential housing. Residential properties are also noted immediately adjacent the southern boundary of the site. To the west of the site lies Otford Road. A wildfowl reserve which is designated a Site of Special Scientific Interest lies approximately 97 metres to the west beyond Otford Road.

From the available data (Appendix C - Envirocheck report) a Landfill is located at National Grid Reference TQ 552850,157150 (Envirocheck Ref 17), approximately 300m north west of the site. The Licence was held by Kent County Council and was authorised to take household, commercial and industrial waste, construction and demolition wastes, excavated natural materials, old vehicles and machinery. The current status of this landfill is unclear, no current valid licence exists and it is assumed that the landfill is no longer operational. Immediately west of this location is a BGS identified landfill (TQ 552401 157400, Envirocheck Ref 20) approximately 515m distant from the site.

2.3 Site Services

The local utility companies were contacted to obtain details of plant and services which may be located on the site. Details of the information obtained is enclosed in Appendix D.

3 Geology, Hydrogeology and Hydrology

3.1 Geology

From the British Geological Society 1:50 000 scale series sheet 287, it appears that the northern half of the site is underlain by Gault Clay which overlies the Folkestone Beds. The southern half of the site is directly underlain by the Folkestone Beds.

Gault Clay is essentially a dark blue or greyish homogeneous clay and where weathered, frequently displays a mottled orange and yellowish colour. The base of the Gault is conformable with the underlying Folkestone Beds and becomes very sandy (glauconitic) with coarse gravel and occasional thin bands of sand.

The Folkestone Beds vary in lithology but consist in the main, of current bedded medium to coarse sands, white or 'silver' with occasional gravel, locally fine grained and silty. A water borehole drilled just south of the site (contained in a report by Travers Morgan in June 1988 - Appendix E) indicates that the Folkestone Beds extend from the surface to approximately 50m below ground level and are underlain by a thin band of clayey sand (Sandgate Beds) which overlie the Hythe Beds, the base of which was not proved.

3.2 Hydrogeology

The hydrogeology has been assessed from the former NRA's Policy and Practice for the Protection of Groundwater, Southern Region (Ref 1).

The Gault Clay is classified as a non aquifer and is negligibly permeable supporting only very minor abstractions. The Folkestone Beds and The Hythe Beds which underlie are highly permeable and classified as major aquifers. They are highly productive strata of regional importance used for large potable abstractions.

Groundwater flow beneath the site in general is likely to be to the west towards the lake in the wildfowl reserve and the River Darent approximately 650m west of the site.

From the available data (Appendix C - Envirocheck Report) there are two licensed groundwater abstraction points within 500m of the site located approximately north

east of the former gasworks. Cramptons Road Pumping Station, operates two boreholes at approximately 464m and 463m from the site (TQ 553301 157260, Ref 4 and 6), both operated by West Kent Water Plc and utilised for Public Water Supply. The abstractions are from the Hythe Beds which underlie the Folkestone Beds, maximum abstraction rate is 21675.33 cubic metres per day.

The South Eastern Gas Board operated a water borehole located probably just south of the present site. Water was extracted from the Folkestone Beds with a maximum yield in 1954 of approximately 91 000 litres per day. The borehole is now sealed. Details of the borehole are enclosed within Appendix E.

3.3 Hydrology

The nearest surface water features are two field drains approximately 60m north west and 90m west respectively. Both converge and flow in a westerly direction and join the River Darent. To the south west of the site is a lake forming a wildfowl reserve on the west side of Otford Road. The River Darent is located approximately 780 metres west. In the former NRAs General Quality Assessment scheme, the River Darent is Class D - 'Fair'. A small partially culverted stream is located approximately 450m north-east of the site. This unidentified stream flows in a north westerly direction joining the River Darrent approximately 1km north of the site. It is considered that those water features including the wildfowl reserve, which overlie the Folkestone beds are in hydraulic continuity with groundwater and hence the groundwater beneath the site.

There are two licensed surface water abstractions recorded at (Appendix C - Envirocheck Report, Ref 3 and 7) 350 and 353 metres to the north east of the site. Abstraction is from the small unidentified stream noted above by Advanced Films Ltd and used for 'industrial cooling and miscellaneous purposes.

Within areas 1 and 2 the majority of surface waters would infiltrate the ground however this would be minimal in Area 3 where hardstandings cover 95% of the surface. A petrol interceptor was not noted within Area 3 at the time of the visit. Surface waters are collected by storm water sewers which are assumed to enter the municipal sewer system.

4 Historical Development

The site history has been assessed from the historical plans, as presented at Figures 4 to 13.

In 1877 (Figure 4), a gasworks was present occupying Area 3. One circular

structure is noted to the south of the Area 2 and was probably located where the current retail premises now stand other unidentified structures occupy the southern part of Area 3. Areas 1 and 2 appear undeveloped. A footpath is located to the east of the gasworks along the line of the current alley separating Area 1 and 2. Otford Road was present in its current position. Surrounding the site were fields. A brickworks and clay pit were located 250m north of the site. The railway ran to the east of the site as at present.

By 1898 (Figure 5), three circular structures, probably gas holders were occupying the site to the west and south west of Area 2. Unidentified buildings probably related to gas production are noted to have occupy the southern half of the site. No further development in the area is noted.

In 1910 (Figure 6) the two northern gasholders are not shown although the circular structure in the centre of the site is present surrounded by an embankment. The buildings to the north-west of the circular structure which were noted on earlier maps are probably residential cottages. The site was linked to the railway by a "tramway" entering the site from the south-east. A single "tank" is noted within area 2. Some buildings appear to the south of the site and were probably part of a domestic development. A brewery had been constructed to the south east of the site. north of the railway line.

By 1936 (Figure 7), the central circular structure had been demolished. A third large gas holder, had been constructed within Area 2 with two possibly new holders located to the south-west of Area 2. Several structures labelled as tanks are shown including two new tanks immediately south-west of the new holder along the boundary of Area 1 and 2. Some new unidentified gasworks buildings were also located to the south of the current site boundary. Area 1 remained undeveloped however to the north, east and south of this area new residential developments are evident. Approximately 250m east of the site was the Sevenoaks Water Works including a groundwater pumping borehole.

A site plan dated 1949 (Figure 8) show the layout of the site and the location of gasworks buildings. The majority of the buildings associated with the production of gas were located along the eastern boundary of Area 2 and 3 and on the southern boundary of Area 3. Other structures located in the west of the site were probably ancillary buildings, residential houses and offices. Identified gasworks structures include retort house, condensers, compressor houses, benzole plant, purifiers and workshops and purifiers. A third gasholder and a governor house was now located within Area1. An unidentified circular structure was located behind the workshops.

An undated aerial photograph (Figure 9) shows the western area of the central portion of the site, the area covered is marked on Figure 8. This photograph shows the gasholder located to the east of some residential properties. The holder which

was empty at the time appears to have been constructed with the base below ground level. The workshops are shown to the left of the photograph with an above ground tank located to the rear which probably represents the unidentified circular structure noted in Figure 8. Apart from the rear of the residential properties where some vegetation was noted this area of the site appeared covered by hardstandings. hardstandings.

A site plan enclosed within Travers Morgan Report, Appendix E, provides further details of the uses of on-site structures. Most notably two tar tanks are shown. The first is the above ground circular tank noted in Figures 8 and 9. The second is believed to have been located below ground to the north of the Exhauster house and was essentially rectangular in plan. An underground pipe appears to connect the tar tank to the pump house located within the workshop area.

No further developments are noted on the map dated 1961 (Figure 10). A gravel pit is noted approximately 500m south-west of the site.

By 1968 (Figure 11) the some of the gasworks buildings in the east and south of the site had been removed although no further developments were noted. The tramway is still evident to the south of the site with further housing development to the east beyond the railway line.

The map dated 1975 (Figure 12) indicates that the tram line had been removed. To the west was a lake associated with the former gravel pit which is now the Wildfowl Reserve. No further major developments are evident either to the site or the areas surrounding the site.

Figure 13, a British Gas South Eastern plan dated 1985, indicates that many of the gasworks structures had been demolished. Some residential houses and other unidentified buildings are still evident in the west of the site. Two gasholders are present in Area 1 and 2. No. 107 Cramptons Road had been constructed within the north-east corner of Area 1 and other structures presently located within Area 1 are noted.

Since 1985 the buildings in the west of the site have been demolished and the current retail complex has been built. The current southern boundary of the site has been established with residential properties located to the south on former gasworks land. Area 1 and 2 remain Transco operational areas. Within Area 1 the disused land to the south-east of the operational area appears to have remained undeveloped. however to the south of this some residential development, fronting Cramptons Road, has taken place on former gasworks land which appeared to have remained undeveloped until relatively recently.

5 Review of Previous Reports

Two previous reports were obtained from BG Research and Technology in Loughborough, these were;

- Report on Ground Contamination with Proposed Remedial Measures - June 1988, undertaken by Travers Morgan for British Gas South Eastern.
- A boundary Survey undertaken by Harrison and Company - November 1992.

A copy of both reports are presented in Appendix E.

5.1 Travers Morgan Report

This report was concerned with the redevelopment of a corner of land located immediately south of Area 1, now a residential area. Information contained in the report, not sourced, indicates that the site may have been used as a coal storage area. Three trial pits were dug, to a maximum depth of 3.3m, from which samples were obtained for chemical analysis. The strata encountered included Made Ground with some ash, coke and clinker fragments overlying probably natural sand.

