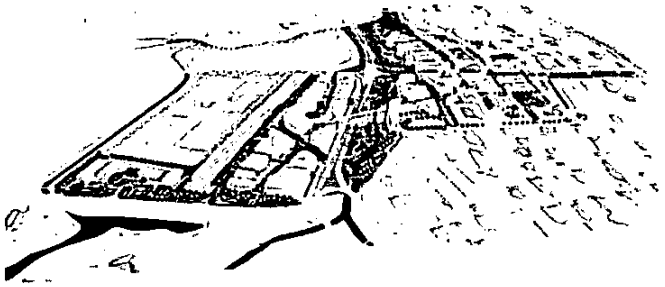
KENNET
PROPERTIES

Foudry Properties Limited

the Gateway Reading

THE GATEWAY - READING
Environmental Statement
Appendix - Volume 2



050548

READING BOROUGH COUNCIL
12 MAY 2005
PLANNING

RMPL

May 2005

Appendix 3

Ground Condition Reports and Remediation Strategies

White Young Green

GROUND CONDITIONS ASSESSMENT
of the
READING SEWAGE TREATMENT WORKS
(MANOR FARM)
on behalf of
KENNET PROPERTIES LTD

Reference: REPORT/E03015/CG/MAY04/GCA-EAST/V3

Issue		Prepared By		Reviewed By	Verified By
V1	OCT 03	ANDY ARDRON Environmental Scientist	PAUL EDWARDS Geo-Environmental Engineer	PATRICIA CARR Principal Engineer	IAN GATENBY Regional Director
V2(S)D	DEC 03				
V2(S)	MAR 04				
V3	MAY 04				

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White Young Green Environmental Yeoman House 63 Croydon Road London SE20 7TS
Telephone: 020 8659 9959 Facsimile: 020 8676 9968 E-Mail: enviro.london@wyg.com

Environmental Consultancy

CONTENTS

			PAGE
0.0		EXECUTIVE SUMMARY	5
1.0		INTRODUCTION	7
	1.1	Instruction	7
	1.2	Brief	7
	1.3	Supporting Documentation	7
	1.4	Conditions	9
2.0		SITE STATUS OVERVIEW	10
	2.1	Site Location	10
	2.2	Proposed Development	10
	2.3	Site Description	10
	2.4	Adjacent Landuses	11
3.0		HISTORICAL REVIEW	12
	3.1	Ordnance Survey Extracts and Site Plans	12
	3.2	Landfills	14
4.0		GEOLOGY, HYDROGEOLOGY & HYDROLOGY	15
	4.1	Geology	15
	4.2	Hydrogeology	15
	4.3	Hydrology	16
5.0		PREVIOUS INVESTIGATIONS BY OTHERS	17
	5.1	Summary	17
	5.2	Enviros Aspinwall/Thames Water Utilities Investigation 2000	17
	5.3	Thames Water Investigation 1999	19
	5.4	Exploration Associates A33 Investigation	19
	5.5	Wembley Laboratories Site Investigation 1977	19
	5.6	Soil Mechanics Associates (1991), Manor Farm STW Report No. 8594/19	21
	5.7	Thames Water Authority, Manor Farm STW, Hydrometric Facility (1986)	21
6.0		WYGE 2003 INVESTIGATION	22
	6.1	Summary Of Scope And Rationale	22
	6.2	Findings and On-Site Testing	23
	6.3	Laboratory Testing	27
7.0		WYGE 2004 INVESTIGATION	29
	7.1	Summary of Scope and Rationale	29
	7.2	Findings of 2004 Investigation	30
	7.3	Laboratory Testing	36
8.0		GEOLOGICAL CONDITIONS ENCOUNTERED	38
	8.1	Soil Conditions	38
9.0		GROUNDWATER DYNAMICS	42

	9.1	Borehole Coverage	42
	9.2	Regional Flow Components	42
	9.3	Local Flow Components	43
	9.4	Implications for the Contaminant Transport in Groundwater	43
10.0		GEOTECHNICAL DISCUSSION	45
	10.1	Summary of Ground Conditions	45
	10.2	Geotechnical Testing	45
	10.3	Geotechnical Parameters	46
	10.4	Engineering Considerations	49
11.0		GROUND CONTAMINATION ASSESSMENT	59
	11.1	Tier 1 Assessment	59
	11.2	Contamination Assessment	64
12.0		QUALITATIVE RISK ASSESSMENT	70
	12.1	Sources	70
	12.2	Potential Pathways	72
	12.3	Potential Contamination Receptors	73
	12.4	Qualitative Risk Assessment	73

SKETCHES

SK101	SITE LOCATION PLAN
SK102	SITE LAYOUT PLAN
SK103	RECORDED HISTORY SUMMARY PLAN
SK113	SITE INVESTIGATION LOCATION PLAN
SK118	GROUNDWATER CONTOURS IN GRAVEL AQUIFER
SK119	GROUNDWATER CONTOURS IN CHALK AQUIFER
SK120	GROUNDWATER CONTOURS IN LAMBETH GROUP AQUIFER
SK124	GEOLOGICAL CROSS SECTION NORTHWEST TO SOUTHEAST ACROSS THE SITE
SK115	SITE CONCEPTUAL MODEL
SK125	PROPOSED MASTERPLAN

APPENDICES

A		REPORT CONDITIONS
B		HISTORICAL INFORMATION
C		INVESTIGATIVE METHODS
D		WYGE (2004) INVESTIGATION
	D1	LOGS
	D2	CONTAMINATION RESULTS
	D3	GEOTECHNICAL RESULTS
	D4	FILTER BED MATERIAL GEOTECHNICAL AND CONTAMINATION RESULTS
E		WYGE (2003) INVESTIGATION
	E1	LOGS
	E2	CONTAMINATION RESULTS
	E3	GEOTECHNICAL RESULTS
F		THAMES WATER/ENVIROS-ASPINWALL/SOIL MECHANICS (2000) INVESTIGATION
	F1	LOGS
	F2	CONTAMINATION RESULTS
	F3	GEOTECHNICAL RESULTS
G		THAMES WATER (1999) TRIAL PITTING INVESTIGATION
	G1	LOGS
	G2	CONTAMINATION TEST RESULTS
H		EXPLORATION ASSOCIATES – A33 LOGS (1988)
I		WEMBLEY LABORATORIES (1977) INVESTIGATION
	I1	VOLUME 1 LOGS AND GEOTECHNICAL RESULTS
	I2	VOLUME 2 LOGS AND GEOTECHNICAL RESULTS
	I3	VOLUME 3 LOGS AND GEOTECHNICAL RESULTS
J		VISUAL OBSERVATIONS – ALL SITE INVESTIGATIONS BY OTHERS
K		TIER 1 EXCEEDENCES – ALL INVESTIGATIONS
L		SURFER PLOTS
M		FOBNEY WATER ABSTRACTION TESTING DATA

0.0 EXECUTIVE SUMMARY

Current Site Status	The site is located approximately 2km south of the centre of Reading and is centred on the approximate National Grid Reference 471250, 170570. The site is 26.7 hectares (66 acres) in size and consists of structures involved with the treatment of sewage, surrounded by hardstanding and areas of rough grass and undergrowth. The site varies in level and height above the Foudry Brook.
Proposed Development	The current proposed development comprises mainly residential use, being a combination of apartments with managed landscaped surrounds and houses with domestic gardens. The south western part, commercial development is proposed, incorporating local shops, leisure facilities such as bars and a health club, whilst a conference centre also forms part of the proposals.
Site History	Open agricultural land and farm buildings until circa 1913. Original sewage works constructed by 1931, including some re-levelling and filling. The sewage works mainly comprised sludge beds until redevelopment to present layout in late 1960s/early 1970s. Significant industrial developments to the south and east throughout 1970s and refuse tips/landfills to the north and west.
Geology	Made Ground generally up to 4m thick, locally areas of landfill in north east where Made Ground is approximately 8m thick. Sewage sludge has been identified within the Made Ground particularly in the north and is generally coincident with the location of sludge beds indicated on historical maps and plans. The Made Ground overlies Alluvium and Valley Gravel in the western and north western parts of the site over the Lambeth Group which in turn overlie the White Chalk. In the eastern and south eastern parts of the site, London Clay directly underlies the Made Ground and the Alluvium and Valley Gravels are absent. The Alluvium and Valley Gravel deposits thin towards the centre of the site, away from Foudry Brook and the River Kennet. Both the London Clay and the Lambeth Group are thickest in the south eastern corner (approximate maximum thicknesses 7m and 20m respectively). The surface of the chalk is shallowest depth in the north west (30mAOD) and it dips south east and in the south eastern corner is encountered 20mAOD.
Hydrogeology	The northwest of the site overlies a Minor Aquifer (Valley Gravels) and the southeast overlies a non-aquifer (London Clay). The underlying White Chalk is classified as a Major Aquifer. Hydraulic continuity between the Minor Aquifer and the Major Aquifer may exist where the London Clay is absent and where sandy strata are present in the Lambeth Group
Hydrology	The Foudry Brook (Grade B – Good) flows north along the western boundary of the site and joins the River Kennet (Grade A – Very Good) at the northwestern boundary.
Radon	No protective measures required.

WYGE site investigation	WYGE undertook borehole and trial pit investigations in 2003 and 244. Both investigations involved contamination and geotechnical laboratory testing and monitoring of groundwater and landgas.
Previous Investigations by Others	Previous investigations have been undertaken by others as follows:- Thames Water /Enviros 2000 – boreholes, trial pits, contamination and geotechnical testing, groundwater monitoring Thames Water 1999 – trial pits and contamination testing Exploration Associates 1986 – boreholes along the A33 (logs only available) Wembley Laboratories 1977 – boreholes and geotechnical testing.
Contamination Test Result Summary	Soils and groundwater (Minor and Major Aquifer) are contaminated with significant ammonia and metals, particularly in the northern area of the site. Pathogens identified in shallow soils and groundwater 1no. significant concentration of methane and 3no. locations of slightly elevated carbon dioxide recorded.
Geotechnical Summary	Where London Clay is present in the east of the site, the use of spread foundations may be possible. Elsewhere on the site, where Made Ground and Alluvium thicknesses are significant, piled foundations or a method of ground improvement will be required. Ground bearing floor slabs may be suitable for use but the improvement of the ground beneath ground bearing slabs is likely to require some improvement. Alternatively, suspended slabs could be used.
Risk Assessment	The identified risks on site include the elevated metals in soils in the northern part of the site, ammonium impact to soils and shallow and deep groundwater, pathogens in shallow soils and groundwater and elevated methane at one location. Due to potential exposure of protected aquifers and surface waters and site users to these hazards, the site is assessed overall as a Medium Risk.
Recommendations	A remediation strategy for the site has been produced and is presented in outline in E03015/PC/APR04/ORS-EASTSITE/V1. A detailed strategy will also be produced.
This sheet is intended to provide a summary only of the initial assessment study of the site in relation to contamination. It does not provide a definitive engineering analysis.	

1.0 INTRODUCTION

1.1. Instruction

WYGE were appointed by Kennet Properties Ltd to undertake an assessment of ground contamination and geotechnical conditions for the proposed development of the Reading Gateway project at the Reading Sewage Treatment Works (STW).

The scope of services have been agreed on the basis of our accepted quotation (20th January 2004) and provided under the terms and conditions of contract of this commission.

1.2 Brief

The purpose of this report is to provide an assessment of the ground contamination and geotechnical conditions of the Reading STW based upon available existing site investigation data and an intrusive investigation undertaken by WYGE.

Factual information referred to may be found within the attached appendices.

The findings of the WYGE 2003 and 2004 investigations form the basis of the assessment of ground conditions provided herein. The investigations included the installation of boreholes with standpipes for landgas and groundwater monitoring plus the excavation of trial pits to assess ground conditions. Soil samples for chemical and geotechnical analysis were recovered and a programme of landgas and groundwater monitoring was undertaken.

1.3 Supporting Documentation

The information available at the time of the writing included the following:-

	Report / Document	Relevant Information Referenced	Included in report
1	Thames Water – Manor Farm STW Various current and historical site layout plans and STW structures and buildings plans A2 and A3 (2 volumes).	Site layout and individual structural plans, present and historical.	Appendix B
2	Tuffin, Ferraby and Taylor. April 2002. Pre-acquisition Condition Survey Report, Smallmead Road/Commercial Road, Reading. Provides information on the condition of two properties located on the industrial estate immediately south of the East Site.	Information regarding hydrocarbon storage on an adjacent site to the south.	Not included

	Report / Document	Relevant Information Referenced	Included in report
3	Peter Brett Associates, April 2001. Geoenvironmental and Geotechnical Desk Study Report and Restricted First Pass Investigation for Reading Gateway, Reading, Berkshire.	Envirocheck Search report and historical maps for the Reading Gateway East Site. Borehole and trial pit logs for the various site investigations including for Enviros Aspinwall/Thames Water October 2000 investigation ad borehole logs produced by Exploration Associates for a strip of land to the west of site along the A33 relief road.	Appendix B – historical maps Appendix F – Enviros/TW 2000 investigation logs and test results Appendix H – Exploration Associated A33 logs
4	Enviros Aspinwall/Thames Water, October 2000: Manor Farm Redevelopment Environmental Statement, Appendix Volume 1: Desk Study and Site Investigation,	This report includes site history, ground and groundwater conditions and chemical contamination and geotechnical results for the Reading STW, Borehole and Trial Pit logs for this investigation are contained within Peter Brett Associates, April 2001 Report.	Appendix F – Enviros/TW investigation logs and test results
5	EDAW Ltd October 2000: Manor Farm Redevelopment Environmental Statement.	General overview of Reading Gateway site including development proposals and ecology and archaeology of the site.	No included
7	Thames Water Manor Farm STW Decontamination Study GG1673 1999.	Thames Water trial pit logs and contamination testing results.	Appendix G – logs and test results
8	Thames Water, Manor Farm STW, Desk Study. G1673 1999.	Historical Maps, Boreholes from 1986, some contamination test results.	Appendix B – historical maps
9	Soil Mechanics Associates, Manor Farm STW. (1991). Report No. 8594/19.	Geotechnical trial pitting investigation for construction of sludge storage area (now built) at northern end of site (6 TPs 2 hand augers)	Not included
10	Thames Water, Hydrometric Facility, Manor Farm STW, 1986. Ref. 347	Geotechnical report for single storey brick building. (2 BHs to approx 3m)	Not included

	Report / Document	Relevant Information Referenced	Included in report
11	Wembley Laboratories Limited: Site Investigation Report, Manor Farm Sewage Works 1977. Reference - 1300/KB.	Borehole logs and descriptions detailing areas of sewage sludge. Geotechnical test results	Appendix I – logs and boreholes

1.4 Conditions

For a detailed review of the extent and limitations of this report, attention is drawn to the report conditions in Appendix A. The scope of services have been agreed on the basis of our accepted quotation (20th January 2004) and provided under the terms and conditions of contract of this commission.

2.0 SITE STATUS OVERVIEW

2.1 Site Location

The site is located approximately 2km south of the centre of Reading and is centred on the approximate National Grid Reference 471250E, 170570N. The location of the site is shown on the attached site location plan, drawing no. SK.101. The site occupies the land east of the A33, south of the River Kennet, a total of 22.3 hectares (55 acres).

2.2 Proposed Development

Reading Gateway

The site forms part of land proposed for the Reading Gateway development which incorporates land to the west of the A33, including the sites currently occupied by J. Mould recycling and Reading greyhound racing stadium. Construction of the whole scheme is expected to be phased over an estimated period of 15 years and will comprise a mixed-use scheme including B1 employment uses (Business/light industrial), housing, a hotel and community facilities, open space and infrastructure. A new STW is currently under construction to the west of the A33, beyond Reading Stadium.

Reading STW (Manor Farm)

The current proposed development comprises mainly residential use, being a combination of apartments with managed landscaped surrounds and houses with domestic gardens. The south western part, commercial development is proposed, incorporating local shops, leisure facilities such as bars and a health club, whilst a conference centre also forms part of the proposals.

The technical assessment considers both a managed hard end use or a residential end use to reflect these plans.

2.3 Site Description

The site covered by this report comprises Reading STW (Manor Farm), a total of 22.3 hectares (55 acres) and the main features are shown on the attached existing site layout plan, drawing no. SK.102. An initial site walkover inspection was carried out by WYGE on 10th February 2003 whilst numerous subsequent visits have been made for site investigation fieldworks and monitoring. The majority of the site is covered by structures involved with the sewage treatment process including settlement tanks, filter beds, digesters and storm tanks. The structures are surrounded by hardstanding and some grass areas whilst rough grass and undergrowth and some trees, cover the areas close to the site boundaries. The general slope of the site is from the southeast to the northwest whilst locally revised areas are associated with the STW structures. The bank of the Foudry Brook, along the western boundary of the site, drops sharply from the site to the watercourse, and beyond the Brook lies the western boundary. The Brook flows south to north and joins the River Kennet at the northwest boundary. There is a substantial ground level

increase along the northeast boundary towards the adjacent Gillette warehouse. A report produced by Wembley laboratories 1977 describes the north and north eastern boundaries as being formed by a man made embankment of refuse up to 15m in height.

An earth/rubble mound was observed in the southeast corner of the site and falls into an area identified as an historical landfill recorded as comprising inert material by the Environment Agency.

The structures on site were generally observed to be old and in a poor state of repair, particularly towards the south of the site. Cracks were observed in the southernmost storm tanks. Between the storm tanks and the southern boundary was an area of uneven land, which looked to have been disturbed, possibly by some form of deposition of surplus materials. To the west, outfalls into the adjacent Foudry Brook are visible. The Brook itself had an unclean appearance with noticeable froth and scum on the surface. The area of land adjacent to the northeastern boundary is understood to have been used as a tipping area for surplus materials by the STW operators. Historical plans indicate that this area was formerly occupied by a sludge lagoon however it is not known whether this was emptied/infilled with inert material prior to tipping (reference section 3.1).

2.4 Adjacent Landuses

An industrial estate borders the site to the south and east and a retail park to the northeast. The western site boundary is formed by the Foudry Brook and the A33 relief road, beyond which are the Reading Stadium, a demolition material recycling area and a motorcross/go-karting track located on landfills filled during the 1960s and 1970s. The northwest boundary is formed by the River Kennet beyond which lies Fobney Meadows which is designated a Wildlife Heritage Site. The land bordering the northeast of the site is occupied Gillette warehousing, located on landfilled material.

Trade directory entries within a 1km radius of the site indicate a large amount of industry within the surrounding area including sheet metal and ball bearing manufacturers, several car servicing and repair firms, electroplating and engineering firms. A vehicle maintenance and repair centre and former spray shop is presently located directly southwest of the site. There are 6no. fuel station entries within 1km of the site.

3.0 HISTORICAL REVIEW

3.1 Ordnance Survey Extracts and Site Plans

- **Open agricultural land and farm buildings until circa 1913.**
- **Original sewage works constructed by 1931.**
- **The sewage works mainly comprised sludge beds until redevelopment to present layout in late 1960s/early 1970s.**
- **Significant industrial developments to the south and east throughout 1970s and refuse tips/landfills to the north and west.**

Information on the history of the site was obtained from the following sources:

- OS plans 1883-1995 (see appendix B).
- Thames Water (TW) historical site plans A2 and A3 (see appendix B).
- Wembley Laboratories Investigation 1977 (borehole logs included in appendix I).
- EA landfill records (see appendix B).

The recorded history of this site is summarised on drawing no. SK.103.

1883 OS plan (1:10,000): the site was occupied by Whitley Manor Farm and consisted of open agricultural land and farm buildings east of Foudry brook. Further farm buildings were located directly south of the site. Directly north of the site was a brick and tileworks known as Rose Kilns and some small reservoirs were located at Fobney Meadows about 800m northwest.

1913 OS plan (1:10,000): shows no further development on site apart from a tramway running north south across the site.

1931 OS plan (1:10,000): the Rose Kilns no longer existed and the site was elevated as a result of landfilling, which extended from the Rose Kilns to the northern boundary of the present sewage works. It is believed that the landfill included biodegradable wastes. Whitley Kiln was established to the north of Rose Kilns but has since closed and a sandpit excavated on its site which has been infilled. The northern half of the Manor Farm site was developed as a sewage works, including sludge beds. There were allotment gardens to the east and beyond these an area of residential development.

1936 OS plan (1:2,500): the southern part of the site remained predominantly undeveloped except for a building later identified as 'isolation hospital' in the southeast. There were also some sewage workings, consisting of sprinkler beds and settling tanks, located directly south of the site.

1959/1969 OS plan (1:2,500): Sludge beds are visible along the northwestern site boundary with a narrow strip of land separating them from the Foudry Brook.

1962 OS plan (1:10,000): there had been some redevelopment of the sewage works layout in the northern part of the site and some expansion onto the southern half of the site towards the eastern boundary. There were several works and depots located

outside the eastern and southern site boundary, the quarried areas to the north had expanded.

July 1963 TW A2 as constructed site layout plan (1:1250): indicates the full extent of the former sludge beds occupying much of the northern third of the site and extending southwards approximately two thirds of the length of the western boundary. Redevelopment of the southeast of the site to form what is almost the present day Manor Farm sewage works had taken place. The high level and low level filter beds are also present on this plan (not indicated on 1962 OS plan).

1966 TW A3 plan "Sludge Treatment and Storage Building": indicates the presence of a 4000 gallon underground oil tank on site.

1972 TW A2 plan "As Constructed Final Sludge Treatment Plan": indicates the location of the sludge treatment building.

1973 TW A3 site plan (1:1250): indicates an extension of the high level and low level filter beds to the west with the low level filter beds extension overlapping the footprint of some of the former sludge beds.

1973 OS plan (1:10,000): The Isolation Hospital building is still present although its use is not marked and may have become the engineering works identified on later maps. The plots of land to the west beyond Foudry Brook, forming the Reading Gateway West Site, had become landfill sites. Land to the south and west was further developed with industrial buildings throughout the 1970s. Infilling of landfill areas to the west had been completed and a greyhound/raceway stadium constructed to the southwest. 1974 – 1988 OS extracts indicate an aluminium works directly southwest of the site.

1976 TW A3 site plan (1:1250): indicates that the isolation hospital has now become an engineering works and motor engineering works. A sludge bed is indicated to the west beyond the Foudry Brook.

Wembley Laboratories Investigation 1977: The area of the site dealt with by Volume I was described as waste ground with dimensions of approximately 110m x 300m. The southeastern portion of this area was surfaced with concrete which formed the base of old sludge beds. Similar features are also understood to have been present in remaining parts, but at the time of visit the area was rough ground covered with old sludge supporting overgrown grass and weeds. The report described how Fill, generally 1m and 2m thick, was encountered with a covering of old sludge type topsoil or ashes in the areas not covered by the concrete slabs.

The area dealt with by Volume II was described as being to the east of the area investigated and described in Volume I, there was a distinct change in height where the ground increased from a level of 39m AOD., in the concrete bases of three sludge beds, to 44m AOD. This area had plan dimensions of 60m x 90m. To the north, between this area and the neighbouring refuse tip, an old sludge bed was present and wet sludge was evident on the surface in parts.

It is understood that within the high ground in the east, there was an infilled sludge lagoon and indeed boreholes 7 and 8 encountered sludge and the concrete base to this structure at an elevation of about 46m AOD. Nevertheless the lagoon did not appear to extend as far west as indicated on an old plan since borehole nos. 8A, 10 and 11 did not encounter concrete although borehole no. 8A did encounter a thin band of sludge.

June 1977 TW A2 site plan (1:500): indicates a large sludge lagoon situated in the northeast of the site and an oil storage tank close to the western boundary.

August 1980 TW A2 site plan (1:500): Indicates the completion of redevelopment works in the north of the site over some of the former sludge bed areas. The sludge lagoon in the northeast remains. An oil storage tank is located in the northeast of the site.

1995 OS plan (1:10,000): the engineering works in the southeast of the site had disappeared and construction of a superstore and retail park development to the northeast of the STW was well underway. The nearby Madejski Stadium and A33 were developed after 1995.

3.2 Landfills

The Environment Agency has provided details on historical landfills within and adjacent to the study area. Those adjacent to the site are summarised below:

- **Manor Farm (on site)** - It was indicated that the southeast corner of the STW site was once landfilled. It is believed to have been filled pre 1974 with inert waste but no details on dates of fill are available.
- **Gillette Warehouse (NE of site)** - site filled pre 1974 with biodegradable wastes. No dates of fill available.
- **Rose Kiln lane (NE of site)** - Pre 1974 site filled with biodegradable wastes. No dates of fill available.
- **Craddock Road (NE of site)** – Closed, EA report gas monitoring has detected no gas.
- **Island Road (NW of site)** - Closed site filled with inert wastes between 1977 and 1985.
- **Smallmead Stadium (W of site)** - Infilling took place pre 1974 and there are no dates or details of fill available although the recent investigation undertaken there by WYGE has indicated domestic waste. Elevated concentrations of methane have been recorded by the Environment Agency and WYGE.
- **Smallmead Farm (SW of site)** - Status is post operational. Fill comprised Inert materials, Semi-inert materials and biodegradable wastes.
- **Reading Sludge Beds (W of site)** – Status is closed.

4.0 GEOLOGY, HYDROGEOLOGY AND HYDROLOGY

4.1 Geology

The underlying natural geology is shown on British Geological Survey (BGS) Sheet 268, Reading. The BGS sheet shows that the underlying solid geology consists of London Clay to the southeast of the site. This overlies Lambeth Group which lie directly beneath the drift deposits, which comprise Alluvium and Terrace Gravels, in the west and north of the site. Upper Chalk, now known as White Chalk, of the Cretaceous period underlies the Lambeth Group. The Chalk is shown to outcrop about 0.5km to the northwest of the site with the strata generally dipping south/southeast.

For details of encountered ground conditions refer to Section 5 (previous Site Investigations) and Section 7 (Encountered Ground Conditions).

The site is not within a radon affected area and less than 1% of homes are classified as being above the Action Level. No radon protective measures are considered necessary for buildings in this area (BGS).

4.2 Hydrogeology

The Environment Agency groundwater vulnerability map of West London (Sheet 39) indicates that the northwestern two thirds of the site overlies a Minor Aquifer (Alluvium/Valley Gravels/Reading Formation) with soils of high soil leaching potential. The remaining third to the southeast overlies a non-aquifer formed by the London Clay. The underlying White Chalk is classified as a Major Aquifer. Groundwater within the Valley Gravels generally flows towards the River Kennet and Foudry Brook to the north and west respectively.

Hydraulic continuity between the Minor Aquifer and the Major Aquifer may exist in some parts of the site where the London Clay is absent and where sandy strata are present in the Lambeth Group. Where little or no sandy material is present within the Lambeth Group, it may be considered to be an aquiclude. Refer to Section 9.0 for an assessment of encountered groundwater conditions and groundwater flow characteristics.

The Hydrogeological Map of the South West Chilterns and The Berkshire and Marlborough Downs (1978) shows the regional groundwater flow (within the Chalk) is towards the southeast. Data from this and previous studies supports this, indicating the groundwater abstraction from the Major Aquifer at Courage Brewery, approximately 1km south of the site may be a factor in the cause of this regime. The Environment Agency has defined a groundwater protection zone around this abstraction and the site falls within Zone 2.

Groundwater flow in the Chalk Aquifer was also assessed as part of the testing of the emergency groundwater scheme at Fobney. The second largest groundwater abstraction licence within 1km of the site belongs to Thames Water Utilities at the nearby Fobney Water Treatment Works, approximately 200m to the west, it is used

for emergency public water supply. The boreholes were constructed during the latter part of the 1990s The Fobney abstraction is only operated intermittently, however, when operational, indications are that the groundwater flow is likely to be temporarily reversed. Hence there is potential for contamination within the Chalk to migrate towards this point when pumping is occurring. Currently, there is no groundwater protection zone associated with this abstraction. Other nearby groundwater abstractions from the Chalk are the Clean Linen Laundry 10m south of the site and Wyncote developments 115m north, both of which abstract water for general industrial purposes.

In total, there are 8no. licensed groundwater abstractions within 1km of the site, 2no. from the Gravel Aquifer and 6no. from the Chalk.

4.3 Hydrology

The Foudry Brook is located along the western boundary of the site. The Brook flows northwards and joins the River Kennet at the northwestern boundary. Environment Agency General Quality Assessment (GQA) classifications are:

- Foudry Brook 'B' (good).
- River Kennet 'A' (good).

There are 23no. historical and current recorded discharge consents within 1km of the site, all relating to the discharge of sewage or trade effluent. Records indicate that the sewage works has a license to discharge sewage effluent into the Brook and the main outfall from the STW into Foudry Brook was seen during the site walkover.

51no. pollution incidents were recorded within 1km of the site between 1989 and 1999. They related mainly to oil spills and also to chemical and sewage spills. The majority were limited impact Class 3 incidents whilst 3no. were Class 2 incidents.

The River Kennet also has 2no. abstraction points 200m upstream (northwest) for Fobney pumping station and a fish farm located close to it.

5.0 PREVIOUS INVESTIGATIONS BY OTHERS

5.1 Summary

This section comprises a summary of previous investigations undertaken on the Reading STW site. These include:

- Enviros Aspinwall/Thames Water Utilities Investigation 2000.
- Thames Water Investigation 1999.
- Exploration Associates A33 Site Investigation 1986.
- Wembley laboratories Site Investigation 1977.

The logs and test results for these investigations are included in Appendices F-I The ground conditions encountered in the investigations are discussed in section 8.0 whilst the contamination test results are described in section 11. Geotechnical test result information is incorporated in section 10.

5.2 Enviros Aspinwall/Thames Water Utilities Investigation 2000

Site investigation works were undertaken in March 2000 (ref. section 1.3) by Soil Mechanics for Enviros Aspinwall on behalf of Thames Water. The site investigations comprised hand excavated trial pits and cable percussion boreholes and samples were taken for geotechnical and contamination testing. The locations of the trial pits and boreholes from the investigations are shown on drawing no. SK.113 and information regarding encountered ground conditions is presented in Section 7 with those encountered during the recent WYGE investigation. The borehole and trial pit logs and the geotechnical and contamination test results may be found in Appendix F.

5.2.1 Fieldwork

Boreholes were drilled at nine locations at the site. At each location up to 4 different depth wells, screened into specific geological strata, were drilled (5 into Fill, 6 into Gravel/Alluvium, 9 into Lambeth Group and 3 into Chalk).

The investigation also comprised the excavation of 8no. hand dug trial pits. Boreholes were drilled, by cable percussion, to a maximum depth of 38.4m below ground level in order to:

- Characterise the nature of the geological succession underlying the site.
- Enable soil samples to be collected.
- Install standpipes to enable groundwater sampling and to monitor for the potential presence of hazardous gases.

The investigation was carried out in order to characterise baseline conditions of the existing STW. The site investigation was limited, partly due to the fact that the majority of the site is covered by operational structures.

5.2.2 Contamination Testing Undertaken

Soil Tests

Soil samples were collected from the different strata as a part of the 2000 investigation. The soils were analysed for the following suite of determinands:

Arsenic, Barium, Cadmium, Chromium, Copper, Mercury, Molybdenum, Nickel, Lead, Antimony, Selenium, Zinc, Water Soluble Boron, Hexavalent Chromium, pH, Total Cyanide, Free Cyanide (if total greater than 5mg/Kg), Thiocyanate, Total phenols (colour), Total sulphate, Sulphide, Chloride, Ammonia, Dry Matter, Diesel Range Organics (DRO), Volatile Organic Compounds (VOC), Semi Volatile Organic Compounds (SVOC), Poly Chlorinated Biphenyls (PCBs), Poly Aromatic Hydrocarbons (PAHs), Elemental Sulphur, TOC on soil and Asbestos.

These previous results are included, for discussion, with the results from the current WYGE site investigation in Section 11. The results data set is included in Appendix F.

Groundwater Tests

Water samples were collected from the different strata as a part of the 2000 investigation. The water samples were analysed for the following suite of determinands:

Arsenic, Boron, Barium, Calcium, Cadmium, Chromium, Copper, Iron, Mercury, Potassium, Magnesium, Manganese, Molybdenum, Sodium, Nickel, Lead, Antimony, Selenium, Zinc, pH, Total Cyanide, (Free Cyanide), Ammonia, Nitrite, Total Oxidised Nitrogen (TON), Alkalinity, Chloride, Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Electrical Conductivity, Total Organic Carbon (TOC), DRO, VOC, SVOC, Total Phenols, PAHs, *E Coli*, Coliforms and Plate Counts.

These previous results are included, for discussion, with the results from the current WYGE site investigation in Section 11. The results data set is included in Appendix F.

Leachate Tests

A quarter of the soil samples from the Made Ground were selected for leaching tests. The leachate was analysed for the following determinands:

Arsenic, Boron, Barium, Calcium, Cadmium, Chromium, Copper, Iron, Mercury, Potassium, Magnesium, Manganese, Molybdenum, Sodium, Nickel, Lead, Antimony, Selenium, Zinc, pH, Total Cyanide, Ammonia, Sulphate, Total Phosphorous, Alkalinity, Chloride, Thiocyanate, Dissolved Hydrocarbons and Phenols. The previous results are included, for discussion, with the results from the current WYGE site investigation in Section 11. The results data set is included in Appendix F.

5.2.3 Geotechnical Testing Undertaken

Geotechnical testing undertaken during this investigation comprised the following:-

- 20No. Particle Size Distribution tests
- 29No. Undrained triaxial tests
- 5No. Permeability tests in a triaxial cell

The results are presented in Appendix F3 and are summarised within Section 10.0.

5.3 Thames Water Investigation 1999

A preliminary ground investigation was undertaken to assess the likely degree of contamination at Manor Farm STW. 17 trial pits were excavated between the 16th and 17th June 1999 using a JCB to depths of up to 2.9 mbgl. A number of disturbed samples were taken from each excavation for contamination testing. Where a significant groundwater strike was encountered, water samples were recovered where possible. The locations of the trial pits and boreholes from the investigations are shown on drawing no. SK.113 and information regarding encountered ground conditions is presented in Section 8 with those encountered during the recent WYGE investigation.

Soil Tests

Soils were analysed for the following suite of determinands:

Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Zinc, Total Polycyclic Aromatic Hydrocarbons (PAH), Water Soluble Boron, Sulphate (% as SO_4), Total Phenols, Total Cyanide, Thiocyanate, Elemental Sulphur, Total Hydrocarbons, Chloride, Dry Solids, Organic Content, pH.

Leachate Tests

Tests were conducted for the following determinands:

Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Zinc, Selenium, Boron, pH, Sulphate (as SO_4), Total Cyanide, Benzo(ghi)Perylene, Indeno 1,2,3-Cdpyrene, Benzo(K)Fluoranthene, Benzo(A)Pyrene, Fluoranthene, Total Hydrocarbons, Chloride, Conductivity.

5.4 Exploration Associates A33 Investigation

The logs from a number of boreholes excavated by Exploration Associates along the adjacent A33 relief road. were used to provide information on the site ground conditions. Only the logs were available, there was no corresponding Exploration Associates report. The logs are included in Appendix H.

5.5 Wembley laboratories Site Investigation 1977

An assessment of ground conditions to assist in foundation design of STW to be constructed in the northeast of the site was carried out by Wembley Laboratories. This was divided into three volumes. Volume I covering the northwest of the site, Volume II covering the northeast part of the site and Volume III covering the current storm water tanks area in the south. The investigation comprised 50 of boreholes, the locations of which are indicated on drawing no. SK.113. whilst no contamination testing was carried out, geotechnical testing was undertaken. Visual observations included descriptions of sewage sludge within the Made Ground

5.5.1 Volume I

The area of the site dealt with by Volume I was described as waste ground with dimensions of approximately 110m x 300m, the general ground level was approximately 38.5-39m AOD. The southeastern portion of this area was surfaced with concrete which formed the base of old sludge beds. Similar features are also understood to have been present in remaining parts, but this area was rough ground covered with old sludge which supported overgrown grass and weeds.

22 boreholes were constructed in the area covered by Volume I to depths of up to 15m below the existing ground surface.

The report describes how "Fill, generally 1m and 2m thick, was encountered with a covering of old sludge type topsoil or ashes in the areas not covered by the concrete slabs".

5.5.2 Volume II

The area dealt with by Volume II is described as being to the east of the area investigated and described in Volume I, there is a distinct change in height where the ground increased from a level of 39m AOD. (Volume I), in the concrete bases of three sludge beds, to 44m AOD. (Volume II). This area has plan dimensions of 60m x 90m. To the north, between this area and the neighbouring refuse tip, an old sludge bed is present and wet sludge is evident on the surface in parts.

A total of 14 boreholes were constructed, normally to a depth of about 15m but borehole no. 15 was taken down to prove the Chalk which was met at 18.8m below the existing ground surface (25.5m AOD.).

It is understood that within the high ground in the east, there is an infilled sludge lagoon (believed to have a concrete base) and indeed boreholes 7 and 8 encountered sludge at 46m AOD and the concrete base to this structure at an elevation of about 43m AOD. Nevertheless the lagoon would not appear to extend as far west as indicated on an old plan (SK103 and 1972 TW A2 site layout plan see appendix B) since borehole nos. 8A, 10 and 11 did not encounter concrete although borehole no. 8A did encounter a thin band of sludge.

5.5.3 Volume III

Volume II deals with an area in the south of the site. 10 boreholes were constructed to depths of between 10m and 15mbgl locations shown on drawing no. SK113. Upon completion of boreholes 2 and 4b, standpipes with piezometer tips were installed to enable the long term standing water level to be measured.

5.5.4 Geotechnical Testing

Geotechnical testing undertaken as a part of the Wembley laboratories 1977 investigation included the following:-

- 15No. Particle Size Distribution test
- 176No. Undrained triaxial tests
- 4No. Oedometer tests
- 5No. Atterberg Limit and Moisture Content tests
- 18No. pH and Sulphate Content tests

5.6 Soil Mechanics Associates (1991), Manor Farm STW Report No.8594/19

Contains geotechnical information from 6 trial pits and 4 hand augers. This report was not used as it was considered not to provide additional relevant information.

5.7 Thames Water Authority, Manor Farm STW, Hydrometric Facility (1986)

Geotechnical information specific to a single storey brick building comprising 2 boreholes to approximately 3.5m depth. This report was not used as it was considered not to provide additional relevant information.

6.0 WYGE 2003 INVESTIGATION

6.1 Summary of Scope and Rationale

Site investigation works were undertaken by White Young Green Environmental during the period 7 July to 15 July 2003. The rationale for the investigation is presented below in Table 6.1.

Table 6.1 Rationale for the Ground Investigation

Location	Rationale	Depth (mbgl)
BH102GC BH102R BH103GC & BH104GC	Investigate general ground conditions at depth to provide guidance on potential soil and groundwater contamination issues and foundation options. Obtain soil and groundwater samples for laboratory testing. Installation of landgas and groundwater monitoring standpipes.	Final depths between 14.0 and 30.0mbgl
TP.A to TP.X	Investigate general near surface ground conditions, particularly within the Made Ground, and provide guidance on potential soil and groundwater contamination issues and foundation options. Obtain soil and groundwater samples for laboratory testing.	0.4 – 4.3mbgl

Details of the strata investigated, and the strata in which monitoring standpipes were installed, are given in Table 6.2 below for each of the above locations.

Table 6.2 Detailed breakdown of the Ground Investigation Locations and Monitoring Installations.

Generic Location	Specific Location	Stratum/ strata Investigated	Installation stratum/ strata	Base Depth (mbgl)
BH102	BH102R	Made Ground, Alluvium, Valley Gravel and Lambeth Group	Lambeth Group	14.0
	BH102GC	As 102R plus Chalk	Valley Gravel (BH102G) and Chalk (BH102C)	20.0
BH103	BH103GC	Made Ground, Alluvium, Valley Gravel, Lambeth Group and Chalk	Valley Gravel (BH103G) and Chalk (BH103C)	18.5
BH104	BH104GC	Made Ground, Alluvium, Valley Gravel and Lambeth Group	Valley Gravel (BHB1104G) and Chalk (BH104C)	30.0

The layout of the exploratory positions, as presented in Fig SK.113, was based on the proposed development as agreed with the client.

Site Investigation Standards

Methods employed during the investigation were undertaken generally in accordance with BS5930 (1999).

Site Investigation Methods

Details of the investigative methods employed during this site investigation are presented in Appendix C.

6.2 Findings and On-Site Testing

The geology of the site is detailed in section 8.0, whilst the groundwater conditions are detailed in section 9.0 and the contamination is discussed in section 11.0. Below are detailed on site observations from the WYGE 2003 investigation.

6.2.1 Obstructions / Existing Foundations

Underground obstructions were encountered in a number of exploratory positions, as detailed on the appended engineering logs, and summarised in Table 6.2.

Table 6.2 Summary of Encountered In-ground Obstructions.

Location	Details of Obstruction				Notes
	Depth (mbgl)	Stratum	Thickness (m)	Composition	
BH102GC	1.90	Made Ground	0.25	Concrete	Obstruction chiselled through.
BH102R	2.10	Made Ground	0.20	Bricks	Obstruction chiselled through.
BH102R	3.05	Made Ground	0.15	Bricks	Obstruction chiselled through.
TP.W1	0.80	Made Ground	Not proven	Cables	Trial pit abandoned and re-excavated as TP.W

6.2.2 Groundwater Conditions

Groundwater was encountered in many investigation locations during the investigation and subsequent return monitoring visits and the full set of monitoring data is presented in Appendix E. Groundwater ingress was noted in most encountered strata.

Within the Made Ground, groundwater was encountered within trial pits TP.A, TP.E and TP.W only. Ingresses occurred as minor discreet seepages at various depths indicating localised perched groundwater conditions.

Groundwater was encountered within the Alluvium in TP.W only, as a slow ingress at 3.8mbgl.
Within the Valley Gravel groundwater ingress occurred at various levels. An average strike depth of 4.9mbgl was recorded, rising by an average of 0.75m during observation of the various water ingresses. During return monitoring groundwater was at an average of 4.7mbgl within this stratum.

A number of groundwater ingresses were noted within the Lambeth Group and occasionally more than one per investigation location. Ingress occurred within both the fine and coarse grained horizons, but tended to be more significant and rise further when struck within the coarse grained sandy soils. An average strike level of 11.1mbgl was recorded, rising on average 2.8m during the observation period. Average water level during return monitoring was 6.4mbgl.

Groundwater strikes were not encountered in the White Chalk. During return monitoring visits, average water levels recorded in standpipes installed within this stratum recorded water at an average of 9.8mbgl.

6.2.3 In-Situ Chemistry Testing

A number of in-situ properties of the groundwater were determined during a return monitoring visit to site on 4 and 5 August 2003. Table 6.3 below provides a summary of the results of this testing, and a full table of all the data collected is presented in Appendix E.

Table 6.3 Summary of In-situ Groundwater Testing Results

	Redox	Dissolved Oxygen (mg/l)	pH	Temp (°C)	Alkalinity	Fe (II) (mg/l)	Fe (III) (mg/l)	Total Fe (mg/l)
Maximum in Valley Gravel	185	3.97	8.8	20.0	486	3.85	4.47	8.32
Minimum in Valley Gravel	-75	0.16	5.7	15.1	216	0.37	1.41	2.12
Average in Valley Gravel	77	2.24	6.8	16.4	348	1.71	2.54	4.25
Max. Lambeth Group	105	4.13	7.7	17.0	380	0.56	3.10	3.66
Min. Reading	-98	0.41	5.9	13.9	364	0.00	1.40	1.40
Ave. Reading	8	2.48	6.6	15.2	371	0.20	2.18	2.38
Max. Chalk	227	6.19	7.9	16.3	878	2.13	0.76	2.68
Min. Chalk	-52	2.50	6.8	13.6	404	0.00	0.19	0.19
Ave. Chalk	59	4.08	7.3	15.3	538	0.53	0.43	0.97

6.2.4 In-situ Permeability Testing

Variable head permeability tests were undertaken in the boreholes within the Lambeth Group and White Chalk strata.

Data obtained during the testing is presented within Appendix E. Using the calculation method provided in the BRE Digest 365, infiltration rates have been calculated for each test as detailed in Table 6.4 below.

Table 6.4 Summary of Soil Infiltration Rates

Borehole No.	Test Stratum	Test Depth (mbgl)	Infiltration Rate (m/s)
BH102GC	White Chalk	16.5-17.0	5.54×10^{-7}
BH104C	White Chalk	26.0-27.0	3.42×10^{-7}
BH104C	Lambeth Group	12.0-12.5	2.25×10^{-6}

6.2.5 Visual / Olfactory Evidence of Contamination

Soil Contamination

During the ground investigation soil contamination was identified by visual / olfactory screening in some of the investigation positions as detailed below. The observed contamination was restricted solely to the Made Ground.

Table 6.5 Summary of visual/ olfactory soil contamination

Location	Top (mbgl)	Base (mbgl)	Description
BH102GC	3.2	4.00	Possible Sewage Sludge.
BH102R	2.3	3.3	Occasional fragments of glass and metal
BH102R	3.3	4.0	Possible Sewage Sludge.
BH103GC	0.6	1.5	Occasional plastic debris
TP.A	1.5	2.3	Possible Sewage Sludge.
TP.B	1.0	1.8	Possible Sewage Sludge.
TP.C	0.8	2.3	Possible Sewage Sludge.
TP.C	1.0	1.2	Fragments of porous rock, possibly filter bed material.
TP.D	0	3.0	Razor Blades, refuse material comprising nylon bags, metal, plastic (junction box), plastic bags and occasional glass fragments. Organic odour noted. Copper pipe and wire, rubber tubing, fibrous board.
TP.E	0.7	0.95	Possible sewage sludge.
TP.M	0.17	0.4	Occasional plastic and metal fragments.
TP.S	0	0.45	Occasional plastic refuse.
TP.W	0.8	2.0	Possible Sewage Sludge.
TP.W	2.0	2.6	Possible Sewage Sludge.
TP.X	0.9	2.5	Possible Sewage Sludge.

Groundwater Contamination

During the ground investigation groundwater contamination was not identified by visual / olfactory screening in any of the investigation positions.

6.2.6 Landgas

Dual purpose land gas and groundwater monitoring standpipes installed in the boreholes drilled during the recent works, as well as several installed during previous site investigation, were monitored on three return visits to site, on 30 July, 15 September and 13 October 2003. All landgas monitoring results are presented in Appendix E and are summarised in Tables 6.6 to 6.8 below.

Methane was recorded at detectable concentrations in BH102C only, at 19.7 and 20.0% by volume during visits one and two respectively. However, on the third visit this concentration had dropped to 3.4%. No flow was recorded from this standpipe on any monitoring occasion.

Carbon dioxide was recorded at detectable concentrations in several locations, as summarised below:

Table 6.6 Summary of Measured Carbon Dioxide Concentrations

Date of Monitoring	Carbon dioxide Concentration (% by Vol)			Atmospheric Pressure Trend
	Max.	Min.	Mean	
30 July 2003	3.4 (BH104G)	0.0	0.9	1014 (6am) 1015 (12pm) 1015 (6pm)
15 Sept 2003	3.3 (BH104G)	0.0	0.8	1027 (6am) 1026 (12pm) 1024 (6pm)
13 October 2003	3.2 (BH3R)	0.0	0.8	1010 to 1011 during the monitoring visit

Table 6.7 Summary of Measured Oxygen Concentrations

Date of Monitoring	Oxygen Concentration (% by Vol)			Atmospheric Pressure Trend
	Max.	Min.	Mean	
30 July 2003	21.0	4.9 (BH102C)	18.2	1014 (6am) 1015 (12pm) 1015 (6pm)
15 Sept 2003	20.7	5.3 (BH102C)	18.3	1027 (6am) 1026 (12pm) 1024 (6pm)
13 October 2003	20.8	12.4 (BH104G)	19.3	1010 to 1011 during the monitoring visit

Table 6.8 Summary of Measured VOC Concentrations

Date of Monitoring	Volatile Organic Compounds (VOCs) Concentration (ppm)			Atmospheric Pressure Trend
	Max.	Min.	Mean	
30 July 2003	0.9	0.6	0.8	1014 (6am) 1015 (12pm) 1015 (6pm)
15 Sept 2003	0.7	0.6	0.6	1027 (6am) 1026 (12pm) 1024 (6pm)
13 October 2003	0.6	0.5	0.5	1010 to 1011 during the monitoring visit

6.3 Laboratory Testing

Testing was undertaken on 26 soil samples, 12 leachate samples and 19 groundwater samples during the 2003 investigation and included testing for the following:

Arsenic, Boron, Cadmium, Chromium (Total), Hexavalent Chromium, Copper, Lead, Mercury, Selenium, Nickel, Zinc, pH, Total Sulphate, Water Soluble Sulphate, Total Cyanide, Exchangeable Ammonium as N, Total Monohydric Phenols, Sulphide, Elemental Sulphur, PAH Screen, Speciated (US EPA) PAHs, PRO, DRO, Total Petroleum Hydrocarbons with RBCA Carbon Banding, Asbestos, Speciated Monohydric Phenols, Organic Matter, Faecal Coliforms, Faecal Streptococci, Alkalinity.

6.3.1 Contamination and Chemistry Tests (Laboratory)

The environmental chemistry of the ground was investigated by specialist chemical analysis of selected samples, scheduled by White Young Green Environmental (WYGE) and carried out by Environmental Analysis Limited (EAL). EAL are an approved supplier in accordance with the requirements of the WYGE quality system and are themselves UKAS accredited for a range of chemical analyses.

The results of contamination analyses undertaken on samples obtained from the WYGE investigation these analyses are given in Appendix E2.

The range of potentially hazardous contaminants present on the site can be wide and varied and the suite has been chosen to reflect both commonly found contaminants and others indicated by research to have a significant risk of being present. It is however possible that others may exist for which analyses have not been carried out or which were outside the scope of completed exploratory holes.

In addition to the above contamination testing, a further suite of determinants was scheduled to provide data to be used to establish a relationship between groundwater bodies beneath the site to form part of a quantitative risk assessment (QRA):

Chloride, Calcium, Iron, Magnesium, Manganese, Nitrate, Potassium, Sodium, Silicon.

6.3.2 Geotechnical Tests

A programme of laboratory testing, scheduled by WYGE, was carried out on representative samples taken from the various strata and groundwater. The results of the tests are presented in Appendix E3.

The test procedures used were generally in accordance with the methods described in BS1377:1990. Details of the specific tests used in each case are presented in Table 6.9.

Table 6.9 Schedule of Laboratory Geotechnical Testing

Type of Test	Standard	No.
Classification		
Moisture Content	BS1377 : Part 2 : Clause 3.2 : 1990	11
Liquid and Plastic Limits of soil 4 point cone penetrometer method	BS1377 : Part 2 : Clauses 4.3, 5.3 & 5.4 1990	11
Particle size distribution by Wet sieve analysis	BS1377 : Part 2 : Clause 9.2 : 1990	3
Shear Strength Tests (Total Stress)		
Undrained Shear Strength in Triaxial Compression without measurement of pore pressure:		
Single stage, single 38mm or 106mm diameter specimen	BS1377 : Part 7 : Clause 8 : 1990	2
Chemical Testing		
Sulphate Content of soil	BS1377: Part 3: 1990, Clause 5.0	7
Determination of pH value of soil	BS1377: Part 3: 1990, Clause 9.0	7

7.0 WYGE 2004 INVESTIGATION

7.1 Summary of Scope and Rationale

Site investigation works were undertaken by White Young Green Environmental during the period 25 February to 29 March 2004. The rationale for the investigation is presented below in Table 7.1.

Table 7.1 Rationale for the Ground Investigation

Location	Rationale	Landgas and Groundwater Monitoring Installation Stratum	Depth (mbgl)
BH201C	Investigate general ground conditions at depth to provide guidance on potential soil and groundwater contamination issues and foundation options for proposed road bridge on Island Road over A33. Obtain soil and groundwater samples for laboratory testing.	White Chalk	24.0m
BH202R BH203R and BH204R	Investigate general ground conditions at depth to provide guidance on potential soil and groundwater contamination issues within Made Ground, London Clay and Lambeth Group only, and foundation options. Obtain soil and groundwater samples for laboratory testing.	Lambeth Group	11.0 to 16.0m
BH202C and BH203C	Investigate general ground conditions at depth to provide guidance on potential soil and groundwater contamination issues and foundation options within all strata to White Chalk. Obtain soil and groundwater samples for laboratory testing.	White Chalk	30.0m
TP201 to TP219	Investigate general near surface ground conditions, particularly within the Made Ground, and provide guidance on potential soil and groundwater contamination issues, earthworks issues and foundation options. Obtain soil and groundwater samples for laboratory testing.	No installation	0.3 to 5.0m
HP1 to HP3	Investigate general near surface ground conditions, particularly within the Made Ground, in central areas of the site. Provide guidance on potential soil and groundwater contamination issues, earthworks and foundation options. Obtain soil and groundwater samples for laboratory testing. Additionally, HP1 used as service-clearance starter pit for BH202R; HP2 used for BH202C.	For HP1 see BH202R For HP2 see BH202C No installation in HP3	1.6 to 3.3m
FB201 to FB204	Obtain sample of filter bed medium for laboratory analysis.	N/A	N/A

The layout of the exploratory positions, is presented in drawing no. SK.113.

7.1.1 Monitoring Since 2003 Investigation

Prior to the 2004 investigation a period of monitoring was undertaken by WYGE.

- Landgas and groundwater levels were recorded on 7 occasions in 14no. borehole positions across the site from at least 1 strata per borehole. The monitoring dates were: 30/07/03, 15/09/03, 13/10/03, 16&19/01/04, 12&13/02/04, 15/03/04 and 23/03/04.
- Surface water monitoring was undertaken at a total of 6no. sampling locations on the 7th January 2004. A further, second round, of monitoring of 4no. of the sampling locations was undertaken on the 16th March 2004.

Samples were collected from the following 6 locations in the locality surrounding the STW:

SW1 – Foudry Brook upstream of the site.
SW2 - Foudry Brook Relief Channel upstream of the site.
SW3 – River Kennet downstream of Fobney Lock upstream of the site.
SW4 – River Kennet upstream of east site.
SW5 – Foudry Brook downstream of the site.
SW6 – River Kennet downstream of the site.

The surface water sampling locations can be found on drawing no. SK.113.

7.1.2 Site Investigation Standards

Methods employed during the investigation were undertaken in accordance with BS5930 (reference appendix C).

7.1.3 Site Investigation Methods

Details of the investigative methods employed during this site investigation are presented in Appendix C.

7.2 Findings of 2004 Investigation

7.2.1 Obstructions/ Existing Foundations

Underground obstructions were encountered in a number of exploratory positions during the recent works, as detailed on the appended engineering logs, and summarised in Table 7.2.

Table 7.2 Summary of encountered in-ground obstructions

Location	Details of Obstruction			Notes
	Depth (mAOD)	Thickness (m)	Composition	
HP3	42.1	N/P	Concrete	Trial pit terminated on concrete obstruction
TP211	38.9	N/P	Concrete	Trial pit terminated on concrete obstruction
TP212	39.7	N/P	Concrete	Trial pit terminated on concrete obstruction
TP214	43.3	N/P	Concrete	Trial pit extended north to avoid obstruction
TP216	42.3	N/P	Concrete	Trial pit extended north to avoid obstruction
TP218	38.7	38.6	Cable	Plastic coated cable (approx 30mm diameter)
TP219	43.7	N/P	Concrete	Trial pit extended south-east to avoid concrete.
TP219	41.4	N/P	Concrete	Trial pit terminated on concrete obstruction
BH203R	40.0	39.5	Concrete	Chiselled through obstruction (45 minutes)

7.2.2 Groundwater Conditions

Groundwater was encountered during the recent investigation and subsequent return monitoring visits. Full details of depths recorded during on-going monitoring at the site are presented in Appendix D1

Groundwater was encountered in the majority of trial pits and boreholes during excavation. In the boreholes, groundwater was encountered in the natural ground. Where Valley Gravels were present, groundwater was generally encountered in this stratum. Where it was absent, groundwater was encountered in the sandy horizons of the London Clay or the Lambeth Group.

In the trial pits, groundwater was encountered in some locations as seepages in the Made Ground, in some cases, associated with structures.

7.2.3 Visual / Olfactory Evidence of Contamination

(i) Soil Contamination

During the ground investigation soil contamination was identified by visual / olfactory screening in some of the investigation positions as detailed below.

Table 7.3 Summary of Visual / Olfactory Evidence of Contamination

Location	Depth (mAOD)		Strata	Nature of Contamination
	From	To		
BH202C	43.6	43.5	MG	Possible sewage sludge
BH204R	28.72	23.22	MG	Occasional plastic and polythene fragments.
BH204R	39.7	37.7	MG	Possible sewage sludge
HP1	46.3	46.0	MG	Possible sewage sludge
HP2	43.6	43.5	MG	Possible sewage sludge
HP3	43.53	42.08	MG	Occasional plastic fragments
TP201	40.4	39.8	MG	Some polystyrene fragments, occasional plastic and scrap metal fragments.
TP204	47.5	46.5	MG	Occasional metal fragments, cables and plastic sheeting.
TP204	46.4	46.1	MG	Possible sewage sludge
TP205	50.1	47.4	MG	Occasional debris including scrap metal, plastic and wire.
TP205	47.4	46.8	MG	Possible sewage sludge
TP205	46.8	46.6	MG	Strong organic odour
TP205	46.6	46.4	MG	Possible sewage sludge
TP207	45.6	45.2	MG	Possible sewage sludge
TP209	47.0	46.7	MG	Slight hydrocarbon odour
TP209	46.5	46.2	MG	Possible sewage sludge
TP211	39.6	38.9	MG	Organic/ tarry odour
TP213	37.9	36.3	MG	Hydrocarbon/ organic decay odour
TP214	43.3	40.7	MG	Organic/ hydrocarbon odour
TP216	41.4	40.1	MG	Possible sewage sludge. Suspected ammonia odour noted.
TP216	40.1	38.8	MG	Possible sewage sludge, some plastic fragments.
TP218	39.1	38.5	MG	Possible sewage sludge
TP219	45.1	43.8	MG	Some refuse including plastic and rags.
TP219	43.8	41.9	MG	Possible sewage sludge

(ii) Groundwater Contamination

During the ground investigation groundwater contamination was not identified by visual or olfactory screening in any of the investigation positions.

(iii) Surface Water Contamination

During the ground investigation surface water contamination was identified by visual screening in one of the sampling locations as detailed below.

Location	Date	Nature of Contamination
SW4	03/03/04	Areas (0.05-0.1m in diameter) of rainbow film appearing and then dissipating on surface as if bubbling from below.
SW5	03/03/04	Patches (0.2m-1m in diameter) of dark grey sewage sludge floating on surface.

7.2.4 Landgas

Dual purpose land gas and groundwater monitoring standpipes were installed in all boreholes drilled during the recent 2004 investigation. In addition to these locations, monitoring and sampling was also undertaken within selected additional standpipes installed during previous phases of works, as tabulated below. In total, seven monitoring rounds were completed.

Monitoring Date	Monitoring locations	Land gas monitoring	Groundwater monitoring	Groundwater sampling
16 & 19/1/04	Soil mechanics 2000 boreholes and WYGE 2003 boreholes	Yes	Yes	No
29/1/04		No	Yes	No
12 & 13/2/04		Yes	Yes	No
3/3/04		No	Yes	No
12/3/04		No	Yes	No
15&16/3/04	BH1R, BH1F BH3R, BH6R BH6C, BH9R BH102C, BH102R BH103C, BH103G BH201C, BH202R, BH203R, BH204R	Yes	Yes	Yes
23/3/04		No	Yes	Yes

All landgas monitoring results are presented in Appendix D and are summarised in Tables 7.4 to 7.7 below:

Methane was recorded at detectable concentrations on BH102C only, at 35%, with no flow, on 16&19/01/2004. The concentration had dropped to 0.1%, with flow recorded at 1.1l/hr, by 12&13/02/2004 and risen to 7.3%, with no flow, by 15&16/03/2004. **Carbon Dioxide** was recorded at detectable concentrations in: BH102C on 16&19/01/2004 at 15% with no flow recorded. BH104G on 12&13/02/2004 at 1.5% with a flow of 1.3l/hr. BH204 on 15&16/03/2004 at 2.2% with no flow. **Oxygen** was not recorded at depleted levels in the corresponding boreholes and on the corresponding dates when Carbon Dioxide was recorded. **VOCs** were detected: on 16&19/01/2004 in BH7G at 4.4ppm with no flow. On 12&13/02/2004 in BH7G at 4.5ppm with no flow and on 15&16/03/2004 in BH103G at 1.5ppm with no flow.

Table 7.4 Summary of measured methane concentrations

Date of Monitoring	Methane Concentration (% by Vol.)			Atmospheric Pressure Trend
	Max.	Min.	Mean	
16&19/01/2004	35.0 (BH102C)	0.0	2.1	16 January: 988 (AM) rising to 995 (PM) 19 January: 1018 (AM) falling to 1012 (PM)
12&13/02/2004	0.1 (BH102C)	0.0	0.0	12 February: 1029 (AM) falling to 1028 (PM) 13 February: 1029 (AM) falling to 1026 (PM)
15&16/03/2004	7.3 (BH102C)	0	0.6	15 March: 1020(AM) falling to 1019 (PM) 16 March: 1020 (AM & PM)

Table 7.5 Summary of measured carbon dioxide concentrations

Date of Monitoring	Carbon dioxide Concentration (% by Vol.)			Atmospheric Pressure Trend
	Max.	Min.	Mean	
16&19/01/2004	15.0 (BH102C)	0.0	1.2	16 January: 988 (AM) rising to 995 (PM) 19 January: 1018 (AM) falling to 1012 (PM)
12&13/02/2004	1.5 (BH104G)	0.0	0.4	12 February: 1029 (AM) falling to 1028 (PM) 13 February: 1029 (AM) falling to 1026 (PM)
15&16/03/2004	2.2 (BH204)	0.0	0.4	15 March: 1020(AM) falling to 1019 (PM) 16 March: 1020 (AM & PM)

Table 7.6 Summary of measured oxygen concentrations

Date of Monitoring	Oxygen Concentration (% by Vol.)			Atmospheric Pressure Trend
	Max.	Min.	Mean	
16&19/01/2004	21.2	5.7 (BH102C)	19.8	16 January: 988 (AM) rising to 995 (PM) 19 January: 1018 (AM) falling to 1012 (PM)
12&13/02/2004	21.1	0.0 (BH4F)	19.3	12 February: 1029 (AM) falling to 1028 (PM) 13 February: 1029 (AM) falling to 1026 (PM)
15&16/03/2004	21.2	18.6 (BH204)	20.5	15 March: 1020(AM) falling to 1019 (PM) 16 March: 1020 (AM & PM)

Table 7.7 Summary of measured VOC concentrations

Date of Monitoring	Volatile Organic Compounds (VOCs) Concentration (ppm)			Atmospheric Pressure Trend
	Max	Min	Mean	
16&19/01/2004	4.4 (BH7G)	0.2	1.4	16 January: 988 (AM) rising to 995 (PM) 19 January: 1018 (AM) falling to 1012 (PM)
12&13/02/2004	4.5 (BH7G)	0.9	1.6	12 February: 1029 (AM) falling to 1028 (PM) 13 February: 1029 (AM) falling to 1026 (PM)
15&16/03/2004	1.5 (BH103G)	0.3	0.7	15 March: 1020(AM) falling to 1019 (PM) 16 March: 1020 (AM & PM)

7.3 Laboratory Testing

Testing was undertaken on 76 soil samples, 20 leachate samples and 14 groundwater samples during the 2004 investigation and included testing for the following:

PH, TOC, Electrical Conductivity, Suspended Solids, Asbestos, Phenolics, US EPA PRIORITY PAHs, Total US EPA 16 PAH, Total Cyanide, Easily Liberated Cyanide, Thiocyanate, Sulphide, Sulphur (free), Total Sulphate, Chloride, Phosphate, Orthophosphate, Exchangeable Ammonium, Nitrate, Nitrite, Antimony, Arsenic, Barium, Boron (Water Soluble), Cadmium, Chromium (Total), Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Zinc, BTEX, MTBE, Diesel Range Organics (DRO), Total Petroleum Hydrocarbons, Organic Matter, Pathogens, Essential Elements, VOCs, SVOCs, Cationic Detergents, Anionic Detergents, Non Ionic Detergents, Alkalinity, Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD), Dissolved Oxygen, Kjeldahl Nitrogen, Dissolved Methane, Detergents (cationic, anionic and non-ionic).

The environmental chemistry of the ground was investigated by specialist chemical analysis of selected samples, scheduled by White Young Green Environmental (WYGE) and carried out by Environmental Analysis Laboratories Limited (EAL). EAL are an approved supplier in accordance with the requirements of the WYGE quality system and are themselves UKAS accredited for a range of chemical analyses.

The results of chemical analyses undertaken on samples obtained from the investigation are given in Appendix D2.

The range of potentially hazardous contaminants present on the site can be wide and varied and the suite has been chosen to reflect both commonly found contaminants and others indicated by research to have a significant risk of being present. It is however possible that others may exist for which analyses have not been carried out or which were outside the scope of completed exploratory holes.

7.3.1 Geotechnical Tests

A programme of laboratory testing, scheduled by WYGE, was carried out on representative samples taken from the various strata and groundwater. The results of the tests are presented in Appendix D3.

The test procedures used were generally in accordance with the methods described in BS1377:1990 (REF). Details of the specific tests used in each case are presented in Table 7.8.

In addition to the tests listed above, the following tests were carried out on samples of the filter bed material and may be found in Appendix D4.

- 4No. Particle Size Distribution tests
- 4No. Aggregate Impact Value tests BS812:Part 112:1990
- 4No. Ten Percent Value BS812: Part 111:1990

Table 7.8 Geotechnical Tests

Type of Test	Standard	No.
Classification		
Moisture Content	BS1377 : Part 2 : Clause 3.2 : 1990	14
Liquid and Plastic Limits of soil 4 point cone penetrometer method	BS1377 : Part 2 : Clauses 4.3, 5.3 & 5.4 1990	14
Particle size distribution by Wet sieve analysis	BS1377 : Part 2 : Clause 9.2 : 1990	23
Compaction Tests		
Dry Density Moisture Content Relationship using (all with 5 compaction points):		
2.5 kg hammer in a 1 litre mould	BS1377 : Part 2 : Clause 3.3 : 1990	23
Moisture Condition Value (MCV)		
Moisture Condition Value / Moisture Content Relationship	BS1377 : Part 4 : Clause 5.5 : 1990	
Undrained Shear Strength in Triaxial Compression without measurement of pore pressure:		
Single stage, single 38mm or 106mm diameter specimen	BS1377 : Part 7 : Clause 8 : 1990	

8.0 GEOLOGICAL CONDITIONS ENCOUNTERED

8.1 Soil Conditions

8.1.1 Summary of Soil Conditions

Ground conditions encountered during the recent investigation were broadly consistent with those identified in the published literature and previous ground investigations. Made Ground was encountered across the site at various thicknesses and compositions, as discussed in Section 1.2 below, and similarly the underlying natural geology also varied across the site.

Below central and south-eastern areas, the encountered sequence can be summarised as Made Ground over the London Clay Formation over Lambeth Group with the White Chalk the deepest stratum encountered, to the full depth of the investigation. To the west, ground conditions generally comprised Made Ground over locally present Alluvium and Valley Gravel over the Lambeth Group, with the White Chalk again the deepest stratum encountered. The generalised ground conditions are shown on the geological section, drawing no. SK124, whilst the surfaces of the individual geological units are shown on the attached surfer plots contained within Appendix L.

Table 8.1 below summarises variations in the strata thicknesses across the site. In addition to the data obtained from the recent 2004 WYGE investigation, the table draws upon information obtained from previous ground investigations detailed in section 5.0.

Table 8.1 Summary of encountered Ground Conditions

Stratum	Thickness			Surface		Observed Trends
	Max (m)	Min (m)	Av (m)	Max (mAOD)	Min (mAOD)	
Sewage Sludge	2.6	0.1	0.8	47.4	38.7	Greater thickness in north (ave. 2.0m) compared to SE (ave. 0.5m). Generally not encountered in central areas. Surface dips SE-NW.
Total Made Ground (all types)	8.0	0.2	1.8	49.1	38.2	Greatest thickness in NE (max 8.0m). Generally uniform thickness (~0.5-2.5m) across rest of site except in mounded area in SE (TP205, 3.7m). Base dips east (~46mAOD) to west (~37mAOD).
				Max Base Depth 50.1	Min Base Depth 35.6	
Alluvium	3.7	0.2	1.8	38.8	36.2	Only encountered below western areas, predominantly in NW. Surface dips east (~41mAOD) to west (~39mAOD)

Stratum	Thickness			Surface		Observed Trends
	Max (m)	Min (m)	Av (m)	Max (mAOD)	Min (mAOD)	
Valley Gravel	4.6	0.6	2.3	37.8	34.0	Generally encountered below Alluvium in western and northwestern areas of site. Generally increased thickness towards north, surface dips east to west.
London Clay	6.9	0.4	2.9	47.5	43.5	Only encountered below central-eastern and southeastern areas, between MG and Lambeth Group. Thickness increases towards SE, surface dips east to west.
Lambeth Group	21.2	6.0	11.7	45.2	31.4	Encountered below entire site. Thickness increases from NW (7m) to SE (21m), surface generally dips east (~43mAOD) to NW (~33-34mAOD)
White Chalk	-	-	-	28.5	17.8	Surface dips north (~27mAOD) to south (~18mAOD). Base depth not proven in any location.

8.1.2 Strata Descriptions

The following strata descriptions are based upon the boreholes and trial pits excavated during the recent WYGE investigation, and they compare well with those encountered during the previous phases of work identified above.

Made Ground was encountered in all investigation locations across the site and based on its composition a sub-category of Sewage Sludge has been identified. The Made Ground was highly variable in composition, comprising both fine and coarse grained soils including:

- brown silty sandy clay with varying amounts of flint gravel and gravel and cobble size brick, concrete and some asphalt fragments;
- bands of brown and grey clayey and/or sandy gravel of brick and concrete fragments
- brown silty sandy locally gravelly and peaty clay topsoil encountered in trial pits excavated in soft ground across the site (HP3, TPs203, 207, 208, 212-214, 217-219), from ground level to between approximately 0.2 and 0.5mbgl.

Fragments of decaying wood, glass and metal were also encountered within the stratum across the site, as well as occasional boulder sized concrete and cemented brick fragments. In general the characteristics of the Made Ground were broadly consistent with the natural ground beneath, with the Made Ground generally comprising brown clay where it overlies London Clay, whilst containing more organic matter over Alluvial Ground. The locations at which sewage sludge was encountered are generally coincident with the historical sludge beds shown on the historical survey plan SK103, although isolate occurrences of sewage sludge have been identified elsewhere.

Some refuse material including plastic and rags was encountered from GL to 1.3mbgl in TP219, located near TP.D (WYGE 2003 SI) in which similar material was encountered.

The base depth of the Made Ground varied from 35.6 to 50.1mAOD, with total thicknesses varying between 0.2 (BH1a) and 8.0m (BH204R), and recorded consistencies were predominantly soft for fine grained soils and loose for granular material.

During the recent and previous WYGE ground investigations, **sewage sludge** was encountered at the northern and southern ends of the site. This material consisted of soft, often friable and fibrous, dark green, grey and brown sandy silty clay and clayey silt with rootlets and occasional flint and/or brick gravel. The material was generally encountered either at the base of the Made Ground or as a discreet unit between two bands of general Made Ground soil. The surface of the sludge decreased from southeast (approx 45 to 46mAOD) to northwest (approx 39 to 40mAOD). Sludge thicknesses were greater towards the northern end of the site, ranging from 0.1m (TW TP11) to 2.6m (WYG-04 TPs 214 and 216), with an average thickness of 1.4m; to the south, an average thickness of 0.5m was encountered.

During previous ground investigation works by Wembley Laboratories (1977), possible sewage sludge was identified during the site walkover in the north-western corner of the site, described in the text of the report as 'rough ground covered with old sludge...'. This corresponds with conditions encountered during the recent WYGE works.

Alluvium was encountered predominantly in northwestern and western areas of the site, underlying the Made Ground. The stratum was generally uniform in composition, consisting of very soft to firm, predominantly soft brown, bluish-grey and locally orange-brown silty clay, with occasional lenses of sandy flint gravel and decaying wood fragments, and thicknesses varied between 0.2 (WYG-03 TPB) and 3.7m (SM-BH8R), tending to increase towards the west of the site. The surface of the Alluvium dipped gently south to north and east to west. The range of Alluvium surface levels varied between 36.2 (BH1R) and 38.9mAOD (BH3R).

Valley Gravel was encountered in western and northwestern areas of the site only, where the base of the Alluvium was penetrated. The stratum consisted of medium dense light and dark grey, cream and yellowy brown sandy gravel of fine to coarse sub-angular to sub-rounded flint, with lesser variable fractions of silt and clay. Proven final thicknesses varied between 0.6 (BH8R) and 4.6m (BH3R) with an average of 2.3m, and the surface of the stratum dips gently east (approximately 36mAOD) to west (approximately 35mAOD).

The **London Clay Formation** was encountered below central and southern eastern areas of the site only, directly underlying the Made Ground. The stratum was variable in composition, generally consisting of soft to firm orange-brown and grey mottled silty clay near the top of the stratum and becoming orange, brown and grey clayey and silty sand with depth. London Clay thicknesses varied between 0.4 (BH1, Wembley 1977) and 6.9m (BH7R), increasing towards the southeast of the site, with

an average of 2.9m. The surface of the stratum was found to dip from east to west, ranging from 47.5mAOD (BH104C) to 43.5mAOD (BH202C).

The Lambeth Group (formerly known as the Reading Beds) were encountered in all investigation positions that penetrated the Valley Gravel or London Clay, and in some locations in the southwest of the site directly below the Made Ground. The stratum was variable in composition, comprising interbedded layers of fine and coarse grained soils including clay, silty clay, sandy silt, silty sand and sand with lesser variable amounts of fossil shell, flint gravel and cobbles and lenses of organic clay. Though variable in composition, the general sequence of the Lambeth Group consisted of a band of clay soil overlying a sandy unit, followed be a second clay band at the base of the stratum.

The surface of the Lambeth Group was found to dip from east to northwest, varying between approximately 43mAOD and 33mAOD. Proven thicknesses were found to vary between 7.0 and 21.0m, increasing from northwest to southeast.

Stratum consistencies varied between medium dense and very dense for coarse grained soils, predominantly dense and very dense, and firm to hard for fine grained soils, predominantly stiff and very stiff.

White Chalk was encountered in all locations where the base of the Lambeth Group was penetrated. The surface of the stratum was found to dip from north (approximately 27.0mAOD) to south (approximately 18.0mAOD), and its final thickness was not proven in any of the locations.

Due to the nature of the cable percussion drilling method chalk arisings returned from the boreholes are highly disturbed and are not considered to be representative of the in-situ material. Accurate classification of the Chalk to the criteria set out in CIRIA document 'C574 – Engineering in Chalk 2002' is therefore not possible. However C574 states that a correlation can be made between SPT N values and the density of the Chalk, such that SPT penetration resistance will be lower for lower strength chalks that are easily fractured and remoulded than for denser chalk. Higher penetration resistances are obtained in medium and high-density un-weathered chalk with tightly closed discontinuities; for these, N values are likely to be more than 25 blows.

SPT tests were carried out within the Chalk in a number of boreholes during the WYGE investigations and investigations by others and assessment of the N values obtained indicates all to have yielded N values exceeding 25 blows. It can therefore tentatively be concluded that the chalk stratum consisted of structured medium to high density material, but further classification beyond this is not possible.

9.0 GROUNDWATER DYNAMICS

Groundwater flow directions and velocities are affected by the geological structure of the site. The project area appears to overlie the contact between the alluvial valley and the lithology in which the valley was cut into. The exact position of the valley edge is not known, but it seems to be located east of borehole BH102.

The consequences of the existence of the buried alluvial valley are as follows:

- Complete erosion of London Clay in the western section of the site
- Partial erosion of the upper clay section of Lambeth Group
- Valley gravel occurring only in the western section of the site and thus the aquifer they form does not appear in the eastern and south-eastern side of the site

The thickness of both the London Clay and Lambeth Group seem to rise towards southeast thus increasing the travel distance between the surface and the major aquifer located in Chalk.

To understand the groundwater flow the piezometric contours were generated for three potential groundwater flow systems (Drawing No. SK118-SK120):

1. Shallow Aquifer (Terrace or Valley Gravel)
2. Lambeth Group
3. Chalk Aquifer

London Clay is a confining unit as are clay lenses in Lambeth Group. The latter may also form local conditions for low-yielding perched aquifers of very limited extent.

9.1 Borehole Coverage

Because of the limited site investigation in the southern part of the site with regards to water level data, the reliability of contouring is not adequate. Therefore, the water level measurements from both this site and the site immediately west were used in order to increase the reliability of the contour interpolation. The flow conditions in Valley Gravel are only relevant for the western side of the project area since this stratum was not encountered in the east and southeast.

9.2 Regional flow components

The groundwater flow in the Lambeth Group and the Chalk is thought to be a part of the regional groundwater flow. On top of it local components are superimposed on this regional flow which may interact at some points (gravel aquifer, perched aquifers).

(a) Lambeth Group

The predominant direction of the groundwater flow in the northern section is west to east to east-south-east in agreement with the dip of the Chalk surface. The drop in the groundwater flow gradient between the western and eastern boundary is in excess of 4m.

(b) Chalk Aquifer

Groundwater flow directions and gradient are similar to the flow in the Lambeth Group. The direction is skewed towards southeast, more than in the Lambeth Group, but this can be a result of interpolation errors due to insufficient borehole cover. The groundwater gradient is indicated at approximately 4m, i.e. similar to Lambeth Group. Essentially there is no evidence that the Lambeth Group and the Chalk Aquifer do not belong to the same groundwater flow system, albeit with different transmissive properties.

9.3 Local flow components

(a) Gravel Aquifer

Groundwater flow direction in this aquifer is directed westwards, i.e. opposite to the direction of the regional groundwater flow. The groundwater flow gradient is relatively small – there is a head drop of about 1m between the site and the area immediately west. The existence of this gradient means there could be some recharging component coming from local perched aquifer. This component may not be permanent, depending on the rainfall recharge feeding perched aquifers. The flow directions and gradients suggest that the Gravel Aquifer discharges into the river and may act as potential agent facilitating the contaminant transfer between the sources on site and the river. The borehole coverage is insufficient to make any statements about the gravel aquifer in the southern and southwestern section of the project area.

(b) Perched Aquifers

Clay and sand lenses may locally form favourable conditions for shallow aquifers of limited extent. These may cease to exist in dry periods. The individual perched aquifers may or may not be interconnected at times; therefore the contaminant transport will be limited. There is however a possibility that they may participate in feeding the Gravel aquifer. There is a drop of about 8m in hydraulic head between the eastern and western boundary; in case the perched aquifers and the Valley Gravel Aquifer are connected (at times) this represents a sizeable flow gradient and potentially significant inflow albeit of assumed short duration.

9.4 Implications for the Contaminant Transport in Groundwater

The existence of two flow systems, i.e. regional and local, contributes to the way the solutes migrate in the subsurface. The two main factors: increasing thickness of Lambeth Group and possibly the London Clay towards east and southeast also increases the distance between contaminant sources and the Chalk Aquifer. The absence of gravels with comparatively higher transmissivity is also a factor favouring reduced risk of contaminant migration in large sections of the site.

The area on the western and northwestern boundary does not have a protective cover of the London Clay confining unit, the thickness of Lambeth Group is reduced and the Gravel Aquifer has very low attenuation capacity and high transmissivity. These factors and the fact that the Chalk Aquifer is closer to the surface make the

conditions more favourable for localised impacts from contaminant sources in this area. It is also possible that the Valley Gravels through their feeding mechanism from possibly intermittent shallow groundwater may "concentrate" contaminant loads arriving from more distant sources. This is supported by solute data distribution, indicating peak concentrations close to the western and northern boundaries of the site.

10.0 GEOTECHNICAL DISCUSSION

10.1 Summary of Ground Conditions

Ground conditions encountered during the recent site investigation compared well with those in published literature and the previous site investigations. Details of the various soils encountered during the recent and previous investigations are presented in Section 8.0 whilst Drawing No. SK124 is a geological cross section from north west to south east across the site. In summary they comprise Made Ground, overlying Alluvium and Valley Gravel in the western and north western parts of the site over the Lambeth Group which in turn overlie the White Chalk. In the eastern and south eastern parts of the site, London Clay directly underlies the Made Ground and the Alluvium and Valley Gravels are absent. The Alluvium and Valley Gravel deposits thin towards the centre of the site, away from Foudry Brook and the River Kennet. Both the London Clay and the Lambeth Group are thickest in the south eastern corner. The surface of the chalk is encountered at the shallowest depth in the north west and it dips south east and in the south eastern corner is encountered at greatest depth.

10.2 Geotechnical Testing

Geotechnical testing carried out during the previous site investigations by others and as a part of the WYGE 2003 and 2004 investigations comprised the following:-

WYGE 2004 Site Investigation

(Samples tested from made ground)

- 14No. Atterberg Limit and Moisture Content Tests
- 23No. Particle Size Distribution Tests
- 23No. Proctor Compaction Tests
- 9No. Moisture Condition Value Tests

WYGE 2003 Site Investigation

(Samples tested from natural ground)

- 11No. Atterberg Limit and Moisture Content Tests
- 3No. Particle Size Distribution Tests
- 2No. Undrained Triaxial Tests
- 7No. pH and Sulphate Content Tests

Thames Water 2000 Site Investigation
(boreholes undertaken by Soil Mechanics)

(Samples tested from natural ground)

- 20No. Particle Size Distribution Tests
- 29No. Undrained Triaxial Tests

- 5No. Constant Head Permeability tests (in a triaxial cell)

Wembley Laboratories 1977 Site Investigation

(Samples tested from natural ground)

Volume 1 – North western part of site (25No. boreholes)

- 5No. Atterberg Limit and Moisture Content Tests
- 6No. Particle Size Distribution Tests
- 62No. Undrained Triaxial Tests
- 4No. Oedometer (consolidation) tests
- 9No. pH and Sulphate Content tests

Volume 2 – North eastern part of site (15No. boreholes)

- 7No. Particle Size Distribution Tests
- 37No. Undrained Triaxial Tests
- 9No. pH and Sulphate Content Tests

Volume 3 – Central eastern part of site (10No. boreholes)

- 2No. Particle Size Distribution Tests
- 77No. Undrained Triaxial Tests

10.3 Geotechnical Parameters

This section discusses the key geotechnical characteristics of each encountered stratum as determined from field observations and field and laboratory geotechnical testing.

10.3.1 Made Ground

The consistencies and relative densities of the Made Ground have been assessed primarily through field observation and confirmed in some instances using SPT testing. The stratum consisted predominantly of fine-grained soils and has been assessed to be generally soft.

The results of the tests undertaken as a part of the WYGE 2004 investigation are summarised on Drawing No. SK122. The results generally indicated a greater homogeneity amongst samples taken from the Made Ground in the south and south east of the site where the Made Ground generally comprised orange brown clay, sometimes sandy and containing gravel and of soft to firm consistency, broadly similar to the natural London Clay underlying it. Typically, the maximum dry densities of this material were 1.7 to 1.8Mg/m^3 with the natural moisture content being about 1 to 3% above the optimum, which was typically between 14 and 17%. The clay was generally of intermediate plasticity and had a Moisture Condition Value at optimum moisture content generally of 10 or 11.

In the north and north west, the made ground exhibited greater heterogeneity. Clay similar to that described above was encountered at some locations. Elsewhere, conditions included a soft greenish grey or dark brown clay with decaying wood fragments, where the initial moisture contents were significantly higher than the optimum moisture contents, the latter being above 20%. Dry densities were lower than in the south of the site particularly where it was silty and the clay soils were highly plastic. These conditions are considered to be more typical of Alluvial derived material or sewage sludge. In some parts of the north of the site, a clayey gravel with a lower natural and optimum moisture content (approximately 13-15% and 10-12% respectively).

10.3.2 Alluvium

Atterberg limit tests undertaken on the Alluvium indicated that the soft orange brown clay material was of intermediate plasticity with moisture contents of between 20% and 40% whilst the more organic material was of extremely high plasticity with moisture contents of over 100%. The organic Alluvium and the sewage sludge are visually similar and exhibit similar index properties.

The results of the undrained triaxial tests indicate that the Alluvium is generally soft with some areas soft to firm consistency whilst very soft clays are also indicated locally.

Using the results of Standard Penetration Tests (SPTs) and the relationship Cu = 4.5 x SPT N Value, the undrained shear strengths within the Alluvium have been assessed as soft or soft to firm.

4No. Oedometer tests were undertaken on the Alluvium during the 1977 Wembley laboratories investigation prior to the construction of the existing filter bed structure in the northern part of the site. At that time, the settlement characteristics indicated a highly compressible soil, with values for the coefficient of compressibility (m_v) of between 1.06 and 1.67m^2/MN and coefficients of consolidation (C_c) of between 0.42 and 2.31m^2/year.

Chemical tests for pH and water-soluble sulphate (2:1 extract as SO_4) were undertaken on one sample of the Alluvium indicated a sulphate concentrations of between 0.34 and 1.1g/l with a corresponding pH values of 6.4 to 8.5.

10.3.3 Valley Gravel

Particle size distribution tests undertaken on the Valley Gravel generally confirmed that the material comprises a very gravely Sand or very sandy Gravel.

SPT testing indicates that the relative density of the Valley Gravels is generally medium dense.

Chemical tests for pH and water-soluble sulphate (2:1 extract as SO_4) were undertaken on two samples of the Valley Gravel. These tests indicated sulphate concentrations of 0.14 and 0.60g/l with corresponding pH values of 7.1 and 7.3.

10.3.4 London Clay Formation

Using the results of Standard Penetration Tests (SPTs) and the relationship Cu = 4.5 x SPT N Value, the undrained shear strengths within the London Clay are generally firm when it is encountered, becoming stiff with depth prior to encountering the Lambeth Group. Undrained triaxial tests generally show the material to be stiff with some results indicating a very stiff consistency at greater depth. Limited Atterberg limit tests indicate that the material is of intermediate plasticity.

10.3.5 Lambeth Group

Determination of Atterberg Limits on three fine grained samples of the Lambeth Group indicated liquid limits in the range of 31 to 74%, plastic limits in the range of 14 to 25% and corresponding plasticity indices in the range of 17 to 49%, indicative of low to very high plasticity clays. Corresponding natural moisture contents occurred in the range of 12 to 23%. The low plasticity sample with a low moisture content was of a silty nature whilst the other two samples comprised a clay.

Particle size distribution tests confirmed the variability observed in the composition of the Lambeth Group which ranges from a sandy clay to a fine to medium sand.

The consistencies of the predominantly fine grained Lambeth Group have been assessed primarily through field observation and confirmed in using SPT testing and by undrained triaxial tests. Using the relationship Cu = 4.5 x SPT N Value shear strengths within the Lambeth Group have been assessed to vary between 90 and 212kN/m^2 (stiff to very stiff). Shear strengths have been confirmed by the undrained triaxial tests which generally give values of greater than 150kN/m^2 or greater than 200kN/m^2 at depth. For the sands of the Lambeth Group, relative densities have been assessed to vary between medium dense to dense using SPT data. Assessment of variation of shear strength and relative density with depth indicates that there is an approximate linear increase in soil competency / relative density with depth.

Chemical tests for pH and water-soluble sulphate (2:1 extract as SO_4) undertaken on three samples of the Lambeth Group indicated sulphate concentrations in the range of 0.30 and 0.53g/l with corresponding pH values in the range of 7.5 to 8.5.

10.3.6 White Chalk

As discussed in Section 4.1, classification of the Chalk to the criteria set out in CIRIA document 'C574 – Engineering in Chalk 2002' is not possible due to the disturbed nature of the material recovered from the boreholes. However the relationship given in this document between SPT N values and chalk densities suggests that the White Chalk underlying the site is medium to high density structured Chalk.

Chemical tests for pH and water-soluble sulphate (2:1 extract as SO_4) were not undertaken on samples of the White Chalk

10.4 Engineering Considerations

10.4.1 Introduction

The current proposed development comprises some commercial buildings, mostly in the south western part of the site, with the remainder of the site comprising managed residential apartments with landscaped surrounds and houses with gardens. It is understood that buildings will generally be between two and four storeys in height and hence our recommendations are based upon such structures.