Contamination levels were found to be generally below ICRCL trigger levels for domestic usage although elevated levels of arsenic, copper, lead, zinc and sulphate were noted within the Made Ground only. Recommendations for development included the use of a class 2 concrete to withstand sulphate attack and the removal of all fill materials.

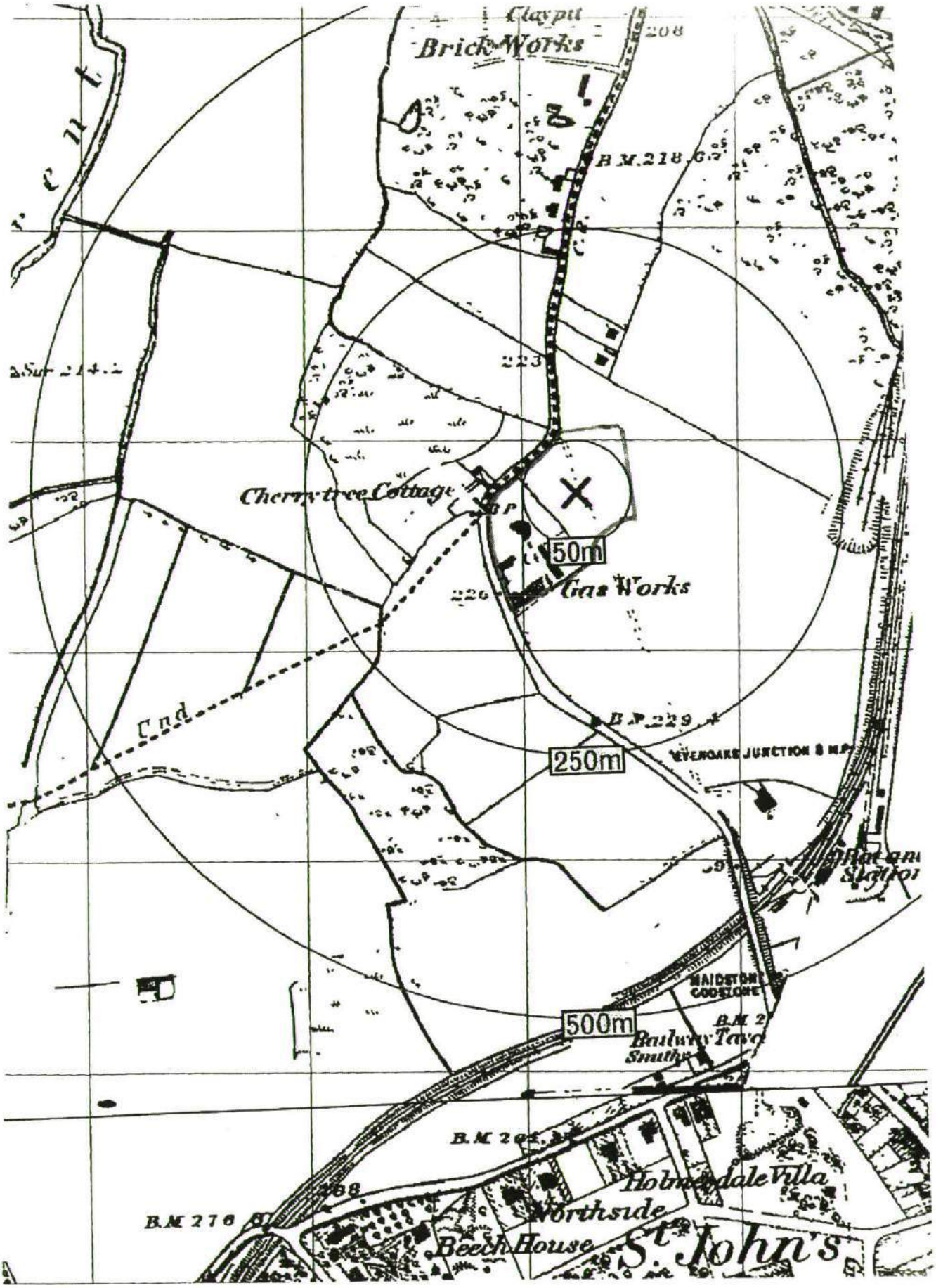
5.2 Harrison and Company Report

This was a report on a boundary survey conducted in 1992 and covered Area 1 and 2 only, no investigative excavations were undertaken in Area 3. The investigation involved the excavation of twenty trial pits around the perimeter of Area 1 and 2. Strata encountered included Made Ground, possibly up to 3m below ground level and was generally composed of locally relatively non-contaminated looking brown silty clays and orange brown silty sands to mixed grey and brown clay and sand with concrete bricks and wood. Within TPs 2, 6, 7, 8, 11, excavations within the Made Ground were accompanied by organic/tar odours. Tar staining was noted within TPs 7, 8, 11 and 12. The material encountered at greater depths, which is probably natural strata, included a firm brown very sandy clay generally underlain by an orange brown silty sand which may represent the basal bed of the Gault Clay underlain by sand of the Folkestone Beds.

Contamination testing indicated relatively low levels of contaminative species within the majority of samples tested. Samples recovered most notably from TPs 6, 7, 8,

10, 11, 12 displayed concentrations of contamination exceeding ICRCL threshold trigger levels for non-sensitive usage including landscaped areas, buildings and hard cover areas. Some very low pHs were recorded within TP7 and 6 (2.85 and 3.50) and phenol concentrations reached a maximum of 1313mg/kg within TP11 at a depth of 0.5 to 1m.

In general the most contaminated area appears to be located in the north-west to south-east area beyond the gasholder occupying Area 2. Contaminating materials appear predominantly contained within the Made Ground although locally within TP2 a slight diesel odour was noted within what is considered to be natural strata.