The existing ground surface rises from the northern and western parts of the site, close to Foudry Brook and the River Kennet where levels are between 39 and 40mAOD (Above Ordnance Datum). The levels rise up towards the eastern and southern parts of the site where they reach 47 to 48 mAOD. The redevelopment works incorporate substantial earthworks in order to achieve the site development levels. Hence, site levels can be expected to alter several metres from existing levels in some areas. However, for the purposes of this preliminary geotechnical assessment, existing ground levels have been assumed since the formation levels have yet to be finalised.

It is anticipated that a combination of both shallow foundation and piled foundations (or an alternative ground improvement solution such as vibrated concrete columns) will be required to provide the foundation solution at the East site. The ground conditions, as indicated in the geological cross section, Drawing No. SK124, vary across the site..

In the north and west, the Made Ground is underlain by river deposits comprising the Alluvium and the Valley Gravel, which together comprise thicknesses of between 2 and 5m. In the southern and eastern areas, where the ground levels are higher, river deposits are absent whilst London Clay is present and is 4 to 7m thick.

In the northern and western areas, the Lambeth Group is present from approximately 34mAOD and underlies the Alluvium and Valley Gravel. In the south and south east the Lambeth Group is present from 38mAOD and underlies the London Clay. The upper part of the Lambeth Group comprises a clay and up to 10m of this upper horizon is present in the south and east but thins towards the north where it may only be 2m thick. Across the site the Lambeth Group sands underlie the Lambeth Group clay and are encountered at between 29 and 32mAOD and are between 4 and 10m in thickness, again the greatest thicknesses being in the south east where the Lambeth Group dip to their lowest point across the site.

The White Chalk is present beneath the whole site and is encountered at 28mAOD (9mbgl) in the north of the site and as deep as 18mAOD (30mbgl) in the south east.

10.4.2 Spread Foundations

In the south eastern and eastern parts of the site where the Made Ground is underlain by London Clay, spread foundations could be considered for low rise buildings, dependant upon the thickness of Made Ground over the London Clay after site re-levelling. It is considered that in most other areas of the site where Made

Ground is thicker or is underlain by soft clay Alluvium, spread footings are not likely to provide suitable foundations for expected structural loads.

For outline design purposes indicative safe bearing pressures have been calculated using Skempton's values for the Bearing Capacity Factor N_c. For a typical 2 x 2m conventional pad foundation bearing on to the London Clay at a depth of 2m below ground level, net allowable bearing pressures of the order of 150kN/m^2 have been estimated based on a conservative undrained shear strength (Cu) value of 75kN/m^2 where settlements are limited to 25mm. For strip footings up to 0.6m wide, also bearing on to the firm Superficial Deposits at an approximate depth of 2.0mbgl, net allowable loads of 175kN/m^2 can be obtained.

When assessing minimum founding depths, consideration should be given to the potential impact of existing trees and proposed planting. Consultation with the NHBC guidance document, Chapter 4.2 "Building Near Trees" should be undertaken prior to deciding upon final foundation depths and tree locations for the development.

Should it be necessary to deepen conventional foundations, due to the potential influence of trees, as discussed above, then this will also have an effect on allowable bearing capacities. In addition, consideration will be need to be given to the groundwater levels and the requirement to pump and support deeper excavations should they be required for foundations Table 10.1 below provides a summary of net allowable bearing pressures at a range of depths;

Table 10.1 Summary of Spread Foundation Options

Footing Depth (mbgl)	Anticipated Soil Type	Allowable Bearing Pressure (kN/m^2)	
		Pad (2mx2m)	10m Strip (up to 0.6m wide)
2.0	London Clay	150	175
3.5	London Clay	160	200

10.4.3 Piled Foundations

It is likely that piled foundations will be required for the buildings to be situated on areas underlain by a significant thickness of Made Ground and Alluvium.

Ultimately, the final selection of pile type most suitable for the site will be influenced by a number of factors. These include the geotechnical characteristics of the ground conditions, the final site levels and the consequent depth to the chalk aquifer and the proximity of the existing water abstraction boreholes constructed into the chalk. The proximity of neighbouring buildings and infrastructure may also need to be considered.

Most importantly, however, the pile design will be significantly influenced by presence of the Major Chalk Aquifer and any risks posed to the aquifer by piling will be discussed with the Environment Agency. At present, it is considered that construction of piles into the Chalk will pose a risk to the quality of groundwater within this aquifer. This is particularly the case at this location, where the southern

part of the site falls within the groundwater protection zone of the abstraction for the Courage brewery to the south east.

Indicative pile designs are detailed below but it must be noted that these preliminary calculations are based upon current site levels and hence detailed pile design will be required once site development levels have been finalised.

The preliminary calculations have been based upon the use of continuous flight auger (CFA) piles extending into the Lambeth Group or the Chalk although the use of alternative method such as driven cast *in-situ* piles could be considered.

The use of CFA piles would also prove beneficial in light of the relatively high groundwater table as this method does not require casing or the use of bentonite slurries. However, there are certain practical constraints when considering the incorporation of large amounts of pile reinforcement. There is also the risk of collapse or necking of the pile bore should the flights be withdrawn and the hole left unsupported. For these reasons, in addition to the need to protect the Chalk aquifer, it is recommended that a competent and experienced specialist piling contractor undertakes all piling works, adopting appropriate controls and that their advice should be sought at the earliest opportunity.

For the purposes of calculation of indicative pile capacities, the site has been considered in two halves, north and south based upon the ground conditions. The north calculations are considered to represent the ground conditions where Alluvium and Valley Gravels overlie the Lambeth Group and where the Chalk is encountered at its shallowest. The south calculations refer to the area where London Clay overlies the Lambeth Group, the river deposits are absent and the Chalk is encountered at greater depth. The assumed vertical ground profiles are detailed in the tables below. For detailed design, it will be necessary, as a consequence of variation in strata thicknesses, ground levels, column loads and group effects (if any), to assess final required pile lengths on a structure-by-structure basis.

The vertical ground profiles for the purpose of these assessment have been considered to be as follows:-

Table 10.2 Ground Profile – North

Depth	Stratum
Ground Level to 4.0m	Made Ground
4.0m to 6.0m	Alluvium
6.0m to 8.0m	Valley Gravel
8.0m to 10.0m	Lambeth Group - Clay
10.0m to 15.0m	Lambeth Group – Sand
15.0m to >26.0m	Structured Chalk

Table 10.3 Ground Profile – South / South East

Depth	Stratum
Ground Level to 2.0m	Made Ground
2.0m to 7.0m	London Clay
7.0m to 19.0m	Lambeth Group (Clay)
19.0m to 26.0m	Lambeth Group (Sand)

It is anticipated that seasonal variations in groundwater levels may occur but would not be of sufficient magnitude to cause significant short term effective stress variations. The ground model has consequently assumed a long term equilibrated groundwater table at 3.00mbgl for both of the generic profiles.
The general equations used for the calculations are as follows:-

For piles end bearing on clay:-

$$Q_{base} = N_c \cdot c_u \cdot A_{base}$$

For skin friction in clay ground conditions:-

$$Q_{shaft} = \alpha \cdot c_u (av). A_{shaft}$$

For piles end bearing in granular ground conditions:-

$$Q_{base} = N_q.\sigma_{vo}A_b$$

For skin friction in granular ground conditions:-

$$Q_{shaft} = 0.5. K_s \cdot \sigma_v' \cdot \tan \delta \cdot A_{shaft}$$

Where:-

Q is the bearing capacity

N_c is the bearing capacity factor

C_u is the undrained shear strength

α is the adhesion factor

N_q is a bearing capacity factor,

σ_v' is the effective stress at the base of the pile

K_s is the coefficient of horizontal soil stress

δ is the angle of friction between the pile and the soil

A_{base} and A_{shaft} are respectively the area of the base and shaft of the pile.

The competency of the soil profile used for these calculations is based on in situ testing, principally SPTs, where estimation of undrained shear strengths (kN/m^2) of the encountered cohesive soils have been calculated using the empirical correlation Cu = 4.5 x SPT N value, and the results of direct laboratory determination of shear strength by undrained triaxial compression tests conducted on samples of cohesive soils.

It has been assumed that little or no positive skin friction will be obtained from the Made Ground and any Alluvium present. Service capacities have been derived with an overall factor of safety (FoS) of 2.5 for piles extending into the Lambeth Group and into the Chalk. For piles constructed into the Chalk and in order to limit settlements to less than 2% of pile diameter CIRIA C574 'Engineering in Chalk' requires the allowable pile capacity to be assessed as the lesser value obtained by either applying a FoS of 2.5 to the combined base and shaft ultimate capacities or the sum of a FoS of 1.0 applied to the shaft ultimate capacity and a FoS of 3.5 applied to the base ultimate capacity. However indicative calculations demonstrate that applying a combined factor of 2.5 within the Chalk provides the lower value for all cases where penetration of the Chalk exceeds 2m and consequently for indicative design purposes a global FoS of 2.5 has been applied to both founding strata for the purposes.

Derivation of, and adopted design values for key geotechnical parameters are discussed in the succeeding paragraphs. Indicative SPT values and adopted design values are summarised in Table 10.4.

Table 10.4 Ground model, indicative SPT values and Adopted Design Values. Note symbols are discussed in text below.

Stratum	Terrace Gravel	London Clay	Lambeth Group (clay)	Lambeth Group (sand)	White Chalk
SPT N value	15	15-20	20-25	25-40	35
γ_{bulk} (kN/m^3)	19	18	18	19	22
N_c	NA	9	9	NA	NA
α	NA	0.5	0.5	NA	NA
c' (kN/m^2)	NA	90	90-120	NA	NA
ϕ'	39	NA	NA	42	NA
OCR	1.0	NA	NA	1.5-1.8	NA
K_o	1	NA	NA	1	NA
K_s/K_o	1	NA	NA	1	NA
β	0.30	NA	NA	0.39-0.44	0.45
τ_{max} (kN/m^2)	100	NA	NA	100	100
k (kN/m^2)	NA	NA	NA	NA	200
$Q_{af\,base\,max}$	That at 10-20 pile diam.	NA	NA	That at 10-20 pile diam.	1800

Typical bulk density values for the strata have been assumed, cognisant of relative densities indicated by the SPT N value data, for the purpose of calculating effective stress.

(a) Parameters for Calculating Base and Shaft Service Capacities in the London Clay and the Lambeth Group (Clay)

The base and shaft capacities in the clay strata of the Lambeth Group have been determined assuming undrained conditions. In addition, as previously noted, all of the pile base capacities have assumed that the pile base will be founded upon clay since the location and thickness of sand strata within the Lambeth Group cannot be accurately predicted.

The adhesion factor, α of 0.50 is a typical value used for over consolidated clay (Tomlinson 1994). A bearing capacity factor, N_c of 9 is considered to be suitable for all types of clay strata.

(b) Parameters for Calculating the Base and Shaft Service Capacities in the Terrace Gravels and the Lambeth Group (Sand)

The shaft friction coefficient value, β is required for calculating the load capacity obtained from skin friction for pile design in the Terrace Gravel and in the sandy Lambeth Group. It has been necessary to make a number of assumptions /

inferences in order to derive values for these parameters. These assumptions are outlined below.

The β value is defined as K_s tan δ, where K_s is the coefficient of horizontal stress and δ is the pile / soil interface fiction value. K_s is related to K_o, the coefficient of earth pressure at rest. This relationship is usually defined as a ratio, dependent on the installation method, generally assumed to be between 0.7 and 1.0 for CFA piles (Tomlinson, 1994) and a value of 1.0 has been assumed for indicative pile designs undertaken. Ultimately both K_s and K_o are a function of effective soil friction value, ϕ', and over consolidation ratio, OCR.

The over consolidation ratio, OCR, is defined as the ratio of the maximum effective stress the soil has been subject to in the past, to the present value of effective stress. It has been considered that the Terrace Gravels are normally consolidated, hence having a OCR of 1, since it is unlikely that they have been subject to levels of effective stress significantly higher than at present. The Lambeth Group are, however, known to be over consolidated, that is, they have been subjected to greater consolidation under greater loads than they are at present. Therefore, an over consolidation ratio of between 1.5 and 1.8 has been assumed for the Lambeth Group, dependant upon the effective stress values.

The value of the effective soil friction value, ϕ', can be derived from SPT N value data for a given effective stress condition as detailed by Mitchell et al., 1978. Average values for each strata have been used, giving 39° for the Terrace Gravel and 42° for the sandy Lambeth Group.

The pile / soil interface fiction value, δ, is dependent on the material the pile comprises, the installation method and soil type and for concrete piles whether the piles are pre-formed or cast in situ. This parameter is related to the soil friction value by a ratio taken as 1.0 for cast in place concrete against sand (Tomlinson 1994).

The unfactored unit shaft resistance (τ) has been limited to 100 kN/m^2 in accordance with Tomlinson (1994).

For the base resistance calculations, the bearing capacity N_q has been used and is based upon values established by Berezantsev and can be considered to be approximately equal to twice the SPT value for a stratum. The ultimate base resistance has been limited to that calculated at between 10 and 20 pile diameters' penetration into the granular stratum.

(c) Parameters for Calculating the Shaft and Base Service Capacities in the Chalk

For Chalk, CIRIA C574 provides guidance on the selection of values for the shaft friction coefficient value, β and for CFA piles a value of 0.45 is recommended for design purposes. The maximum unit shaft resistance, τ is limited to 100 kN/m^2 in the absence of pile load tests. Should such tests be undertaken it may be appropriate to increase the value of τ to a maximum of 200 kN/m^2, dependent on test results. The CIRIA document rather than recommending N_q values, states that the unfactored

ultimate unit area base resistance should be related to SPT N value by a factor k, where $q_{(u\ base)}$ = k x SPT N. CIRIA C574 recommends a 'k' value of 200 kN/m^2 for CFA piles. This document also recommends that the unfactored allowable unit area base resistance is restricted to between 1000 and 1800 kN/m^2 where SPT N values are in excess of 25 as is the case for the Chalk encountered at all exploratory points. A value of 1800 kN/m^2 has been assumed for indicative designs reported herein. The values adopted for design within the Chalk stratum are summarized in Table 10.4.

Service capacities for a range of possible founding depths and pile dimensions have been calculated for CFA piles as outlined below in Tables 10.5 and 10.6.

Table 10.5 Indicative service capacities of piles bearing into various strata – North of Site

Founding Stratum	Pile Diameter (m)	Pile Length (m)	Pile Diameter and Service Capacities (kN)		
			Shaft	Base	Total
Lambeth Group (clay)	0.45	9m	60	50	110
Lambeth Group (sand)	0.45	12m	140	390	530
Lambeth Group (sand)	0.45	14m	180	450	630
Chalk	0.45	20m	480	290	770
Chalk	0.45	26m	820	290	1110

Table 10.6 Indicative service capacities of piles bearing into various strata – South of Site

Founding Strata	Pile Diameter (m)	Pile Length (m)	Pile Diameter and Service Capacities		
			Shaft	Base	Total
London Clay	0.45	6m	80	50	129
Lambeth Group (clay)	0.45	12m	230	50	280
Lambeth Group (clay)	0.45	18m	410	70	480
Lambeth Group (sand)	0.45	26m	780	1060	1840

On the basis of the illustrative calculations, settlements are likely to be within permissible tolerances.

The above calculated values are presented for indicative purposes only. Where preliminary and working pile load tests are undertaken it may be appropriate to reduce Safety Factors.

10.4.4 Ground Improvement

As an alternative to piled foundations, where shallow foundations are unsuitable, ground improvement techniques could be considered.

Vibrated Stone Columns (VSCs) can be used in Made Ground and Alluvium provided the shear strength of the material is adequate. It is known, from construction precedents elsewhere, that the use of stone columns can be unsatisfactory in their intended purpose to support applied foundation loads in some 'soft ground' conditions. This is particularly true where stone columns are constructed in very soft, highly organic and / or distinctly peaty, alluvial clay soils subject to typical bearing pressures. However, the Alluvium at this site is generally a soft silty clay with little evidence of peat and hence is likely to be suitable for the use of VSCs. However, VSCs can be considered to be a pathway for contamination and are therefore may not be suitable in the northern part of the site where leachable contaminants have been identified, although some remediation is proposed in that area. Furthermore, the sludge beds in the north of the site comprise organic, peat-like material which is unlikely to be suitable for VSCs. The Environment Agency should be consulted regarding the use of VSCs at the site if they are to be considered for use at the site.

Vibrated Concrete Columns (VCCs) are unlikely to suffer any detrimental effect from passing through soft strata such as the Alluvium or the sludge beds. A suitable stratum for the VCCs to bear upon is required and the Valley Gravel are likely to be suitable whilst the stiff clay Lambeth Group may also prove to be a suitable founding stratum. However, it is unlikely that VCCs will accommodate adequate loads for heavier structures, where piled foundations would be required.

Specialist advice should be sought should designers wish to further evaluate the viability of ground improvement techniques.

10.4.5 Floor Slabs

In areas where buildings are piled and where substantial thicknesses of Made Ground and Alluvium are present, it is likely that suspended floor slabs will be required in order to guard against unacceptable settlements. Settlements in the Alluvium, where present, could be expected to be long term and in order of up to 30mm for a typical floor loading of 25kN/m^2. It should be noted that similar settlements could also be expected for every metre of fill placed over the Alluvium to increase site levels. However, consideration could be given to the alternative methods described below.

Alternatives to the use of suspended slabs could include the following:-

- Ground improvement beneath the proposed slab by the installation of vibrated stone columns or vibrated concrete columns or by in situ soil mixing.

- The removal and replacement with engineering fill of the unsuitable materials beneath the proposed slab may be viable above the water table and where thicknesses of unsuitable ground are limited. This would guard against differential settlements as a result of variations in the composition of the Made Ground or Alluvial materials. It may be possible to obtain suitable material for use as engineered fill by the screening, treatment and sorting of excavated or other site won materials.

Where spread footings are suitable for use on the London Clay, ground bearing floor slabs could be used although consideration will need to be given to the shrinking and swelling properties of the London Clay and some ground improvement may still be required. Careful assessment of the potential for heave movements will be required if reduction in level is proposed over areas underlain by London Clay. Consideration could be given to the alteration of soil beneath the proposed slab by excavation and treatment by lime stabilisation which reduces the volume change on wetting and drying.

10.4.6 Concrete

Sulphate tests indicated that maximum determined levels correspond to Design Sulphate Class DS-1 to DS-3 in accordance with BRE Special Digest 1, 'Ground Aggressivity on Concrete'. As mainly brownfield ground conditions persist and groundwater is assumed to be relatively mobile, the Aggressive Chemical Environment for Concrete (ACEC) is considered to be AC-3 in accordance with the aforementioned document. We would advise that all cements used for sub-surface concrete should conform to the advice given within this publication unless otherwise specified or required.

11.0 GROUND CONTAMINATION ASSESSMENT

11.1 Tier 1 Assessment

11.1.1 Soils

It is recognised by the industry that the Soil Guideline Values (SGV) from the Contaminated Land Exposure Model (CLEA) are those now favoured by the Environment Agency who prefer a risk-based assessment. The development plans for the site (SK125) include a majority coverage by residential buildings. Assuming that some or all will have gardens associated with them the CLEA SGV for residential with plant uptake has been used as an initial Tier 1 Screening Criteria. In the absence of CLEA SGVs, the results of the soil analyses have been compared to the most appropriate guidelines available for each determinand, generally Dutch Intervention Values. Elsewhere, where an appropriate guideline value was not available to determine the risks applicable to this site, professional engineering judgement has been used to derive an appropriate level at which to screen the raw data. These are generally derived from the guideline value for the groundwater for that determinand. The values used for the Tier 1 Screening Criteria are presented in Table 11.1.

These values are to provide an initial indication of contaminants present but not used as criteria upon which the decision is made to recommend remediation. This decision is based on the evaluation of a number of factors which when combined together present a statutory or non-statutory liability that may require remedial action.

Table 11.1 Tier 1 Screening Criteria for Soils

Determinand	Tier 1 Screening Criteria (mg/kg except pH & Faecal counts)	Source of Screening Value
pH	<6.0 or >8.0	Professional Judgement
Total Phenols	2	Professional Judgement
Total PAH	40	Dutch Intervention Value
Benzo(a)pyrene	0.3	Professional Judgement
DRO/PRO	200	Professional Judgement
sVOCs	20	Professional Judgement
Faecal Streptococci	1000 no./g	Professional Judgement
Faecal Coliforms	1000 no./g	Professional Judgement
Clostridia	1000 no./g wet wt	Professional Judgement
Total Cyanide	20	Dutch Intervention Value
Ammonium	15	Professional Judgement
Arsenic	20	CLEA SGV
Boron	3	Professional Judgement
Cadmium	1	CLEA SGV
Total Chromium	130	CLEA SGV
Copper	190	Dutch Intervention Value
Lead	450	CLEA SGV
Mercury	8	CLEA SGV
Nickel	50	CLEA SGV
Selenium	35	CLEA SGV

Determinand	Tier 1 Screening Criteria (mg/kg except pH & Faecal counts)	Source of Screening Value
Zinc	720	DIV

NB PAH = Poly-aromatic hydrocarbons
DRO/PRO = Diesel Range Organics/Petrol Range Organics
VOCs = Volatile Organic Carbons

Table 11.2 provides a summary of an initial screening exercise highlighting the results which exceed the appropriate tier 1 screening values.

Table 11.2 Summary of Tier 1 Screening of Soil Contaminants

Soil Contaminant	Number of samples showing elevated levels	Maximum Exceedence mg/kg
Ammonium	94	2625
Boron	60	29
Cadmium	41	69
Benzo(a)pyrene	28	8.9
Selenium	21	1357
Total Chromium	20	1432
Nickel	19	271
Copper	16	879
DRO	15	7868
Zinc	11	2735
sVOCs	11	99
Lead	8	795
Total PAH	7	595
Total Phenols	7	30
Mercury	6	12
Total Cyanide	2	75
Arsenic	2	34
Clostridia	1	2000

11.1.2 Groundwater

For groundwater, sensitivity designations have resulted in the use of UK Water Supply (Water Quality Standards) as an initial guideline value in order to provide protection to the underlying Major Aquifer within the Chalk which is used as a public drinking supply. However, the River Kennet, which supports a fish farm, lies at the northern boundary of the site and as such the Environmental Quality Standards (freshwater) are also applicable as a screening guide to assess groundwater conditions on site. As such, the most sensitive value provided by these two standards was used as an initial guideline value in assessing contamination to groundwater and leachate. Table 11.3 lists the guidance values used.

As for soils, this assessment is only an initial screening exercise and does not imply

that remediation is necessarily required.

Table 11.3 Tier 1 Screening Criteria used for Initial Assessment of Groundwater and Leachate

Determinand	Tier 1 Screening Criteria (µg/L except pH)	Source of Screening Value
pH	<6.0 or >8.0	Professional Judgement
Total Phenols	0.5	Water Supply
Total PAH	0.2	Water Supply
DRO/PRO	10	Water Supply
sVOCs	10	Professional Judgement
Total Cyanide	1	EQS Freshwater
Ammonium	15	EQS Freshwater
Arsenic	10	Water Supply
Boron	2000	Water Supply/EQS Freshwater
Cadmium	5	Water Supply/EQS Freshwater
Total Chromium	5	EQS Freshwater
Copper	1	EQS Freshwater
Lead	4	EQS Freshwater
Mercury	1	Water Supply/EQS Freshwater
Nickel	50	Water Supply/EQS Freshwater
Selenium	10	Water Supply
Zinc	8	EQS Freshwater
Nitrate	50000	Water Supply

Table 11.4 provides a summary of an initial screening exercise highlighting the results which exceed the appropriate tier 1 screening values.

Table 11.4 Summary of Tier 1 Screening of Groundwater Contaminants

Groundwater Contaminant	Number of samples showing elevated levels	Maximum Exceedence µg/l
Ammonium	31	33079
Zinc	28	406
Copper	23	49
DRO	21	2857
Chromium	9	20
Total Cyanide	8	9
Arsenic	6	37
Boron	5	3267
Nickel	5	123
Nitrate	1	322559
Lead	1	6
Total Phenols	1	87

11.1.3 Leachates

Guideline values used for leachate assessment are the same as those for the groundwater (See Table 11.3). Table 11.5 provides a summary of an initial screening exercise highlighting the results which exceed the appropriate tier 1 screening values.

Table 11.5 Summary of Tier 1 Screening of Leachate Contaminants

Leachate Contaminant	Number of samples showing elevated levels	Maximum Exceedence µg/l
Zinc	38	496
Copper	35	418
Ammonium	23	16937
Lead	19	128
Cadmium	18	542.1
Total Cyanide	18	64
Nitrate	12	330782
Chromium (dissolved)	6	57
Arsenic	4	36
Boron	4	4219
Nickel	3	114
Total PAH	1	3.5
Chromium (hexavalent)	1	5.1
Mercury	1	1.92
Selenium	1	10

11.1.4 Filter Bed Material

The samples taken from the filter bed material indicate slightly elevated levels of heavy metals, ammonium and pathogens. However, higher levels of pathogens would have been expected from these beds particularly since they were still in use at the time that the samples were taken. It is considered likely that the results would have been higher had samples been taken from the base of the filter material rather than the upper layers.

11.1.5 Landgas

Landgas levels were recorded on 7 occasions in 14no. borehole positions across the site from at least one strata per borehole. BRE212 indicates a trigger value of 1.5% by vol. for carbon dioxide, above which adoption of gas preventative measures should be considered. Carbon dioxide concentrations measured in 7 of the 22 standpipes monitored exceeded this trigger value and concentrations in 2 standpipes (BH8G and BH102C) exceeded the 5% action value set out by BRE212, above which gas preventative measures must be taken.

The trigger value for methane as set out in BRE212 is 1% by vol. This value is exceeded in 1 location only (BH102C) with levels of up to 35%. Unusually, these elevated methane levels were all recorded within the Chalk only on this site. During the Enviros Aspinwall 2000 investigation, no elevated methane was encountered from any location or strata across the site and only slight exceedences of the carbon dioxide 1.5% trigger value were recorded at four locations with the remainder below this limit.

Exceedences were considered above 1% for Methane (Lower Explosive Limits 5-15%), 1.5% for Carbon Dioxide and above background levels for VOCs. Oxygen levels are included for reference although below 18% is generally considered significant. VOCs were not recorded to be significantly above respective background levels. Table 11.6 details the standpipes where an exceedence of carbon dioxide or methane levels was recorded. The full set of gas monitoring data is shown in Appendix D-F.

Table 11.6 Exceedences of Recorded Methane and Carbon Dioxide (listed in date order)

Sampling Location	Date Monitored	Strata	Gases (%)			
			Methane	Carbon dioxide	Oxygen	VOCs
BH102C	30/07/03	CHALK	19.7	WL	4.9	WL
BH102C	15/09/03	CHALK	20	WL	5.3	WL
BH102C	13/10/03	CHALK	3.4	WL	17.4	WL
BH102C	15/03/04	CHALK	7.3	2.1	WL	WL
BH102C	16&19/01/04	CHALK	35	15	5.7	WL
BH103G	16&19/01/04	GRAVELS	WL	WL	WL	WL
BH103G	12&13/02/04	GRAVELS	WL	WL	WL	WL
BH104G	30/07/03	GRAVELS	WL	3.4	11.7	WL
BH104G	15/09/03	GRAVELS	WL	3.3	11	WL
BH104G	13/10/03	GRAVELS	WL	3	12.4	WL
BH204	15/03/04	LAMBETH GROUP	WL	2.2	WL	WL
BH3G	30/07/03	GRAVELS	WL	1.6	WL	WL
BH3R	30/07/03	LAMBETH GROUP	WL	2.9	17.8	WL
BH3R	15/09/03	LAMBETH GROUP	WL	3	WL	WL
BH3R	13/10/03	LAMBETH GROUP	WL	3.2	18	WL

Sampling Location	Date Monitored	Strata	Gases (%)			
			Methane	Carbon dioxide	Oxygen	VOCs
BH6C	30/07/03	CHALK	WL	2.6	16.6	WL
BH6C	15/09/03	CHALK	WL	2.5	17.3	WL
BH6C	13/10/03	CHALK	WL	2.7	17.3	WL
BH7G	16&19/01/04	GRAVELS	WL	WL	WL	WL
BH7G	12&13/02/04	GRAVELS	WL	WL	WL	WL
BH8G	23/03/04	GRAVELS	WL	11.4	6.5	WL

W.L. Within limits

11.2 Contamination Assessment

Tables providing an initial screening exercise highlighting the full set of results which exceed the appropriate tier 1 screening values are included in appendix K For soils, groundwater and leachate.

The identified contamination, both observed during excavations and as revealed by chemical analysis, appears to be predominantly associated with the past use of the site as a sewage treatment works.

Soil, filter bed material, groundwater, surface water and leachate samples were collected and analysed from those areas of the site where access was not restricted by the presence of above ground structures or underground services. However, due to these access restrictions, uncertainty remains with regard to the overall spatial distribution of contamination across the site. Areas of the site where sample collection was not possible were notably: beneath and adjacent to the high and low level filter beds, beneath a wide strip of the site extending from the southern storm tanks to the storm tanks in the northeast of the site and also beneath the settlement tanks located in the northeast of the site. Furthermore, the number of boreholes and machine excavated trial pits which could be safely excavated in the southern half of the site was extremely limited due to the presence of underground services and hence, many of the trial pits in this area are shallow, land excavated pits only.

11.2.1 Ammonium Impact to Soils and Groundwater

The most widespread contaminant identified on site is ammonium with the majority of soil, leachate and groundwater samples recording elevated levels of this determinand at a range of depths through the soil profile. Significantly elevated levels have been recorded in soil samples obtained form the north and the northeast of the site particularly WYG 2004-TP216 (2625mg/kg) and WYG 2004-TP218 (1465mg/kg). The high levels encountered in these two locations may be associated with the current refuse tip and site of former sludge lagoon in this area of the site and/or the Gillette warehouse/Rosekiln Lane former landfills.

Ammonium is a common subsurface contaminant of landfills and sewage treatment works, often present at high concentrations. Ammoniacal nitrogen is one of the pollutants still present after secondary sewage treatment. This is initially present in wastewater but the concentration of ammonia may be enhanced as a result of biological oxidation of organic nitrogen during the earlier stages of treatment. Such ammonia will arise from the breakdown of proteins, amines, urea and other organic compounds.

As shown by the elevated concentrations of ammonium in leachate, this compound easily dissolves in water as ammonium ions and the highest concentrations of ammonium on this site are recorded in the shallow groundwater held within the Gravels and Lambeth Group. The highest concentration recorded is in the Lambeth Group groundwater in ENVIROS 2000-BH3R at 33,079µg/l. However, elevated levels are also present within the Chalk groundwater with 9,189µg/l recorded in WYG2003-BH102C. When compared with the Drinking Water Quality standards of 500µg/l, the significance of these exceedences becomes apparent, particularly given the nearby abstractions from this aquifer.

Given the landuse in the wider area (several landfills), it is considered possible that a degree of ammonium contamination is migrating downwards to the Major Aquifer from these contaminant sources (on and off-site). In this respect, it appears that the Lambeth Group are not wholly preventing the vertical transfer of pollutants through them although the elevated levels of ammonium in this stratum indicate that some retardation of contamination is occurring here.

11.2.2 Soil Impact by Metals, Hydrocarbons and Inorganic Contaminants

When compared to the Tier 1 Screening Criteria, the soils show some elevated levels of heavy metals and in particular, the levels of the phytotoxic metals **copper**, **zinc**, **nickel** and **boron** are elevated. Some slightly elevated levels of **cadmium**, **lead**, **chromium** and **mercury** (mercury was not considered to be significantly elevated according to our screening criteria but has been detected at concentrations greater than naturally occurring levels) which are toxic to human health, are also noted.

Distribution of impact by the metals shows a distinct spatial trend with the majority of significantly elevated metals being recorded in the northern end of the site at the location of the former sludge beds, these include **cadmium** and **boron** which have been observed in isolated areas in the south and middle of the site but appear to be more concentrated in the north and northwest of the site. The highest levels of cadmium were recorded in ENVIROS-BH1F (68.69mg/kg) and WYG 2003-TPE (68.4mg/kg) in the northwest of the site and in WYGE-2004-TP218 (62.4mg/kg) in the north of the site in the refuse tip area. Elevated levels of **chromium** show a similar distribution in the north and northwestern areas. Elevated concentrations of metal contaminants were typically encountered within the upper 3m of the soil profile and represent the Made Ground or waste sewage works materials.

The distribution of Tier 1 exceedences of **PAHs** and **hydrocarbons** do not trend towards the north of the site as with the metals, instead concentrations tend to represent localised soil zones across the site

The most elevated hydrocarbon concentration measured is **diesel range organics** in BH1 in the Made Ground at the north end of the site. However, Tier 1 exceedences of PAH (including **benzo(a)pyrene**), **phenols** and **sVOCs** are also recorded in the south and central areas of the site.

Inorganic contamination Tier 1 exceedences, in addition to ammonium, consist of total cyanide recorded in the Made Ground in the north and northwest of the site.

11.2.3 Microbes/Pathogens

Initial biological testing has indicated the presence of certain bacteria in the soil. Microbial analysis of groundwater during the earlier investigation (Enviros Aspinwall, 2000) entailed plate counts (cfu/ml) after 48h at 37°C and 72h at 22°C, total coliform and *E.coli* counts were also conducted. Results of each assessment were compared with those from an off site borehole at Fobney. Samples from the site showed higher counts than the off site borehole for each assessment.

During the recent WYGE investigation **faecal streptococci**, **faecal coliforms** and **Clostridia** counts were undertaken on shallow soils. However, no faecal indicators were detected at levels greater than the assessment threshold value of 1000cfu/g but **Clostridia** were detected at 2000cfu/g in WYG 2004-TP216 in the north of the site, possibly associated with the refuse tip in this location and/or the former sludge beds and sludge lagoon.

11.2.4 Leachability of Contaminants

Of the elevated concentrations of leachable contaminants detected – concentrations of **ammonium** and the phytotoxic metals **zinc** and **copper** exceeded the tier 1 screening criteria in the majority of samples tested. **Total cyanide** along with the metals **lead** and **cadmium** exceeded the Tier 1 screening criteria in nearly half of the samples tested. **Nitrate, chromium**, **arsenic**, **boron**, **nickel**, **mercury** and **total PAH** concentrations exceeded the Tier 1 screening criteria in few of the samples tested. The highest concentrations of leachable contaminants i.e. metals and ammonia were generally recorded in samples obtained from the north and west of the site which concurs with the distribution of contaminants identified in the soils and in general with the historical locations of sludge beds as shown on drawing no. SK.103. The high leachability of nitrate on site supports the fact that the site is acting as a source for the nitrate recorded in the Foudry Brook surface water samples.

11.2.5 Groundwater Impact

The following contaminants were found to exceed tier 1 screening criteria in all or the majority of the samples tested: **Ammonium, zinc, copper, chromium** and **total cyanide** whereas **arsenic, boron, nickel** and **nitrate** were elevated in some of the samples tested.

Elevated levels of contaminants have been recorded across all the underlying strata. Observed distribution of groundwater contaminants is similar to the distribution of ammonium and metals within the shallow soils, the highest incident of ammonium and metals impacted groundwater has been recorded the northern end of the site.

Again, the presence of slightly elevated metals within the Chalk groundwaters indicates the existence of partial continuity between the shallow and deeper groundwater.

Low levels of the Diesel Range Organics are also observed within the shallow groundwater under the site although no one concentration is considered to be significant. The vast majority of these incidences are from the Enviros Aspinwall 2000 investigation and are likely to represent naturally occurring hydrocarbons in the ground identified by differing laboratory analytical techniques used at that time. These humic acid type compounds are likely to be present on this site and present no environmental risk. These compounds can be extracted by the solvents used during general hydrocarbon testing and affect the data produced for diesel range organics in that they elevate the results obtained.

11.2.6 Observed Hazards

In addition to the soil and groundwater chemical analysis, observations during the site investigation are also critical to the overall assessment. Hazardous wastes may be revealed on site that were not identified by laboratory analysis of soil samples. Of particular note are any extraneous odours or anomalous physical wastes. Tables 6.5 and 7.4 in sections 6 and 7 respectively, detail visual and olfactory findings. Observations of physical wastes described as landfilled materials where encountered in some locations, these were evident in the northern end of the site in TPD, BH102, BH103GC, BH204R, HP3, TP216 and TP219, and included metal wire, glass fragments, plastic, polythene, nylon and occasional sharps. Given the proximity of the neighbouring former Gillette landfill, just northeast of the site and within metres of some of these locations, it is possible that these materials represent past overspill from that off-site source or deposited screenings from the sewage treatment process.

Some locations in the south of the site also contained these materials: TPM, TPS, TP201 and notably TP204 and TP205 in the area of the former landfill in this part of the site (reference section 3.2). Trials pits excavated into the mound over the former landfill in the southeast of the site had to be undertaken by hand due to the density of services in this area. The top metre of ground here revealed Made Ground with brick and concrete fragments, likely demolition waste.
A summary of visual and olfactory contamination encountered during previous investigations is included in Appendix J. During the Thames Water 1999 Investigation. cloth, metal, glass, tar, plastic, and sanitary towels were encountered in a number of trial pits located across the site e.g. TW-TP12 and TW-TP15 in the north and northwest of the site. The nature of the waste suggests that it has derived from the STW.

Fibrous spongy peaty deposits with an organic odour have been encountered at the within the area of the former sludge beds in the northern end of the site and at the southern end of the site, although not recorded on historical plans, this has been visually identified in trial pits on site. This material differs in description from the underlying Alluvium and other Made Ground and is assumed to be sewage sludge deposits encountered either at the base of the Made Ground or as a discreet unit within the Made Ground. Sludge deposition is likely to be responsible for some of the metal impact to soils and shallow groundwater observed in the northern area.

During surface water sampling, visual contamination was observed at two locations: SW4 (River Kennet) Areas (0.05-0.1m in diameter) of rainbow film appearing and then dissipating on surface as if bubbling from below. SW5 (Foudry Brook) Patches (0.2m-1m in diameter) of dark grey sewage sludge floating on surface.

11.2.7 Landgas Assessment

A total of 7 landgas monitoring visits were undertaken between 30/07/03 to 23/03/04. Carbon dioxide was detected as elevated in six of the boreholes monitored on the site although significant flow rates were not recorded. Concentrations exceed the BRE action level of 5% in BH102C and BH8G. The elevated levels were recorded predominantly in the northern part of the site, although a distribution pattern of elevated landgas cannot be fully determined since some parts of the site do not have monitoring boreholes due to difficulties with access caused by numerous services and ongoing sewage treatment operations.

Methane was only detected at one location on site where it appeared to be emanating from the Chalk. This is not easily explained given that Chalk is not typically a source of methane although carbon dioxide can be emitted from chalk through breakdown of this geology by water. Levels of up to 35% by volume of methane were recorded. Methane is potentially explosive at concentrations between 5 and 15% and this gas may act as an asphyxiant or explosive if trapped in confined spaces above ground. However, again, significant flow rates for this landgas were not detected. The general absence of methane across the site indicates that landgas is not currently migrating onto site from neighbouring landfills.

11.2.8 Surface Water Assessment

EA, WYGE and Thames water monitoring data shows the general quality within both the River Kennet and the Foudry Brook to be of good quality with Dissolved Oxygen not exceeding the EQS Freshwater standard of <7mg/l at all times. With the exception of slightly depleted oxygen recorded at 3 locations (both upstream and downstream of the site) by Thames Water on the 30/05/2000.

BOD generally does not exceed the freshwater EQS of 3mg/l at all locations with the exception of apparently anomalous readings recorded during the WYGE second round of monitoring in March 2004 (reading of 33mg/l to 34 mg/l at all four locations monitored). Ammonium similarly meets the EQS of 0.78mg/l at the majority of locations, again except for the WYGE March readings downstream of the STW discharge for both the Foudry Brook and the River Kennet. Essentially, the impact of STW effluent discharge into the Foudry Brook has been identified with slightly elevated BOD, depleted oxygen and increased concentrations of Ammonium downstream of this location. Although it must be noted that ammonium and BOD levels (with the exception of the results recorded on the 16/03/04) remain below the licensed allowable effluent concentration of 5mg/l and 20mg/l respectively.

No heavy metal or hydrocarbon contamination of surface waters has been identified with the exception of elevated concentrations of boron downstream of the STW effluent outlet and two elevated concentrations of PAH. Elevated PAH was detected

upstream of the effluent outlet (44.4µg/l) and in the Foudry Brook Flood Relief Channel (6µg/l), despite concentrations further downstream recorded to be below the limit of detection. The results from sampling on the 16th March 2004 indicate that PAH levels are all within water guidance values.

12.0 QUALITATIVE RISK ASSESSMENT

Current environmental legislation in respect of contaminated land includes the Environment Act 1995, Water Resources Act 1994, Environmental Protection Act 1990, Health and Safety at Work Act 1994, Town and Country Planning Act 1990 and Building Regulations 1985.

Part IIA of the EPA 1990 was implemented by Section 57 of the Environment Act (EA) 1995. The regime is detailed in the Department of Environment, Transport and Regions (DETR) circular 02/2000 which includes a statement of government policy, a description of the new regime, the statutory guidance and a guide to the supporting regulations.

The regime provides a statutory definition of contaminated land based on the risk of significant harm to human health and the environment, or pollution of controlled waters. By adopting the principles of risk assessment and risk management the intention is to ensure that contaminated land is managed effectively, based on its current use, proposed end use and environmental setting.

Under the regime, land is only defined as contaminated if there is a significant 'pollutant linkage'. This requires evidence of the presence of a contaminant (the source), a pathway (or pathways) through which contaminants could travel, and a receptor that could be harmed by the contaminant. In addition the type of receptor and any harm must meet the descriptions of significant harm given in the statutory guidance. A site where a contaminant is causing or is likely to cause pollution of surface water or groundwater (controlled waters) also constitutes contaminated land.

This section of the report provides a qualitative assessment of environmental risks associated with the site. The qualitative risk assessment is achieved by the classification of the significance of the potential harm and the probability of a pollutant linkage. The harm and probability of linkage via identified pathways are then compared to indicate the potential environmental risk for a pollutant linkage. The assessment has been developed with cognisance of:

- the nature, level and extent of identified contamination (this may include for duration and frequency),
- potential contamination receptors, and
- regard to the current site status

The risk assessment will also reflect the potential sensitivity of the receptors and the significance of the contaminant source (i.e. the volume and concentration of the contaminant source). The site's sources, pathways and receptors are schematically illustrated in a conceptual model SK.115.

12.1 Sources

A number of indicators of potential hazards with regard to possible sources of contamination are identified as a result of historical and current activities both on and off-site. Some of these have been identified during the recent investigations and others, although not encountered to date, may still be present in areas of the site,

particularly those not investigated due to coverage by operational structures or services.

12.1.1 The historical sewage sludge beds in the northern and western part of the site

Sewage sludge is highly organic and anaerobic degradation may release methane, carbon dioxide and hydrogen sulphide gas. Sewage sludge may also contain a wide range of toxic heavy metals and pathogenic bacteria which remain in the underlying soils and groundwater and nitrates which may cause eutrophication if they enter surface watercourses. Dried sludges and sludge impacted soils may support combustion if ignited by an external source such as a surface fire or by spontaneous ignition. Evidence for the deposition of sludge has been identified in the northern and western areas of the site.

12.1.2 Sewage Treatment Works Processes

A variety of solid, semi-solid and liquid wastes may be present at sewage works sites. The wastes present may include; solid detrital material removed by screening in the preliminary treatment stage; sludges produced in various stages of treatment and in a range of physical forms from dried solid matter to unconsolidated semi-solid and liquid sludges of high moisture content and liquids and settled solids present in lagoons, tanks and drying beds etc. Sewage screening material was not noted as obvious in the recent investigations however, sanitary towels were included among visual contamination encountered during the Thames Water Investigation in 1999 so its potential presence across the site cannot be entirely ruled out. The presence of wastes in former lagoons, drying beds, humus tanks etc may be less obvious over time as their surface layers dry out and become vegetated. Filter bed material may be re-used on site and is likely to be contaminated with a range of pathogenic organisms. Sewage treatment can result in the release of contaminants, particularly heavy metals, to the underlying soils. Disease producing organisms are present in sewage but their numbers are greatly reduced by treatment processes. The current sewage works structures were noted to be in poor repair which may result in leaks of their contents from the current operations.

12.1.3 Historical landfills on and adjacent to the site

It was indicated that the southeast corner of the site was landfilled pre 1974 with inert waste and this area is currently mounded above the surrounds. However, there is no evidence to suggest that this material is a potential contamination source albeit through limited investigation. However, excavations in the northeastern area of the site have revealed the presence of landfilled materials. Adjacent to the site the north east area, the Gillette Landfill, is recorded to be filled with biodegradable wastes (pre-1974) and may be a source of the landfilled materials in the northeast of the site at one location adjacent to this boundary. There is evidence of recent tipping of refuse material in the northeastern area of the site and historical maps indicates former sludge lagoons in this area which may have been infilled with these wastes. Significant landfills are also noted to the west of the site and described as domestic waste by previous investigations.

Hazards associated with former landfill sites depend on the type of wastes present and the presence of a wide variety of chemicals with a heterogeneous distribution is typical. Mobile leachate is often present within the waste fill whilst landgas comprising methane and carbon dioxide generated from biodegradable wastes is flammable, toxic and a potential asphyxiant in confined spaces. Underground combustion in the presence of a limited air supply can also occur leading to the formation of voids and unstable surfaces. The noted presence of sharps (razor blades) in one location is also a potential physical hazard. Waste fill is typically of varying compaction and density and prone to settlement.

12.1.4 Leaks or spills from vehicles or other fuel sources

Lorry movements in and out of the sewage works and standing vehicles within it, have the potential to leak small quantities of fuels which may result in localised areas of hydrocarbon impact to the shallow soils. It is considered unlikely that these will be significant unless major spillage has occurred on site and there is no evidence to suggest this has occurred. However, elevated hydrocarbons at isolated locations in the north and southwest parts of the site may be representative of localised fuel spillages/leaks.

12.1.5 Historical Industrial Use On and Off-site

In the southeast corner of the site, the historical review revealed the presence of an 'Isolation Hospital' which was later replaced by an Engineering Works. During the decommissioning of the hospital it is not known to what extent the site was cleared and if all wastes and structures associated with this building were removed at that time. As such, there remains the risk that associated wastes remain within the ground at and around this location although these were not revealed by the site investigation, albeit only shallow depths were covered. The subsequent Engineering Works may have also left a legacy of contamination potentially comprising hydrocarbons, metals and asbestos containing compounds although, again, these were not detected at this location. However, the landfilling of inert wastes has been undertaken in this same area and may disguise any underlying impact.

Various types of industry to the south and southeast of the site including a timber yard, engineering works and an electronic works have the potential to have contaminated the ground in that area with a wide range of contaminants. The flow of the shallow groundwater northwards and westwards towards the Kennet and Foudry increase the potential for contaminants from these sources to migrate onto site. Excluding the elevated soil hydrocarbons observed in the southwest of the site, there is no other evidence of this potential occurrence on site.

12.2 Potential Pathways

The key environmental pathways and exposure routes by which the potentially toxic substances can reach the potential receptors (see Section 12.3) are considered to be;

- Vertical migration of leachate from contaminants from the shallow soils into strata and groundwater beneath

- Surface runoff to the River Kennet
- Surface runoff to the Foudry Brook
- Groundwater movement laterally and vertically through the Made Ground
- Groundwater movement laterally and vertically through the Valley Gravels
- Groundwater movement vertically through sandy deposits within the Lambeth Group
- Groundwater movement through the Chalk
- Landgas movement through the permeable ground strata
- Inhalation of dust, vapours or landgas
- Ingestion and uptake of soil, groundwater or dust (plants and humans)
- Dermal contact with contaminated surface soil, groundwater or sewage treatment wastes.
- Migration along pipeline runs and services
- Ingress of landgas into buildings
- Exposure of dried sludge in soil to heat/fire resulting in combustion

A schematic conceptual model of site showing the sources, pathways and receptors are shown on figure SK.115.

12.3 Potential Contamination Receptors

Receptors that may be affected by the contamination are:-

- The Minor Aquifer formed by the Valley Gravels beneath the site and adjacent sites
- The Major Aquifer formed by the Chalk beneath the site and surrounding area.
- Fobney Pumping Station emergency public supply abstraction to the NW (~200m)
- The Courage Brewery abstraction (~1100m S)
- The River Kennet
- The Foudry Brook
- Other groundwater abstraction boreholes within the vicinity
- The Fish Farm
- Current and future site users
- Adjacent site users
- Construction workers during any redevelopment, remediation and general groundworks
- Flora and Fauna including the Fobney Meadow Wildlife Heritage Site
- The fabric of future building and services

12.4 Qualitative Risk Assessment

The risk of pollution to the following receptors listed below have been assessed and a summary is presented at the end of this section in Table 12.1.

1. *Future Site Users:*

Proposals for the site are currently for a mixed-use development. Potential pollutant linkages through which future site users may be exposed to contaminants are ingestion and inhalation of airborne dusts and dermal contact with ground/groundwater. These media in the north end of the site are likely to contain elevated levels of heavy metals. Strong odours, although mostly associated with the current sewage treatment operations, are likely to be unacceptable to future landuse.

Hazards from the presence of pathogens recorded within the soils and any filter bed material which is re-used in the site development are also of concern although are likely to present a potential occupational health risk during future large scale processing regeneration works undertaken on the site rather than a long term risk to eventual site occupiers. The rate of pathogenic die-off is influenced by a number of factors including sunlight, temperature and moisture. Bacterial pathogens (Faecal streptococci etc) of mammals have optimum growth temperatures around the body temperature and are unlikely to multiply at temperatures below 25^{0}c. As such, by the time of future site occupation, the human health risk associated with these microbes is likely to have significantly reduced. However, although some viruses are unable to multiply outside their host they can survive in adverse conditions and *Cryptospiridium* and *Giardia* are extremely resistant to the stresses of the ambient environment and may persist.

The construction of a hardstanding surface on some of the proposed development would provide a low permeability barrier between sources of contaminants and future site users and appropriate gas mitigation measures would reduce any risks posed from the gas. However, landscaped areas do not present an effective barrier to underlying contaminants and as such, it is considered that a potential pathway to site users may exist through such locations.

On the basis of the above discussion and the potential hazards observed at shallow depth, the risk posed to **future site users** is **Medium.** However, appropriate mitigation measures included in the development can be used to reduce these risks down to an acceptable level. The rating would reduce according to the degree of remediation undertaken.

2. *Groundwater:*

Assessment of groundwater conditions has revealed complex groundwater dynamics. It is considered that the groundwater flow system beneath the site is an interaction of three major hydraulic units which are mostly, but not entirely independent of each other. The Gravels, the Minor Aquifer, are very permeable and allow the rapid transport of groundwater (and therefore contaminants) within it from the Made Ground above. Contaminants within the soil matrix have proved to be fairly mobile (leachable) in the northern area of the site which may provide ongoing contamination of the shallow groundwater. The elevated levels of metals and ammonium recorded both

within shallow soils and particularly the ammonium in shallow groundwater at this location are likely to be sourced from the former sludge deposition in this area.

Although the Minor Aquifer is not directly abstracted locally for use, it is in partial hydraulic continuity with the nearby River Kennet and Foudry Brook and also the underlying Major Aquifer. Given these pathways and the contaminant load in shallow soils in the north part of the site, the risk to the **Minor Aquifer** on this site is considered to be **Medium**.

Where the Lambeth Group are clay rich (forming an aquitard), and the London Clay (forming an aquiclude) are present, these strata slow down or stop the vertical migration of contaminants from the overlying Minor Aquifer and thus accumulate the contaminant load coming down from the shallow soils above. However, in sandier zones of the Lambeth Group, where the attenuation capacity within this strata is reduced, and where the London Clay is absent in the north and northwest of the site, it appears that some contamination is maybe penetrating through to the Chalk. Ammonium and metal impact to the Major Aquifer has been recorded in places and incidences of this in the southeast of the site have migrated there from sources in the northern end of the site as part of the predominant Chalk groundwater flow. It is considered unlikely that the London Clay will allow the penetration of surface contaminants (although no significant sources were identified in the southwest of the site) to the deeper strata. It is considered likely that the majority of ammonium contamination migrating downwards to the Major Aquifer derives from the landuse in the wider area which includes several landfills.

The Major Aquifer is considered a valuable water supply resource, used locally for public water supply and the Brewery. However, contamination testing of abstracted water at the Fobney Public Water Supply (Appendix M) has recorded metal and ammonium concentrations as being compliant with Drinking Water Quality Standards. Predominant groundwater flow is to the south towards the Brewery and given the sensitivities of the **Major Chalk Aquifer** and the contamination identified, it is assessed that the risk posed by the site to the groundwater is **Medium.**

3. *Surface Water:*

The River Kennet borders the northern site boundary and assessment of groundwater conditions indicates that the Minor Aquifer within the gravels which is predominantly flowing in this direction, is in hydraulic continuity with this River. In addition, the proximity of the Foudry Brook on the western boundary indicates the potential connection of shallow groundwater with this watercourse as well. Migration of ammonium impacted groundwaters through the Gravels and through drain runs below ground on the site, could present a risk to these surface waters through nitrification and possibly eutrophication. However, given the volume of flows within the River Kennet and the natural effects of attenuation and dilution, the severity of the impact of such intrusion

by contaminated groundwater will be reduced. However, the sensitivity of this receptor, given the local abstractions, and the levels of ammonium on site, it is assessed that the risk posed to **surface water** is **Medium.** This risk rating also reflects the classified nature of both surface watercourses by the Environment Agency.

4. *Construction Workers:*

Groundwork excavations may promote the pathways of dermal contact, inhalation of airborne dust and vapours and ingestion of Made Ground soils. In addition, development workers may come in contact with physical hazards such as sharps, although only noted at one location, and combusting wastes (potentially the sludge deposits). In addition, as described above under 'Future Site Users', the presence of pathogens on site within soils, filter bed material and shallow groundwater may present a hazard to groundworkers.

The duration of the exposure is controlled to a large extent by the scope of the works being undertaken and the precautions taken by the workers themselves to limit exposure (detailed below). However it is recognised that given the nature of potential worker activities that there is a higher potential for acute exposure to significantly elevated concentrations of contaminants which have been identified throughout the soil profile investigated. Overall the contamination identified is considered to present a **Medium** risk to ground workers.

Appropriate worker briefing and safety precautions must be employed for all groundworks within contaminated areas, and to comply with the Construction (Design and Management) Regulations 1994. A site specific working plan will be a pre-requisite for any groundworks on the site. If the appropriate level of heath and safety is adopted and appropriately managed then the risk to **construction workers** can be reduced.

5. *Flora and Fauna:*

The Environmental Statement suggests that Foudry Brook and the Fobney Meadow Wildlife Heritage Site (150m N) have potential for reasonable conservation value although are severely degraded and will continue to degrade unless conservation is initiated. The Reading Unitary Council (Borough Council) are likely to support any measure to maintain or increase the habitat value of the area and as such it is intended that the northernmost part of the Reading STW development will comprise a wildlife heritage site. In addition, the River Kennet supports a fish farm and deterioration to the river water quality is likely to adversely affect this use. Other flora and fauna present in the Kennet and Foudry Brook will also be sensitive to changes in water quality.

The proposed development is likely to include areas of landscaping and elevated levels of phytotoxic metals recorded within shallow soils may adversely impact any plants in these areas through root uptake of soil solution resulting in stunted growth or even the perish of the plant. This is particularly

likely to be a risk in the northern area of the site where historic sludge deposition has resulted in elevated metals within shallow soils.

As such the risks posed to **flora and fauna** both surrounding the site and as part of the future development are considered to be **Medium.** Appropriate mitigation/remedial measures included as part of the development will reduce this risk down to a more acceptable level.

6. *Current Users/Trespassers:*

The main site access is located on the eastern boundary and is controlled by a barrier and security guard. Entry to the site is controlled by a strict 'sign-in' process and contractors have to undertake a safety briefing. The entire site is fenced and not easily accessible to the general public.

A potential risk to site users exists through contact with sewage wastes although the necessary health and safety applied to site workers and their operations will effectively minimise this risk. Given the presence of hazardous sewage wastes on site and the protection measures already in place to cope with such, the additional risk from contact with contaminated underlying soils is considered to be minimal. Additionally, much of the site is covered in hard surfacing providing an impermeable barrier to underlying hazards.

Considering only the risk from ground conditions and not site operations to site users/trespassers, and given the health and safety measures already in place, the overall risk posed to **current site users/trespassers** is considered to be **Low to Medium**.

7. *Adjacent Land Uses:*

Environmental risk posed <u>from</u> the site

Excluding nearby surface waters and Fobney Meadows which are already discussed above, sensitive receptors located on adjacent land are limited at present as they are typically industrial landuse and landfilled areas with likely contamination issues of their own. However, potential liabilities associated with site ownership and off-site migration of contamination may be a cause for concern if adjacent areas are remediated and any new development becomes a more sensitive receptor such as residential areas.

Potential pathways onto adjacent land from the site are considered to be deposition of airborne dust (during groundworks) and the migration of groundwater and contaminated run off after rainfall. Conveyance of odours from current operations and during decommissioning of the sewage works are also likely to impact upon neighbouring land users. Intrusive groundworks are likely to remove surface layers and disturb underlying contamination, potentially mobilising it and creating new pathways to offsite receptors

Although the Foudry Brook and the River Kennet will form partial barriers to the western and northern migration of contaminants within the shallow

groundwater, the investigation revealed a deeper level of impact within the Lambeth Group and Chalk which may travel beyond these physical barriers. These surface waters as a receptor are considered in greater detail in item 3.

Given the concentrations of contaminants identified in the groundwater and soils, particularly in the northern end of the site, but reflecting the low sensitivity of the surrounding land uses and the physical barriers presented by the two surface watercourses, it is considered that the risk posed **from the site** to offsite receptors is **Low to Medium**.

Environmental risk posed to the site

Landfills surround the site to the north and west and are likely to contain soil and groundwater contamination and elevated landgas. Investigations have not proved any encapsulation of those sites by means of clay liners or the like and the permeable strata (Chalk and Gravels) underlying the site are likely to allow some lateral movement of contaminants from one site to the next. Shallow flows of impacted groundwater and leachate are likely to be at least partially interrupted by the intervening surface watercourses. Deeper impact by adjacent sites to the Chalk Aquifer, however, is likely to have influenced deep groundwater quality on site. The level of risk associated with **on site migration** of contaminants is therefore considered to be **Medium**.

8. *Future Infrastructure*

The risks posed to future buildings and services derive from the geotechnical and contamination characteristics of the ground. The putrescible nature of buried sludges may result in compression resulting in differential settlements of proposed buildings. This could adversely affect the site's infrastructure. The presence of contaminants within the soils could also impact upon the materials used for pipework for services. It is therefore considered that the current risk to **future infrastructure** is **Medium**. However, remedial measures and ground improvements can reduce this to an acceptable level.

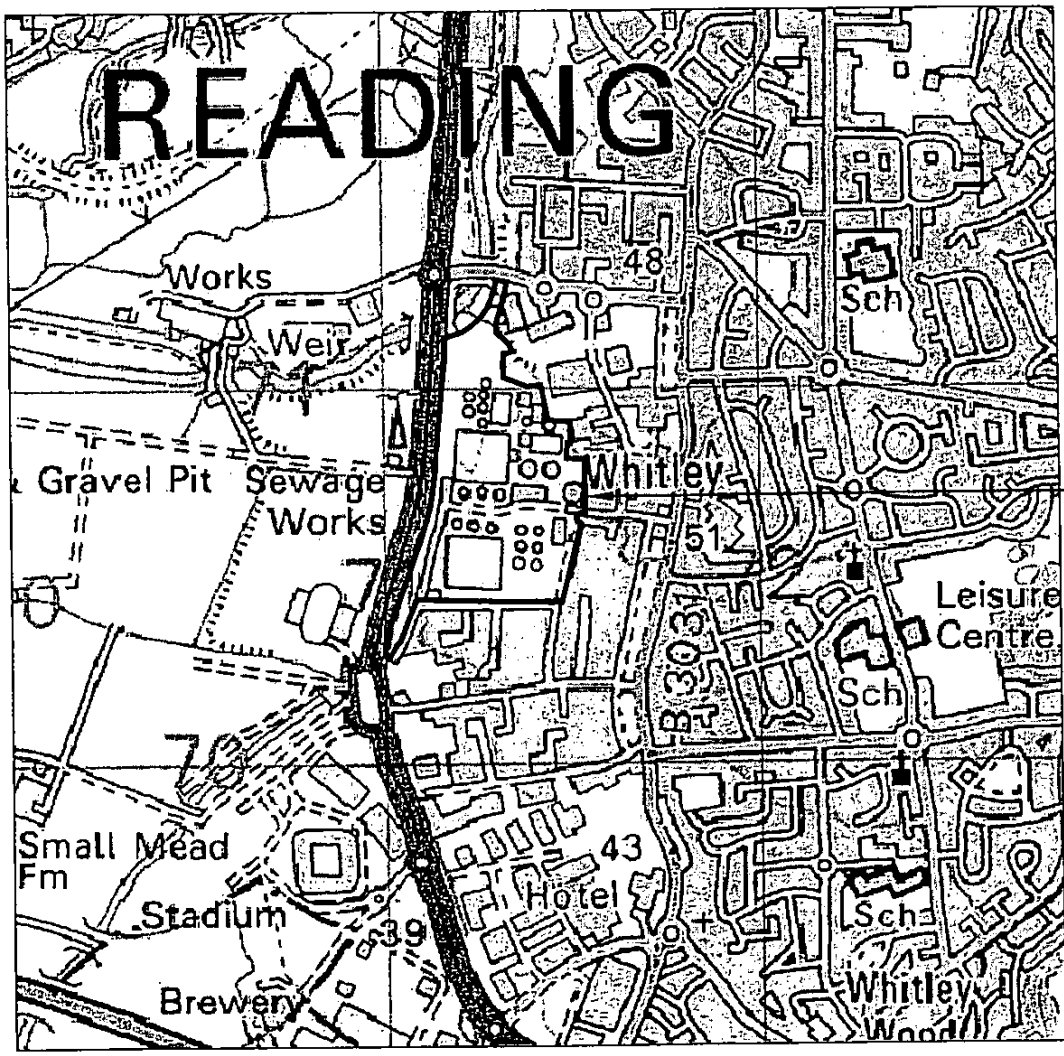
Table 12.1 Risk Summary Table

The following table has sought to highlight those pollution linkages that have a medium or above likelihood of being realised. Subsequently they are used as key drivers for remediation reflecting potential liabilities associated with the current and assumed future usage (mixed use).

Source	Pathway	Receptor	Likelihood of Pollution Linkage	Summary	Suggested Remedial Activities
Contaminated Soils/Dust, buried sludges, filter bed material and landfill wastes	Ingestion, inhalation or direct contact	Current site users	LOW TO MEDIUM	Site users are already subject to health and safety precautions relating to their work which will also afford them protection from underlying ground contamination. Majority of site covered in hardstanding or vegetation reducing slight risk from exposed soils	Maintain integrity of ground cover and avoidance of any excavation or intrusion below current ground level. Maintain use of Personal Protective Equipment on site by site employees and contractors.
		Construction Workers	MEDIUM	Ground disturbance can cause exposure to contaminants and pathogens by inhalation of generated dust and dermal contact with hazardous sewage wastes. Combustion risk from buried sludge.	Suppression of dust. Appropriate PPE and RPE.. No naked flames. Filter bed material will be disposed of off site or washed prior to re-use
		Future site users	MEDIUM	Disturbance of the ground to enable a new development may create new pathways resulting in exposure of site occupants to underlying contaminant and pathogen hazards.	Source removal and removal of pathways (e.g. hardstanding). Filter bed material will be disposed of off site or washed prior to re-use
	Groundwater contact or leaching	Groundwater in Minor Aquifer	MEDIUM	Movement of water and leachates through the contaminated soil profile likely to impact the shallow groundwater body.	Remediation of localised shallow contaminated soils.
	Groundwater seepage	Groundwater in Major Aquifer	MEDIUM	The Lambeth Group do not provide complete a barrier to downward migration in the north of the site and the Major Aquifer is a valuable resource.	Prevention of further leachate generation by removal/treatment of impacted localised soils as above plus natural attenuation and dilution.

Source	Pathway	Receptor	Likelihood of Pollution Linkage	Summary	Suggested Remedial Activities
	Surface water flow or groundwater movement	Fobney Brook & River Kennet	MEDIUM	Proximity of Brook to site indicates that exchange of contaminants is possible. Valley gravels in lateral hydraulic continuity with the brook and River	Source removal
Contaminated Groundwater – Minor Aquifer	Groundwater movement	Major Aquifer in Chalk	MEDIUM	Slight contamination impact to the Chalk groundwaters indicates that shallow contaminated water may be moving downwards to the Major Aquifer. This groundwater is being used as a sensitive resource.	Source removal
Contaminated Groundwater – Major Aquifer	Groundwater movement	Fobney Pumping Station Groundwater Abstraction	LOW TO MEDIUM	Groundwater utilised as a sensitive resource (public supply). However, monitoring at this point has not recorded contaminant levels in excess of DWQS. Risk is absent when pumping station is not in operation and groundwater flows south.	Natural attenuation and dilution processes.
		Courage Brewery Abstraction	MEDIUM	Water contamination levels critical to its use and predominant groundwater flow is towards Brewery. However, no reported problems with water quality from current abstractions.	Natural attenuation and dilution processes. Prevention of further impact to the Major Aquifer.
Landgas/ Vapours	Inhalation and/or explosion	Current Site Users	LOW TO MEDIUM	Significant landgas levels identified but some of site is uncovered allowing dispersion and dilution by air.	No construction of new buildings or change in land cover without due regard to potential requirement for landgas protection. Current dispersion and dilution by air likely to be sufficient to minimise current risks.

Source	Pathway	Receptor	Likelihood of Pollution Linkage	Summary	Suggested Remedial Activities
		Construction Workers	MEDIUM	Significant landgas levels identified locally which are a potential hazard during earthworks.	No entry into enclosed below ground spaces (e.g. manholes) without prior and then continued monitoring for landgas
		Future Site users	MEDIUM	Locally elevated methane apparently sourced from Chalk stratum. Slightly elevated CO_2 across site although low flows. Migration of landgas into buildings via cracks and services could cause asphyxiation and explosions.	Low level gas mitigation and protection measures potentially required in development
Phytotoxic Contaminants	Direct uptake of soil solution via root	Flora	MEDIUM TO HIGH	Significant levels of phytotoxic contaminants identified in shallow soils on site, particularly in the northern area of site	Source removal and clean topsoil in all landscaped areas.
Neighbouring Industry	Groundwater Migration, Leachate migration through permeable strata	Site soils and groundwater	LOW TO MEDIUM	Potential impact from neighbouring industry.	
Offsite Landfill	Leachate, landgas or impacted groundwater migration	Site soils, groundwater and buildings	MEDIUM	Contaminated and hazardous wastes may leach onto site from neighbouring landfills. However, no evidence of such except impact to deep groundwater by NH_4^+	Many sources of ammonium in the area hence remediation requires an area wide solution.
Contaminated soil, groundwater and elevated landgas	Offsite migration by leachate, groundwater and landgas movement through permeable deposits	Adjacent Sites – soil, and groundwater	LOW TO MEDIUM	Neighbouring sites do not currently have a sensitive use (e.g. landfill, industry). However, potential liabilities associated with offsite migration of contaminants needs to be addressed.	Prevention of further leachate generation and shallow groundwater impact. Removal of significantly impacted soils.



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Roman House
Croydon Road
London SE20 7TS
Tel: 020 8659 9959
Fax: 020 8676 9968
e-mail: swero.london@wyg.com

Environmental Consultancy
Civil Structural Mechanical Electrical Process Rail Traffic Environmental Project Management

Project: READING FARM SEWAGE TREATMENT WORKS (MANOR FARM)

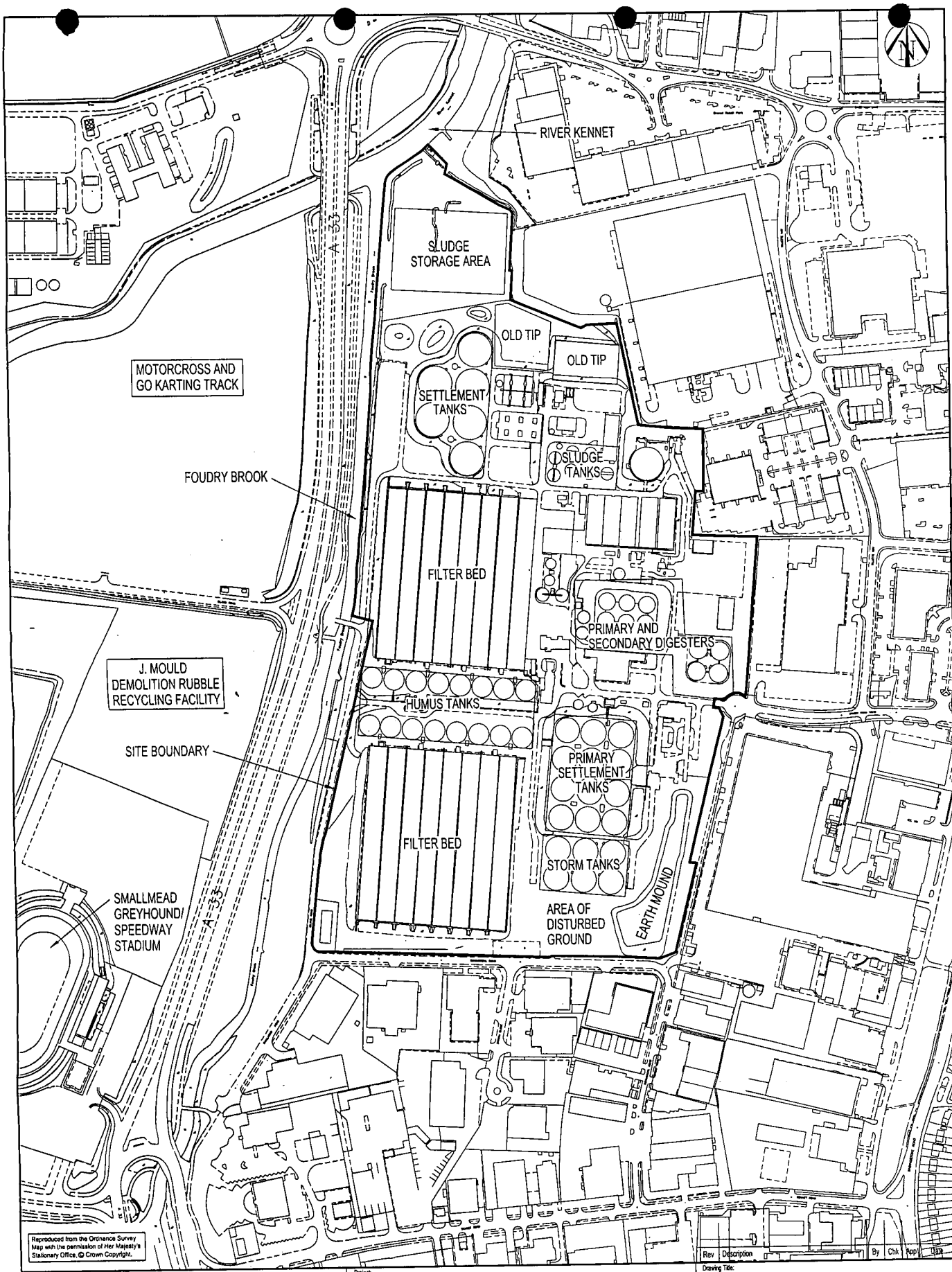
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Drawing Title: SITE LOCATION PLAN

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N.T.S.	N.J.C.	MAR. 2003	P.C.	MAR. 2003	P.C.	MAR. 2003

Office	Type	Project No.	Drawing No.	Revision
40	ENV	E03015	SK. 101	A

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Yeoman House
63 Croydon Road
London SE20 7TS
Tel: 020 8659 9959
Fax: 020 8676 9968
e-mail: enviro.london@wyg.com

Environmental Consultancy
Civil Structural Mechanical Electrical Process Rail Traffic Environmental Project Management

Project:
READING SEWAGE TREATMENT WORKS
(MANOR FARM)

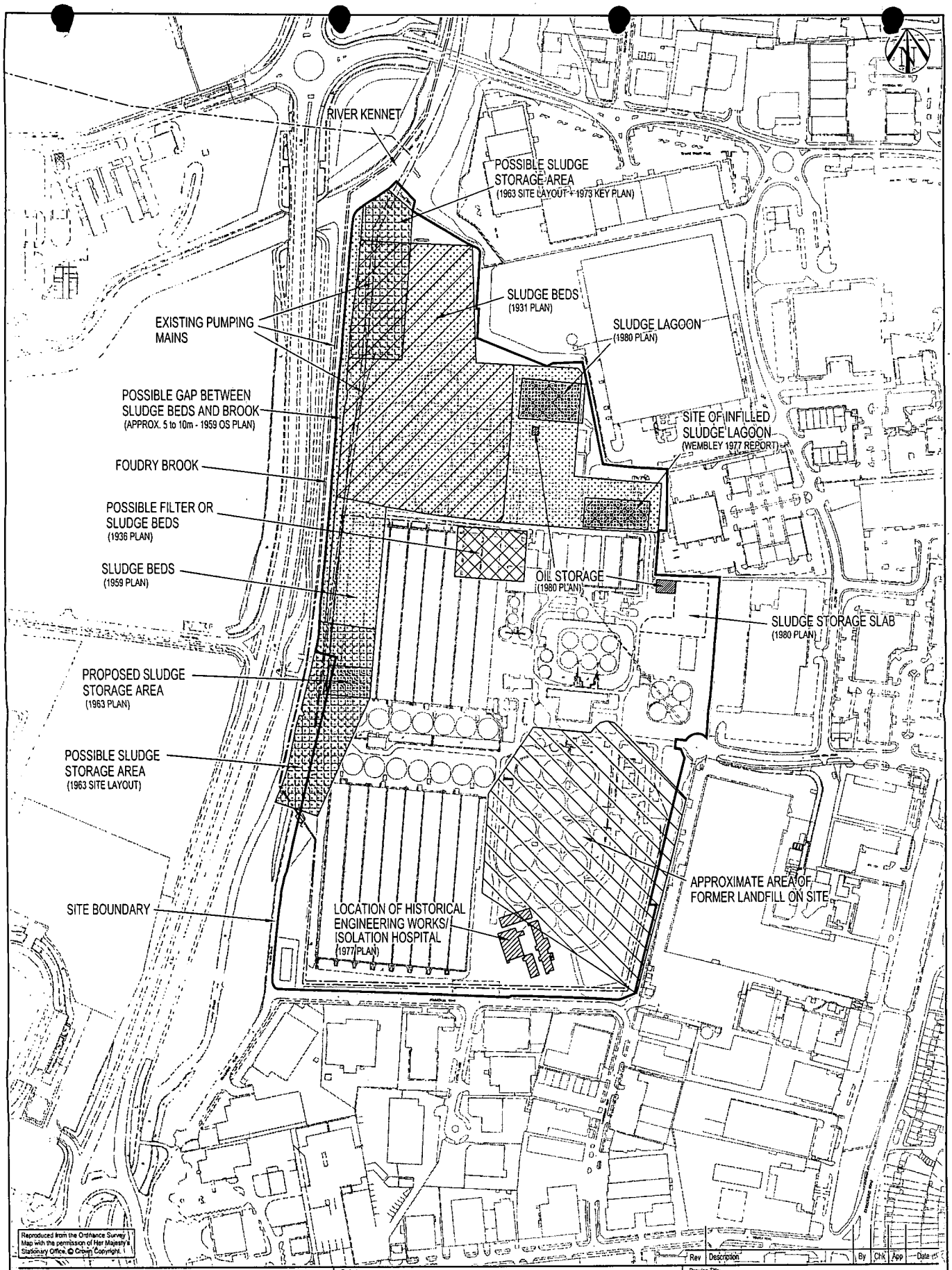
Client:
KENNET PROPERTIES Ltd.

Drawing Title:
CURRENT SITE LAYOUT PLAN

Scale at A3	Drawn By / Date	Checked By / Date	Approved By / Date
N. T. S.	N. J. C. MAR. 2003	P. C. MAR. 2003	P. C. MAR. 2003

Office	Type	Project No.	Drawing No.	Revision
40	ENV	E03015	SK. 102	A

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Yeoman House
63 Croydon Road
London SE20 7TS
Tel: 020 8659 9959
Fax: 020 8676 9968
e-mail: enviro.london@wyg.com

White Young Green
Environmental Consultancy
Civil Structural Mechanical Electrical Process Rail Traffic Environmental Project Management

Project:
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Client:
KENNET PROPERTIES Ltd.

Drawing Title.
RECORDED HISTORY SUMMARY PLAN

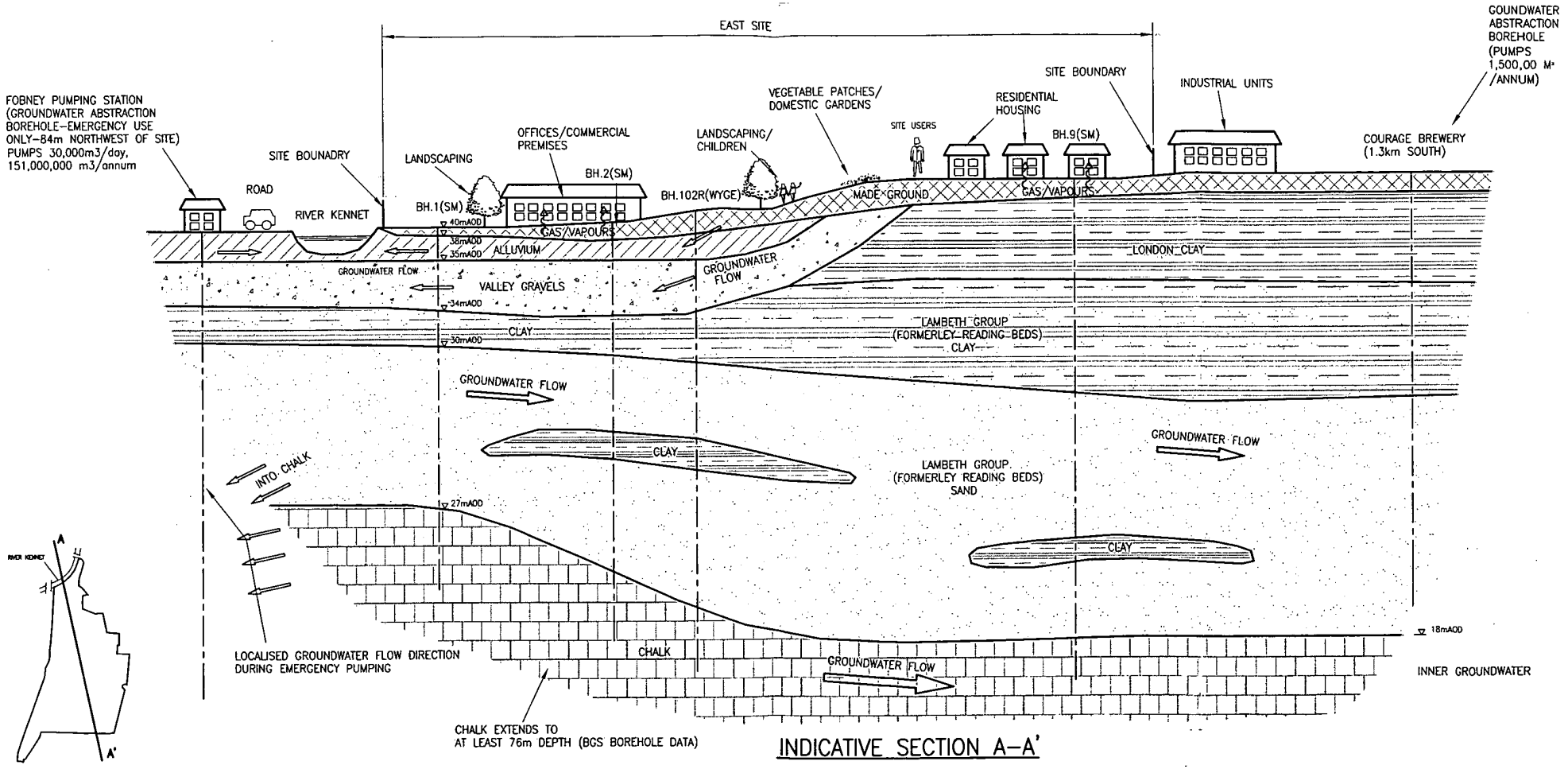
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NTS	N. J. C.	MAR. 2003	A. A.	MAR. 2003	P. C.	MAR. 2003

Office	Type	Project No.	Drawing No.	Revision
40	ENV	E03015	SK.103	C

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NORTH WEST

SOUTH EAST



LAYOUT PLAN

INDICATIVE SECTION A–A'

EXTENDS 250m NORTH OF SITE | OUTER GROUNDWATER PROTECTION ZONE | EXTENDS 300m SOUTH OF SITE | INNER GROUNDWATER PROTECTION ZONE

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White Young Green Environmental Ltd.
Yeoman House
63 Croydon Road
London SE20 7TS
Tel: 020 8659 9959
Fax: 020 8676 9968
e-mail: enviro.london@wyg.com
Environmental Consultancy
Civil Structural Mechanical Electrical Process Rail Traffic Environmental Project Management

Project:
READING GATEWAY - READING - EAST SITE

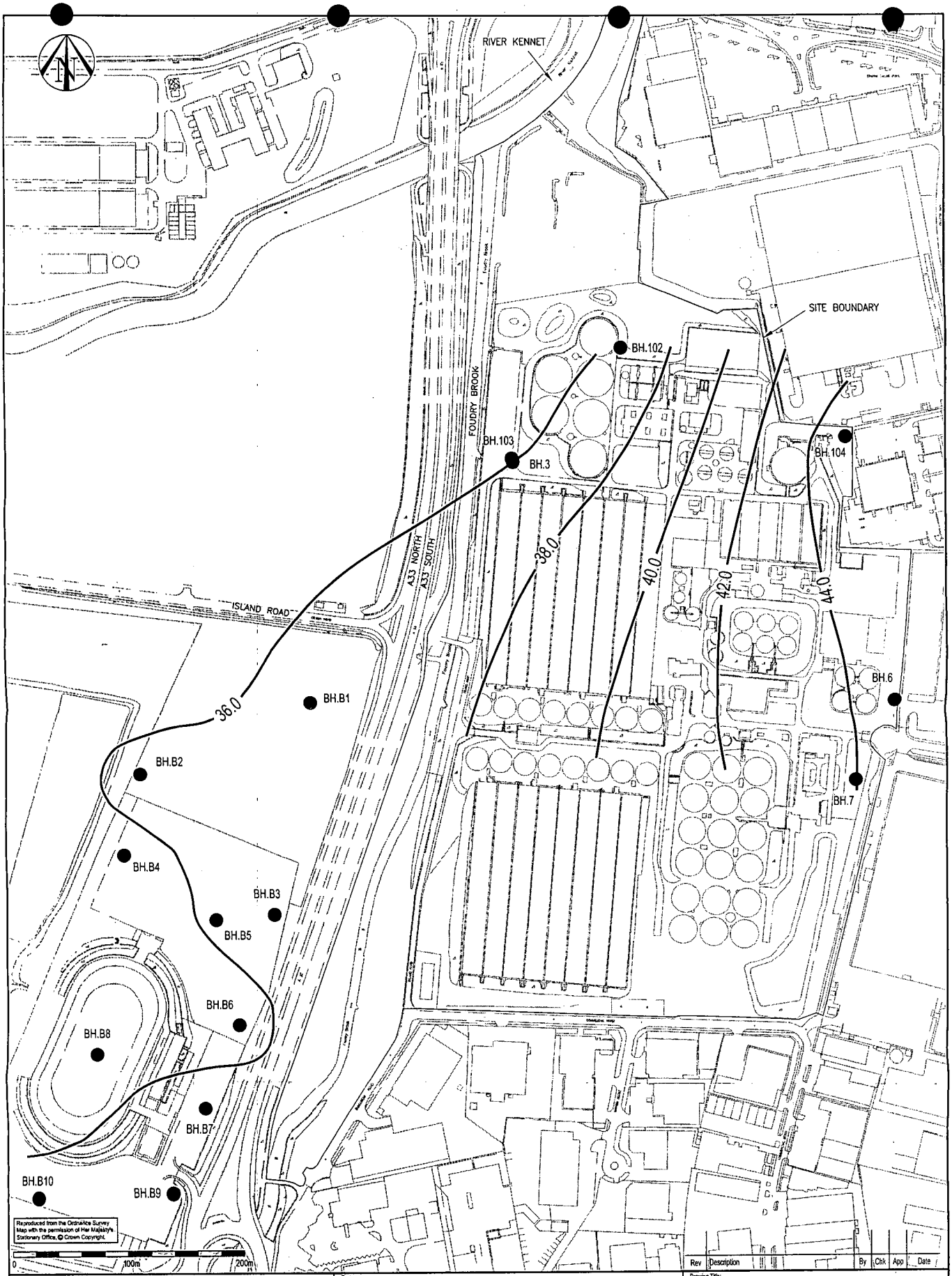
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KENNET PROPERTIES Ltd.

Drawing Title:
SITE CONCEPTUAL MODEL

Scale at A3	Drawn By	Date	Checked By	Date	Approved By	Date
N.T.S.	D.J.B.	FEB. 2004	L.H.	FEB. 2004	P.C.	FEB. 2004

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40	ENV	E03015	SK. 115	

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Yeoman House
63 Croydon Road
London SE20 7TS
Tel: 020 8659 9959
Fax: 020 8676 9968
e-mail: enviro.london@wyg.com

Environmental Consultancy

Civil Structural Mechanical Electrical Process Rail Traffic Environmental Project Management

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(MANOR FARM)

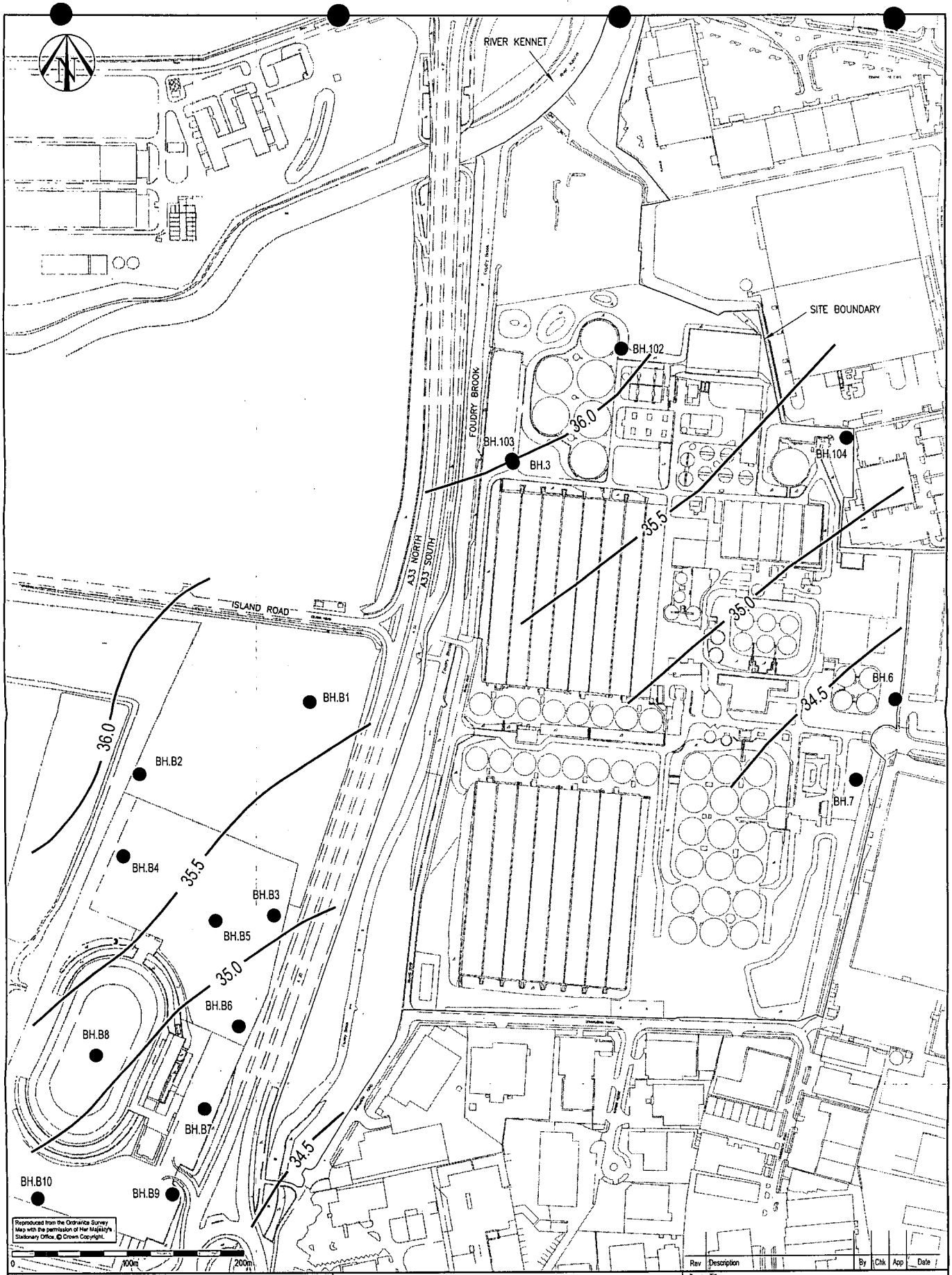
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KENNET PROPERTIES Ltd.