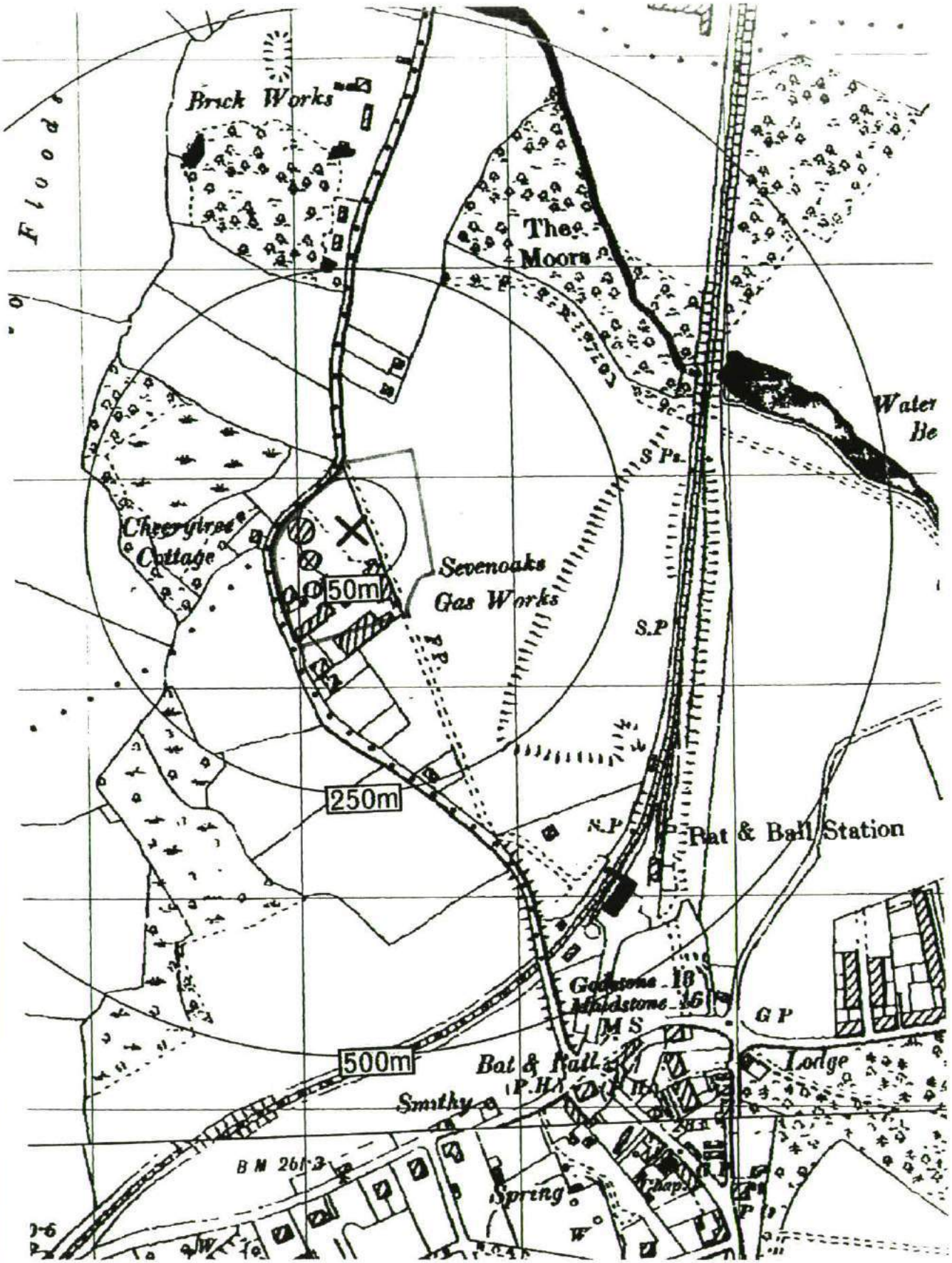


Stanger

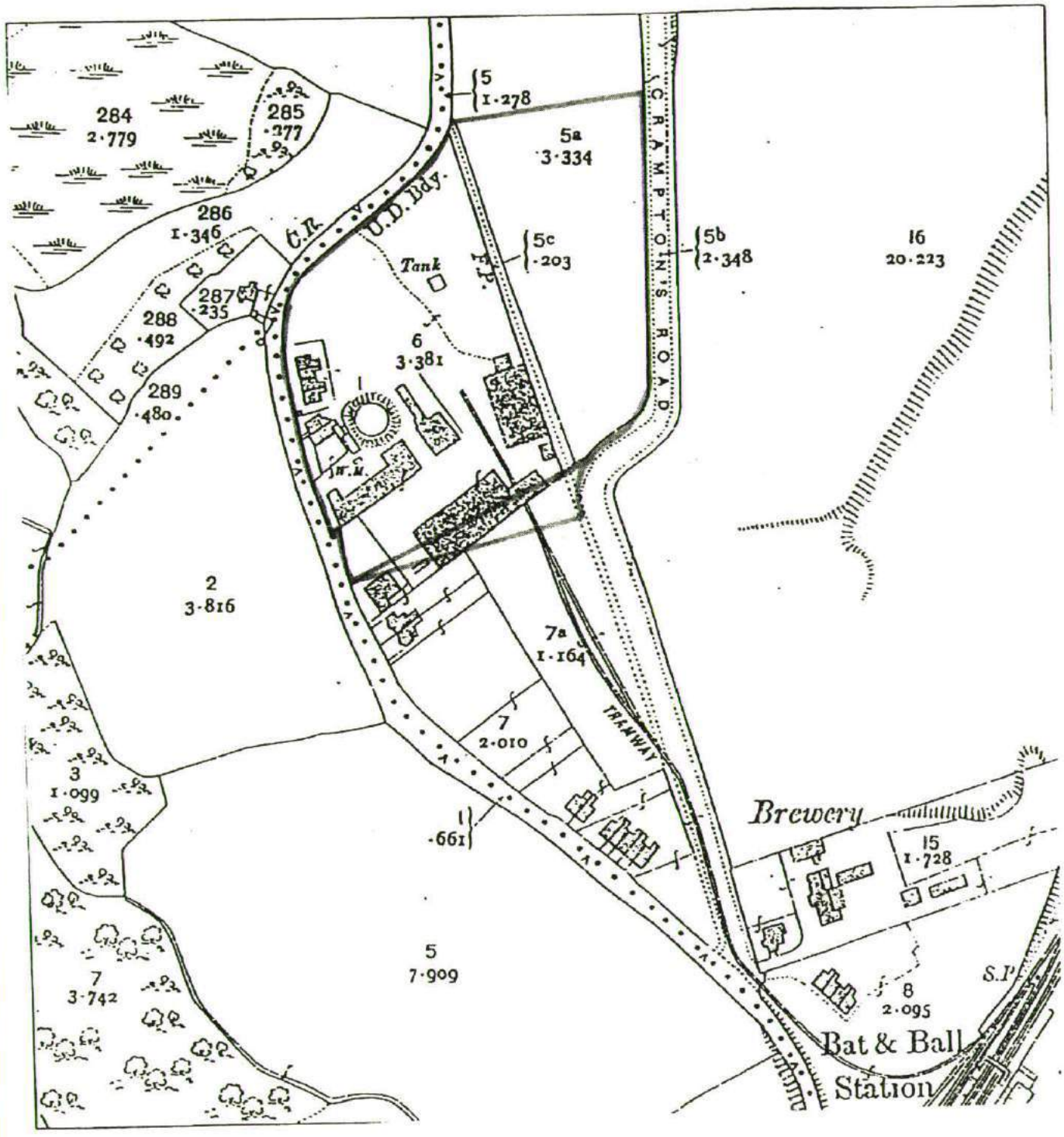
Louisa House, 92/93 Edward St
Birmingham B1 2RE

Site in 1877

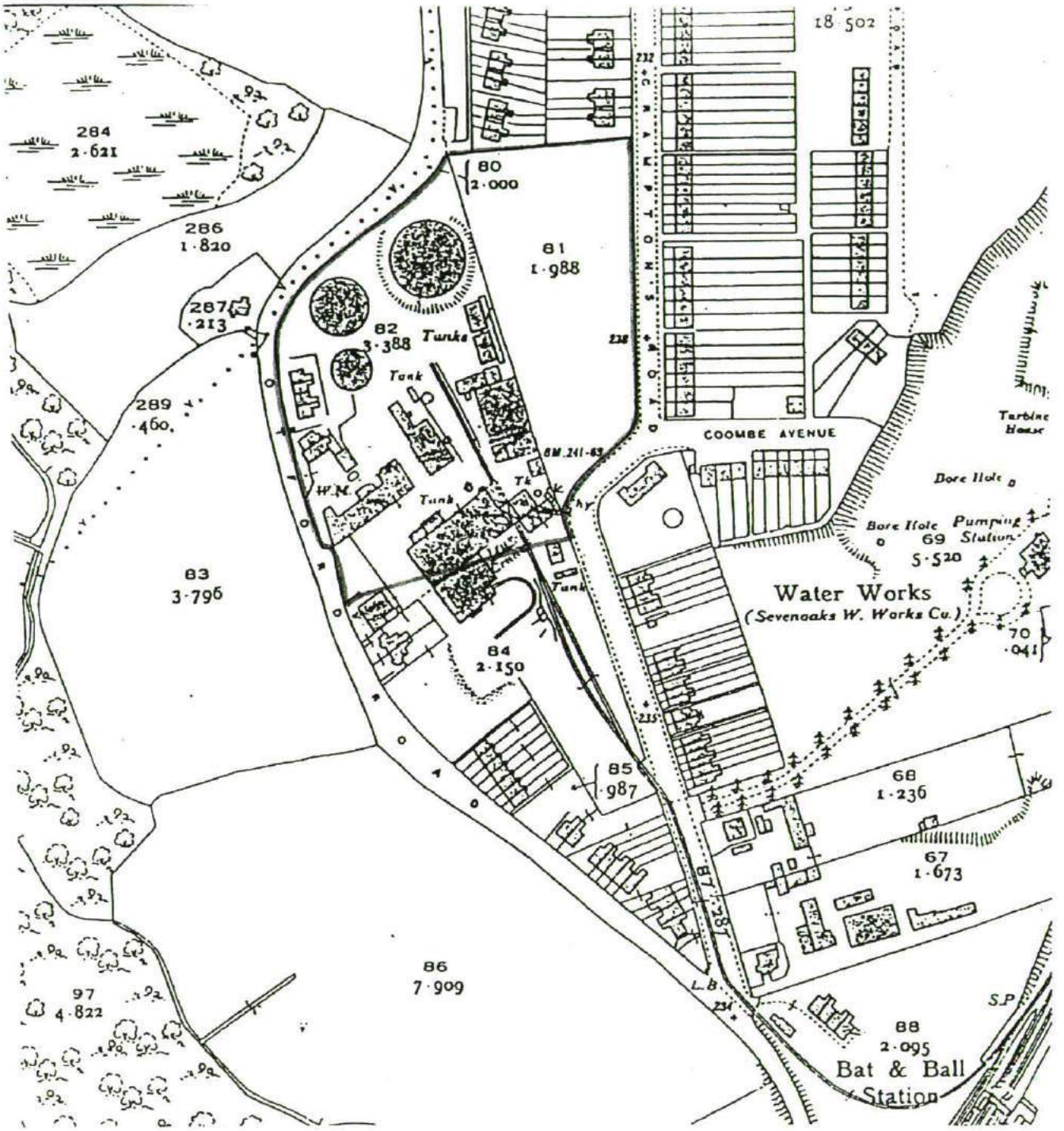
Title				
Site: Cramptons Road	550\0229 Project No	NTS Scale	DEC97 Date	4 Figure