Drawing Title:
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40	ENV	E03015	SK. 118	A

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63 Croydon Road
London SE20 7TS
Tel: 020 8659 9959
Fax: 020 8676 9968
e-mail: enviro.london@wyg.com

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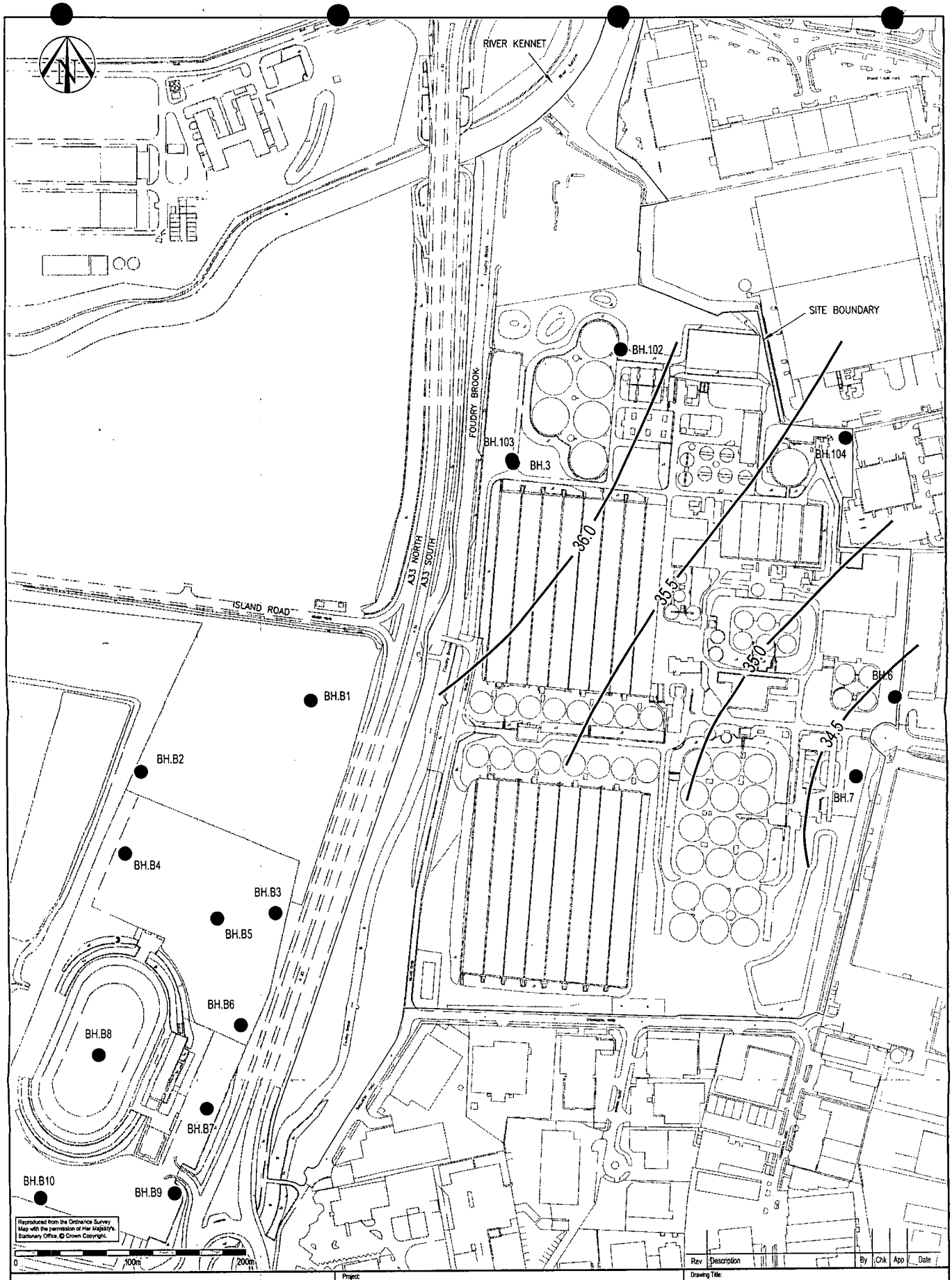
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KENNET PROPERTIES Ltd.

Drawing Title:
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Yeoman House
63 Croydon Road
London SE20 7TS
Tel: 020 8659 9959
Fax: 020 8676 9968
e-mail: enviro.london@wyg.com

Environmental Consultancy

Civil Structural Mechanical Electrical Process Rail Traffic Environmental Project Management

Project:
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(MANOR FARM)

Client:
KENNET PROPERTIES Ltd.

Drawing Title:
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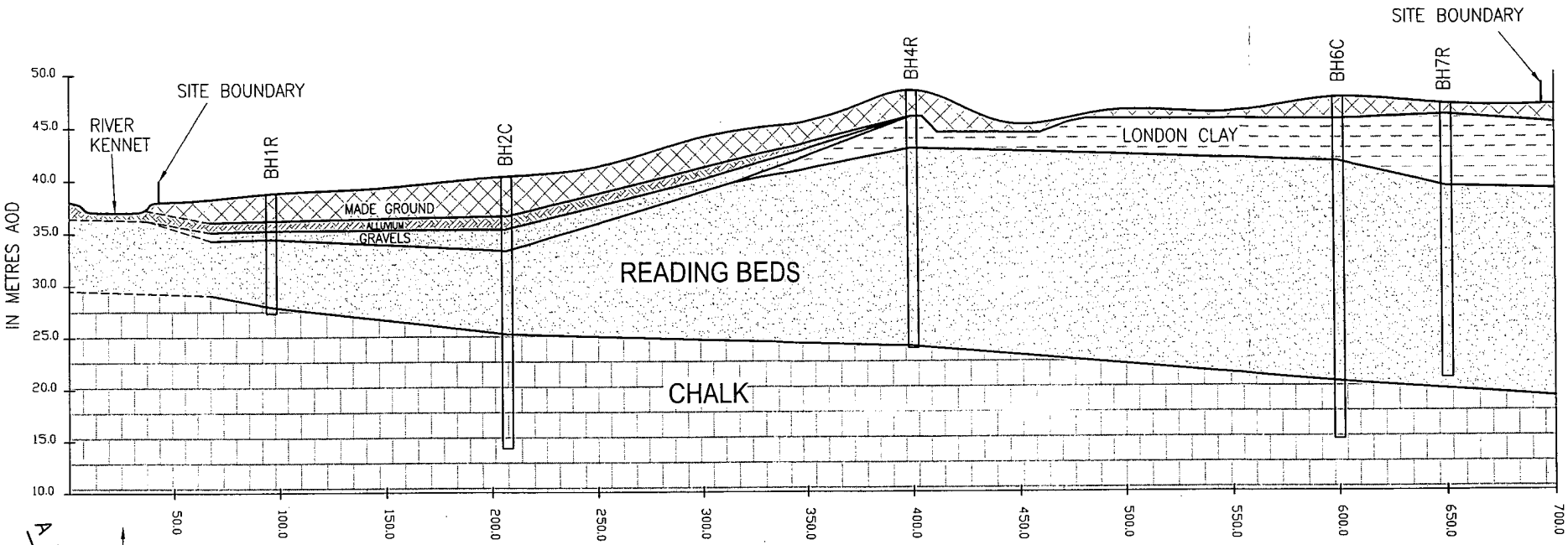
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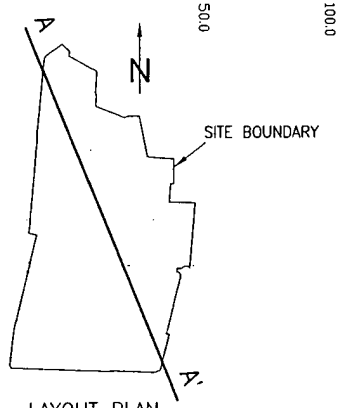
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40	ENV	E03015	SK. 120	A

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NORTH WEST

SOUTH EAST





LAYOUT PLAN

SECTION A-A'

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63 Croydon Road
London SE20 7TS
Tel: 020 8659 9959
Fax: 020 8676 9968
e-mail: enviro.london@wyg.com

Environmental Consultancy
Civil Structural Mechanical Electrical Process Rail Traffic Environmental Project Management

Project:
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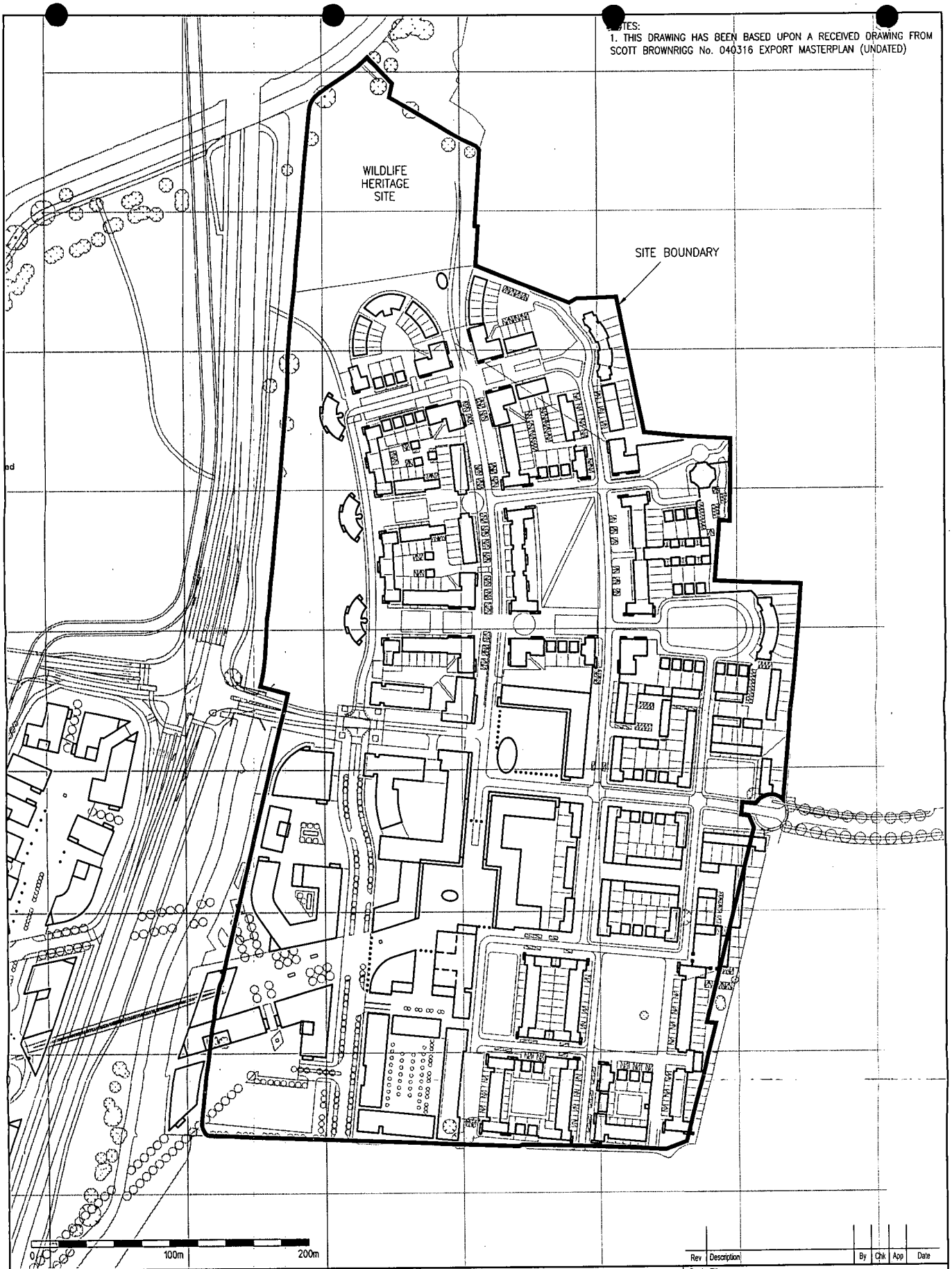
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Office	Type	Project No.	Drawing No.	Revision
40	ENV	E03015	SK. 124	

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NOTES:
1. THIS DRAWING HAS BEEN BASED UPON A RECEIVED DRAWING FROM SCOTT BROWNRIGG No. 040316 EXPORT MASTERPLAN (UNDATED)



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Yeoman House
63 Croydon Road
London SE20 7TS
Tel: 020 8659 9959
Fax: 020 8676 9968
e-mail: enviro.london@wyg.com

Environmental Consultancy
Civil Structural Mechanical Electrical Process Rail Traffic Environmental Project Management

Project:
READING SEWAGE TREATMENT WORKS
(MANOR FARM)

Client:
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Drawing Title:
PROPOSED MASTERPLAN

Scale at A3	Drawn By	Date	Checked By	Date	Approved By	Date
1 : 2500	D. J. B.	MAY 2004	P. C.	MAY 2004	P. C.	MAY 2004

Office	Type	Project No.	Drawing No.	Revision
40	ENV	E03015	SK. 125	

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WHITE YOUNG GREEN ENVIRONMENTAL

APPENDIX A - REPORT CONDITIONS (STAGE 2)

GROUND INVESTIGATION

This report is produced solely for the benefit of Kennet Properties and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise. This report refers, within the limitations stated, to the condition of the site at the time of the inspections. No warranty is given as to the possibility of future changes in the condition of the site as characteristics, especially liquid and gaseous materials, are likely to vary with time.

This report is based on readily available geological records, the recorded physical investigation, the strata observed in the works, together with the results of completed site and laboratory tests. Whilst skill and care has been taken to interpret these conditions likely between or below investigation points, the possibility of other characteristics not revealed cannot be discounted, for which no liability can be accepted. The impact of our assessment on other aspects of the development requires evaluation by other involved parties.

Whilst confident in the findings detailed within this report because ground conditions is not an exact science, subject to risk analysis, we are unable to give categoric assurances that they will be accepted by others as they may have differing objectives. This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to WYGE. In time improved practices or amended legislation may necessitate a re-assessment.

The opinions expressed cannot be absolute due to the limitations of time and resources within the context of the agreed brief and the possibility of unrecorded previous in ground activities. The ground conditions have been sampled or monitored in recorded locations and tested for some of the more common chemicals generally expected, including any highlighted in the client's instructions. Other concentrations or types of chemicals may exist. Factual results are presented initially compared to commonly adopted guidelines which are not definitive in the UK and should be further assessed for actual risk.

APPENDIX B

HISTORICAL INFORMATION



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Peter Brett Associates'
Snook House 66 Tilehurst Road
READING
Berkshire RG30 2JH

SITE DETAILS

Grid Reference 471680 171350

Reading Gateway

FIG 3

Historical Map Legend

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

BERKSHIRE

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

1883

North

Map Scale=1:10,000

Date(s) of Publication

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Exeter EX2 7HY
LANDMARK Telephone 01392 441729 Fax 01392 441709



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Peter Brett Associates'
Snook House 66 Tilehurst Road
READING
Berkshire RG30 2JH

SITE DETAILS

Grid Reference 471680 171350

Reading Gateway

FIG 5

Historical Map Legend

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

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North

Map Scale=1:10,000

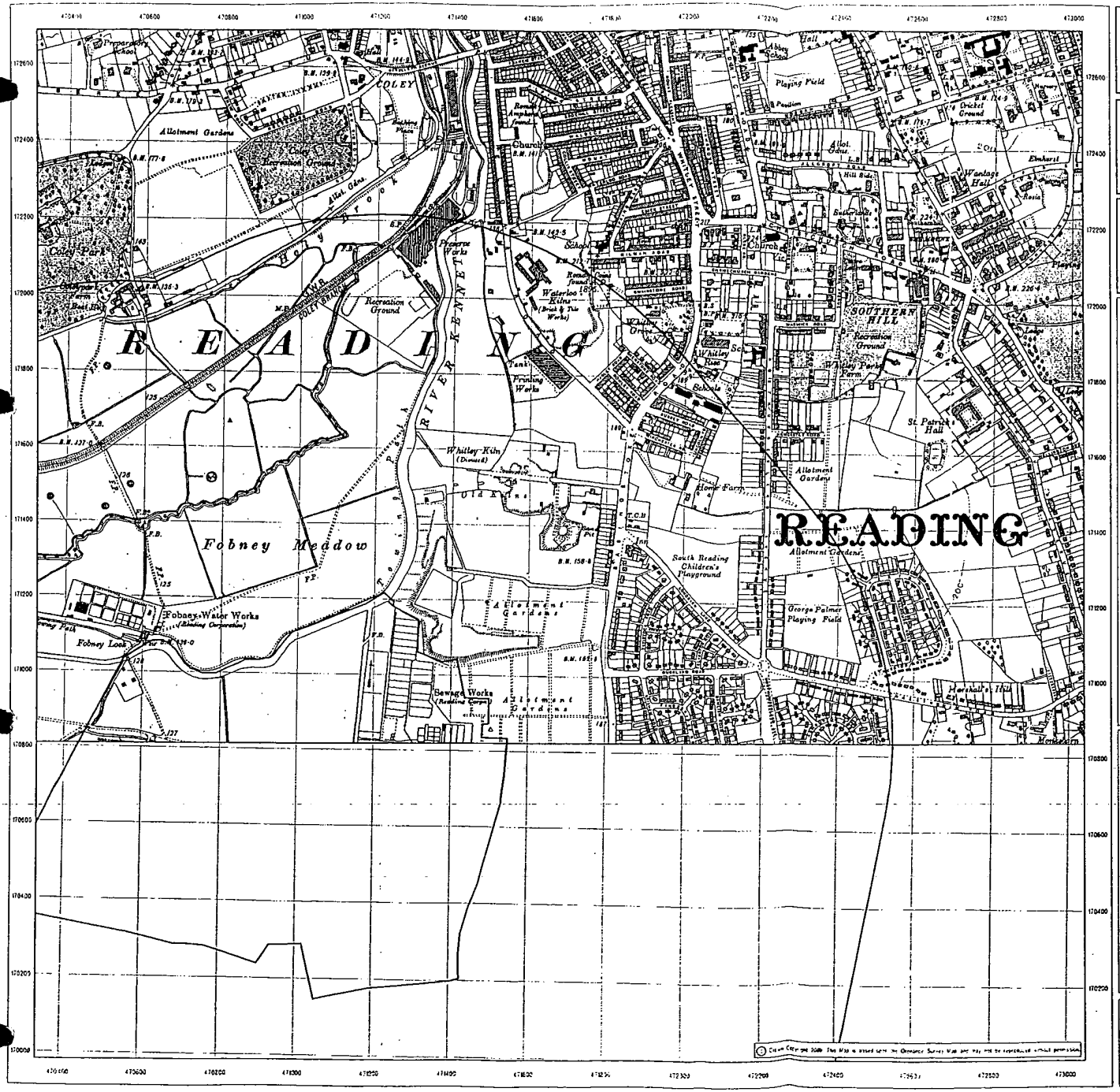
1913
1913

Date(s) of Publication

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READING
Berkshire RG30 2JH

SITE DETAILS
Grid Reference 471680 171350
Reading Gateway

FIG 6

Historical Map Legend

Quarry
Shingle
Railway over Road
Road over Railway
Railway over River
Gravel Pit
Sand Pit
Level Crossing
Other Pits
Road over River or Canal
Road over Stream
Mixed Wood
Rough Pasture
Road over Stream
Marsh
Sunken Road
Raised Road
Skelched Contour
Arrow denotes flow of water
Instrumental Contour

BERKSHIRE

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In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were faithfully overprinted 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.

North

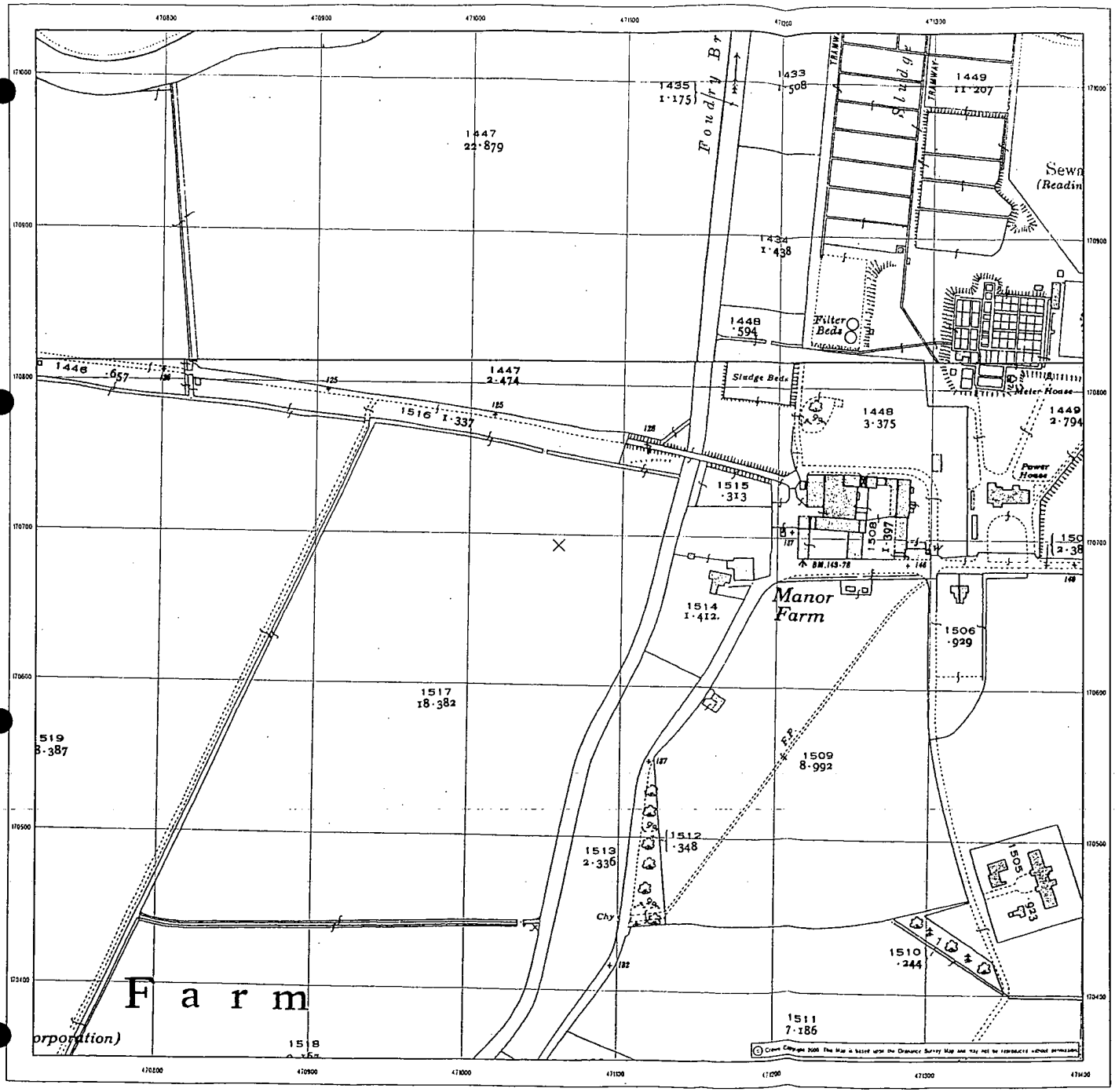
Map Scale 1:10,000

1931

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Exeter EX2 7HY
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Peter Brett Associates*
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READING
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SITE DETAILS

Grid Reference 471060 170690

Reading Gateway

FIG 7

Historical Map Legend

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

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The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1800's. In 1854 the 1:500 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 1854, 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.

1932

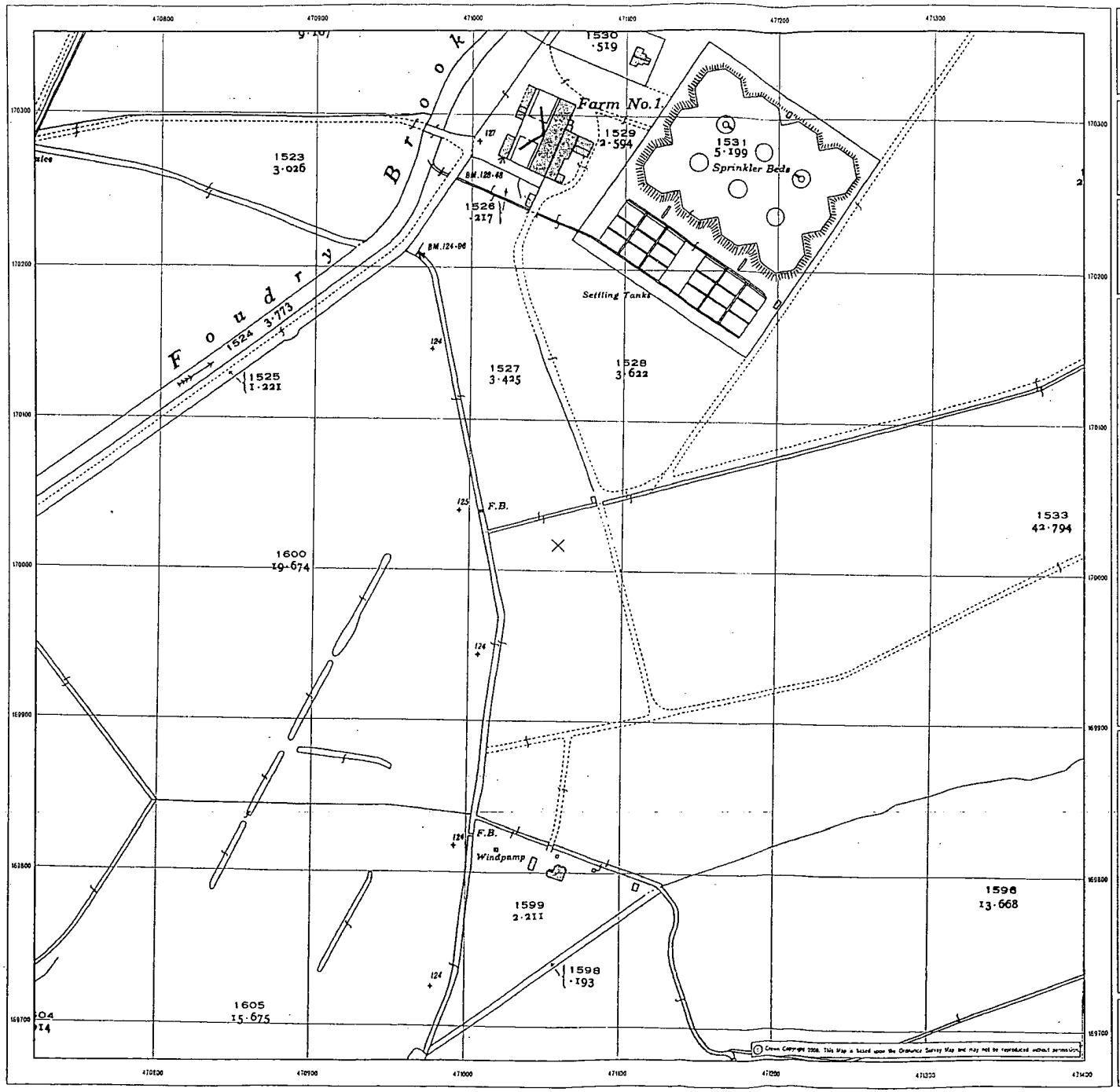
1935

North

Map Scale-1:2,500

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Peter Brett Associates*
Snook House 66 Tilehurst Road
READING
Berkshire RG30 2JH

SITE DETAILS

Grid Reference 471060 170020

Reading Gateway

FIG 8

Historical Map Legend

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

BERKSHIRE

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 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 unifying areas.

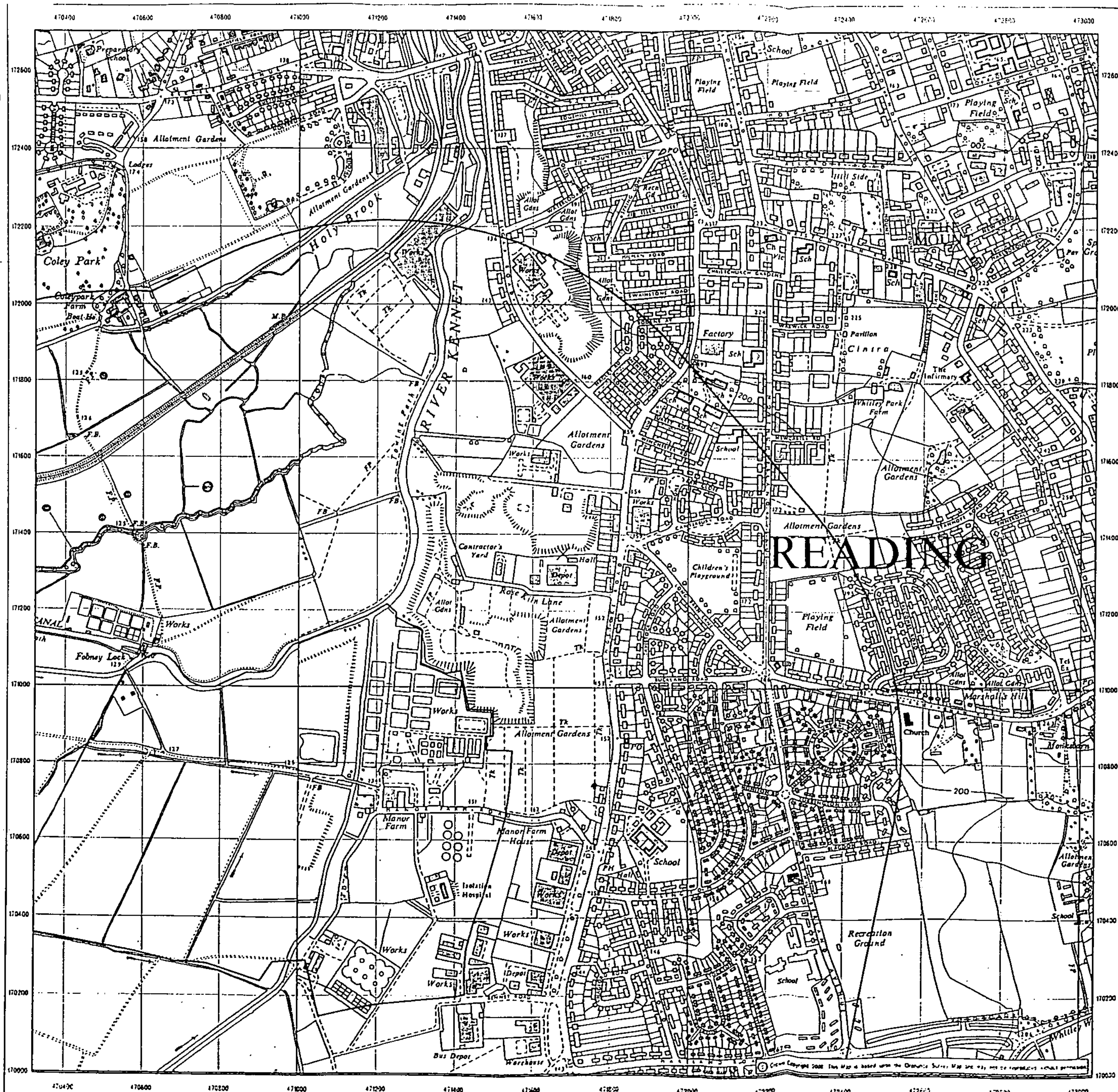
1936

North

Map Scale=1:2,500

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Berkshire RG30 2JH

SITE DETAILS

Grid Reference 471680 171350

Reading Gateway

FIG 9

Historical Map Legend

Quarry, Shingle, Railway over Road, Road over Railway, Railway over River, Gravel Pit, Sand Pit, Level Crossing, Other Pits, Road over River or Canal, Road over Stream, Mixed Wood, Rough Pasture, Road over Stream, Marsh, Sunken Road, Raised Road, Sketched Contour, Instrumental Contour

Arrow denotes flow of water

Ordnance Survey Plan

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1850's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

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

North

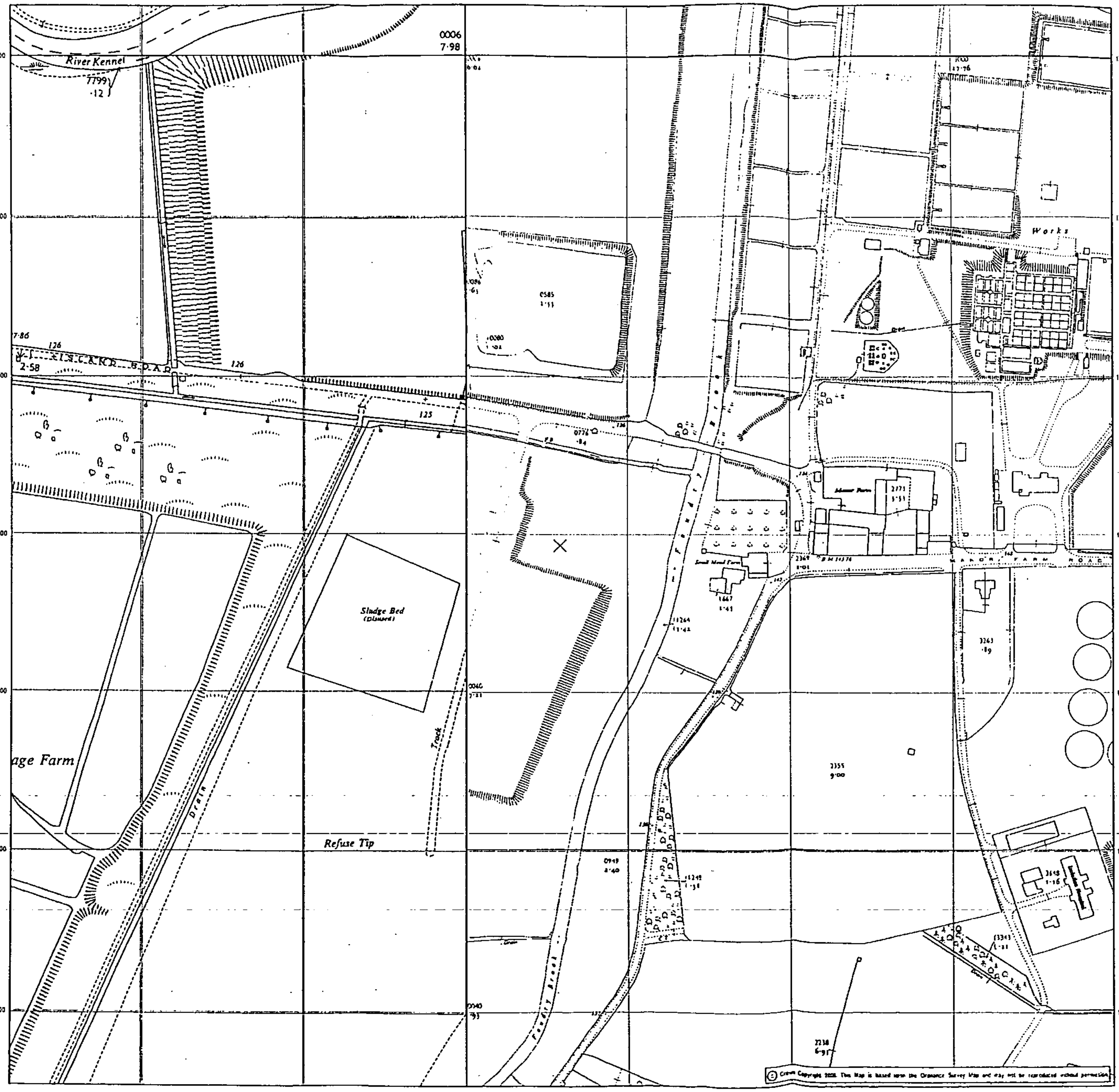
Map Scale 1:10,000

Date(s) of Publication
1962

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Berkshire RG30 2JH

SITE DETAILS

Grid Reference 471060 170690

Reading Gateway

FIG 10

Historical Map Legend

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

Ordnance Survey Plan

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North

Map Scale=1:2,500

1969	1959

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SITE DETAILS

Grid Reference 471680 171350

Reading Gateway

FIG 11

Historical Map Legend

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

Ordnance Survey Plan

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

North

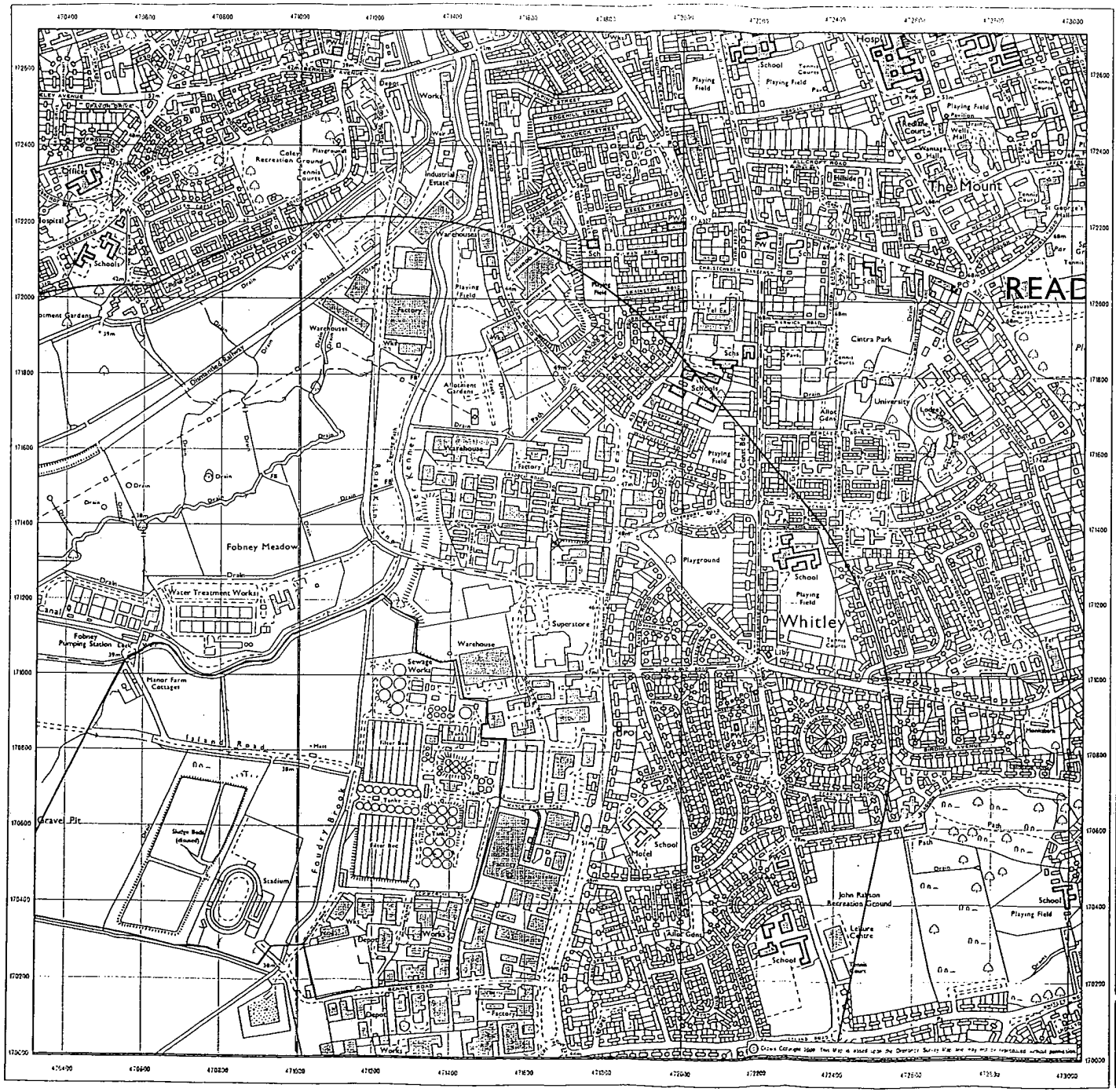
Map Scale=1:10,000

1973

Date(s) of Publication

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Peter Brett Associates*
Snook House 66 Tilehurst Road
READING
Berkshire RG30 2JH

SITE DETAILS

Grid Reference 471680 171350

Reading Gateway

FIG 13

Historical Map Legend

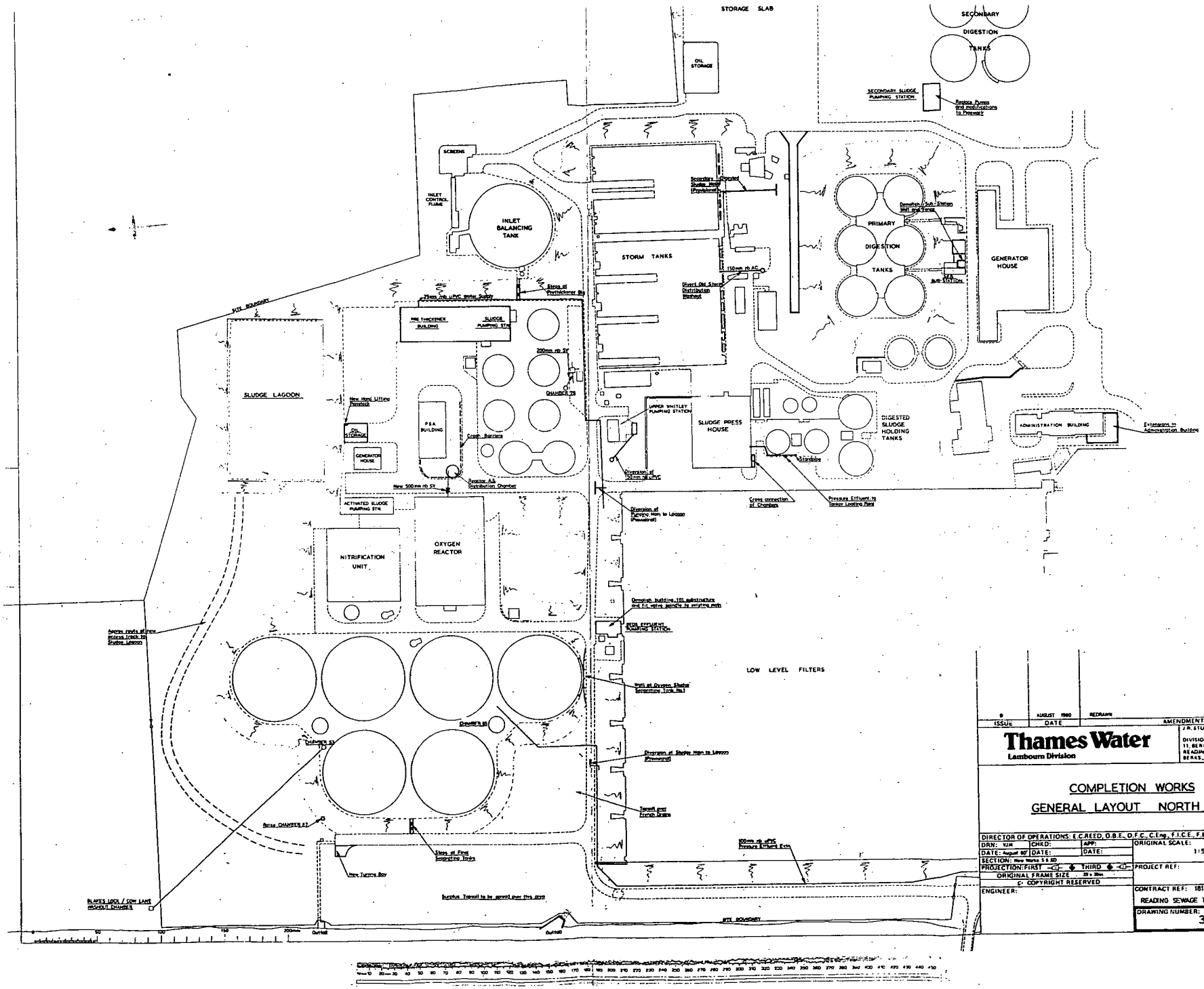
Ordnance Survey Plan

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In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1978, the first 1:50,000 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.

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ISSUE	DATE	AMENDMENT
0	AUGUST 1980	REDRAWN

Thames Water
Lambourn Division

J.R. STUDHOLME, B.Eng., C.Eng., MICE., MIWES.
DIVISIONAL MANAGER,
11, BERKELEY AVENUE,
READING,
BERKS., RG1 6JJ

COMPLETION WORKS
GENERAL LAYOUT NORTH END

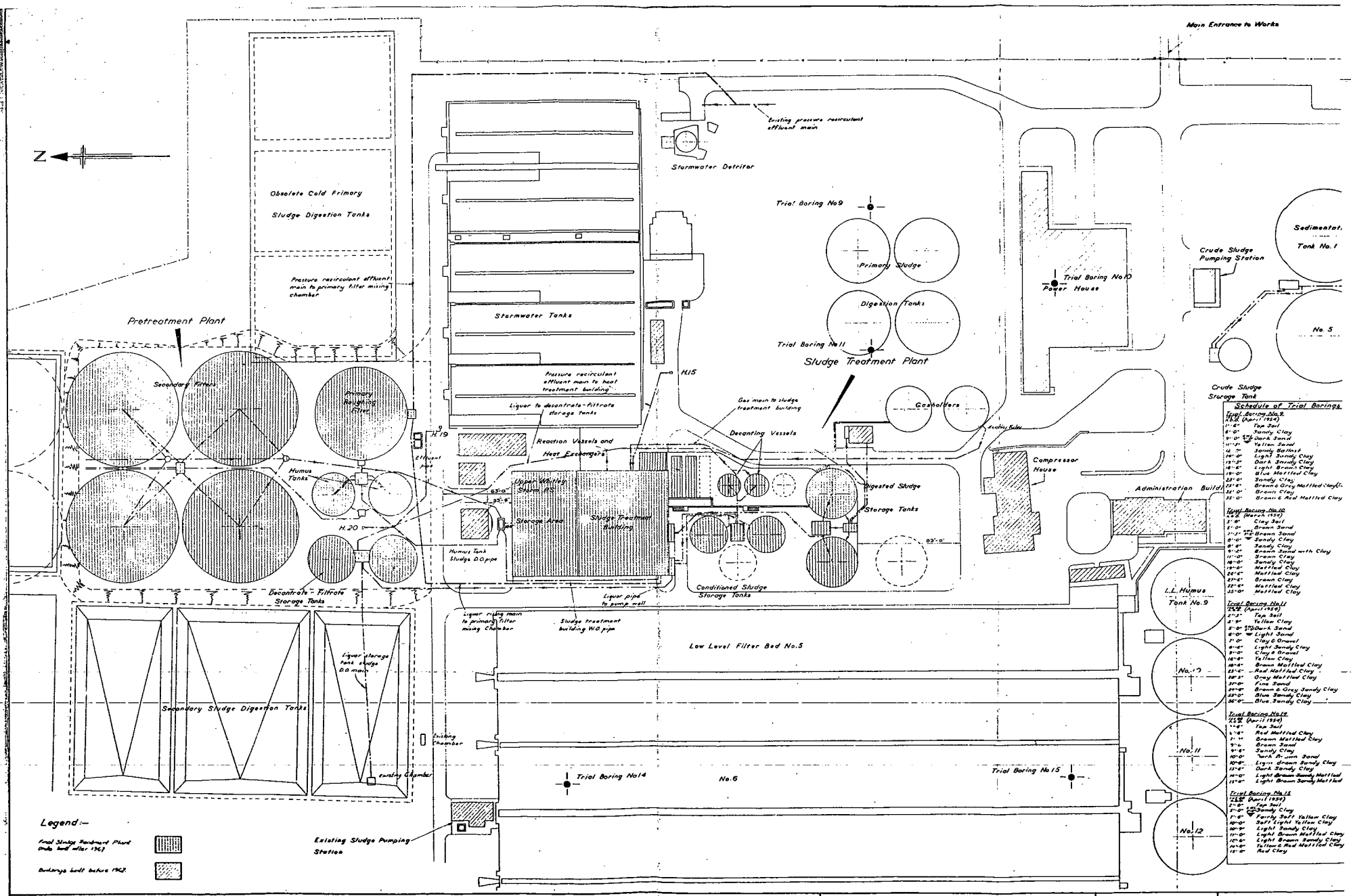
DIRECTOR OF OPERATIONS: E.C.REED, O.B.E., D.F.C., C.Eng., F.I.C.E., F.I.Mun.E., F.I.W.E.S., M.B.I.M.

DRN: WJH	CHKD:	APP:	ORIGINAL SCALE: 1:500
DATE: August 80	DATE:	DATE:	
SECTION: New Works S & SD			PROJECT REF:
PROJECTION: FIRST ◁ ◆ THIRD ◆ ▷			
ORIGINAL FRAME SIZE 29 × 38cm			

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ENGINEER:

CONTRACT REF: 181/1004
READING SEWAGE TREATMENT WORKS
DRAWING NUMBER: 392 / 2223 B



Corporation of Reading

SEWERAGE AND SEWAGE DISPOSAL

AS CONSTRUCTED – MARCH 1972

Final Sludge Treatment Plant

Layout Plan

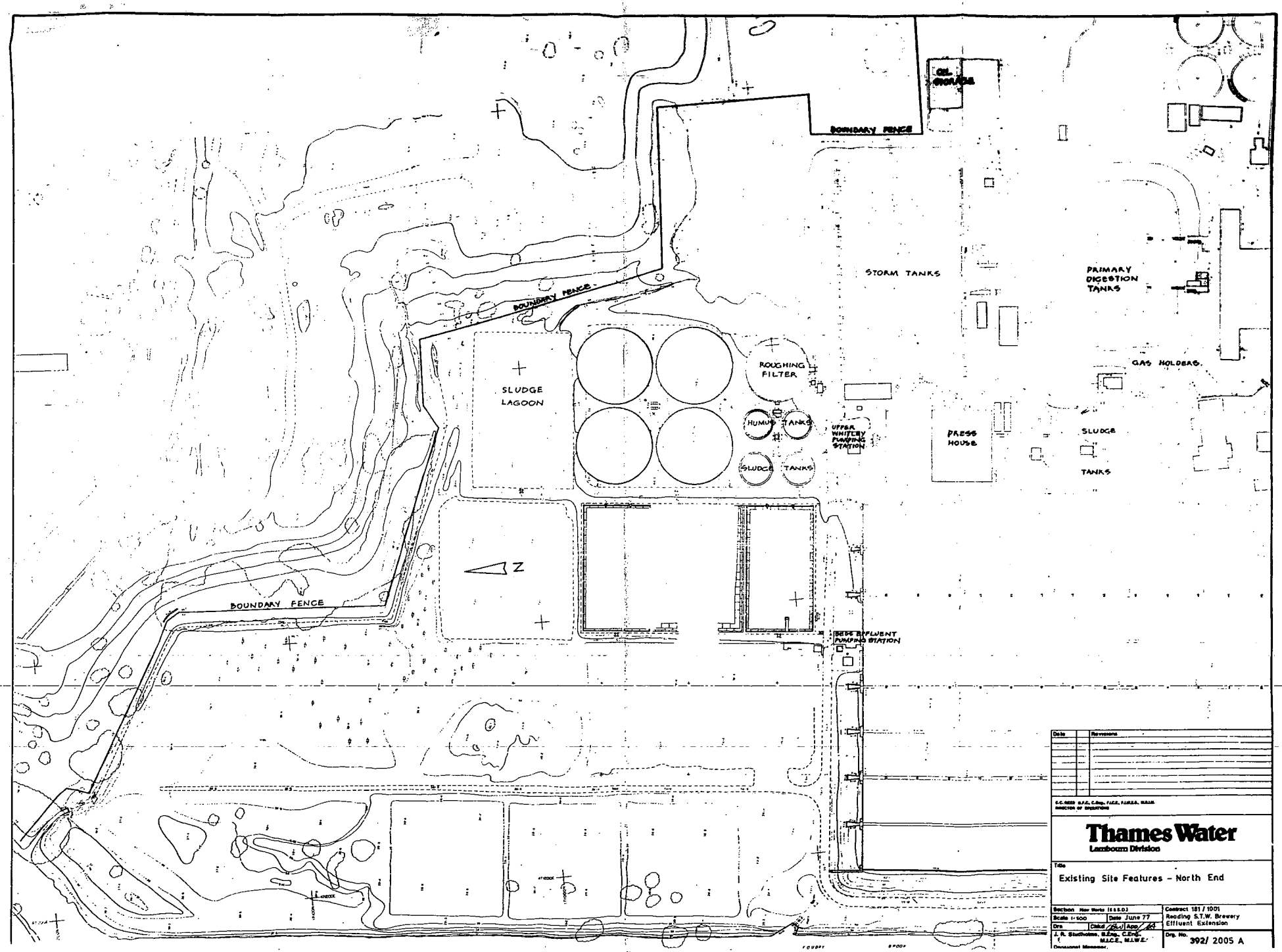
Scale:- 1" to 30ft.

Ref. No. 10.057.0 WL

Drawing No. H1/1

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Westminster House
West Street
Epsom, Surrey.



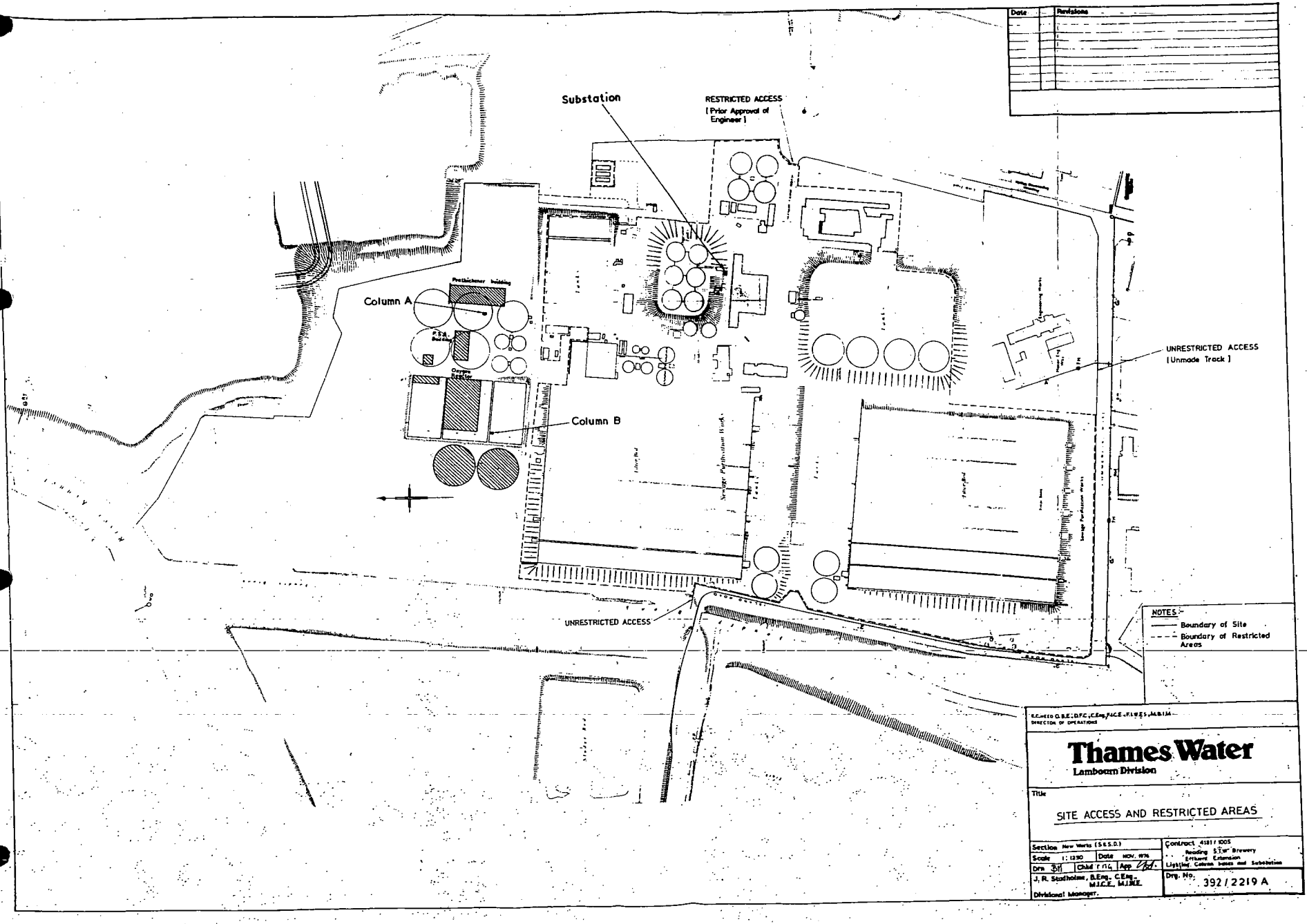
Date	Revisions

Thames Water
Lambourn Division

Title
Existing Site Features – North End

Section New Works (S.E.S.D.)	Contract 181 / 1001
Scale 1:500	Reading S.T.W. Brewery Effluent Extension
Date June 77	
Drn Chkd Apd	Drg. No. 392/ 2005 A

J. R. Stothoms, B.Eng., C.Eng., M.I.C.E., M.I.W.E.
Divisional Manager.



Date	Revisions

R.C.HEED O.B.E.,D.F.C.,C.Eng.,F.I.C.E.,F.I.W.E.S.,M.B.I.M.
DIRECTOR OF OPERATIONS

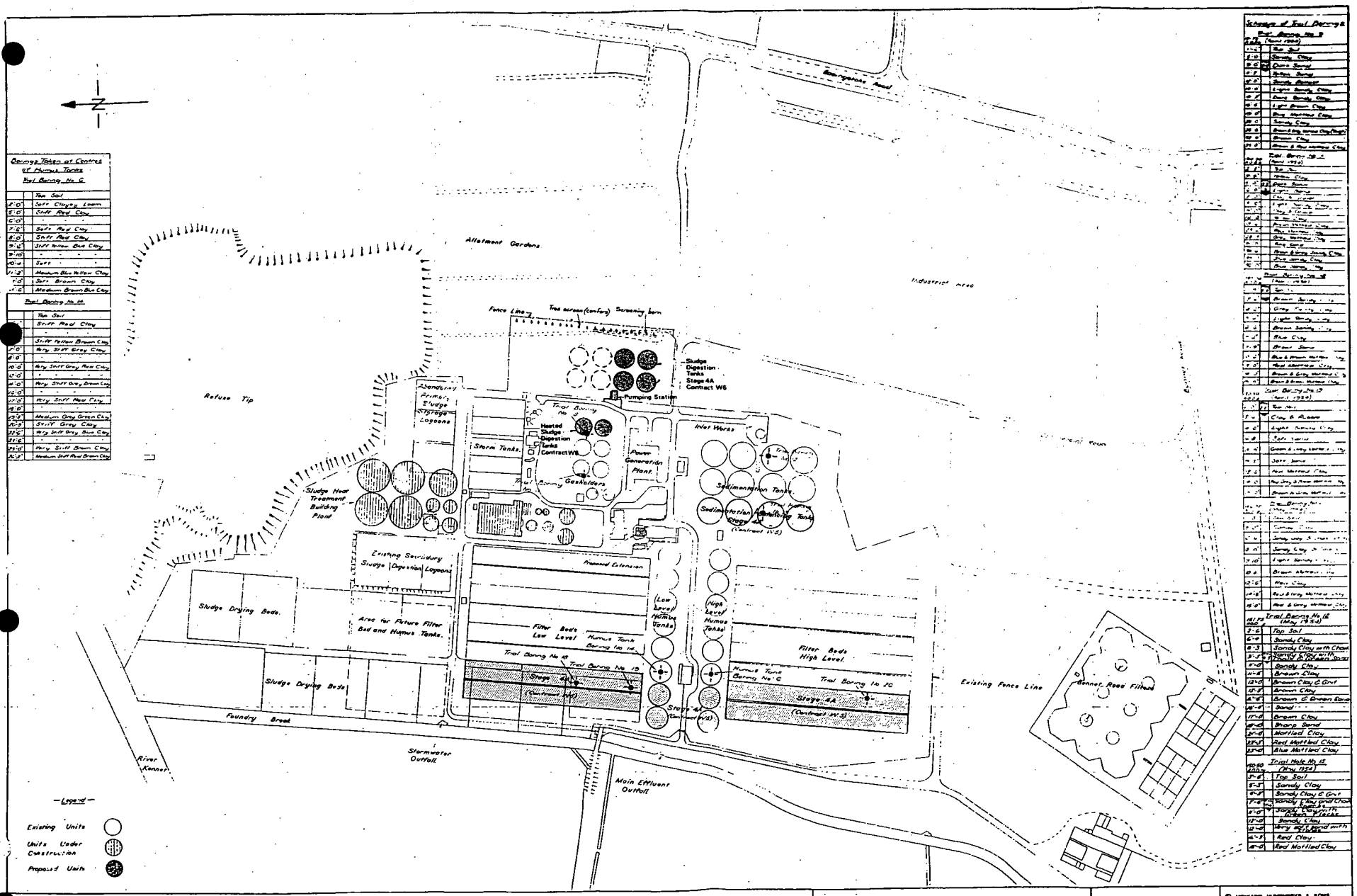
Thames Water
Lambourn Division

Title
SITE ACCESS AND RESTRICTED AREAS

Section New Works (S.E.S.D.)
Scale 1:1250 Date NOV. 1976
Drn [illegible] Chkd [illegible] App [illegible]
J. R. Stedholme, B.Eng., C.Eng., M.I.C.E. M.I.W.E.
Divisional Manager.

Contract 4181/1005
Reading S.T.W. Brewery Effluent Extension
Lighting Cabinets Boxes and Substation

Drg. No. 392/2219 A



Corporation of Reading

SEWERAGE AND SEWAGE DISPOSAL

Manor Farm Works

Key Plan

Scale: 1/1250

As Constructed

Revisions | 1. Fence line alteration

REF. No. 10.062.0

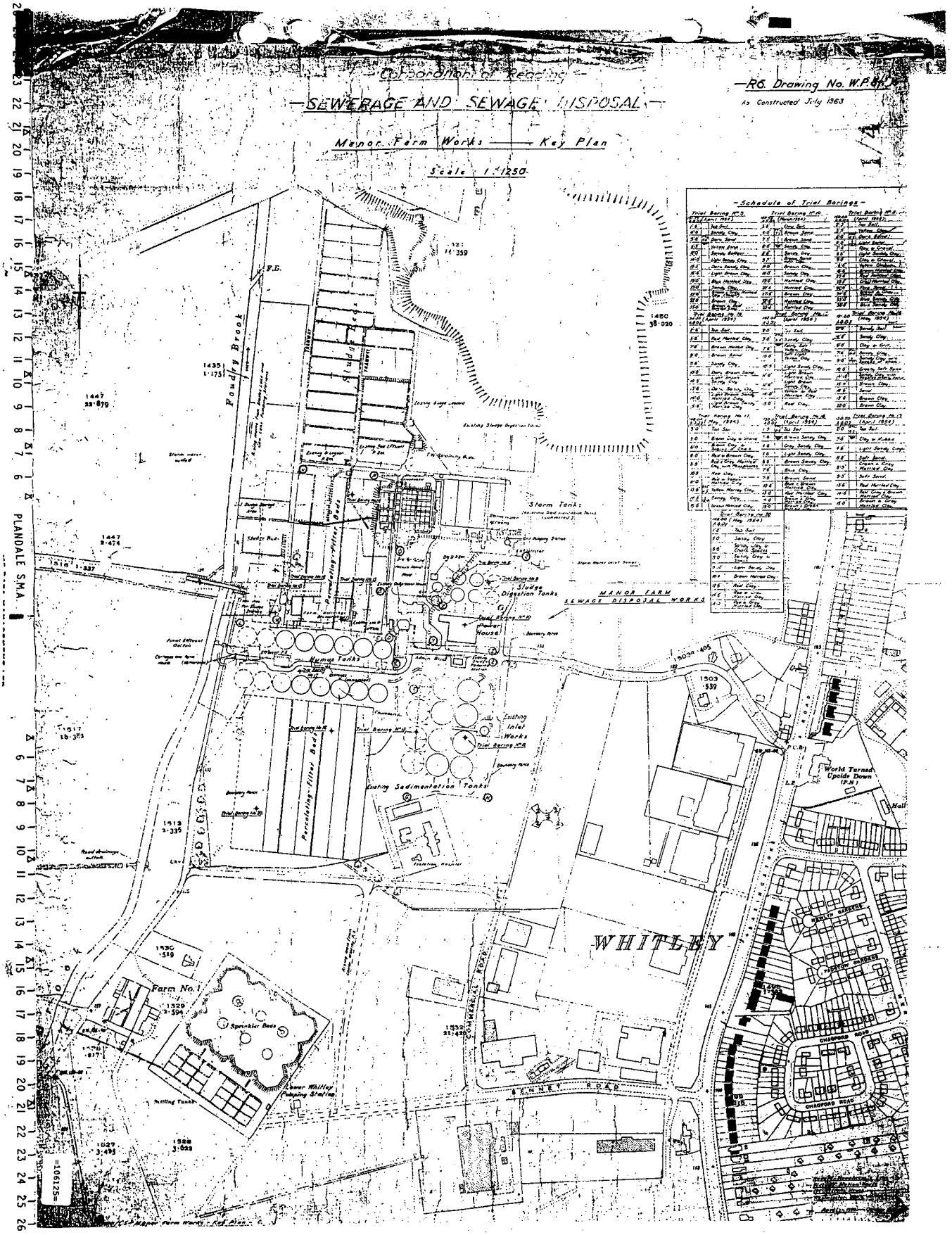
Drawing No. W31

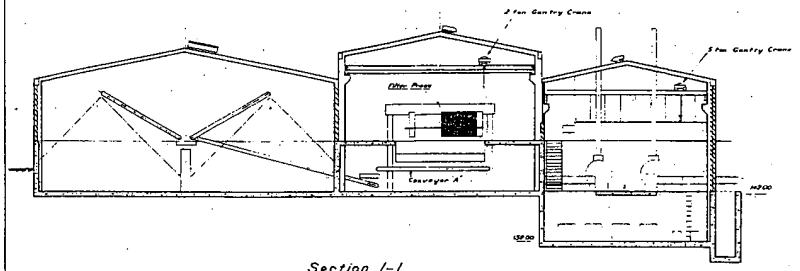
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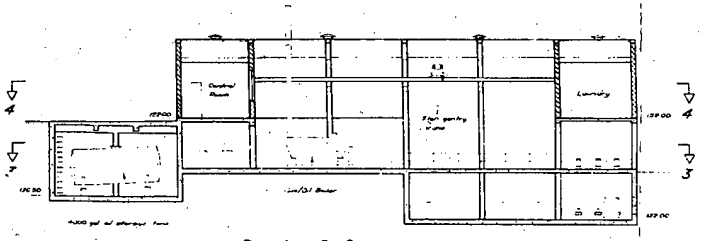
DECEMBER 1973

392 / 096 A

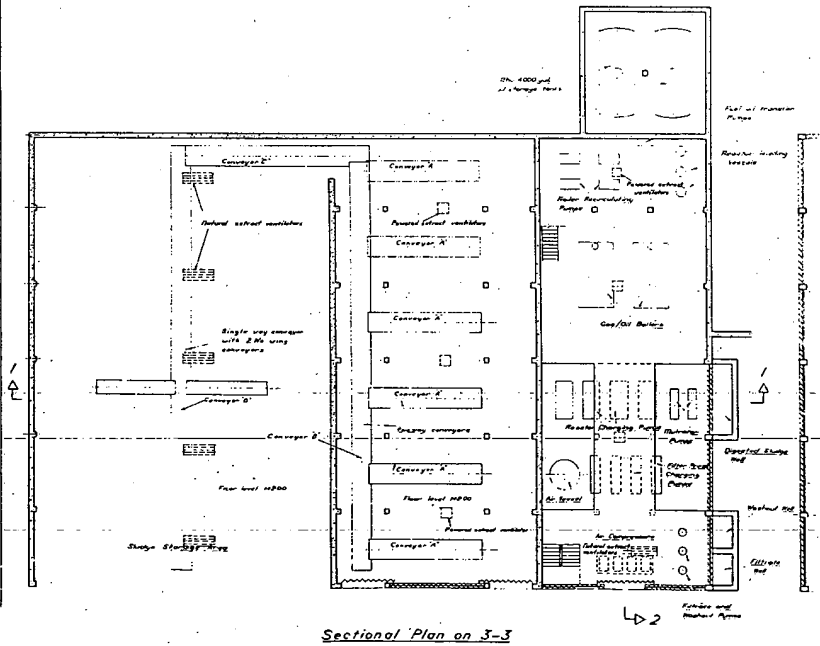

Subdivision of Reading
SEWERAGE AND SEWAGE DISPOSAL
R6. Drawing No. W.P.B.H.
As Constructed July 1963
Manor Farm Works — Key Plan
Scale 1"=1250'
Schedule of Trial Borings
Powdry Brook
Storm Tanks
Sludge Digestion Tanks
MANOR FARM SEWAGE DISPOSAL WORKS
House
Humus Tanks
Existing Inlet Works
Existing Sedimentation Tanks
Percolating Filter Beds
Farm No. 1
Sprinkler Beds
Lower Whitley Pumping Station
Settling Tanks
WHITLEY
KENNET ROAD
COMMERCIAL ROAD
OXFORD ROAD
World Turned Upside Down (P.H.)
PLAINDALE S.M.A.



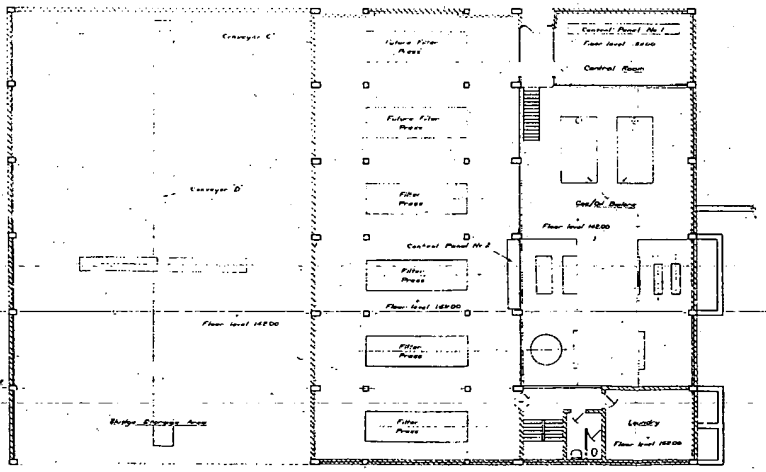
Section 1-1



Section 2-2



Sectional Plan on 3-3



Sectional Plan on 4-4

Corporation of Reading

SEWERAGE & SEWAGE DISPOSAL

Sludge Treatment and Storage Building

Scale-⅛" to 1'-0"

R.6/9 Drawing No. P.8

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Consulting Engineers
8 Francis Street
Westminster S.W.1.

January 1966

Environment Agency - Thames West Area
Database Extract

SiteName: SMALLMEAD STADIUM

District: READING

GridRef: SU 709 705

Status: CLOSED

Landowner:

Operator:

WasteCategories:

Licence: NO LICENCE

Monitoring:

General: INCREASED CONCENTRATIONS OF METHANE WERE MEASURED IN 4 PLACES: 1) 1000PPM 2) 2000PPM 3) 300PPM 4) 300PPM.

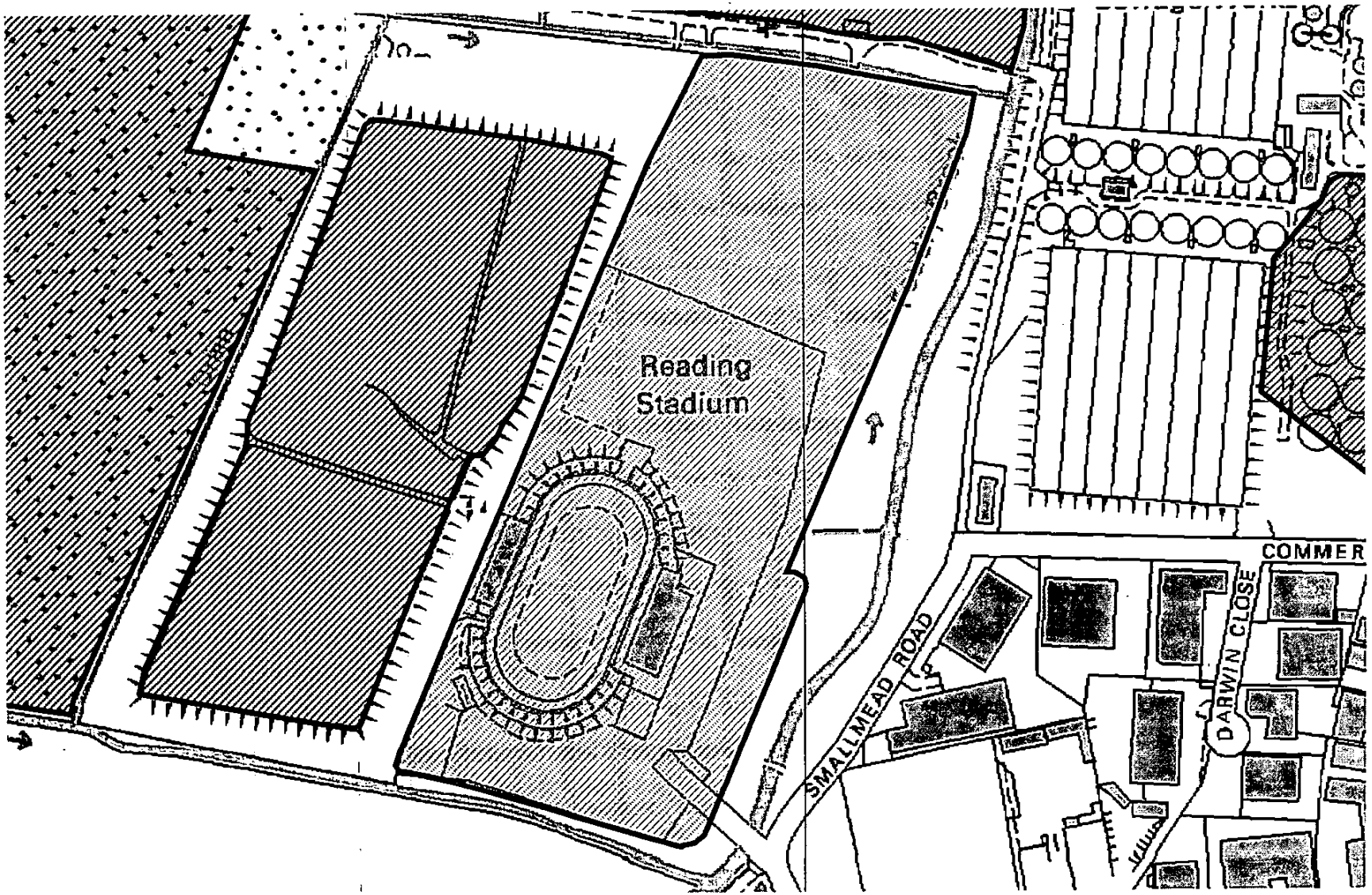
FileNumber:

Geology: GRAVEL

Waste Categories
A: Inert materials (soil, brick, concrete, glass, clay, sand etc.)
B: Semi-inert materials (wood, paper, cardboard, plasterboard, plastic, etc.)
C: Biodegradable wastes (food, sewage sludge, household, garden etc.)
D: Difficult wastes (e.g. tyres, sludges)
E: Special wastes (hazardous chemical wastes, asbestos)

Smallmead Stadium Reading

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Environment Agency - Thames West Area
Database Extract

SiteName: SMALLMEAD FARM READING

District: READING

GridRef: SU709700

Status: POST-OPERATIONAL

Landowner:

Operator: HALL AGGREGATES LTD

WasteCategories: A, B & C

Licence: 54/12/4/91 ISSUED 23/05/80 MODIFIED 30/3/93 AND 13/06/95

Monitoring: LANDFILL GAS, GROUNDWATER, SURFACE WATER AND LEACHATE MONITORING. 46 GAS AND 25 GROUNDWATER BOREHOLES.

General: SITE PREVIOUSLY OPERATED PRIOR TO LICENCE BY READING BOROUGH COUNCIL. Site Doomed over existing fill.

FileNumber:

TPnumber: TP0042

Waste Categories
A: Inert materials (soil, brick, concrete, glass, clay, sand etc.)
B: Semi-inert materials (wood, paper, cardboard, plasterboard, plastic, etc.)
C: Biodegradable wastes (food, sewage sludge, household, garden etc.)
D: Difficult wastes (e.g. tyres, sludges)
E: Special wastes (hazardous chemical wastes, asbestos)

Environment Agency - Thames West Area Database Extract

SiteName: SMALLMEAD FARM (58 ACRE)

District: READING

GridRef: SU 706 708

Status: OPERATIONAL

Landowner:

Operator: HALL AGGREGATES LTD

WasteCategories: A, B & C

Licence: 54/12/4/43 ISSUED 10/10/80 MODIFIED 30/03/93, 13/06/95 NAD 07/08/96

Monitoring:

General:

FileNumber:

Geology: READING BEDS

Waste Categories
A: Inert materials (soil, brick, concrete, glass, clay, sand etc.)
B: Semi-inert materials (wood, paper, cardboard, plasterboard, plastic, etc.)
C: Biodegradable wastes (food, sewage sludge, household, garden etc.)
D: Difficult wastes (e.g. tyres, sludges)
E: Special wastes (hazardous chemical wastes, asbestos)

Environment Agency - Thames West Area Database Extract

SiteName: SMALLMEAD(100 ACRE)

District: READING

GridRef: SU 709 700

Status: POST-OPERATIONAL

Landowner:

Operator: HALL AGGREGATES LTD

WasteCategories: A, B & C

Licence: 54/12/4/91 ISSUED 23/05/80 MODIFIED 30/3/93 AND 13/06/95

Monitoring: LANDFILL GAS, GROUNDWATER, SURFACE WATER AND LEACHATE MONITORING. 46 GAS AND 25 GROUNDWATER BOREHOLES.

General: SITE PREVIOUSLY OPERATED PRIOR TO LICENCE BY READING BOROUGH COUNCIL.

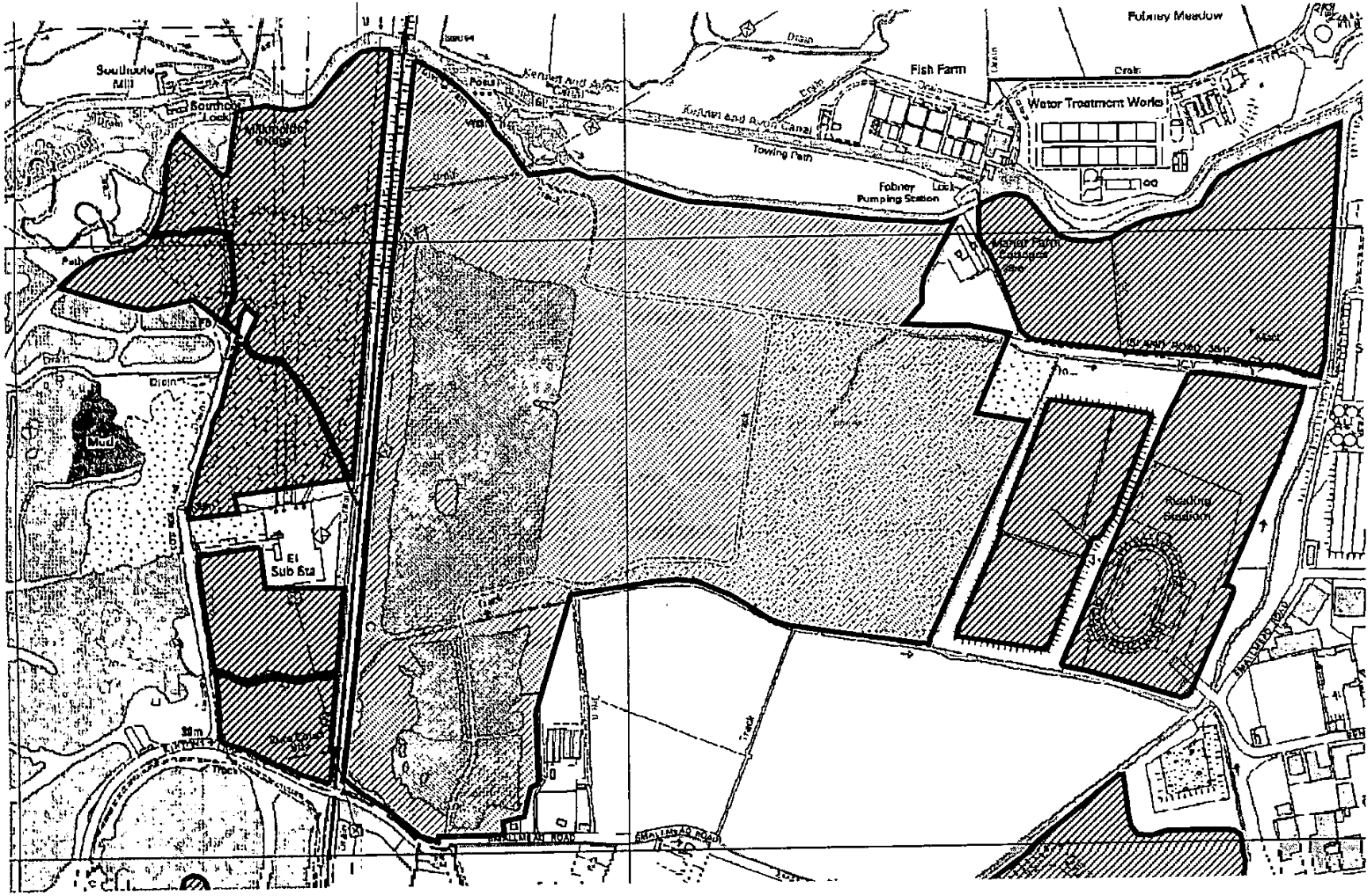
FileNumber:

Geology: GRAVELS

Waste Categories
A: Inert materials (soil, brick, concrete, glass, clay, sand etc.)
B: Semi-inert materials (wood, paper, cardboard, plasterboard, plastic, etc.)
C: Biodegradable wastes (food, sewage sludge, household, garden etc.)
D: Difficult wastes (e.g. tyres, sludges)
E: Special wastes (hazardous chemical wastes, asbestos)

Smallmead Farm Reading

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Environment Agency - Thames West Area Database Extract

SiteName: ROSE KILN LANE SOUTH

District: READING

GridRef: SU 715 712

Status: CLOSED

Landowner:

Operator:

WasteCategories: C

Licence: NO LICENCE

Monitoring:

General: SPIKING 1994. GRASSED AREAS OUTSIDE PARIMETER FENCE WERE UNDULATING AND PARTIALLY BURIED WASTE WAS VISABLE.

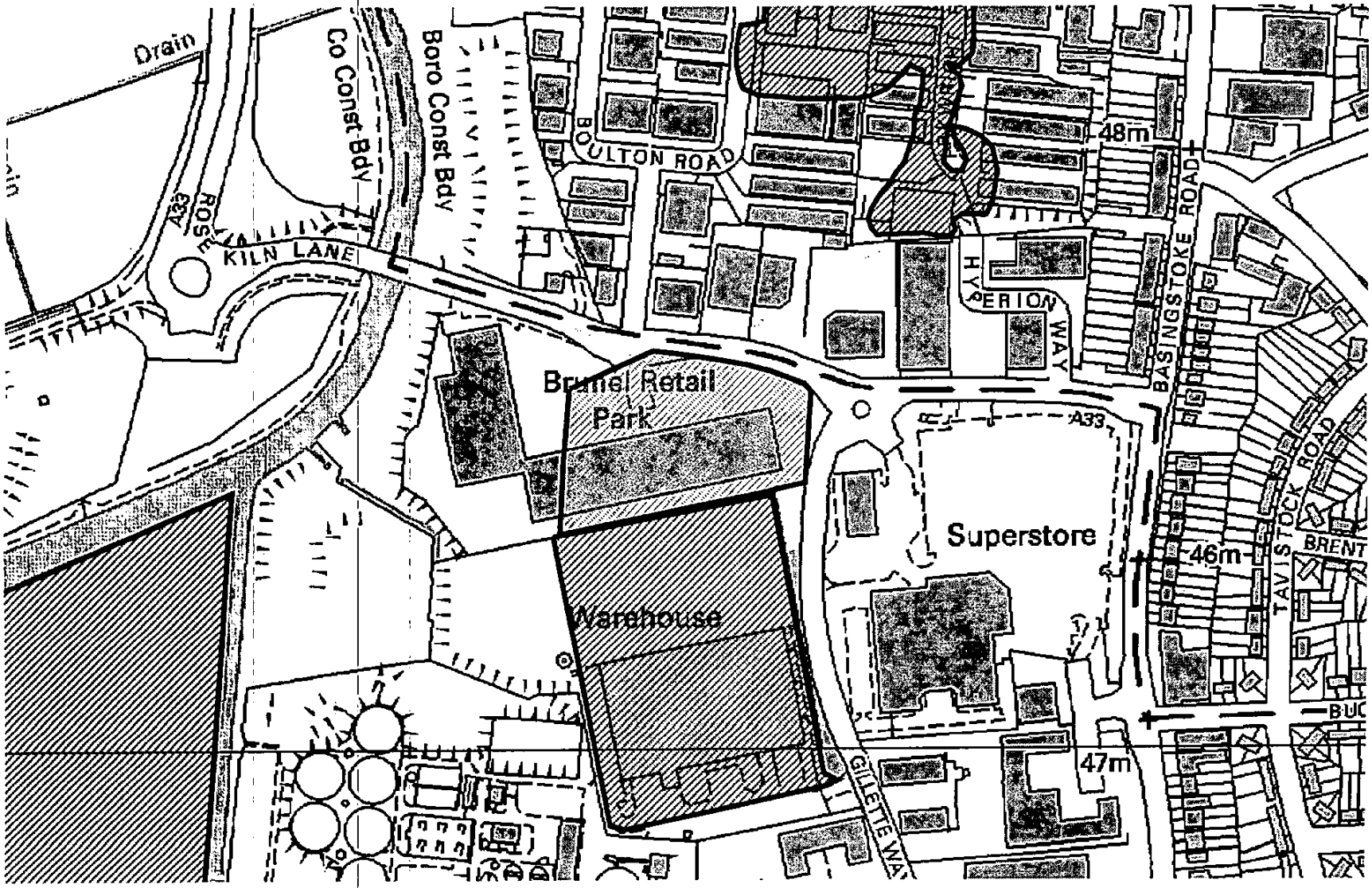
FileNumber:

Geology:

Waste Categories
A: Inert materials (soil, brick, concrete, glass, clay, sand etc.)
B: Semi-inert materials (wood, paper, cardboard, plasterboard, plastic, etc.)
C: Biodegradable wastes (food, sewage sludge, household, garden etc.)
D: Difficult wastes (e.g. tyres, sludges)
E: Special wastes (hazardous chemical wastes, asbestos)

Rose Kiln Lane. Reading

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WASTE REGULATION AUTHORITY	Ref: QAP/408/FB1 Issue: 1 Date: November 1993

SURVEY OF LANDFILL SITES - NO BOREHOLE

SITE: ROSE KILN LANE, S., READING GRID REF: 715 712

WEATHER: DRY GROUND CONDITIONS: DRY

BAROMETRIC PRESSURE: START: 1024 FINISH: 1024

SURVEY CARRIED OUT BY J. Reid/ J. Stark. DATE: 16/6/94

Topography	UNDULATING	Buildings	NO
Slumping	YES	Winter Waterlogging	NO
Surface Cracks	NO	Visible Waste	YES
Impermeable Cap	see notes	Soil Cover	YES
Vegetation	YES	Vegetation stress	NO
Odour	NO	Gas Bubbles	NO

NOTES: Spiked holes were made around the edge of the tarmac at Horsemen's Depo.
The grassed area outside the perimeter fence were undulating and partially buried waste was visible.

→ Has not been capped, but has a soil covering of clay material, and was partially harrowed.

Signed: J. Reid

Date: 13.6.94.

TP 106

INSTRUCTIONS TO BE USED IN CONJUNCTION WITH THE PROCEDURE FOR GAS AND WATER MONITORING	Ref No: QAF MWM W34B-2 Issue: 2 Date: January 1993

LANDFILL GAS DATA (BOREHOLE AND SPIKED HOLE)

SITE: ROSE KILN S., READING REFERENCE: 415 412

WEATHER: SUNNY TEMPERATURE: 16°C

GROUND CONDITIONS: DRY BAROMETRIC PRESSURE: START: 1024 FINISH: 1024

MONITORING CARRIED OUT BY: J. REID / J. STARK DATE: 10.6.94

INSTRUMENTS USED: CH_4 GAS TECC SER. NO: N/A
CO_2 SER. NO:

BH (Spiked hole)	CH_4 (ppm) % Vol.	CO_2 % Vol	BH	CH_4 % Vol.	CO_2 % Vol	BH	CH_4 % Vol.	CO_2 % Vol
1	8							
2	4							
3	10C							
4	20C							
5	25							
6	11C							
7	15							
8	1C							
9	8							
10	15							
11	2C							

COMMENTS:

SIGNED: J. Reid SEEN BY: JM Stark

DATE: 13. 6. 94. ACTIONED PROPOSED

Environment Agency - Thames West Area
Database Extract

SiteName: READING SLUDGE BEDS

District: READING

GridRef: SU 707 705

Status: CLOSED

Landowner:

Operator:

WasteCategories:

Licence: NO LICENCE

Monitoring:

General:

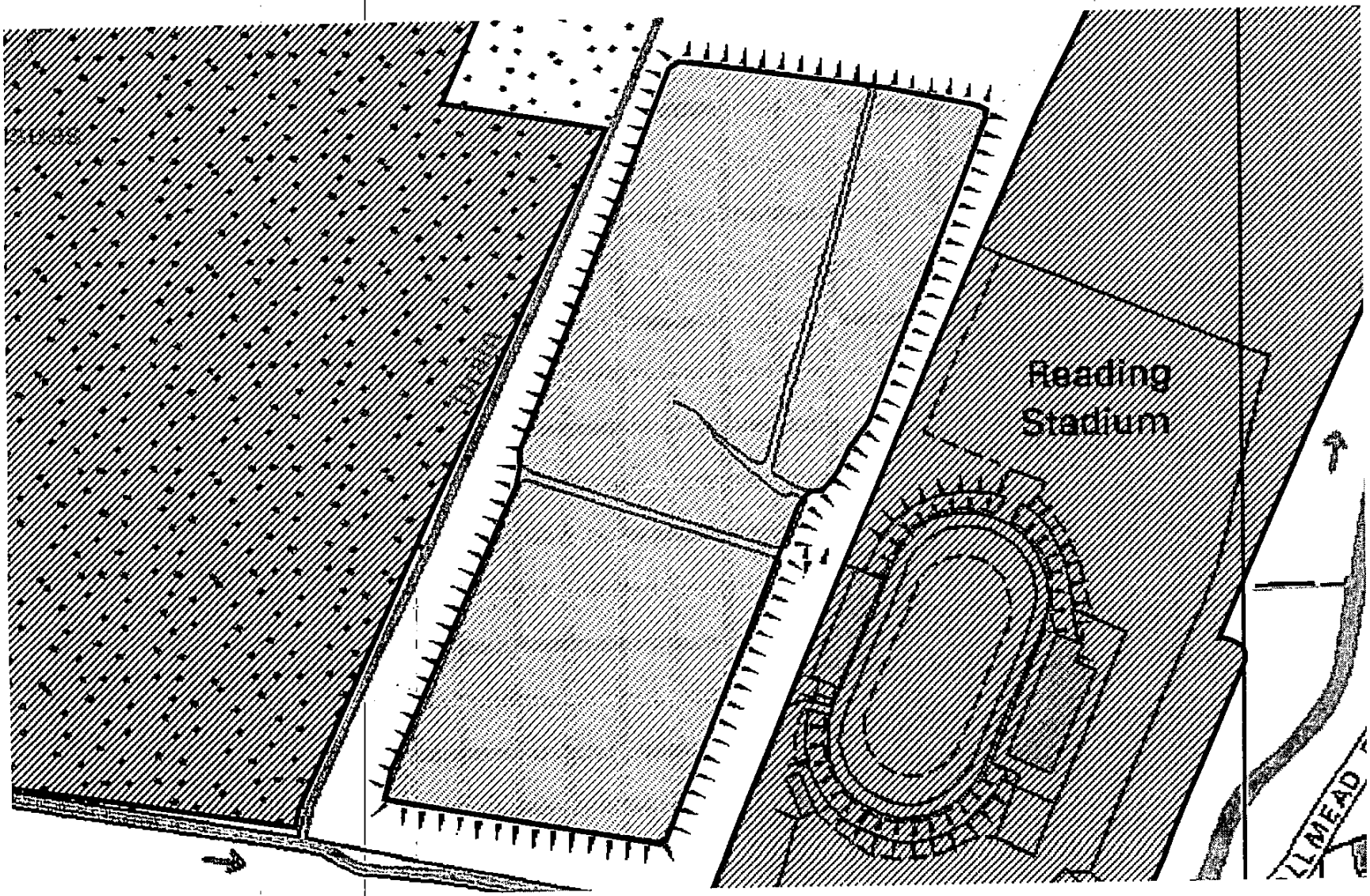
FileNumber:

Geology:

Waste Categories
A: Inert materials (soil, brick, concrete, glass, clay, sand etc.)
B: Semi-inert materials (wood, paper, cardboard, plasterboard, plastic, etc.)
C: Biodegradable wastes (food, sewage sludge, household, garden etc.)
D: Difficult wastes (e.g. tyres, sludges)
E: Special wastes (hazardous chemical wastes, asbestos)

SLUDGE BEDS READING

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Environment Agency - Thames West Area
Database Extract

SiteName: ISLAND ROAD

District: READING

GridRef: SU 708 709

Status: CLOSED

Landowner:

Operator:

WasteCategories: A

Licence: 54/12/4/23 RETURNED

Monitoring:

General: 4.0HA FILLED 1977-85

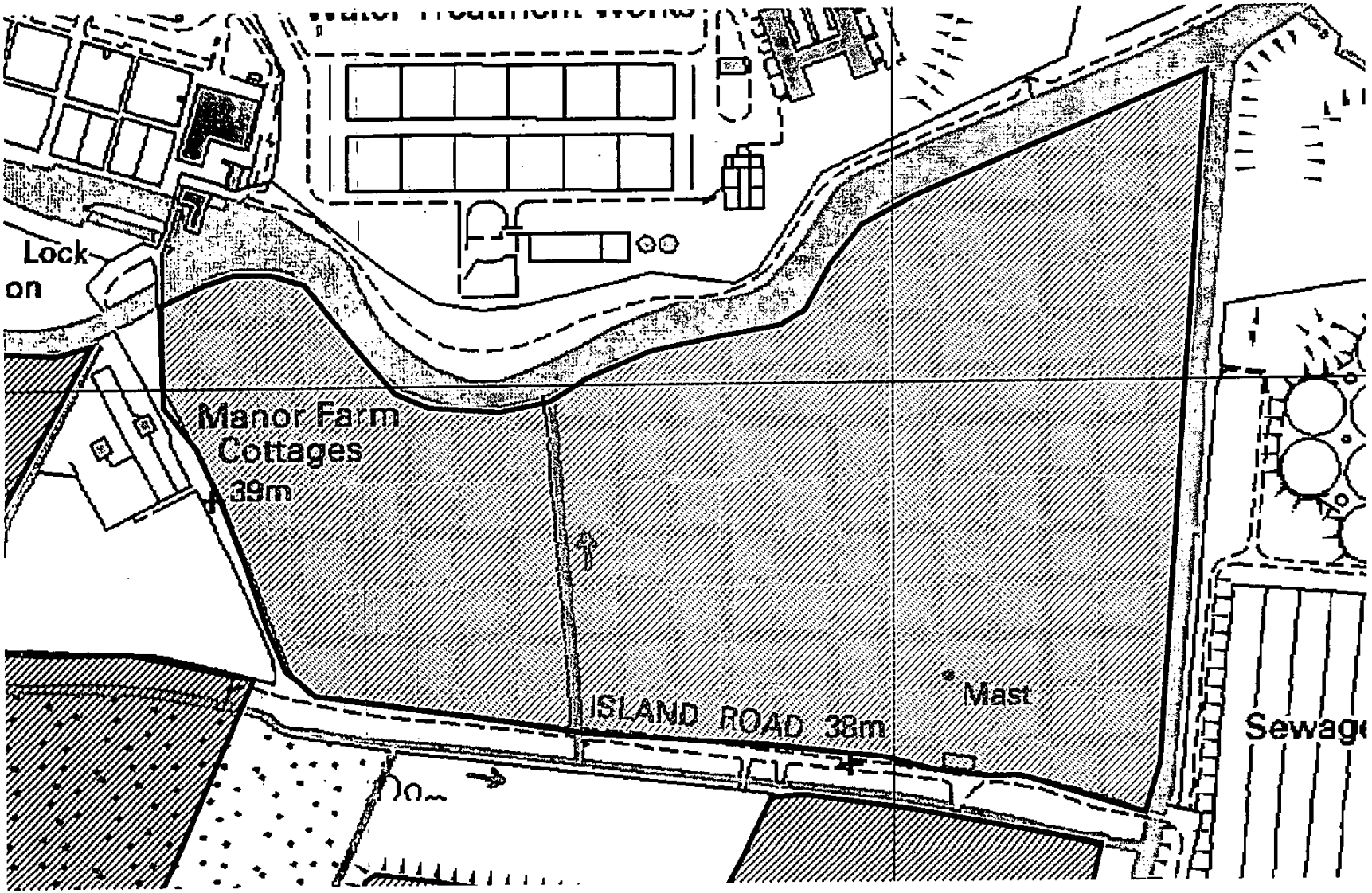
FileNumber:

Geology: GRAVEL

Waste Categories
A: Inert materials (soil, brick, concrete, glass, clay, sand etc.)
B: Semi-inert materials (wood, paper, cardboard, plasterboard, plastic, etc.)
C: Biodegradable wastes (food, sewage sludge, household, garden etc.)
D: Difficult wastes (e.g. tyres, sludges)
E: Special wastes (hazardous chemical wastes, asbestos)

ISLAND ROAD READING

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WASTE REGULATION AUTHORITY	Ref: QAP/408/FB2 Issue: 1 Date: November 1993

LANDFILL GAS DATA (BOREHOLE AND SPIKED HOLE)

SITE: INGLEWOOD ROAD REFERENCE:

WEATHER: FINE TEMPERATURE: 19 °C

GROUND CONDITIONS: DRY BAROMETRIC PRESSURE: 1012 START: 1012 FINISH: 1012.

MONITORING CARRIED OUT BY: J. REID, M. RAMSHAW DATE: 30/09/94

INSTRUMENTS USED: CH_4 Landsurveyor SER. NO:
CO_2 SER. NO:

BH	CH_4 % Vol.	CO_2 % Vol	BH	CH_4 % Vol.	CO_2 % Vol	BH	CH_4 % Vol.	CO_2 % Vol
1	0							
2	0.005							
3	0.005							
4	0							

COMMENTS:
Need to resample once crop has been harvested.

Signed:: Martin Ramshaw Seen By: Jan Lilley

Date: 7/11/94. Actioned Proposed
to county

10/11/93
SH

SURVEY OF LANDFILL SITES

Site INGLEWOOD ROAD, KINTBURY

Grid Ref 362 668

Weather & Ground Conditions FINE & DRY

Topography LEVEL

Slumping NO

Winter Waterlogging —

Surface Cracks NO

Visible Waste SOME SURFACE WASTE (DUE TO PLOUGHING OF FIELD)

Impermeable Cap NO

Soil Cover YES

Vegetation CROP

Vegetation Stress NO

Odour NO

Gas Bubbles NO

Buildings NO

Barometric Pressure Start 1012 Finish 1012

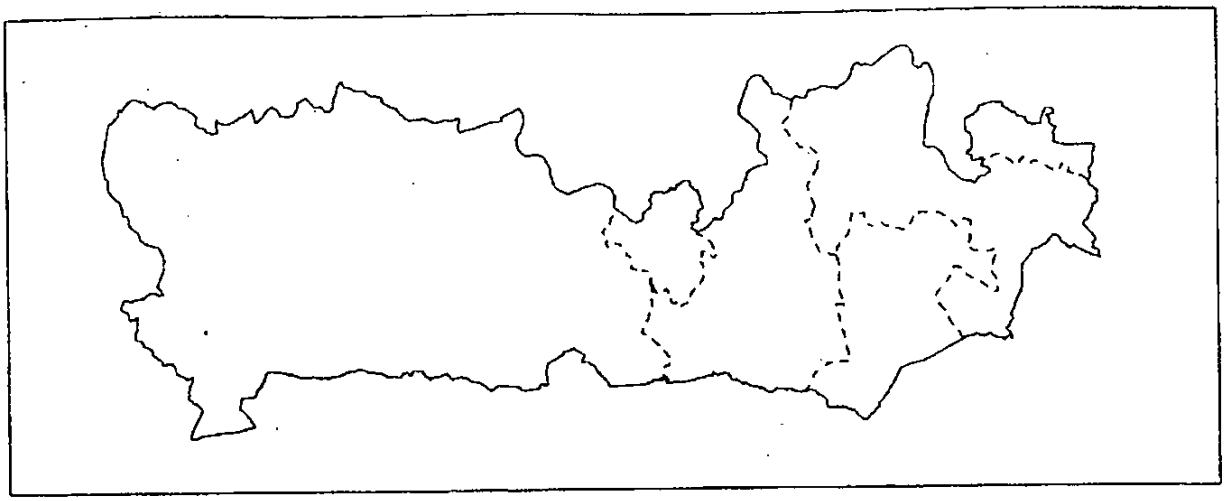
Notes

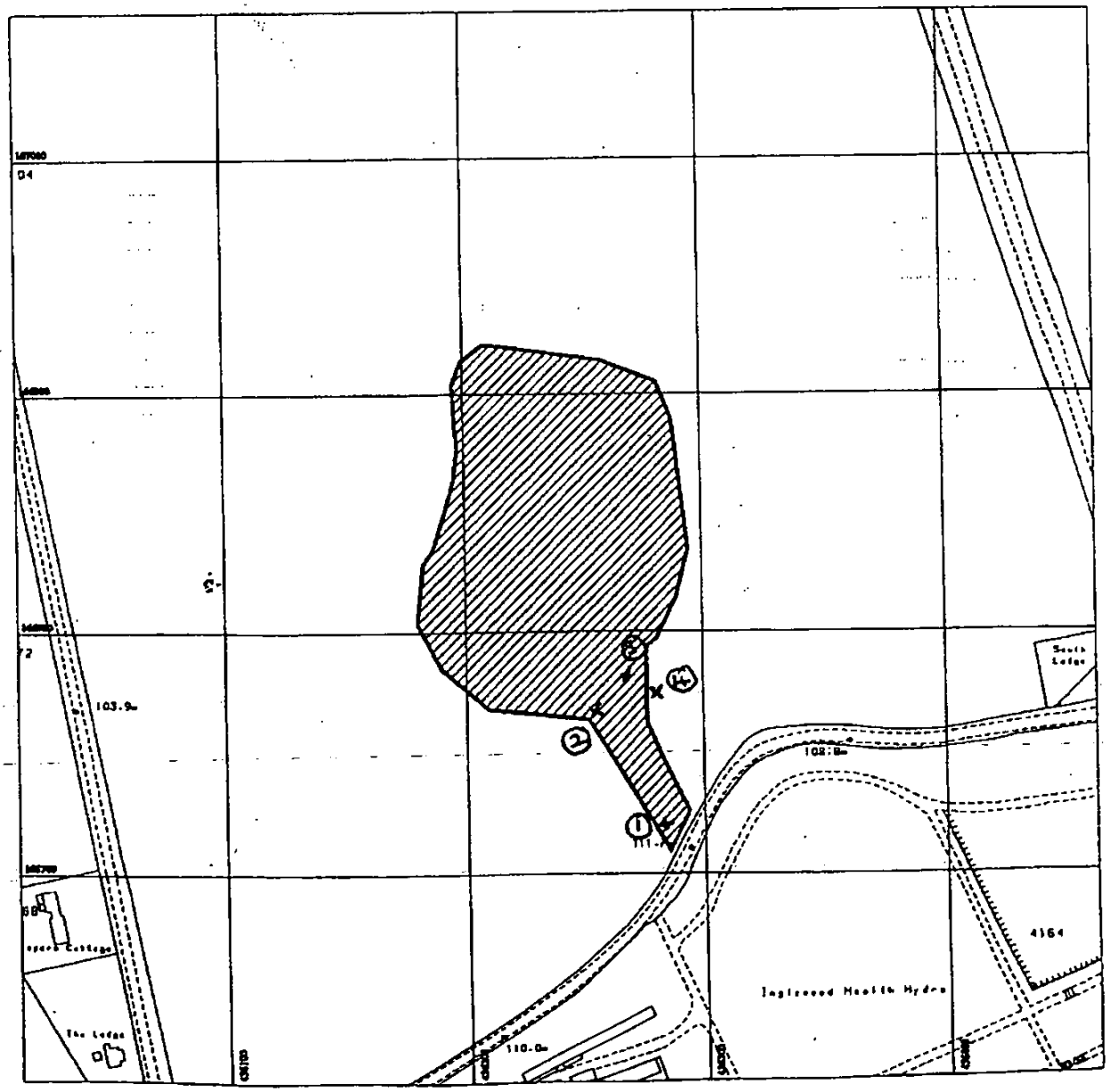
Unable to spike on main part of site due to the presence of crops. Locals informed us that the land was owned by Lord Howard De Walden and that it was filled with tree trunks, hedge clippings and road sweepings (Newbury District Council)

Probably worth a visit when crops have been harvested.

M. Ramshaw 30/09/94.

SU 362 668 INGLEWOOD ROAD KINTBURY





SCALE - 1:2500

Environment Agency - Thames West Area
Database Extract

SiteName: CRADDOCK ROAD

District: READING

GridRef: SU 715 715

Status: CLOSED

Landowner:

Operator:

WasteCategories:

Licence: NO LICENCE

Monitoring: GASTEC REVEALED NO GAS

General:

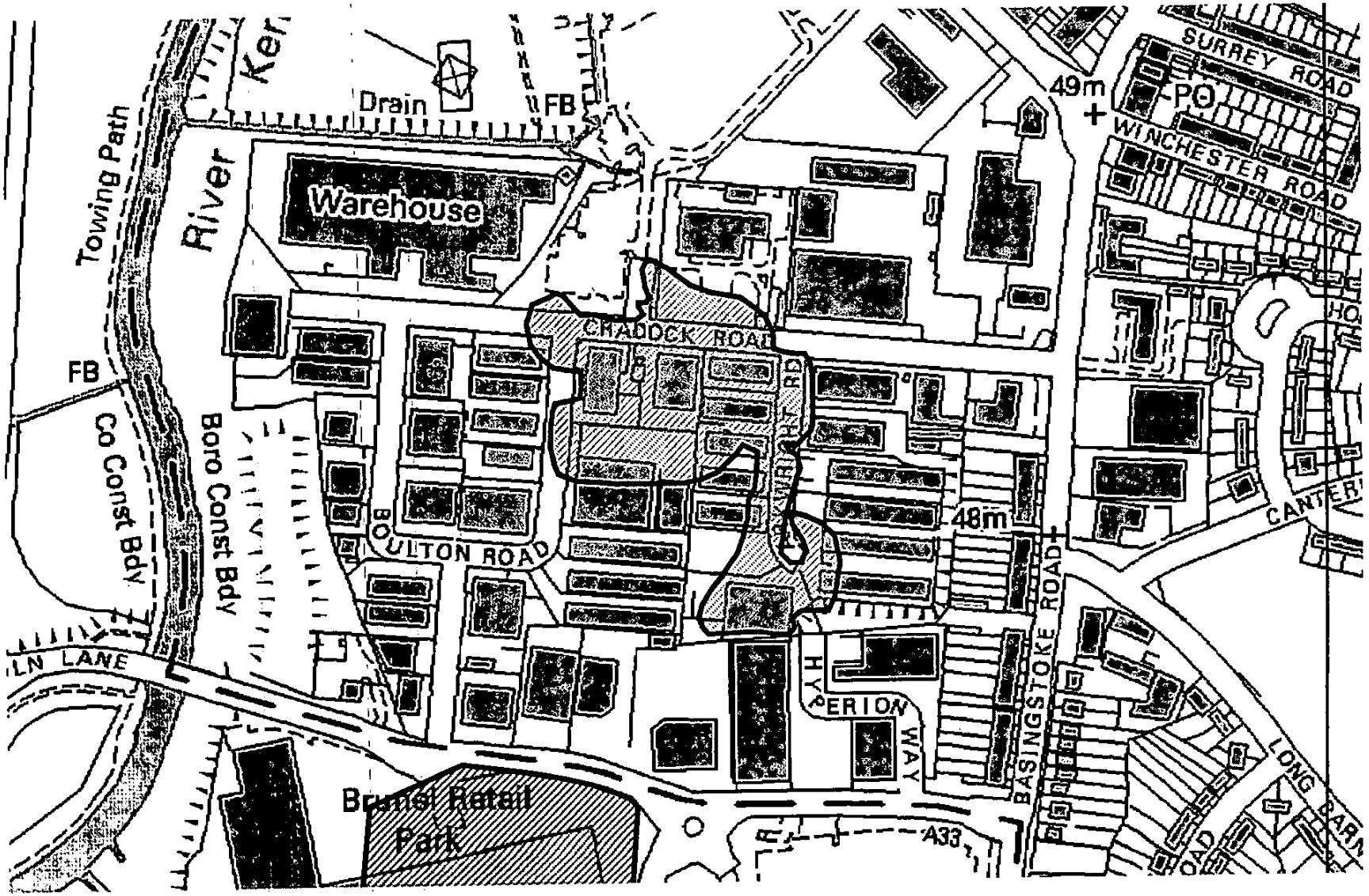
FileNumber:

Geology:

Waste Categories
A: Inert materials (soil, brick, concrete, glass, clay, sand etc.)
B: Semi-inert materials (wood, paper, cardboard, plasterboard, plastic, etc.)
C: Biodegradable wastes (food, sewage sludge, household, garden etc.)
D: Difficult wastes (e.g. tyres, sludges)
E: Special wastes (hazardous chemical wastes, asbestos)

Craddock Road Reading

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WASTE REGULATION AUTHORITY	Ref: QAP/408/FB1 Issue: 1 Date: November 1993

11/10/

SURVEY OF LANDFILL SITES - NO BOREHOLE

SITE: CRANBROOK ROAD, READING. GRID REF: SU 715 715

WEATHER: OVERCAST BUT DRY. GROUND CONDITIONS: TREACHEROUS

BAROMETRIC PRESSURE: START: 1010mb FINISH: 1010 mb.

SURVEY CARRIED OUT BY EDWARD FLEET DATE: 15.06.95

Topography INDUSTRIAL ESTATE.	Buildings INDUSTRIAL ESTATE
Slumping NO	Winter Waterlogging N/A
Surface Cracks NO	Visible Waste NO
Impermeable Cap NOT KNOWN	Soil Cover N/A
Vegetation GRASS, WEEDS	Vegetation stress NO.
Odour NO.	Gas Bubbles N/A

NOTES: Gastec Survey of the Site.
Both sides of the roads were walked and no evidence of methane concentration was measured.

Signed: E Fleet

Date: 15.06.95

19/11/93
SH

3/6

Environment Agency - Thames West Area
Database Extract

SiteName: GILETTE WAREHOUSE

District: READING

GridRef: SU 716 710

Status: CLOSED

Landowner:

Operator:

WasteCategories: C

Licence: NO LICENCE

Monitoring:

General: 3.0HA FILLED 1930'S

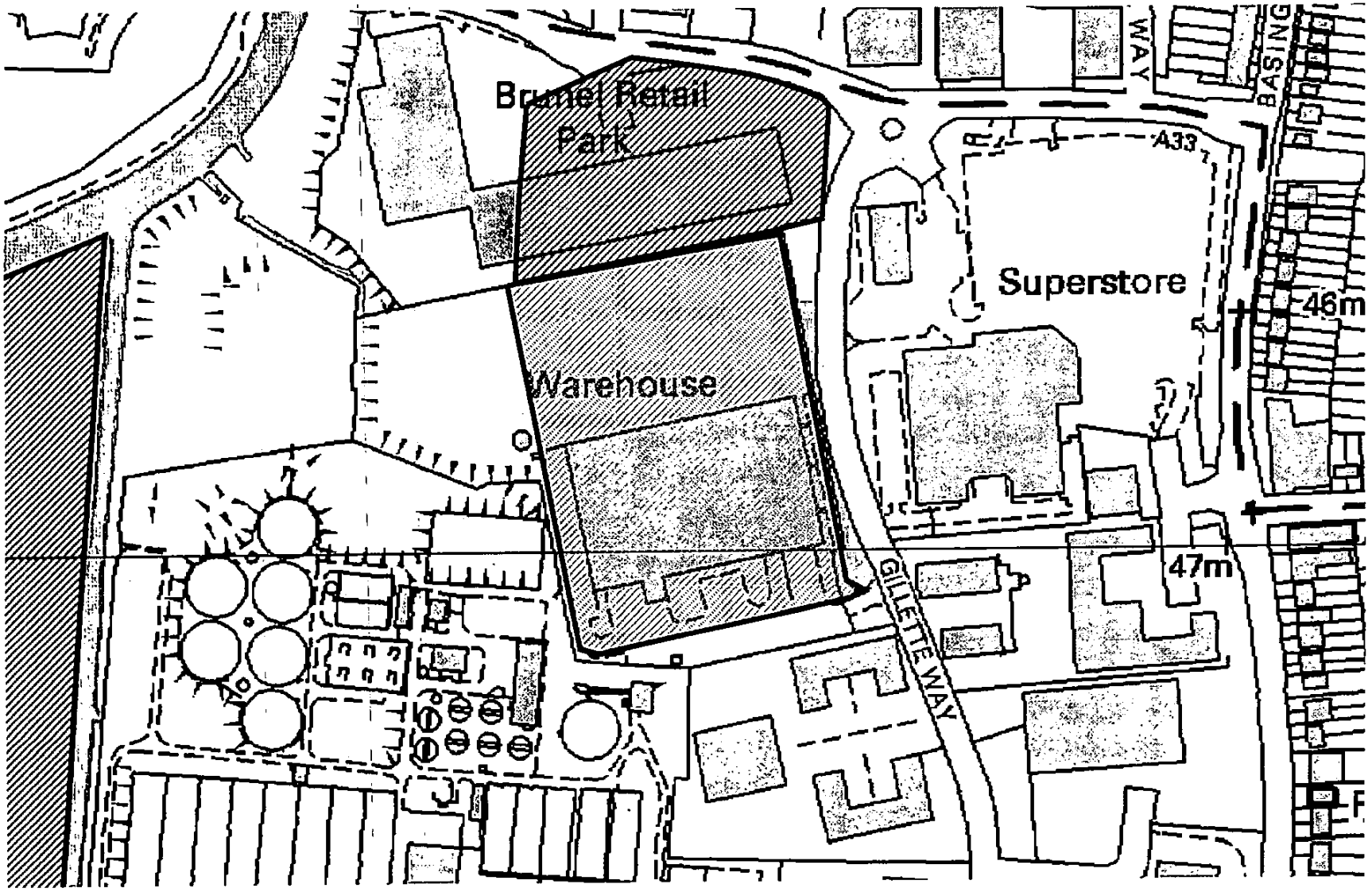
FileNumber:

Geology: GRAVEL

Waste Categories
A: Inert materials (soil, brick, concrete, glass, clay, sand etc.)
B: Semi-inert materials (wood, paper, cardboard, plasterboard, plastic, etc.)
C: Biodegradable wastes (food, sewage sludge, household, garden etc.)
D: Difficult wastes (e.g. tyres, sludges)
E: Special wastes (hazardous chemical wastes, asbestos)

Gilette Warehouse Reading

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Environment Agency - Thames West Area
Database Extract

SiteName: MANOR FARM

District: READING

GridRef: SU 713 705

Status: CLOSED

Landowner:

Operator:

WasteCategories: A

Licence: NO LICENCE

Monitoring: GASTEC REVEALED NO GAS

General: 4.0HA. SPIKING REVEALED MINIMAL GAS

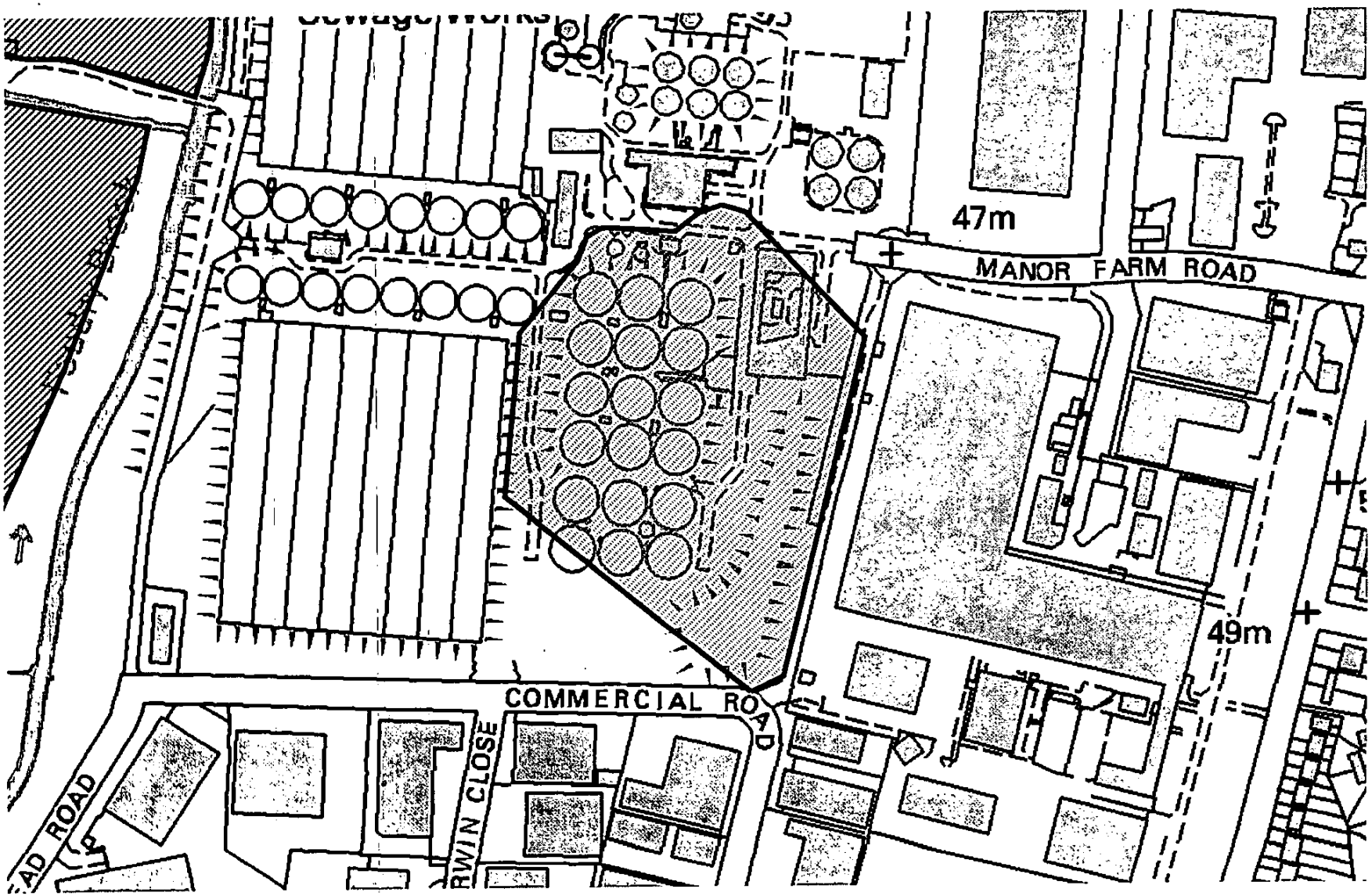
FileNumber:

Geology: CLAY

Waste Categories
A: Inert materials (soil, brick, concrete, glass, clay, sand etc.)
B: Semi-inert materials (wood, paper, cardboard, plasterboard, plastic, etc.)
C: Biodegradable wastes (food, sewage sludge, household, garden etc.)
D: Difficult wastes (e.g. tyres, sludges)
E: Special wastes (hazardous chemical wastes, asbestos)

Manor Farm Reading

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SURVEY OF LANDFILL SITES

Site	Manor Farm Reading
Grid Ref	SU 713 705
Weather & Ground Conditions	Dry Ground moist
Topography	Banked
Slumping	No
Winter Waterlogging	No
Surface Cracks	No
Visible Waste	No
Impermeable Cap	No
Soil Cover	Yes
Vegetation	Grass
Vegetation Stress	No
Odour	Yes
Gas Bubbles	No
Buildings	Yes
Barometric Pressure Start	1005 Finish 1005

Notes

Gastec affected by sewage works. no detectable gas from filled area.

SPIKING, RIVENHALL MISHAM [illegible]

SURVEY OF LANDFILL SITES

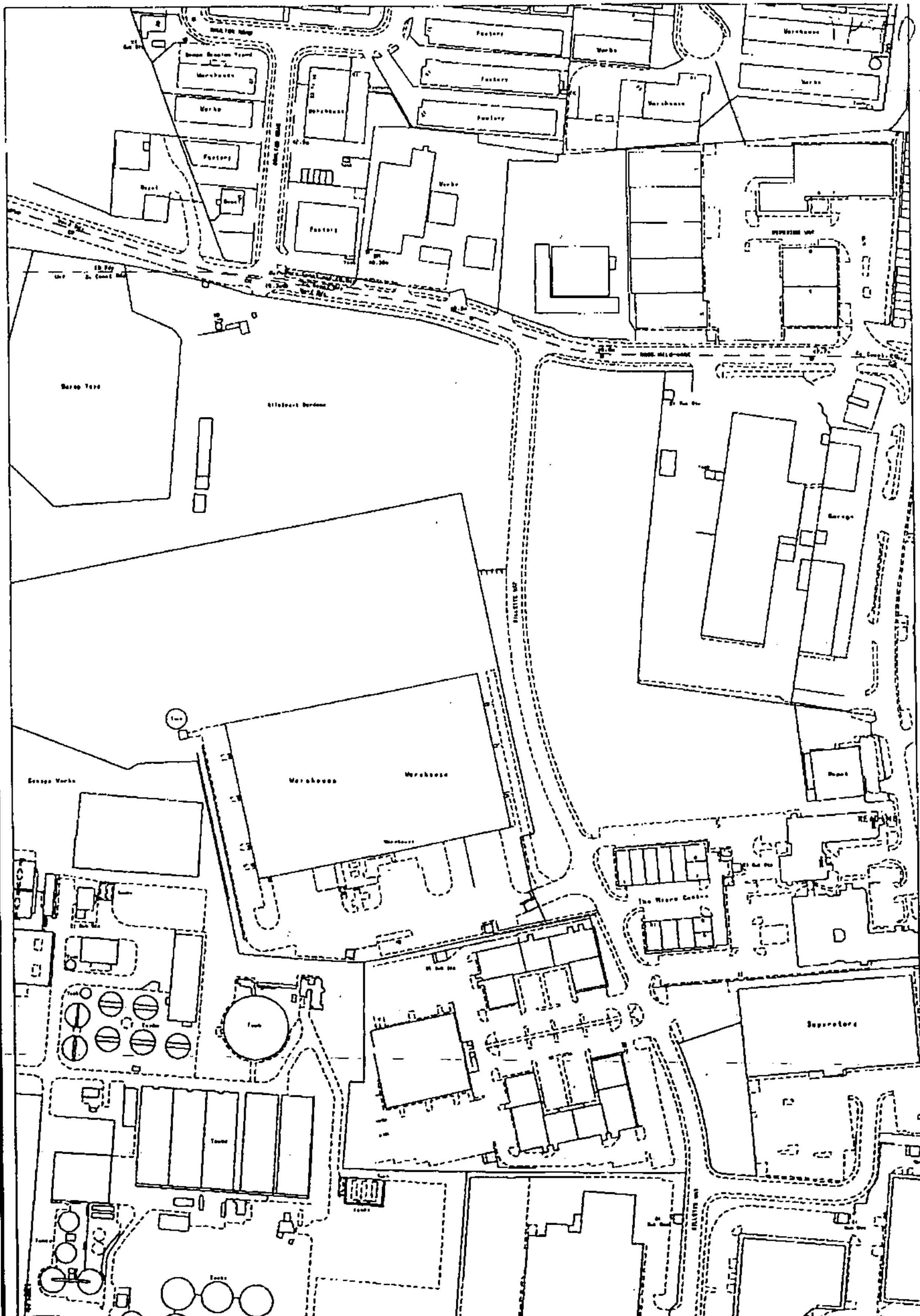
Site	Manor Farm Reading
Grid Ref	SU 713 705
Weather & Ground Conditions	Dry Ground moist
Topography	Banked
Slumping	No
Winter Waterlogging	No
Surface Cracks	No
Visible Waste	No
Impermeable Cap	No
Soil Cover	Yes
Vegetation	Grass
Vegetation Stress	No
Odour	Yes
Gas Bubbles	No
Buildings	Yes
Barometric Pressure Start	1005 Finish 1005

Notes

Gastec affected by sewage works. No detectable gas from filled area.

SPIKING, REVEALED MINIMAL GAS

yh168



© Ordnance Survey 1991

1:2500

Within Site Sampling

Borehole	CH_4	CO_2	O_2
1	<0.1	1.0	
2	0	0.4	
3	0	0.2	
4	<0.1	1.2	
5	<0.1	1.1	
6	<0.1	0.6	

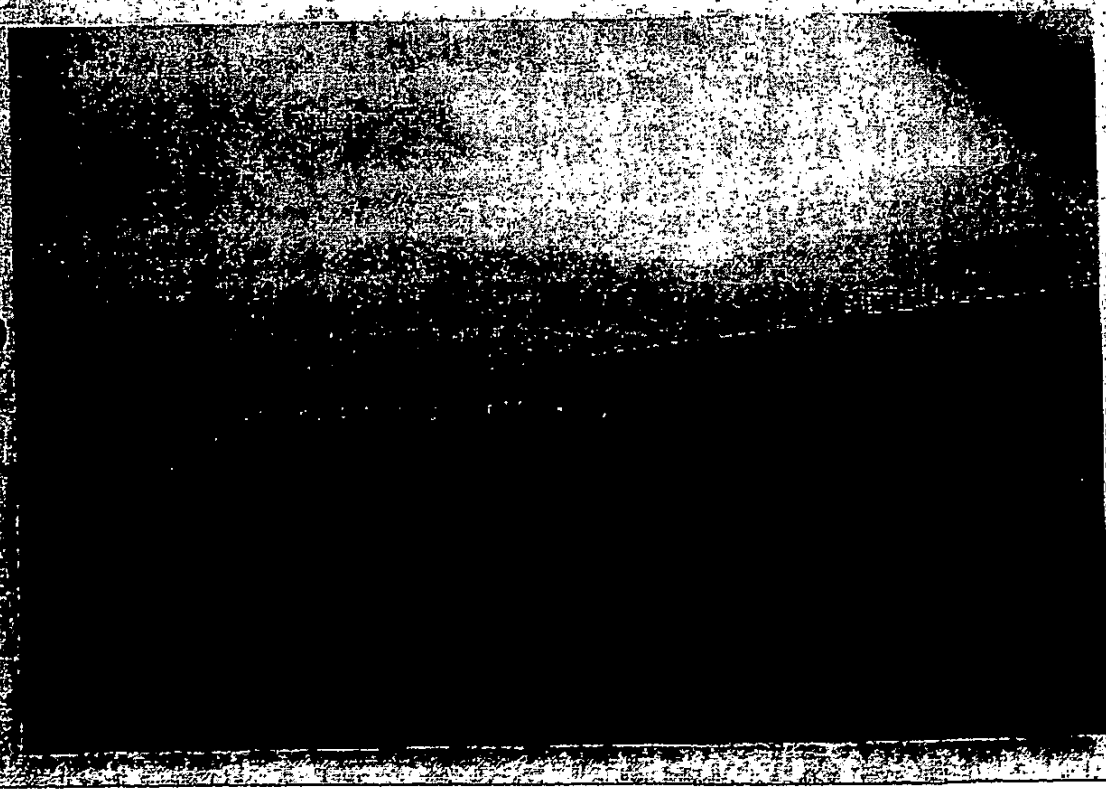
Perimeter Sampling

Borehole	CH_4	CO_2	O_2
	1.4	1.4	

MANOR FARM SEWAGE WORKS

SU 713 705

TP0104



APPENDIX C

INVESTIGATIVE METHODS

Sample Collection and Handling

Soil

Disturbed and undisturbed soil samples were collected from each of the boreholes and trial pits at the depths shown on the following logs. Small disturbed samples were obtained from throughout the total depth for identification purposes and chemical analysis.

Samples for chemical analysis were collected from fresh arisings from the boreholes, or from relatively undisturbed material from the centre of the excavator bucket, using a clean stainless steel trowel. The sample material was placed directly into laboratory prepared containers.

To prevent cross contamination, the sampling trowel was firstly scrubbed free of adhering material and washed in a solution of Decon 90 (phosphate free detergent), then rinsed with distilled water after collection of each sample.

Labelling of sample containers was effected with permanent marking ink on the laboratory label on the body of the container.

After collection, samples for organic analyses were placed into chilled insulated secure cooler boxes, with samples for inorganic analysed placed into secure plastic crates. All samples remained under the control of the site engineer during the course of the investigation.

Groundwater

After purging the required volume of water from the well, samples were retrieved either using a new clean disposable polycarbonate bailer or a dedicated watera pump. Samples were discharged directly into laboratory prepared containers in a manner which reduced oxidation and agitation of the sample.

Samples for chemical analysis were placed directly into secure insulated containers at a temperature less than 4°C at the completion of sampling at each location. The containers remained under the control of the engineer on site during the course of the sampling event.

Surplus purged water was placed in secure 200ltr metal drums on site, pending receipt of chemical analysis and subsequent disposal to a suitably licensed liquid waste facility.

Trial Pitting and Trenching

Trial pits and trenches were excavated using a rubber tyred JCB 3CX excavator, with backhoe attachment. Plastic sheeting was placed on one side of the excavation. Material within the trial excavation was removed slowly in six inch layers to ensure no underground services were intercepted and changes in strata detected, with arisings placed on to the plastic sheeting.

Trial excavations were backfilled in the order in which the material was removed, to ensure no impacted material remained at the surface on completion of the excavation.

Surplus borehole and excavation arisings were placed in a secure lined skip on site, pending receipt of chemical analysis and subsequent disposal to a suitably licensed solid waste facility.

APPENDIX D

WYGE (2004) INVESTIGATION

APPENDIX D1

LOGS

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Trial Pit Number **HP1**

Sheet 1 of 1

1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Hand Tools**

Ground Level **47.15mOD**

Start Date **26/02/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Grass over soft brown silty sandy gravelly clay with some cobble size brick and concrete fragments. Gravel is flint, brick, concrete and asphalt fragments. (MADE GROUND)						0.35	D	
		46.25	0.90			0.80	D,B	
Soft dark greenish grey sandy silt with occasional flint gravel. Sand is fine. Possible sewage sludge. (c) (MADE GROUND)						1.00	D	
		45.95	1.20					
Stiff reddish-brown and grey mottled silty clay. (MADE GROUND)								
		45.65	1.50			1.60	D,B	
Soft greyish greenish brown very clayey very silty sand with some gravel of concrete and flint. (MADE GROUND)								
		45.20	1.95			2.00	D,B	
Loose orange-brown silty SAND. (LONDON CLAY)						2.50	D,B	
. . . below 2.5mbgl: becomes very clayey silty sand, with occasional flint gravel.								
		43.85	3.30			3.20	D,B	
Trial Pit Completed at 3.30 mbgl								

Remarks:

Stability: Some instability GL-0.9m.
Groundwater: No groundwater encountered.

Installation Details: Backfilled with arisings.

Other Observations:

Pit Dimensions:
Length: 3.50m
Width: 1.00m
Bearing:
of Long Side: degrees

JOB NUMBER E3015/23
Logged By PE
Checked By

FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Trial Pit Number **HP2**

Sheet 1 of 1
1:50

Project **Reading Gateway**	Client **Kennet Properties Ltd**
Method **Hand Tools**	Ground Level **44.33mOD**
	Start Date **27/02/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft brown silty sandy slightly gravelly clay with occasional brick and concrete fragments. (MADE GROUND)		44.03	0.30			0.30	B	
Asphalt. (MADE GROUND)		44.01	0.32			0.50	D	
Loose sandy clayey gravel of brick and concrete fragments. (MADE GROUND)		43.63	0.70					
Soft greenish-grey sandy clayey silt. (Possible sewage sludge) (c). (MADE GROUND)		43.53	0.80			1.00	B	
. . . from 0.70 to 1.07mbgl: concrete foundation along east face of pit.						1.20	D	
Firm orange-brown silty locally very sandy CLAY. (LONDON CLAY)						1.30	B	
. . . below 1.6mbgl, becomes very clayey, very silty SAND.						1.50	B	
						1.60	B	
		41.33	3.00			3.00	B	
Trial Pit Completed at 3.00 mbgl								

Remarks:

Stability: Stable.
Groundwater: Slow groundwater ingress from base of pit at 3.0mbgl.

Installation Details: Backfilled with arisings.

Other Observations:

Pit Dimensions:
Length: 3.50m
Width: 1.20m
Bearing:
of Long Side: degrees

JOB NUMBER E3015/23
Logged By PE
Checked By

FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Trial Pit Number **HP3**

Sheet 1 of 1
1:50

Project **Reading Gateway**	Client **Kennet Properties Ltd**
Method **Hand Tools**	Ground Level **43.68mOD**
	Start Date **27/02/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft brown silty sandy clay topsoil with frequent rootlets. (MADE GROUND)		43.53	0.15			0.30	D	
Soft orange-brown very gravelly, cobbley, locally very sandy, silty clay. Gravel is flint, brick and concrete. Cobbles are concrete, whole bricks and cemented brick fragments. Occasional plastic fragments. (MADE GROUND)						0.70	D,B	
						1.00	D	
. . . at 1.0mbgl: concrete boulder (700mm diameter) encountered. . . . at 1.0mbgl: brick structure, possibly former manhole chamber or foundation, encountered. Pit extended south. . . . at 1.2mbgl: concrete boulder (500mm diameter) encountered.								
		42.08	1.60			1.60	D,B	
Trial Pit Completed at 1.60 mbgl								

Remarks:

Stability: Generally stable; some collapse of pit walls when boulders removed.
Groundwater: No groundwater encountered.

Installation Details: Backfilled with arisings.

Other Observations: Refusal at 1.6mbgl on concrete obstruction. Trial pit abandoned

Pit Dimensions:
Length: 1.40m
Width: 3.00m
Bearing of Long Side: degrees

JOB NUMBER E3015/23
Logged By PE
Checked By

FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Trial Pit Number **TP201**

Sheet 1 of 1
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Mechanical Excavator**

Ground Level **40.37mOD**

Start Date **05/03/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft very gravelly sandy silty clay. Gravel is flint, brick and concrete. Some cobble size brick and concrete fragments. Frequent timber fragments, some polystyrene fragments. Occasional asphalt, plastic and scrap metal fragments. (MADE GROUND)		39.77	0.60			0.40	D	
Soft dark greenish-brown silty sandy clay with occasional brick fragments. (MADE GROUND)						0.80	D	
. . . below 1.0mbgl, with some orange-brown silt clay.		39.17	1.20			1.30	D	
Soft reddish-orange-brown with a little grey, very silty slightly sandy CLAY. (READING BEDS)								
. . . below 1.6mbgl, becomes firm red-brown with grey veins silty CLAY with a little fine gravel of flint.								
. . . below 2.4mbgl, becomes stiff.		37.57	2.80					
Stiff grey and orange brown mottled silty CLAY with occasional veins of decaying wood. Some pockets of very sandy clay/clayey sand. (READING BEDS)								
Trial Pit Completed at 4.00 mbgl		36.37	4.00					

Remarks:

Stability: Hole unstable between ground level and 0.9mbgl.
Groundwater: No groundwater encountered.

Installation Details: Backfilled with arisings.

Other Observations:

Pit Dimensions:
Length: 2.50m
Width: 0.60m
Bearing:
of Long Side: degrees

JOB NUMBER E3015/23
Logged By
Checked By

FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Trial Pit Number **TP202**

Sheet 1 of 1
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Mechanical Excavator**

Ground Level **40.89mOD**

Start Date **05/03/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft brown very cobbly very gravelly silty sandy clay. Gravel and cobbles are brick, concrete, abundant flint, some whole and half bricks, with occasional metal wire and timber fragments. (MADE GROUND)						0.40	D,B	
		40.19	0.70					
Soft dark greenish brown silty clay, locally slightly sandy, with occasional flint gravel and brick fragments. (MADE GROUND)						1.00	D,B	
. . . below 1.2mbgl becomes sandy and intermixed with some orange-brown silty clay.		39.39	1.50			1.80	D	
Firm red-orange brown with a little grey slightly sandy silty CLAY with very occasional fine flint gravel. (READING BEDS)								
. . . below 2.2mbgl, becomes stiff.		38.39	2.50					
Stiff light grey and orange brown mottled silty CLAY. (READING BEDS)						3.20	D	
		37.39	3.50	3.50				
Trial Pit Completed at 3.50 mbgl								

Remarks:

Stability: Pit unstable from GL to 0.7mbgl, stable from 0.7m to base.
Groundwater: Slight groundwater ingress at base of pit.

Installation Details: Backfilled with arisings.

Other Observations:

Pit Dimensions:
Length: 2.40m
Width: 0.60m
Bearing:
of Long Side: degrees

JOB NUMBER E3015/23
Logged By PE
Checked By

FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Trial Pit Number **TP203A**

Sheet 1 of 1
1:50

Project **Reading Gateway**	Client **Kennet Properties Ltd**
Method **Mechanical Excavator**	Ground Level **46.83mOD**
	Start Date **26/02/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Loose dark brown silty sandy topsoil with abundant shells and shell fragments, (MADE GROUND)		46.53	0.30					
Trial Pit Completed at 0.30 mbgl								

Remarks:

Stability: Unstable.
Groundwater: No groundwater encountered.

Installation Details: Backfilled with arisings.

Other Observations: Trial pit terminated at 0.3mbgl on concrete slab. Re-excavated as TP203B.

Pit Dimensions:
Length: 3.00m
Width: 0.60m
Bearing:
of Long Side: degrees

JOB NUMBER E3015/23
Logged By PC
Checked By

FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Trial Pit Number **TP203B**

Sheet 1 of 1
1:50

Project **Reading Gateway**	Client **Kennet Properties Ltd**
Method **Mechanical Excavator**	Ground Level **46.83mOD**
	Start Date **26/02/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Loose dark brown silty sandy topsoil with abundant fine gravel size shells. (MADE GROUND)						0.20	D,B	
		46.33	0.50					
Soft brown mottled grey sandy silty clay with frequent whole and half brick and gravel size brick fragments. (MADE GROUND)						0.80	D	
		45.83	1.00					
Firm to stiff orange-brown mottled slightly sandy silty CLAY. (LONDON CLAY)								
						2.30	D	
. . . below 2.5m: becoming very sandy and with occasional shale fragments.								
		43.83	3.00					
Trial Pit Completed at 3.00 mbgl								

Remarks:

Stability: Unstable GL-0.5m.
Groundwater: No groundwater encountered.

Installation Details: Backfilled with arisings.

Other Observations:

Pit Dimensions:
Length: 2.40m
Width: 0.60m
Bearing:
of Long Side: degrees

JOB NUMBER E3015/23
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FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL
Ground Technologies and Investigation
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Tel. 020 8659 9959 Fax. 020 8676 9968

Trial Pit Number **TP204**

Sheet 1 of 1
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Mechanical Excavator**

Ground Level **47.54mOD**

Start Date **27/02/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft to firm silty clay with some flint gravel. Occasional cobble size brick and concrete fragments, occasional metal fragments, cables and plastic sheeting. (MADE GROUND)						0.20	D	
						0.90	D	
Light brown clayey sandy gravel intermixed with some ashy charcoal fragments. (c) (MADE GROUND)		46.54	1.00			1.20	D	
Black sandy ashy charcoal (c). (MADE GROUND)		46.44	1.10			1.25	D	
Soft dark greenish grey-brown clayey sandy silt. (Possible sewage sludge) (c). (MADE GROUND)		46.39	1.15					
Firm to stiff orange-brown and grey mottled CLAY. (LONDON CLAY)		46.14	1.40			2.00	D	
. . . below 2.0mbgl: becomes sandy clay with occasional pockets of greenish blue-grey clayey sand.								
Trial Pit Completed at 3.40 mbgl		44.14	3.40			3.40	D	

Remarks:

Stability: Stable.
Groundwater: No groundwater encountered.

Installation Details: Backfilled with arisings.

Other Observations:

Pit Dimensions:
Length: 2.70m
Width: 0.60m
Bearing:
of Long Side: degrees

JOB NUMBER E3015/23
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FIG. NO.

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Trial Pit Number **TP205**

Sheet 1 of 1
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Mechanical Excavator**

Ground Level **50.09mOD**

Start Date **27/02/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft slightly sandy gravelly silty clay. Gravel is predominantly flint with occasional brick, concrete and chalk fragments. Occasional debris including scrap metal, plastic and wire. Intermittent bands of clayey sandy medium to coarse gravel of flint with a little chalk. (MADE GROUND)						0.15	D	
						0.90	D,B	
						1.50	D	
. . . at 1.7mbgl: with occasional concrete boulders.						2.10	B	
						2.40	D	
		47.39	2.70			2.80	D	
Soft dark greenish grey very silty clay with occasional medium to coarse flint gravel. (Possible sewage sludge) (c). (MADE GROUND)								
		46.79	3.30			3.30	D	
Soft dark grey/ black sandy clay. Sand is medium to coarse. Occasional gravel size brick fragments. Strong organic odour noted. (c). (MADE GROUND)		46.59	3.50			3.50	D	
		46.39	3.70					
Stiff greenish grey/ brown sandy clayey silt. (Possible sewage sludge) (c). (MADE GROUND)								
Stiff green/grey with orange mottling silty CLAY. (LONDON CLAY)								
		45.59	4.50					
Trial Pit Completed at 4.50 mbgl								

Remarks:

Stability: Unstable GL-2.7m.
Groundwater: Slow groundwater seepage at 2.7mbgl.

Installation Details: Backfilled with arisings.

Other Observations:

Pit Dimensions:
Length: 3.30m
Width: 0.60m
Bearing:
of Long Side: degrees

JOB NUMBER E3015/23
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FIG. NO.

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Trial Pit Number **TP206**

Sheet 1 of 1
1:50

Project **Reading Gateway**	Client **Kennet Properties Ltd**
Method **Mechanical Excavator**	Ground Level **46.57mOD** — Start Date **25/02/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Grass over soft brown clayey silt topsoil with occasional rootlets. (MADE GROUND)		46.42	0.15			0.10	D	
Firm light grey and orange mottled silty sandy clay with occasional orange brick fragments and concrete cobbles. (MADE GROUND)						0.50	B	
						0.60	D	
		45.82	0.75					
Concrete (former road?) (MADE GROUND)		45.67	0.90					
Firm greyish brown locally mottled orange-brown silty clay. (MADE GROUND)						1.00	D	
						1.20	D	
		45.17	1.40					
Soft orange-brown slightly sandy silty clay. (MADE GROUND)								
						2.00	B	
						2.80	D	
				3.60				
		42.97	3.60			3.50	D	
Trial Pit Completed at 3.60 mbgl								

Remarks:

Stability: Stable throughout.
Groundwater: Slow groundwater ingress from base of pit at 3.6mbgl.

Installation Details: Backfilled with arisings.

Other Observations:

Pit Dimensions:
Length: 2.60m
Width: 0.60m
Bearing:
of Long Side: degrees

JOB NUMBER E3015/23
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Checked By

FIG. NO.

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Trial Pit Number **TP207**

Sheet 1 of 1
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Mechanical Excavator**

Ground Level **47.50mOD**

Start Date **26/02/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Dark brown sandy silty clayey topsoil with occasional rootlets. (MADE GROUND)		47.30	0.20			0.30	D	
Firm to stiff brown, orange brown, and grey mottled slightly sandy silty clay with occasional pockets of red-brown clay and fine to medium flint gravel. (MADE GROUND)		46.70	0.80			0.60 0.80	B D	
Soft dark and light brown very sandy silty clay with some subangular fine to medium flint gravel and some gravel size brick fragments. (MADE GROUND)		45.60	1.90			1.50	D,B	
Soft friable grey/ black very sandy clayey silt with frequent rootlets and very occasional fine gravel size brick fragments. Possible sewage sludge. (c) (MADE GROUND)		45.20	2.30			2.00 2.10	D B	
Firm to stiff mottled grey-brown slightly sandy silty clay with occasional rootlets, brick fragments and selenite crystals. (MADE GROUND)		44.00	3.50			2.80	D,B	
Firm orange-brown mottled sandy silty CLAY. Sand is fine. (LONDON CLAY)		43.50	4.00			3.80	D,B	
Trial Pit Completed at 4.00 mbgl								

Remarks:

Stability: Stable throughout.
Groundwater: No groundwater encountered.

Installation Details: Backfilled with arisings.

Other Observations:

Pit Dimensions:
Length: 2.40m
Width: 0.60m
Bearing:
of Long Side: degrees

JOB NUMBER E3015/23
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FIG. NO.

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Trial Pit Number **TP208**

Sheet 1 of 1
1:50

Project **Reading Gateway**	Client **Kennet Properties Ltd**
Method **Mechanical Excavator**	Ground Level **46.86mOD**
	Start Date **26/02/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft brown silty clay topsoil with some rootlets and flint gravel.		46.66	0.20			0.25	D	
Soft brown sandy gravelly clay. Gravel is brick, concrete, flint and occasional asphalt fragments. (MADE GROUND)		46.36	0.50			0.40	B	
Dark grey/ black sandy ashy charcoal with some soft grey/brown clay and some flint gravel. (MADE GROUND)		46.26	0.60			0.50	D	
Firm orange-brown and grey mottled silty CLAY. (LONDON CLAY)						0.90	B	
. . . at 1.1mbgl: ceramic land drain (approx 75mm diameter) encountered at northern end of pit.						1.50	D	
. . . below 1.8mbgl: becomes sandy silty clay.								
		44.16	2.70			2.60	D	
Trial Pit Completed at 2.70 mbgl								

Remarks:
Stability: Stable throughout.
Groundwater: No groundwater encountered.
Installation Details: Backfilled with arisings.
Other Observations:

Pit Dimensions:
Length: 2.80m
Width: 0.60m
Bearing:
of Long Side: degrees

JOB NUMBER E3015/23
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Checked By
FIG. NO.

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Trial Pit Number **TP209**

Sheet 1 of 1
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Mechanical Excavator**

Ground Level **48.61mOD**

Start Date **27/02/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft to firm brown silty sandy clay with some flint gravel and occasional brick and chalk fragments. (MADE GROUND)						0.20	D	
						0.60	B	
						0.70	D	
. . . below 0.6mbgl: occasional black gravel size clinker/ coal fragments (c).								
. . . below 1.0mbgl: becomes firm orange-brown silty sandy clay with occasional grey pockets and very occasional brick fragments and flint gravel.						1.30	D,B	
		46.96	1.65					
Firm greenish grey silty sandy clay with occasional brick, concrete and chalk fragments. Slight hydrocarbon odour noted (c). (MADE GROUND)		46.71	1.90			1.90	D	
Brick and concrete (possible former foundation). (MADE GROUND)		46.51	2.10					
Firm greenish-grey locally mottled orange very silty sandy clay. (Possible sewage sludge) (c). (MADE GROUND)		46.21	2.40			2.30	D	
						2.50	D	
Firm to stiff orange-brown and grey mottled silty clay. (LONDON CLAY)								
. . . below 2.8mbgl: becomes sandy.								
		45.21	3.40			3.40	D	
Trial Pit Completed at 3.40 mbgl								

Remarks:

Stability: Stable throughout.
Groundwater: No groundwater encountered.

Installation Details: Backfilled with arisings.

Other Observations:

Pit Dimensions:
Length: 3.50m
Width: 0.60m
Bearing:
of Long Side: degrees

JOB NUMBER E3015/23
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FIG. NO.

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Trial Pit Number **TP210**

Sheet 1 of 1
1:50

Project **Reading Gateway**	Client **Kennet Properties Ltd**
Method **Mechanical Excavator**	Ground Level **49.81mOD**
	Start Date **01/03/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft to firm brown silty sandy clay with occasional flint gravel and occasional fragments of brick and chalk. Very occasional gravel size fragments of black clinker/ coal (c). (MADE GROUND)						0.40	D	
. . . at 0.7mbgl: some fragments of iron/steel pipe.						0.80	D,B	
. . . below 1.0mbgl: becomes firm very friable orange-brown with some grey mottling silty clay with occasional chalk and brick fragments.						1.80	D,B	
. . . below 1.9mbgl: becomes firm brown locally orange and grey very sandy silty clay.						2.00	D	
						2.50	D,B	
		47.21	2.60					
Orange, brown, grey and black brick, flint, chalk and asphalt FILL with some firm brown gravelly clay and dark greenish grey sandy silt. (MADE GROUND)		47.11	2.70			2.80	D	
Firm very friable dark greenish grey slightly sandy silt with occasional gravel of flint and brick fragments and abundant rootlets. (MADE GROUND)						3.50	D	
		46.21	3.60			3.70	D	
Stiff grey with orange mottling locally sandy silty CLAY with very occasional flint gravel and rare fine rootlets. (LONDON CLAY)								
		45.51	4.30			4.30	D	
Trial Pit Completed at 4.30 mbgl								

Remarks:

Stability: Stable throughout.
Groundwater: No groundwater encountered.

Installation Details: Backfilled with arisings.

Other Observations:

Pit Dimensions:
Length: 2.30m
Width: 0.60m
Bearing:
of Long Side: degrees

JOB NUMBER E3015/23
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FIG. NO.

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Trial Pit Number **TP211**

Sheet 1 of 1

1:50

Project **Reading Gateway**	Client **Kennet Properties Ltd**
Method **Mechanical Excavator**	Ground Level **42.93mOD**
	Start Date **01/03/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft dark brown slightly sandy silt/clay topsoil with abundant rootlets and occasional flint gravel. (MADE GROUND)		42.73	0.20			0.15	D	
						0.35	D,B	
Loose light brown sandy cobbley gravel of flint, granite and concrete fragments. Rare half bricks and brick fragments, plastic debris and metal wire. (MADE GROUND)		42.43	0.50			0.50	D,B	
Loose orange-brown clayey sandy gravel. Gravel is fine to coarse flint. (MADE GROUND)						1.00	D	
		41.73	1.20					
Soft brown very gravelly, very sandy silty slightly cobbley clay with occasional decaying wood fragments. Gravel and cobbles are flint and brick fragments. (MADE GROUND)						1.60	D	
		41.23	1.70			1.80	D	
Dark greenish grey silty clay with occasional gravel of brick and asphalt and occasional decaying wood fragments. (MADE GROUND)				2.50		1.90	B	
. . . at 3.0mbgl: concrete boulder encountered.								
. . . below 3.3mbgl: with pockets of dark grey very silty clay with occasional fragments, rootlets and clinker. Slight organic/ tarry odour (c).						3.70	D	
						3.90	D	
Trial Pit Completed at 4.00 mbgl		38.93	4.00					

=39.6mAOD

Remarks:

Stability: Unstable GL-1.3m.
Groundwater: Slow groundwater ingress from eastern wall of pit at 2.5mbgl.
Installation Details: Backfilled with arisings.
Other Observations: Trial pit terminated at 4.0mbgl on concrete obstruction.

Pit Dimensions:
Length: 2.60m
Width: 1.00m
Bearing of Long Side: Uns degrees

JOB NUMBER E3015/23
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FIG. NO.

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Trial Pit Number **TP212**

Sheet 1 of 1
1:50

Project **Reading Gateway**	Client **Kennet Properties Ltd**
Method **Mechanical Excavator**	Ground Level **40.50mOD**
	Start Date **01/03/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft dark brown slightly sandy silt/clay with occasional gravel of flint. (TOPSOIL)		40.35	0.15			0.10	D	
Loose reddy brown sandy very clayey very silty gravel. Gravel is fine coarse flint with occasional fragments of brick, asphalt, metal and tile. (MADE GROUND)						0.60	D,B	
		39.70	0.80			0.80	D	
Concrete slab (possible foundation, running the length of the pit. (CONCRETE)		39.60	0.90					
Trial Pit Completed at 0.90 mbgl								

Remarks:
Stability: Stable.
Groundwater: No groundwater encountered.
Installation Details: Backfilled with arisings.
Other Observations: Pit abandoned at 0.9mbgl, unable to break through concrete obstruction.

Pit Dimensions:
Length: 5.00m
Width: 0.60m
Bearing:
of Long Side: degrees

JOB NUMBER E3015/23
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FIG. NO.

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Trial Pit Number **TP213**

Sheet 1 of 1
1:50

Project **Reading Gateway**	Client **Kennet Properties Ltd**
Method **Mechanical Excavator**	Ground Level **38.68mOD**
	Start Date **01/03/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft brown/dark brown sandy clayey silt with abundant rootlets and occasional brick fragments and flint gravel. (TOPSOIL)		38.58	0.10			0.30	D	
Loose brown very clayey sandy cobbly gravel of brick, flint and occasional concrete and plastic fragments and occasional whole and half bricks. (MADE GROUND)		37.93	0.75			0.60	D	
Loose dark grey silt/clay with occasional flint gravel. Rare ceramic, glass and tile fragments. Hydrocarbon/organic decay odour. (MADE GROUND)						1.80	D,B	
						2.20	D	
		36.28	2.40	2.60		2.50	D	
Soft to very soft light grey silty clay. (MADE GROUND) . . . between 2.6 and 2.8mbgl, becomes sandy and gravelly. Gravel is fine to coarse flint.		35.88	2.80					
Loose to medium dense yellowy brown sandy silty GRAVEL of fine to coarse sub-angular to sub-rounded flint. (MADE GROUND)						3.20	D,B	
		35.28	3.40					
Trial Pit Completed at 3.40 mbgl								

Remarks:

Stability:
Groundwater: Groundwater ingress at 2.6mbgl. Final depth 3.0mbgl, but still trickling in from pit walls.
Installation Details: Backfilled with arisings.
Other Observations:

Pit Dimensions:
Length: 0.00m
Width: 0.00m
Bearing:
of Long Side: degrees

JOB NUMBER E3015/23
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FIG. NO.

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WHITE YOUNG GREEN ENVIRONMENTAL

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Trial Pit Number **TP214**

Sheet 1 of 1
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Mechanical Excavator**

Ground Level **45.20mOD**

Start Date **02/03/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Grass and scrub over soft brown silty sandy peaty TOPSOIL. With occasional fine to medium gravel of flint and occasional cobble sized fragments of brick and concrete. (TOPSOIL)						0.15	D	
						0.40	D	
. . . below 0.3mbgl, intermixed with much sandy gravelly clay.		44.60	0.60					
Very soft brown, very sandy silty gravelly clay. Gravel is fine to coarse flint, brick and concrete with occasional concrete and brick cobbles. (MADE GROUND)						0.80	D,B	
. . . between 1.0 to 1.5mbgl concrete boulders.						1.50	D,B	
		43.40	1.80					
Concrete. (MADE GROUND).		43.30	1.90					
				2.10				
Firm dark green/brown grey very gravelly, very sandy silty clay. Gravel is medium to coarse flint, brick, concrete and clinker. With occasional cobbles of concrete, brick fragments and decayed wood. Rare pieces of plastic pipe. Slight organic/hydrocarbon odour (c). (MADE GROUND).						2.20	D	
						2.40	B	
						3.60	D,B	
		40.70	4.50					
Soft friable dark brown silt/clay with occasional rootlets and fine to medium gravel of flint. Rare glass fragments. (MADE GROUND).		40.60	4.60			4.60	D	
Trial Pit Completed at 4.60 mbgl								

Remarks:

Stability: Pit walls unstable from ground level to 1.9mbgl.
Groundwater: Groundwater seepage at 2.1mbgl.

Installation Details: Backfilled with arisings.

Other Observations: Pit extended at 1.9mbgl due to concrete obstruction.

Pit Dimensions:
Length: 5.00m
Width: 1.00m
Bearing:
of Long Side: degrees

JOB NUMBER E3015/23
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FIG. NO.

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Trial Pit Number **TP215**

Sheet 1 of 1
1:50

Project **Reading Gateway**	Client **Kennet Properties Ltd**
Method **Mechanical Excavator**	Ground Level **44.72mOD**
	Start Date **02/03/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft orange brown very silty clay with some flint gravel, occasional half bricks and brick fragments and decaying wood fragments. Occasional concrete cobbles. (MADE GROUND)						0.40	D	
						0.60	D	
		43.82	0.90					
Soft dark greenish grey and brown sandy very silty clay. Sand is fine. Some gravel and cobbles of flint, concrete, brick and occasional metal debris. Some orange brown silt/clay intermixed with very occasional black angular gravel size coal/clinker fragments (c). (MADE GROUND)						1.00	D	
						1.50	D,B	
						2.00	D	
. . . below 2.5mbgl becomes less gravelly, predominantly soft, very silty sandy clay.				3.10		2.80	D	
		41.12	3.60	3.60		3.60	D,B	
Trial Pit Completed at 3.60 mbgl								

Remarks:

Stability: Pit walls unstable to 2.5mbgl.

Groundwater: Major water ingress from below a concrete structure at 3.6mbgl, rising to a final depth of 3.1mbgl.

Installation Details: Backfilled with arisings.

Other Observations: Hole abandoned at 3.6mbgl due to major water strike.

Pit Dimensions:
Length: 0.00m
Width: 0.00m
Bearing:
of Long Side: degrees

JOB NUMBER E3015/23
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FIG. NO.

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Trial Pit Number **TP216**

Sheet 1 of 1
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Mechanical Excavator**

Ground Level **43.84mOD**

Start Date **03/03/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft very gravelly sandy silty clay. Gravel is fine to coarse flint, some concrete and occasional brick fragments. With pockets/lenses of loose clayey sandy gravel throughout. Occasional, 0.5m long, decaying timber fragments. (MADE GROUND)						0.20	D	
						0.70	D	
. . . below 1.0mbgl, becomes very sandy clayey silty gravel.						1.00	D,B	
						1.70	D	
		41.44	2.40					
Soft dark brown/black, silt/clay with some flint gravel and some soft grey silt pockets. Soft decaying wood fragments and occasional plastic debris. Malodour (possibly ammonia) noted. (MADE GROUND)				2.60 ▼		2.50	D	
						3.60	D,B	
		40.14	3.70					
Firm, greenish grey/brown clayey sandy silt. Sand is fine. Some plastic fragments, occasional gravel and cobble sized brick fragments and concrete. Mixed with some light grey and brown silty sandy clay. (possible sludge moved from elsewhere and reworked with site rubbish.) (MADE GROUND)						4.40	D	
. . . below 4.5mbgl, becomes mixed with much brown soft silty clay.								
		38.84	5.00			5.00	D,B	
Trial Pit Completed at 5.00 mbgl								

Remarks:

Stability:
Groundwater: Very slow groundwater ingress from southern face at 2.6mbgl.

Installation Details: Backfilled with arisings.

Other Observations: Concrete obstruction in southern end of pit at 1.5mbgl, therefore, trial pit extended to the north.

Pit Dimensions:
Length: 4.10m
Width: 1.00m
Bearing:
of Long Side: degrees

JOB NUMBER E3015/23
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FIG. NO.

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Trial Pit Number **TP217**

Sheet 1 of 1
1:50

Project **Reading Gateway**	Client **Kennet Properties Ltd**
Method **Mechanical Excavator**	Ground Level **38.61mOD**
	Start Date **03/03/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft sandy clayey silt topsoil with some roots/rootlets and occasional chalk and flint gravel. (TOPSOIL)		38.11	0.50			0.30	D	
Firm orange brown silty sandy clay with some half brick and brick fragments, some pockets of grey/brown silty clay, occasional chalk and flint gravel. (MADE GROUND)		38.11	0.50			0.60	D	
Soft dark brown organic silt/clay. (MADE GROUND)		37.66	0.95			0.90	D	
Medium dense black sandy gravel of asphalt and flint. (MADE GROUND)		37.61	1.00					
Medium dense dark brown/grey/black sandy gravel of fine to medium sub-rounded to sub-angular flint. (MADE GROUND)		37.41	1.20	1.35		1.40	D,B	
Medium dense orange brown and dark brown silty sandy gravel of fine to coarse flint with some clinker fragments (c). Occasional cobbles and clayey pockets. (MADE GROUND)		37.11	1.50			1.60	D	
Soft greenish-grey and orange brown very silty CLAY. (ALLUVIUM)		36.61	2.00			1.80	D	
Soft to very soft bluish grey silty CLAY with occasional lenses of sandy gravel of fine to coarse flint. (ALLUVIUM)						3.00	D,B	
Trial Pit Completed at 3.20 mbgl		35.41	3.20					

Chromium

Remarks:

Stability: Stable throughout.
Groundwater: Groundwater ingress at 1.35mbgl from base of pit.

Installation Details: Backfilled with arisings.

Other Observations:

Pit Dimensions:
Length: 2.60m
Width: 0.60m
Bearing:
of Long Side: degrees

JOB NUMBER E3015/23
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FIG. NO.

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WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

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Trial Pit Number **TP218**

Sheet 1 of 1
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Mechanical Excavator**

Ground Level **40.51mOD**

Start Date **04/03/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft very gravelly sandy clayey silty topsoil. Gravel is fine to coarse flint, occasional flint cobbles and occasional cobble size concrete and brick fragments. (MADE GROUND)		39.61	0.90					
Loose orange-brown and brown sandy silty clayey gravel of fine to coarse flint. Some pockets of silty gravelly clay, some brick and concrete gravel and cobbles. Occasional asphalt fragments. (MADE GROUND)		39.11	1.40	1.20		1.50	D	
Soft friable dark brown/black silt/clay with occasional flint gravel. Occasional fibrous material. Organic odour - possible sewage sludge (c). (MADE GROUND) . . . below 1.8mbgl, becomes dark greenish-grey slightly sandy silt/clay. At 1.8mbgl, plastic coated cable of approximately 3cm diameter, running E to W.		38.51	2.00			2.20	D	
Very soft very friable dark brown peaty silty clay. Slightly fibrous. (MADE GROUND)		37.71	2.80			2.90	D	
Very soft bluish-grey with a little orange mottling, very silty CLAY. Occasional pockets of fibrous decaying wood fragments. (ALLUVIUM) . . . below 3.5mbgl, becomes soft and dark. . . . below 4.0mbgl, becomes light grey and locally orange sandy silty CLAY, with a little flint gravel and very occasional lenses of silty SAND.				4.30		4.10	D	
Trial Pit Completed at 4.50 mbgl		36.01	4.50					

Remarks:

Stability: Pit slightly unstable in top 1m.

Groundwater: Slow groundwater ingress from pit walls between 1.2 to 1.4 mbgl. Groundwater strike at 4.3mbgl

Installation Details: Backfilled with arisings.

Other Observations: Pit extended to the north to avoid cable encountered at 1.8mbgl

Pit Dimensions:
Length: 2.50m
Width: 0.60m
Bearing:
of Long Side: degrees

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FIG. NO.

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Trial Pit Number **TP219**

Sheet 1 of 1
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method

Ground Level **45.08mOD**

Start Date **04/03/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft brown sandy clayey gravelly silt topsoil with occasional cobbles of concrete. Half and whole bricks, some refuse including plastic and rags (>5%). Occasionial rootlets. (MADE GROUND)		43.78	1.30					
Dark greenish grey sandy silty clay with some brick and concrete fragments. (MADE GROUND) . . . at 1.35mbgl, concrete obstruction encountered. . . . below 1.5mbgl, pockets and lenses of brown and orange brown sandy clay and clayey sand.		41.88	3.20	3.20 ▼				
Greyish brown loose, very silty clayey cobbly gravel of flint, concrete and occasional brick. Many concrete boulders. (MADE GROUND)		41.38	3.70					
Trial Pit Completed at 3.70 mbgl								

Remarks:

Stability:
Groundwater: Major groundwater ingress at 3.2mbgl. Water level remains at 3.2m.

Installation Details: Backfilled with arisings.

Other Observations: Pit extended to the SE to avoid concrete obstruction encountered at 1.35mbgl. Refusal due to large concrete boulders at 3.7mbgl.

Pit Dimensions:
Length: 0.00m
Width: 0.00m
Bearing:
of Long Side: degrees

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FIG. NO.

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Borehole Number **BH201**

Sheet 1 of 3
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Cable Percussive Rig**

Ground Level **38.27mOD**

Start Date 09/03/04
Finish Date 09/03/04

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft dark brown sandy gravelly silty clay. Gravel of flint, brick and concrete. (MADE GROUND)							0.00	B	
. . . below 1.0mbgl firm.							1.00	S	N=12 (3,4,4,2,3,3)
		36.87	1.40				1.40	B	
Firm brown and bluish-grey silty slightly peaty CLAY. (ALLUVIUM)							2.00	B	N=14 (1,2,3,3,4,4)
					2.64 / 2.90				
		35.37	2.90				3.00	B	N=22 (4,5,5,6,6,5)
Medium dense light and dark grey and cream sandy GRAVEL of fine to coarse sub-rounded to sub-angular flint. (VALLEY GRAVEL)									N=21 (2,3,4,4,7,6)
		33.82	4.45				4.45	B	
Stiff brown and grey mottled silty CLAY. (READING BEDS)				5.00 250mm			5.00	D	N=22 (2,3,4,5,6,7)
							6.00	D	
		31.97	6.30						
Medium dense light brown silty SAND with frequent bands of sandy clay. (READING BEDS)							8.50	D	N=27 (4,4,6,6,7,8)
							8.00	D	N=29 (2,3,5,5,8,11)
		29.17	9.10						
Dense grey locally clayey silty SAND. Sand is fine to medium. (READING BEDS)							9.50	D	N=44 (4,6,8,10,12,14)

Remarks:
Chiselling:
Installation / Backfill:

Groundwater:
Other Observations:

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FIG. NO.

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Borehole Number **BH201**

Sheet 2 of 3
1:50

Project **Reading Gateway**	Client **Kennet Properties Ltd**
Method **Cable Percussive Rig**	Ground Level **38.27mOD**

Start Date 09/03/04
Finish Date 09/03/04

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Dense clayey silty SAND as previous page.							11.00	D	
							12.50	D	
CHALK recovered as soft off-white silt with some weak low density gravel size chalk fragments. (WHITE CHALK)		24.17	14.10	14.10 200mm			14.10	D	
. . . below 15.0m: with occasional black angular flint gravel.							15.00	D	N=23 (1,3,4,6,7,6)
							16.50	D	N=26 (3,4,5,6,6,6)
							18.00	D	N=16 (3,4,3,4,4,5)
							19.50	D	N=21 (4,4,5,5,6,5)

Remarks:
Chiselling:
Installation / Backfill:

Groundwater:
Other Observations:

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FIG. NO.

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Borehole Number **BH201**

Sheet 3 of 3
1:50

Project **Reading Gateway**	Client **Kennet Properties Ltd**
Method **Cable Percussive Rig**	Ground Level **38.27mOD**

Start Date 09/03/04
Finish Date 09/03/04

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
CHALK, as previous page.							21.00	D	N=28 (4,11,6,7,7,8)
							22.50	D	N=25 (3,5,5,7,7,6)
		14.27	24.00	24.00 150mm			24.00	D	N=59 (9,11,14,12,17,16)
Borehole completed at 24.45mbgl									

Remarks:
Chiselling:
Installation / Backfill:

Groundwater:
Other Observations:

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FIG. NO.

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Borehole Number **BH202C**

Sheet 1 of 3
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Cable Percussion**

Ground Level **44.33mOD**

Start Date 09/03/04
Finish Date 09/03/04

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft brown silty sandy slightly gravelly clay. Occasional brick and concrete fragments. (MADE GROUND)		44.13	0.20						
Asphalt. (MADE GROUND)		44.01	0.32						
Loose sandy clayey gravel of brick and concrete fragments. (MADE GROUND)		43.63	0.70						
Soft greenish-grey sandy clayey silt. (Possible sewage sludge) (c). (MADE GROUND)		43.53	0.80						
Firm orange brown silty locally very sandy CLAY. (LONDON CLAY)					2.80				
							3.00	B	
					4.00				
. . . at 4.0mbgl, soft and slightly gravelly.							4.00	S,D	N=8 (3,2,1,2,2,3)
				4.50 250mm					
. . . at 5.0mbgl, stiff.							5.00	S,	N=23 (2,2,3,6,7,7)
		38.93	5.40						
Stiff red-brown and grey silty CLAY. (READING BEDS)									
		38.03	6.30						
Stiff purple-red, orange-brown and grey silty CLAY. (READING BEDS)							6.50	S,D	N=21 (2,3,4,5,6,6)
. . . from 8.0-9.5m: locally light grey clayey SILT.							8.00	S,D	N=23 (2,3,4,5,6,8)
. . . at 9.5mbgl, becomes very stiff.							9.50	S,D	N=43 (4,5,8,9,11,15)

Remarks:

Chiselling: None undertaken.

Installation / Backfill: 50mm diameter HDPE standpipe installed to 29.0mbgl, slotted from 23.0-29.0m. Gravel filter 29.0-22.5m. Bentonite seal 22.5-21.0m. Grout 21.0-0.25m. Finished with end cap, gas valve and flush-fitting steel cover.

Groundwater: Slow groundwater ingress at 4.0mbgl. Rose to 2.8mbgl over-night.

Other Observations: Hand-dug starter pit excavated to 3.0mbgl (HP2)

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FIG. NO.

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Borehole Number **BH202C**

Sheet 2 of 3
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Cable Percussion**

Ground Level **44.33mOD**

Start Date 09/03/04
Finish Date 09/03/04

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
		33.63	10.70						
Very stiff greyish brown very sandy very silty CLAY. (READING BEDS)							11.00	S,D	N=64 (4,6,10,17,17,20)
							12.50	S,D	N=60 (4,5,7,12,16,23)
		31.13	13.20						
Very stiff grey/ brown very sandy silty CLAY. (READING BEDS)							14.00	S,D	N=62 (2,5,11,14,16,21)
		28.83	15.50				15.50	S,D	53/225mm (5,7,15,17,21)
Very dense grey and brown silty SAND with frequent bands of sandy clay. (READING BEDS)							16.00	B	
							17.00	S,D	N=54 (5,7,11,12,15,16)
							18.50	S,D	65/225mm (8,10,23,20,22)
							19.50	D	
							20.00	S,D	57/150mm (9,14,19,24)

Remarks:

Chiselling: None undertaken.

Installation / Backfill: 50mm diameter HDPE standpipe installed to 29.0mbgl, slotted from 23.0-29.0m. Gravel filter 29.0-22.5m. Bentonite seal 22.5-21.0m. Grout 21.0-0.25m. Finished with end cap, gas valve and flush-fitting steel cover.

Groundwater: Slow groundwater ingress at 4.0mbgl. Rose to 2.8mbgl over-night.

Other Observations: Hand-dug starter pit excavated to 3.0mbgl (HP2).

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FIG. NO.

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Borehole Number **BH202C**

Sheet 3 of 3
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Cable Percussion**

Ground Level **44.33mOD**

Start Date 09/03/04
Finish Date 09/03/04

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
							20.00	S,D	53/150mm (9,14,19,34)
							20.50	D	
		23.23	21.10				21.10	D	
Stiff dark grey silty CLAY. (READING BEDS)							21.50	S,D	62/225mm (5,10,17,22,23)
		22.43	21.90				22.00	D	
				22.00					
Stiff greyish brown silty CLAY with occasional fine black gravel of flint and occasional white shell fragments. (READING BEDS)				200mm			22.30	D	
		22.03	22.30						
CHALK recovered as soft creamy white silt matrix with some weak gravel size chalk fragments. (WHITE CHALK)							22.50	S	N=35 (4,5,6,7,10,12)
							23.00	D	
. . . below 23.0m with some black angular flint gravel.									
							24.00	S,D	N=39 (5,5,7,9,9,14)
		19.33	25.00				25.00	D	
CHALK recovered as cobble size fragments of weak low density chalk with some creamy white silt matrix. (WHITE CHALK)				25.50			25.50	U	86 blows
				150mm					
							26.00	D	
							27.00	S,D	N=43 (5,7,8,9,11,15)
							28.00	D	
							28.50	S	N=44 (6,8,8,9,12,15)
							29.00	D	
							29.50	U	98 blows
Borehole completed at 30.00mbgl		14.33	30.00				30.00	D	

Remarks:

Chiselling: None undertaken.

Installation / Backfill: 50mm diameter HDPE standpipe installed to 29.0mbgl, slotted from 23.0-29.0m. Gravel filter 29.0-22.5m. Bentonite seal 22.5-21.0m. Grout 21.0-0.25m. Finished with end cap, gas valve and flush-fitting steel cover.

Groundwater: Slow groundwater ingress at 4.0mbgl. Rose to 2.8mbgl over-night.

Other Observations: Hand-dug starter pit excavated to 3.0mbgl (HP2)

JOB NUMBER E3015/23

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FIG. NO.

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Borehole Number **BH202R**

Sheet 1 of 2
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Cable Percussion**

Ground Level **47.15mOD**

Start Date 08/03/04
Finish Date 08/03/04

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft brown silty sandy gravelly clay with some cobbles size brick and concrete fragments. Gravel is flint, concrete, brick and asphalt. (MADE GROUND)							0.00	B	
. . . at 0.6mbgl a concrete boulder was encountered.		46.25	0.90				1.00	DBS	N=6 (1,3,2,1,3,0)
Soft dark greenish grey sandy silt. Sand is fine. Occasional flint gravel. (MADE GROUND)		45.95	1.20						
Stiff reddish-brown and grey mottled clay. (MADE GROUND)		45.65	1.50						
Soft greyish greenish brown sandy slightly clayey silt with gravel of concrete and flint. (MADE GROUND)		45.20	1.95				1.60	B	
Medium dense orange brown silty SAND. (LONDON CLAY)							2.00	D,S	N=11 (2,3,3,3,2,3)
. . . below 2.5mbgl, becomes clayey sand.							2.50	B	
. . . below 3.0mbgl, with occasional flint gravel.							3.00	D,S	N=19 (3,3,4,4,5,6)
		43.65	3.50				3.50	B	
Stiff orange-brown very sandy silty CLAY with very occasional fine flint gravel. (LONDON CLAY)							4.00	D,S	N=28 (2,4,7,7,6,8)
		42.65	4.50						
Stiff light grey sandy silty CLAY. Sand is fine. (READING BEDS)					4.80		5.00	D,S	N=30 (3,5,7,8,8,7)
. . . below 6.5mbgl, becoming hard.							6.50	D,S	N=75 (4,5,8,11,24,32)
							7.00	B	
. . . below 8.0mbgl, with some orange mottling. . . . below 8.0mbgl, becoming very stiff.				8.00 200mm			8.00	D,S	N=56 (4,7,12,14,14,16)
		37.65	9.50				9.50	DBS	N=66 (8,13,17,14,16,19)
Hard red-brown and grey mottled CLAY. (READING BEDS)							9.80	B	

Remarks:

Chiselling: None undertaken.

Installation / Backfill: 50mm diameter HDPE standpipe installed to 15.5mbgl, slotted 15.5-9.0m. Borehole collapse 16.0-15.5mbgl. Gravel filter 15.5-9.0m, bentonite seal 9.7-7.0m, grout 7.0m-0.25. Finished with end cap and gas valve and flush fitting steel cover.

Groundwater: Groundwater strike at 4.8mbgl. Did not rise after 20 minutes.

Other Observations:

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FIG. NO.