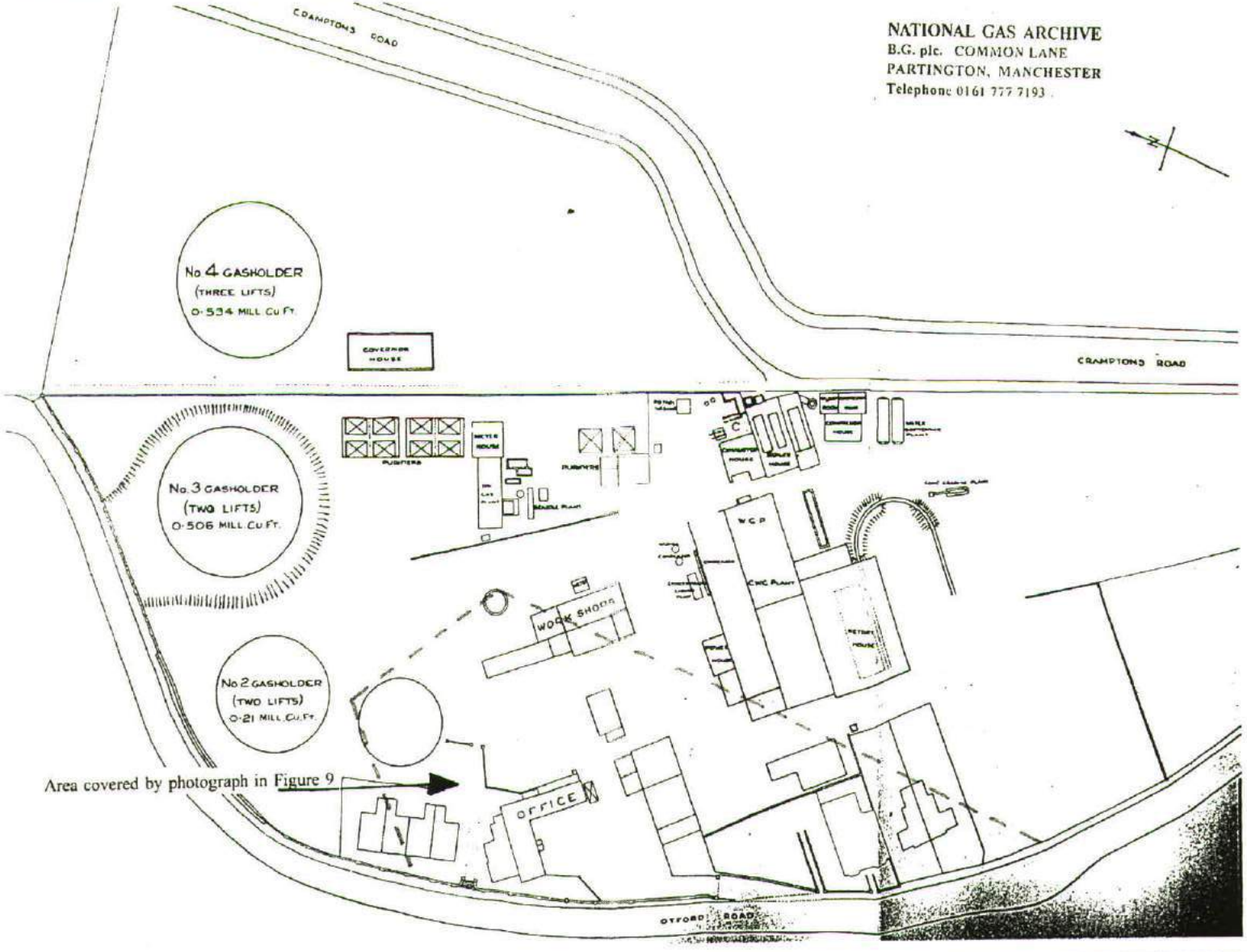
Stanger Lousa House, 92/93 Edward St Birmingham B1 2RE	Site in 1898 Title				
	Cramptons Road Site	550\0229 Project No.	NTS Scale	DEC97 Date	5



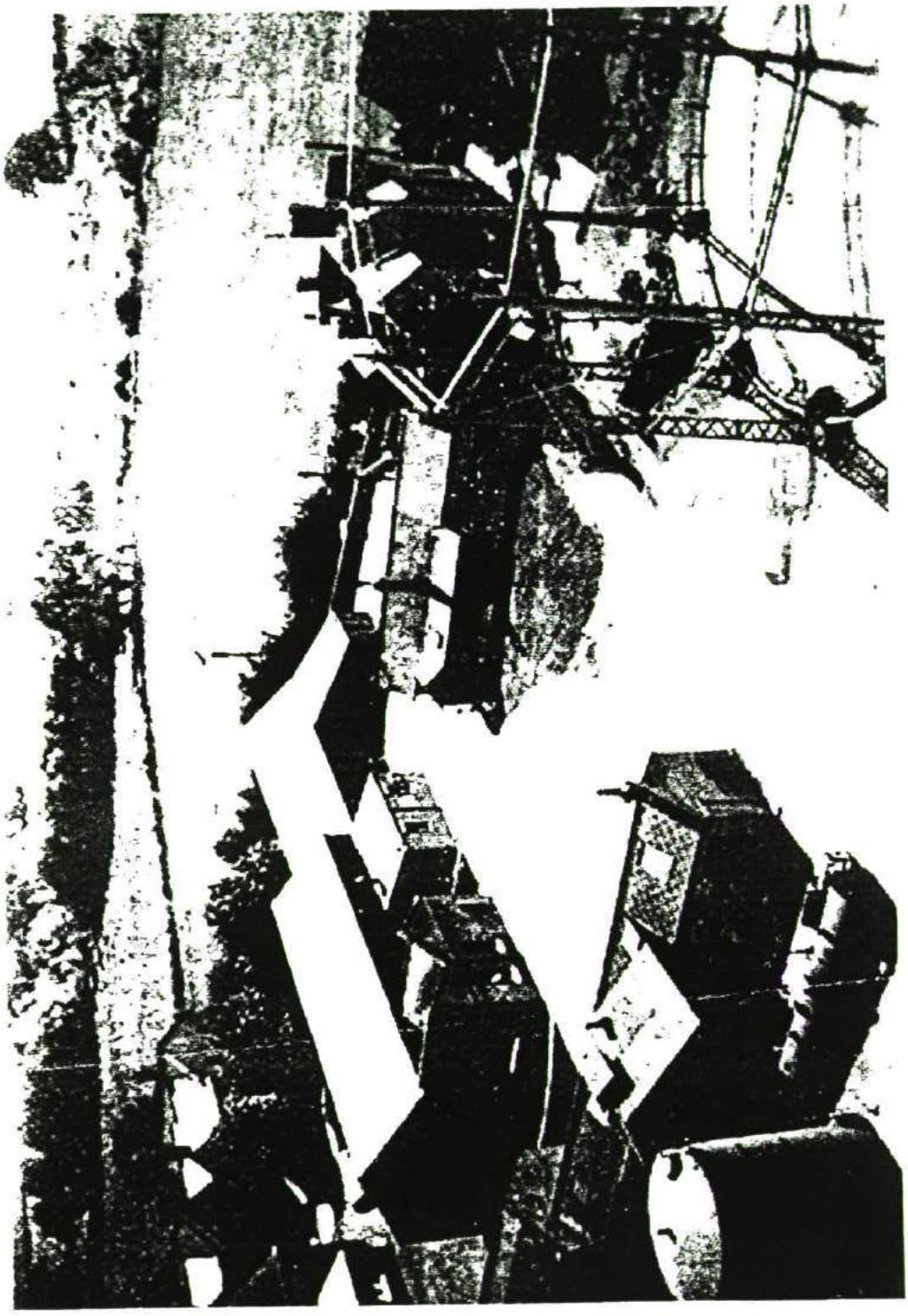
Stanger Lousa House, 92/93 Edward St. Birmingham B1 2RE	Site in 1909 Title				
	Cramptons Road Site	550\0229 Project No.	NTS Scale	DEC97 Date	6 Figure



Stanger Louisa House, 92/93 Edward St Birmingham B1 2RE	Title: **Site in 1936**				
	Site: **Cramptons Road**	Project No.: **550\0229**	Scale: **NTS**	Date: DEC97	7



Stanger Science & Environment Louisa House, 92/93 Edward St Birmingham, B1 2RE	Site Plan dated 1949 Title Cramptons Road, Sevenoaks Site	NTS Scale	550/0229/97 Project Number	Dec 1997 Date	8 Figure