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Borehole Number **BH202R**

Sheet 2 of 2
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Cable Percussion**

Ground Level **47.15mOD**

Start Date **08/03/04**
Finish Date **08/03/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
				10.50 150mm			11.00	DUS	N=81 (11,14,16,17,22,26)
Hard purple and grey silty CLAY. (READING BEDS) . . . From 11.0-11.5mbgl: slightly sandy silty CLAY		36.15	11.00				11.50	B	
. . . at 12.5mbgl, very stiff.							12.50	D,S	N=61 (8,8,13,17,15,16)
Very stiff light grey locally mottled orangey brown clayey SILT. (READING BEDS)		33.15	14.00				14.00	D,S	N=39 (5,7,8,8,9,14)
							15.50	S	N=54 (5,11,13,12,14,15)
Borehole completed at 16.00mbgl		31.15	16.00						

Remarks:

Chiselling: None undertaken.

Installation / Backfill: 50mm diameter HDPE standpipe installed to 15.5mbgl, slotted 15.5-9.0m. Borehole collapse 16.0-15.5mbgl. Gravel filter 15.5-9.0m, bentonite seal 9.7-7.0m, grout 7.0m-0.25. Finished with end cap and gas valve and flush fitting steel cover.

Groundwater: Groundwater strike at 4.8mbgl. Did not rise after 20 minutes.

Other Observations:

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FIG. NO.

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Borehole Number **BH203C**

Sheet 1 of 3
1:50

Project **Reading Gateway**
Client **Kennet Properties Ltd**
Method **Cable Percussion**
Ground Level **41.28mOD**
Start Date 17/03/04
Finish Date 19/03/04

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft dark brown gravelly sandy silty clay. Gravel is concrete, asphalt, brick and flint. (MADE GROUND)							1.00	S,D	N=18 (1,2,3,4,5,6)
		39.38	1.90				2.00	S,D	N=6 (1,0,1,2,1,2)
Firm reddish-brown silty sandy CLAY with occasional fine gravel of flint. (READING BEDS)							3.00	U	18 blows
		38.28	3.00				3.50	D	
Firm red-brown, yellow and grey mottled silty CLAY. (READING BEDS)							4.00	S,D	N=9 (1,1,1,2,2,4)
		37.18	4.10				4.50	D	
Firm light brown very sandy SILT/ CLAY (READING BEDS)							5.00	S,D	N=18 (1,2,3,4,5,8)
		36.38	4.90				6.00	U,D	30 blows
Stiff grey and red-brown silty CLAY. (READING BEDS)							6.50	D	
							7.00	D	
. . . at 7.5mbgl, very stiff.							7.50	S	N=40 (4,6,9,8,11,12)
							8.00	D	
							9.00	S,D	N=32 (3,4,7,7,8,10)
							10.00	D	

Remarks:
Chiselling: None undertaken.
Installation / Backfill: 50mm diameter HDPE standpipe installed to 29.0mbgl, stolled from 29.0-23.0m. Borehole collapse 30.0-29.0mbgl. Gravel filter 29.0-22.0m. Bentonite seal 22.0-20.0m. Grout 20.0-0.25m. Finished with end cap and gas valve and flush-fitting steel cover.
Groundwater: Groundwater strike at 12.9mbgl, rising to 11.05m after 20 minutes.
Other Observations: *Denotes driller's description.

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FIG. NO.

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Borehole Number **BH203C**

Sheet 2 of 3
1:50

Project **Reading Gateway**	Client **Kennet Properties Ltd**
Method **Cable Percussion**	Ground Level **41.28mOD**

Start Date **17/03/04**
Finish Date **19/03/04**

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Stiff silty CLAY as previous page.					11.05		10.00	D	
							10.50	U	50 blows
							11.00	D	
					12.90		12.00	S,D	N=54 (5,7,8,10,16,20)
		28.38	12.90						
Very dense grey silty clayey SAND. (READING BEDS)							13.00	D	
							13.50	S	N=56 (4,8,12,17,13,14)
		27.28	14.00	14.00			14.00	D	
Firm to stiff grey very sandy silty CLAY. (READING BEDS)				250mm					
		26.28	15.00				15.00	U,D	64 blows
Very dense grey silty clayey SAND. (READING BEDS)							15.50	D	
							16.00	B,D	
							16.50	S	52/225mm (6,8,10,14,28)
							17.00	D	
							18.00	S,D	50/225mm (5,9,11,17,22)
							19.00	B,D	
. . . at 19.5mbgl, dense.							19.50	S	N=44 (2,5,17,7,7,13)
		21.28	20.00				20.00	D	

Remarks:

Chiselling: None undertaken.

Installation / Backfill: 50mm diameter HDPE standpipe installed to 29.0mbgl, stolled from 29.0-23.0m. Borehole collapse 30.0-29.0mbgl. Gravel filter 29.0-22.0m. Bentonite seal 22.0-20.0m. Grout 20.0-0.25m. Finished with end cap and gas valve and flush-fitting steel cover.

Groundwater: Groundwater strike at 12.9mbgl, rising to 11.05m after 20 minutes.

Other Observations: *Denotes driller's description.

JOB NUMBER E3015/23

Logged By PE

Checked By

FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London. SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Borehole Number **BH203C**

Sheet 3 of 3
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Cable Percussion**

Ground Level **41.28mOD**

Start Date 17/03/04
Finish Date 19/03/04

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Stiff dark grey silty CLAY. (READING BEDS)		21.28	20.00				20.00	D	
		20.68	20.60						
Stiff green-grey sandy CLAY with occasional flint gravel. * (READING BEDS)		20.28	21.00	21.00			21.00	U,D	90 blows
CHALK recovered as white comminuted sand and silt matrix with occasional very weak low density gravel size chalk fragments. (WHITE CHALK)				200mm			21.45	D	
							22.00	D	
							22.50	S	N=26 (4,5,6,7,6,7)
							23.00	D	
							24.00	D	
							24.50	S	N=33 (4,6,6,7,6,12)
							25.00	D	
				25.50			25.50	U	75 blows
				150mm			26.00	D	
							27.00	S,D	N=40 (5,6,8,9,11,12)
							28.00	D	
							28.50	S	N=41 (6,8,8,9,10,14)
							29.00	D	
							29.50	U	84 blows
Borehole completed at 30.00mbgl		11.28	30.00				30.00	D	

Remarks:

Chiselling: None undertaken.

Installation / Backfill: 50mm diameter HDPE standpipe installed to 29.0mbgl, slotted from 29.0-23.0m. Borehole collapse 30.0-29.0mbgl. Gravel filter 29.0-22.0m. Bentonite seal 22.0-20.0m. Grout 20.0-0.25m. Finished with end cap and gas valve and flush-fitting steel cover.

Groundwater: Groundwater strike at 12.9mbgl, rising to 11.05m after 20 minutes.

Other Observations: *Denotes driller's description.

JOB NUMBER E3015/23

Logged By PE

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FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London. SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Borehole Number **BH203R**

Sheet 1 of 2
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Cable Percussion**

Ground Level **41.21mOD**

Start Date 09/03/04
Finish Date 09/03/04

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft dark brown very gravelly cobbly silty sandy clay. Gravel and cobbles are flint, brick and concrete, with some metal and plastic fragments and occasional rags. (MADE GROUND)							0.50	B	50/0mm (3,8,50)
		40.01	1.20						
Concrete. * (MADE GROUND)		39.71	1.50				1.50	B	
Soft red-brown, orange-brown and grey silty locally very sandy clay. (Re-worked Reading Beds). (MADE GROUND)		39.21	2.00				2.00	D	N=15 (3,5,4,3,3,5)
Firm light grey with a little orange mottling very silty slightly sandy CLAY. (READING BEDS)							2.50	B	
. . . at 3.0mbgl, stiff.							3.00	D	N=18 (3,3,4,5,5,4)
							3.50	B	
		37.21	4.00				4.00	D	N=17 (4,4,5,4,4,4)
Stiff reddish-brown, grey and orange silty CLAY. (READING BEDS)							4.50	D	
. . . below 4.0mbgl, becoming purple and grey.		36.21	5.00	5.00 200mm			5.00	D	N=44 (4,6,8,8,12,16)
Very stiff purple, orange and grey silty CLAY (READING BEDS)							6.50	D	
					9.00		8.00	D	N=46 (4,6,9,9,11,17)
							9.50	D	N=64 (7,10,14,14,19,17)

Remarks:

Chiselling: Chiselling from 1.2 to 1.7mbgl for 45 minutes.

Installation / Backfill: 50mm diameter HDPE standpipe installed to 15.0mbgl, slotted 9.0-15.0m. Gravel filter 15.0-9.0m, bentonite seal 9.0-7.0m, grout 7.0-0.25m. Finished with end cap and gas valve and flush-fitting steel cover.

Groundwater: Groundwater strike at 14.0mbgl, rising to 9.0m after 20 minutes.

Other Observations: *Denotes driller's description.

JOB NUMBER E3015/23
Logged By PE
Checked By

FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

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Tel. 020 8659 9959 Fax. 020 8676 9968

Borehole Number **BH203R**

Sheet 2 of 2

1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Cable Percussion**

Ground Level **41.21mOD**

Start Date 09/03/04
Finish Date 09/03/04

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
. . . at 11.0mbgl, hard.				10.50 150mm			11.00	D	N=70 (6,9,13,17,21,19)
							12.50	D	
					14.00				
		27.21	14.00				14.00	D	N=66 (8,12,14,17,19,16)
Very dense silty fine to coarse SAND. (READING BEDS)									
		26.21	15.00				15.00	D	N=52 (5,8,11,14,11,16)
Borehole completed at 15.45mbgl									

Remarks:

Chiselling: Chiselling from 1.2 to 1.7mbgl for 45 minutes.

Installation / Backfill: 50mm diameter HDPE standpipe installed to 15.0mbgl, slotted 9.0-15.0m. Gravel filter 15.0-9.0m, bentonite seal 9.0-7.0m, grout 7.0-0.25m. Finished with end cap and gas valve and flush-fitting steel cover.

Groundwater: Groundwater strike at 14.0mbgl, rising to 9.0m after 20 minutes.

Other Observations: *Denotes driller's description.

JOB NUMBER E3015/23

Logged By PE

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FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London. SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Borehole Number **BH204R**

Sheet 1 of 2
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Cable Percussion**

Ground Level **28.72mOD**

Start Date 09/02/04
Finish Date 09/02/04

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft to firm brown very gravelly sandy silt/ clay. Gravel is concrete and flint. Occasional plastic and polythene fragments. (MADE GROUND)							0.50	D	
							1.00	D	
. . . at 1.5mbgl: intermixed with some grey and dark grey silty clay.							1.50	D	
. . . at 2.0mbgl: with occasional charcoal fragments.							2.00	D	
. . . at 2.5mbgl: with occasional chalk fragments.							2.50	D	
							3.00	D	
							3.50	D	
							4.00	D	
							4.50	D	
							5.00	D	
		23.22	5.50				5.50	D	
Soft dark brown friable slightly organic silt/ clay with occasional glass fragments. Organic odour. (Possible sewage sludge) (c). (MADE GROUND)							6.00	D	
							6.50	D	
							7.00	D	
		21.22	7.50		7.60		7.50	D	
Yellow sand. * (MADE GROUND)					6.00				
		20.72	8.00				8.00	D	
Loose greenish grey very silty clayey sand. (MADE GROUND)							8.50	D	
							9.00	D	
							9.50	D	
							10.00	D	

Remarks:

Chiselling:

Installation / Backfill: 50mm HDPE standpipe installed to 14.0mbgl, slitted from 11.0-14.0m. Gravel filter 14.0-11.0m, bentonite seal 11.0-9.0m, grout 9.0-0.25m. Finished with end cap and gas valve and flush fitting steel cover.

Groundwater: Groundwater strike at 8.0mbgl, rising to 7.6m after 20 minutes.

Other Observations: *Denotes driller's description

JOB NUMBER E3015/23

Logged By PE

Checked By

FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London. SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Borehole Number **BH204R**

Sheet 2 of 2
1:50

Project **Reading Gateway**	Client **Kennet Properties Ltd**
Method **Cable Percussion**	Ground Level **28.72mOD**

Start Date 09/02/04
Finish Date 09/02/04

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
							10.00	D	
							10.50	D	
		17.72	11.00				11.00	D,B	
Loose grey silty SAND with frequent bands of stiff bluish grey silty clay. (READING BEDS)							11.50	D	
				12.50			12.50	D	
				150mm					
							13.50	D	
		14.72	14.00						
Borehole completed at 14.00mbgl									

Remarks:

Chiselling:

Installation / Backfill: 50mm HDPE standpipe installed to 14.0mbgl, slitted from 11.0-14.0m. Gravel filter 14.0-11.0m, bentonite seal 11.0-9.0m, grout 9.0-0.25m. Finished with end cap and gas valve and flush fitting steel cover.

Groundwater: Groundwater strike at 8.0mbgl, rising to 7.6m after 20 minutes.

Other Observations: *Denotes driller's description.

JOB NUMBER E3015/23

Logged By PE

Checked By

FIG. NO.

D2

CONTAMINATION RESULTS

WYGE 2004 - Schedule of Laboratory Contamination Testing

Determinant	Soil No.	Leachate No.	Groundwater No.	Surface Water Visit 1 No.	Surface Water Visit 2 No.
pH	76	20	14	3	-
TOC	-	-	-	6	-
Electrical Conductivity	-	-	-	6	-
Suspended Solids	-	-	-	-	4
Asbestos	15	-	-	-	-
Phenolics:					
Catechol	75	20	14	6	-
Cresols (sum)	75	20	14	6	-
Naphthols	75	20	14	6	-
Phenol	75	20	14	6	-
Resorcinol	75	20	14	6	-
Trimethylphenol	75	20	14	6	-
Xylenols & Ethylphenols	75	20	14	6	-
Total Phenols	75	20	14	6	-
US EPA PRIORITY PAHs:					
Acenaphthene6	72	20	14	6	4
Acenaphthylene	72	20	14	6	4
Anthracene	72	20	14	6	4
Benzo(a)Anthracene	72	20	14	6	4
Benzo(a)pyrene	72	20	14	6	4
Benzo(b)fluoranthene	72	20	14	6	4
Benzo(k)fluoranthene	72	20	14	6	4
Benzo(g,h,i)perylene	72	20	14	6	4
Chrysene	72	20	14	6	4
Di-benzo(a,h)anthracene	72	20	14	6	4
Indeno(1,2,3-cd)pyrene	72	20	14	6	4
Fluoranthene	72	20	14	6	4
Fluorene	72	20	14	6	4
Naphthalene	72	20	14	6	4
Phenanthrene	72	20	14	6	4
Pyrene	72	20	14	6	4
Total US EPA 16 PAH	72	20	14	6	4
Total Cyanide	76	20	1	6	-
Easily Liberated Cyanide	-	-	-	6	-
Thiocyanate	-	-	-	6	-
Sulphide	76	20	14	6	-
Sulphur (free)	76	-	-	6	-
Total Sulphate	76	20	14	6	-
Exchangeable Ammonium	76	20	14	6	-
Nitrate	-	-	-	6	-
Nitrite	-	-	-	6	-
Antimony	-	-	-	6	-
Arsenic	76	20	14	6	-
Barium	-	-	-	6	-
Boron (Water Soluble)	76	20	14	6	-
Cadmium	76	20	14	6	-
Chromium (Total)	76	20	14	6	-
Copper	76	20	14	6	-
Lead	76	20	14	6	-
Mercury	76	20	14	6	-
Molybdenum	-	-	-	6	-
Nickel	76	20	14	6	-
Selenium	76	20	14	6	-
Zinc	76	20	14	6	-
Benzene	75	20	14	-	-
Toluene	75	20	14	-	-
Ethylbenzene	75	20	14	-	-

Meta & Para Xylene	75	20	14	-	-
Ortho Xylene	75	20	14	-	-
Total Xylenes	76	20	14	-	-
MTBE	75	20	14	-	-
Diesel Range Organics (DRO)	-	-	-	6	-
Total Petroleum Hydrocarbons	-	-	-	6	-
TPH RBCA CARBON BANDING					
TPH Aliphatic >C_5-C_6	75	20	14	-	-
TPH Aliphatic >C_6-C_8	75	20	14	-	-
TPH Aliphatic >C_8-C_{10}	76	20	14	-	-
TPH Aliphatic >C_{10}-C_{12}	76	20	14	-	-
TPH Aliphatic >C_{12}-C_{16}	76	20	14	-	-
TPH Aliphatic >C_{16}-C_{21}	76	20	14	-	-
TPH Aliphatic >C_{21}-C_{34}	76	20	14	-	-
TPH Aliphatic (Total)	76	20	14	-	-
TPH Aromatic >C_5-C_7	75	20	14	-	-
TPH Aromatic >C_7-C_8	75	20	14	-	-
TPH Aromatic >C_8-C_{10}	70	20	14	-	-
TPH Aromatic >C_{10}-C_{12}	70	20	14	-	-
TPH Aromatic >C_{12}-C_{16}	70	20	14	-	-
TPH Aromatic >C_{16}-C_{21}	70	20	14	-	-
TPH Aromatic >C_{21}-C_{35}	70	20	14	-	-
TPH Aromatic (Total)	76	20	14	-	-
Total Phthalates	-	20	-	-	-
Organic Matter	73	-	-	-	-
Faecal Coliforms	27	-	-	-	-
Faecal Streptococci	27	-	-	-	-
Colstridia	10	-	-	-	-
Essential Elements					
Calcium	-	-	14	6	-
Magnesium	-	-	14	6	-
Manganese	-	-		6	-
Potassium	-	-	14	6	-
Sodium	-	-	14	6	-
Alkalinity	-	-	14	-	-
VOC's					
1,1,1-Trichloroethane	-	-	-	6	-
1,1,2,2-Tetrachloroethane	-	-	-	6	-
1,1,2-Trichloro-1,2,2-trifluoroethane	-	-	-	6	-
1,1,2-Trichloroethane	-	-	-	6	-
1,1-Dichloroethane	-	-	-	6	-
1,1-Dichloroethene	-	-	-	6	-
1,2,3-Trichloropropane	-	-	-	6	-
1,2,3-Trimethylbenzene	-	-	-	6	-
1,2,4-Trichlorobenzene	-	-	-	6	-
1,2,4-Trimethylbenzene	-	-	-	6	-
1,2-Dibromo-3-Chloropropane	-	-	-	6	-
1,2-Dichlorobenzene	-	-	-	6	-
1,2-Dichloroethane	-	-	-	6	-
1,2-Dichloropropane	-	-	-	6	-
1,2-Dichloropropene	-	-	-	6	-
1,3,5-Trimethylbenzene	-	-	-	6	-
1,3-Dichlorobenzene	-	-	-	6	-
1,3-Dichloropropane	-	-	-	6	-
1,4-Dichlorobenzene	-	-	-	6	-
1-Chlorotoluene	-	-	-	6	-
1-Methylpropylbenzene	-	-	-	6	-
2,2-Dichloropropane	-	-	-	6	-
2-Chlorotoluene	-	-	-	6	-
Benzene	-	-	-	6	-
Bromobenzene	-	-	-	6	-

Bromochloromethane	-	-	-	6	-
Bromodichloromethane	-	-	-	6	-
Bromoform	-	-	-	6	-
Carbon Tetrachloride (PCM)	-	-	-	6	-
Chlorobenzene (sum)	-	-	-	6	-
Chlorodibromomethane	-	-	-	6	-
Chloroethane	-	-	-	6	-
Chloroform	-	-	-	6	-
cis-1,2-Dichloroethylene	-	-	-	6	-
cis-1,3-Dichloropropene	-	-	-	6	-
Dibromochloromethane	-	-	-	6	-
Dibromoethane	-	-	-	6	-
Dibromomethane	-	-	-	6	-
Dichlorobenzene	-	-	-	6	-
Dichloromethane	-	-	-	6	-
Ethylbenzene	-	-	-	6	-
Hexachlorobutadiene	-	-	-	6	-
meta & para Xylene	-	-	-	6	-
Methyl-isopropylbenzene	-	-	-	6	-
Monochlorobenzene	-	-	-	6	-
Monochlorophenols (sum)	-	-	-	6	-
n Butylbenzene	-	-	-	6	-
n Propylbenzene	-	-	-	6	-
ortho Xylene	-	-	-	6	-
Styrene	-	-	-	6	-
tert Butylbenzene	-	-	-	6	-
Tetrachlorobenzene	-	-	-	6	-
Tetrachloroethene (PCE)	-	-	-	6	-
Tetrahydrofuran	-	-	-	6	-
Toluene	-	-	-	6	-
trans-1,2-Dichloroethene	-	-	-	6	-
trans-1,3-dichloropropene	-	-	-	6	-
Trichloroethene (TCE)	-	-	-	6	-
Trichlrofluoromethane	-	-	-	6	-
Trichloromethane	-	-	-	6	-
Vinyl Chloride	-	-	-	6	-
SVOCs					
1,4-Dichlorobenzene	-	-	-	6	-
2,3,4,6-Tetrachlorophenol (sum)	-	-	-	6	-
2,4,5-Trichlorophenol	-	-	-	6	-
2,4,6-Trichlorophenol	-	-	-	6	-
2,4-Dichlorophenol (sum)	-	-	-	6	-
2,4-Dimethylphenol	-	-	-	6	-
2,4-Dinitrotoluene	-	-	-	6	-
2,6-Dimethylphenol	-	-	-	6	-
2,6-Dinitrotoluene	-	-	-	6	-
2-Chloronaphthalene	-	-	-	6	-
2-Chlorophenol (sum)	-	-	-	6	-
2-Methylphenol	-	-	-	6	-
2-Nitrophenol	-	-	-	6	-
4-Chloro-3-methylphenol	-	-	-	6	-
4-chlorobenzylphenylether	-	-	-	6	-
4-Methylphenol	-	-	-	6	-
4-Nitrophenol	-	-	-	6	-
Azobenzene	-	-	-	6	-
bis(2-chloroethyl)ether	-	-	-	6	-
bis(2-chloroethyoxy)methane	-	-	-	6	-
bis(chloroisopropyl)ether	-	-	-	6	-
Bromophenylphenylether	-	-	-	6	-
Hexachloro-1,3-butadiene	-	-	-	6	-
Hexachlorobenzene	-	-	-	6	-

Hexachloroethane	-	-	-	6	-
Isophorone	-	-	-	6	-
Nitrobenzene	-	-	-	6	-
n-nitrosodi-n-propyl-1-propanamine	-	-	-	6	-
Pentachlorobenzene	-	-	-	6	-
Pentachlorophenol	-	-	-	6	-
Faecal Coliforms	-	-	-	2	4
Faecal Streptococci	-	-	-	2	4
Cationic Detergents	-	-	-	6	-
Anionic Detergents	-	-	-	6	-
Non Ionic Detergents	-	-	-	6	-
Alkalinity	-	-	-	6	-
Chemical Oxygen Demand (COD)	-	-	-	6	-
Biological Oxygen Demand (BOD)	-	-	-	6	4
Dissolved Oxygen	-	-	-	3	-
Kjeldahl Nitrogen	-	-	-	-	4
Dissolved Methane	-	-	-	-	4

Date Sampled									
Lab Ref. No:		197117	197118	197119	197120	197121	197122	197123	197124
Customer Ref. No.									
Sample Type									
Trial Pit / Borehole No.		BH202R	BH202R	BH202R	BH201	BH201	BH201	BH202C	BH202C
Depth (m)		1.00-1.45	3.50-4.00	14.00-14.45	5.00	9.50-12.50	15.00-15.45	8.00-9.50	22.30-23.00
Hardstanding at Surface (Y/N)									
TPH Aliphatic >C_5-C_6	mg/kg	*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TPH Aliphatic >C_6-C_8	mg/kg	*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TPH Aliphatic >C_8-C_{10}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{10}-C_{12}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{12}-C_{16}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{16}-C_{21}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{21}-C_{34}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic (Total)	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aromatic >C_5-C_7	mg/kg	*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TPH Aromatic >C_7-C_8	mg/kg	*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TPH Aromatic >C_8-C_{10}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aromatic >C_{10}-C_{12}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aromatic >C_{12}-C_{16}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aromatic >C_{16}-C_{21}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aromatic >C_{21}-C_{35}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aromatic (Total)	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5
Organic Matter	%	0.5	0.6	0.1	0.3	0.2	0.4	0.1	0.7
Faecal Coliforms	no / g								
Faecal Streptococci	no / g								
Clostridia	no / g wet wt								

*Insufficient sample

Date Sampled									
Lab Ref. No:		197117	197118	197119	197120	197121	197122	197123	197124
Customer Ref. No.									
Sample Type									
Trial Pit / Borehole No.		BH202R	BH202R	BH202R	BH201	BH201	BH201	BH202C	BH202C
Depth (m)		1.00-1.45	3.50-4.00	14.00-14.45	5.00	9.50-12.50	15.00-15.45	8.00-9.50	22.30-23.00
Hardstanding at Surface (Y/N)									
HEAVY METALS/METALLOIDS									
Aluminium	mg/kg								
Antimony	mg/kg								
Arsenic	mg/kg	<5	<5	<5	<5	<5	<5	<5	10.0
Barium	mg/kg								
Beryllium	mg/kg								
Boron (Water Soluble)	mg/kg	0.8	0.9	<0.5	0.7	0.5	<0.5	<0.5	0.6
Cadmium	mg/kg	0.8	<0.5	<0.5	<0.5	<0.5	0.9	<0.5	0.9
Chromium (Total)	mg/kg	10	12	11	22	<1	1	11	17
Chromium (Hexavalent)	mg/kg								
Cobalt	mg/kg								
Copper	mg/kg	6	7	7	16	1	1	7	<1
Germanium	mg/kg								
Lead	mg/kg	69	17	<10	13	<10	<10	<10	<10
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	mg/kg								
Nickel	mg/kg	6	9	18	23	3	2	19	8
Selenium	mg/kg	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	0.6
Vanadium	mg/kg								
Zinc	mg/kg	34	38	32	48	7	14	26	40
ESSENTIAL ELEMENTS									
Calcium	mg/kg								
Iron	mg/kg								
Magnesium	mg/kg								
Manganese	mg/kg								
Potassium	mg/kg								
Sodium	mg/kg								
MONOAROMATICS									
Benzene	mg/kg		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	mg/kg		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	mg/kg		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Meta & Para Xylene	mg/kg		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ortho Xylene	mg/kg		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Xylenes	mg/kg		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MTBE	mg/kg		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2,4-Trimethylbenzene	mg/kg								
1,3,5-Trimethylbenzene	mg/kg								
TOTAL HYDROCARBONS									
Petroleum Range Organics (C_6-C_{10})	mg/kg								
Diesel Range Organics (C_{10}-C_{28})	mg/kg								
Hydrocarbon Screen (GC-FID)	mg/kg								
VOCs									
1,1,1-Trichloroethane	mg/kg								
1,1,2,2-Tetrachloroethane	mg/kg								
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg								
1,1,2-Trichloroethane	mg/kg								
1,1-Dichloroethane	mg/kg								
1,1-Dichloroethene	mg/kg								
1,2,3-Trichloropropane	mg/kg								
1,2,3-Trimethylbenzene	mg/kg								
1,2,4-Trichlorobenzene	mg/kg								
1,2,4-Trimethylbenzene	mg/kg								
1,2-Dibromo-3-Chloropropane	mg/kg								
1,2-Dichlorobenzene	mg/kg								
1,2-Dichloroethane	mg/kg								
1,2-Dichloropropane	mg/kg								
1,2-Dichloropropene	mg/kg								
1,3,5-Trimethylbenzene	mg/kg								
1,3-Dichlorobenzene	mg/kg								

Date Sampled									
Lab Ref. No:		197117	197118	197119	197120	197121	197122	197123	197124
Customer Ref. No.									
Sample Type									
Trial Pit / Borehole No.		BH202R	BH202R	BH202R	BH201	BH201	BH201	BH202C	BH202C
Depth (m)		1.00-1.45	3.50-4.00	14.00-14.45	5.00	9.50-12.50	15.00-15.45	8.00-9.50	22.30-23.00
Hardstanding at Surface (Y/N)									
* pH	Value	8.4	8.3	9.0	8.7	8.6	8.5	8.9	8.5
* % Loss on Ignition	%								
* % Moisture	%								
* % Stones	%								
* Asbestos	%								
*									
* PHENOLICS									
* Butyl Phenols	mg/kg								
* Catechol	mg/kg	*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Cresols (sum)	mg/kg	*	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Naphthols	mg/kg	*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Phenol	mg/kg	*	1.1	0.4	0.3	0.2	0.2	0.2	0.4
* Resorcinol	mg/kg	*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Trimethylphenol	mg/kg	*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Xylenols & Ethylphenols	mg/kg	*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
*									
* Total Phenols	mg/kg	*	1.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
*									
* US EPA PRIORITY PAH's									
* Acenaphthene	mg/kg	*	*	*	<0.1	<0.1	<0.1	<0.1	*
* Acenaphthylene	mg/kg	*	*	*	<0.1	<0.1	<0.1	<0.1	*
* Anthracene	mg/kg	*	*	*	<0.1	<0.1	<0.1	<0.1	*
* Benzo(a)Anthracene	mg/kg	*	*	*	<0.1	<0.1	<0.1	<0.1	*
* Benzo(a)pyrene	mg/kg	*	*	*	<0.1	<0.1	<0.1	<0.1	*
* Benzo(b)fluoranthene	mg/kg	*	*	*	<0.1	<0.1	<0.1	<0.1	*
* Benzo(k)fluoranthene	mg/kg	*	*	*	<0.1	<0.1	<0.1	<0.1	*
* Benzo(g,h,i)perylene	mg/kg	*	*	*	<0.1	<0.1	<0.1	<0.1	*
* Chrysene	mg/kg	*	*	*	<0.1	<0.1	<0.1	<0.1	*
* Di-benzo(a,h)anthracene	mg/kg	*	*	*	<0.1	<0.1	<0.1	<0.1	*
* Indeno(1,2,3-cd)pyrene	mg/kg	*	*	*	<0.1	<0.1	<0.1	<0.1	*
* Fluoranthene	mg/kg	*	*	*	<0.1	<0.1	<0.1	<0.1	*
* Fluorene	mg/kg	*	*	*	<0.1	<0.1	<0.1	<0.1	*
* Naphthalene	mg/kg	*	*	*	<0.1	<0.1	<0.1	<0.1	*
* Phenanthrene	mg/kg	*	*	*	<0.1	<0.1	<0.1	<0.1	*
* Pyrene	mg/kg	*	*	*	<0.1	<0.1	<0.1	<0.1	*
*									
* Total US EPA 16 PAH	mg/kg	*	*	*	<0.1	<0.1	<0.1	<0.1	*
* OTHER PAH's									
* Anthanthrene	mg/kg								
* Benzo(e)pyrene	mg/kg								
* Cyclopenta(cd)pyrene	mg/kg								
*									
* GENERAL INORGANICS									
* Complex Cyanide	mg/kg								
* Easily Liberatable Cyanide (free)	mg/kg								
* Thiocyanate	mg/kg								
* Total Cyanide	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1
*									
* Sulphide	mg/kg	<2	<2	<2	<2	<2	<2	<2	<2
* Sulphur (free)	mg/kg	20	<20	30	50	50	50	50	50
* Total Sulphate	mg/kg	<100	100	200	100	100	200	200	100
* Water Soluble Sulphate	mg/kg								
*									
* Water Soluble Chloride	mg/kg								
* Water Soluble Phosphate	mg/kg								
*									
* Exchangeable Ammonium	mg/kg	61.9	12.5	37.3	24.8	25.0	12.5	24.8	24.9
* Water Soluble Nitrate	mg/kg								
* Water Soluble Nitrite	mg/kg								

Date Sampled										
Lab Ref. No:		197108	197109	197110	197111	197112	197113	197114	197115	197116
Customer Ref. No.										
Sample Type										
Trial Pit / Borehole No.		TP218	TP218	TP218	TP219	TP219	TP201	TP201	TP202	TP202
Depth (m)		1.50	2.20	2.90	1.40	2.50	0.40	1.30	0.40	1.60
Hardstanding at Surface (Y/N)										
TPH Aliphatic >C_6-C_8	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TPH Aliphatic >C_8-C_9	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TPH Aliphatic >C_9-C_{10}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{10}-C_{12}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{12}-C_{16}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{16}-C_{21}	mg/kg	<5	<5	<5	<5	<5	5	<5	<5	<5
TPH Aliphatic >C_{21}-C_{34}	mg/kg	<5	<5	<5	<5	<5	264	<5	<5	<5
TPH Aliphatic (Total)	mg/kg	<5	<5	<5	<5	<5	269	<5	<5	<5
TPH Aromatic >C_6-C_7	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TPH Aromatic >C_7-C_8	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TPH Aromatic >C_8-C_{10}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aromatic >C_{10}-C_{12}	mg/kg	<5	<5	<5	<5	<5	39	<5	<5	<5
TPH Aromatic >C_{12}-C_{16}	mg/kg	<5	<5	<5	<5	<5	243	<5	<5	<5
TPH Aromatic >C_{16}-C_{21}	mg/kg	8	134	<5	13	10	2340	16	<5	<5
TPH Aromatic >C_{21}-C_{35}	mg/kg	46	485	<5	50	<5	1182	52	<5	<5
TPH Aromatic (Total)	mg/kg	54	619	<5	62	10	3804	68	<5	<5
Organic Matter	%	11.6	19.4	3.1	2.4	1.0	13.4	0.8	0.9	0.5
Faecal Coliforms	no / g	<100	<100	<100	100.0	<100	<100			
Faecal Streptococci	no / g	100	<100	<100	200	<100	<100			
Clostridia	no / g wet wt		<100							

*Insufficient sample

Date Sampled										
Lab Ref. No:		197108	197109	197110	197111	197112	197113	197114	197115	197116
Customer Ref. No.										
Sample Type										
Trial Pit / Borehole No.		TP218	TP218	TP218	TP219	TP219	TP201	TP201	TP202	TP202
Depth (m)		1.50	2.20	2.90	1.40	2.50	0.40	1.30	0.40	1.60
Hardstanding at Surface (Y/N)										
HEAVY METALS/METALLOIDS										
Aluminium	mg/kg									
Antimony	mg/kg									
Arsenic	mg/kg	<5	<5	13.0	9.0	5.9	7.5	<5	5.1	5.8
Barium	mg/kg									
Beryllium	mg/kg									
Boron (Water Soluble)	mg/kg	6.0	6.2	3.4	1.3	0.7	2.5	0.8	1.4	0.8
Cadmium	mg/kg	8.4	62.4	1.0	2.9	<0.5	<0.5	0.8	<0.5	0.6
Chromium (Total)	mg/kg	288	671	38	60	15	13	19	24	17
Chromium (Hexavalent)	mg/kg	<2	<2	<2	<2					
Cobalt	mg/kg									
Copper	mg/kg	576	716	35	44	10	27	8	20	7
Germanium	mg/kg									
Lead	mg/kg	149	380	91	56	27	70	15	36	11
Mercury	mg/kg	4.0	9.0	0.8	0.5	<0.1	0.4	<0.1	<0.1	<0.1
Molybdenum	mg/kg									
Nickel	mg/kg	83	248	20	20	10	8	7	19	8
Selenium	mg/kg	1.6	4.8	0.9	0.7	<0.5	<0.5	<0.5	0.7	<0.5
Vanadium	mg/kg									
Zinc	mg/kg	624	2332	137	136	48	224	28	61	23
ESSENTIAL ELEMENTS										
Calcium	mg/kg									
Iron	mg/kg									
Magnesium	mg/kg									
Manganese	mg/kg									
Potassium	mg/kg									
Sodium	mg/kg									
MONOAROMATICS										
Benzene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Meta & Para Xylene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ortho Xylene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Xylenes	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MTBE	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2,4-Trimethylbenzene	mg/kg									
1,3,5-Trimethylbenzene	mg/kg									
TOTAL HYDROCARBONS										
Petroleum Range Organics (C_6-C_{10})	mg/kg									
Diesel Range Organics (C_{10}-C_{28})	mg/kg									
Hydrocarbon Screen (GC-FID)	mg/kg									
VOCs										
1,1,1-Trichloroethane	mg/kg									
1,1,2,2-Tetrachloroethane	mg/kg									
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg									
1,1,2-Trichloroethane	mg/kg									
1,1-Dichloroethane	mg/kg									
1,1-Dichloroethene	mg/kg									
1,2,3-Trichloropropane	mg/kg									
1,2,3-Trimethylbenzene	mg/kg									
1,2,4-Trichlorobenzene	mg/kg									
1,2,4-Trimethylbenzene	mg/kg									
1,2-Dibromo-3-Chloropropane	mg/kg									
1,2-Dichlorobenzene	mg/kg									
1,2-Dichloroethane	mg/kg									
1,2-Dichloropropane	mg/kg									
1,2-Dichloropropene	mg/kg									
1,3,5-Trimethylbenzene	mg/kg									
1,3-Dichlorobenzene	mg/kg									

Date Sampled										
Lab Ref. No:		197108	197109	197110	197111	197112	197113	197114	197115	197116
Customer Ref. No.										
Sample Type										
Trial Pit / Borehole No.		TP218	TP218	TP218	TP219	TP219	TP201	TP201	TP202	TP202
Depth (m)		1.50	2.20	2.90	1.40	2.50	0.40	1.30	0.40	1.60
Hardstanding at Surface (Y/N)										
* pH	Value	7.3	8.4	8.3	8.3	8.2	7.7	7.7	8.4	8.1
* % Loss on Ignition	%									
* % Moisture	%									
* % Stones	%									
* Asbestos	%								<0.001	
*										
* PHENOLICS										
* Butyl Phenols	mg/kg									
* Catechol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Cresols (sum)	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Naphthols	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Phenol	mg/kg	0.4	0.5	0.3	0.2	0.2	0.3	0.2	0.3	0.3
* Resorcinol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Trimethylphenol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Xylenols & Ethylphenols	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
*										
* Total Phenols	mg/kg	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
*										
* US EPA PRIORITY PAH's										
* Acenaphthene	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Acenaphthylene	mg/kg	<0.1	0.9	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Anthracene	mg/kg	<0.1	0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Benzo(a)Anthracene	mg/kg	0.6	0.5	<0.1	0.2	0.4	<0.1	<0.1	<0.1	<0.1
* Benzo(a)pyrene	mg/kg	0.7	8.1	<0.1	0.3	0.4	<0.1	<0.1	<0.1	<0.1
* Benzo(b)fluoranthene	mg/kg	1.0	16.3	<0.1	0.7	0.6	<0.1	<0.1	0.3	<0.1
* Benzo(k)fluoranthene	mg/kg	0.3	5.2	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	<0.1
* Benzo(g,h,i)perylene	mg/kg	0.4	5.5	<0.1	0.2	0.2	<0.1	<0.1	<0.1	<0.1
* Chrysene	mg/kg	0.7	1.8	<0.1	0.3	0.4	<0.1	<0.1	<0.1	<0.1
* Di-benzo(a,h)anthracene	mg/kg	<0.1	0.9	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Indeno(1,2,3-cd)pyrene	mg/kg	0.7	11.4	<0.1	0.3	0.4	<0.1	<0.1	<0.1	<0.1
* Fluoranthene	mg/kg	1.2	1.3	<0.1	0.3	0.8	<0.1	<0.1	<0.1	<0.1
* Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Naphthalene	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Phenanthrene	mg/kg	0.6	0.4	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	<0.1
* Pyrene	mg/kg	0.9	1.4	<0.1	0.2	0.6	<0.1	<0.1	<0.1	<0.1
*										
* Total US EPA 16 PAH	mg/kg	7.1	54.6	<0.1	2.5	4.5	<0.1	<0.1	0.3	<0.1
*										
* OTHER PAH's										
* Anthanthrene	mg/kg									
* Benzo(e)pyrene	mg/kg									
* Cyclopenta(cd)pyrene	mg/kg									
*										
* GENERAL INORGANICS										
* Complex Cyanide	mg/kg									
* Easily Liberatable Cyanide (free)	mg/kg									
* Thiocyanate	mg/kg									
* Total Cyanide	mg/kg	1.5	60.0	2.1	<1	1.7	<1	<1	<1	<1
*										
* Sulphide	mg/kg	45.8	4.4	15.9	3.4	3.8	12.5	<2	<2	<2
* Sulphur (free)	mg/kg	180	130	70	20	320	<20	<20	<20	<20
* Total Sulphate	mg/kg	200	700	300	100	100	100	100	100	100
* Water Soluble Sulphate	mg/kg									
*										
* Water Soluble Chloride	mg/kg									
* Water Soluble Phosphate	mg/kg									
*										
* Exchangeable Ammonium	mg/kg	335.2	1464.8	1085.3	99.1	25.1	37.8	25.0	50.3	25.2
* Water Soluble Nitrate	mg/kg									
* Water Soluble Nitrite	mg/kg									

Date Sampled										
Lab Ref. No:		196096	196097	196098	196099	196100	196101	196102	196103	196104
Customer Ref. No.										
Sample Type										
Trial Pit / Borehole No.		TP209	TP209	TP209	TP209	TP210	TP210	TP210	TP210	TP210
Depth (m)		0.70	1.30	1.90	2.50	0.40	0.80	1.60	2.50	4.30
Hardstanding at Surface (Y/N)										
TPH RBCA CARBON BANDING										
(S) TPH Aliphatic >C_5-C_6	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
(S) TPH Aliphatic >C_6-C_8	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TPH Aliphatic >C_8-C_{10}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{10}-C_{12}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{12}-C_{16}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{16}-C_{21}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{21}-C_{34}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic (Total)	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5
(S) TPH Aromatic >C_6-C_7	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
(S) TPH Aromatic >C_7-C_8	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TPH Aromatic >C_8-C_{10}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aromatic >C_{10}-C_{12}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aromatic >C_{12}-C_{16}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aromatic >C_{16}-C_{21}	mg/kg	31.3	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aromatic >C_{21}-C_{35}	mg/kg	75.7	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aromatic (Total)	mg/kg	107	<5	<5	<5	<5	<5	<5	<5	<5
Organic Matter	%	0.7	0.5	1.2	0.4	1.0	0.9	1.5	0.6	0.2
(S) Faecal Coliforms	no / g		<100	<100	<100					
(S) Faecal Streptococci	no / g		<100	<100	<100					
(S) Colstridia	no / g wet wt				<100					

(S) Subcontracted analysis

*Insufficient sample

Date Sampled										
Lab Ref. No:		196096	196097	196098	196099	196100	196101	196102	196103	196104
Customer Ref. No.										
Sample Type										
Trial Pit / Borehole No.		TP209	TP209	TP209	TP209	TP210	TP210	TP210	TP210	TP210
Depth (m)		0.70	1.30	1.90	2.50	0.40	0.80	1.60	2.50	4.30
Hardstanding at Surface (Y/N)										
HEAVY METALS/METALLOIDS										
Aluminium	mg/kg									
Antimony	mg/kg									
Arsenic	mg/kg	9.6	8.2	5.6	9.5	7.4	<5	<5	<5	5.9
Barium	mg/kg									
Beryllium	mg/kg									
Boron (Water Soluble)	mg/kg	<0.5	<0.5	1.6	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	mg/kg	0.6	0.7	0.6	0.7	0.9	0.7	0.7	0.7	0.7
Chromium (Total)	mg/kg	26	25	16	32	21	20	24	22	28
Chromium (Hexavalent)	mg/kg	<2			<2					<2
Cobalt	mg/kg									
Copper	mg/kg	14	13	16	22	15	13	17	14	18
Germanium	mg/kg									
Lead	mg/kg	25	21	27	20	26	28	39	25	17
Mercury	mg/kg	0.1	<0.1	0.2	<0.1	<0.1	0.1	0.6	0.1	<0.1
Molybdenum	mg/kg									
Nickel	mg/kg	19	18	14	28	19	14	12	16	31
Selenium	mg/kg	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5
Vanadium	mg/kg									
Zinc	mg/kg	54	52	59	64	60	49	61	53	60
ESSENTIAL ELEMENTS										
Calcium	mg/kg									
Iron	mg/kg									
Magnesium	mg/kg									
Manganese	mg/kg									
Potassium	mg/kg									
Sodium	mg/kg									
MONOAROMATICS										
(S) Benzene	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
(S) Toluene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
(S) Ethylbenzene	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
(S) Meta & Para Xylene	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ortho Xylene	mg/kg									
Total Xylenes	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
(S) MTBE	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2,4-Trimethylbenzene	mg/kg									
1,3,5-Trimethylbenzene	mg/kg									
TOTAL HYDROCARBONS										
Petroleum Range Organics (C_6-C_{10})	mg/kg									
Diesel Range Organics (C_{10}-C_{28})	mg/kg									
Hydrocarbon Screen (GC-FID)	mg/kg									
VOCs										
1,1,1-Trichloroethane	mg/kg									
1,1,2,2-Tetrachloroethane	mg/kg									
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg									
1,1,2-Trichloroethane	mg/kg									
1,1-Dichloroethane	mg/kg									
1,1-Dichloroethene	mg/kg									
1,2,3-Trichloropropane	mg/kg									
1,2,3-Trimethylbenzene	mg/kg									
1,2,4-Trichlorobenzene	mg/kg									
1,2,4-Trimethylbenzene	mg/kg									
1,2-Dibromo-3-Chloropropane	mg/kg									
1,2-Dichlorobenzene	mg/kg									
1,2-Dichloroethane	mg/kg									
1,2-Dichloropropane	mg/kg									
1,2-Dichloropropene	mg/kg									
1,3,5-Trimethylbenzene	mg/kg									
1,3-Dichlorobenzene	mg/kg									

Date Sampled										
Lab Ref. No:		196096	196097	196098	196099	196100	196101	196102	196103	196104
Customer Ref. No.										
Sample Type										
Trial Pit / Borehole No.		TP209	TP209	TP209	TP209	TP210	TP210	TP210	TP210	TP210
Depth (m)		0.70	1.30	1.90	2.50	0.40	0.80	1.60	2.50	4.30
Hardstanding at Surface (Y/N)										
* pH	Value	8.0	8.2	7.9	7.9	12.1	12.1	7.8	8.2	7.6
* % Loss on ignition	%									
* % Moisture	%									
* % Stones	%									
* Asbestos	%							<0.001		
*										
* PHENOLICS										
* Butyl Phenols	mg/kg									
* Catechol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Cresols (sum)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Naphthols	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Phenol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Resorcinol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Trimethylphenol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Xylenols & Ethylphenols	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
*										
* Total Phenols	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
*										
* US EPA PRIORITY PAH's										
* (S) Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Acenaphthylene	mg/kg	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Anthracene	mg/kg	<0.1	<0.1	0.6	<0.1	0.1	<0.1	<0.1	<0.1	<0.1
* (S) Benzo(a)Anthracene	mg/kg	<0.1	0.1	1.5	<0.1	0.4	0.2	0.2	<0.1	<0.1
* (S) Benzo(a)pyrene	mg/kg	<0.1	<0.1	1.4	<0.1	0.5	<0.1	<0.1	<0.1	<0.1
* (S) Benzo(b)fluoranthene	mg/kg	<0.1	<0.1	1.8	<0.1	0.6	<0.1	<0.1	<0.1	<0.1
* (S) Benzo(k)fluoranthene	mg/kg	<0.1	<0.1	1.0	<0.1	0.3	<0.1	<0.1	<0.1	<0.1
* (S) Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	0.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Chrysene	mg/kg	<0.1	0.2	1.7	<0.1	0.6	0.3	0.3	<0.1	<0.1
* (S) Di-benzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Indeno(1,2,3-cd)pyrene	mg/kg	<0.1	<0.1	0.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Fluoranthene	mg/kg	<0.1	0.3	3.3	<0.1	0.9	0.4	0.4	<0.1	0.3
* (S) Fluorene	mg/kg	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Phenanthrene	mg/kg	<0.1	0.1	2.5	<0.1	0.5	0.1	0.1	<0.1	<0.1
* (S) Pyrene	mg/kg	<0.1	0.2	2.6	<0.1	0.7	0.3	0.3	<0.1	0.2
*										
* Total US EPA 16 PAH	mg/kg	<0.1	0.9	18.2	<0.1	4.6	1.3	1.3	<0.1	0.5
* OTHER PAH's										
* Anthanthrene	mg/kg									
* Benzo(e)pyrene	mg/kg									
* Cyclopenta(cd)pyrene	mg/kg									
*										
* GENERAL INORGANICS										
* Complex Cyanide	mg/kg									
* Easily Liberatable Cyanide (free)	mg/kg									
* Thiocyanate	mg/kg									
* Total Cyanide	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1
*										
* Sulphide	mg/kg	<2	<2	9.6	<2	<2	<2	<2	<2	<2
* Sulphur (free)	mg/kg	<20	20	110	20	30	<20	<20	<20	<20
* Total Sulphate	mg/kg	200	100	100	<100	<100	100	100	1500	100
* Water Soluble Sulphate	mg/kg									
*										
* Water Soluble Chloride	mg/kg									
* Water Soluble Phosphate	mg/kg									
*										
* Exchangeable Ammonium	mg/kg	62.1	50.3	62.8	67.5	86.7	87.5	25.1	99.8	50.0
* Water Soluble Nitrate	mg/kg									
* Water Soluble Nitrite	mg/kg									

Date Sampled											
Lab Ref. No:		196086	196087	196088	196089	196090	196091	196092	196093	196094	196095
Customer Ref. No.											
Sample Type											
Trial Pit / Borehole No.		HP3	HP3	TP204	TP204	TP204	TP204	TP205	TP205	TP205	TP205
Depth (m)		1.00	1.60	0.90	1.25	2.00	3.40	1.50	2.40	2.80	3.50
Hardstanding at Surface (Y/N)											
TPH RBCA CARBON BANDING											
(S) TPH Aliphatic >C_5-C_6	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
(S) TPH Aliphatic >C_6-C_8	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TPH Aliphatic >C_8-C_{10}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{10}-C_{12}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	20
TPH Aliphatic >C_{12}-C_{16}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	194
TPH Aliphatic >C_{16}-C_{21}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	171
TPH Aliphatic >C_{21}-C_{34}	mg/kg	<5	<5	58	<5	<5	<5	<5	<5	<5	39
TPH Aliphatic (Total)	mg/kg	<5	<5	58	<5	<5	<5	<5	<5	<5	423
(S) TPH Aromatic >C_5-C_7	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
(S) TPH Aromatic >C_7-C_8	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TPH Aromatic >C_8-C_{10}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	*	<5
TPH Aromatic >C_{10}-C_{12}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	*	<5
TPH Aromatic >C_{12}-C_{16}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	*	60.5
TPH Aromatic >C_{16}-C_{21}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	*	76.3
TPH Aromatic >C_{21}-C_{35}	mg/kg	<5	<5	91.5	15.9	<5	<5	<5	<5	*	<5
TPH Aromatic (Total)	mg/kg	<5	<5	92	16	<5	<5	<5	<5	*	137
Organic Matter	%	1.2	0.5	4.3	2.0	0.4	0.2	0.9	0.8	1.4	0.6
(S) Faecal Coliforms	no / g	<100			<100					<100	
(S) Faecal Streptococci	no / g	<100			<100					<100	
(S) Colstridia	no / g wet wt									300	

(S) Subcontracted analysis

*Insufficient sample

Date Sampled											
Lab Ref. No:		196086	196087	196088	196089	196090	196091	196092	196093	196094	196095
Customer Ref. No.											
Sample Type											
Trial Pit / Borehole No.		HP3	HP3	TP204	TP204	TP204	TP204	TP205	TP205	TP205	TP205
Depth (m)		1.00	1.60	0.90	1.25	2.00	3.40	1.50	2.40	2.80	3.50
Hardstanding at Surface (Y/N)											
HEAVY METALS/METALLOIDS											
Aluminium	mg/kg										
Antimony	mg/kg										
Arsenic	mg/kg	<5	<5	<5	<5	<5	8.0	7.3	7.0	5.4	<5
Barium	mg/kg										
Beryllium	mg/kg										
Boron (Water Soluble)	mg/kg	0.6	0.9	<0.5	1.1	<0.5	<0.5	0.6	0.5	0.7	<0.5
Cadmium	mg/kg	<0.5	<0.5	1.8	0.8	0.7	0.7	1.0	1.0	<0.5	<0.5
Chromium (Total)	mg/kg	22	16	99	24	37	38	33	37	17	24
Chromium (Hexavalent)	mg/kg			<2		<2	<2	<2	<2		
Cobalt	mg/kg										
Copper	mg/kg	17	12	126	20	25	15	35	17	11	9
Germanium	mg/kg										
Lead	mg/kg	28	20	111	28	22	17	65	29	26	16
Mercury	mg/kg	0.2	0.3	1.6	0.3	<0.1	<0.1	0.2	<0.1	0.1	<0.1
Molybdenum	mg/kg										
Nickel	mg/kg	9	12	29	8	37	24	21	22	9	10
Selenium	mg/kg	0.6	<0.5	0.9	0.7	1.8	0.6	<0.5	0.6	<0.5	<0.5
Vanadium	mg/kg										
Zinc	mg/kg	46	55	246	68	79	68	168	701	55	40
ESSENTIAL ELEMENTS											
Calcium	mg/kg										
Iron	mg/kg										
Magnesium	mg/kg										
Manganese	mg/kg										
Potassium	mg/kg										
Sodium	mg/kg										
MONOAROMATICS											
(S) Benzene	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
(S) Toluene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
(S) Ethylbenzene	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
(S) Meta & Para Xylene	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ortho Xylene	mg/kg										
Total Xylenes	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
(S) MTBE	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2,4-Trimethylbenzene	mg/kg										
1,3,5-Trimethylbenzene	mg/kg										
TOTAL HYDROCARBONS											
Petroleum Range Organics (C_6-C_{10})	mg/kg										
Diesel Range Organics (C_9-C_{25})	mg/kg										
Hydrocarbon Screen (GC-FID)	mg/kg										
VOCs											
1,1,1-Trichloroethane	mg/kg										
1,1,2,2-Tetrachloroethane	mg/kg										
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg										
1,1,2-Trichloroethane	mg/kg										
1,1-Dichloroethane	mg/kg										
1,1-Dichloroethene	mg/kg										
1,2,3-Trichloropropane	mg/kg										
1,2,3-Trimethylbenzene	mg/kg										
1,2,4-Trichlorobenzene	mg/kg										
1,2,4-Trimethylbenzene	mg/kg										
1,2-Dibromo-3-Chloropropane	mg/kg										
1,2-Dichlorobenzene	mg/kg										
1,2-Dichloroethane	mg/kg										
1,2-Dichloropropane	mg/kg										
1,2-Dichloropropene	mg/kg										
1,3,5-Trimethylbenzene	mg/kg										
1,3-Dichlorobenzene	mg/kg										

Date Sampled											
Lab Ref. No:		196086	196087	196088	196089	196090	196091	196092	196093	196094	196095
Customer Ref. No.											
Sample Type											
Trial Pit / Borehole No.		HP3	HP3	TP204	TP204	TP204	TP204	TP205	TP205	TP205	TP205
Depth (m)		1.00	1.60	0.90	1.25	2.00	3.40	1.50	2.40	2.80	3.50
Hardstanding at Surface (Y/N)											
* pH	Value	8.3	9.1	7.7	7.5	7.6	8.3	8.6	8.1	8.4	7.4
* % Loss on Ignition	%										
* % Moisture	%										
* % Stones	%										
* Asbestos	%	<0.001		<0.001				<0.001	<0.001		
* PHENOLICS											
* Butyl Phenols	mg/kg										
* Catechol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Cresols (sum)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Naphthols	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Phenol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Resorcinol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Trimethylphenol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Xylenols & Ethylphenols	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Total Phenols	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
* US EPA PRIORITY PAH's											
* (S) Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1
* (S) Benzo(a)Anthracene	mg/kg	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	0.2	<0.1	0.2	<0.1
* (S) Benzo(a)pyrene	mg/kg	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	2.3	<0.1
* (S) Benzo(b)fluoranthene	mg/kg	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	1.8	<0.1
* (S) Benzo(k)fluoranthene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	1.3	<0.1
* (S) Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.5	<0.1
* (S) Chrysene	mg/kg	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	0.2	<0.1	1.7	<0.1
* (S) Di-benzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Indeno(1,2,3-cd)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.4	<0.1
* (S) Fluoranthene	mg/kg	<0.1	<0.1	0.5	<0.1	<0.1	<0.1	0.4	<0.1	2.0	<0.1
* (S) Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Phenanthrene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	0.2	<0.1	0.4	<0.1
* (S) Pyrene	mg/kg	<0.1	<0.1	0.5	<0.1	<0.1	<0.1	0.3	<0.1	2.4	<0.1
* Total US EPA 16 PAH	mg/kg	<0.1	<0.1	2.7	<0.1	<0.1	<0.1	1.3	<0.1	13.1	<0.1
* OTHER PAH's											
* Anthanthrene	mg/kg										
* Benzo(e)pyrene	mg/kg										
* Cyclopenta(cd)pyrene	mg/kg										
* GENERAL INORGANICS											
* Complex Cyanide	mg/kg										
* Easily Liberatable Cyanide (free)	mg/kg										
* Thiocyanate	mg/kg										
* Total Cyanide	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
* Sulphide	mg/kg	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
* Sulphur (free)	mg/kg	<20	<20	<20	20	<20	<20	<20	<20	<20	<20
* Total Sulphate	mg/kg	100	100	100	<100	100	100	100	100	100	<100
* Water Soluble Sulphate	mg/kg										
* Water Soluble Chloride	mg/kg										
* Water Soluble Phosphate	mg/kg										
* Exchangeable Ammonium	mg/kg	25.0	172.5	138.6	138.6	61.9	50.1	24.8	24.8	125.4	138.6
* Water Soluble Nitrate	mg/kg										
* Water Soluble Nitrite	mg/kg										

Date Sampled											
Lab Ref. No:		196076	196077	196078	196079	196080	196081	196082	196083	196084	196085
Customer Ref. No.											
Sample Type											
Trial Pit / Borehole No.		TP216	TP216	TP214	TP214	TP214	TP211	TP211	TP211	TP211	HP3
Depth (m)		2.50	4.40	0.40	0.80	1.50	0.35	0.50	1.60	3.90	0.70
Hardstanding at Surface (Y/N)											
TPH RBCA CARBON BANDING											
(S) TPH Aliphatic >C_5-C_6	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
(S) TPH Aliphatic >C_6-C_8	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TPH Aliphatic >C_8-C_{10}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{10}-C_{12}	mg/kg	8	<5	<5	<5	<5	<5	<5	<5	17	<5
TPH Aliphatic >C_{12}-C_{16}	mg/kg	9	<5	<5	<5	<5	<5	<5	<5	46	<5
TPH Aliphatic >C_{16}-C_{21}	mg/kg	36	<5	<5	12	<5	<5	<5	<5	73	<5
TPH Aliphatic >C_{21}-C_{34}	mg/kg	125	<5	<5	22	<5	<5	<5	<5	115	<5
TPH Aliphatic (Total)	mg/kg	177	<5	<5	33	<5	<5	<5	<5	249	<5
(S) TPH Aromatic >C_5-C_7	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
(S) TPH Aromatic >C_7-C_8	mg/kg	0.10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TPH Aromatic >C_8-C_{10}	mg/kg	<5	*	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aromatic >C_{10}-C_{12}	mg/kg	<5	*	<5	<5	<5	<5	<5	<5	5.6	<5
TPH Aromatic >C_{12}-C_{16}	mg/kg	13.4	*	<5	<5	<5	<5	<5	<5	48.8	<5
TPH Aromatic >C_{16}-C_{21}	mg/kg	64.5	*	<5	<5	<5	<5	<5	<5	155.0	43.1
TPH Aromatic >C_{21}-C_{35}	mg/kg	369.2	*	16.4	<5	<5	<5	<5	<5	527.1	90.7
TPH Aromatic (Total)	mg/kg	447	*	16	<5	<5	<5	<5	<5	737	134
Organic Matter	%	16.6	1.5	2.8	2.7	1.7	0.3	1.1	1.2	6.8	0.7
(S) Faecal Coliforms	no / g	<100	<100			<100		<100		<100	<100
(S) Faecal Streptococci	no / g	<100	<100			<100		<100		<100	<100
(S) Colstridia	no / g wet wt	2000	<100			600					

(S) Subcontracted analysis

*Insufficient sample

Date Sampled											
Lab Ref. No:		196076	196077	196078	196079	196080	196081	196082	196083	196084	196085
Customer Ref. No.											
Sample Type											
Trial Pit / Borehole No.		TP216	TP216	TP214	TP214	TP214	TP211	TP211	TP211	TP211	HP3
Depth (m)		2.50	4.40	0.40	0.80	1.50	0.35	0.50	1.60	3.90	0.70
Hardstanding at Surface (Y/N)											
HEAVY METALS/METALLOIDS											
Aluminium	mg/kg										
Antimony	mg/kg										
Arsenic	mg/kg	<5	<5	5.3	<5	6.2	<5	<5	<5	18.9	<5
Barium	mg/kg										
Beryllium	mg/kg										
Boron (Water Soluble)	mg/kg	1.5	1.5	1.8	1.6	<0.5	1.1	<0.5	4.0	7.2	<0.5
Cadmium	mg/kg	2.5	1.3	7.4	4.5	2.1	1.1	0.7	1.4	18.4	<0.5
Chromium (Total)	mg/kg	166	43	181	137	58	16	28	53	452	20
Chromium (Hexavalent)	mg/kg	<2	*	<2	<2	<2		<2	<2	<2	
Cobalt	mg/kg										
Copper	mg/kg	370	36	115	82	46	12	28	48	338	14
Germanium	mg/kg										
Lead	mg/kg	92	58	116	89	78	76	494	97	457	21
Mercury	mg/kg	1.9	0.6	1.8	1.4	0.8	0.1	0.2	0.9	6.8	0.1
Molybdenum	mg/kg										
Nickel	mg/kg	32	19	41	32	21	7	10	22	101	11
Selenium	mg/kg	1.5	0.7	1.2	0.9	0.8	<0.5	<0.5	0.7	2.0	<0.5
Vanadium	mg/kg										
Zinc	mg/kg	403	129	323	307	150	84	78	138	663	42
ESSENTIAL ELEMENTS											
Calcium	mg/kg										
Iron	mg/kg										
Magnesium	mg/kg										
Manganese	mg/kg										
Potassium	mg/kg										
Sodium	mg/kg										
MONOAROMATICS											
(S) Benzene	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
(S) Toluene	mg/kg	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
(S) Ethylbenzene	mg/kg	0.010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
(S) Meta & Para Xylene	mg/kg	0.010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ortho Xylene	mg/kg										
Total Xylenes	mg/kg	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
(S) MTBE	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2,4-Trimethylbenzene	mg/kg										
1,3,5-Trimethylbenzene	mg/kg										
TOTAL HYDROCARBONS											
Petroleum Range Organics (C_6-C_{10})	mg/kg										
Diesel Range Organics (C_8-C_{28})	mg/kg										
Hydrocarbon Screen (GC-FID)	mg/kg										
VOCs											
1,1,1-Trichloroethane	mg/kg										
1,1,2,2-Tetrachloroethane	mg/kg										
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg										
1,1,2-Trichloroethane	mg/kg										
1,1-Dichloroethane	mg/kg										
1,1-Dichloroethene	mg/kg										
1,2,3-Trichloropropane	mg/kg										
1,2,3-Trimethylbenzene	mg/kg										
1,2,4-Trichlorobenzene	mg/kg										
1,2,4-Trimethylbenzene	mg/kg										
1,2-Dibromo-3-Chloropropane	mg/kg										
1,2-Dichlorobenzene	mg/kg										
1,2-Dichloroethane	mg/kg										
1,2-Dichloropropane	mg/kg										
1,2-Dichloropropene	mg/kg										
1,3,5-Trimethylbenzene	mg/kg										
1,3-Dichlorobenzene	mg/kg										

Date Sampled											
Lab Ref. No:		196076	196077	196078	196079	196080	196081	196082	196083	196084	196085
Customer Ref. No.											
Sample Type											
Trial Pit / Borehole No.		TP216	TP216	TP214	TP214	TP214	TP211	TP211	TP211	TP211	HP3
Depth (m)		2.50	4.40	0.40	0.80	1.50	0.35	0.50	1.60	3.90	0.70
Hardstanding at Surface (Y/N)											
* pH	Value	8.2	8.3	7.8	7.8	8.0	10.6	9.4	8.2	8.9	8.6
* % Loss on Ignition	%										
* % Moisture	%										
* % Stones	%										
* Asbestos	%							<0.001			<0.001
*											
* PHENOLICS											
* Butyl Phenols	mg/kg										
* Catechol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Cresols (sum)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Naphthols	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Phenol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Resorcinol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Trimethylphenol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Xylenols & Ethylphenols	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
*											
* Total Phenols	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
*											
* US EPA PRIORITY PAH's											
* (S) Acenaphthene	mg/kg	1.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	<0.1
* (S) Benzo(a)Anthracene	mg/kg	<0.1	<0.1	0.2	0.2	0.2	<0.1	0.2	0.1	0.8	<0.1
* (S) Benzo(a)pyrene	mg/kg	<0.1	<0.1	0.5	<0.1	<0.1	<0.1	0.2	<0.1	0.9	<0.1
* (S) Benzo(b)fluoranthene	mg/kg	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	0.4	<0.1	1.0	<0.1
* (S) Benzo(k)fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	0.5	<0.1
* (S) Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Chrysene	mg/kg	<0.1	<0.1	0.3	0.3	0.2	<0.1	0.2	0.2	0.9	<0.1
* (S) Di-benzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Indeno(1,2,3-cd)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Fluoranthene	mg/kg	1.2	<0.1	0.4	0.4	0.3	<0.1	0.3	0.2	1.9	<0.1
* (S) Fluorene	mg/kg	1.9	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Naphthalene	mg/kg	0.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1
* (S) Phenanthrene	mg/kg	1.8	<0.1	0.2	0.3	0.2	<0.1	0.1	0.1	0.8	<0.1
* (S) Pyrene	mg/kg	0.9	<0.1	0.3	0.4	0.2	<0.1	0.2	0.1	1.7	<0.1
*											
* Total US EPA 16 PAH	mg/kg	7.8	<0.1	2.3	1.6	1.1	<0.1	1.7	0.7	8.9	<0.1
*											
* OTHER PAH's											
* Anthanthrene	mg/kg										
* Benzo(e)pyrene	mg/kg										
* Cyclopenta(cd)pyrene	mg/kg										
*											
* GENERAL INORGANICS											
* Complex Cyanide	mg/kg										
* Easily Liberatable Cyanide (free)	mg/kg										
* Thiocyanate	mg/kg										
* Total Cyanide	mg/kg	4.2	<1	2.3	4.0	2.1	<1	2.5	<1	12.8	<1
*											
* Sulphide	mg/kg	4.6	3.1	<2	<2	<2	<2	<2	<2	13.3	<2
* Sulphur (free)	mg/kg	1600	30	20	60	20	<20	<20	<20	190	<20
* Total Sulphate	mg/kg	600	200	100	100	200	2300	100	100	700	100
* Water Soluble Sulphate	mg/kg										
*											
* Water Soluble Chloride	mg/kg										
* Water Soluble Phosphate	mg/kg										
*											
* Exchangeable Ammonium	mg/kg	2624.7	425.2	64.3	100.3	163.4	62.4	12.5	75.0	806.9	<5
* Water Soluble Nitrate	mg/kg										
* Water Soluble Nitrite	mg/kg										

Date Sampled											
Lab Ref. No:		196066	196067	196068	196069	196070	196071	196072	196073	196074	196075
Customer Ref. No.											
Sample Type											
Trial Pit / Borehole No.		TP217	TP213	TP213	TP213	TP212	TP212	TP212	TP216	TP216	TP216
Depth (m)		1.60	0.30	1.80	2.20	0.10	0.50	0.80	0.20	0.70	1.00
Hardstanding at Surface (Y/N)											
TPH RBCA CARBON BANDING											
(S) TPH Aliphatic >C_5-C_6	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
(S) TPH Aliphatic >C_6-C_8	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TPH Aliphatic >C_8-C_{10}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{10}-C_{12}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{12}-C_{16}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{16}-C_{21}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{21}-C_{34}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic (Total)	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
(S) TPH Aromatic >C_5-C_7	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
(S) TPH Aromatic >C_7-C_8	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TPH Aromatic >C_8-C_{10}	mg/kg	<5	<5	*	<5	<5	<5	*	<5	<5	<5
TPH Aromatic >C_{10}-C_{12}	mg/kg	<5	<5	*	<5	<5	<5	*	<5	<5	<5
TPH Aromatic >C_{12}-C_{16}	mg/kg	<5	<5	*	<5	<5	<5	*	<5	<5	<5
TPH Aromatic >C_{16}-C_{21}	mg/kg	<5	36.8	*	<5	<5	<5	*	24.6	<5	<5
TPH Aromatic >C_{21}-C_{35}	mg/kg	<5	172.2	*	<5	<5	8.4	*	101.9	31.0	106.0
TPH Aromatic (Total)	mg/kg	<5	209	*	<5	<5	8	*	127	31	106
Organic Matter	%	4.5	2.9	6.8	6.8	4.2	1.8	1.6	2.0	0.9	13.0
(S) Faecal Coliforms	no / g	<100		<100	<100						<100
(S) Faecal Streptococci	no / g	<100		<100	<100						<100
(S) Colstridia	no / g wet wt			800							

(S) Subcontracted analysis

*Insufficient sample

Date Sampled										
Lab Ref. No:		196066	196067	196068	196069	196070	196071	196072	196073	196074	196075
Customer Ref. No.											
Sample Type											
Trial Pit / Borehole No.		TP217	TP213	TP213	TP213	TP212	TP212	TP212	TP216	TP216	TP216
Depth (m)		1.60	0.30	1.60	2.20	0.10	0.50	0.80	0.20	0.70	1.00
Hardstanding at Surface (Y/N)											
HEAVY METALS/METALLOIDS											
Aluminium	mg/kg										
Antimony	mg/kg										
Arsenic	mg/kg	13.9	10.5	23.0	9.4	10.1	5.7	<5	14.0	<5	<5
Barium	mg/kg										
Beryllium	mg/kg										
Boron (Water Soluble)	mg/kg	6.4	1.4	9.8	8.1	1.9	1.7	2.0	<0.5	0.8	0.9
Cadmium	mg/kg	1.7	2.1	4.5	2.5	1.4	1.2	1.3	4.0	<0.5	<0.5
Chromium (Total)	mg/kg	46	65	111	55	34	45	39	20	17	24
Chromium (Hexavalent)	mg/kg	<2	<2	*	<2	<2	<2	*			
Cobalt	mg/kg										
Copper	mg/kg	47	80	293	136	71	48	40	14	11	13
Germanium	mg/kg										
Lead	mg/kg	183	141	610	230	502	117	102	171	22	34
Mercury	mg/kg	1.1	1.1	8.2	1.2	1.0	0.4	0.6	0.3	0.3	0.2
Molybdenum	mg/kg						<5				
Nickel	mg/kg	28	28	62	29	18	24	23	7	7	9
Selenium	mg/kg	1.5	0.7	3.0	3.0	0.6	0.6	<0.5	<0.5	<0.5	0.8
Vanadium	mg/kg										
Zinc	mg/kg	169	371	881	274	440	148	128	948	49	44
ESSENTIAL ELEMENTS											
Calcium	mg/kg										
Iron	mg/kg										
Magnesium	mg/kg										
Manganese	mg/kg										
Potassium	mg/kg										
Sodium	mg/kg										
MONOAROMATICS											
(S) Benzene	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
(S) Toluene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
(S) Ethylbenzene	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
(S) Meta & Para Xylene	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ortho Xylene	mg/kg										
Total Xylenes	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
(S) MTBE	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2,4-Trimethylbenzene	mg/kg										
1,3,5-Trimethylbenzene	mg/kg										
TOTAL HYDROCARBONS											
Petroleum Range Organics (C_6-C_{10})	mg/kg										
Diesel Range Organics (C_6-C_{28})	mg/kg										
Hydrocarbon Screen (GC-FID)	mg/kg										
VOCs											
1,1,1-Trichloroethane	mg/kg										
1,1,2,2-Tetrachloroethane	mg/kg										
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg										
1,1,2-Trichloroethane	mg/kg										
1,1-Dichloroethane	mg/kg										
1,1-Dichloroethene	mg/kg										
1,2,3-Trichloropropane	mg/kg										
1,2,3-Trimethylbenzene	mg/kg										
1,2,4-Trichlorobenzene	mg/kg										
1,2,4-Trimethylbenzene	mg/kg										
1,2-Dibromo-3-Chloropropane	mg/kg										
1,2-Dichlorobenzene	mg/kg										
1,2-Dichloroethane	mg/kg										
1,2-Dichloropropane	mg/kg										
1,2-Dichloropropene	mg/kg										
1,3,5-Trimethylbenzene	mg/kg										
1,3-Dichlorobenzene	mg/kg										

Date Sampled											
Lab Ref. No:		196066	196067	196068	196069	196070	196071	196072	196073	196074	196075
Customer Ref. No.											
Sample Type											
Trial Pit / Borehole No.		TP217	TP213	TP213	TP213	TP212	TP212	TP212	TP216	TP216	TP216
Depth (m)		1.60	0.30	1.80	2.20	0.10	0.50	0.80	0.20	0.70	1.00
Hardstanding at Surface (Y/N)											
* pH	Value	7.3	8.3	7.2	7.3	7.6	8.4	8.3	8.9	8.3	8.6
* % Loss on Ignition	%										
* % Moisture	%										
* % Stones	%										
* Asbestos	%		<0.001				<0.001				<0.001
*											
* PHENOLICS											
* Butyl Phenols	mg/kg										
* Catechol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Cresols (sum)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Naphthols	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Phenol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Resorcinol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Trimethylphenol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* Xylenols & Ethylphenols	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
*											
* Total Phenols	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
*											
* US EPA PRIORITY PAH's											
* (S) Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Acenaphthylene	mg/kg	<0.1	0.2	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Anthracene	mg/kg	<0.1	0.4	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Benzo(a)Anthracene	mg/kg	<0.1	1.8	0.4	<0.1	0.5	0.2	0.3	0.4	<0.1	0.4
* (S) Benzo(a)pyrene	mg/kg	<0.1	2.2	0.6	<0.1	0.6	0.4	0.4	0.7	1.2	0.5
* (S) Benzo(b)fluoranthene	mg/kg	<0.1	2.8	0.7	<0.1	1.1	0.5	0.5	0.8	<0.1	<0.1
* (S) Benzo(k)fluoranthene	mg/kg	<0.1	1.0	0.3	<0.1	0.5	0.2	0.2	0.4	<0.1	<0.1
* (S) Benzo(g,h,i)perylene	mg/kg	<0.1	0.7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Chrysene	mg/kg	<0.1	1.9	0.6	<0.1	0.7	0.2	0.4	0.5	<0.1	0.4
* (S) Di-benzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Indeno(1,2,3-cd)pyrene	mg/kg	<0.1	0.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Fluoranthene	mg/kg	<0.1	3.6	0.8	<0.1	0.9	0.3	0.5	0.9	0.3	0.6
* (S) Fluorene	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Naphthalene	mg/kg	<0.1	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
* (S) Phenanthrene	mg/kg	<0.1	1.4	0.5	<0.1	0.3	0.2	0.3	0.3	0.2	0.2
* (S) Pyrene	mg/kg	<0.1	3.0	0.7	<0.1	0.8	0.2	0.4	0.8	0.3	0.5
*											
* Total US EPA 16 PAH	mg/kg	<0.1	20.0	4.7	<0.1	5.8	2.2	3.0	4.8	2.0	2.6
*											
* OTHER PAH's											
* Anthanthrene	mg/kg										
* Benzo(e)pyrene	mg/kg										
* Cyclopenta(cd)pyrene	mg/kg										
*											
* GENERAL INORGANICS											
* Complex Cyanide	mg/kg										
* Easily Liberatable Cyanide (free)	mg/kg										
* Thiocyanate	mg/kg										
* Total Cyanide	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
*											
* Sulphide	mg/kg	3.2	2.3	2.8	9.0	<2	4.6	18.9	<2	<2	8.3
* Sulphur (free)	mg/kg	30	350	190	20	30	130	120	<20	20	40
* Total Sulphate	mg/kg	100	400	1500	500	100	100	100	800	100	<100
* Water Soluble Sulphate	mg/kg										
*											
* Water Soluble Chloride	mg/kg										
* Water Soluble Phosphate	mg/kg										
*											
* Exchangeable Ammonium	mg/kg	75.6	24.8	122.6	110.9	36.7	12.5	12.4	75.0	86.9	24.9
* Water Soluble Nitrate	mg/kg										
* Water Soluble Nitrite	mg/kg										

Date Sampled											
Lab Ref. No:		196056	*196057	196058	196059	196060	196061	196062	196063	196064	196065
Customer Ref. No.											
Sample Type											
Trial Pit / Borehole No.		TP207	TP207	TP203 (B)	TP203 (B)	TP208	TP208	TP208	TP208	TP217	TP217
Depth (m)		2.00	2.80	0.80	2.30	0.25	0.50	1.65	2.60	0.60	0.90
Hardstanding at Surface (Y/N)											
TPH RBCA CARBON BANDING											
(S) TPH Aliphatic >C_5-C_6	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
(S) TPH Aliphatic >C_6-C_8	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TPH Aliphatic >C_8-C_{10}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{10}-C_{12}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{12}-C_{16}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{16}-C_{21}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{21}-C_{34}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	38
TPH Aliphatic (Total)	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	38
(S) TPH Aromatic >C_5-C_7	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
(S) TPH Aromatic >C_7-C_8	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TPH Aromatic >C_8-C_{10}	mg/kg	*	<5	<5	<5	<5	*	<5	<5	<5	<5
TPH Aromatic >C_{10}-C_{12}	mg/kg	*	<5	<5	<5	<5	*	<5	<5	<5	<5
TPH Aromatic >C_{12}-C_{16}	mg/kg	*	<5	<5	<5	<5	*	<5	<5	<5	<5
TPH Aromatic >C_{16}-C_{21}	mg/kg	*	<5	<5	<5	<5	*	<5	<5	30.8	<5
TPH Aromatic >C_{21}-C_{35}	mg/kg	*	<5	9.7	<5	<5	*	<5	<5	52.7	187.4
TPH Aromatic (Total)	mg/kg	*	<5	10	<5	<5	*	<5	<5	84	187
Organic Matter	%	2.0	1.6	3.3	0.2	1.1	2.6	0.2	0.2	1.3	6.8
(S) Faecal Coliforms	no / g	<100	<100				<100				<100
(S) Faecal Streptococci	no / g	<100	<100				<100				<100
(S) Colstridia	no / g wet wt	<100	<100								200

(S) Subcontracted analysis

*Insufficient sample

Date Sampled											
Lab Ref. No:		196056	196057	196058	196059	196060	196061	196062	196063	196064	196065
Customer Ref. No.											
Sample Type											
Trial Pit / Borehole No.		TP207	TP207	TP203 (B)	TP203 (B)	TP208	TP208	TP208	TP208	TP217	TP217
Depth (m)		2.00	2.80	0.80	2.30	0.25	0.50	1.65	2.60	0.60	0.90
Hardstanding at Surface (Y/N)											
HEAVY METALS/METALLOIDS											
Aluminium	mg/kg										
Antimony	mg/kg										
Arsenic	mg/kg	<5	8.3	<5	5.7	8.1	<5	9.4	<5	8.7	<5
Barium	mg/kg										
Beryllium	mg/kg										
Boron (Water Soluble)	mg/kg	0.8	<0.5	2.1	<0.5	1.4	1.7	<0.5	<0.5	0.7	3.5
Cadmium	mg/kg	<0.5	<0.5	1.1	0.8	<0.5	0.6	<0.5	0.7	1.7	29.6
Chromium (Total)	mg/kg	16	19	48	39	24	23	35	25	58	702
Chromium (Hexavalent)	mg/kg			<2	<2			<2		<2	*
Cobalt	mg/kg										
Copper	mg/kg	11	11	82	22	15	40	28	12	52	457
Germanium	mg/kg										
Lead	mg/kg	21	31	102	26	35	16	26	15	77	303
Mercury	mg/kg	<0.1	0.1	0.8	<0.1	0.1	<0.1	<0.1	<0.1	0.6	7.9
Molybdenum	mg/kg										
Nickel	mg/kg	10	12	14	33	18	28	43	37	17	127
Selenium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.9	0.6	0.8	2.1
Vanadium	mg/kg										
Zinc	mg/kg	85	47	305	73	77	48	67	59	119	1126
ESSENTIAL ELEMENTS											
Calcium	mg/kg										
Iron	mg/kg										
Magnesium	mg/kg										
Manganese	mg/kg										
Potassium	mg/kg										
Sodium	mg/kg										
MONOAROMATICS											
(S) Benzene	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
(S) Toluene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
(S) Ethylbenzene	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
(S) Meta & Para Xylene	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ortho Xylene	mg/kg										
Total Xylenes	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
(S) MTBE	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2,4-Trimethylbenzene	mg/kg										
1,3,5-Trimethylbenzene	mg/kg										
TOTAL HYDROCARBONS											
Petroleum Range Organics (C_6-C_{10})	mg/kg										
Diesel Range Organics (C_6-C_{28})	mg/kg										
Hydrocarbon Screen (GC-FID)	mg/kg										
VOCs											
1,1,1-Trichloroethane	mg/kg										
1,1,2,2-Tetrachloroethane	mg/kg										
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg										
1,1,2-Trichloroethane	mg/kg										
1,1-Dichloroethane	mg/kg										
1,1-Dichloroethene	mg/kg										
1,2,3-Trichloropropane	mg/kg										
1,2,3-Trimethylbenzene	mg/kg										
1,2,4-Trichlorobenzene	mg/kg										
1,2,4-Trimethylbenzene	mg/kg										
1,2-Dibromo-3-Chloropropane	mg/kg										
1,2-Dichlorobenzene	mg/kg										
1,2-Dichloroethane	mg/kg										
1,2-Dichloropropane	mg/kg										
1,2-Dichloropropene	mg/kg										
1,3,5-Trimethylbenzene	mg/kg										
1,3-Dichlorobenzene	mg/kg										

Date Sampled											
Lab Ref. No:		196056	196057	196058	196059	196060	196061	196062	196063	196064	196065
Customer Ref. No.											
Sample Type											
Trial Pit / Borehole No.		TP207	TP207	TP203 (B)	TP203 (B)	TP208	TP208	TP208	TP208	TP217	TP217
Depth (m)		2.00	2.80	0.80	2.30	0.25	0.50	1.65	2.60	0.60	0.90
Hardstanding at Surface (Y/N)											
pH	Value	7.7	7.7	7.8	7.8	8.4	8.2	8.0	7.9	8.0	7.5
% Loss on Ignition	%										
% Moisture	%										
% Stones	%										
Asbestos	%									<0.001	
PHENOLICS											
Butyl Phenols	mg/kg										
Catechol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cresols (sum)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Naphthols	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Resorcinol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Trimethylphenol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylenols & Ethylphenols	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Phenols	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
US EPA PRIORITY PAH's											
(S) Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
(S) Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1
(S) Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1
(S) Benzo(a)Anthracene	mg/kg	<0.1	<0.1	0.3	<0.1	0.1	0.1	<0.1	<0.1	0.6	0.3
(S) Benzo(a)pyrene	mg/kg	<0.1	<0.1	0.4	<0.1	0.2	0.2	<0.1	<0.1	1.0	0.4
(S) Benzo(b)fluoranthene	mg/kg	<0.1	<0.1	0.4	<0.1	0.2	0.3	<0.1	<0.1	1.2	<0.1
(S) Benzo(k)fluoranthene	mg/kg	<0.1	<0.1	0.3	<0.1	0.2	0.1	<0.1	<0.1	0.5	<0.1
(S) Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
(S) Chrysene	mg/kg	<0.1	<0.1	0.3	<0.1	0.1	0.2	<0.1	<0.1	0.8	0.3
(S) Di-benzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
(S) Indeno(1,2,3-cd)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
(S) Fluoranthene	mg/kg	0.1	<0.1	0.5	<0.1	0.3	0.2	<0.1	<0.1	0.9	0.6
(S) Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
(S) Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	0.1	0.2
(S) Phenanthrene	mg/kg	<0.1	<0.1	0.2	<0.1	0.2	0.3	<0.1	<0.1	0.4	0.3
(S) Pyrene	mg/kg	0.1	<0.1	0.4	<0.1	<0.1	0.1	<0.1	<0.1	0.9	0.5
Total US EPA 16 PAH	mg/kg	0.2	<0.1	2.8	<0.1	1.3	1.7	<0.1	<0.1	6.6	2.8
OTHER PAH's											
Anthanthrene	mg/kg										
Benzo(e)pyrene	mg/kg										
Cyclopenta(cd)pyrene	mg/kg										
GENERAL INORGANICS											
Complex Cyanide	mg/kg										
Easily Liberatable Cyanide (free)	mg/kg										
Thiocyanate	mg/kg										
Total Cyanide	mg/kg	<1	<1	<1	<1	<1	<1	7.5	<1	1.3	1.4
Sulphide	mg/kg	6.1	<2	<2	<2	<2	<2	<2	<2	12.5	<2
Sulphur (free)	mg/kg	70	<20	<20	<20	<20	20	<20	<20	<20	<20
Total Sulphate	mg/kg	100	100	100	700	100	1000	100	2200	<100	1000
Water Soluble Sulphate	mg/kg										
Water Soluble Chloride	mg/kg										
Water Soluble Phosphate	mg/kg										
Exchangeable Ammonium	mg/kg	75.0	37.1	12.4	37.4	12.4	12.4	12.5	<5	24.8	<5
Water Soluble Nitrate	mg/kg										
Water Soluble Nitrite	mg/kg										

Date Sampled											
Lab Ref. No:		196046	196047	196048	196049	196050	196051	196052	196053	196054	196055
Customer Ref. No.											
Sample Type											
Trial Pit / Borehole No.		HP1	HP1	HP1	HP1	HP1	HP2	HP2	TP207	TP207	TP207
Depth (m)		0.35	1.00	2.00	2.50	3.20	0.50	1.20	0.30	0.80	1.50
Hardstanding at Surface (Y/N)											
TPH RBCA CARBON BANDING											
(S) TPH Aliphatic >C_5-C_6	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
(S) TPH Aliphatic >C_6-C_8	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TPH Aliphatic >C_8-C_{10}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{10}-C_{12}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{12}-C_{16}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{16}-C_{21}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic >C_{21}-C_{34}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aliphatic (Total)	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
(S) TPH Aromatic >C_5-C_7	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
(S) TPH Aromatic >C_7-C_8	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TPH Aromatic >C_8-C_{10}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aromatic >C_{10}-C_{12}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aromatic >C_{12}-C_{16}	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH Aromatic >C_{16}-C_{21}	mg/kg	<5	<5	<5	<5	<5	86.7	<5	<5	<5	<5
TPH Aromatic >C_{21}-C_{35}	mg/kg	<5	<5	<5	<5	<5	183.1	<5	<5	<5	<5
TPH Aromatic (Total)	mg/kg	<5	<5	<5	<5	<5	270	<5	<5	<5	<5
Organic Matter	%	1.2	1.6	0.4	0.2	0.1	1.4	0.1	0.6	0.4	1.5
(S) Faecal Coliforms	no / g		<100								
(S) Faecal Streptococci	no / g		<100								
(S) Colstridia	no / g wet wt										