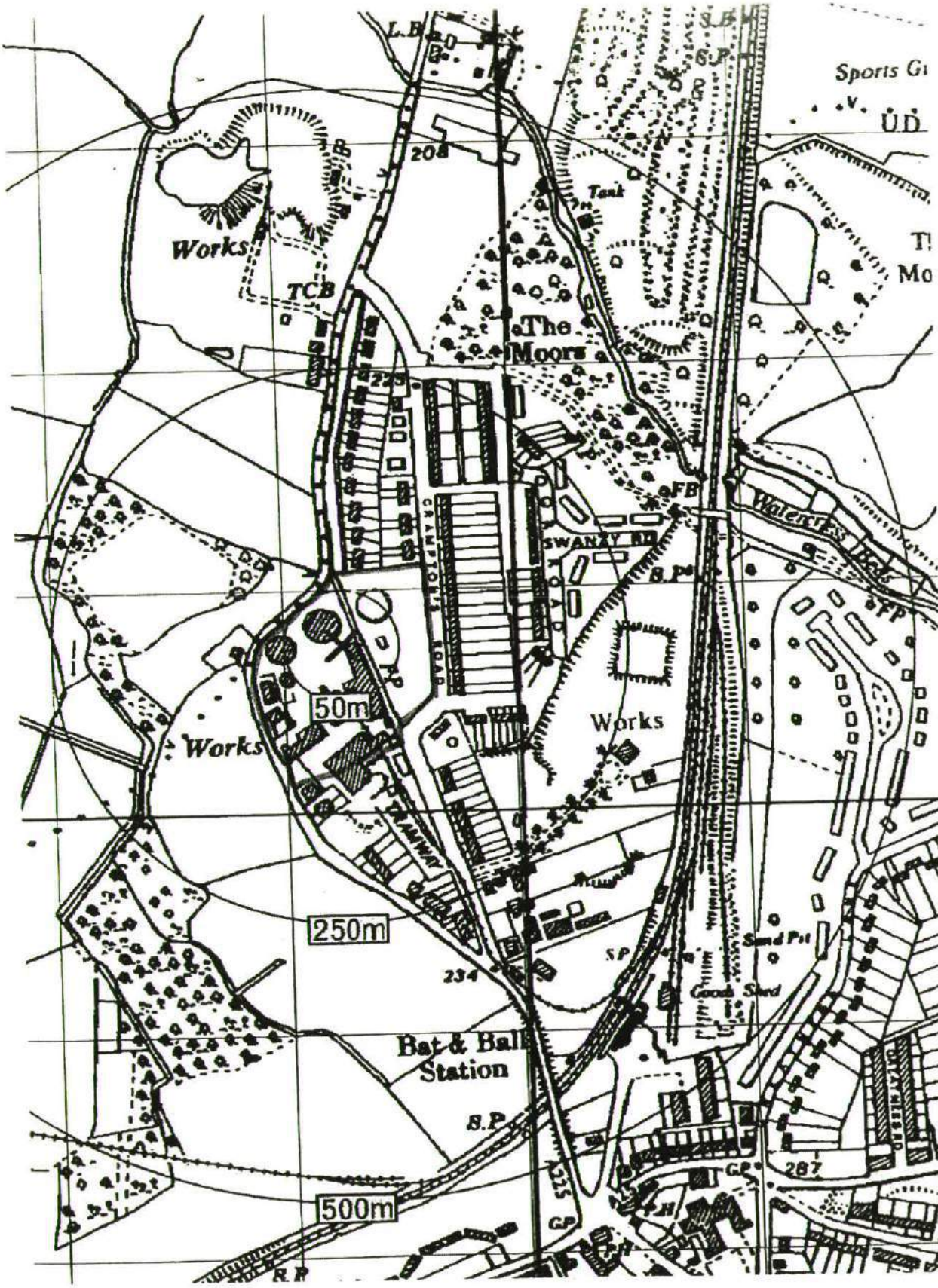
Stanger

Louisa House 72-93 Edward St

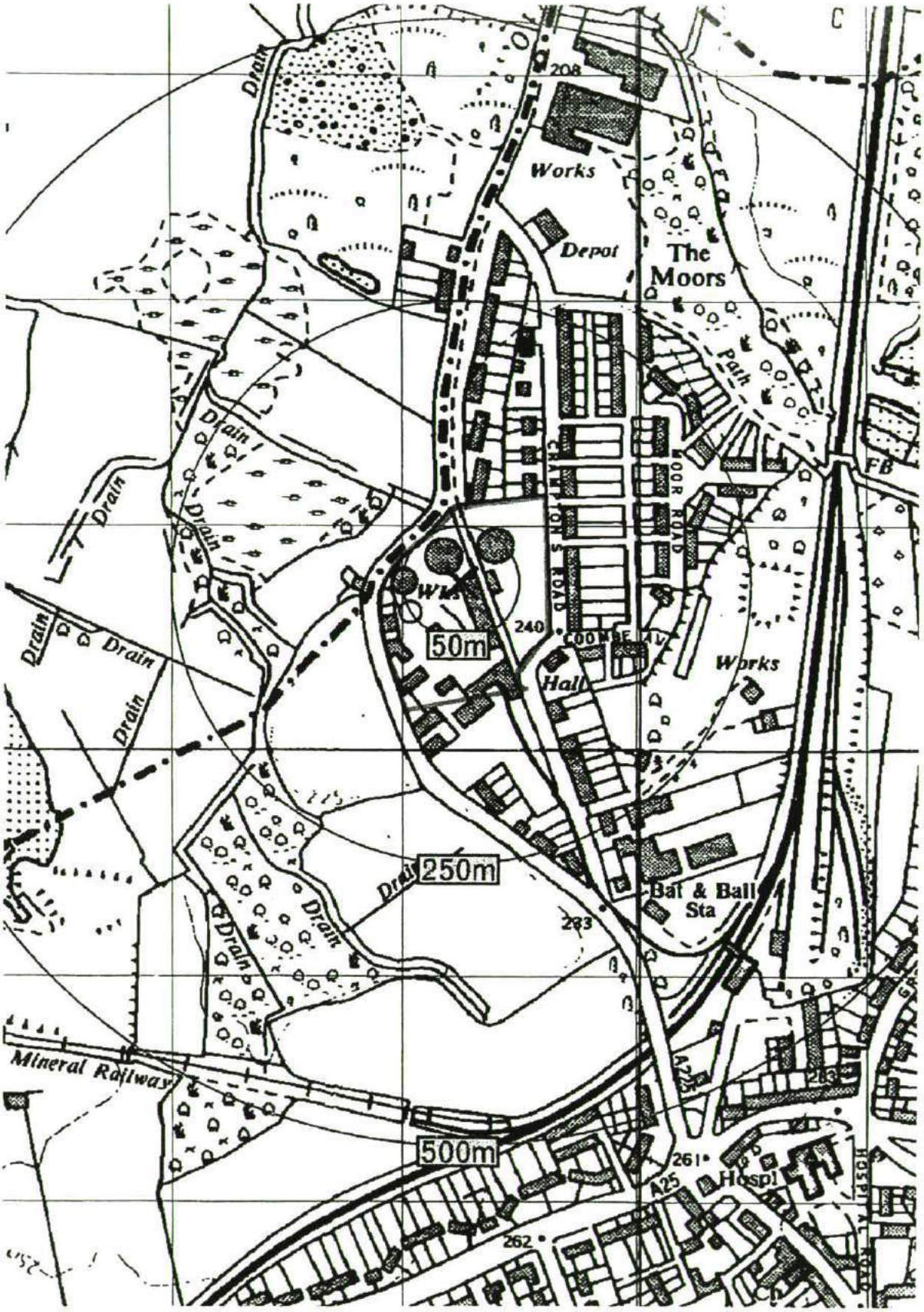
Birmingham B1 2RB

Title: **Undated Aerial photograph**

Site	Project No.	Scale	Date	Figure
Cramptons Road	550\0229	NTS	DEC97	9



Stanger Louisa House, 92/93 Edward St Birmingham B1 2RE	Site in 1961				
	Title Cramptons Road Site	550\0229 Project No.	NTS Scale	DEC97 Date	10 Figure



Stanger

Louisa House, 92/93 Edward St
Birmingham B1 2RE

Site in 1968

Title

Cramptons Road

Site

550\0229

Project No.