(S) Subcontracted analysis

*Insufficient sample

Date Sampled										
Lab Ref. No:		196046	196047	196048	196049	196050	196051	196052	196053	196054	196055
Customer Ref. No.											
Sample Type											
Trial Pit / Borehole No.		HP1	HP1	HP1	HP1	HP1	HP2	HP2	TP207	TP207	TP207
Depth (m)		0.35	1.00	2.00	2.50	3.20	0.50	1.20	0.30	0.80	1.50
Hardstanding at Surface (Y/N)											
HEAVY METALS/METALLOIDS											
Aluminium	mg/kg										
Antimony	mg/kg										
Arsenic	mg/kg	<5	<5	<5	7.7	6.9	<5	<5	5.1	5.1	<5
Barium	mg/kg										
Beryllium	mg/kg										
Boron (Water Soluble)	mg/kg	<0.5	0.9	0.5	0.8	0.9	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	mg/kg	0.6	0.6	<0.5	0.6	0.8	<0.5	<0.5	0.6	0.5	0.9
Chromium (Total)	mg/kg	25	18	12	20	28	20	12	20	23	18
Chromium (Hexavalent)	mg/kg					<2					
Cobalt	mg/kg										
Copper	mg/kg	17	12	7	8	11	16	5	14	14	14
Germanium	mg/kg										
Lead	mg/kg	42	63	15	10	14	37	<10	21	18	27
Mercury	mg/kg	0.2	0.2	<0.1	<0.1	<0.1	0.3	<0.1	0.1	0.1	0.2
Molybdenum	mg/kg										
Nickel	mg/kg	15	8	5	14	28	10	10	13	7	7
Selenium	mg/kg	0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	0.9	0.8	<0.5
Vanadium	mg/kg										
Zinc	mg/kg	56	52	33	33	49	54	22	37	20	57
ESSENTIAL ELEMENTS											
Calcium	mg/kg										
Iron	mg/kg										
Magnesium	mg/kg										
Manganese	mg/kg										
Potassium	mg/kg										
Sodium	mg/kg										
MONOAROMATICS											
(S) Benzene	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
(S) Toluene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
(S) Ethylbenzene	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
(S) Meta & Para Xylene	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ortho Xylene	mg/kg										
Total Xylenes	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
(S) MTBE	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2,4-Trimethylbenzene	mg/kg										
1,3,5-Trimethylbenzene	mg/kg										
TOTAL HYDROCARBONS											
Petroleum Range Organics (C_6-C_{10})	mg/kg										
Diesel Range Organics (C_6-C_{28})	mg/kg										
Hydrocarbon Screen (GC-FID)	mg/kg										
VOCs											
1,1,1-Trichloroethane	mg/kg										
1,1,2,2-Tetrachloroethane	mg/kg										
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg										
1,1,2-Trichloroethane	mg/kg										
1,1-Dichloroethane	mg/kg										
1,1-Dichloroethene	mg/kg										
1,2,3-Trichloropropane	mg/kg										
1,2,3-Trimethylbenzene	mg/kg										
1,2,4-Trichlorobenzene	mg/kg										
1,2,4-Trimethylbenzene	mg/kg										
1,2-Dibromo-3-Chloropropane	mg/kg										
1,2-Dichlorobenzene	mg/kg										
1,2-Dichloroethane	mg/kg										
1,2-Dichloropropane	mg/kg										
1,2-Dichloropropene	mg/kg										
1,3,5-Trimethylbenzene	mg/kg										
1,3-Dichlorobenzene	mg/kg										

White Young Green Environmental
R70657 - Reading East Additional SI

Date Sampled									
Lab Ref. No:		196046	196047	196048	196049	196050	196051	196052	196053
Customer Ref. No.									
Sample Type									
Trial Pit / Borehole No.		HP1	HP1	HP1	HP1	HP1	HP2	HP2	TP207
Depth (m)		0.35	1.00	2.00	2.50	3.20	0.50	1.20	0.30
Hardstanding at Surface (Y/N)									
pH	Value	8.1	7.5	8.1	8.0	8.0	8.0	8.4	8.2
% Loss on Ignition	%								
% Moisture	%								
% Stones	%								
Asbestos	%	<0.001					<0.001		
PHENOLICS									
Butyl Phenols	mg/kg								
Catechol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cresols (sum)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Naphthols	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Resorcinol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Trimethylphenol	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylenols & Ethylphenols	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Phenols	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
US EPA PRIORITY PAH's									
(S) Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
(S) Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1	0.1	<0.1	<0.1
(S) Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	0.7	1.0	<0.1	<0.1
(S) Benzo(a)Anthracene	mg/kg	0.2	<0.1	<0.1	<0.1	1.2	7.1	<0.1	<0.1
(S) Benzo(a)pyrene	mg/kg	0.4	<0.1	<0.1	<0.1	1.3	8.9	<0.1	<0.1
(S) Benzo(b)fluoranthene	mg/kg	0.3	<0.1	<0.1	<0.1	1.5	9.5	<0.1	<0.1
(S) Benzo(k)fluoranthene	mg/kg	0.3	<0.1	<0.1	<0.1	0.7	3.1	<0.1	<0.1
(S) Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.4	1.5	<0.1	<0.1
(S) Chrysene	mg/kg	0.2	<0.1	<0.1	<0.1	1.3	7.2	<0.1	<0.1
(S) Di-benzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2	0.5	<0.1	<0.1
(S) Indeno(1,2,3-cd)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.6	1.4	<0.1	<0.1
(S) Fluoranthene	mg/kg	0.3	<0.1	<0.1	<0.1	2.4	12.8	<0.1	<0.1
(S) Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2	0.2	<0.1	<0.1
(S) Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1
(S) Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	2.0	2.2	<0.1	<0.1
(S) Pyrene	mg/kg	0.2	<0.1	<0.1	<0.1	1.9	12.7	<0.1	<0.1
Total US EPA 16 PAH	mg/kg	2.1	<0.1	<0.1	<0.1	14.5	68.5	<0.1	<0.1
OTHER PAH's									
Anthanthrene	mg/kg								
Benzo(e)pyrene	mg/kg								
Cyclopenta(cd)pyrene	mg/kg								
GENERAL INORGANICS									
Complex Cyanide	mg/kg								
Easily Liberatable Cyanide (free)	mg/kg								
Thiocyanate	mg/kg								
Total Cyanide	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1
Sulphide	mg/kg	<2	<2	<2	<2	<2	<2	<2	<2
Sulphur (free)	mg/kg	<20	<20	<20	<20	20	<20	<20	<20
Total Sulphate	mg/kg	100	100	100	<100	<100	<100	100	100
Water Soluble Sulphate	mg/kg								
Water Soluble Chloride	mg/kg								
Water Soluble Phosphate	mg/kg								
Exchangeable Ammonium	mg/kg	12.6	100.8	<5	<5	25.1	<5	62.4	24.7
Water Soluble Nitrate	mg/kg								
Water Soluble Nitrite	mg/kg								

Date Sampled									
Lab Ref. No:		196047	196051	196054	196056	196057	196058	196061	196065
Customer Ref. No.									
Sample Type									
Trial Pit / Borehole No.		HP1	HP2	TP207	TP207	TP207	TP203 (B)	TP208	TP217
Depth (m)		1.00	0.50	0.80	2.00	2.80	0.80	0.50	0.90
pH	Value	7.2	7.1	7.4	6.8	6.9	6.9	7.2	6.9
TOC	mg/l								
Electrical Cond. (µS/cm)	µS/cm								
PHENOLICS									
Butyl Phenols	ug/l								
Catechol	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cresols (sum)	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Naphthols	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenol	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Resorcinol	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Trimethylphenol	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylenols & Ethylphenols	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Phenols	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
US EPA PRIORITY PAH's									
Acenaphthene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)Anthracene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Di-benzo(a,h)anthracene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluorene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Naphthalene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Pyrene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total US EPA 16 PAH	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
OTHER PAH's									
Anthanthrene	ug/l								
Benzo(e)pyrene	ug/l								
Cyclopenta(cd)pyrene	ug/l								
GENERAL INORGANICS									
Complex Cyanide	ug/l								
Easily Liberatable Cyanide (free)	ug/l								
Thiocyanate	ug/l								
Total Cyanide	ug/l	11	<5	<5	<5	<5	<5	<5	13
Sulphide	ug/l	173	210	103	<100	123	<100	<100	<100
Sulphur (free)	ug/l								
Sulphate	ug/l	24454	20335	20023	54014	21602	29978	30376	37149
Chloride	ug/l								
Phosphate	ug/l								
Exchangeable Ammonium	ug/l	1368	<100	<100	3500	1582	<100	936	<100
Nitrate	ug/l								
Nitrite	ug/l								

Date Sampled									
Lab Ref. No:		196047	196051	196054	196056	196057	196058	196061	196065
Customer Ref. No.									
Sample Type									
Trial Pit / Borehole No.		HP1	HP2	TP207	TP207	TP207	TP203 (B)	TP208	TP217
Depth (m)		1.00	0.50	0.80	2.00	2.80	0.80	0.50	0.90
HEAVY METALS/METALLOIDS									
Aluminium	ug/l								
Antimony	ug/l								
Arsenic	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Barium	ug/l								
Beryllium	ug/l								
Boron	ug/l	111	<20	<20	112	25	49	62	71
Cadmium	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chromium (Dissolved)	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Chromium (Hexavalent)	ug/l								
Cobalt	ug/l								
Copper	ug/l	13	13	3	9	6	17	6	19
Germanium	ug/l								
Lead	ug/l	<1	19	<1	2	4	<1	<1	<1
Mercury	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	ug/l								
Nickel	ug/l	<20	<20	<20	<20	<20	<20	<20	<20
Selenium	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Vanadium	ug/l								
Zinc	ug/l	19	42	18	30	19	24	21	25
ESSENTIAL ELEMENTS									
Calcium	ug/l								
Iron	ug/l								
Magnesium	ug/l								
Manganese	ug/l								
Potassium	ug/l								
Sodium	ug/l								
MONOAROMATICS									
Benzene	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Toluene	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Ethylbenzene	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Meta & Para Xylene	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Ortho Xylene	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Total Xylenes	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
MTBE	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
1,2,4-Trimethylbenzene	ug/l								
1,3,5-Trimethylbenzene	ug/l								
TOTAL HYDROCARBONS									
Petroleum Range Organics (C_6-C_{10})	ug/l								
Diesel Range Organics (C_6-C_{28})	ug/l								
Hydrocarbon Screen (GC-FID)	ug/l								
VOC's									
1,1,1-Trichloroethane	ug/l								
1,1,2,2-Tetrachloroethane	ug/l								
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/l								
1,1,2-Trichloroethane	ug/l								
1,1-Dichloroethane	ug/l								
1,1-Dichloroethene	ug/l								
1,2,3-Trichloropropane	ug/l								
1,2,3-Trimethylbenzene	ug/l								
1,2,4-Trichlorobenzene	ug/l								
1,2,4-Trimethylbenzene	ug/l								
1,2-Dibromo-3-Chloropropane	ug/l								
1,2-Dichlorobenzene	ug/l								
1,2-Dichloroethane	ug/l								
1,2-Dichloropropane	ug/l								
1,2-Dichloropropene	ug/l								
1,3,5-Trimethylbenzene	ug/l								
1,3-Dichlorobenzene	ug/l								
1,3-Dichloropropane	ug/l								
1,4-Dichlorobenzene	ug/l								
1-Chlorotoluene	ug/l								
1-Methylpropylbenzene	ug/l								

Date Sampled									
Lab Ref. No:		196047	196051	196054	196056	196057	196058	196061	196065
Customer Ref. No.									
Sample Type									
Trial Pit / Borehole No.		HP1	HP2	TP207	TP207	TP207	TP203 (B)	TP208	TP217
Depth (m)		1.00	0.50	0.80	2.00	2.80	0.80	0.50	0.90
TPH Aliphatic >C_5-C_6	µg/l	<10	<10	<10	<10	<10	<10	<10	<10
TPH Aliphatic >C_6-C_8	µg/l	<10	<10	<10	<10	<10	<10	<10	<10
TPH Aliphatic >C_8-C_{10}	µg/l	<100	<100	<100	<100	<100	<100	<100	<100
TPH Aliphatic >C_{10}-C_{12}	µg/l	<100	<100	<100	<100	<100	<100	<100	<100
TPH Aliphatic >C_{12}-C_{16}	µg/l	<100	<100	<100	<100	<100	<100	<100	<100
TPH Aliphatic >C_{16}-C_{21}	µg/l	<100	<100	<100	<100	<100	<100	<100	<100
TPH Aliphatic >C_{21}-C_{34}	µg/l	<100	<100	<100	<100	<100	<100	<100	<100
TPH Aliphatic (Total)	µg/l	<100	<100	<100	<100	<100	<100	<100	<100
TPH Aromatic >C_5-C_7	µg/l	<10	<10	<10	<10	<10	<10	<10	<10
TPH Aromatic >C_7-C_8	µg/l	<10	<10	<10	<10	<10	<10	<10	<10
TPH Aromatic >C_8-C_{10}	µg/l	<100	<100	<100	<100	<100	<100	<100	<100
TPH Aromatic >C_{10}-C_{12}	µg/l	<100	<100	<100	<100	<100	<100	<100	<100
TPH Aromatic >C_{12}-C_{16}	µg/l	<100	<100	<100	<100	<100	<100	<100	<100
TPH Aromatic >C_{16}-C_{21}	µg/l	<100	<100	<100	<100	<100	<100	230	<100
TPH Aromatic >C_{21}-C_{35}	µg/l	<100	<100	<100	<100	<100	<100	2930	<100
TPH Aromatic (Total)	µg/l	<100	<100	<100	<100	<100	<100	3160	<100
Alkalinity	mgCaCO3/l	33	44	67	39	41	31	46	95

Date Sampled									
Lab Ref. No:		196068	196072	196075	196077	196080	196082	196084	196085
Customer Ref. No.									
Sample Type									
Trial Pit / Borehole No.		TP213	TP212	TP216	TP216	TP214	TP211	TP211	HP3
Depth (m)		1.80	0.80	1.00	4.40	1.50	0.50	3.90	0.70
pH	Value	7.0	7.6	7.9	7.4	7.1	7.3	7.7	7.1
TOC	mg/l								
Electrical Cond. (µS/cm)	µS/cm								
PHENOLICS									
Butyl Phenols	ug/l								
Catechol	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cresols (sum)	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Naphthols	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenol	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Resorcinol	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Trimethylphenol	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylenols & Ethylphenols	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Phenols	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
US EPA PRIORITY PAH's									
Acenaphthene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)Anthracene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Di-benzo(a,h)anthracene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluorene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Naphthalene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Pyrene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total US EPA 16 PAH	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
OTHER PAH's									
Anthanthrene	ug/l								
Benzo(e)pyrene	ug/l								
Cyclopenta(cd)pyrene	ug/l								
GENERAL INORGANICS									
Complex Cyanide	ug/l								
Easily Liberatable Cyanide (free)	ug/l								
Thiocyanate	ug/l								
Total Cyanide	ug/l	7	11	7	13	11	11	9	<5
Sulphide	ug/l	107	<100	<100	<100	<100	<100	<100	<100
Sulphur (free)	ug/l								
Sulphate	ug/l	97681	27125	21536	25093	61424	20692	67014	20302
Chloride	ug/l								
Phosphate	ug/l								
Exchangeable Ammonium	ug/l	4642	111	850	5302	<100	<100	16937	<100
Nitrate	ug/l								
Nitrite	ug/l								

Date Sampled									
Lab Ref. No:		196068	196072	196075	196077	196080	196082	196084	196085
Customer Ref. No.									
Sample Type									
Trial Pit / Borehole No.		TP213	TP212	TP216	TP216	TP214	TP211	TP211	HP3
Depth (m)		1.80	0.80	1.00	4.40	1.50	0.50	3.90	0.70
HEAVY METALS/METALLOIDS									
Aluminium	ug/l								
Antimony	ug/l								
Arsenic	ug/l	<10	<10	<10	<10	<10	<10	15	<10
Barium	ug/l								
Beryllium	ug/l								
Boron	ug/l	275	73	48	88	95	<20	542	44
Cadmium	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chromium (Dissolved)	ug/l	<5	<5	<5	<5	<5	<5	5	<5
Chromium (Hexavalent)	ug/l								
Cobalt	ug/l								
Copper	ug/l	17	9	5	23	9	10	48	4
Germanium	ug/l								
Lead	ug/l	2	1	<1	<1	<1	1	6	<1
Mercury	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1
Molybdenum	ug/l								
Nickel	ug/l	<20	<20	<20	<20	<20	<20	50	<20
Selenium	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Vanadium	ug/l								
Zinc	ug/l	60	18	17	21	23	20	81	18
ESSENTIAL ELEMENTS									
Calcium	ug/l								
Iron	ug/l								
Magnesium	ug/l								
Manganese	ug/l								
Potassium	ug/l								
Sodium	ug/l								
MONOAROMATICS									
Benzene	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Toluene	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Ethylbenzene	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Meta & Para Xylene	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Ortho Xylene	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Total Xylenes	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
MTBE	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
1,2,4-Trimethylbenzene	ug/l								
1,3,5-Trimethylbenzene	ug/l								
TOTAL HYDROCARBONS									
Petroleum Range Organics (C_6-C_{10})	ug/l								
Diesel Range Organics (C_6-C_{28})	ug/l								
Hydrocarbon Screen (GC-FID)	ug/l								
VOC's									
1,1,1-Trichloroethane	ug/l								
1,1,2,2-Tetrachloroethane	ug/l								
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/l								
1,1,2-Trichloroethane	ug/l								
1,1-Dichloroethane	ug/l								
1,1-Dichloroethene	ug/l								
1,2,3-Trichloropropane	ug/l								
1,2,3-Trimethylbenzene	ug/l								
1,2,4-Trichlorobenzene	ug/l								
1,2,4-Trimethylbenzene	ug/l								
1,2-Dibromo-3-Chloropropane	ug/l								
1,2-Dichlorobenzene	ug/l								
1,2-Dichloroethane	ug/l								
1,2-Dichloropropane	ug/l								
1,2-Dichloropropene	ug/l								
1,3,5-Trimethylbenzene	ug/l								
1,3-Dichlorobenzene	ug/l								
1,3-Dichloropropane	ug/l								
1,4-Dichlorobenzene	ug/l								
1-Chlorotoluene	ug/l								
1-Methylpropylbenzene	ug/l								

Date Sampled									
Lab Ref. No:		196068	196072	196075	196077	196080	196082	196084	196085
Customer Ref. No.									
Sample Type									
Trial Pit / Borehole No.		TP213	TP212	TP216	TP216	TP214	TP211	TP211	HP3
Depth (m)		1.80	0.80	1.00	4.40	1.50	0.50	3.90	0.70
TPH Aliphatic >C_5-C_6	µg/l	<10	<10	<10	<10	<10	<10	<10	<10
TPH Aliphatic >C_6-C_8	µg/l	<10	<10	<10	<10	<10	<10	<10	<10
TPH Aliphatic >C_8-C_{10}	µg/l	<100	<100	<100	<100	<100	<100	<100	<100
TPH Aliphatic >C_{10}-C_{12}	µg/l	<100	<100	<100	<100	<100	<100	<100	<100
TPH Aliphatic >C_{12}-C_{16}	µg/l	<100	<100	<100	<100	<100	<100	<100	<100
TPH Aliphatic >C_{16}-C_{21}	µg/l	<100	<100	<100	<100	<100	<100	<100	<100
TPH Aliphatic >C_{21}-C_{34}	µg/l	<100	<100	<100	<100	<100	<100	<100	<100
TPH Aliphatic (Total)	µg/l	<100	<100	<100	<100	<100	<100	<100	<100
TPH Aromatic >C_5-C_7	µg/l	<10	<10	<10	<10	<10	<10	<10	<10
TPH Aromatic >C_7-C_8	µg/l	<10	<10	<10	<10	<10	<10	<10	<10
TPH Aromatic >C_8-C_{10}	µg/l	<100	<100	<100	<100	<100	<100	<100	<100
TPH Aromatic >C_{10}-C_{12}	µg/l	<100	<100	<100	<100	<100	<100	<100	<100
TPH Aromatic >C_{12}-C_{16}	µg/l	<100	<100	<100	<100	<100	<100	<100	<100
TPH Aromatic >C_{16}-C_{21}	µg/l	<100	<100	<100	<100	<100	<100	<100	<100
TPH Aromatic >C_{21}-C_{35}	µg/l	<100	<100	<100	<100	<100	<100	<100	<100
TPH Aromatic (Total)	µg/l	<100	<100	<100	<100	<100	<100	<100	<100
Alkalinity	mgCaCO3/l	49	44	49	62	49	139	36	33

Date Sampled					
Lab Ref. No:		196089	196094	196097	196099
Customer Ref. No.					
Sample Type					
Trial Pit / Borehole No.		TP204	TP205	TP209	TP209
Depth (m)		1.25	2.80	1.30	2.50
pH	Value	6.8	7.3	7.3	7.3
TOC	mg/l				
Electrical Cond. (µS/cm)	µS/cm				
PHENOLICS					
Butyl Phenols	ug/l				
Catechol	ug/l	<0.1	<0.1	<0.1	<0.1
Cresols (sum)	ug/l	<0.1	<0.1	<0.1	<0.1
Naphthols	ug/l	<0.1	<0.1	<0.1	<0.1
Phenol	ug/l	<0.1	<0.1	<0.1	<0.1
Resorcinol	ug/l	<0.1	<0.1	<0.1	<0.1
Trimethylphenol	ug/l	<0.1	<0.1	<0.1	<0.1
Xylenols & Ethylphenols	ug/l	<0.1	<0.1	<0.1	<0.1
Total Phenols	ug/l	<0.5	<0.5	<0.5	<0.5
US EPA PRIORITY PAH's					
Acenaphthene	ug/l	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	ug/l	<0.01	<0.01	<0.01	<0.01
Anthracene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(a)Anthracene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	ug/l	<0.01	<0.01	<0.01	<0.01
Chrysene	ug/l	<0.01	<0.01	<0.01	<0.01
Di-benzo(a,h)anthracene	ug/l	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	ug/l	<0.01	<0.01	<0.01	<0.01
Fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Fluorene	ug/l	<0.01	<0.01	<0.01	<0.01
Naphthalene	ug/l	<0.01	<0.01	<0.01	<0.01
Phenanthrene	ug/l	<0.01	<0.01	<0.01	<0.01
Pyrene	ug/l	<0.01	<0.01	<0.01	<0.01
Total US EPA 16 PAH	ug/l	<0.01	<0.01	<0.01	<0.01
OTHER PAH's					
Anthanthrene	ug/l				
Benzo(e)pyrene	ug/l				
Cyclopenta(cd)pyrene	ug/l				
GENERAL INORGANICS					
Complex Cyanide	ug/l				
Easily Liberatable Cyanide (free)	ug/l				
Thiocyanate	ug/l				
Total Cyanide	ug/l	7	9	<5	<5
Sulphide	ug/l	<100	<100	<100	<100
Sulphur (free)	ug/l				
Sulphate	ug/l	24489	28326	20143	26046
Chloride	ug/l				
Phosphate	ug/l				
Exchangeable Ammonium	ug/l	963	153	601	<100
Nitrate	ug/l				
Nitrite	ug/l				

Date Sampled					
Lab Ref. No:		196089	196094	196097	196099
Customer Ref. No.					
Sample Type					
Trial Pit / Borehole No.		TP204	TP205	TP209	TP209
Depth (m)		1.25	2.80	1.30	2.50
HEAVY METALS/METALLOIDS					
Aluminium	ug/l				
Antimony	ug/l				
Arsenic	ug/l	<10	<10	<10	<10
Barium	ug/l				
Beryllium	ug/l				
Boron	ug/l	50	55	32	54
Cadmium	ug/l	<1	<1	<1	<1
Chromium (Dissolved)	ug/l	<5	<5	<5	<5
Chromium (Hexavalent)	ug/l				
Cobalt	ug/l				
Copper	ug/l	5	6	2	5
Germanium	ug/l				
Lead	ug/l	<1	<1	<1	<1
Mercury	ug/l	<0.1	<0.1	<0.1	<0.1
Molybdenum	ug/l				
Nickel	ug/l	<20	<20	<20	<20
Selenium	ug/l	<10	<10	<10	<10
Vanadium	ug/l				
Zinc	ug/l	23	17	17	21
ESSENTIAL ELEMENTS					
Calcium	ug/l				
Iron	ug/l				
Magnesium	ug/l				
Manganese	ug/l				
Potassium	ug/l				
Sodium	ug/l				
MONOAROMATICS					
Benzene	ug/l	<10	<10	<10	<10
Toluene	ug/l	<10	<10	<10	<10
Ethylbenzene	ug/l	<10	<10	<10	<10
Meta & Para Xylene	ug/l	<10	<10	<10	<10
Ortho Xylene	ug/l	<10	<10	<10	<10
Total Xylenes	ug/l	<10	<10	<10	<10
MTBE	ug/l	<10	<10	<10	<10
1,2,4-Trimethylbenzene	ug/l				
1,3,5-Trimethylbenzene	ug/l				
TOTAL HYDROCARBONS					
Petroleum Range Organics (C_6-C_{10})	ug/l				
Diesel Range Organics (C_6-C_{28})	ug/l				
Hydrocarbon Screen (GC-FID)	ug/l				
VOC's					
1,1,1-Trichloroethane	ug/l				
1,1,2,2-Tetrachloroethane	ug/l				
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/l				
1,1,2-Trichloroethane	ug/l				
1,1-Dichloroethane	ug/l				
1,1-Dichloroethene	ug/l				
1,2,3-Trichloropropane	ug/l				
1,2,3-Trimethylbenzene	ug/l				
1,2,4-Trichlorobenzene	ug/l				
1,2,4-Trimethylbenzene	ug/l				
1,2-Dibromo-3-Chloropropane	ug/l				
1,2-Dichlorobenzene	ug/l				
1,2-Dichloroethane	ug/l				
1,2-Dichloropropane	ug/l				
1,2-Dichloropropene	ug/l				
1,3,5-Trimethylbenzene	ug/l				
1,3-Dichlorobenzene	ug/l				
1,3-Dichloropropane	ug/l				
1,4-Dichlorobenzene	ug/l				
1-Chlorotoluene	ug/l				
1-Methylpropylbenzene	ug/l				

Date Sampled					
Lab Ref. No:		196089	196094	196097	196099
Customer Ref. No.					
Sample Type					
Trial Pit / Borehole No.		TP204	TP205	TP209	TP209
Depth (m)		1.25	2.80	1.30	2.50
TPH Aliphatic >C_5-C_6	µg/l	<10	<10	<10	<10
TPH Aliphatic >C_6-C_8	µg/l	<10	<10	<10	<10
TPH Aliphatic >C_8-C_{10}	µg/l	<100	<100	<100	<100
TPH Aliphatic >C_{10}-C_{12}	µg/l	<100	<100	<100	<100
TPH Aliphatic >C_{12}-C_{16}	µg/l	<100	<100	<100	<100
TPH Aliphatic >C_{16}-C_{21}	µg/l	<100	<100	<100	<100
TPH Aliphatic >C_{21}-C_{34}	µg/l	<100	<100	<100	<100
TPH Aliphatic (Total)	µg/l	<100	<100	<100	<100
TPH Aromatic >C_5-C_7	µg/l	<10	<10	<10	<10
TPH Aromatic >C_7-C_8	µg/l	<10	<10	<10	<10
TPH Aromatic >C_8-C_{10}	µg/l	<100	<100	<100	<100
TPH Aromatic >C_{10}-C_{12}	µg/l	<100	<100	<100	<100
TPH Aromatic >C_{12}-C_{16}	µg/l	<100	<100	<100	<100
TPH Aromatic >C_{16}-C_{21}	µg/l	<100	<100	<100	<100
TPH Aromatic >C_{21}-C_{35}	µg/l	<100	<100	<100	<100
TPH Aromatic (Total)	µg/l	<100	<100	<100	<100
Alkalinity	mgCaCO3/l	80	49	28	39

White Young Green Environmental
R70821 - Reading, Manor Farm STW

Date Sampled		16/03/04	16/03/04	16/03/04	16/03/04	16/03/04	16/03/04	16/03/04
Lab Ref. No:		1971158	1971159	1971160	1971161	197162	197163	197164
Customer Ref. No.								
Sample Type		W	W	W	W	W	W	W
Trial Pit / Borehole No.		SW1	SW5	SW6	SW4	BH103G	BH103C	BH3R
pH	Value					7.6	7.2	7.4
TOC	mg/l							
Suspended Solids	mg/l	<5	26	18	8			
Electrical Cond. (µS/cm)	µS/cm							
PHENOLICS								
Butyl Phenols	µg/l							
Catechol	µg/l					<0.1	<0.1	<0.1
Cresols (sum)	µg/l					<0.1	<0.1	<0.1
Naphthols	µg/l					<0.1	<0.1	<0.1
Phenol	µg/l					<0.1	<0.1	<0.1
Resorcinol	µg/l					<0.1	<0.1	<0.1
Trimethylphenol	µg/l					<0.1	<0.1	<0.1
Xylenols & Ethylphenols	µg/l					<0.1	<0.1	<0.1
Total Phenols	µg/l					<0.5	<0.5	<0.5
US EPA PRIORITY PAH's								
Acenaphthene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)Anthracene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Di-benzo(a,h)anthracene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoranthene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluorene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Naphthalene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Pyrene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total US EPA 16 PAH	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
OTHER PAH's								
Anthanthrene	µg/l							
Benzo(e)pyrene	µg/l							
Cyclopenta(cd)pyrene	µg/l							
GENERAL INORGANICS								
Complex Cyanide	µg/l							
Easily Liberatable Cyanide (free)	µg/l							
Thiocyanate	µg/l							
Total Cyanide	µg/l							
Sulphide	µg/l					<100	<100	<100
Sulphur (free)	µg/l							
Sulphate	µg/l					41196	63294	24176
Chloride	µg/l							
Phosphate	µg/l	<5000	<5000	<5000	<5000			
Exchangeable Ammonium	µg/l	<100	2012413	95511	<100	11271	3416	33079
Nitrate	µg/l	33144	68018	28182	27545			
Nitrite	µg/l	<5000	<5000	<5000	<5000			

Date Sampled		16/03/04	16/03/04	16/03/04	16/03/04	16/03/04	16/03/04	16/03/04
Lab Ref. No:		1971158	1971159	1971160	1971161	197162	197163	197164
Customer Ref. No.								
Sample Type		W	W	W	W	W	W	W
Trial Pit / Borehole No.		SW1	SW5	SW6	SW4	BH103G	BH103C	BH3R
HEAVY METALS/METALLOIDS								
Aluminium	µg/l							
Antimony	µg/l							
Arsenic	µg/l					37	<10	<10
Barium	µg/l							
Beryllium	µg/l							
Boron	µg/l					860	387	1449
Cadmium	µg/l					<1	<1	<1
Chromium (Dissolved)	µg/l					<5	<5	<5
Chromium (Hexavalent)	µg/l							
Cobalt	µg/l							
Copper	µg/l					2	1	2
Germanium	µg/l							
Lead	µg/l					<1	<1	<1
Mercury	µg/l					<0.1	<0.1	<0.1
Molybdenum	µg/l							
Nickel	µg/l					<20	<20	<20
Selenium	µg/l					<10	<10	<10
Vanadium	µg/l							
Zinc	µg/l					9	17	18
ESSENTIAL ELEMENTS								
Calcium	µg/l							
Iron	µg/l							
Magnesium	µg/l							
Manganese	µg/l							
Potassium	µg/l							
Sodium	µg/l							
MONOAROMATICS								
Benzene	µg/l					<10	<10	<10
Toluene	µg/l					<10	<10	<10
Ethylbenzene	µg/l					<10	<10	<10
Meta & Para Xylene	µg/l					<10	<10	<10
Ortho Xylene	µg/l					<10	<10	<10
Total Xylenes	µg/l					<10	<10	<10
MTBE	µg/l					<10	<10	<10
1,2,4-Trimethylbenzene	µg/l							
1,3,5-Trimethylbenzene	µg/l							
TOTAL HYDROCARBONS								
Petroleum Range Organics (C_6-C_{10})	µg/l							
Diesel Range Organics (C_8-C_{25})	µg/l							
Hydrocarbon Screen (GC-FID)	µg/l	217	464	<100	132			
VOC's								
1,1,1-Trichloroethane	µg/l							
1,1,2,2-Tetrachloroethane	µg/l							
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l							
1,1,2-Trichloroethane	µg/l							
1,1-Dichloroethane	µg/l							
1,1-Dichloroethene	µg/l							
1,2,3-Trichloropropane	µg/l							
1,2,3-Trimethylbenzene	µg/l							
1,2,4-Trichlorobenzene	µg/l							
1,2,4-Trimethylbenzene	µg/l							
1,2-Dibromo-3-Chloropropane	µg/l							
1,2-Dichlorobenzene	µg/l							
1,2-Dichloroethane	µg/l							
1,2-Dichloropropane	µg/l							
1,2-Dichloropropene	µg/l							
1,3,5-Trimethylbenzene	µg/l							

Date Sampled		16/03/04	16/03/04	16/03/04	16/03/04	16/03/04	16/03/04	16/03/04
Lab Ref. No:		1971158	1971159	1971160	1971161	197162	197163	197164
Customer Ref. No.								
Sample Type		W	W	W	W	W	W	W
Trial Pit / Borehole No.		SW1	SW5	SW6	SW4	BH103G	BH103C	BH3R
TPH RBCA CARBON BANDING								
TPH Aliphatic >C_5-C_6	µg/l					<10	<10	<10
TPH Aliphatic >C_6-C_8	µg/l					<10	<10	<10
TPH Aliphatic >C_8-C_{10}	µg/l					<100	<100	<100
TPH Aliphatic >C_{10}-C_{12}	µg/l					<100	<100	<100
TPH Aliphatic >C_{12}-C_{16}	µg/l					<100	<100	<100
TPH Aliphatic >C_{16}-C_{21}	µg/l					<100	<100	<100
TPH Aliphatic >C_{21}-C_{34}	µg/l					<100	<100	<100
TPH Aliphatic (Total)	µg/l					<100	<100	<100
TPH Aromatic >C_5-C_7	µg/l					<10	<10	<10
TPH Aromatic >C_7-C_8	µg/l					<10	<10	<10
TPH Aromatic >C_8-C_{10}	µg/l					<100	<100	<100
TPH Aromatic >C_{10}-C_{12}	µg/l					<100	<100	<100
TPH Aromatic >C_{12}-C_{16}	µg/l					<100	<100	<100
TPH Aromatic >C_{16}-C_{21}	µg/l					<100	<100	<100
TPH Aromatic >C_{21}-C_{35}	µg/l					<100	<100	<100
TPH Aromatic (Total)	µg/l					<100	<100	<100
Alkalinity	mgCaCO3/l					467	395	483
(S) Faecal Coliforms	no / 100ml	4	21	17	2			
(S) Faecal Streptococci	no / 100ml	1	2	3	1			
BOD	mg/l	32	32	33	32			
Kjeldahl Nitrogen	mg/l	215.7	7066.7	3988.4	163.7			
(S) Dissolved Methane	µg/l	<10	36	24	25			

(S) Subcontracted Analysis

Date Sampled		16/03/04	16/03/04	16/03/04	16/03/04	16/03/04	16/03/04	16/03/04
Lab Ref. No:		197165	197166	197167	197168	197169	197170	Not
Customer Ref. No.								
Sample Type		W	W	W	W	W	W	W
Trial Pit / Borehole No.		BH6R	BH6C	BH9R	BH102R	BH102C	BH1R	BH1C
* pH	Value	7.3	7.3	7.3	7.4	7.3	7.0	
* TOC	mg/l							
* Suspended Solids	mg/l							
* Electrical Cond. (µS/cm)	µS/cm							
*								
* PHENOLICS								
* Butyl Phenols	µg/l							
* Catechol	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
* Cresols (sum)	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
* Naphthols	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
* Phenol	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
* Resorcinol	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
* Trimethylphenol	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
* Xylenols & Ethylphenols	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
*								
* Total Phenols	µg/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
*								
* US EPA PRIORITY PAH's								
* Acenaphthene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
* Acenaphthylene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
* Anthracene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
* Benzo(a)Anthracene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
* Benzo(a)pyrene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
* Benzo(b)fluoranthene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
* Benzo(k)fluoranthene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
* Benzo(g,h,i)perylene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
* Chrysene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
* Di-benzo(a,h)anthracene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
* Indeno(1,2,3-cd)pyrene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
* Fluoranthene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
* Fluorene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
* Naphthalene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
* Phenanthrene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
* Pyrene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
*								
* Total US EPA 16 PAH	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
* OTHER PAH's								
* Anthanthrene	µg/l							
* Benzo(e)pyrene	µg/l							
* Cyclopenta(cd)pyrene	µg/l							
*								
* GENERAL INORGANICS								
* Complex Cyanide	µg/l							
* Easily Liberatable Cyanide (free)	µg/l							
* Thiocyanate	µg/l							
* Total Cyanide	µg/l							
*								
* Sulphide	µg/l	<100	<100	117	<100	<100	<100	
* Sulphur (free)	µg/l							
* Sulphate	µg/l	123359	94991	136132	74841	81855	478844	
*								
* Chloride	µg/l							
* Phosphate	µg/l							
*								
* Exchangeable Ammonium	µg/l	999	7380	1721	9987	7410	4197	
* Nitrate	µg/l							
* Nitrite	µg/l							

Date Sampled		16/03/04	16/03/04	16/03/04	16/03/04	16/03/04	16/03/04	16/03/04
Lab Ref. No:		197165	197166	197167	197168	197169	197170	Not
Customer Ref. No.								
Sample Type		W	W	W	W	W	W	W
Trial Pit / Borehole No.		BH6R	BH6C	BH9R	BH102R	BH102C	BH1R	BH1C
HEAVY METALS/METALLOIDS								
Aluminium	µg/l							
Antimony	µg/l							
Arsenic	µg/l	<10	<10	<10	15	<10	<10	
Barium	µg/l							
Beryllium	µg/l							
Boron	µg/l	560	995	965	872	812	867	
Cadmium	µg/l	<1	<1	<1	<1	<1	<1	
Chromium (Dissolved)	µg/l	<5	<5	<5	<5	<5	<5	
Chromium (Hexavalent)	µg/l							
Cobalt	µg/l							
Copper	µg/l	<1	1	12	2	<1	1	
Germanium	µg/l							
Lead	µg/l	<1	<1	<1	<1	<1	<1	
Mercury	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Molybdenum	µg/l							
Nickel	µg/l	<20	<20	<20	<20	<20	<20	
Selenium	µg/l	<10	<10	<10	<10	<10	<10	
Vanadium	µg/l							
Zinc	µg/l	19	18	20	14	15	34	
ESSENTIAL ELEMENTS								
Calcium	µg/l							
Iron	µg/l							
Magnesium	µg/l							
Manganese	µg/l							
Potassium	µg/l							
Sodium	µg/l							
MONOAROMATICS								
Benzene	µg/l	<10	<10	<10	<10	<10	<10	
Toluene	µg/l	<10	<10	<10	<10	<10	<10	
Ethylbenzene	µg/l	<10	<10	<10	<10	<10	<10	
Meta & Para Xylene	µg/l	<10	<10	<10	<10	<10	<10	
Ortho Xylene	µg/l	<10	<10	<10	<10	<10	<10	
Total Xylenes	µg/l	<10	<10	<10	<10	<10	<10	
MTBE	µg/l	<10	<10	<10	<10	<10	<10	
1,2,4-Trimethylbenzene	µg/l							
1,3,5-Trimethylbenzene	µg/l							
TOTAL HYDROCARBONS								
Petroleum Range Organics (C_6-C_{10})	µg/l							
Diesel Range Organics (C_9-C_{28})	µg/l							
Hydrocarbon Screen (GC-FID)	µg/l							
VOC's								
1,1,1-Trichloroethane	µg/l							
1,1,2,2-Tetrachloroethane	µg/l							
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l							
1,1,2-Trichloroethane	µg/l							
1,1-Dichloroethane	µg/l							
1,1-Dichloroethene	µg/l							
1,2,3-Trichloropropane	µg/l							
1,2,3-Trimethylbenzene	µg/l							
1,2,4-Trichlorobenzene	µg/l							
1,2,4-Trimethylbenzene	µg/l							
1,2-Dibromo-3-Chloropropane	µg/l							
1,2-Dichlorobenzene	µg/l							
1,2-Dichloroethane	µg/l							
1,2-Dichloropropane	µg/l							
1,2-Dichloropropene	µg/l							
1,3,5-Trimethylbenzene	µg/l							

Date Sampled		16/03/04	16/03/04	16/03/04	16/03/04	16/03/04	16/03/04	16/03/04
Lab Ref. No:		197165	197166	197167	197168	197169	197170	Not
Customer Ref. No.								
Sample Type		W	W	W	W	W	W	W
Trial Pit / Borehole No.		BH6R	BH6C	BH9R	BH102R	BH102C	BH1R	BH1C
TPH Aliphatic >C_6-C_8	µg/l	<10	<10	<10	<10	<10	<10	
TPH Aliphatic >C_8-C_{10}	µg/l	<100	<100	<100	<100	<100	<100	
TPH Aliphatic >C_{10}-C_{12}	µg/l	<100	<100	<100	<100	<100	<100	
TPH Aliphatic >C_{12}-C_{16}	µg/l	<100	<100	<100	<100	<100	<100	
TPH Aliphatic >C_{16}-C_{21}	µg/l	<100	<100	<100	<100	<100	<100	
TPH Aliphatic >C_{21}-C_{34}	µg/l	<100	<100	<100	<100	<100	<100	
TPH Aliphatic (Total)	µg/l	<100	<100	<100	<100	<100	<100	
TPH Aromatic >C_5-C_7	µg/l	<10	<10	<10	<10	<10	<10	
TPH Aromatic >C_7-C_8	µg/l	<10	<10	<10	<10	<10	<10	
TPH Aromatic >C_8-C_{10}	µg/l	<100	<100	<100	<100	<100	<100	
TPH Aromatic >C_{10}-C_{12}	µg/l	<100	<100	<100	<100	<100	<100	
TPH Aromatic >C_{12}-C_{16}	µg/l	<100	<100	<100	<100	<100	<100	
TPH Aromatic >C_{16}-C_{21}	µg/l	<100	<100	<100	<100	<100	<100	
TPH Aromatic >C_{21}-C_{35}	µg/l	<100	<100	<100	<100	<100	<100	
TPH Aromatic (Total)	µg/l	<100	<100	<100	<100	<100	<100	
Alkalinity	mgCaCO3/l	426	395	565	478	421	421	
(S) Faecal Coliforms	no / 100ml							
(S) Faecal Streptococci	no / 100ml							
BOD	mg/l							
Kjeldahl Nitrogen	mg/l							
(S) Dissolved Methane	µg/l							

(S) Subcontracted Analysis

White Young Green Environmental
R70821 - Reading, Manor Farm STW

Date Sampled		16/03/04	17/03/04	17/03/04	17/03/04	17/03/04	17/03/04
Lab Ref. No:		Not	Not	197174	197175	197176	197177
Customer Ref. No.							
Sample Type		W	W	W	W	W	W
Trial Pit / Borehole No.		BH1G	BH8	BH201C	BH202R	BH203R	BH204R
pH	Value			7.4	7.9	7.8	6.9
TOC	mg/l						
Suspended Solids	mg/l						
Electrical Cond. (µS/cm)	µS/cm						
PHENOLICS							
Butyl Phenols	µg/l						
Catechol	µg/l			<0.1	<0.1	<0.1	<0.1
Cresols (sum)	µg/l			<0.1	<0.1	<0.1	<0.1
Naphthols	µg/l			<0.1	<0.1	<0.1	<0.1
Phenol	µg/l			<0.1	<0.1	<0.1	<0.1
Resorcinol	µg/l			<0.1	<0.1	<0.1	<0.1
Trimethylphenol	µg/l			<0.1	<0.1	<0.1	<0.1
Xylenols & Ethylphenols	µg/l			<0.1	<0.1	<0.1	<0.1
Total Phenols	µg/l			<0.5	<0.5	<0.5	<0.5
US EPA PRIORITY PAH's							
Acenaphthene	µg/l			<0.01	<0.01	<0.01	<0.01
Acenaphthylene	µg/l			<0.01	<0.01	<0.01	<0.01
Anthracene	µg/l			<0.01	<0.01	<0.01	<0.01
Benzo(a)Anthracene	µg/l			<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	µg/l			<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	µg/l			<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/l			<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/l			<0.01	<0.01	<0.01	<0.01
Chrysene	µg/l			<0.01	<0.01	<0.01	<0.01
Di-benzo(a,h)anthracene	µg/l			<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	µg/l			<0.01	<0.01	<0.01	<0.01
Fluoranthene	µg/l			<0.01	<0.01	<0.01	<0.01
Fluorene	µg/l			<0.01	<0.01	<0.01	<0.01
Naphthalene	µg/l			<0.01	<0.01	<0.01	<0.01
Phenanthrene	µg/l			<0.01	<0.01	<0.01	<0.01
Pyrene	µg/l			<0.01	<0.01	<0.01	<0.01
Total US EPA 16 PAH	µg/l			<0.01	<0.01	<0.01	<0.01
OTHER PAH's							
Anthanthrene	µg/l						
Benzo(e)pyrene	µg/l						
Cyclopenta(cd)pyrene	µg/l						
GENERAL INORGANICS							
Complex Cyanide	µg/l						
Easily Liberatable Cyanide (free)	µg/l						
Thiocyanate	µg/l						
Total Cyanide	µg/l						
Sulphide	µg/l			<100	<100	<100	<100
Sulphur (free)	µg/l						
Sulphate	µg/l			68389	170426	208197	871654
Chloride	µg/l						
Phosphate	µg/l						
Exchangeable Ammonium	µg/l			967	1078	686	4197
Nitrate	µg/l						
Nitrite	µg/l						

Date Sampled		16/03/04	17/03/04	17/03/04	17/03/04	17/03/04	17/03/04
Lab Ref. No:		Not	Not	197174	197175	197176	197177
Customer Ref. No.							
Sample Type		W	W	W	W	W	W
Trial Pit / Borehole No.		BH1G	BH8	BH201C	BH202R	BH203R	BH204R
HEAVY METALS/METALLOIDS							
Aluminium	µg/l						
Antimony	µg/l						
Arsenic	µg/l			<10	<10	<10	22
Barium	µg/l						
Beryllium	µg/l						
Boron	µg/l			246	862	984	2525
Cadmium	µg/l			<1	<1	<1	<1
Chromium (Dissolved)	µg/l			<5	<5	<5	<5
Chromium (Hexavalent)	µg/l						
Cobalt	µg/l						
Copper	µg/l			<1	3	4	3
Germanium	µg/l						
Lead	µg/l			<1	<1	<1	<1
Mercury	µg/l			<0.1	<0.1	<0.1	<0.1
Molybdenum	µg/l						
Nickel	µg/l			<20	<20	<20	123
Selenium	µg/l			<10	<10	<10	<10
Vanadium	µg/l						
Zinc	µg/l			15	19	41	406
ESSENTIAL ELEMENTS							
Calcium	µg/l						
Iron	µg/l						
Magnesium	µg/l						
Manganese	µg/l						
Potassium	µg/l						
Sodium	µg/l						
MONOAROMATICS							
Benzene	µg/l			<10	<10	<10	<10
Toluene	µg/l			<10	<10	<10	<10
Ethylbenzene	µg/l			<10	<10	<10	<10
Meta & Para Xylene	µg/l			<10	<10	<10	<10
Ortho Xylene	µg/l			<10	<10	<10	<10
Total Xylenes	µg/l			<10	<10	<10	<10
MTBE	µg/l			<10	<10	<10	<10
1,2,4-Trimethylbenzene	µg/l						
1,3,5-Trimethylbenzene	µg/l						
TOTAL HYDROCARBONS							
Petroleum Range Organics (C_6-C_{10})	µg/l						
Diesel Range Organics (C_8-C_{25})	µg/l						
Hydrocarbon Screen (GC-FID)	µg/l						
VOC's							
1,1,1-Trichloroethane	µg/l						
1,1,2,2-Tetrachloroethane	µg/l						
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l						
1,1,2-Trichloroethane	µg/l						
1,1-Dichloroethane	µg/l						
1,1-Dichloroethene	µg/l						
1,2,3-Trichloropropane	µg/l						
1,2,3-Trimethylbenzene	µg/l						
1,2,4-Trichlorobenzene	µg/l						
1,2,4-Trimethylbenzene	µg/l						
1,2-Dibromo-3-Chloropropane	µg/l						
1,2-Dichlorobenzene	µg/l						
1,2-Dichloroethane	µg/l						
1,2-Dichloropropane	µg/l						
1,2-Dichloropropene	µg/l						
1,3,5-Trimethylbenzene	µg/l						

Date Sampled		16/03/04	17/03/04	17/03/04	17/03/04	17/03/04	17/03/04
Lab Ref. No:		Not	Not	197174	197175	197176	197177
Customer Ref. No.							
Sample Type		W	W	W	W	W	W
Trial Pit / Borehole No.		BH1G	BH8	BH201C	BH202R	BH203R	BH204R
TPH Aliphatic >C_6-C_8	µg/l			<10	<10	<10	<10
TPH Aliphatic >C_8-C_{10}	µg/l			<100	<100	<100	<100
TPH Aliphatic >C_{10}-C_{12}	µg/l			<100	<100	<100	<100
TPH Aliphatic >C_{12}-C_{16}	µg/l			<100	<100	<100	<100
TPH Aliphatic >C_{16}-C_{21}	µg/l			<100	<100	<100	<100
TPH Aliphatic >C_{21}-C_{34}	µg/l			<100	<100	<100	<100
TPH Aliphatic (Total)	µg/l			<100	<100	<100	<100
TPH Aromatic >C_5-C_7	µg/l			<10	<10	<10	<10
TPH Aromatic >C_7-C_8	µg/l			<10	<10	<10	<10
TPH Aromatic >C_8-C_{10}	µg/l			<100	<100	<100	<100
TPH Aromatic >C_{10}-C_{12}	µg/l			<100	<100	<100	<100
TPH Aromatic >C_{12}-C_{16}	µg/l			<100	<100	<100	<100
TPH Aromatic >C_{16}-C_{21}	µg/l			<100	500	<100	170
TPH Aromatic >C_{21}-C_{35}	µg/l			<100	11130	<100	410
TPH Aromatic (Total)	µg/l			<100	11630	<100	580
Alkalinity	mgCaCO3/l			303	231	426	965
(S) Faecal Coliforms	no / 100ml						
(S) Faecal Streptococci	no / 100ml						
BOD	mg/l						
Kjeldahl Nitrogen	mg/l						
(S) Dissolved Methane	µg/l						

(S) Subcontracted Analysis

Date Sampled		23/03/04
Lab Ref. No:		198329
Customer Ref. No.		
Sample Type		W
Trial Pit / Borehole No.		BH8G
* pH	Value	7.6
* TOC	mg/l	
* Suspended Solids	mg/l	
* Electrical Cond. (µS/cm)	µS/cm	
*		
* **PHENOLICS**		
* Butyl Phenols	µg/l	
* Catechol	µg/l	<0.1
* Cresols (sum)	µg/l	<0.1
* Naphthols	µg/l	<0.1
* Phenol	µg/l	<0.1
* Resorcinol	µg/l	<0.1
* Trimethylphenol	µg/l	<0.1
* Xylenols & Ethylphenols	µg/l	<0.1
*		
* **Total Phenols**	µg/l	<0.5
*		
* **US EPA PRIORITY PAH's**		
* Acenaphthene	µg/l	<0.01
* Acenaphthylene	µg/l	<0.01
* Anthracene	µg/l	<0.01
* Benzo(a)Anthracene	µg/l	<0.01
* Benzo(a)pyrene	µg/l	<0.01
* Benzo(b)fluoranthene	µg/l	<0.01
* Benzo(k)fluoranthene	µg/l	<0.01
* Benzo(g,h,i)perylene	µg/l	<0.01
* Chrysene	µg/l	<0.01
* Di-benzo(a,h)anthracene	µg/l	<0.01
* Indeno(1,2,3-cd)pyrene	µg/l	<0.01
* Fluoranthene	µg/l	<0.01
* Fluorene	µg/l	<0.01
* Naphthalene	µg/l	<0.01
* Phenanthrene	µg/l	<0.01
* Pyrene	µg/l	<0.01
*		
* **Total US EPA 16 PAH**	µg/l	<0.01
* **OTHER PAH's**		
* Anthanthrene	µg/l	
* Benzo(e)pyrene	µg/l	
* Cyclopenta(cd)pyrene	µg/l	
*		
* **GENERAL INORGANICS**		
* Complex Cyanide	µg/l	
* Easily Liberatable Cyanide (free)	µg/l	
* Thiocyanate	µg/l	
* Total Cyanide	µg/l	<5
*		
* Sulphide	µg/l	<100
* Sulphur (free)	µg/l	
* Sulphate	µg/l	389525
*		
* Chloride	µg/l	
* Phosphate	µg/l	
*		
* Exchangeable Ammonium	µg/l	78400
* Nitrate	µg/l	
* Nitrite	µg/l	

Date Sampled		23/03/04
Lab Ref. No:		198329
Customer Ref. No.		
Sample Type		W
Trial Pit / Borehole No.		BH8G
HEAVY METALS/METALLOIDS		
Aluminium	µg/l	
Antimony	µg/l	
Arsenic	µg/l	<10
Barium	µg/l	
Beryllium	µg/l	
Boron	µg/l	295
Cadmium	µg/l	<1
Chromium (Dissolved)	µg/l	<5
Chromium (Hexavalent)	µg/l	
Cobalt	µg/l	
Copper	µg/l	2
Germanium	µg/l	
Lead	µg/l	<1
Mercury	µg/l	<0.1
Molybdenum	µg/l	
Nickel	µg/l	32
Selenium	µg/l	<10
Vanadium	µg/l	
Zinc	µg/l	34
ESSENTIAL ELEMENTS		
Calcium	µg/l	
Iron	µg/l	
Magnesium	µg/l	
Manganese	µg/l	
Potassium	µg/l	
Sodium	µg/l	
MONOAROMATICS		
Benzene	µg/l	<10
Toluene	µg/l	<10
Ethylbenzene	µg/l	<10
Meta & Para Xylene	µg/l	<10
Ortho Xylene	µg/l	<10
Total Xylenes	µg/l	<10
MTBE	µg/l	<10
1,2,4-Trimethylbenzene	µg/l	
1,3,5-Trimethylbenzene	µg/l	
TOTAL HYDROCARBONS		
Petroleum Range Organics (C_6-C_{10})	µg/l	
Diesel Range Organics (C_8-C_{25})	µg/l	
Hydrocarbon Screen (GC-FID)	µg/l	
VOC's		
1,1,1-Trichloroethane	µg/l	
1,1,2,2-Tetrachloroethane	µg/l	
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	
1,1,2-Trichloroethane	µg/l	
1,1-Dichloroethane	µg/l	
1,1-Dichloroethene	µg/l	
1,2,3-Trichloropropane	µg/l	
1,2,3-Trimethylbenzene	µg/l	
1,2,4-Trichlorobenzene	µg/l	
1,2,4-Trimethylbenzene	µg/l	
1,2-Dibromo-3-Chloropropane	µg/l	
1,2-Dichlorobenzene	µg/l	
1,2-Dichloroethane	µg/l	
1,2-Dichloropropane	µg/l	
1,2-Dichloropropene	µg/l	
1,3,5-Trimethylbenzene	µg/l	

Date Sampled		23/03/04
Lab Ref. No:		198329
Customer Ref. No.		
Sample Type		W
Trial Pit / Borehole No.		BH8G
TPH RBCA CARBON BANDING		
TPH Aliphatic >C_5-C_6	µg/l	<10
TPH Aliphatic >C_6-C_8	µg/l	<10
TPH Aliphatic >C_8-C_{10}	µg/l	<100
TPH Aliphatic >C_{10}-C_{12}	µg/l	<100
TPH Aliphatic >C_{12}-C_{16}	µg/l	<100
TPH Aliphatic >C_{16}-C_{21}	µg/l	<100
TPH Aliphatic >C_{21}-C_{34}	µg/l	<100
TPH Aliphatic (Total)	µg/l	<100
TPH Aromatic >C_5-C_7	µg/l	<10
TPH Aromatic >C_7-C_8	µg/l	<10
TPH Aromatic >C_8-C_{10}	µg/l	<100
TPH Aromatic >C_{10}-C_{12}	µg/l	<100
TPH Aromatic >C_{12}-C_{16}	µg/l	<100
TPH Aromatic >C_{16}-C_{21}	µg/l	<100
TPH Aromatic >C_{21}-C_{35}	µg/l	<100
TPH Aromatic (Total)	µg/l	<100
Alkalinity	mgCaCO3/l	673

White Young Green Environmental
R70878 - Reading, Manor Farm STW

Date Sampled		22/03/04
Lab Ref. No:		197859
Customer Ref. No.		
Sample Type		W
Trial Pit / Borehole No.		BH203C
pH	Value	9.8
TOC	mg/l	
Suspended Solids	mg/l	
Electrical Cond. (µS/cm)	µS/cm	
PHENOLICS		
Butyl Phenols	µg/l	
Catechol	µg/l	<0.1
Cresols (sum)	µg/l	<0.1
Naphthols	µg/l	<0.1
Phenol	µg/l	<0.1
Resorcinol	µg/l	<0.1
Trimethylphenol	µg/l	<0.1
Xylenols & Ethylphenols	µg/l	<0.1
Total Phenols	µg/l	<0.5
US EPA PRIORITY PAH's		
Acenaphthene	µg/l	<0.01
Acenaphthylene	µg/l	<0.01
Anthracene	µg/l	<0.01
Benzo(a)Anthracene	µg/l	<0.01
Benzo(a)pyrene	µg/l	<0.01
Benzo(b)fluoranthene	µg/l	<0.01
Benzo(k)fluoranthene	µg/l	<0.01
Benzo(g,h,i)perylene	µg/l	<0.01
Chrysene	µg/l	<0.01
Di-benzo(a,h)anthracene	µg/l	<0.01
Indeno(1,2,3-cd)pyrene	µg/l	<0.01
Fluoranthene	µg/l	<0.01
Fluorene	µg/l	<0.01
Naphthalene	µg/l	<0.01
Phenanthrene	µg/l	<0.01
Pyrene	µg/l	<0.01
Total US EPA 16 PAH	µg/l	<0.01
OTHER PAH's		
Anthanthrene	µg/l	
Benzo(e)pyrene	µg/l	
Cyclopenta(cd)pyrene	µg/l	
GENERAL INORGANICS		
Complex Cyanide	µg/l	
Easily Liberatable Cyanide (free)	µg/l	
Thiocyanate	µg/l	
Total Cyanide	µg/l	<5
Sulphide	µg/l	157
Sulphur (free)	µg/l	
Sulphate	µg/l	120710
Chloride	µg/l	
Phosphate	µg/l	
Exchangeable Ammonium	µg/l	6081
Nitrate	µg/l	
Nitrite	µg/l	

Date Sampled		22/03/04
Lab Ref. No:		197859
Customer Ref. No.		
Sample Type		W
Trial Pit / Borehole No.		BH203C
HEAVY METALS/METALLOIDS		
Aluminium	µg/l	
Antimony	µg/l	
Arsenic	µg/l	<10
Barium	µg/l	
Beryllium	µg/l	
Boron	µg/l	535
Cadmium	µg/l	<1
Chromium (Dissolved)	µg/l	20
Chromium (Hexavalent)	µg/l	<20
Cobalt	µg/l	
Copper	µg/l	4
Germanium	µg/l	
Lead	µg/l	<1
Mercury	µg/l	<0.1
Molybdenum	µg/l	
Nickel	µg/l	<20
Selenium	µg/l	<10
Vanadium	µg/l	
Zinc	µg/l	19
ESSENTIAL ELEMENTS		
Calcium	µg/l	
Iron	µg/l	
Magnesium	µg/l	
Manganese	µg/l	
Potassium	µg/l	
Sodium	µg/l	
MONOAROMATICS		
Benzene	µg/l	<10
Toluene	µg/l	<10
Ethylbenzene	µg/l	<10
Meta & Para Xylene	µg/l	<10
Ortho Xylene	µg/l	<10
Total Xylenes	µg/l	<10
MTBE	µg/l	<10
1,2,4-Trimethylbenzene	µg/l	
1,3,5-Trimethylbenzene	µg/l	
TOTAL HYDROCARBONS		
Petroleum Range Organics (C_6-C_{10})	µg/l	
Diesel Range Organics (C_8-C_{25})	µg/l	
Hydrocarbon Screen (GC-FID)	µg/l	
VOC's		
1,1,1-Trichloroethane	µg/l	
1,1,2,2-Tetrachloroethane	µg/l	
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	
1,1,2-Trichloroethane	µg/l	
1,1-Dichloroethane	µg/l	
1,1-Dichloroethene	µg/l	
1,2,3-Trichloropropane	µg/l	
1,2,3-Trimethylbenzene	µg/l	
1,2,4-Trichlorobenzene	µg/l	
1,2,4-Trimethylbenzene	µg/l	
1,2-Dibromo-3-Chloropropane	µg/l	
1,2-Dichlorobenzene	µg/l	
1,2-Dichloroethane	µg/l	
1,2-Dichloropropane	µg/l	
1,2-Dichloropropene	µg/l	
1,3,5-Trimethylbenzene	µg/l	

Date Sampled		22/03/04
Lab Ref. No:		197859
Customer Ref. No.		
Sample Type		W
Trial Pit / Borehole No.		BH203C
TPH RBCA CARBON BANDING		
TPH Aliphatic >C_5-C_6	µg/l	<10
TPH Aliphatic >C_6-C_8	µg/l	<10
TPH Aliphatic >C_8-C_{10}	µg/l	<100
TPH Aliphatic >C_{10}-C_{12}	µg/l	<100
TPH Aliphatic >C_{12}-C_{16}	µg/l	<100
TPH Aliphatic >C_{16}-C_{21}	µg/l	<100
TPH Aliphatic >C_{21}-C_{34}	µg/l	<100
TPH Aliphatic (Total)	µg/l	<100
TPH Aromatic >C_5-C_7	µg/l	<10
TPH Aromatic >C_7-C_8	µg/l	<10
TPH Aromatic >C_8-C_{10}	µg/l	<100
TPH Aromatic >C_{10}-C_{12}	µg/l	<100
TPH Aromatic >C_{12}-C_{16}	µg/l	120
TPH Aromatic >C_{16}-C_{21}	µg/l	<100
TPH Aromatic >C_{21}-C_{35}	µg/l	220
TPH Aromatic (Total)	µg/l	340
Alkalinity	mgCaCO3/l	329

Date Sampled		16/03/04	16/03/04	16/03/04	16/03/04	16/03/04	16/03/04	16/03/04
Lab Ref. No:		197162	197163	197164	197165	197166	197167	197168
Customer Ref. No.								
Sample Type		W	W	W	W	W	W	W
Trial Pit / Borehole No.		BH103G	BH103G	BH3R	BH6R	BH6C	BH9R	BH102R
HEAVY METALS/METALLOIDS								
Aluminium	µg/l							
Antimony	µg/l							
Arsenic	µg/l							
Barium	µg/l							
Beryllium	µg/l							
Boron	µg/l							
Cadmium	µg/l							
Chromium (Dissolved)	µg/l							
Chromium (Hexavalent)	µg/l							
Cobalt	µg/l							
Copper	µg/l							
Germanium	µg/l							
Lead	µg/l							
Mercury	µg/l							
Molybdenum	µg/l							
Nickel	µg/l							
Selenium	µg/l							
Vanadium	µg/l							
Zinc	µg/l							
ESSENTIAL ELEMENTS								
Calcium	µg/l	106490	128000	81200	130000	134000	131000	125000
Iron	µg/l							
Magnesium	µg/l	13393	25492	20932	50900	21905	69800	16403
Manganese	µg/l							
Potassium	µg/l	14386	9760	19900	16807	13667	14900	18153
Sodium	µg/l	115595	36700	95300	46300	68000	88100	109000
MONOAROMATICS								
Benzene	µg/l							
Toluene	µg/l							
Ethylbenzene	µg/l							
Meta & Para Xylene	µg/l							
Ortho Xylene	µg/l							
Total Xylenes	µg/l							
MTBE	µg/l							
1,2,4-Trimethylbenzene	µg/l							
1,3,5-Trimethylbenzene	µg/l							
TOTAL HYDROCARBONS								
Petroleum Range Organics (C_6-C_{10})	µg/l							
Diesel Range Organics (C_8-C_{26})	µg/l							
Hydrocarbon Screen (GC-FID)	µg/l							
VOC's								
1,1,1-Trichloroethane	µg/l							
1,1,2,2-Tetrachloroethane	µg/l							
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l							
1,1,2-Trichloroethane	µg/l							
1,1-Dichloroethane	µg/l							
1,1-Dichloroethene	µg/l							
1,2,3-Trichloropropane	µg/l							
1,2,3-Trimethylbenzene	µg/l							
1,2,4-Trichlorobenzene	µg/l							
1,2,4-Trimethylbenzene	µg/l							
1,2-Dibromo-3-Chloropropane	µg/l							
1,2-Dichlorobenzene	µg/l							
1,2-Dichloroethane	µg/l							
1,2-Dichloropropane	µg/l							
1,2-Dichloropropene	µg/l							
1,3,5-Trimethylbenzene	µg/l							

Date Sampled		16/03/04	16/03/04	16/03/04	16/03/04	16/03/04	16/03/04	16/03/04
Lab Ref. No:		197162	197163	197164	197165	197166	197167	197168
Customer Ref. No.								
Sample Type		W	W	W	W	W	W	W
Trial Pit / Borehole No.		BH103G	BH103G	BH3R	BH6R	BH6C	BH9R	BH102R
TPH RBCA CARBON BANDING								
TPH Aliphatic >C_5-C_6	µg/l							
TPH Aliphatic >C_6-C_8	µg/l							
TPH Aliphatic >C_8-C_{10}	µg/l							
TPH Aliphatic >C_{10}-C_{12}	µg/l							
TPH Aliphatic >C_{12}-C_{16}	µg/l							
TPH Aliphatic >C_{16}-C_{21}	µg/l							
TPH Aliphatic >C_{21}-C_{34}	µg/l							
TPH Aliphatic (Total)	µg/l							
TPH Aromatic >C_5-C_7	µg/l							
TPH Aromatic >C_7-C_8	µg/l							
TPH Aromatic >C_8-C_{10}	µg/l							
TPH Aromatic >C_{10}-C_{12}	µg/l							
TPH Aromatic >C_{12}-C_{16}	µg/l							
TPH Aromatic >C_{16}-C_{21}	µg/l							
TPH Aromatic >C_{21}-C_{35}	µg/l							
TPH Aromatic (Total)	µg/l							
Alkalinity	mgCaCO3/l							
Free Chlorine	mg/l	<4	<4	<4	<4	<4	<4	<4
Silicon	µg/l	10443	12130	9412	9878	10287	10829	5181

Date Sampled		16/03/04	16/03/04	Not	Not	Not	17/03/04	17/03/04
Lab Ref. No:		197169	197170	Received	Received	Received	197174	197175
Customer Ref. No.								
Sample Type		W	W	W	W	W	W	W
Trial Pit / Borehole No.		BH102C	BH1R	BH1C	BH1G	BH8	BH201C	BH202R
HEAVY METALS/METALLOIDS								
Aluminium	µg/l							
Antimony	µg/l							
Arsenic	µg/l							
Barium	µg/l							
Beryllium	µg/l							
Boron	µg/l							
Cadmium	µg/l							
Chromium (Dissolved)	µg/l							
Chromium (Hexavalent)	µg/l							
Cobalt	µg/l							
Copper	µg/l							
Germanium	µg/l							
Lead	µg/l							
Mercury	µg/l							
Molybdenum	µg/l							
Nickel	µg/l							
Selenium	µg/l							
Vanadium	µg/l							
Zinc	µg/l							
ESSENTIAL ELEMENTS								
Calcium	µg/l	96400	260000				115000	44800
Iron	µg/l							
Magnesium	µg/l	20517	28848				12773	36678
Manganese	µg/l							
Potassium	µg/l	14180	12288				4646	21100
Sodium	µg/l	72100	90900				32900	229000
MONOAROMATICS								
Benzene	µg/l							
Toluene	µg/l							
Ethylbenzene	µg/l							
Meta & Para Xylene	µg/l							
Ortho Xylene	µg/l							
Total Xylenes	µg/l							
MTBE	µg/l							
1,2,4-Trimethylbenzene	µg/l							
1,3,5-Trimethylbenzene	µg/l							
TOTAL HYDROCARBONS								
Petroleum Range Organics (C_6-C_{10})	µg/l							
Diesel Range Organics (C_5-C_{28})	µg/l							
Hydrocarbon Screen (GC-FID)	µg/l							
VOC's								
1,1,1-Trichloroethane	µg/l							
1,1,2,2-Tetrachloroethane	µg/l							
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l							
1,1,2-Trichloroethane	µg/l							
1,1-Dichloroethane	µg/l							
1,1-Dichloroethene	µg/l							
1,2,3-Trichloropropane	µg/l							
1,2,3-Trimethylbenzene	µg/l							
1,2,4-Trichlorobenzene	µg/l							
1,2,4-Trimethylbenzene	µg/l							
1,2-Dibromo-3-Chloropropane	µg/l							
1,2-Dichlorobenzene	µg/l							
1,2-Dichloroethane	µg/l							
1,2-Dichloropropane	µg/l							
1,2-Dichloropropene	µg/l							
1,3,5-Trimethylbenzene	µg/l							

Date Sampled		16/03/04	16/03/04	Not	Not	Not	17/03/04	17/03/04
Lab Ref. No:		197169	197170	Received	Received	Received	197174	197175
Customer Ref. No.								
Sample Type		W	W	W	W	W	W	W
Trial Pit / Borehole No.		BH102C	BH1R	BH1C	BH1G	BH8	BH201C	BH202R
TPH Aliphatic >C_6-C_8	µg/l							
TPH Aliphatic >C_8-C_{10}	µg/l							
TPH Aliphatic >C_{10}-C_{12}	µg/l							
TPH Aliphatic >C_{12}-C_{16}	µg/l							
TPH Aliphatic >C_{16}-C_{21}	µg/l							
TPH Aliphatic >C_{21}-C_{34}	µg/l							
TPH Aliphatic (Total)	µg/l							
TPH Aromatic >C_5-C_7	µg/l							
TPH Aromatic >C_7-C_8	µg/l							
TPH Aromatic >C_8-C_{10}	µg/l							
TPH Aromatic >C_{10}-C_{12}	µg/l							
TPH Aromatic >C_{12}-C_{16}	µg/l							
TPH Aromatic >C_{16}-C_{21}	µg/l							
TPH Aromatic >C_{21}-C_{35}	µg/l							
TPH Aromatic (Total)	µg/l							
Alkalinity	mgCaCO3/l							
Free Chlorine	mg/l	<4	<4				<4	<4
Silicon	µg/l	7957	8771				10542	5617

Date Sampled		17/03/104	17/03/04	22/03/04
Lab Ref. No:		197176	197177	197859
Customer Ref. No.				
Sample Type		W	W	W
Trial Pit / Borehole No.		BH203R	BH204R	BH203C
* **HEAVY METALS/METALLOIDS**				
* Aluminium	µg/l			
* Antimony	µg/l			
* Arsenic	µg/l			
* Barium	µg/l			
* Beryllium	µg/l			
* Boron	µg/l			
* Cadmium	µg/l			
* Chromium (Dissolved)	µg/l			
* Chromium (Hexavalent)	µg/l			
* Cobalt	µg/l			
* Copper	µg/l			
* Germanium	µg/l			
* Lead	µg/l			
* Mercury	µg/l			
* Molybdenum	µg/l			
* Nickel	µg/l			
* Selenium	µg/l			
* Vanadium	µg/l			
* Zinc	µg/l			
*				
* **ESSENTIAL ELEMENTS**				
* Calcium	µg/l	154000	543000	13547
* Iron	µg/l			
* Magnesium	µg/l	79600	58100	35753
* Manganese	µg/l			
* Potassium	µg/l	25500	28100	24000
* Sodium	µg/l	339000	104000	165000
*				
* **MONOAROMATICS**				
* Benzene	µg/l			
* Toluene	µg/l			
* Ethylbenzene	µg/l			
* Meta & Para Xylene	µg/l			
* Ortho Xylene	µg/l			
Total Xylenes	µg/l			
*				
* MTBE	µg/l			
* 1,2,4-Trimethylbenzene	µg/l			
* 1,3,5-Trimethylbenzene	µg/l			
*				
* **TOTAL HYDROCARBONS**				
* Petroleum Range Organics (C_6-C_{10})	µg/l			
* Diesel Range Organics (C_8-C_{25})	µg/l			
* Hydrocarbon Screen (GC-FID)	µg/l			
*				
* **VOC's**				
* 1,1,1-Trichloroethane	µg/l			
* 1,1,2,2-Tetrachloroethane	µg/l			
* 1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l			
* 1,1,2-Trichloroethane	µg/l			
* 1,1-Dichloroethane	µg/l			
* 1,1-Dichloroethene	µg/l			
* 1,2,3-Trichloropropane	µg/l			
* 1,2,3-Trimethylbenzene	µg/l			
* 1,2,4-Trichlorobenzene	µg/l			
* 1,2,4-Trimethylbenzene	µg/l			
* 1,2-Dibromo-3-Chloropropane	µg/l			
* 1,2-Dichlorobenzene	µg/l			
* 1,2-Dichloroethane	µg/l			
* 1,2-Dichloropropane	µg/l			
* 1,2-Dichloropropene	µg/l			
* 1,3,5-Trimethylbenzene	µg/l			

Date Sampled		17/03/104	17/03/04	22/03/04
Lab Ref. No:		197176	197177	197859
Customer Ref. No.				
Sample Type		W	W	W
Trial Pit / Borehole No.		BH203R	BH204R	BH203C
TPH Aliphatic >C_5-C_8	µg/l			
TPH Aliphatic >C_8-C_{10}	µg/l			
TPH Aliphatic >C_{10}-C_{12}	µg/l			
TPH Aliphatic >C_{12}-C_{16}	µg/l			
TPH Aliphatic >C_{16}-C_{21}	µg/l			
TPH Aliphatic >C_{21}-C_{34}	µg/l			
TPH Aliphatic (Total)	µg/l			
TPH Aromatic >C_5-C_7	µg/l			
TPH Aromatic >C_7-C_8	µg/l			
TPH Aromatic >C_8-C_{10}	µg/l			
TPH Aromatic >C_{10}-C_{12}	µg/l			
TPH Aromatic >C_{12}-C_{16}	µg/l			
TPH Aromatic >C_{16}-C_{21}	µg/l			
TPH Aromatic >C_{21}-C_{35}	µg/l			
TPH Aromatic (Total)	µg/l			
Alkalinity	mgCaCO3/l			
Free Chlorine	mg/l	<4	<4	<4
Silicon	µg/l	7209	6180	15599

White Young Green Environmental
R69714 - Reading Gateway - Surface Water Sampling

Date Sampled		07/01/04	07/01/04	07/01/04	07/01/04	07/01/04	07/01/04	R69714
Lab Ref. No:		188915	188916	188917	188918	188919	188920	AQC
Customer Ref. No.								Lab Std
Sample Type		W	W	W	W	W	W	
Trial Pit / Borehole No.		SW1	SW2	SW3	SW4	SW5	SW6	
pH	Value	7.6			8.0	7.5		7.7
TOC	mg/l	7.2	8.9	2.9	2.9	11.3	5.6	117.4
Suspended Solids	mg/l							
Electrical Cond. (µS/cm)	µS/cm	657			607	819		583
PHENOLICS								
Butyl Phenols	ug/l							
Catechol	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Cresols (sum)	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Naphthols	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Phenol	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Resorcinol	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Trimethylphenol	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Xylenols & Ethylphenols	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Total Phenols	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	292.0
US EPA PRIORITY PAH's								
Acenaphthene	ug/l	1.0	<0.2	<0.2	<0.2	<0.2	<0.2	
Acenaphthylene	ug/l	0.5	<0.2	<0.2	<0.2	<0.2	<0.2	
Anthracene	ug/l	8.0	1.7	<0.2	<0.2	<0.2	<0.2	
Benzo(a)Anthracene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Benzo(a)pyrene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	18.9
Benzo(b)fluoranthene *1	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Benzo(k)fluoranthene *1	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Benzo(g,h,i)perylene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Chrysene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Di-benzo(a,h)anthracene *2	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Indeno(1,2,3-cd)pyrene *2	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Fluoranthene	ug/l	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	
Fluorene	ug/l	4.4	0.5	<0.2	<0.2	<0.2	<0.2	
Naphthalene	ug/l	19.0	1.5	<0.2	<0.2	<0.2	<0.2	16.0
Phenanthrene	ug/l	10.4	2.3	<0.2	<0.2	<0.2	<0.2	
Pyrene	ug/l	0.8	<0.2	<0.2	<0.2	<0.2	<0.2	
Total US EPA 16 PAH	ug/l	44.4	6.0	<0.2	<0.2	<0.2	<0.2	
OTHER PAH's								
Anthanthrene	ug/l							
Benzo(e)pyrene	ug/l							
Cyclopenta(cd)pyrene	ug/l							
GENERAL INORGANICS								
Complex Cyanide	ug/l							
Easily Liberatable Cyanide (free)	ug/l	<5	<5	<5	<5	<5	<5	1986
Thiocyanate	ug/l	<100	<100	<100	<100	<100	<100	98370
Total Cyanide	ug/l	<5	<5	<5	<5	<5	<5	1986
Sulphide	ug/l	<100	<100	<100	<100	<100	<100	770
Sulphur (free)	ug/l	<100	<100	<100	<100	<100	<100	
Sulphate	ug/l	<5000	<5000	<5000	<5000	<5000	<5000	103289
Chloride	ug/l	57171	40410	24749	25183	87276	53832	25258
Phosphate	ug/l	13907	<5000	<5000	13032	14111	13643	104351
Exchangeable Ammonium	ug/l	216	<100	<100	<100	395	254	100200
Nitrate	ug/l	50611	24072	29273	29232	65253	45456	51453
Nitrite	ug/l	<5000	<5000	<5000	<5000	<5000	<5000	

White Young Green Environmental
R69714 - Reading Gateway - Surface Water Sampling

Date Sampled		07/01/04	07/01/04	07/01/04	07/01/04	07/01/04	07/01/04	R69714
Lab Ref. No:		188915	188916	188917	188918	188919	188920	AQC
Customer Ref. No.								Lab Std
Sample Type		W	W	W	W	W	W	
Trial Pit / Borehole No.		SW1	SW2	SW3	SW4	SW5	SW6	
HEAVY METALS/METALLOIDS								
Aluminium	ug/l							
Antimony	ug/l	<20	<20	<20	<20	<20	<20	59
Arsenic	ug/l	<10	<10	<10	<10	<10	<10	61
Barium	ug/l	23	68	26	26	22	23	542
Beryllium	ug/l							
Boron	ug/l	71	104	41	41	159	100	170
Cadmium	ug/l	<1	<1	<1	<1	<1	<1	13
Chromium (Dissolved)	ug/l	<20	<20	<20	<20	<20	<20	59
Chromium (Hexavalent)	ug/l							
Cobalt	ug/l							
Copper	ug/l	16	<5	7	<5	6	<5	153
Germanium	ug/l							
Lead	ug/l	<20	<20	<20	<20	<20	<20	38
Mercury	ug/l	0.5	<0.1	<0.1	<0.1	<0.1	<0.1	6.4
Molybdenum	ug/l	<1	<1	<1	<1	<1	<1	95
Nickel	ug/l	<20	<20	<20	<20	<20	<20	54
Selenium	ug/l	<10	<10	<10	<10	<10	<10	41
Vanadium	ug/l							
Zinc	ug/l	<50	<50	<50	<50	<50	<50	414
ESSENTIAL ELEMENTS								
Calcium	ug/l	57259	101841	88342	87359	77300	86191	19428
Iron	ug/l							
Magnesium	ug/l	14595	10215	3735	3837	15056	8582	19100
Manganese	ug/l	<10	45	<10	<10	<10	<10	63
Potassium	ug/l	8479	6183	3068	3121	14532	8264	9740
Sodium	ug/l	26938	20899	16779	17054	61307	36861	6970
MONOAROMATICS								
Benzene	ug/l							
Toluene	ug/l							
Ethylbenzene	ug/l							
Meta & Para Xylene	ug/l							
Ortho Xylene	ug/l							
Total Xylenes	ug/l							
MTBE	ug/l							
1,2,4-Trimethylbenzene	ug/l							
1,3,5-Trimethylbenzene	ug/l							
TOTAL HYDROCARBONS								
Petroleum Range Organics (C_6-C_{10})	ug/l							
Diesel Range Organics (C_9-C_{28})	ug/l	<100	<100	<100	<100	<100	<100	
Hydrocarbon Screen (GC-FID)	ug/l	<100	<100	<100	<100	<100	<100	
VOC's								
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/l	<1	<1	<1	<1	<1	<1	
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	
1,1-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	
1,2,3-Trimethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	
1,2,4-Trichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	
1,2,4-Trimethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	
1,2-Dibromo-3-Chloropropane	ug/l	<1	<1	<1	<1	<1	<1	
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	
1,2-Dichloropropene	ug/l	<1	<1	<1	<1	<1	<1	

White Young Green Environmental
R69714 - Reading Gateway - Surface Water Sampling

Date Sampled		07/01/04	07/01/04	07/01/04	07/01/04	07/01/04	07/01/04	R69714	
Lab Ref. No:		188915	188916	188917	188918	188919	188920	AQC	
Customer Ref. No.								Lab Std	
Sample Type		W	W	W	W	W	W		
Trial Pit / Borehole No.		SW1	SW2	SW3	SW4	SW5	SW6		
1,3,5-Trimethylbenzene	ug/l	<1	<1	<1	<1	<1	<1		
1,3-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1		
1,3-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1		
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1		
1-Chlorotoluene	ug/l	<1	<1	<1	<1	<1	<1		
1-Methylpropylbenzene	ug/l	<1	<1	<1	<1	<1	<1		
2,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1		
2-Chlorotoluene	ug/l	<1	<1	<1	<1	<1	<1		
Benzene	ug/l	<1	<1	<1	<1	<1	<1		
Bromobenzene	ug/l	<1	<1	<1	<1	<1	<1		
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1		
Bromodichloromethane	ug/l	<1	<1	<1	<1	<1	<1		
Bromoform	ug/l	<1	<1	<1	<1	<1	<1		
Carbon Tetrachloride (PCM)	ug/l	<1	<1	<1	<1	<1	<1		
Chlorobenzene (sum)	ug/l	<1	<1	<1	<1	<1	<1		
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1		
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1		
Chloroform	ug/l	<1	<1	<1	<1	<1	<1		
cis-1,2-Dichloroethylene	ug/l	<1	<1	<1	<1	<1	<1		
cis-1,3-Dichloropropene	ug/l	<1	<1	<1	<1	<1	<1		
Dibromochloromethane	ug/l	<1	<1	<1	<1	<1	<1		
Dibromoethane	ug/l	<1	<1	<1	<1	<1	<1		
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1		
Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1		
Dichloromethane	ug/l	<1	<1	<1	<1	<1	<1		
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1		
Hexachlorobutadiene	ug/l	<1	<1	<1	<1	<1	<1		
meta & para Xylene	ug/l	<1	<1	<1	<1	<1	<1		
Methyl-isopropylbenzene	ug/l	<1	<1	<1	<1	<1	<1		
Monochlorobenzene	ug/l	<1	<1	<1	<1	<1	<1		
Monochlorophenols (sum)	ug/l	<1	<1	<1	<1	<1	<1		
n Butylbenzene	ug/l	<1	<1	<1	<1	<1	<1		
n Propylbenzene	ug/l	<1	<1	<1	<1	<1	<1		
ortho Xylene	ug/l	<1	<1	<1	<1	<1	<1		
Styrene	ug/l	<1	<1	<1	<1	<1	<1		
tert Butylbenzene	ug/l	<1	<1	<1	<1	<1	<1		
Tetrachlorobenzene	ug/l	<1	<1	<1	<1	<1	<1		
Tetrachloroethene (PCE)	ug/l	<1	<1	<1	<1	<1	<1		
Tetrahydrofuran	ug/l	<1	<1	<1	<1	<1	<1		
Toluene	ug/l	<1	<1	<1	<1	<1	<1		
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1		
trans-1,3-dichloropropene	ug/l	<1	<1	<1	<1	<1	<1		
Trichloroethene (TCE)	ug/l	<1	<1	<1	<1	<1	<1		
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1		
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1		
Vinyl Chloride	ug/l	<1	<1	<1	<1	<1	<1		
SVOC's									
1,2,4-Trichlorobenzene	ug/l								
1,4-Dichlorobenzene	ug/l	<10	<10	<10	<10	<10	<10		
2,3,4,6-Tetrachlorophenol (sum)	ug/l	<10	<10	<10	<10	<10	<10		
2,4,5-Trichlorophenol	ug/l	<10	<10	<10	<10	<10	<10		
2,4,6-Trichlorophenol	ug/l	<10	<10	<10	<10	<10	<10		
2,4-Dichlorophenol (sum)	ug/l	<10	<10	<10	<10	<10	<10		
2,4-Dimethylphenol	ug/l	<10	<10	<10	<10	<10	<10		
2,4-Dinitrotoluene	ug/l	<10	<10	<10	<10	<10	<10		
2,6-Dimethylphenol	ug/l	<10	<10	<10	<10	<10	<10		
2,6-Dinitrotoluene	ug/l	<10	<10	<10	<10	<10	<10		
2-Chloronaphthalene	ug/l	<10	<10	<10	<10	<10	<10		
2-Chlorophenol (sum)	ug/l	<10	<10	<10	<10	<10	<10		
2-Methylphenol	ug/l	<10	<10	<10	<10	<10	<10		
2-Nitrophenol	ug/l	<10	<10	<10	<10	<10	<10		
4-Chloro-3-methylphenol	ug/l	<10	<10	<10	<10	<10	<10		
4-chlorobenzylphenylether	ug/l	<10	<10	<10	<10	<10	<10		

White Young Green Environmental
R69714 - Reading Gateway - Surface Water Sampling

Date Sampled		07/01/04	07/01/04	07/01/04	07/01/04	07/01/04	07/01/04	R69714
Lab Ref. No:		188915	188916	188917	188918	188919	188920	AQC
Customer Ref. No.								Lab Std
Sample Type		W	W	W	W	W	W	
Trial Pit / Borehole No.		SW1	SW2	SW3	SW4	SW5	SW6	
* 4-Methylphenol	ug/l	<10	<10	<10	<10	<10	<10	
* 4-Nitrophenol	ug/l	<10	<10	<10	<10	<10	<10	
* Azobenzene	ug/l	<10	<10	<10	<10	<10	<10	
* bis(2-chloroethyl)ether	ug/l	<10	<10	<10	<10	<10	<10	
* bis(2-chloroethyoxy)methane	ug/l	<10	<10	<10	<10	<10	<10	
* bis(chloroisopropyl)ether	ug/l	<10	<10	<10	<10	<10	<10	
* Bromophenylphenylether	ug/l	<10	<10	<10	<10	<10	<10	
* Hexachloro-1,3-butadiene	ug/l	<10	<10	<10	<10	<10	<10	
* Hexachlorobenzene	ug/l	<10	<10	<10	<10	<10	<10	
* Hexachloroethane	ug/l	<10	<10	<10	<10	<10	<10	
* Isophorone	ug/l	<10	<10	<10	<10	<10	<10	
* Nitrobenzene	ug/l	<10	<10	<10	<10	<10	<10	
* n-nitrosodi-n-propyl-1-propanamine	ug/l	<10	<10	<10	<10	<10	<10	
* Pentachlorobenzene	ug/l	<10	<10	<10	<10	<10	<10	
* Pentachlorophenol	ug/l	<10	<10	<10	<10	<10	<10	
*								
* Bis(2-ethylhexyl)phthalate	ug/l							
* Butylbenzylphthalate	ug/l							
* Diethylphthalate	ug/l							
* Dimethylphthalate	ug/l							
* Di-n-butylphthalate	ug/l							
* Di-n-octyl phthalate	ug/l							
*								
* Total Phthalates	ug/l							
*								
* **ORGANO CHLORINE PESTICIDES**								
* Aldrin	ug/l							
* Beta-HCH (Beta BHC)	ug/l							
* Chlordane	ug/l							
* DDD	ug/l							
* Dieldrin	ug/l							
* Drins (total)	ug/l							
* Endosulfan I	ug/l							
* Endosulfan II	ug/l							
* Endosulfan Sulphate	ug/l							
* Endrin	ug/l							
* Endrin Endrin Aldehyde	ug/l							
* Gamma HCH (Lindane)	ug/l							
* Heptachlor	ug/l							
* Heptachlor epoxide	ug/l							
* Heptachlorobenzene	ug/l							
* Methoxychlor	ug/l							
* pp'-DDE	ug/l							
* pp'DDT	ug/l							
* pp'-TDE	ug/l							
*								
* **ORGANO PHOSPHOROUS PESTICIDES**								
* Azinphos methyl	ug/l							
* Demeton-s-methyl	ug/l							
* Diazinon	ug/l							
* Dichlorvos	ug/l							
* Dioxathion	ug/l							
* Disulfoton	ug/l							
* EPN Ethion	ug/l							
* Malathion	ug/l							
* Methyl Parathion	ug/l							
* Parathion	ug/l							
* Terbufos	ug/l							
*								
* **CARBAMATE (Pesticide)**								
* Carbaryl	ug/l							
* Carbofuran	ug/l							
* Maneb	ug/l							
*								

White Young Green Environmental
R69714 - Reading Gateway - Surface Water Sampling

Date Sampled		07/01/04	07/01/04	07/01/04	07/01/04	07/01/04	07/01/04	R69714
Lab Ref. No:		188915	188916	188917	188918	188919	188920	AQC
Customer Ref. No.								Lab Std
Sample Type		W	W	W	W	W	W	
Trial Pit / Borehole No.		SW1	SW2	SW3	SW4	SW5	SW6	
PHENOL UREA HERBICIDES								
Chlorotoluron	ug/l							
Diuron	ug/l							
Isoproturon	ug/l							
Linuron	ug/l							
CHLOROPHENOXY ACIDIC HERBICIDES								
2,4,5-T	ug/l							
2,4-D	ug/l							
Chloro-o-tolyloxyacetic acid	ug/l							
Dicamba	ug/l							
Dichloroprop	ug/l							
Mecoprop	ug/l							
Silvex	ug/l							
TRIAZINES								
Altrizine	ug/l							
Simazine	ug/l							
PCB's								
PCB Congener 28	ug/l							
PCB Congener 52	ug/l							
PCB Congener 101	ug/l							
PCB Congener 118	ug/l							
PCB Congener 138	ug/l							
PCB Congener 153	ug/l							
PCB Congener 180	ug/l							
Total PCB's	ug/l							
ALCOHOLS								
Butanol	ug/l							
Ethanol	ug/l							
Ethylene Glycol	ug/l							
Methanol	ug/l							
Propan-1-ol	ug/l							
Propan-2-ol	ug/l							
MISCELLANEOUS								
Silver	ug/l							
Tin	ug/l							
1,2-Dichloropropane	ug/l							
1,3-Dichloropropene	ug/l							
2,4-Dinitrophenol	ug/l							
Acetone	ug/l							
Carbazole	ug/l							
Carbon disulphide	ug/l							
Creosote (TPH by GCFID)	ug/l							
Cyclohexane	ug/l							
Cyclohexanone	ug/l							
Hexachlorocyclopentadiene	ug/l							
Hydroquinone	ug/l							
N-Nitrosodiphenylamine	ug/l							
p-Chloroaniline	ug/l							
Premethrin/Cypermethrin	ug/l							
Pyridine	ug/l							
Styrene	ug/l							
Sulpholane	ug/l							
Toluene Extractable Matter (Historic)	ug/l							
Toxaphene	ug/l							
Tributyl Tin	ug/l							
Trichloromethane	ug/l							
Vinyl Acetate	ug/l							

White Young Green Environmental
R69714 - Reading Gateway - Surface Water Sampling

Date Sampled		07/01/04	07/01/04	07/01/04	07/01/04	07/01/04	07/01/04	R69714
Lab Ref. No:		188915	188916	188917	188918	188919	188920	AQC
Customer Ref. No.								Lab Std
Sample Type		W	W	W	W	W	W	
Trial Pit / Borehole No.		SW1	SW2	SW3	SW4	SW5	SW6	
* Vinyl Acetate	ug/l							
Faecal Coliforms	No / 100ml			36			44	
Faecal Streptococci	No / 100ml			8			11	
Cationic Detergents	mg/l	<1	<1	<1	<1	<1	<1	
Anionic Detergents	mg/l	<1	<1	<1	<1	<1	<1	
Non Ionic Detergents	mg/l	<10	<10	<10	<10	<10	<10	
Alkalinity	mg/l	209	497	417	407	328	397	968
Chemical Oxygen Demand (COD)	mg/l	27	28	20	22	42	32	119
Biological Oxygen Demand (BOD)	mg/l	4	<2	<2	<2	<2	<2	194
Dissolved Oxygen	mg/l	8.8			10.1	7.5		

White Young Green Environmental

LAND GAS AND GROUNDWATER MONITORING RESULTS

White Young Green

Site Name: Reading East. Sewage Treatment Works **Job No.:** E3015

Instruments Used: Ga94 landgas analyser with flow pod, dual phase dip meter, PID. **Date Sampled:** 16+19/01/04

Monitoring Engineer: Phil Davies

Installation No.	CH_4 %	CO_2 %	O_2 %	VOC ppm	H_2S ppm	Atmos Pressure m bar	Flow High l/hr	Flow Low l/hr	Air Temp °C	BH Water Temp °C	Water Depth m	Base Depth m	Water Eh Value	Water pH Value	LNAPL Depth m	DNAPL Depth m	Time	Remarks
BH1R	0	0.4	20.2	1.1	-	1015	0.0	0.0	-	-	2.04	6.42	-	-	N/D	N/D	-	Freeventing 19/01/04
BH1F	0	1.2	19.4	1.2	-	1015	0.0	0.0	-	-	1.38	2.00	-	-	N/D	N/D	-	19/01/04
BH3R	0.0	0.3	20.9	1.0	-	1014	0.0	0.0	-	-	2.62	13.00	-	-	N/D	N/D	-	19/01/04
BH3G	0.0	0.1	21.0	0.8	-	1014	0.0	0.0	-	-	2.60	8.19	-	-	N/D	N/D	-	19/01/04
BH4F	0.0	0.3	21.2	1.6	-	988	0.0	0.0	-	-	2.42	3.90	-	-	N/D	N/D	-	16/01/04
BH6C	0.0	0.0	20.9	0.8	-	989	0.0	0.0	-	-	13.20	>30	-	-	N/D	N/D	-	16/01/04
BH6R	0.0	0.0	21.0	1.0	-	989	0.0	0.0	-	-	13.06	19.21	-	-	N/D	N/D	-	16/01/04
BH7G	0.0	1.4	20.3	4.4	-	990	0.0	0.0	-	-	2.52	7.56	-	-	N/D	N/D	-	16/01/04
BH7R	0.0	0.0	20.9	1.0	-	990	0.0	0.0	-	-	12.22	26.00	-	-	N/D	N/D	-	Freeventing 16/01/04
BH9R	0.0	0.8	19.5	0.5	-	1012	0.0	0.0	-	-	11.90	28.84	-	-	N/D	N/D	-	19/01/04
BH102C	35.0	15.0	5.7	0.2	-	991	0.0	0.0	-	-	4.94	15.50	-	-	N/D	N/D	-	16/01/04
BH102G	0.0	0.1	20.9	0.9	-	991	0.0	0.0	-	-	4.91	8.00	-	-	N/D	N/D	-	16/01/04
BH102R	0.3	0.0	20.5	1.2	-	991	0.0	0.0	-	-	4.60	8.20	-	-	N/D	N/D	-	16/01/04
BH103C	0.0	0.0	21.0	1.1	-	1014	0.0	0.0	-	-	2.97	16.93	-	-	N/D	N/D	-	19/01/04
BH103G	0.0	0.0	21.1	3.3	-	1014	0.0	0.0	-	-	2.54	5.74	-	-	N/D	N/D	-	19/01/04
BH104C	0.0	0.1	21.1	1.4	-	988	0.0	0.0	-	-	12.70	29.16	-	-	N/D	N/D	-	16/01/04
BH104G	0.0	0.3	21.0	1.5	-	988	0.0	0.0	-	-	2.50	4.10	-	-	N/D	N/D	-	16/01/04
Maximum	35.0	15.0	21.2	4.4		1015.0	0.0	0.0			13.2	29.2						
Minimum	0.0	0.0	5.7	0.2		988.0	0.0	0.0			1.4	2.0						
Average	2.1	1.2	19.8	1.4		999.6	0.0	0.0			5.8	12.7						

Background Gas Levels 16/01/04

	CH_4 %	CO_2 %	O_2 %	VOC ppm	Atmos mbar
Before Monitoring	0.0	0.0	21.0	0.3	988
After Monitoring	0.0	0.0	21.0	0.4	991

Atmospheric Pressure Trend (at sea level)

988 mbar (AM) rising to 995 mbar (PM)
Weather eye, Pickering.
Atmospheric Pressures have not been altitude corrected

Background Gas Levels 19/01/04

	CH_4 %	CO_2 %	O_2 %	VOC ppm	Atmos mbar
Before Monitoring	0.0	0.0	20.4	0.4	1015
After Monitoring	0.0	0.0	20.3	0.4	1012

Atmospheric Pressure Trend (at sea level)

1018 mbar (AM) falling to 1012 mbar (PM)
Weather eye, Pickering.
Atmospheric Pressures have not been altitude corrected

Calibration

External Calibration Details (see attached sheet)
Internal Calibration Details (see attached sheet)

N/A = Measurement not available
ND = Not detected

White Young Green Environmental
LAND GAS AND GROUNDWATER MONITORING RESULTS

White Young Green

Site Name: Reading East. Sewage Treatment Works **Job No.:** E3015

Instruments Used: Ga94 landgas analyser with flow pod, dual phase dip meter, PID. **Date Sampled:** 29/01/04

Monitoring Engineer: Phil Davies

Installation No.	CH_4 %	CO_2 %	O_2 %	VOC ppm	H_2S ppm	Atmos Pressure m bar	Flow High l/hr	Flow Low l/hr	Air Temp °C	BH Water Temp °C	Water Depth m	Base Depth m	Water Eh Value	Water pH Value	LNAPL Depth m	DNAPL Depth m	Time	Remarks
BH1R	-	-	-	-	-	-	-	-	-	-	2.17	6.73	-	-	-	-	29/01/04	
BH1F	-	-	-	-	-	-	-	-	-	-	1.38	2.00	-	-	-	-	29/01/04	
BH3R	-	-	-	-	-	-	-	-	-	-	2.70	13.20	-	-	-	-	29/01/04	
BH3G	-	-	-	-	-	-	-	-	-	-	2.70	8.46	-	-	-	-	29/01/04	
BH4F	-	-	-	-	-	-	-	-	-	-	2.82	3.83	-	-	-	-	29/01/04	
BH6C	-	-	-	-	-	-	-	-	-	-	13.11	35.50	-	-	-	-	29/01/04	
BH6R	-	-	-	-	-	-	-	-	-	-	13.05	24.70	-	-	-	-	29/01/04	
BH7G	-	-	-	-	-	-	-	-	-	-	2.68	7.50	-	-	-	-	29/01/04	
BH7R	-	-	-	-	-	-	-	-	-	-	12.20	25.66	-	-	-	-	29/01/04	
BH9R	-	-	-	-	-	-	-	-	-	-	11.77	28.20	-	-	-	-	29/01/04	
BH102C	-	-	-	-	-	-	-	-	-	-	5.26	16.64	-	-	-	-	29/01/04	
BH102G	-	-	-	-	-	-	-	-	-	-	5.22	8.00	-	-	-	-	29/01/04	
BH102R	-	-	-	-	-	-	-	-	-	-	4.95	8.66	-	-	-	-	29/01/04	
BH103C	-	-	-	-	-	-	-	-	-	-	2.97	17.47	-	-	-	-	29/01/04	
BH103G	-	-	-	-	-	-	-	-	-	-	2.67	5.97	-	-	-	-	29/01/04	
BH104C	-	-	-	-	-	-	-	-	-	-	12.80	29.16	-	-	-	-	29/01/04	
BH104G	-	-	-	-	-	-	-	-	-	-	2.87	4.13	-	-	-	-	29/01/04	
Maximum											13.1	35.5						
Minimum											1.4	2.0						
Average											6.0	14.5						

Q:\PROJECTS\E3015\All East Site Gas Data (relabelled)\[All East Site Gas Data (relabelled).xls]29 01 04

Background Gas Levels

	CH_4 %	CO_2 %	O_2 %	VOC ppm	Atmos mbar
Before Monitoring	-	-	-	-	-
After Monitoring	-	-	-	-	-

N/A = Measurement not available
ND = Not detected

Atmospheric Pressure Trend (at sea level)

XXXX mbar (AM) falling / rising / steady to XXXX mbar (PM)
Weather eye, Pickering.
Atmospheric Pressures have not been altitude corrected

Calibration

External Calibration Details (see attached sheet)
Internal Calibration Details (see attached sheet)

White Young Green Environmental
LAND GAS AND GROUNDWATER MONITORING RESULTS

Site Name: Reading East. Sewage Treatment Works **Job No.:** E3015

Instruments Used: Ga94 landgas analyser with flow pod, dual phase dip meter, PID. **Date Sampled:** 12+13/02/04

Monitoring Engineer: Vicki Murphy

Installation No.	CH_4 %	CO_2 %	O_2 %	VOC ppm	H_2S ppm	Atmos Pressure m bar	Flow High l/hr	Flow Low l/hr	Air Temp °C	BH Water Temp °C	Water Depth m	Base Depth m	Water Eh Value	Water pH Value	LNAPL Depth m	DNAPL Depth m	Time	Remarks
BH 1R	0.0	0.8	19.4	1.3	-	1028	0.0	0.0	-	-	2.05	6.90	-	-	-	-	12/02/04	
BH 1F	0.0	1.0	19.6	1.3	-	1029	0.2	0.2	-	-	1.30	2.00	-	-	-	-	12/02/04	
BH3R	0.0	0.4	20.6	1.3	-	1028	0.0	0.0	-	-	2.50	13.42	-	-	-	-	12/02/04	
BH3G	0.0	1.1	19.6	1.2	-	1029	0.0	0.0	-	-	2.68	7.55	-	-	-	-	12/02/04	
BH4F	0.0	1.0	0.0	1.0	-	1028	1.2	1.2	-	-	2.85	3.85	-	-	-	-	13/02/04	
BH6C	0.0	0.0	20.5	0.9	-	1029	0.0	0.0	-	-	13.28	>30.0	-	-	-	-	13/02/04	
BH6R	0.0	0.1	20.7	1.0	-	1029	0.0	0.0	-	-	13.18	19.43	-	-	-	-	13/02/04	
BH7G	0.0	0.3	20.7	4.5	-	1030	0.0	0.0	-	-	2.70	7.90	-	-	-	-	13/02/04	
BH 7R	0.0	1.1	20.5	1.4	-	1029	0.0	0.0	-	-	12.35	26.72	-	-	-	-	13/02/04	
BH9R	0.0	0.2	20.7	1.2	-	1029	0.0	0.0	-	-	11.92	29.03	-	-	-	-	13/02/04	
BH102C	0.1	0.0	21.0	-	-	1029	1.1	1.1	-	-	5.21	16.90	-	-	-	-	13/02/04	
BH102G	0.0	0.1	20.9	-	-	1029	0.8	0.8	-	-	5.20	8.22	-	-	-	-	13/02/04	
BH102R	0.0	0.0	21.0	-	-	1029	0.9	0.9	-	-	4.50	8.95	-	-	-	-	13/02/04	
BH103C	0.0	0.0	20.9	1.2	-	1028	0.5	0.5	-	-	3.02	17.79	-	-	-	-	12/02/04	
BH103G	0.0	0.0	21.1	3.0	-	1028	0.4	0.4	-	-	2.60	6.10	-	-	-	-	12/02/04	
BH104C	0.0	0.0	20.9	1.1	-	1029	1.3	1.3	-	-	12.85	29.90	-	-	-	-	13/02/04	
BH104G	0.0	1.5	19.4	1.1	-	1029	1.3	1.3	-	-	2.90	4.14	-	-	-	-	13/02/04	
Maximum	0.1	1.5	21.1	4.5		1030.0	1.3	1.3			13.3	29.9						
Minimum	0.0	0.0	0.0	0.9		1028.0	0.0	0.0			1.3	2.0						
Average	0.0	0.4	19.3	1.6		1028.8	0.5	0.5			5.9	13.1						

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Background Gas Levels on 12 02 04

	CH_4 %	CO_2 %	O_2 %	VOC ppm	Atmos mbar
Before Monitoring	0.0	0.0	21.1	1.0	1029
After Monitoring	0.0	0.0	21.1	1.1	1028

Background Gas Levels on 13 02 04

	CH_4 %	CO_2 %	O_2 %	VOC ppm	Atmos mbar
Before Monitoring	0.0	0.0	21.1	1.0	1029
After Monitoring	0.0	0.0	21.2	1.1	1026

Calibration

External Calibration Details (see attached sheet)
Internal Calibration Details (see attached sheet)

Calibration

External Calibration Details (see attached sheet)
Internal Calibration Details (see attached sheet)

White Young Green Environmental
LAND GAS AND GROUNDWATER MONITORING RESULTS

Site Name: Reading East. Sewage Treatment Works **Job No.:** E3015

Instruments Used: Dual phase dip meter **Date Sampled:** 03/03/04

Monitoring Engineer: Vicki Murphy

Installation No.	CH_4 %	CO_2 %	O_2 %	VOC ppm	H_2S ppm	Atmos Pressure m bar	Flow High l/hr	Flow Low l/hr	Air Temp °C	BH Water Temp °C	Water Depth m	Base Depth m	Water Eh Value	Water pH Value	LNAPL Depth m	DNAPL Depth m	Time	Remarks
BH 1R	-	-	-	-	-	-	-	-	-	-	2.23	6.65	-	-	-	-		
BH 1F	-	-	-	-	-	-	-	-	-	-	1.39	1.98	-	-	-	-		
BH3R	-	-	-	-	-	-	-	-	-	-	2.73	13.33	-	-	-	-		
BH3G	-	-	-	-	-	-	-	-	-	-	2.83	8.62	-	-	-	-		
BH4F	-	-	-	-	-	-	-	-	-	-	3.15	3.87	-	-	-	-		
BH6C	-	-	-	-	-	-	-	-	-	-	13.42	>30	-	-	-	-		
BH6R	-	-	-	-	-	-	-	-	-	-	13.27	25.82	-	-	-	-		
BH7G	-	-	-	-	-	-	-	-	-	-	3.02	7.89	-	-	-	-		
BH 7R	-	-	-	-	-	-	-	-	-	-	12.45	26.55	-	-	-	-		
BH9R	-	-	-	-	-	-	-	-	-	-	11.90	28.92	-	-	-	-		
BH102C	-	-	-	-	-	-	-	-	-	-	5.34	16.84	-	-	-	-		
BH102G	-	-	-	-	-	-	-	-	-	-	5.33	8.15	-	-	-	-		
BH102R	-	-	-	-	-	-	-	-	-	-	4.58	8.80	-	-	-	-		
BH103C	-	-	-	-	-	-	-	-	-	-	3.20	17.72	-	-	-	-		
BH103G	-	-	-	-	-	-	-	-	-	-	2.74	6.05	-	-	-	-		
BH104C	-	-	-	-	-	-	-	-	-	-	13.04	29.87	-	-	-	-		
BH104G	-	-	-	-	-	-	-	-	-	-	3.25	4.14	-	-	-	-		

White Young Green Environmental
LAND GAS AND GROUNDWATER MONITORING RESULTS

Site Name: Reading East. Sewage Treatment Works **Job No.:** E3015

Instruments Used: Dual phase dip meter **Date Sampled:** 12/03/04

Monitoring Engineer: Vicki Murphy

Installation No.	CH_4 %	CO_2 %	O_2 %	VOC ppm	H_2S ppm	Atmos Pressure m bar	Flow High l/hr	Flow Low l/hr	Air Temp °C	BH Water Temp °C	Water Depth m	Base Depth m	Water Eh Value	Water pH Value	LNAPL Depth m	DNAPL Depth m	Time	Remarks
BH 1R	-	-	-	-	-	-	-	-	-	-	2.20	6.60	-	-	-	-		
BH 1F	-	-	-	-	-	-	-	-	-	-	1.47	1.97	-	-	-	-		
BH3R	-	-	-	-	-	-	-	-	-	-	2.70	13.40	-	-	-	-		Dark grey-black silt at base
BH3G	-	-	-	-	-	-	-	-	-	-	2.80	8.19	-	-	-	-		
BH4F	-	-	-	-	-	-	-	-	-	-	3.17	3.85	-	-	-	-		
BH6C	-	-	-	-	-	-	-	-	-	-	13.20	>30	-	-	-	-		
BH6R	-	-	-	-	-	-	-	-	-	-	13.17	25.47	-	-	-	-		
BH7G	-	-	-	-	-	-	-	-	-	-	2.94	7.50	-	-	-	-		
BH 7R	-	-	-	-	-	-	-	-	-	-	12.35	26.53	-	-	-	-		
BH9R	-	-	-	-	-	-	-	-	-	-	11.82	29.15	-	-	-	-		
BH102C	-	-	-	-	-	-	-	-	-	-	5.34	16.80	-	-	-	-		
BH102G	-	-	-	-	-	-	-	-	-	-	5.30	8.17	-	-	-	-		
BH102R	-	-	-	-	-	-	-	-	-	-	4.56	8.76	-	-	-	-		
BH103C	-	-	-	-	-	-	-	-	-	-	3.16	17.67	-	-	-	-		
BH103G	-	-	-	-	-	-	-	-	-	-	2.70	6.04	-	-	-	-		
BH104C	-	-	-	-	-	-	-	-	-	-	12.98	29.78	-	-	-	-		
BH104G	-	-	-	-	-	-	-	-	-	-	3.20	4.14	-	-	-	-		

White Young Green Environmental
LAND GAS AND GROUNDWATER MONITORING RESULTS

Site Name: Reading East. Sewage Treatment Works **Job No.:** E3015

Instruments Used: Ga94 landgas analyser with flow pod, dual phase dip meter, PID. **Date Sampled:** 15/03/04

Monitoring Engineer: Paul Edwards and Vicki Murphy

Installation No.	CH_4 %	CO_2 %	O_2 %	VOC ppm	H_2S ppm	Atmos Pressure m bar	Flow High l/hr	Flow Low l/hr	Air Temp °C	BH Water Temp °C	Water Depth m	Base Depth m	Water Eh Value	Water pH Value	LNAPL Depth m	DNAPL Depth m	Date	Remarks
BH 1R	0.0	0.3	20.9	0.7	-	1020	-	-	-	-	2.05	6.52	-	-	-	-	15/03/04	Groundwater samples taken
BH 1F	0.0	0.8	20.1	0.5	-	1020	-	-	-	-	1.45	1.95	-	-	-	-	15/03/04	Groundwater samples taken
BH3R	0.0	0.4	20.1	0.8	-	1019	-	-	-	-	2.69	12.85	-	-	-	-	15/03/04	Groundwater samples taken
BH103G	0.0	0.0	21.0	1.5	-	1019	-	-	-	-	2.64	6.04	-	-	-	-	15/03/04	Groundwater samples taken
BH103C	0.0	0.0	21.1	0.8	-	1020	-	-	-	-	3.11	17.60	-	-	-	-	15/03/04	Groundwater samples taken
BH102C	7.3	2.1	18.8	0.3	-	1019	-	-	-	-	5.30	16.47	-	-	-	-	15/03/04	Groundwater samples taken
BH102R	0.0	0.0	20.9	0.8	-	1019	-	-	-	-	4.46	8.57	-	-	-	-	15/03/04	Groundwater samples taken
BH6R	0.0	0.0	21.2	0.7	-	1020	-	-	-	-	13.23	26.07	-	-	-	-	16/03/04	Groundwater samples taken
BH8C	0.0	0.0	20.8	0.5	-	1020	-	-	-	-	13.25	>30	-	-	-	-	16/03/04	Groundwater samples taken
BH9R	0.0	0.0	21.0	0.6	-	1019	-	-	-	-	11.87	28.92	-	-	-	-	16/03/04	Groundwater samples taken
BH202R	0.0	0.0	21.0	N/D	-	1020	-	-	-	-	5.20	15.02	-	-	-	-	16/03/04	FREE VENTING, Groundwater samples taken
BH204	0.4	2.2	18.6	0.5	-	1019	-	-	-	-	8.60	14.36	-	-	-	-	16/03/04	FREE VENTING, Groundwater samples taken
BH203R	0.0	0.0	21.2	0.8	-	1019	-	-	-	-	3.46	13.77	-	-	-	-	16/03/04	FREE VENTING, Groundwater samples taken
BH201C	0.0	0.0	20.9	0.5	-	1020	-	-	-	-	2.17	22.95	-	-	-	-	16/03/04	Groundwater samples taken
					-		-	-	-	-			-	-	-	-		
					-		-	-	-	-			-	-	-	-		
					-		-	-	-	-			-	-	-	-		
Maximum																		
Minimum																		
Average																		

Q:\PROJECTS\E3015\All East Site Gas Data (relabelled)\[All East Site Gas Data (relabelled).xls]15+16 03 04

Background Gas Levels on 15 03 04

	CH_4 %	CO_2 %	O_2 %	VOC ppm	Atmos mbar
Before Monitoring	0.0	0.3	20.9	0.7	1020
After Monitoring	0.0	0.0	21.2	0.8	1019

Calibration
External Calibration Details (see attached sheet)
Internal Calibration Details (see attached sheet)

Background Gas Levels on 16 03 04

	CH_4 %	CO_2 %	O_2 %	VOC ppm	Atmos mbar
Before Monitoring	0.0	0.0	21.2	0.9	1020
After Monitoring	0.0	0.0	21.2	0.8	1020

Calibration
External Calibration Details (see attached sheet)
Internal Calibration Details (see attached sheet)

White Young Green Environmental
LAND GAS AND GROUNDWATER MONITORING RESULTS

Site Name: Reading East. Sewage Treatment Works **Job No.:** E3015

Instruments Used: Ga94 landgas analyser with flow pod, dual phase dip meter, PID. **Date Sampled:** 23/03/04

Monitoring Engineer: Paul Edwards and Vicki Murphy

Installation No.	CH_4 %	CO_2 %	O_2 %	VOC ppm	H_2S ppm	Atmos Pressure m bar	Flow High l/hr	Flow Low l/hr	Air Temp °C	BH Water Temp °C	Water Depth m	Base Depth m	Water Eh Value	Water pH Value	LNAPL Depth m	DNAPL Depth m	Date	Remarks
BH 1R	-	-	-	-	-	-	-	-	-	-	2.12	6.60	-	-	-	-	23/03/04	
BH 1F	-	-	-	-	-	-	-	-	-	-	1.31	1.94	-	-	-	-	23/03/04	
BH3R	-	-	-	-	-	-	-	-	-	-	2.72	13.30	-	-	-	-	23/03/04	
BH103G	-	-	-	-	-	-	-	-	-	-	2.73	6.10	-	-	-	-	23/03/04	
BH103C	-	-	-	-	-	-	-	-	-	-	3.21	17.77	-	-	-	-	23/03/04	
BH102C	-	-	-	-	-	-	-	-	-	-	5.73	19.66	-	-	-	-	23/03/04	
BH102R	-	-	-	-	-	-	-	-	-	-	5.12	9.18	-	-	-	-	23/03/04	
BH6R	-	-	-	-	-	-	-	-	-	-	13.25	22.81	-	-	-	-	23/03/04	
BH6C	-	-	-	-	-	-	-	-	-	-	13.29	>30	-	-	-	-	23/03/04	
BH9R	-	-	-	-	-	-	-	-	-	-	11.90	29.06	-	-	-	-	23/03/04	
BH202R	-	-	-	-	-	-	-	-	-	-	5.82	15.20	-	-	-	-	23/03/04	
BH204	-	-	-	-	-	-	-	-	-	-	8.92	14.41	-	-	-	-	23/03/04	
BH203R	-	-	-	-	-	-	-	-	-	-	4.65	14.09	-	-	-	-	23/03/04	
BH201C	-	-	-	-	-	-	-	-	-	-	2.28	22.32	-	-	-	-	23/03/04	
BH3G	-	-	-	-	-	-	-	-	-	-	2.89	6.60	-	-	-	-	23/03/04	
BH203C	-	-	-	-	-	-	-	-	-	-	6.38	30.27	-	-	-	-	23/03/04	
BH102G	-	-	-	-	-	-	-	-	-	-	5.33	8.10	-	-	-	-	23/03/04	
BH104C	-	-	-	-	-	-	-	-	-	-	13.06	29.79	-	-	-	-	23/03/04	
BH104G	-	-	-	-	-	-	-	-	-	-	3.16	4.16	-	-	-	-	23/03/04	
BH4F	-	-	-	-	-	-	-	-	-	-	3.05	3.85	-	-	-	-	23/03/04	
BH7G	-	-	-	-	-	-	-	-	-	-	2.87	7.86	-	-	-	-	23/03/04	
BH7R	-	-	-	-	-	-	-	-	-	-	12.43	26.58	-	-	-	-	23/03/04	
BH8G	0	11.4	6.5	0.9	-	1012	-	-	-	-	3.78	6.74	-	-	-	-	23/03/04	No gas valve fitted.
Maximum																		
Minimum																		
Average																		

Q:\PROJECTS\E3015\All East Site Gas Data (relabelled)\[All East Site Gas Data (relabelled).xls]23 03 04

Background Gas Levels on 23 03 04

	CH_4 %	CO_2 %	O_2 %	VOC ppm	Atmos mbar
Before Monitoring	0.0	0.3	21.3	0.7	1012
After Monitoring	0.0	0.0	21.3	0.7	1012

D3

GEOTECHNICAL RESULTS

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hand Pit Number	Sample Number	Depth m	Description of Sample
1	MG/Clay	1.60	MADE GROUND dark grey gravelly very clayey very silty sand with some ash and clinker.
1	Sand	2.50	Brown slightly gravelly very clayey very silty SAND.
2	LC?	1.60	Brown very clayey very silty SAND.
3	MG	0.70	Brown very gravelly very clayey very silty SAND.
3	MG	1.60	Brown mottled grey very gravelly very sandy silty CLAY.

Butterley Geotechnical

Compiled by	Date	Checked by	Date	Approved by	Date
	29/3/04		29/3/04		29/3/04

MANOR FARM SEWAGE WORKS, READING.

Contract No NL240620

Client Ref: E3015/23

South Kirkby, Pontefract, WF9 3AP.

SUMMARY OF SOIL CLASSIFICATION TESTS

(B.S. 1377 : PART 2 : 1990)

Hand 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	MC	1.60	21			2.44	34	20	14	75	Intermediate plasticity CI.
1	Sand	2.50	19				27	19	8	95	Low plasticity CL.
2	LC?	1.60	19				25	17	8	92	Low plasticity CL.
3	MC	0.70	15			2.64					
3	MC	1.60	13			2.65	37	14	23	73	Intermediate plasticity CI.

SYMBOLS : NP : Non Plastic

* : Liquid Limit and Plastic Limit Wet Sieved.

Butterley Geotechnical

Compiled by	Date	Checked by	Date	Approved by	Date
	29/3/04		29/3/04		29/3/04

MANOR FARM SEWAGE WORKS, READING.

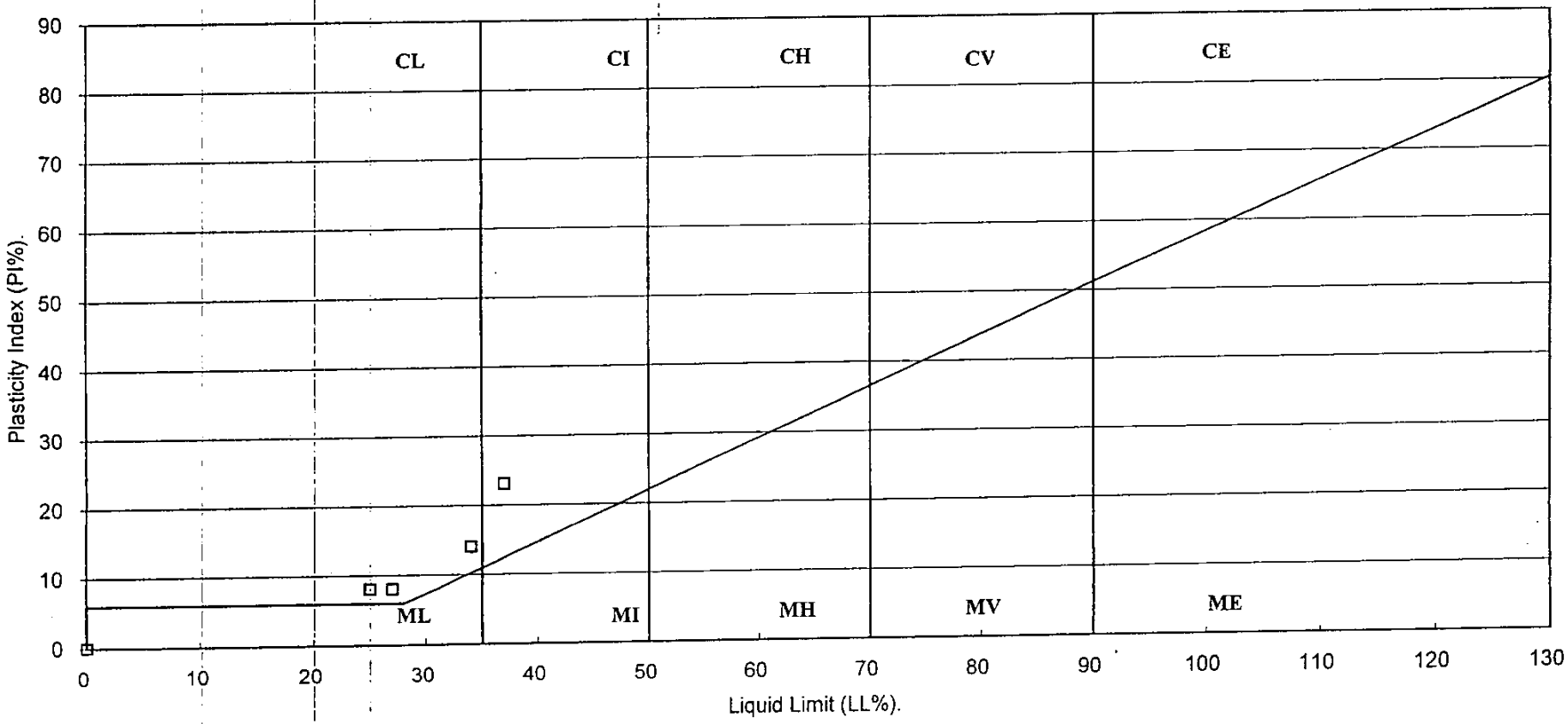
Contract No NL240620

Client Ref:

South Kirkby, Pontefract, WF9 3AP.

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(B.S.5930 : 1999)



Butterley Geotechnical

Compiled by	Date	Checked by	Date	Approved by	Date
	29/3/04		29/3/04		29/3/04

MANOR FARM SEWAGE WORKS, READING.

Contract No NL240620

Client Ref:

South Kirkby, Pontefract, WF9 3AP.

MOISTURE CONDITION VALUE CALIBRATION
BS1377 : Part 4 : 1990.

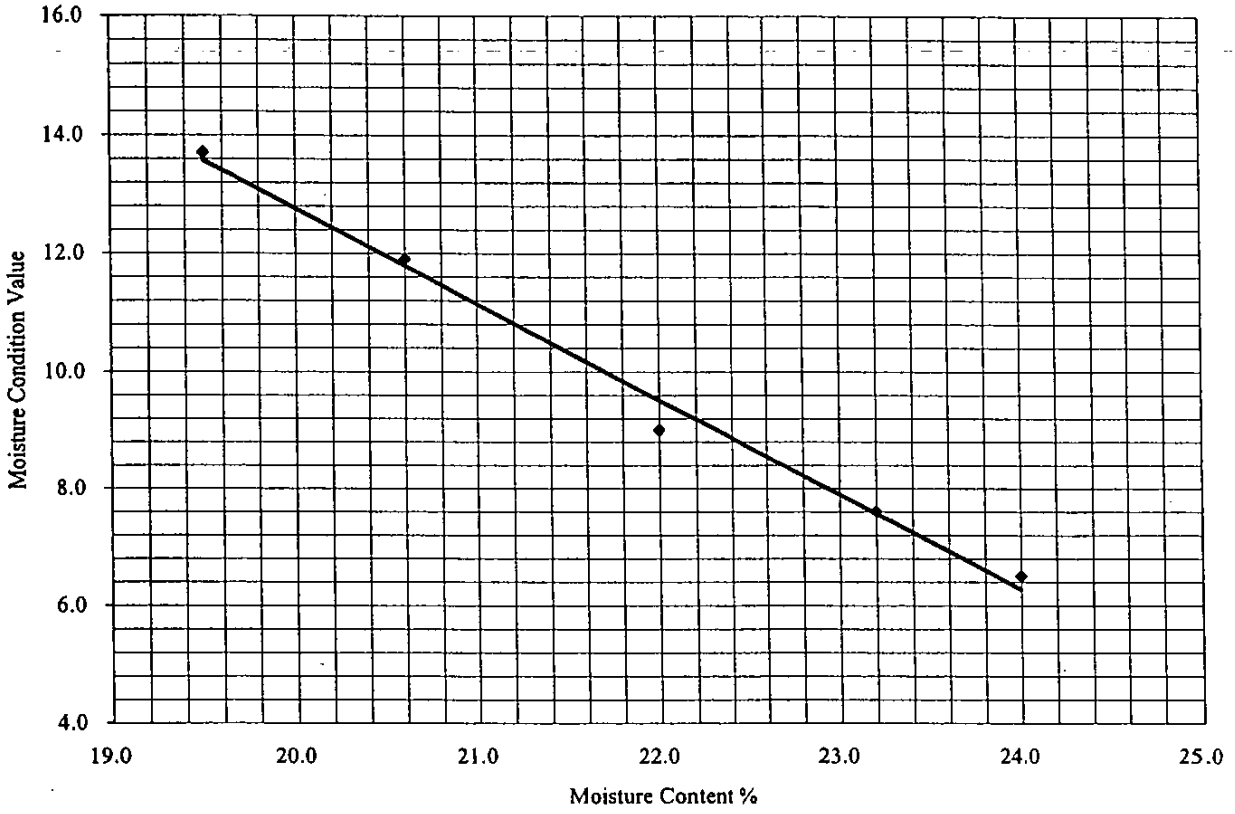
Hand Pit 1 Depth (m): 1.60

Sample Number:

MC

Sample Type: Bulk

Initial Moisture Content (%).:	21
Single/Separate Samples Tested.	Separate
Material Retained on the 20mm BS Test Sieve (%).:	3



Test Results.

Test Number.	1	2	3	4	5
Moisture Content (%).	19.5	20.6	22.0	23.2	24.0
MCV	13.7	11.9	9.0	7.6	6.5

Checked and Approved By

Date 24/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING

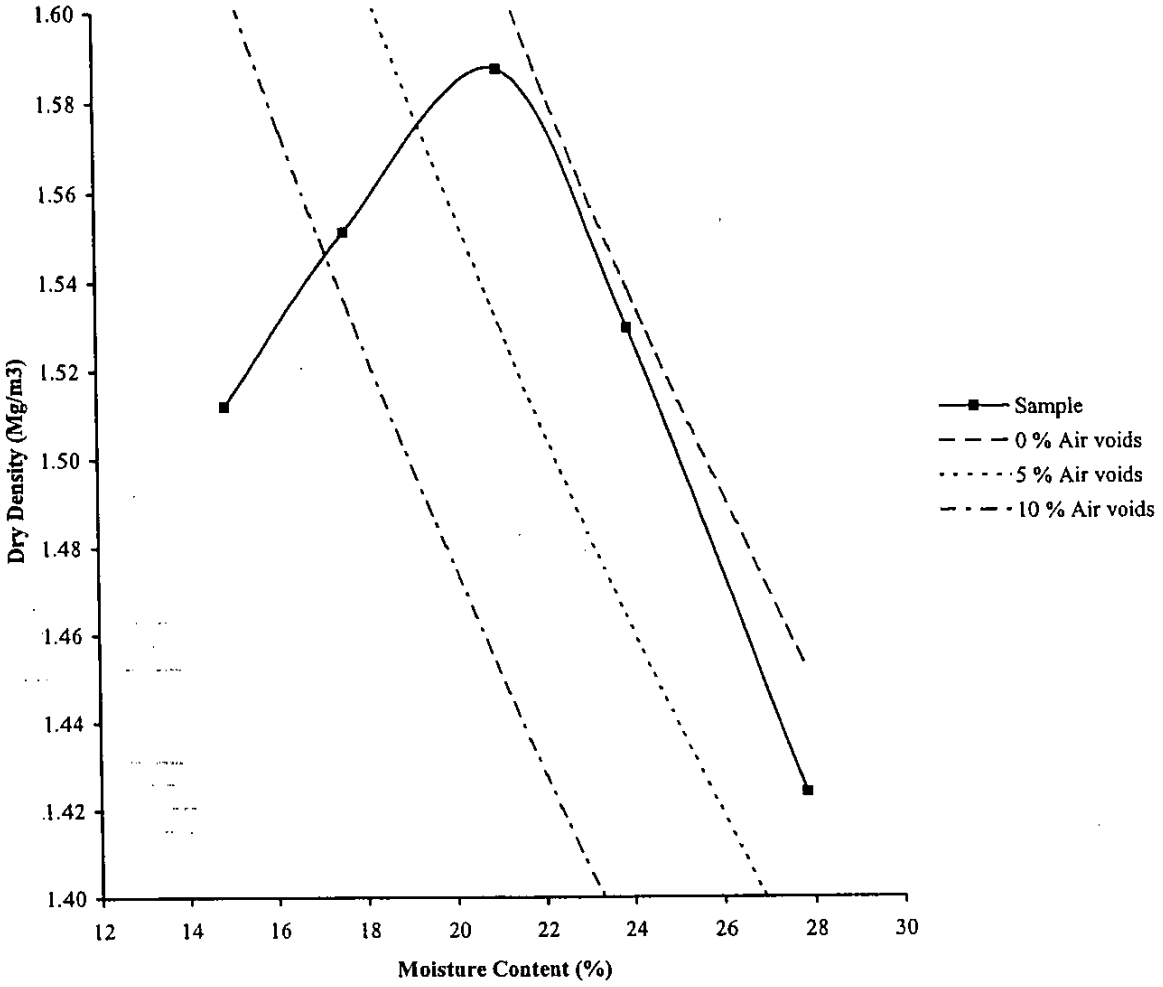
Contract No.:
NL240620

Dry Density /Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Hand Pit /Sample Number : 1 **Depth (m) :** 1.60

MC



Initial Moisture Content:	21	Method of Compaction	2.5 Kg Rammer / Separate Sample	
Particle Density (Mg/m3):	2.44	Measured	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (mg/m3):		1.59	Material Retained on 20.0 mm Test Sieve (%):	3
Optimum Moisture Content (%):		21		
Remarks	See summary of soil descriptions.			

Checked By	Date	Approved By	Date
	24/3/04		24/3/04.

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

Contract No.
NL240620

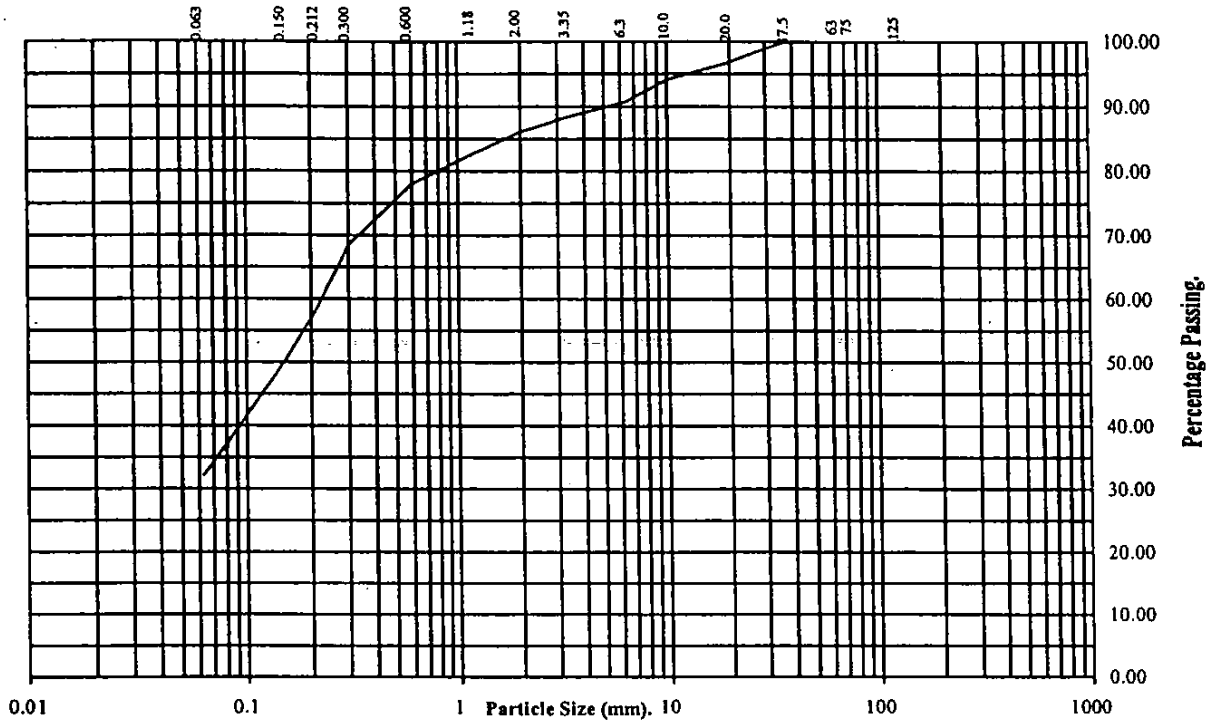
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Hand Pit /Sample Number: 1 **Depth (m):** 1.60

MG



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	97
10	94
6.3	91
3.35	88
2	86
1.18	83
0.6	78
0.3	68
0.212	58
0.15	50
0.063	32

Soil Fraction	Total Percentage
Cobbles	0
Gravel	14
Sand	54
Silt/Clay	32

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
	24/3/04		24/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

Contract No.:
NL240620

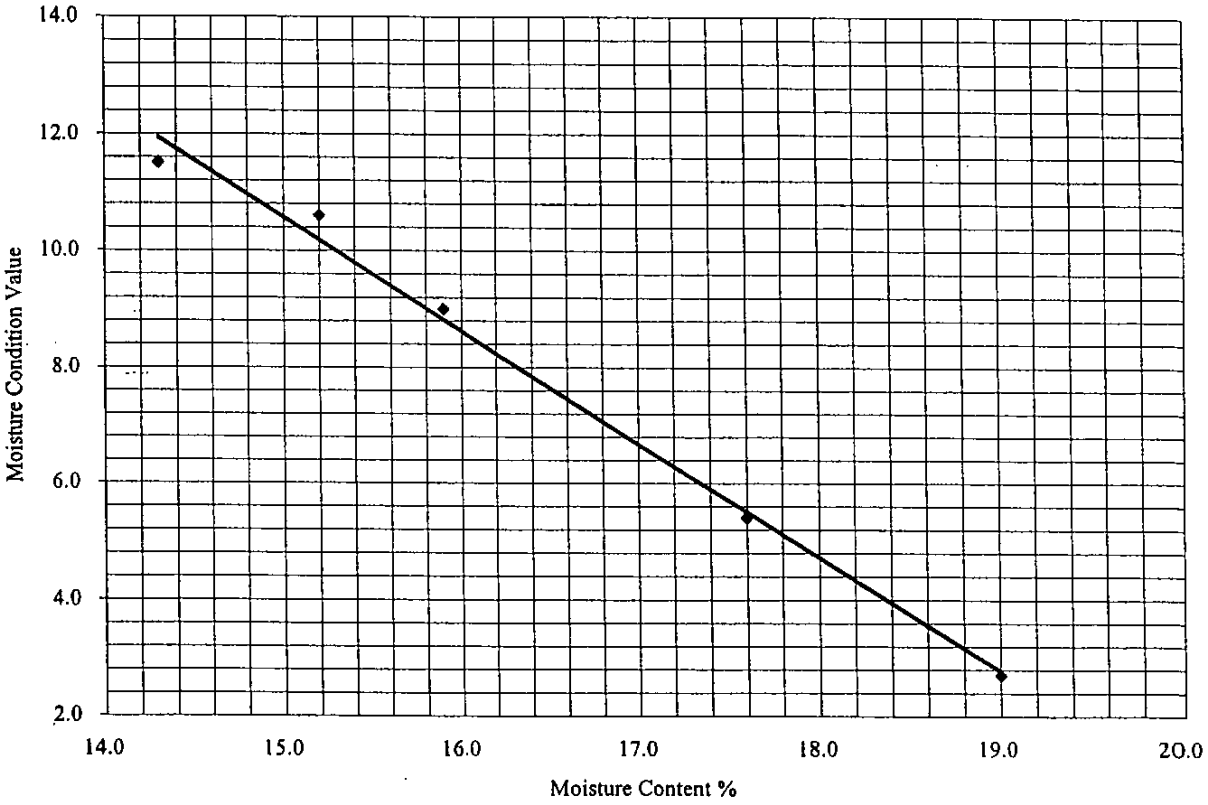
MOISTURE CONDITION VALUE CALIBRATION
BS1377 : Part 4 : 1990.

Hand Pit 1 Depth (m): 2.50

Sample Number:

Sample Type: Bulk

Initial Moisture Content (%).:	19
Single/Separate Samples Tested.	Separate
Material Retained on the 20mm BS Test Sieve (%).:	0



Test Results.

Test Number.	1	2	3	4	5
Moisture Content (%).	14.3	15.2	15.9	17.6	19.0
MCV	11.5	10.6	9.0	5.4	2.7

Checked and Approved By

Date 25/9/07

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING

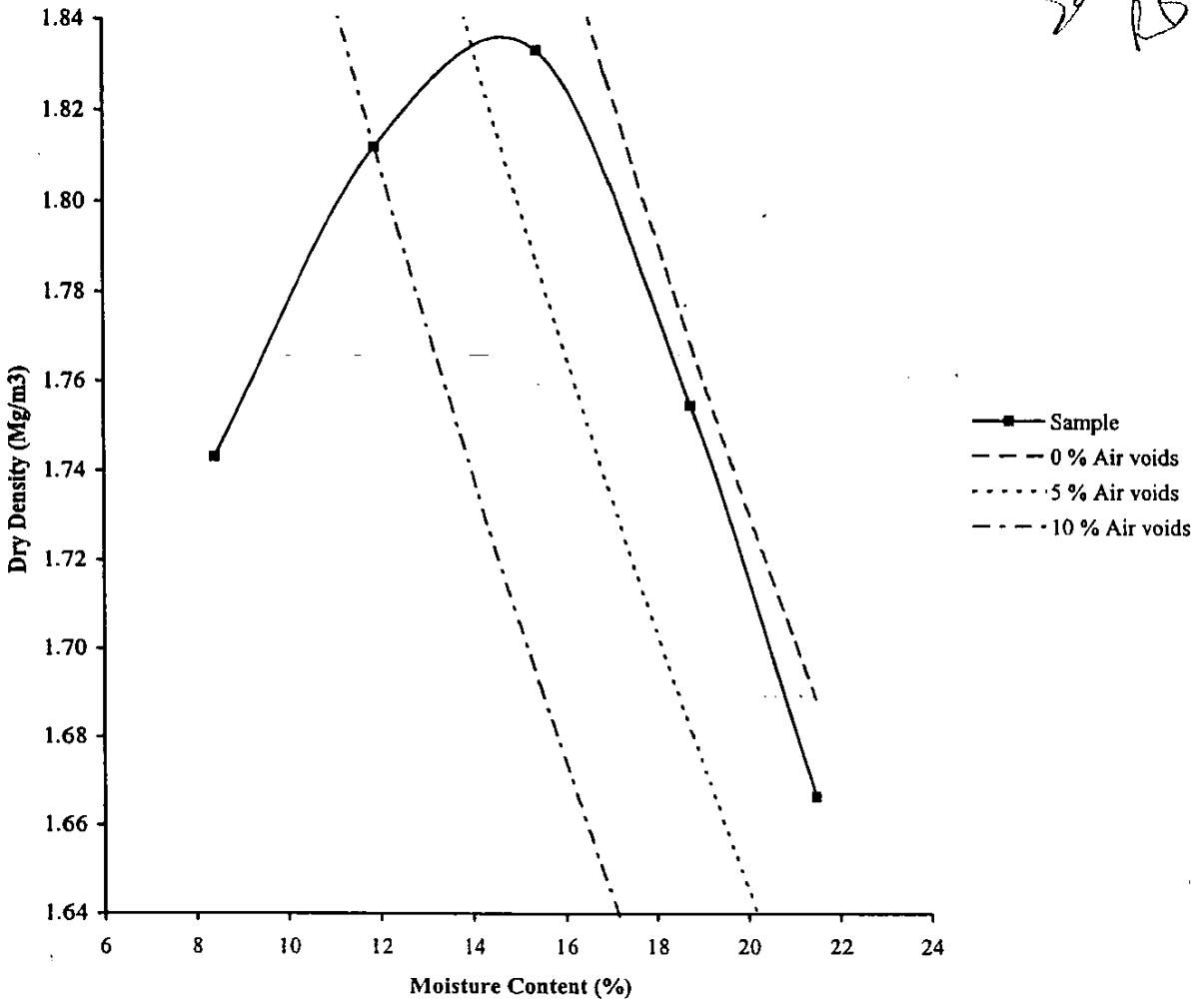
Contract No.:
NL240620

Dry Density /Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Hand Pit /Sample Number : 1 **Depth (m) : 2.50**

Sand RB



Initial Moisture Content:	19	Method of Compaction	2.5 Kg Rammer / Separate Sample	
Particle Density (Mg/m3):	2.65	Assumed	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (mg/m3):		1.84	Material Retained on 20.0 mm Test Sieve (%):	0
Optimum Moisture Content (%):		14		
Remarks	See summary of soil descriptions.			

Checked By	Date	Approved By	Date
	25/5/04		25/5/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

Contract No.
NL240620

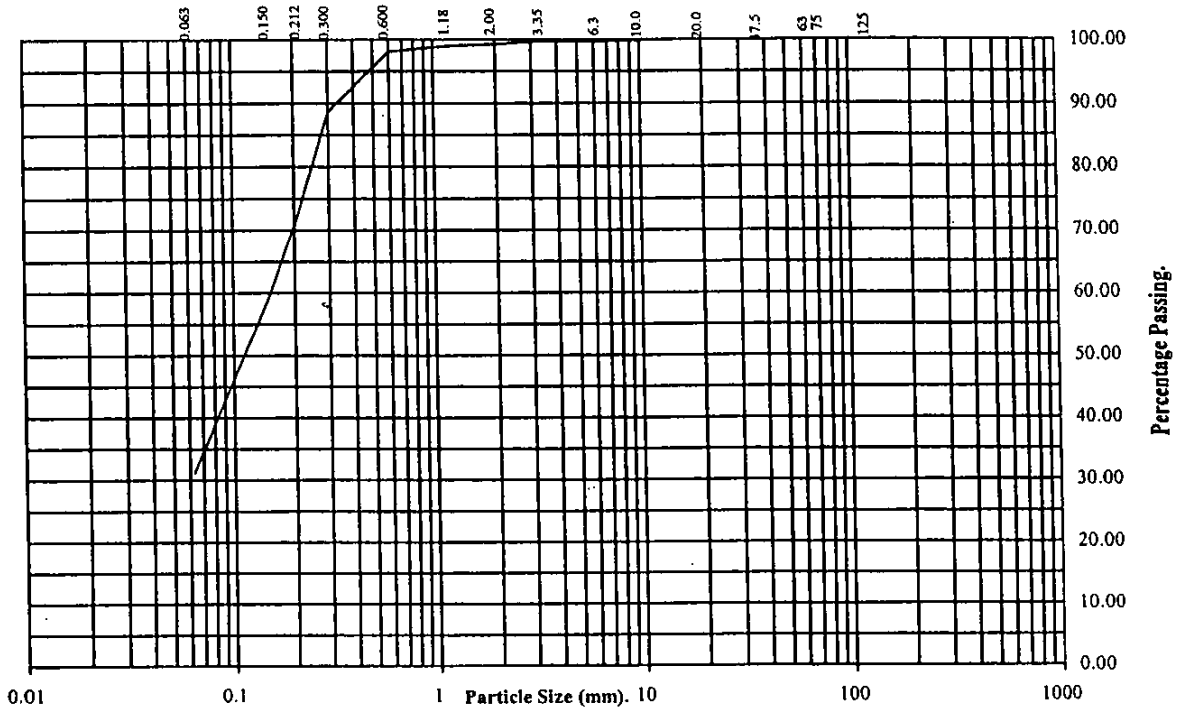
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Hand Pit /Sample Number: 1 **Depth (m):** 2.50

sand



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	99
1.18	99
0.6	98
0.3	89
0.212	73
0.15	60
0.063	31

Soil Fraction	Total Percentage
Cobbles	0
Gravel	1
Sand	68
Silt/Clay	31

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
	25/3/04		25/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

Contract No.:
NL240620

MOISTURE CONDITION VALUE CALIBRATION
BS1377 : Part 4 : 1990.

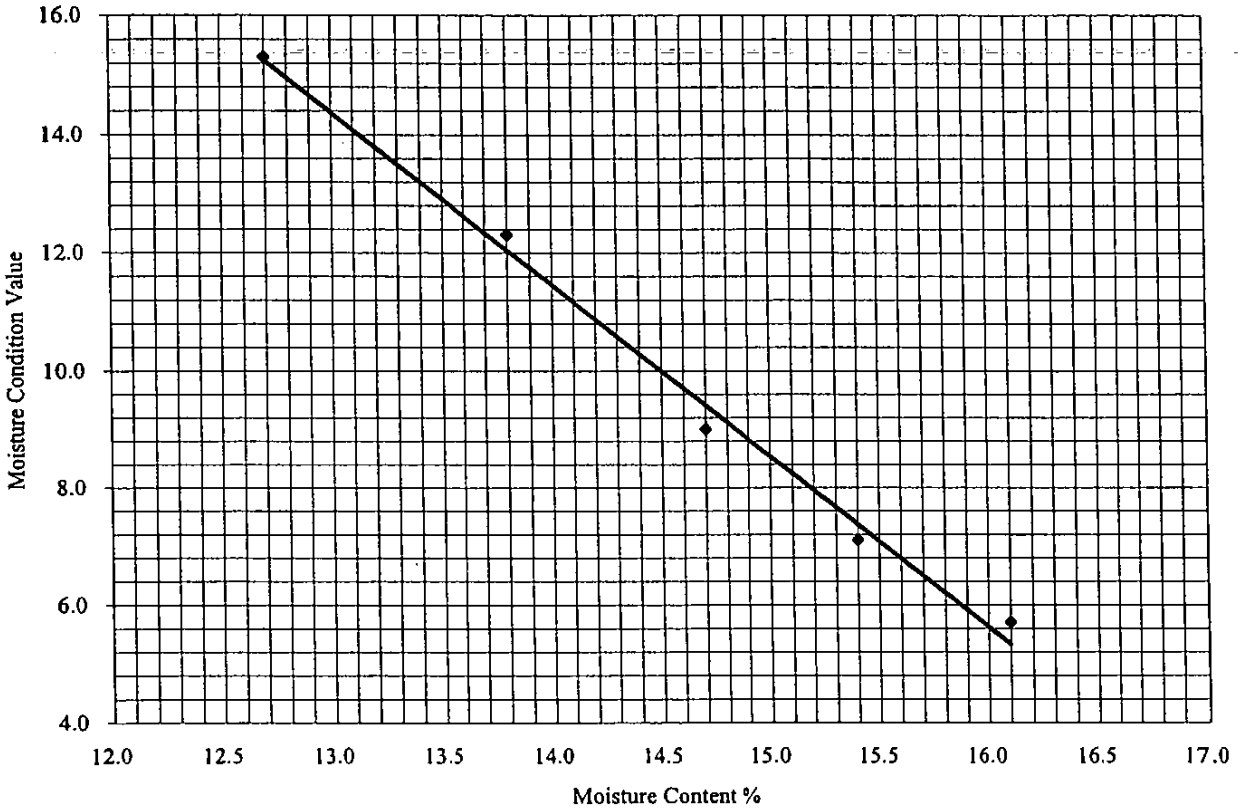
Hand Pit 2 Depth (m): 1.60

Sample Number:

Sample Type: Bulk

LC?

Initial Moisture Content (%).:	19
Single/Separate Samples Tested.	Separate
Material Retained on the 20mm BS Test Sieve (%).:	0



Test Results.

Test Number.	1	2	3	4	5
Moisture Content (%).	12.7	13.8	14.7	15.4	16.1
MCV	15.3	12.3	9.0	7.1	5.7

Checked and Approved By **Date**

24/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING

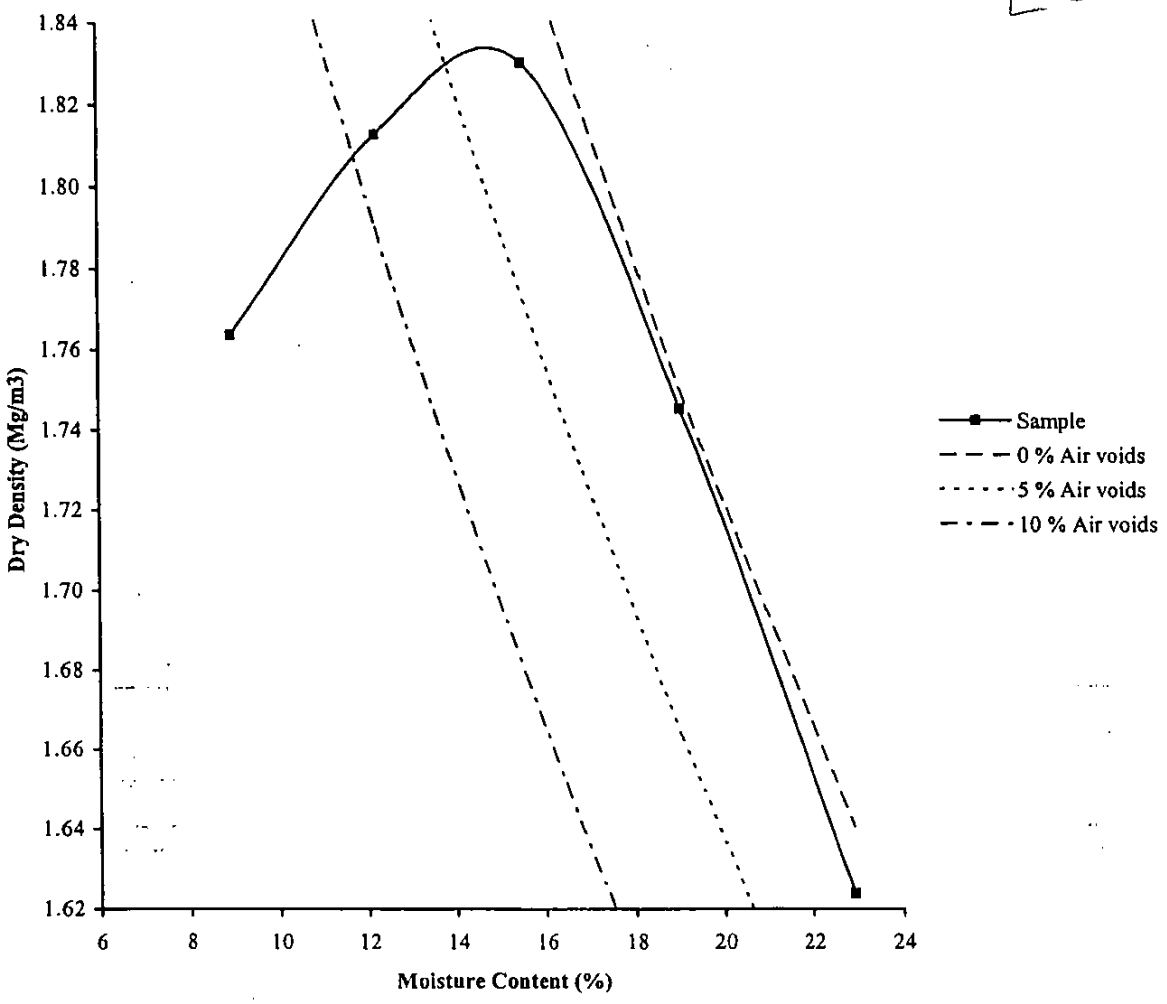
Contract No.:
NL240620

Dry Density /Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Hand Pit /Sample Number : 2 **Depth (m) : 1.60**

LC?



Initial Moisture Content:	19	Method of Compaction	2.5 Kg Rammer / Separate Sample	
Particle Density (Mg/m3):	2.63	Assumed	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (mg/m3):		1.83	Material Retained on 20.0 mm Test Sieve (%):	0
Optimum Moisture Content (%):		15		
Remarks	See summary of soil descriptions.			

Checked By	Date	Approved By	Date
	24/3/04		24/3/04.

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

Contract No.
NL240620

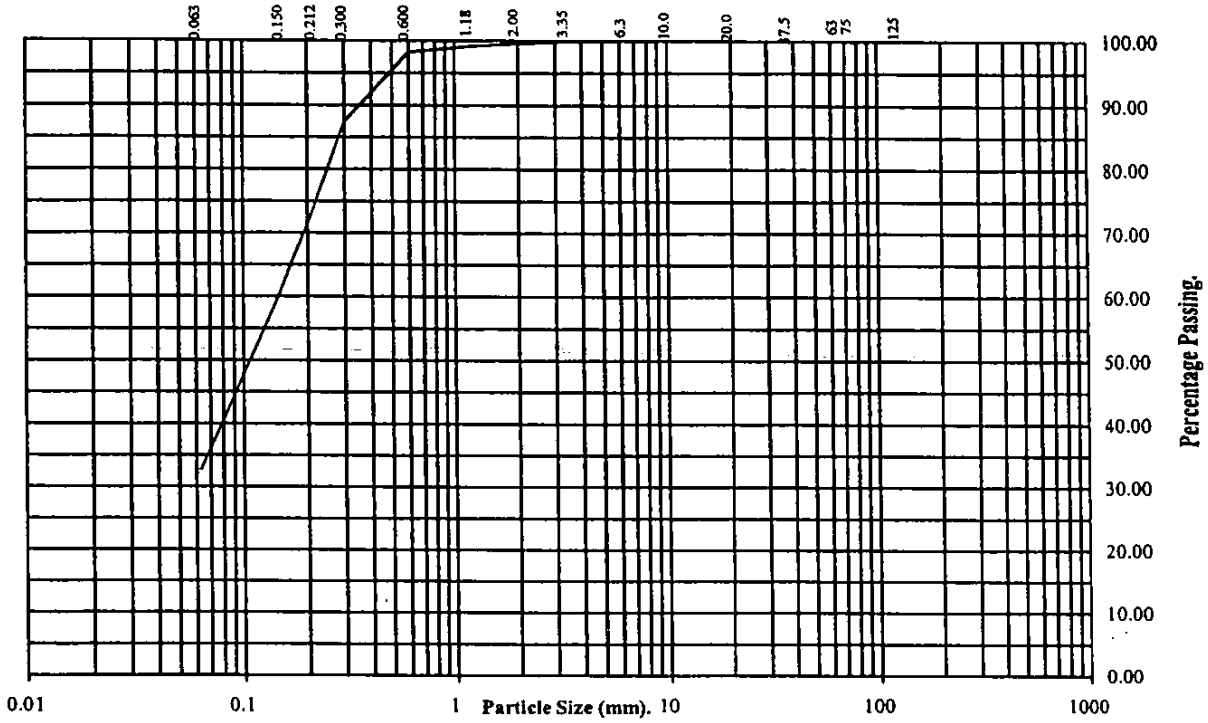
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Hand Pit /Sample Number: 2 **Depth (m):** 1.60

LC?



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	99
0.6	98
0.3	87
0.212	73
0.15	61
0.063	33

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	67
Silt/Clay	33

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
	24/3/04		24/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

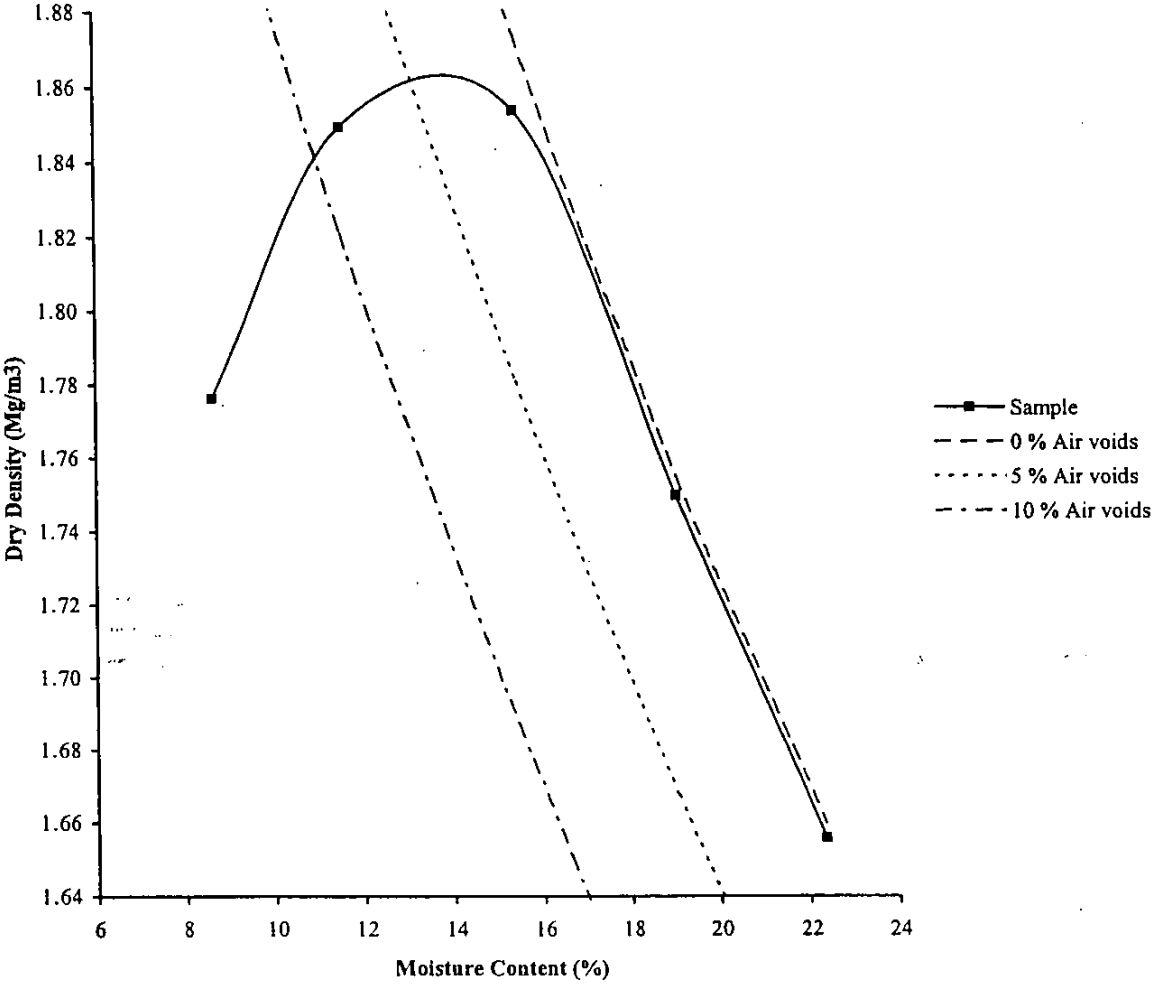
Contract No.:
NL240620

Dry Density /Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Hand Pit /Sample Number : 3 **Depth (m) :** 0.70

MC



Initial Moisture Content:	15	Method of Compaction	2.5 Kg Rammer / Separate	Sample
Particle Density (Mg/m3):	2.64	Measured	Material Retained on 37.5 mm Test Sieve (%):	2
Maximum Dry Density (mg/m3):		1.86	Material Retained on 20.0 mm Test Sieve (%):	6
Optimum Moisture Content (%):		14		
Remarks	See summary of soil descriptions.			

Checked By	Date	Approved By	Date
	25/3/04		26/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

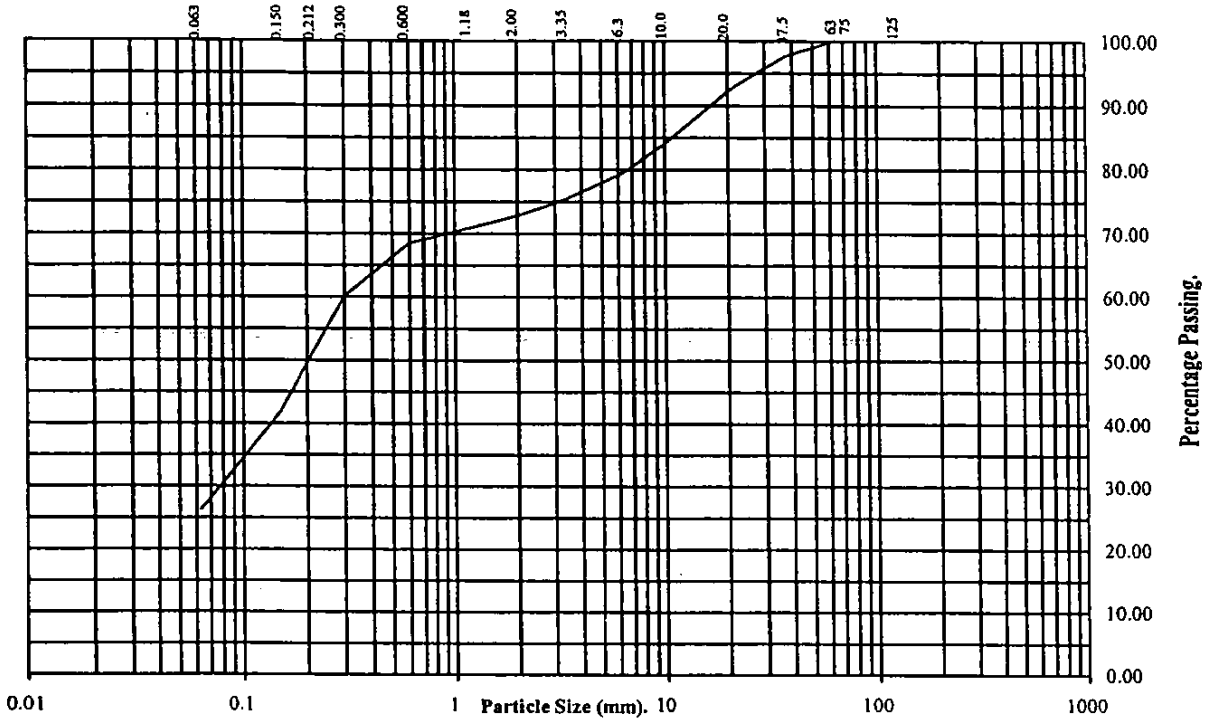
Contract No.
NL240620

PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Hand Pit /Sample Number: 3 **Depth (m):** 0.70 MC



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	98
20	92
10	84
6.3	79
3.35	75
2	73
1.18	71
0.6	69
0.3	60
0.212	51
0.15	42
0.063	26

Soil Fraction	Total Percentage
Cobbles	0
Gravel	27
Sand	47
Silt/Clay	26

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
	25/8/04		25/7/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

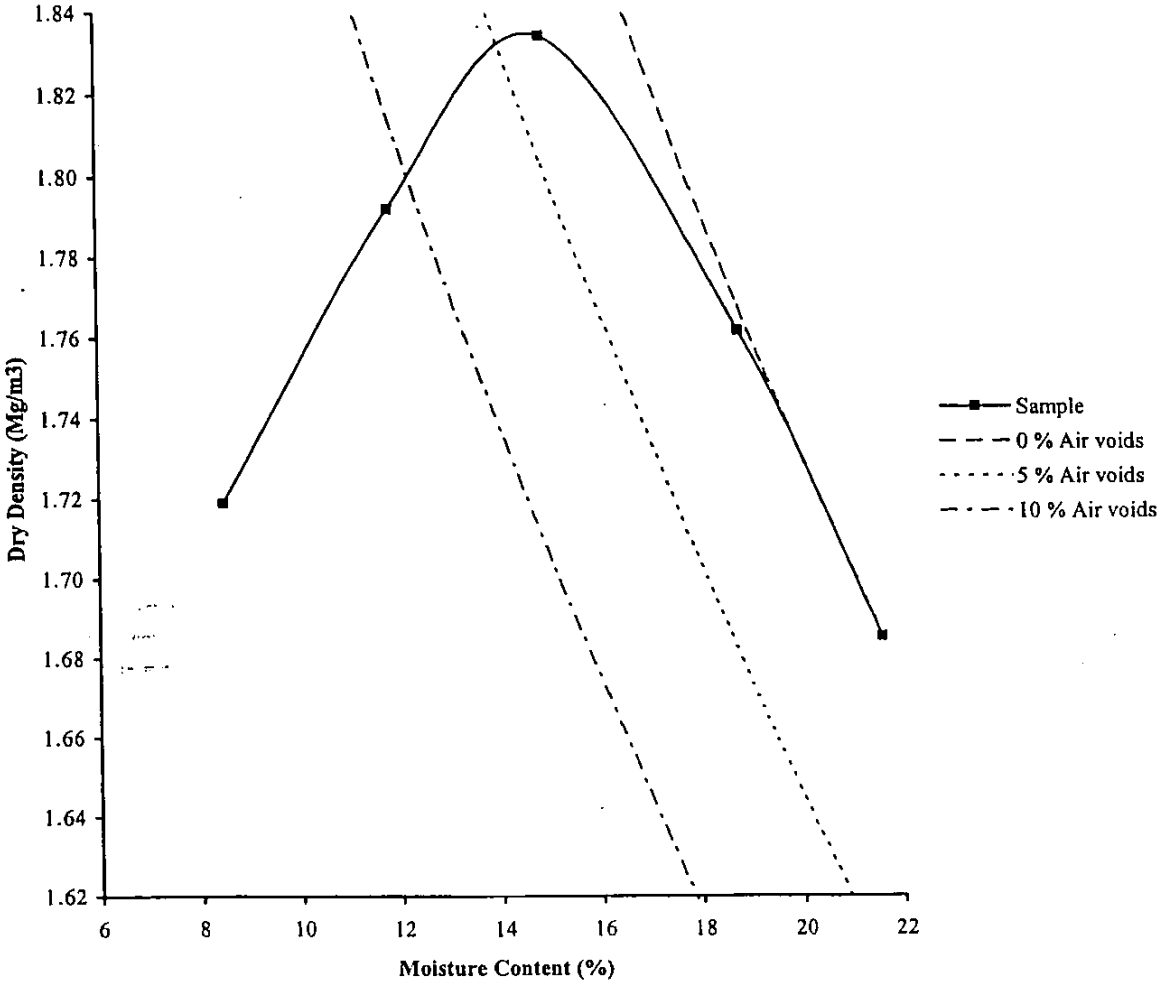
Contract No.:
NL240620

Dry Density /Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Hand Pit /Sample Number : 3 **Depth (m) :** 1.60

MG



Initial Moisture Content:	19	Method of Compaction	2.5 Kg Rammer / Separate Sample	
Particle Density (Mg/m3):	2.65	Measured	Material Retained on 37.5 mm Test Sieve (%):	5
Maximum Dry Density (mg/m3):		1.84	Material Retained on 20.0 mm Test Sieve (%):	4
Optimum Moisture Content (%):		15		
Remarks	See summary of soil descriptions.			

Checked By	Date	Approved By	Date
	15/3/04		25/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

Contract No.
NL240620

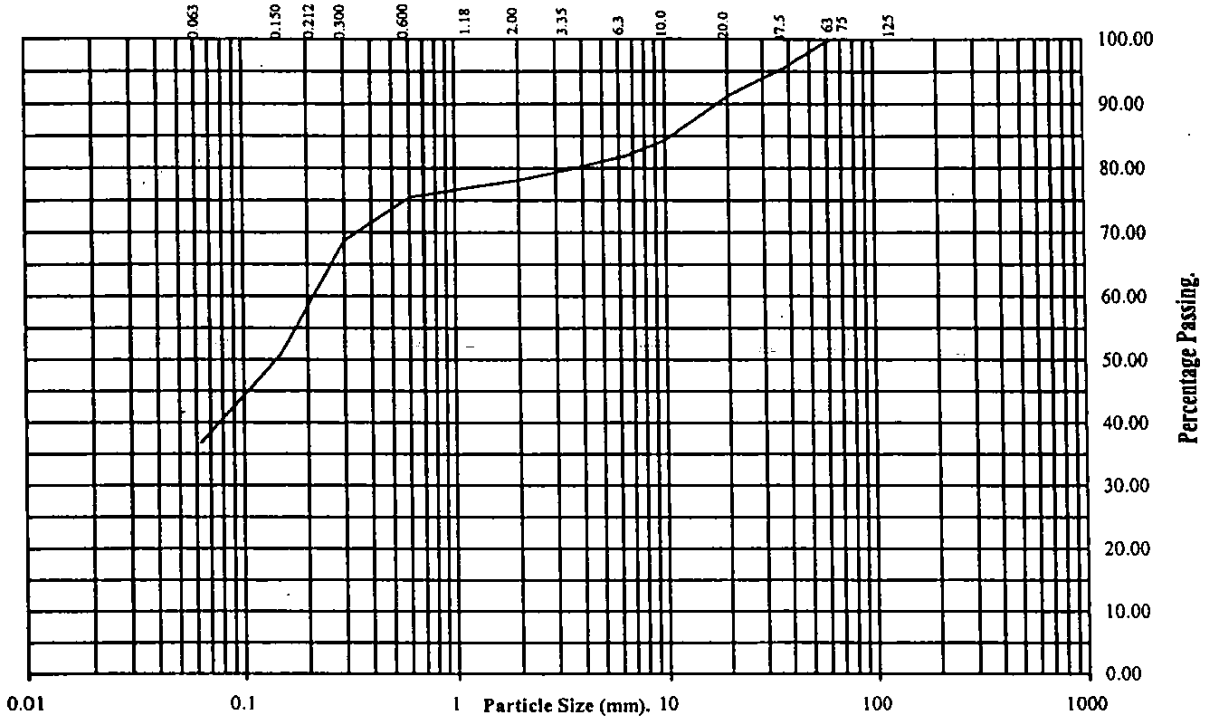
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Hand Pit /Sample Number: 3 **Depth (m):** 1.60

MC



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	95
20	91
10	84
6.3	82
3.35	80
2	78
1.18	77
0.6	75
0.3	69
0.212	60
0.15	51
0.063	37

Soil Fraction	Total Percentage
Cobbles	0
Gravel	22
Sand	41
Silt/Clay	37

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
	25/3/04		25/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

Contract No.:
NL240620

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Trial Pit Number	Sample Number	Depth m	Description of Sample
205	MC	0.90	Brown gravelly very sandy silty CLAY.
206	MC	0.50	Brown and grey slightly gravelly very sandy silty CLAY.
207	MC	0.80	Brown and grey slightly gravelly very sandy silty CLAY.
207	MC	2.80	Brown slightly gravelly sandy very silty CLAY.
208	MC	0.20	MADE GROUND dark brown very gravelly very sandy silty clay with some ash and clinker.
209	MC	1.30	Dark brown gravelly very sandy silty CLAY.
210	MC	0.80	Brown slightly gravelly very sandy silty CLAY.
210	MC	1.60	Brown gravelly very sandy silty CLAY.
211	MC	1.60	Brown very gravelly very sandy silty CLAY.
211	MC	1.90	Grey very gravelly very sandy silty CLAY with some organic material.
212	MC	0.60	Brown very gravelly very sandy silty CLAY.
213	Gravel	3.20	Brown very sandy silty GRAVEL.
214	MC	0.80	Brown gravelly very sandy silty CLAY.
214	MC	2.40	Brown very gravelly very sandy silty CLAY.
214	MC	3.60	Brown very gravelly very sandy silty CLAY.
216	Gravel	1.00	Brown very sandy clayey silty GRAVEL.
217	MC	1.40	MADE GROUND dark brown sandy slightly clayey silty gravel of ash and clinker.
217	MC	3.00	Grey mottled brown gravelly very sandy silty CLAY with some organic material.

Butterley Geotechnical

Compiled by	Date	Checked by	Date	Approved by	Date
	29/3/04		29/3/04		29/3/04

MANOR FARM SEWAGE WORKS, READING.

Contract No NL240620

Client Ref: E3015/23

South Kirkby, Pontefract, WF9 3AP.

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
205	MC	0.90	16				35	14	21	75	Intermediate plasticity CI.
206	MC	0.50	18			2.66					
207	MC	0.80	18			2.68					
207	MC	2.80	26				62	22	40	90	High plasticity CH.
208	MC	0.20	16			2.54	40	18	22	74	Intermediate plasticity CI.
209	MC	1.30	19			2.61					
210	MC	0.80	19			2.6					
210	MC	1.60	18				33	17	16	78	Low plasticity CL.
211	MC	1.60	20			2.58	39	19	20	70	Intermediate plasticity CI.
211	MC	1.90	29				54	24	30	68	High plasticity CH.
212	MC	0.60	17			2.62	35	15	20	58	Intermediate plasticity CI.
213	Gravel	3.20	13			2.69					
214	MC	0.80	19			2.54					
214	MC	2.40	19			2.61	44	19	25	62	Intermediate plasticity CI.
214	MC	3.60	24				44	21	23	65	Intermediate plasticity CI.
216	Gravel	1.00	13				26	15	11	45	Low plasticity CL.
217	MC	1.40	32			2.2		NP			
217	MC	3.00	45			2.62					
	MC										

SYMBOLS : NP : Non Plastic

* : Liquid Limit and Plastic Limit Wet Sieved.

Butterley Geotechnical

Compiled by	Date	Checked by	Date	Approved by	Date
	29/3/04		29/3/04		29/3/04

MANOR FARM SEWAGE WORKS, READING.

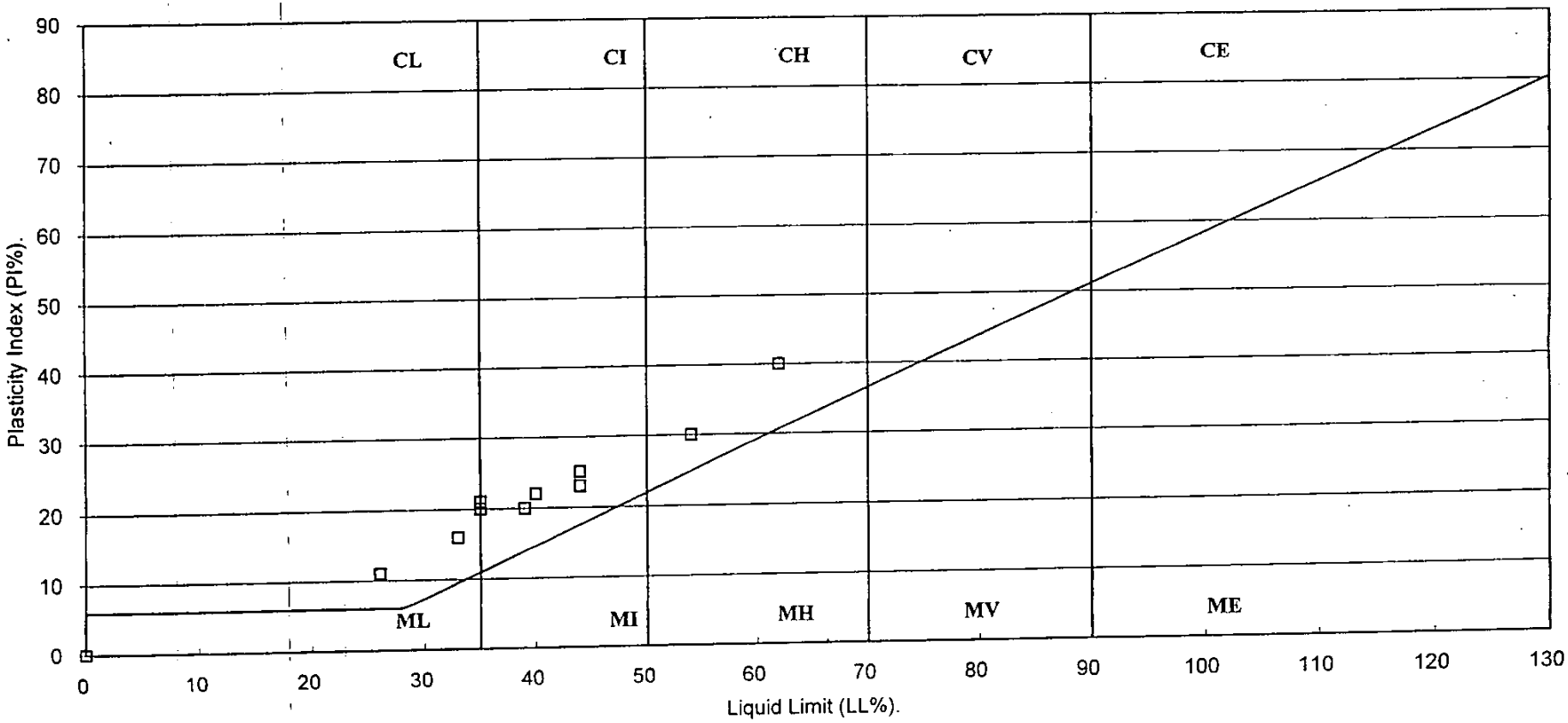
Contract No NL240620

Client Ref:

South Kirkby, Pontefract, WF9 3AP.

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(B.S.5930 : 1999)



Butterley Geotechnical

Compiled by	Date	Checked by	Date	Approved by	Date
	29/3/04		29/8/04		29/3/04

MANOR FARM SEWAGE WORKS, READING.