NTS

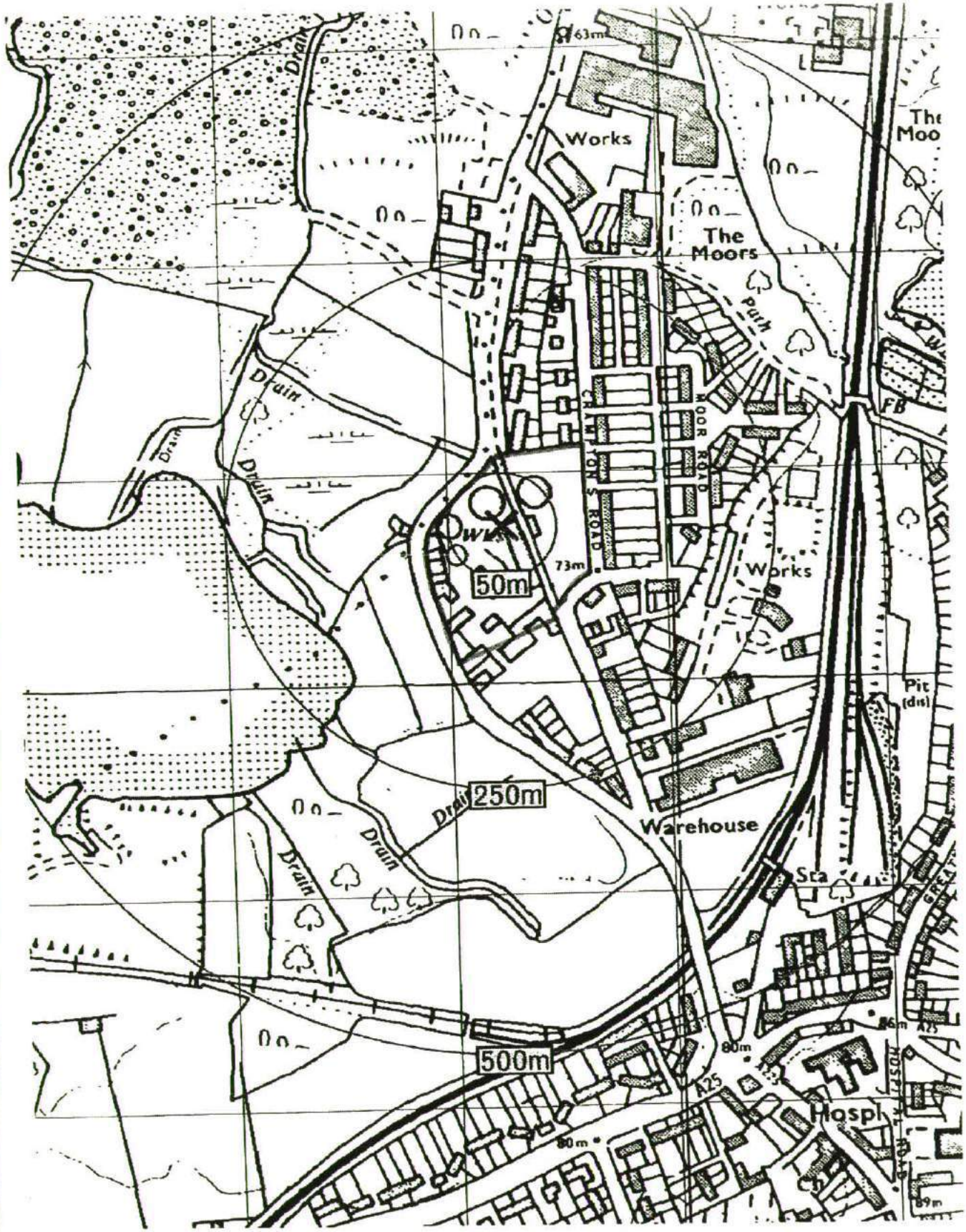
Scale

DEC97

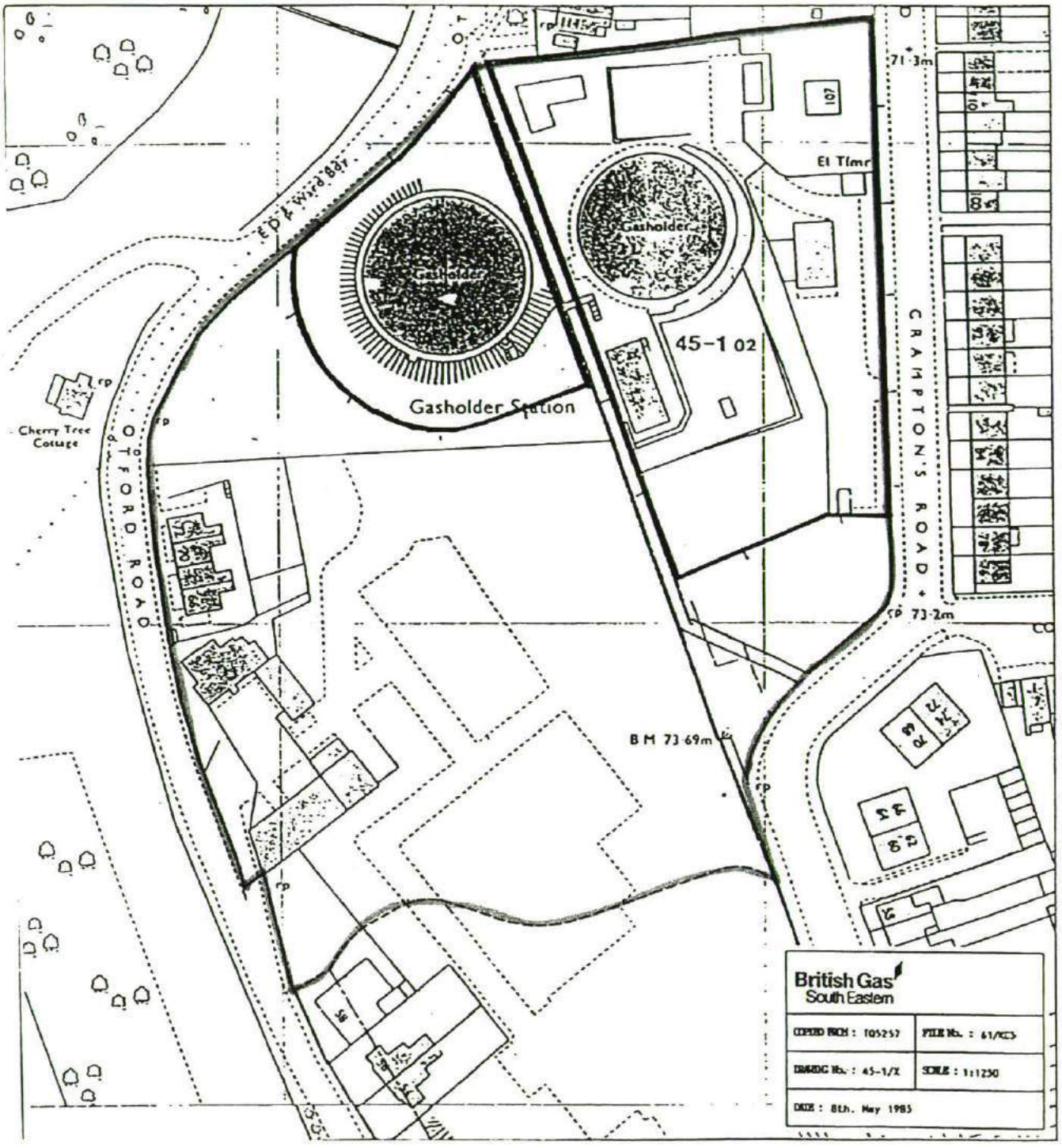
Date

11

Figure



Stanger Lousa House, 92/93 Edward St. Birmingham B1 2RE	Site in 1975 Title				
	Cramptons Road Site	550\0229 Project No.	NTS Scale	DEC97 Date	12 Figure



N

Stanger Lousa House, 92/93 Edward St. Birmingham B1 2RE	Site in 1985 Title				
	Cramptons Road Site	550\0229 Project No.	NTS Scale	DEC97 Date	13 Figure

Sources of Information

Historic Information:
British Gas Title Deeds;
Tim Fieldsend
British Gas plc
Aviary Court
Wade Road
Basingstoke
Hants, RG24 8GZ
Tel: 01256 308803

BG plc Gas Research and Technology
Ashby Road
Loughborough
Leicestershire
LE11 3GR
Tel: 01509 282000

National Gas Archives
BG plc
Common Lane
Partington
Manchester
M31 4BR
Tel 0161 7777193

Sarah Shrimpton
Landmark Information Group Ltd
7 Abbey Court
Eagle Way
Exeter, EX2 7HY
Tel: 01392 441700

Regulatory Authority Data:
Sarah Shrimpton
Landmark Information Group Ltd
7 Abbey Court
Eagle Way
Exeter, EX2 7HY
Tel: 01392 441700

Geological/Hydrogeological Information:
British Geological Society Geology Map, 1:50,000 scale, sheet 176 Lowestoft.

Environmental Setting

How To Read This Table	
MAPid	This table provides details of the Setting of the site and within a 1000m proximity zone. The Map IDs refer to the EnviroCheck Site Sensitivity Map. Landmark has geocoded data to 1m where possible. Where data is not geocoded to 1m accuracy, data is to +/-100m accuracy. Landfill sites have been given a 500m buffer and the estimated distance from the site is to the nearest arc formed by this buffer. We therefore recommend all points are cross referenced with a map, the location in the detail box and the NGR supplied.

Map ID	Details	Estimated Distance from Site	National Grid Reference
1	*Licenced Abstraction Point* **Operator** S W Kenton & Sons **Licence No** 4/0129/ /SR **Location** Worth **Abstraction** Agriculture (General) **Source** Stream **Daily Rate** 18.18 cubic metres **Yearly Rate** 13.6 cubic metres **Details** Delf Stream	713	552291 156710
2	*Licenced Abstraction Point* **Operator** Royal St George'S Golf Club **Licence No** 4/0182/ /SR **Location** Sandwich **Abstraction** Spray Irrigation **Source** Stream **Daily Rate** 545.46 cubic metres **Yearly Rate** 23863.6 cubic metres **Details** North Stream	953	553131 158060
3	*Licenced Abstraction Point* **Operator** Advanced Films Ltd **Licence No** 1/0214/ /S **Location** Sevenoaks **Abstraction** Industrial Cooling (Miscellaneous) **Source** Stream **Daily Rate** 10.91 cubic metres **Yearly Rate** 3982.3 cubic metres **Details**	353	553141 157350
4	*Licenced Abstraction Point* **Operator** West Kent Water Plc **Licence No** 1/0143/ /GR **Location** Pumping Station, Cramptons Road **Abstraction** Public Water Supply **Source** Groundwater **Daily Rate** 21675.33 cubic metres **Yearly Rate** 6444682.4 cubic metres **Details** H2B Hythe Beds	464	553391 157260
5	*Licenced Abstraction Point* **Operator** S W KENTON & SONS **Licence No** 4/0129/ /SR **Location** Worth **Abstraction** Agriculture (General) **Source** Stream **Daily Rate** 18.18 cubic metres **Yearly Rate** 13.6 cubic metres **Details** Delf Stream	716	552241 156705

Map ID	Details	Estimated Distance from Site	National Grid Reference
6	*Licenced Abstraction Point* **Operator** WEST KENT WATER PLC **Licence No** 1/0143/ /GR **Location** Pumping Station, Cramptons Road **Abstraction** Public Water Supply **Source** Groundwater **Daily Rate** 21675.33 cubic metres **Yearly Rate** 6444682.4 cubic metres **Details** H2B Hythe Beds	463	553301 157255
7	*Licenced Abstraction Point* **Operator** ADVANCED FILMS LTD **Licence No** 1/0214/ /S **Location** Sevenoaks **Abstraction** Industrial Cooling (Miscellaneous) **Source** Stream **Daily Rate** 10.91 cubic metres **Yearly Rate** 3982.3 cubic metres **Details**	350	553141 157345
8	*Licenced Abstraction Point* **Operator** ROYAL ST GEORGE'S GOLF CLUB **Licence No** 4/0182/ /SR **Location** Sandwich **Abstraction** Spray Irrigation **Source** Stream **Daily Rate** 545.46 cubic metres **Yearly Rate** 23863.6 cubic metres **Details** North Stream	948	553131 158055
9	*Surface Water Discharge Consent* **Operator** SHELL U K LTD **Property Type** **Location** Land At Seal Road Self Serve, 126-130 Seal Road, Sevenoaks **Catchment Area** **Discharge Ref** P 4499/K/T/92 **Issued** 05-JAN-93 **Discharge Type** Surface Water **Dis. Environment** Land/Soakaway **Received Water**	797	553521 156720
10	*Surface Water Discharge Consent* **Operator** Davis Garages **Property Type** **Location** Davis Garages, Otford Road, Sevenoaks **Catchment Area** **Discharge Ref** P 5152/K/T/93 **Issued** 02-MAR-94 **Discharge Type** Site drainage **Dis. Environment** Freshwater Stream/River **Received Water**	453	552903 157600

Map ID	Details	Estimated Distance from Site	National Grid Reference
11	*Surface Water Discharge Consent* Operator TILCON LTD Property Type Location Tilcon, Greatness, Sevenoaks Catchment Area Discharge Ref T304N/S/81 Issued 01-MAR-81 Discharge Type Unknown Dis. Environment Freshwater Stream/River Received Water	852	553701 157100
12	*Surface Water Discharge Consent* Operator J SAINSBURY Property Type Location Otford Paper Products, Otford Road, Sevenoaks Catchment Area Discharge Ref T393N/S/82 Issued 01-APR-91 Discharge Type Trade Effluent Discharge-Condensate Water Dis. Environment Freshwater Stream/River Received Water	337	553121 157350
13	*Surface Water Discharge Consent* Operator Otford Group Ltd Property Type Location Vestry Road, Otford Catchment Area Discharge Ref TCP2357/S/88 Issued 01-APR-91 Discharge Type Surface Water Dis. Environment Freshwater Stream/River Received Water	327	553141 157300
14	*Surface Water Discharge Consent* Operator Hampshire County Council Property Type Location Idv Site, Old Otford Road, Sevenoaks Catchment Area Discharge Ref P6286/K/T/96 Issued 19-JUL-96 Discharge Type Trade Effluent Discharge-Site Drainage Dis. Environment Freshwater Stream/River Received Water	475	553001 157600
15	*Site of Special Scientific Interest*	732	553407 157525
16	*Site of Special Scientific Interest*	97	552779 157215

HARRISON & COMPANY

(Soils and Foundation Engineers) Limited.
117 Beulah Road, Thornton Heath, Surrey CR7 8JJ.
Telephone 081 653 9168 Fax 081 768 0628

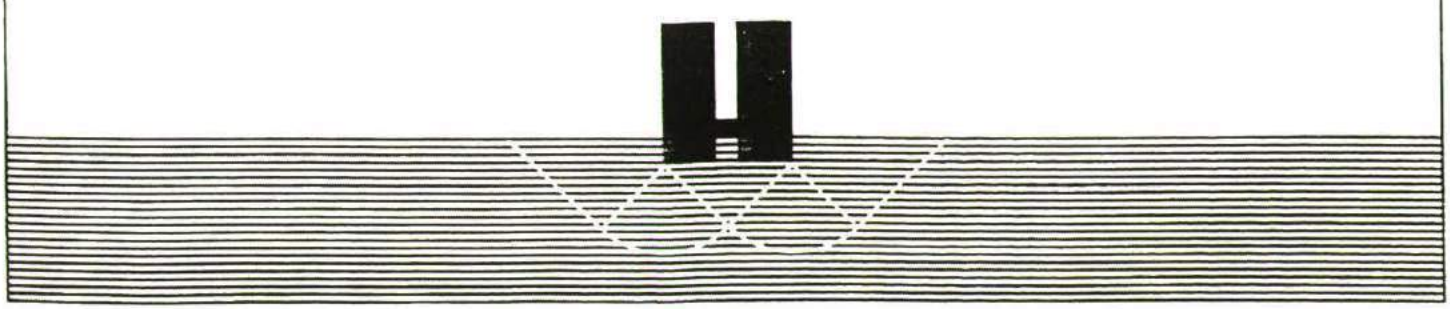
Directors: David Harrison B.Sc.(Eng), F.G.S., Allen Davis M.Sc., Ph.D., D.Sc., Malcolm Price M.Sc., C.Eng., M.I.C.E., F.G.S., Pauline Clarke (Secretary). Associate: Michael Hoar B.Sc., C.Geol., F.G.S.
Consultant: Eric Steger B.Sc., C.Eng., F.I.C.E., F.I.Struct.E., F.G.S.
Registered in England No. 1306165. Registered Office: 50 Unthank Road, Norwich.

REPORT No. : **C1935 / 22**

DATE : **November 1992**

LOCATION : **Otford Road, Sevenoaks, Kent.**

CLIENT : **British Gas (South Eastern) plc.**



HARRISON & COMPANY	Trial Pit Record	
	Location : Otford Road, Sevenoaks, Kent.	
Client : British Gas (South Eastern).	Date : 6/8/92	Job No. : C1935/22
Plant : J.C.B. Excavator	Diameter : 0.70m x 1.50m	Trial Pit No. : 1

Soil Description	Depth below Ground Level (m)	Sample Type	Sample Depth (m)	Notes (e.g. Colour, Smell)
	0.0			
Gravel and vegetation over soft to firm brown fine sandy silty CLAY containing frequent roots. (Possibly FILL?).		D1/J1	0.5-1.0	
		D2/J2	1.5-2.0	
	2.0			
Yellow-brown silty fine to coarse SAND. (Possibly FILL?).		D3/J3	2.5-3.0	
	3.0			
Trial Pit Complete at 3.0m.				

Remarks :

Groundwater was not encountered.

Trial pit relatively stable on completion.

Key :

D : Disturbed Sample

J : Jar Sample

W : Water Sample

HARRISON & COMPANY

Trial Pit Record

Location : Otford Road, Sevenoaks, Kent.

Client : British Gas (South Eastern).

Date : 6/8/92

Job No. : C1935/22

Plant : J.C.B. Excavator

Diameter : 0.70m x 1.50m

Trial Pit No. : 2

Soil Description	Depth below Ground Level (m)	Sample Type	Sample Depth (m)	Notes (e.g. Colour, Smell)
	0.0			
Vegetation over TOPSOIL (Grey-brown silty CLAY containing frequent roots).				
	0.5	D1/J1	0.5-1.0	
Orange-brown silty fine to medium SAND. (Possibly FILL?).		D2/J2	1.5-2.0	
	2.2			
Green-grey silty fine to coarse SAND. (Possibly FILL?).		D3/J3	2.5-3.0	1 : There was a slight oil / diesel (?) smell between 2.2m and 3.0m depth.
	3.0			
Trial Pit Complete at 3.0m.				

Remarks :

Groundwater was not encountered.

Trial pit relatively stable on completion.

Key :

D : Disturbed Sample

J : Jar Sample

W : Water Sample

HARRISON & COMPANY

Trial Pit Record

Location : Otford Road, Sevenoaks, Kent.

Client : British Gas (South Eastern).	Date : 6/8/92	Job No. : C1935/22
Plant : J.C.B. Excavator	Diameter : 0.70m x 1.50m	Trial Pit No. : 3

Soil Description	Depth below Ground Level (m)	Sample Type	Sample Depth (m)	Notes (e.g. Colour, Smell)
	0.0			
Vegetation over TOPSOIL (Grey-brown silty clay containing frequent roots)	0.2			
Orange-brown very clayey silty fine to coarse SAND, becoming brown and less clayey with depth. (Possibly FILL?).		D1/J1	0.5-1.0	
		D2/J2	1.5-2.0	
	1.7			
Orange-brown silty fine to coarse SAND. (Possibly FILL?).		D3/J3	2.5-3.0	
	3.0			
Trial Pit Complete at 3.0m.				

Remarks :

Groundwater was not encountered.

Trial pit relatively stable on completion.

Key :

D : Disturbed Sample

J : Jar Sample

W : Water Sample

HARRISON & COMPANY	Trial Pit Record		
	Location : Otford Road, Sevenoaks, Kent.		
Client : British Gas (South Eastern).	Date : 6/8/92		Job No. : C1935/22
Plant : J.C.B. Excavator	Diameter : 0.70m x 1.50m		Trial Pit No. : 4

Soil Description	Depth below Ground Level (m)	Sample		Notes (e.g. Colour, Smell)
		Type	Depth (m)	
	0.0			
TARMAC.	0.05			
Soft to firm brown silty CLAY. (Possibly FILL?).	0.6	D1/J1	0.5-1.0	
Orange-brown silty fine to coarse SAND and fine GRAVEL. (Possibly FILL?).	1.2			
Firm orange-brown very fine sandy silty CLAY. (Possibly FILL?).		D2/J2	1.5-2.0	
Firm grey-brown silty CLAY. (Possibly FILL?).	1.7			
White-brown silty fine to coarse SAND. (Possibly FILL?).	2.3	D3/J3	2.5-3.0	
Trial Pit Complete at 3.0m.	3.0			

Remarks :

Groundwater was not encountered.

Trial pit relatively stable on completion.

Key :

D : Disturbed Sample

J : Jar Sample

W : Water Sample

HARRISON & COMPANY	Trial Pit Record	
	Location : Otford Road, Sevenoaks, Kent.	
Client : British Gas (South Eastern).	Date : 6/8/92	Job No. : C1935/22
Plant : J.C.B. Excavator	Diameter : 0.70m x 1.50m	Trial Pit No. : 5

Soil Description	Depth below Ground Level (m)	Sample Type	Sample Depth (m)	Notes (e.g. Colour, Smell)
	0.0			
FILL (Grey slightly clayey silt with frequent fine shale fragments).	0.2			
Soft to firm brown very sandy silty CLAY. (Possibly FILL?).	0.6	D1/J1	0.5-1.0	
Orange-brown silty fine to coarse SAND and fine GRAVEL. (Possibly FILL?).	1.1			
Orange-brown silty fine to coarse SAND. (Possibly FILL?).		D2/J2	1.5-2.0	
		D3/J3	2.5-3.0	
	3.0			
Trial Pit Complete at 3.0m.				

Remarks :

Groundwater was not encountered.

Trial pit relatively stable on completion.

Key :

D : Disturbed Sample

J : Jar Sample

W : Water Sample

HARRISON & COMPANY

Trial Pit Record

Location : Otford Road, Sevenoaks, Kent.

Client : British Gas (South Eastern).

Date : 7/8/92

Job No. : C1935/22

Plant : J.C.B. Excavator

Diameter : 0.70m x 1.50m

Trial Pit No. : 6

Soil Description	Depth below Ground Level (m)	Sample Type	Sample Depth (m)	Notes (e.g. Colour, Smell)
	0.0			
FILL (Brown slightly sandy silty clay containing frequent concrete, timber and brick fragments).		D1/J1	0.5-1.0	
		D2/J2	1.5-2.0	
	1.8			1 : There was a strong organic/tar (?) smell and occasional black staining below 1.8m depth.
Firm blue-grey, black in parts, silty CLAY. (Possibly FILL?).	2.0			
Trial Pit Complete at 2.0m.				

Remarks :

Groundwater was not encountered.

Trial pit relatively stable on completion.

Trial pit terminated at 2.0m due to an obstruction (?).

Key :

D : Disturbed Sample

J : Jar Sample

W : Water Sample

HARRISON & COMPANY

Trial Pit Record

Location : Otford Road, Sevenoaks, Kent.

Client : British Gas (South Eastern).

Date : 7/8/92

Job No. : C1935/22

Plant : J.C.B. Excavator

Diameter : 0.70m x 1.50m

Trial Pit No. : 7

Soil Description	Depth below Ground Level (m)	Sample Type	Sample Depth (m)	Notes (e.g. Colour, Smell)
	0.0			
FILL (Grey-brown slightly sandy silty clay with frequent brick, coke and concrete fragments).		D1/J1	0.5-1.0	
FILL (Yellow-brown silty fine to coarse sand).	0.7			
FILL (Black silty fine to coarse sand. Stained with black tar (?) in parts).	0.8			1 : There was a strong tar (?) smell below 0.8m depth.
FILL (Black-grey silty clay).	1.3	D2/J2	1.5-2.0	
FILL (Black silty ash).	1.7			
Black to brown silty fine to coarse SAND. (Possibly FILL?).	2.2	D3/J3	2.5-3.0	
Trial Pit Complete at 3.0m.	3.0			

Remarks :

Groundwater was not encountered.

Trial pit relatively stable on completion.

Key :

D : Disturbed Sample

J : Jar Sample

W : Water Sample

HARRISON & COMPANY	Trial Pit Record		
	Location : Otford Road, Sevenoaks, Kent.		
Client : British Gas (South Eastern).	Date : 7/8/92		Job No. : C1935/22
Plant : J.C.B. Excavator	Diameter : 0.70m x 1.50m		Trial Pit No. : 8

Soil Description	Depth below Ground Level (m)	Sample		Notes (e.g. Colour, Smell)
		Type	Depth (m)	
	0.0			
FILL (Grey-brown sandy silty clay with frequent brick and coke fragments).				1 : There was a strong tar (?) smell throughout the excavation.
	0.6	D1/J1	0.5-1.0	
FILL (Black silty fine to coarse sand. Stained with black tar (?) in parts).				
	0.9			
FILL (Black-grey silty clay).				
	1.3			
		D2/J2	1.5-2.0	
FILL (Black silty ashy clay).				
		D3/J3	2.5-3.0	
	2.7			
Black to brown silty fine to coarse SAND. (Possibly FILL?).				
	3.0			
Trial Pit Complete at 3.0m.				

Remarks :

Groundwater was not encountered.

Trial pit relatively stable on completion.

Key :

D : Disturbed Sample

J : Jar Sample

W : Water Sample

HARRISON & COMPANY

Trial Pit Record

Location : Otford Road, Sevenoaks, Kent.

Client : British Gas (South Eastern).

Date : 7/8/92

Job No. : C1935/22

Plant : J.C.B. Excavator

Diameter : 0.70m x 1.50m

Trial Pit No. : 9

Soil Description	Depth below Ground Level (m)	Sample Type	Sample Depth (m)	Notes (e.g. Colour, Smell)
	0.0			
FILL (Grey-brown sandy silty clay with frequent brick and coke fragments).		D1/J1	0.5-1.0	
	0.7			
Orange-brown silty fine to coarse SAND. (Possibly FILL?).		D2/J2	1.5-2.0	
	2.0			
Firm brown very sandy silty CLAY. (Possibly FILL?).		D3/J3	2.5-3.0	
	3.0			
Trial Pit Complete at 3.0m.				

Remarks :

Groundwater was not encountered.

Trial pit relatively stable on completion.

Key :

D : Disturbed Sample

J : Jar Sample

W : Water Sample

HARRISON & COMPANY

Trial Pit Record

Location : Otford Road, Sevenoaks, Kent.

Client : British Gas (South Eastern).

Date : 7/8/92

Job No. : C1935/22

Plant : J.C.B. Excavator

Diameter : 0.70m x 1.50m

Trial Pit No. : 10

Soil Description	Depth below Ground Level (m)	Sample Type	Sample Depth (m)	Notes (e.g. Colour, Smell)
	0.0			
FILL (Grey-brown sandy silty clay with frequent brick, concrete, pipe and coke fragments).		D1/J1	0.5-1.0	
		D2/J2	1.5-2.0	
		D3/J3	2.5-3.0	
	3.0			
Trial Pit Complete at 3.0m.				

Remarks :

Groundwater was not encountered.

Trial pit relatively stable on completion.

Key :

D : Disturbed Sample

J : Jar Sample

W : Water Sample

HARRISON & COMPANY

Trial Pit Record

Location : Otford Road, Sevenoaks, Kent.

Client : British Gas (South Eastern).

Date : 7/8/92

Job No. : C1935/22

Plant : J.C.B. Excavator

Diameter : 0.70m x 1.50m

Trial Pit No. : 11

Soil Description	Depth below Ground Level (m)	Sample Type	Sample Depth (m)	Notes (e.g. Colour, Smell)
	0.0			
FILL : Grey slightly silty clay with occasional brick and coke fragments. Stained with black tar (?) in parts).				1 : There was a slight naphthalene (?) smell between about 0.2m and 0.5m depth.
	0.5	D1/J1	0.5-1.0	
Firm brown slightly sandy silty CLAY containing occasional roots. (Possibly FILL?).		D2/J2	1.5-2.0	
	2.1			
Orange-brown slightly clayey silty fine to coarse SAND. (Possibly FILL?).		D3/J3	2.5-3.0	
	3.0			
Trial Pit Complete at 3.0m.				

Remarks :

Groundwater was not encountered.

Trial pit relatively stable on completion.

Key :

D : Disturbed Sample

J : Jar Sample

W : Water Sample

HARRISON & COMPANY

Trial Pit Record

Location : Otford Road, Sevenoaks, Kent.

Client : British Gas (South Eastern).	Date : 7/8/92	Job No. : C1935/22
Plant : J.C.B. Excavator	Diameter : 0.70m x 1.50m	Trial Pit No. : 12

Soil Description	Depth below Ground Level (m)	Sample Type	Sample Depth (m)	Notes (e.g. Colour. Smell)
	0.0			
FILL (Grey slightly clayey silty sand containing frequent brick rubble. Very tarry in parts).		D1/J1	0.5-1.0	
	1.4			
Red-brown silty SAND. (Possibly FILL?).		D2/J2	1.5-2.0	
	1.8			
Firm brown very sandy silty CLAY. (Possibly FILL?).		D3/J3	2.5-3.0	
	3.0			
Trial Pit Complete at 3.0m.				

Remarks :

Groundwater was not encountered.

Trial pit relatively stable on completion.

Key :

D : Disturbed Sample

J : Jar Sample

W : Water Sample