Contract No NL240620

Client Ref:

South Kirkby, Pontefract, WF9 3AP.

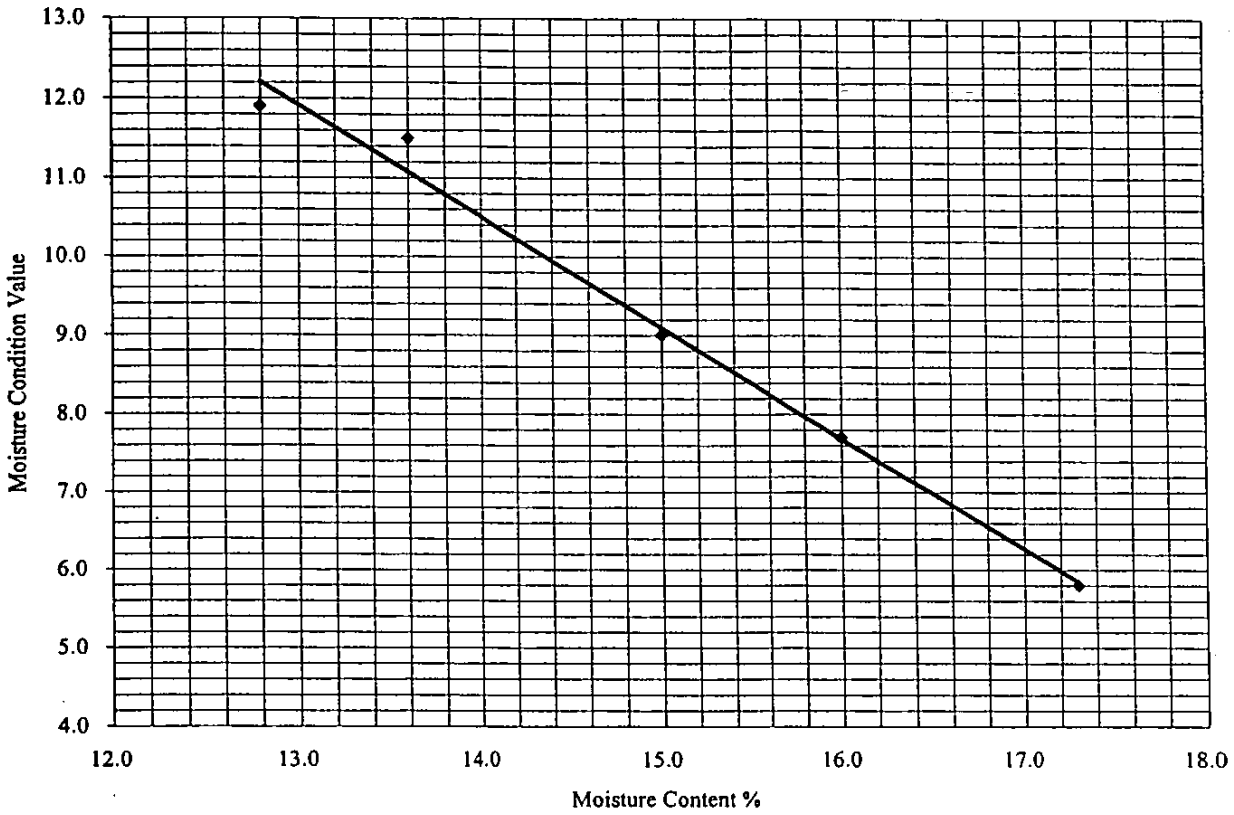
MOISTURE CONDITION VALUE CALIBRATION
BS1377 : Part 4 : 1990.

Trial Pit 205 Depth (m): 0.90 MC

Sample Number:

Sample Type: Bulk

Initial Moisture Content (%).:	16
Single/Separate Samples Tested.	Separate
Material Retained on the 20mm BS Test Sieve (%).:	5



Test Results.

Test Number.	1	2	3	4	5
Moisture Content (%).	12.8	13.6	15.0	16.0	17.3
MCV	11.9	11.5	9.0	7.7	5.8

Checked and Approved By

Date 24/3/04.

Butterley Geotechnical

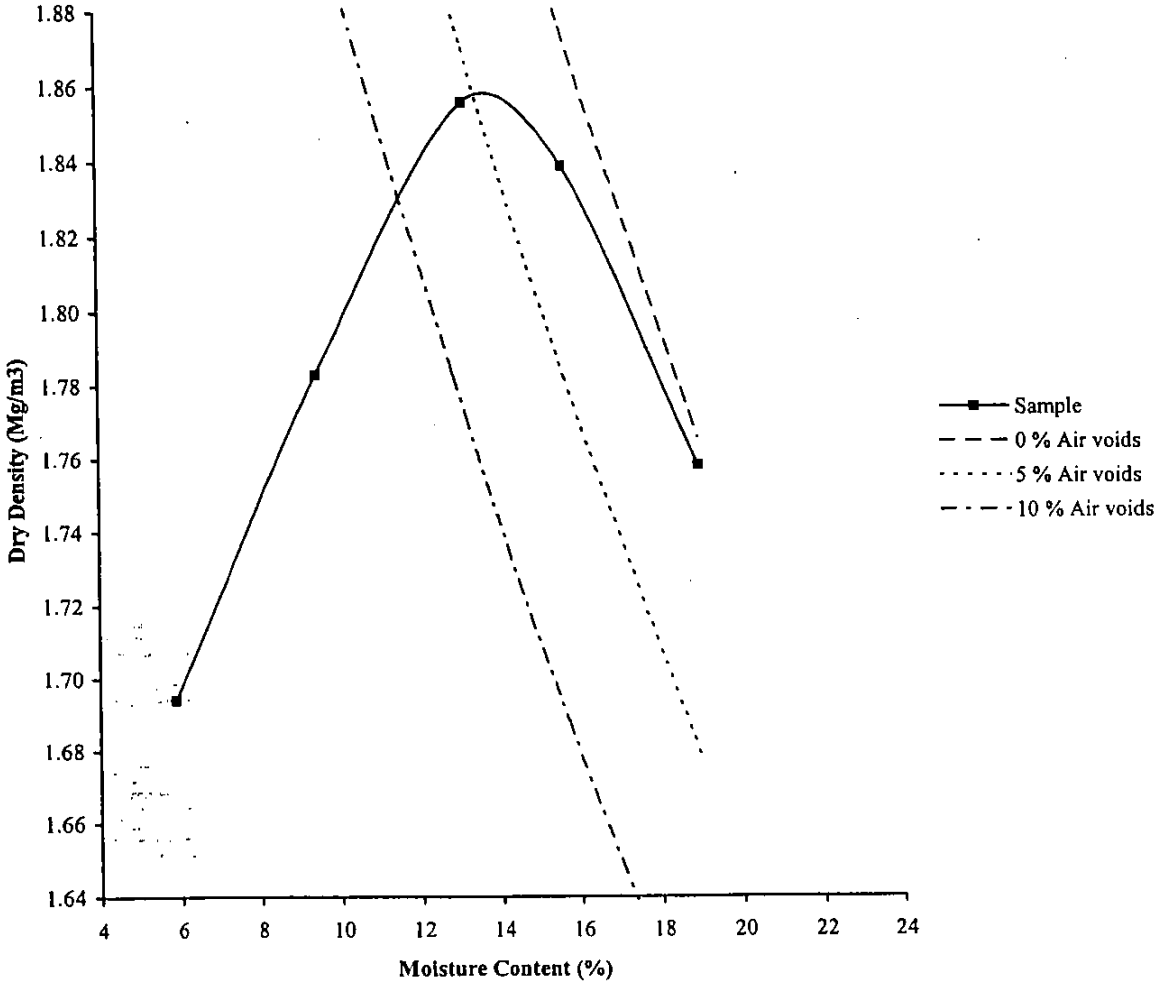
MANOR FARM
SEWAGE WORKS, READING

Contract No.:
NL240620

Dry Density /Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : 205 **Depth (m) : 0.90** MC



Initial Moisture Content:	16	Method of Compaction	2.5 Kg Rammer / Separate Sample	
Particle Density (Mg/m3):	2.66	Assumed	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (mg/m3):		1.86	Material Retained on 20.0 mm Test Sieve (%):	5
Optimum Moisture Content (%):		14		
Remarks	See summary of soil descriptions.			

Checked By	Date	Approved By	Date
	24/3/04		24/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

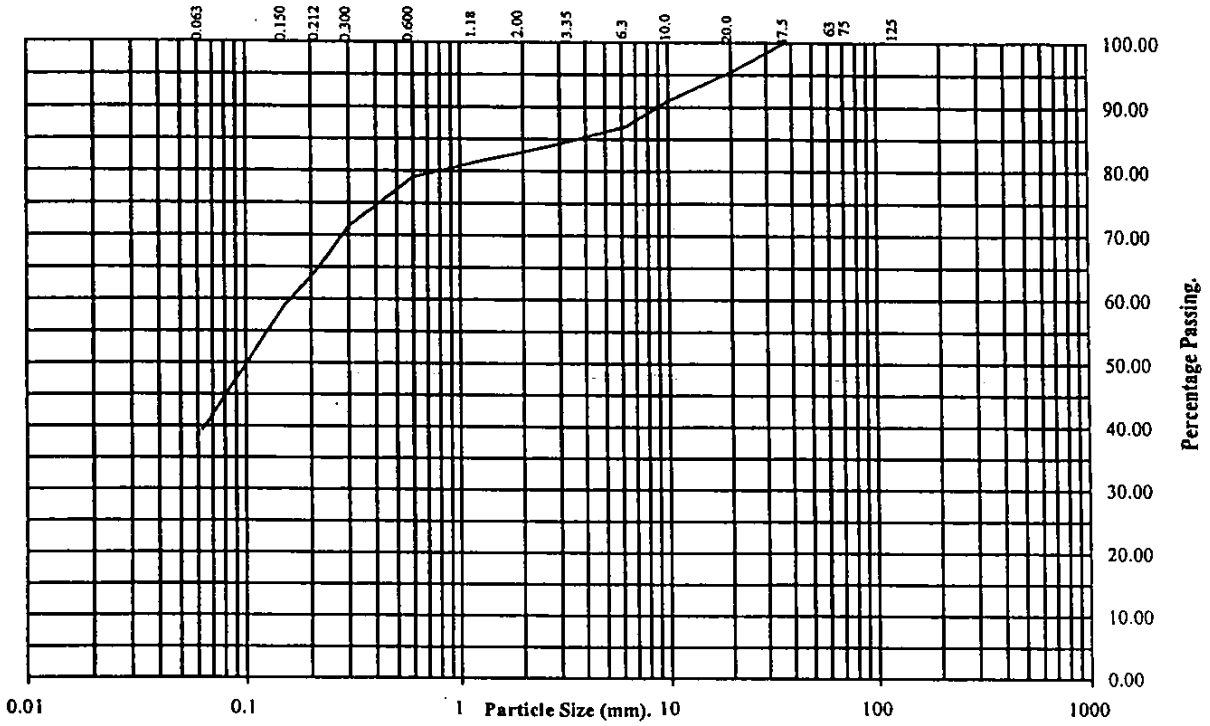
Contract No.
NL240620

PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: 205 **Depth (m):** 0.90 MC



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	95
10	91
6.3	87
3.35	85
2	83
1.18	81
0.6	79
0.3	71
0.212	64
0.15	59
0.063	39

Soil Fraction	Total Percentage
Cobbles	0
Gravel	17
Sand	44
Silt/Clay	39

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
[signature]	24/3/04	[signature]	24/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

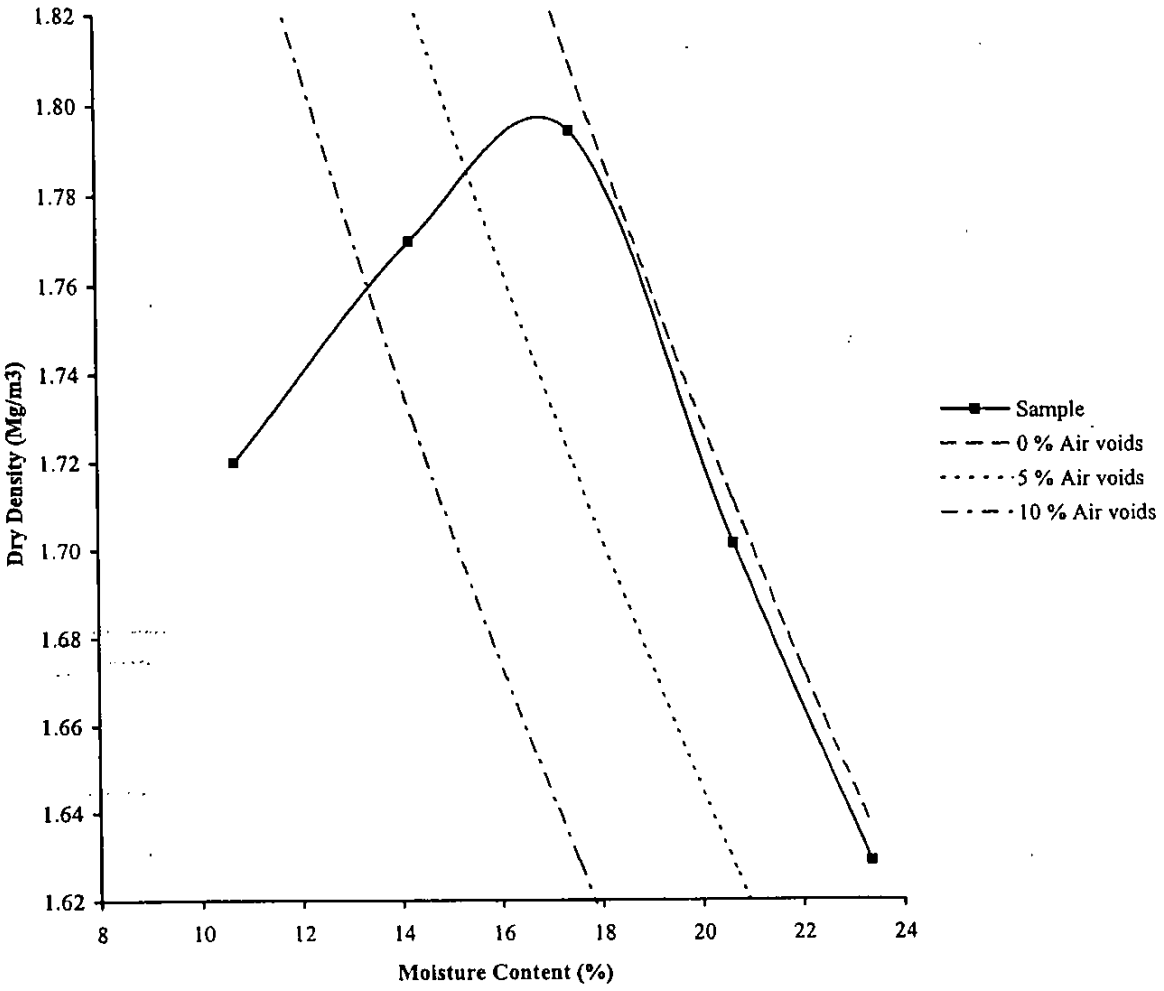
Contract No.:
NL240620

Dry Density /Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : 206 **Depth (m) : 0.50**

MC



Initial Moisture Content:	18	Method of Compaction	2.5 Kg Rammer / Separate	Sample	
Particle Density (Mg/m3):	2.65	Measured	Material Retained on 37.5 mm Test Sieve (%):	0	
Maximum Dry Density (mg/m3):		1.80	Material Retained on 20.0 mm Test Sieve (%):	1	
Optimum Moisture Content (%):		17			
Remarks	See summary of soil descriptions.				

Checked By	Date	Approved By	Date
	25/3/04		25/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

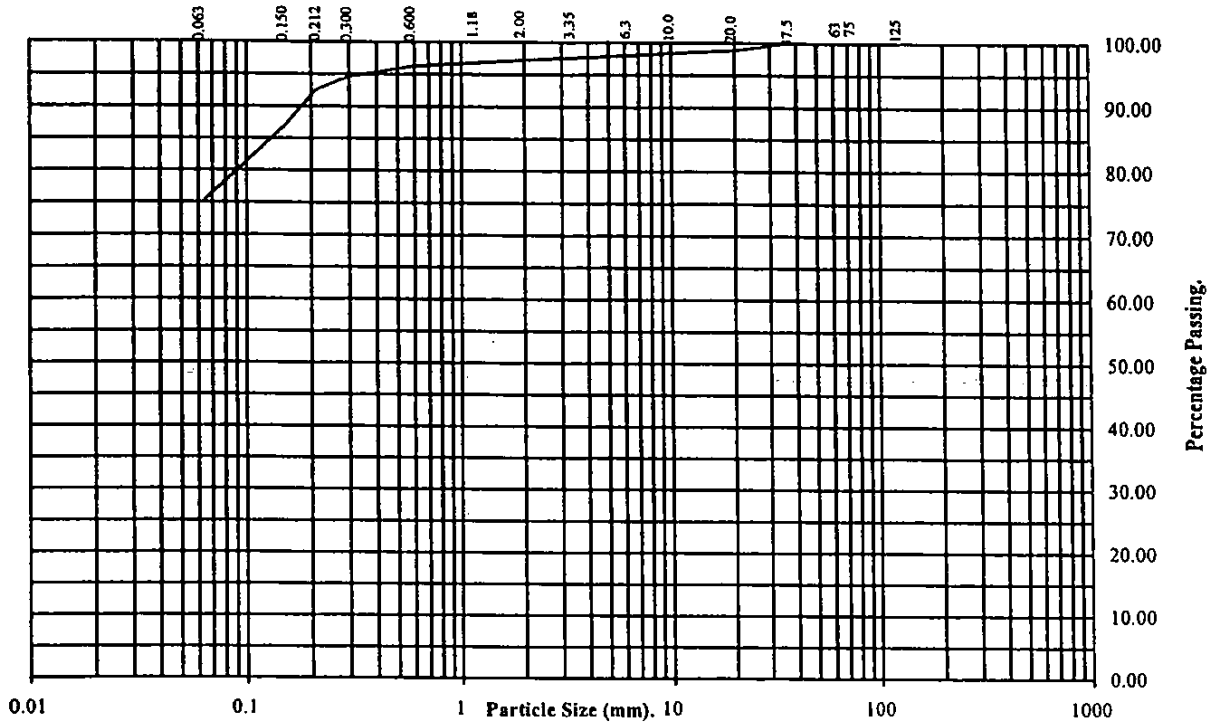
Contract No.
NL240620

PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: 206 **Depth (m):** 0.50



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	99
10	98
6.3	98
3.35	98
2	97
1.18	97
0.6	96
0.3	95
0.212	93
0.15	87
0.063	75

Soil Fraction	Total Percentage
Cobbles	0
Gravel	3
Sand	22
Silt/Clay	75

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
	25/3/04		25/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

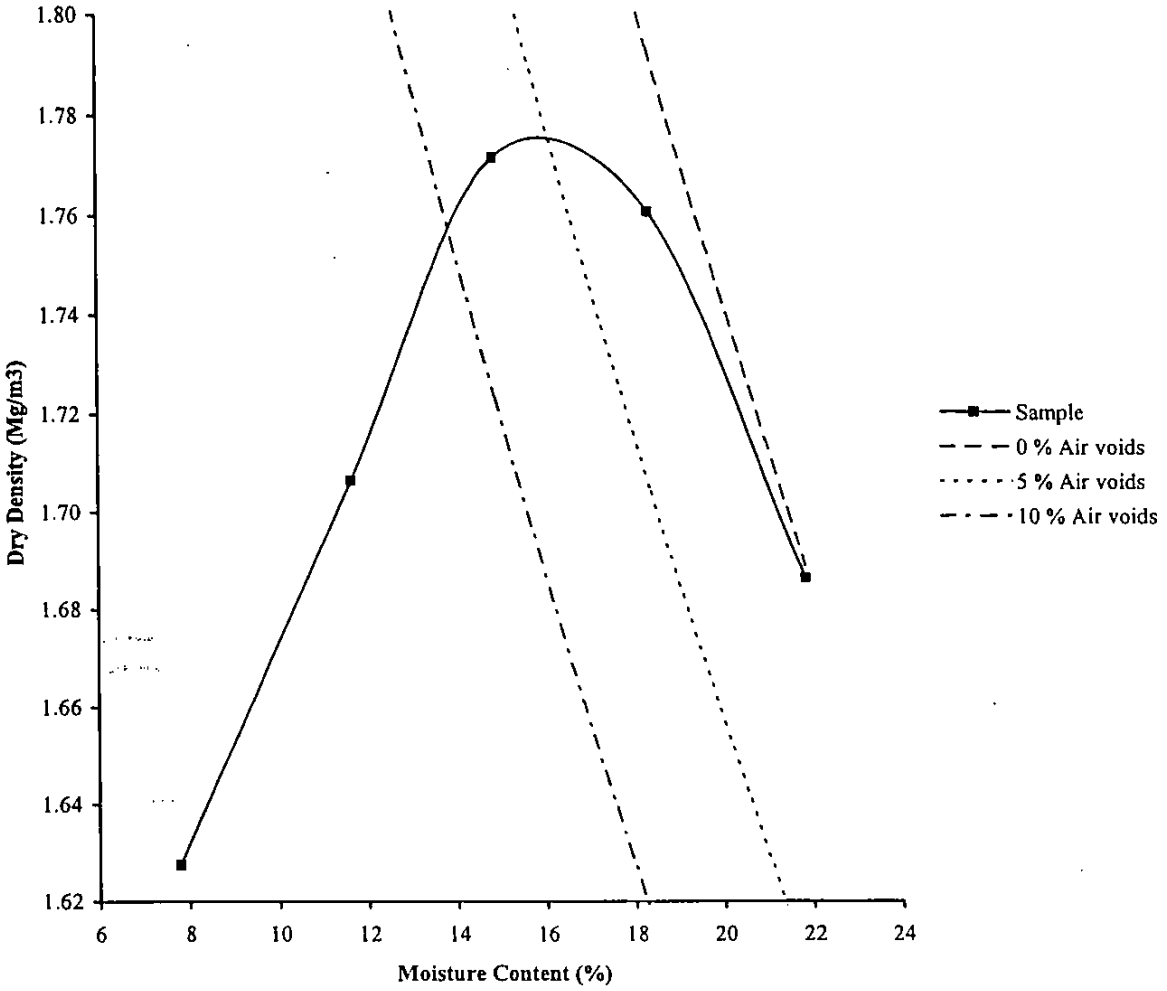
Contract No.:
NL240620

Dry Density /Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : 207 **Depth (m) : 0.80**

MC



Initial Moisture Content:	18	Method of Compaction	2.5 Kg Rammer / Separate	Sample
Particle Density (Mg/m3):	2.68	Measured	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (mg/m3):		1.78	Material Retained on 20.0 mm Test Sieve (%):	1
Optimum Moisture Content (%):		16		
Remarks	See summary of soil descriptions.			

Checked By	Date	Approved By	Date
	25/3/04		25/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

Contract No.
NL240620

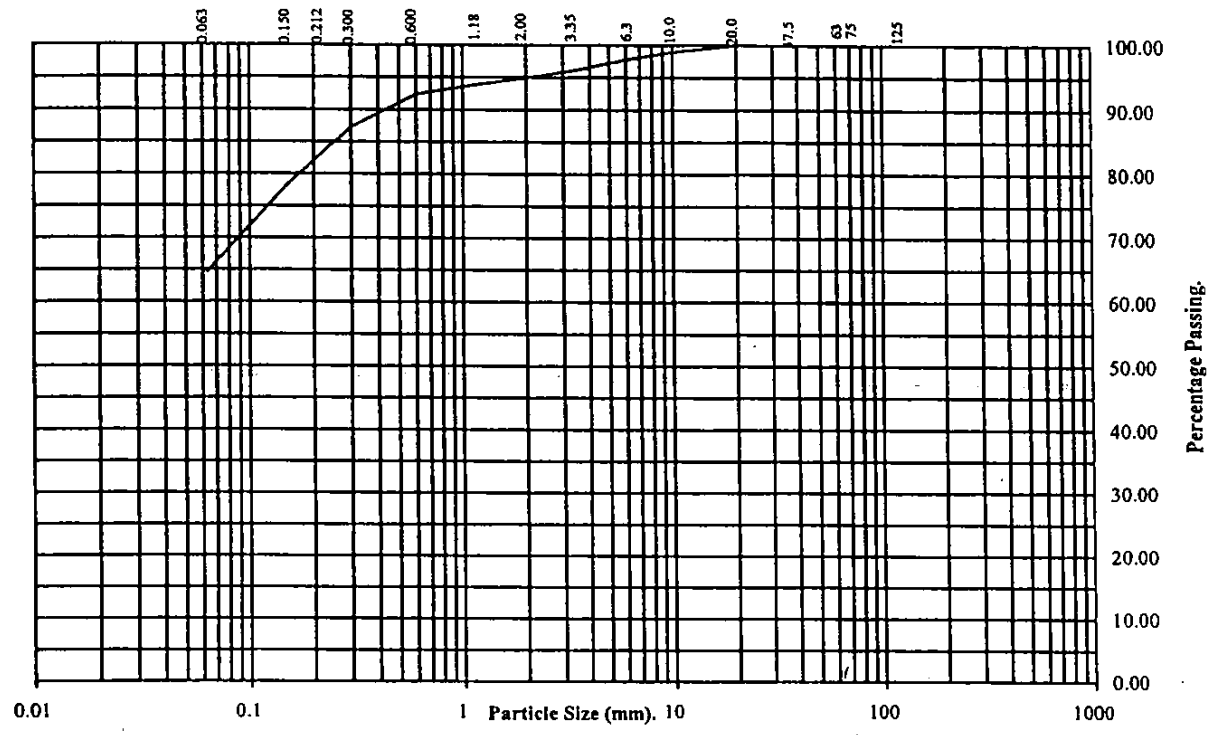
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: 207 **Depth (m):** 0.80

MC



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	99
6.3	98
3.35	96
2	95
1.18	94
0.6	92
0.3	87
0.212	83
0.15	78
0.063	65

Soil Fraction	Total Percentage
Cobbles	0
Gravel	5
Sand	30
Silt/Clay	65

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
	25/3/04		25/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

Contract No.:
NL240620

MOISTURE CONDITION VALUE CALIBRATION
BS1377 : Part 4 : 1990.

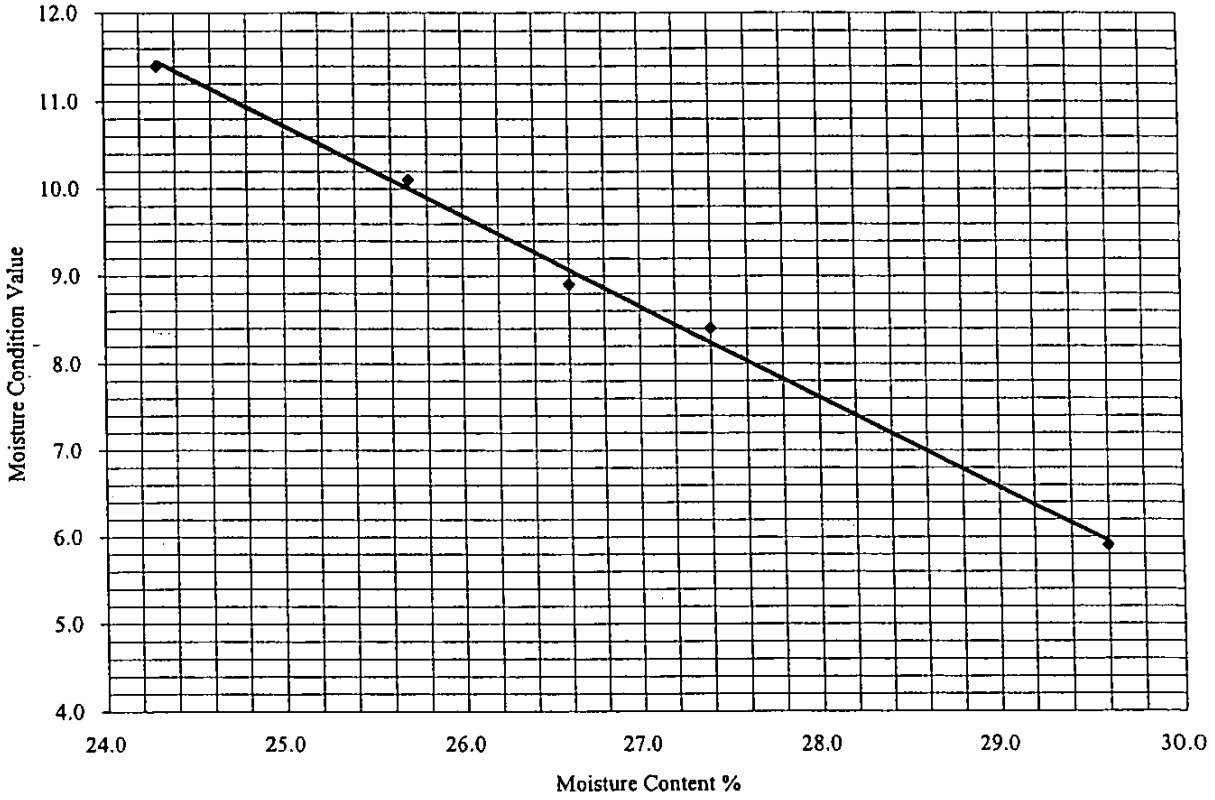
Trial Pit 207 Depth (m): 2.80

MC

Sample Number:

Sample Type: Bulk

Initial Moisture Content (%).:	25.7
Single/Separate Samples Tested.	Separate
Material Retained on the 20mm BS Test Sieve (%).:	6



Test Results.

Test Number.	1	2	3	4	5
Molsture Content (%).	24.3	25.7	26.6	27.4	29.6
MCV	11.4	10.1	8.9	8.4	5.9

Checked and Approved By

Date 25/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING

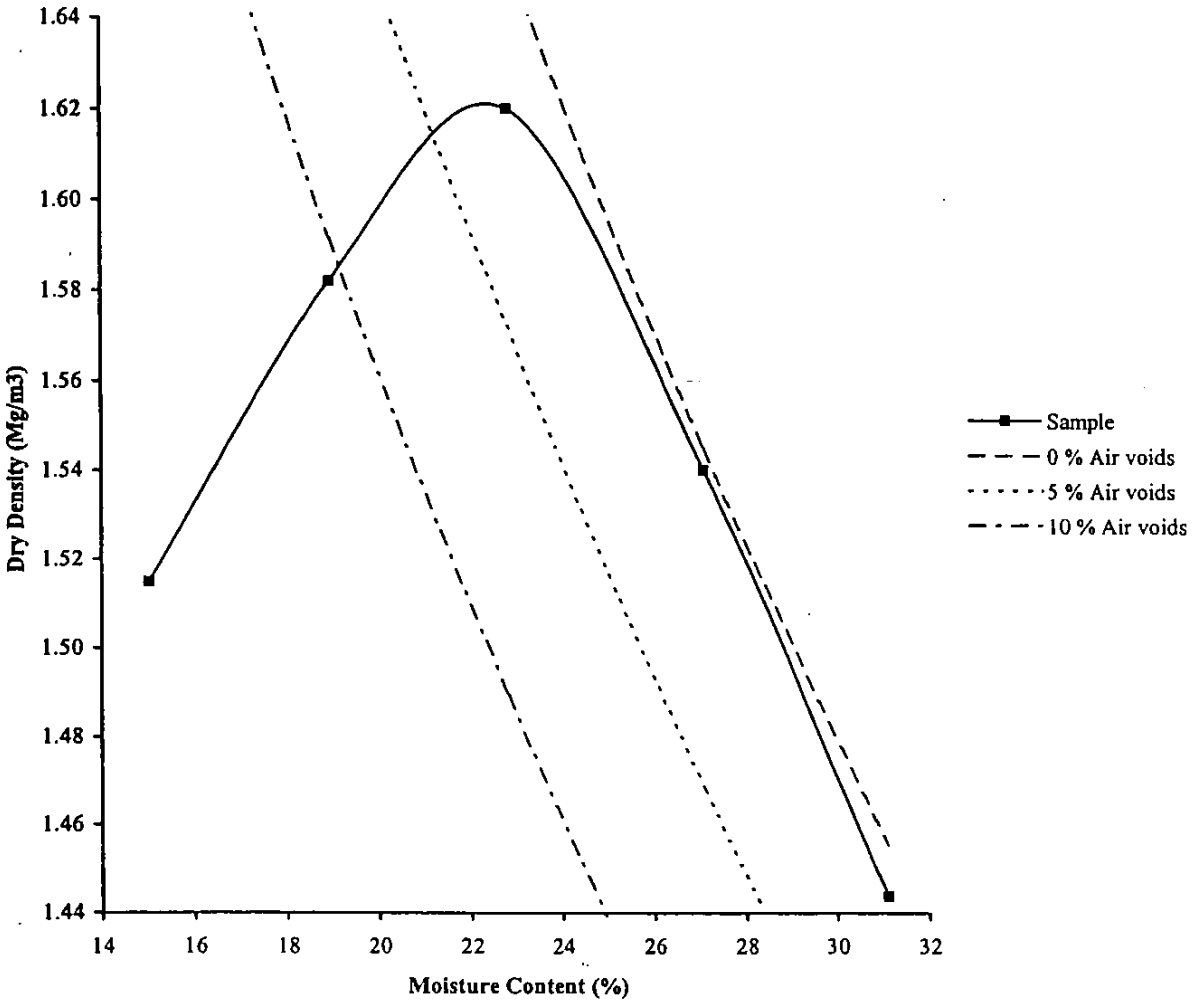
Contract No.:
NL240620

Dry Density /Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : 207 **Depth (m) : 2.80**

MC



Initial Moisture Content:	27	Method of Compaction	2.5 Kg Rammer / Separate Sample	
Particle Density (Mg/m3):	2.66	Assumed	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (mg/m3):		1.62	Material Retained on 20.0 mm Test Sieve (%):	6
Optimum Moisture Content (%):		23		
Remarks	See summary of soil descriptions.			

Checked By	Date	Approved By	Date
	25/3/04		25/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

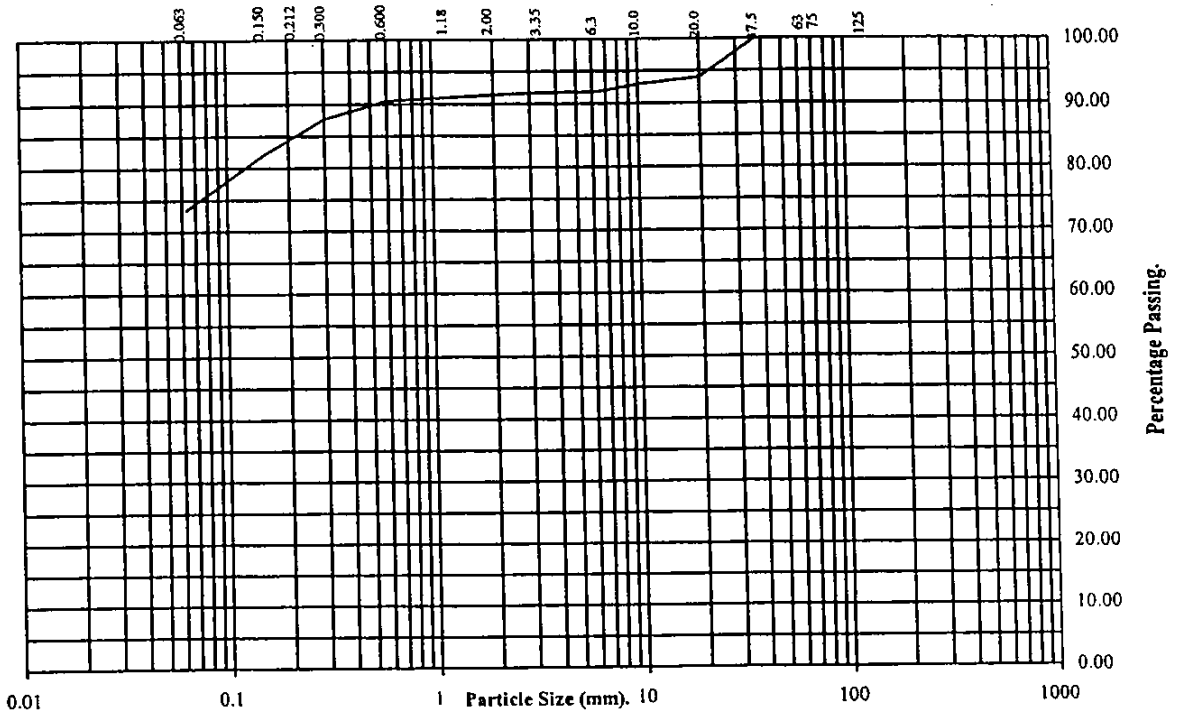
Contract No.
NL240620

PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: 207 **Depth (m):** 2.80 MG



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	94
10	93
6.3	92
3.35	92
2	91
1.18	91
0.6	90
0.3	88
0.212	85
0.15	82
0.063	73

Soil Fraction	Total Percentage
Cobbles	0
Gravel	9
Sand	18
Silt/Clay	73

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
	25/2/04		25/2/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

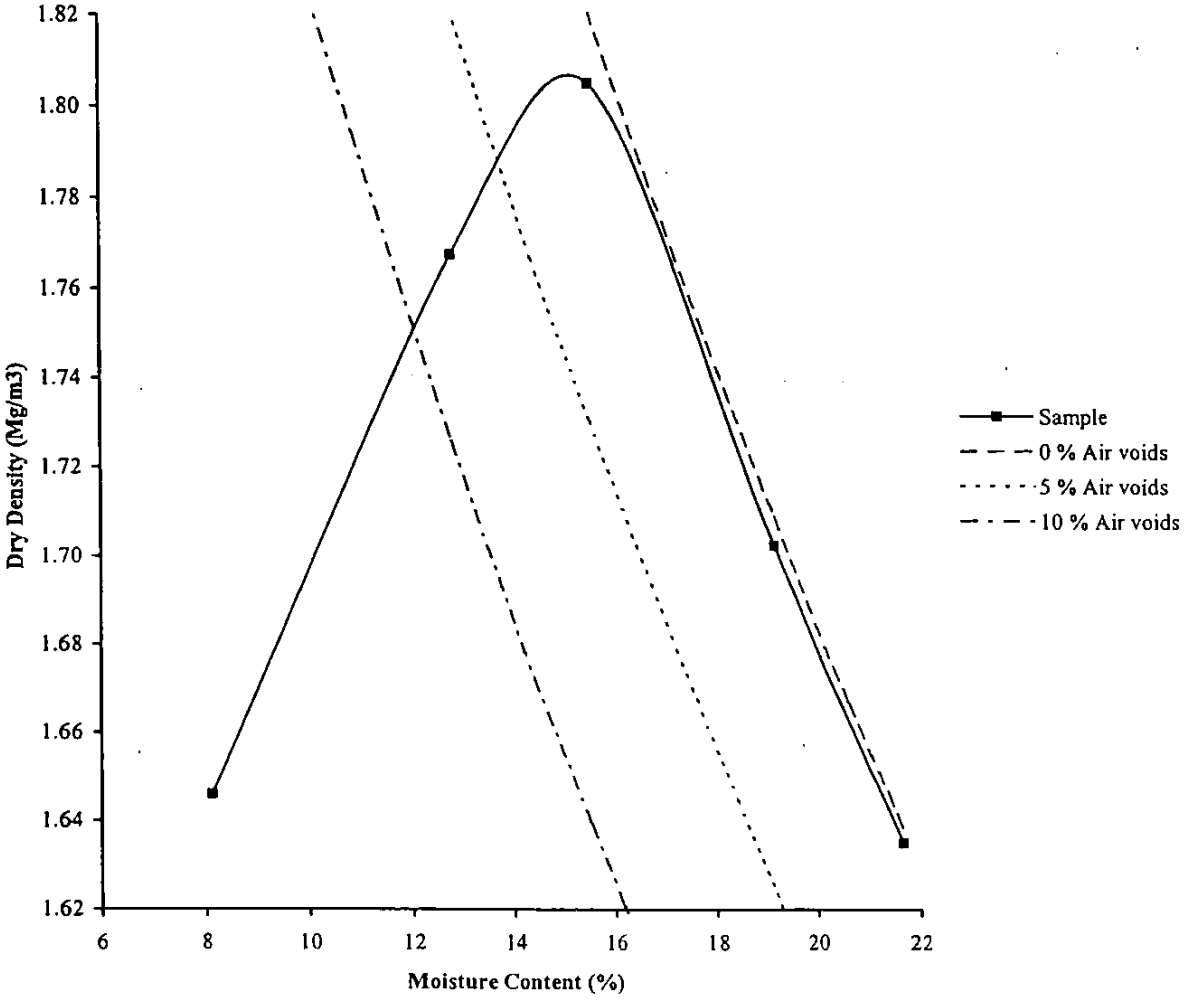
Contract No.:
NL240620

Dry Density /Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : 208 **Depth (m) : 0.20**

MC



Initial Moisture Content:	16	Method of Compaction	2.5 Kg Rammer / Separate Sample	
Particle Density (Mg/m3):	2.54	Measured	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (mg/m3):		1.83	Material Retained on 20.0 mm Test Sieve (%):	3
Optimum Moisture Content (%):		15		
Remarks	See summary of soil descriptions.			

Checked By	Date	Approved By	Date
	26/8/04		26/8/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

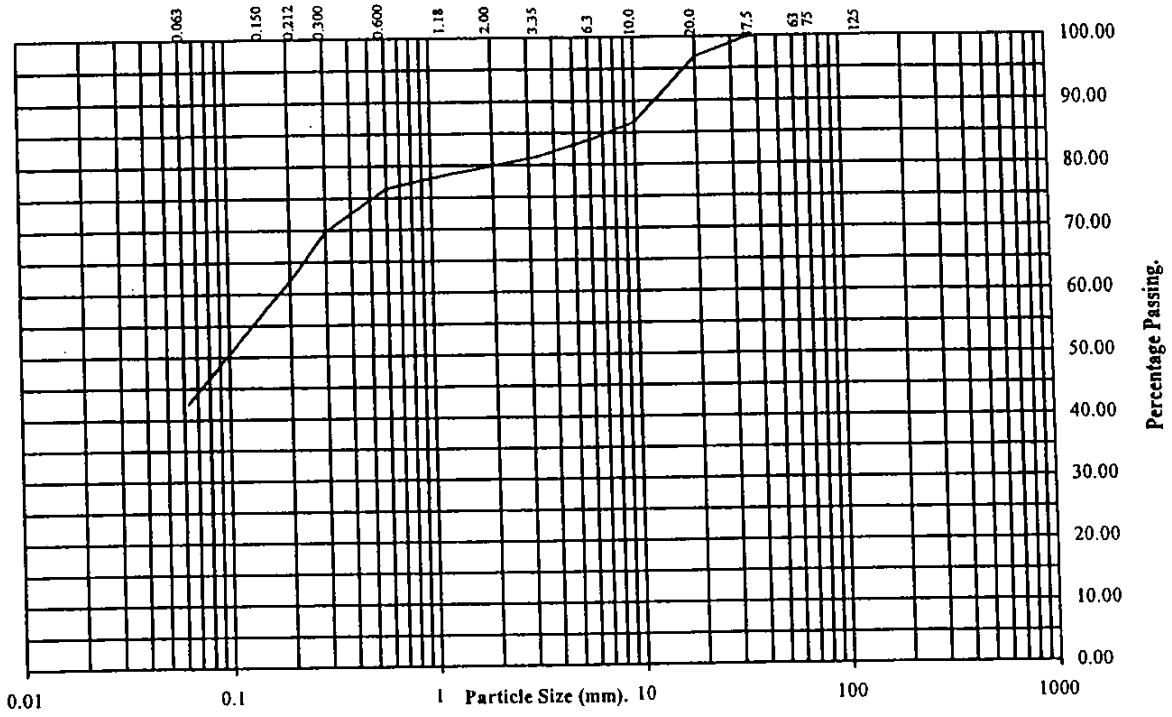
Contract No.
NL240620

PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: 208 **Depth (m):** 0.20 MC



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	97
10	87
6.3	84
3.35	81
2	80
1.18	79
0.6	76
0.3	70
0.212	63
0.15	57
0.063	43

Soil Fraction	Total Percentage
Cobbles	0
Gravel	20
Sand	37
Silt/Clay	43

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
	26/3/04		26/3/04

Butterley Geotechnical

MANOR FARM SEWAGE WORKS, READING.

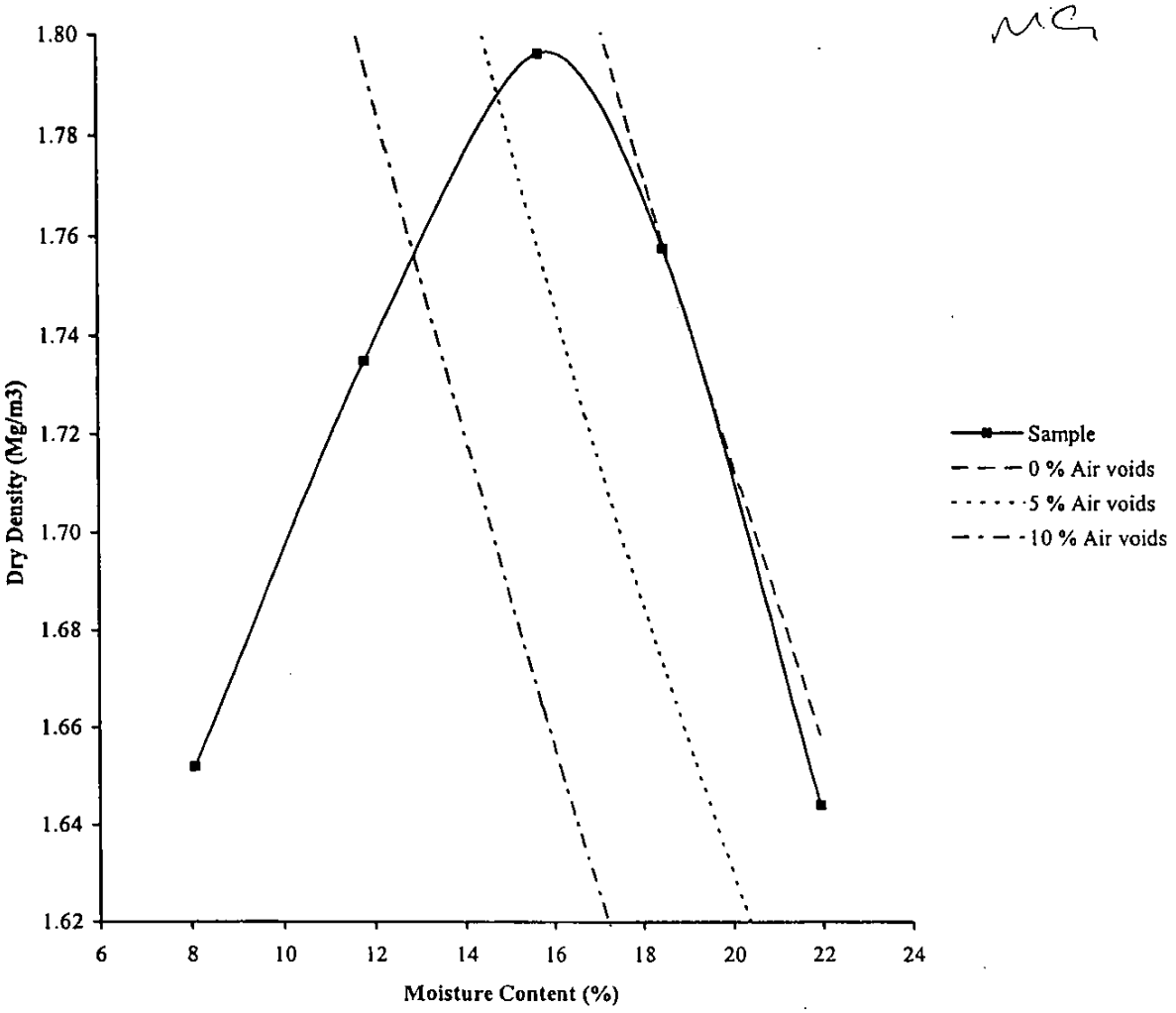
Contract No.: NL240620

Dry Density /Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : 209 **Depth (m) : 1.30**

MC



Initial Moisture Content:	19	Method of Compaction	2.5 Kg Rammer / Separate	Sample
Particle Density (Mg/m3):	2.61	Measured	Material Retained on 37.5 mm Test Sieve (%):	3
Maximum Dry Density (mg/m3):		1.80	Material Retained on 20.0 mm Test Sieve (%):	6
Optimum Moisture Content (%):		16		
Remarks	See summary of soil descriptions.			

Checked By	Date	Approved By	Date
	26/5/04		26/5/04.

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

Contract No.
NL240620

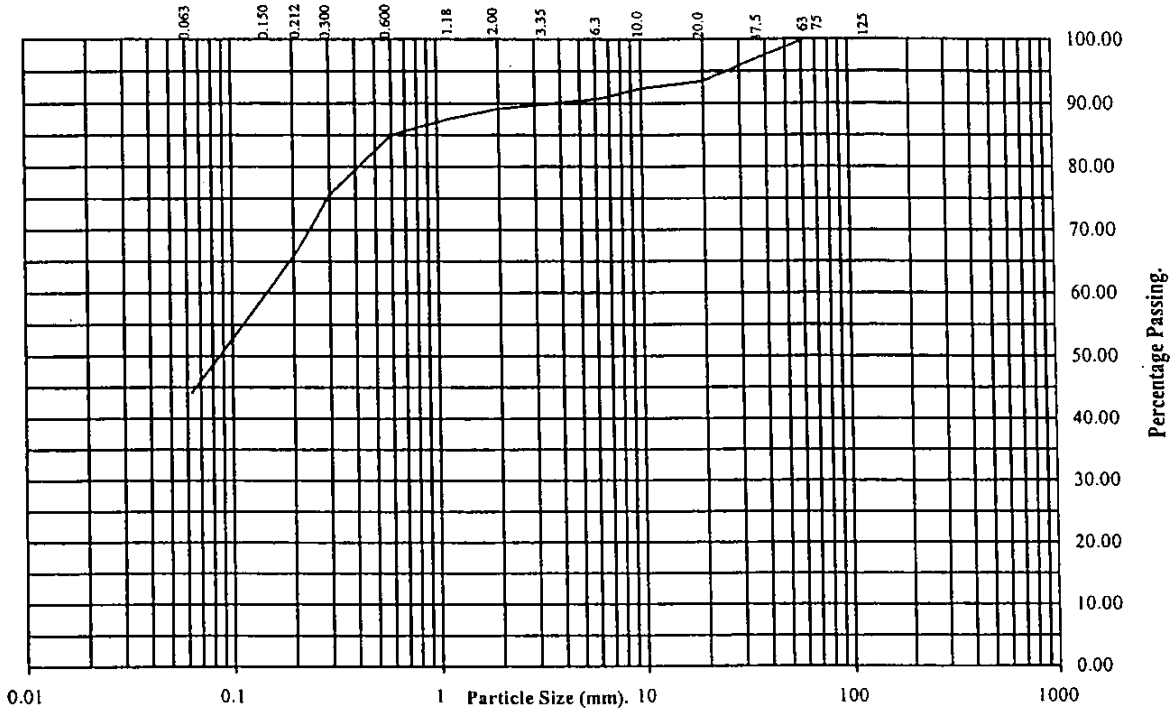
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: 209 **Depth (m):** 1.30

MC



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	97
20	93
10	92
6.3	91
3.35	90
2	89
1.18	88
0.6	85
0.3	76
0.212	67
0.15	60
0.063	44

Soil Fraction	Total Percentage
Cobbles	0
Gravel	11
Sand	45
Silt/Clay	44

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
	26/3/04		26/3/04

Butterley otechnical

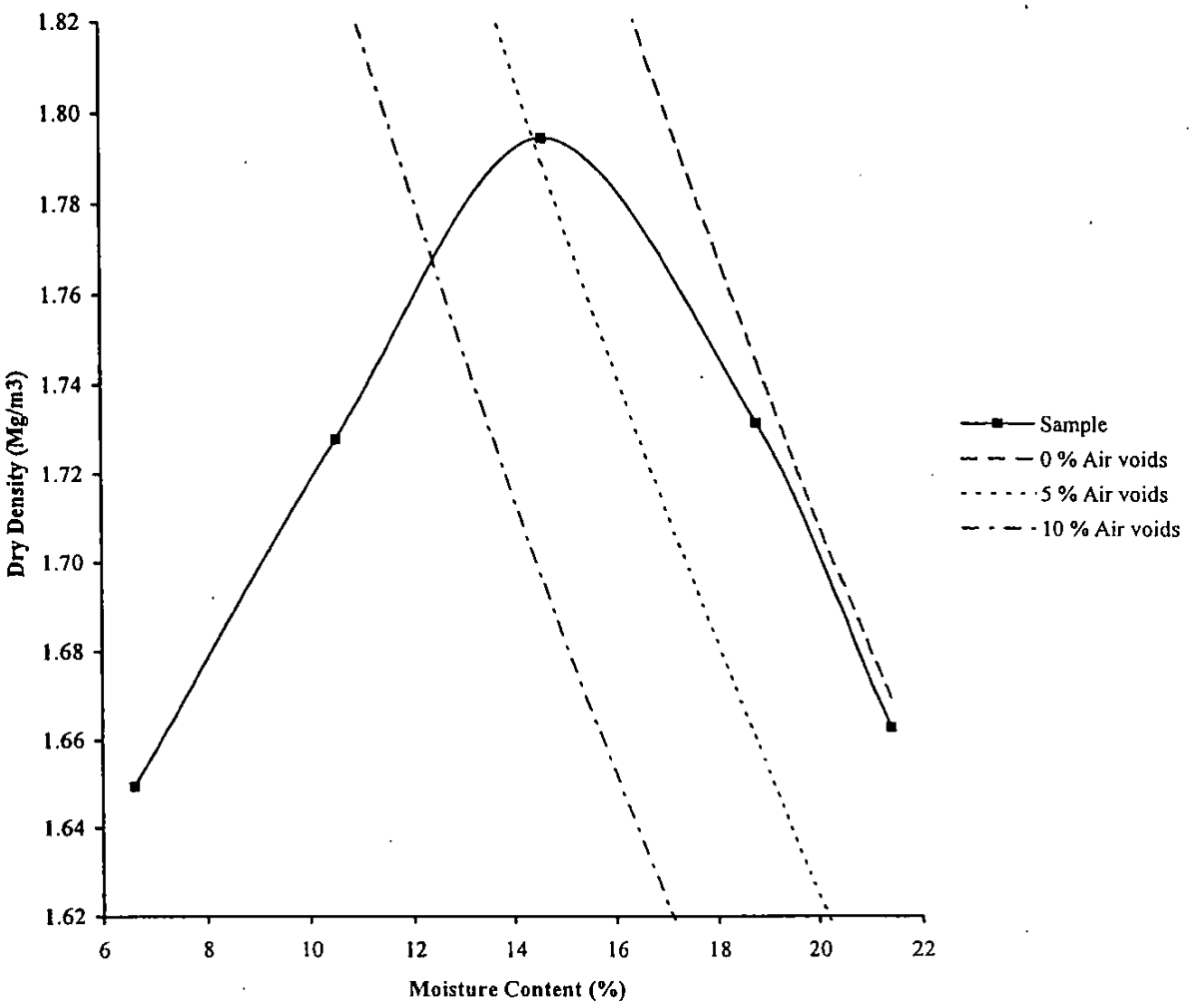
MANOR FARM
SEWAGE WORKS, READING.

Contract No.:
NL240620

Dry Density /Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : 210 **Depth (m) : 0.80** MC



Initial Moisture Content:	19	Method of Compaction	2.5 Kg Rammer / Separate Sample	
Particle Density (Mg/m3):	2.6	Measured	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (mg/m3):		1.80	Material Retained on 20.0 mm Test Sieve (%):	3
Optimum Moisture Content (%):		15		
Remarks	See summary of soil descriptions.			

Checked By	Date	Approved By	Date
	29/3/04		29/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

Contract No.
NL240620

MOISTURE CONDITION VALUE CALIBRATION
BS1377 : Part 4 : 1990.

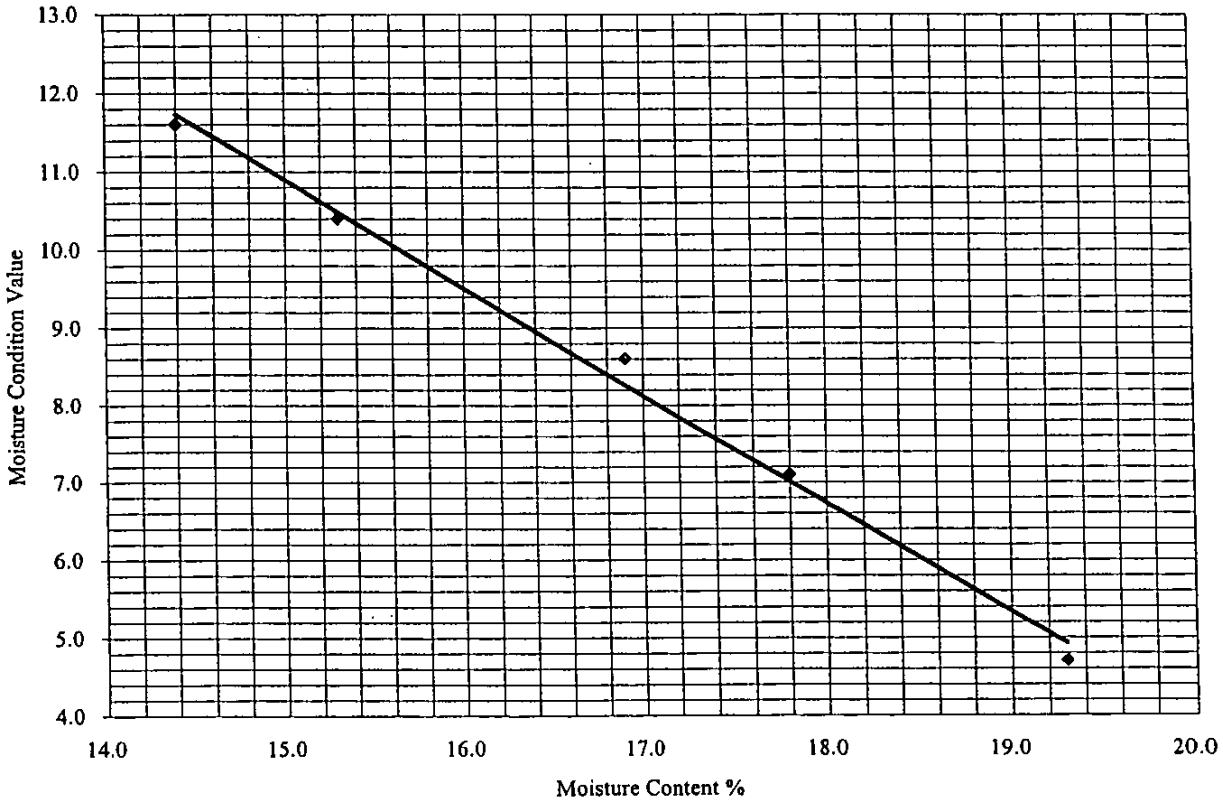
Trial Pit 210 Depth (m): 1.60

MC

Sample Number:

Sample Type: Bulk

Initial Moisture Content (%).:	18
Single/Separate Samples Tested.	Separate
Material Retained on the 20mm BS Test Sieve (%).:	8



Test Results.

Test Number.	1	2	3	4	5
Moisture Content (%).	14.4	15.3	16.9	17.8	19.3
MCV	11.6	10.4	8.6	7.1	4.7

Checked and Approved By

Date 24/3/04.

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING

Contract No.:
NL240620

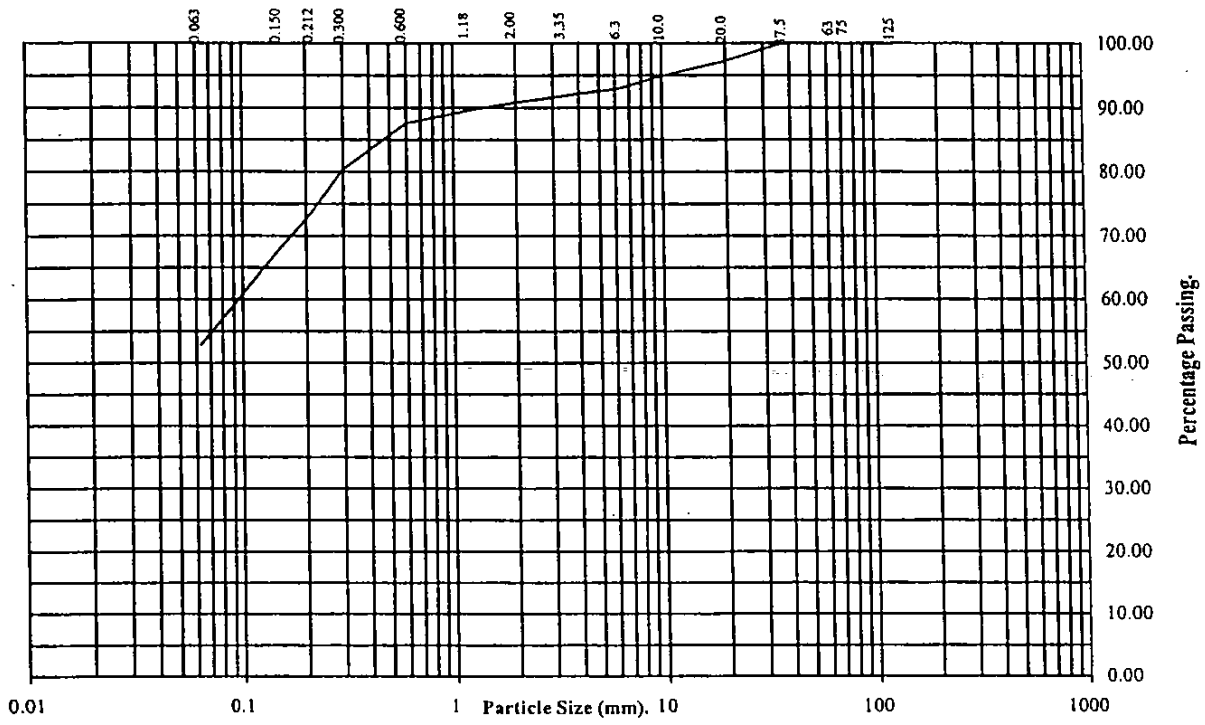
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: 210 **Depth (m):** 0.80

MG



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	97
10	95
6.3	93
3.35	92
2	91
1.18	90
0.6	88
0.3	80
0.212	74
0.15	68
0.063	53

Soil Fraction	Total Percentage
Cobbles	0
Gravel	9
Sand	38
Silt/Clay	53

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
	26/3/04		26/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

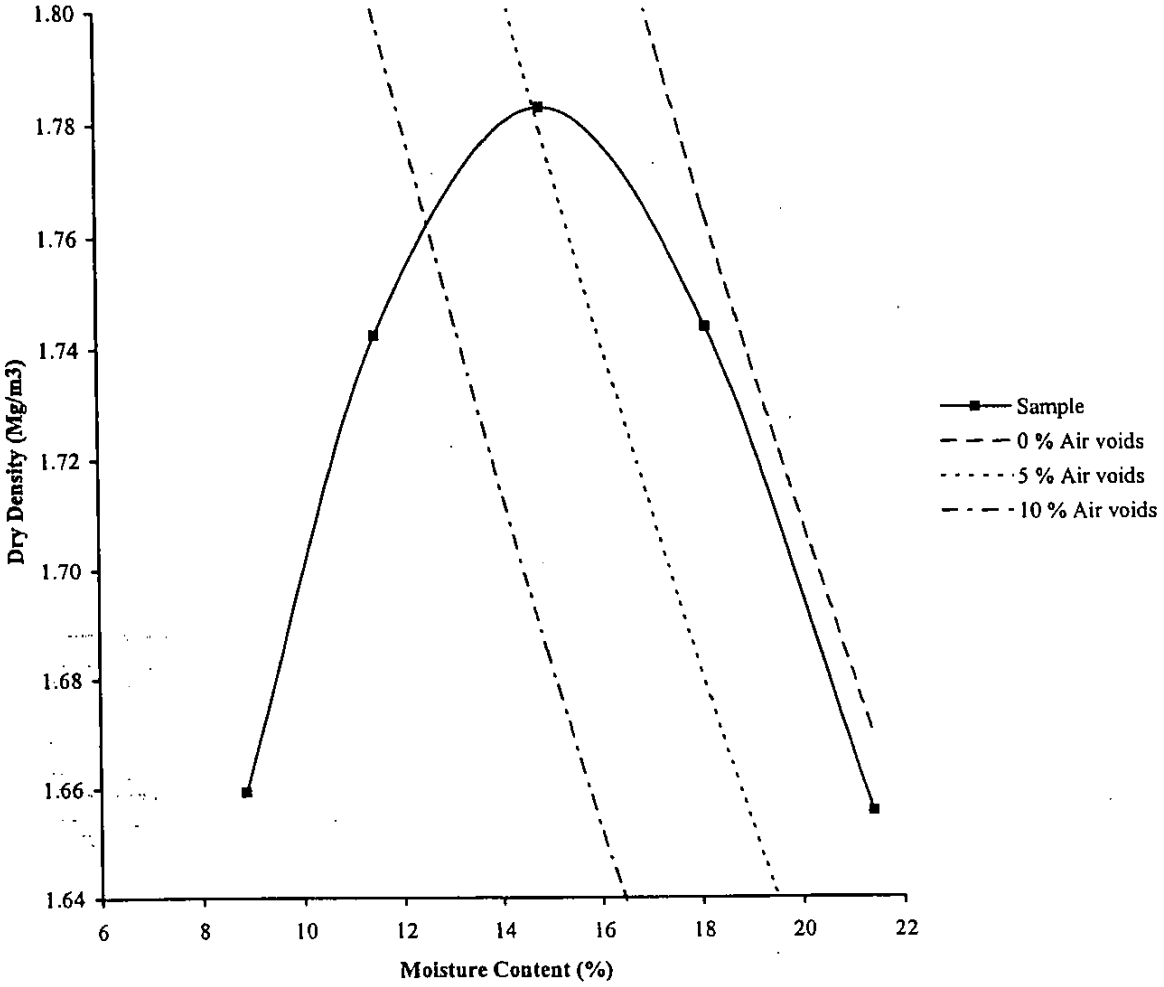
Contract No.:
NL240620

Dry Density /Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : 210 **Depth (m) : 1.60**

MC



Initial Moisture Content:	18	Method of Compaction	2.5 Kg Rammer / Separate	Sample
Particle Density (Mg/m3):	2.6	Measured	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (mg/m3):		1.78	Material Retained on 20.0 mm Test Sieve (%):	8
Optimum Moisture Content (%):		15		
Remarks	See summary of soil descriptions.			

Checked By	Date	Approved By	Date
	24/3/04		24/3/04.

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

Contract No.
NL240620

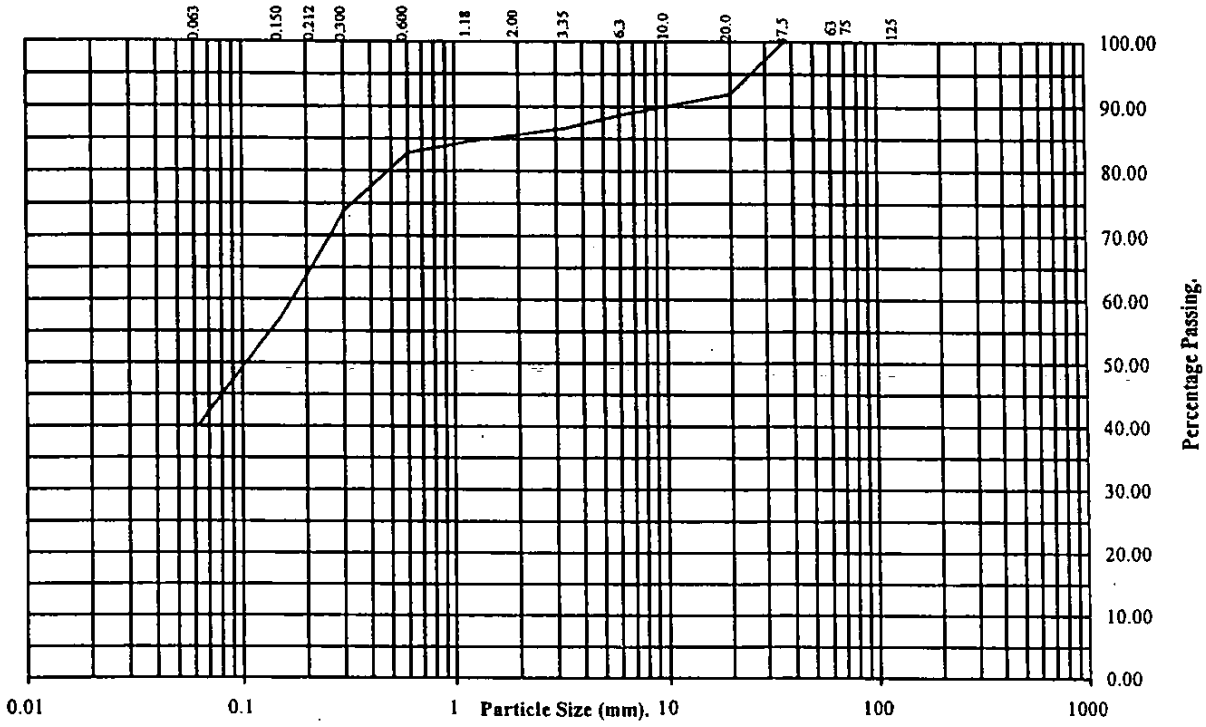
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: 210 **Depth (m):** 1.60

MG



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	92
10	90
6.3	89
3.35	87
2	86
1.18	85
0.6	83
0.3	74
0.212	65
0.15	57
0.063	40

Soil Fraction	Total Percentage
Cobbles	0
Gravel	14
Sand	46
Silt/Clay	40

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
[signature]	24/3/04	[signature]	24/3/04.

Butterley Geotechnical

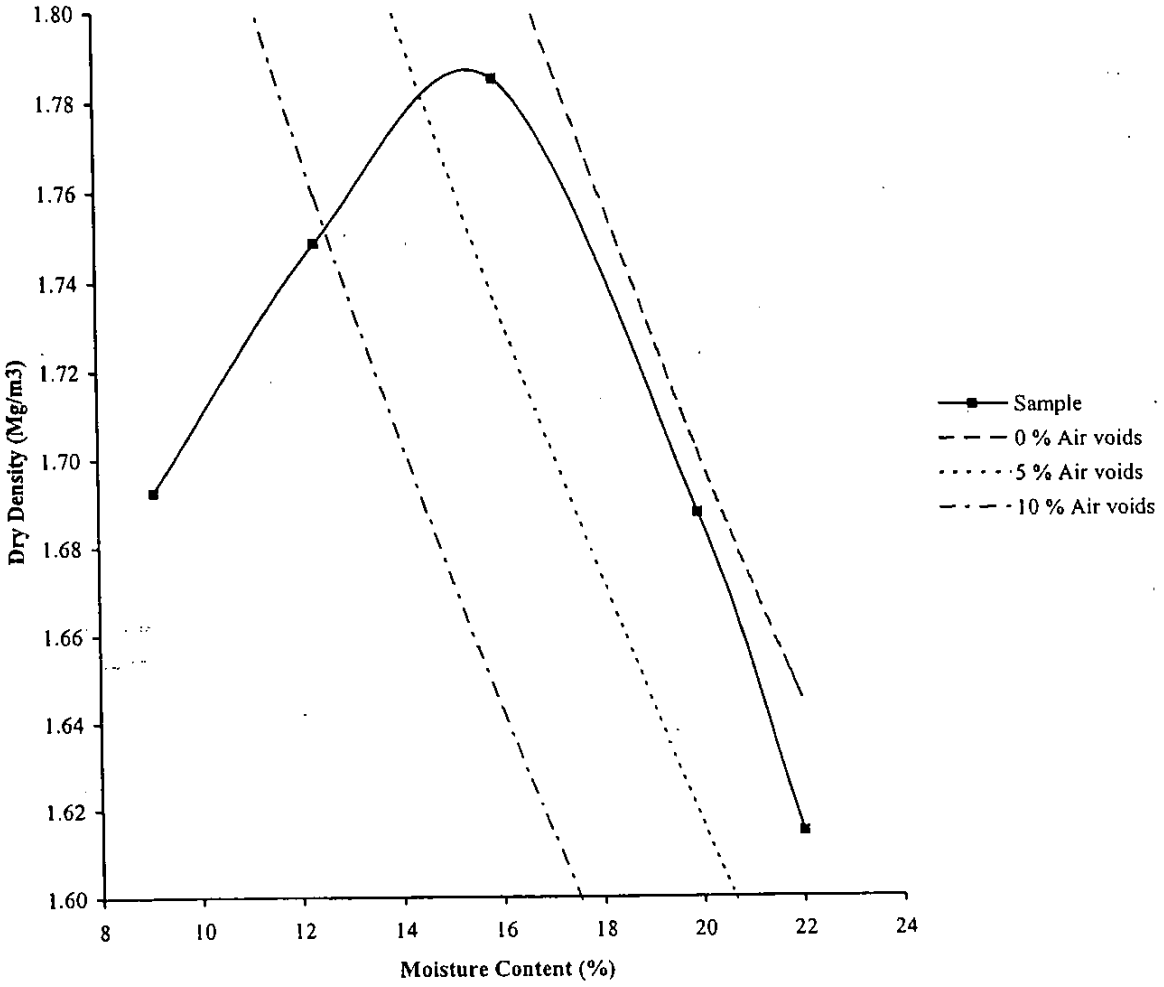
MANOR FARM
SEWAGE WORKS READING.

Contract No.:
NL240620

Dry Density /Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : 211 **Depth (m) : 1.60**



Initial Moisture Content:	20	Method of Compaction	2.5 Kg Rammer / Separate Sample	
Particle Density (Mg/m3):	2.58	Measured	Material Retained on 37.5 mm Test Sieve (%):	4
Maximum Dry Density (mg/m3):		1.79	Material Retained on 20.0 mm Test Sieve (%):	7
Optimum Moisture Content (%):		16		
Remarks	See summary of soil descriptions.			

Checked By	Date	Approved By	Date
	26/7/04		26/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

Contract No.
NL240620

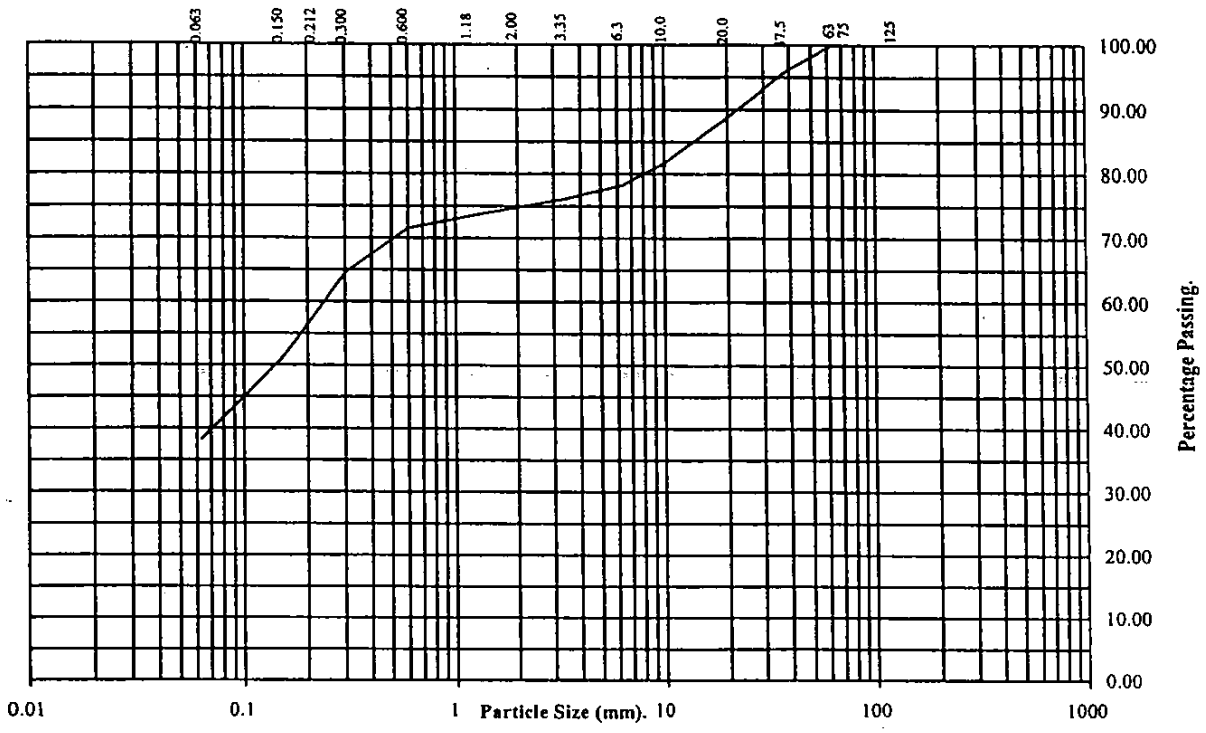
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: 211 **Depth (m):** 1.60

MG



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	96
20	89
10	82
6.3	78
3.35	76
2	75
1.18	73
0.6	72
0.3	64
0.212	57
0.15	51
0.063	38

Soil Fraction	Total Percentage
Cobbles	0
Gravel	25
Sand	37
Silt/Clay	38

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
	26/1/04		26/1/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

Contract No.:
NL240620

MOISTURE CONDITION VALUE CALIBRATION
BS1377 : Part 4 : 1990.

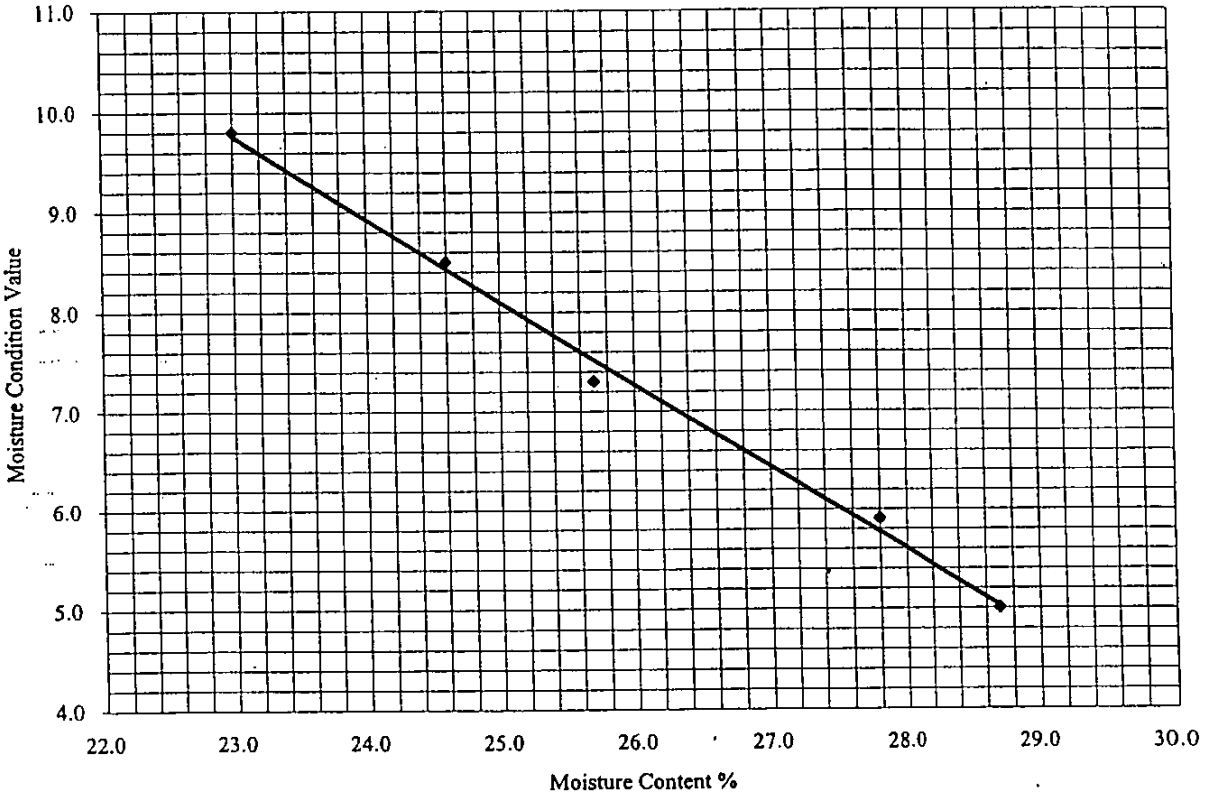
Trial Pit 211 Depth (m): 1.90

MC

Sample Number:

Sample Type: Bulk

Initial Moisture Content (%).:	27.8
Single/Separate Samples Tested.	Separate
Material Retained on the 20mm BS Test Sieve (%).:	15



Test Results.

Test Number.	1	2	3	4	5
Moisture Content (%).	23.0	24.6	25.7	27.8	28.7
MCV	9.8	8.5	7.3	5.9	5.0

Checked and Approved By

Date 24/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING

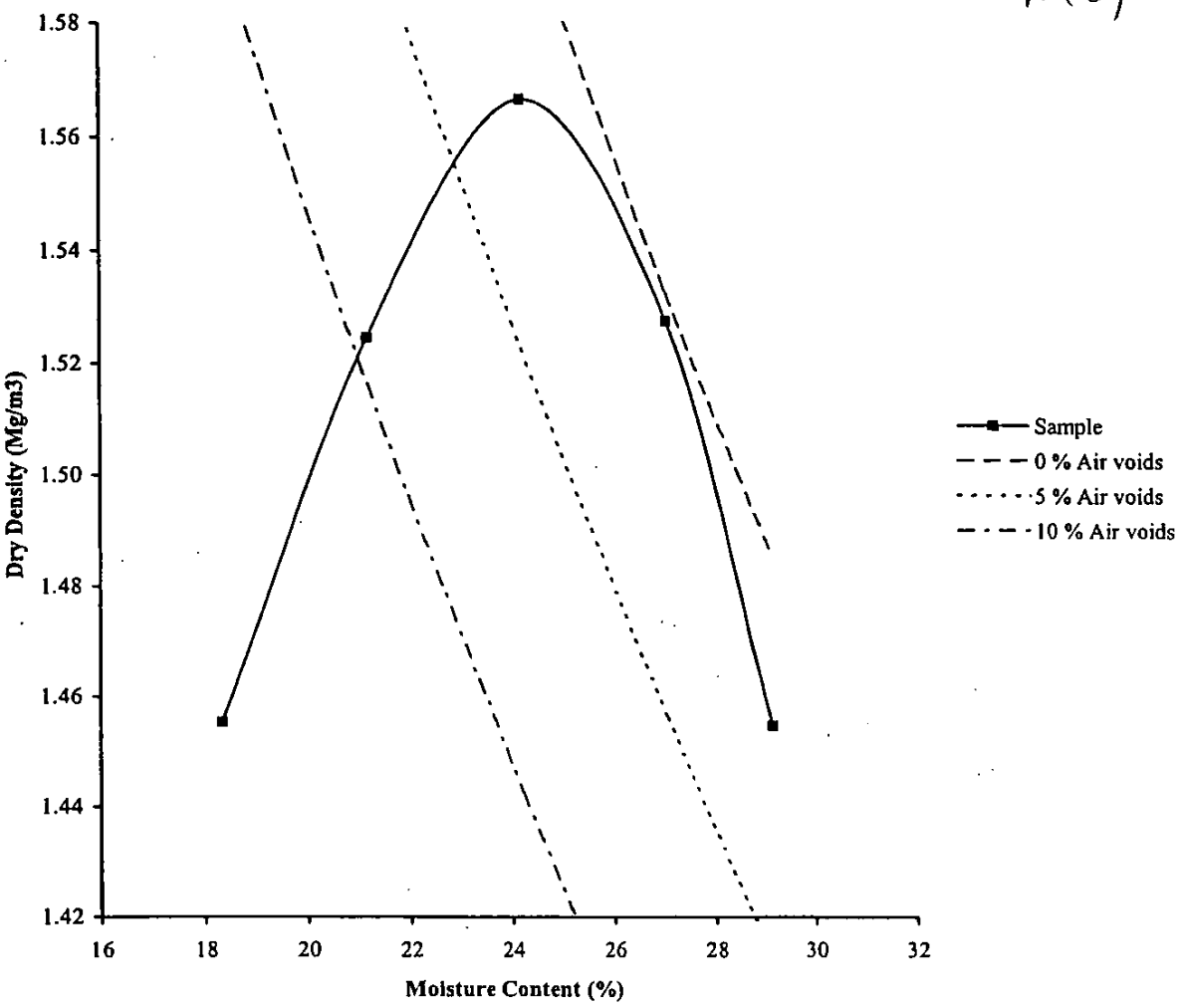
Contract No.:
NL240620

Dry Density /Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : 211 **Depth (m) : 1.90**

MG



Initial Moisture Content:	29	Method of Compaction	2.5 Kg Rammer / Separate Sample	
Particle Density (Mg/m3):	2.62	Assumed	Material Retained on 37.5 mm Test Sieve (%):	5
Maximum Dry Density (mg/m3):		1.57	Material Retained on 20.0 mm Test Sieve (%):	10
Optimum Moisture Content (%):		24		
Remarks	See summary of soil descriptions.			

Checked By	Date	Approved By	Date
	24/3/04		24/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

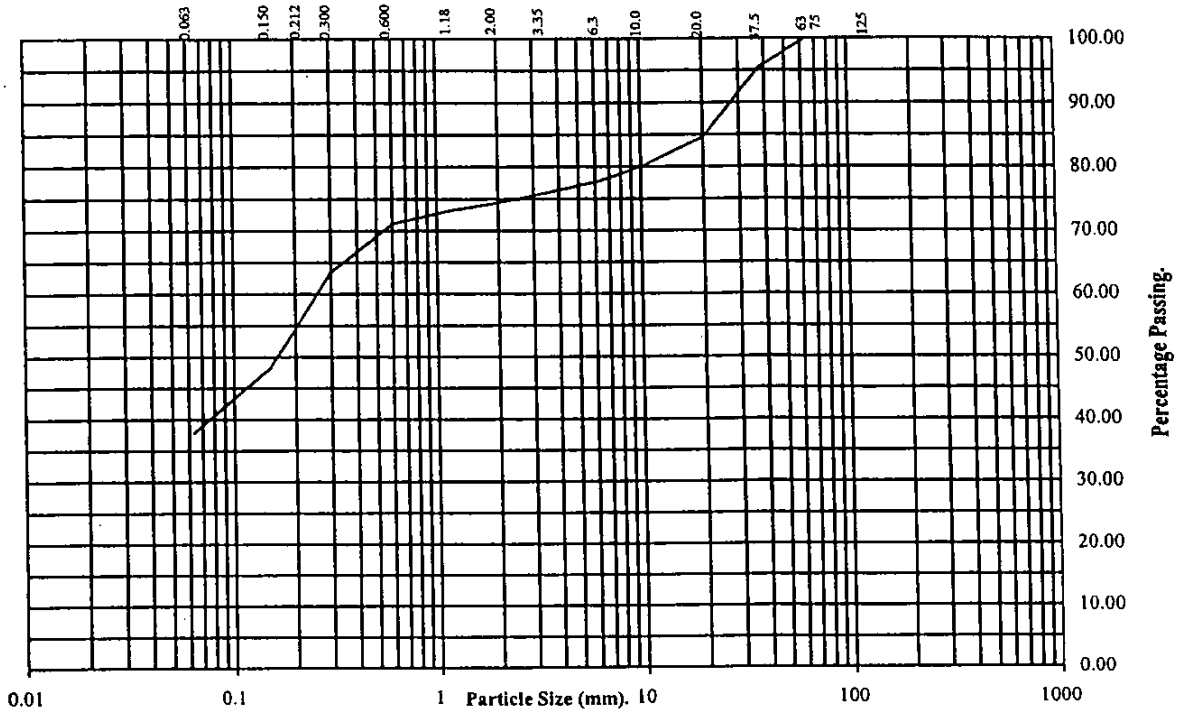
Contract No.
NL240620

PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: 211 **Depth (m):** 1.90 MG



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	95
20	85
10	80
6.3	78
3.35	76
2	74
1.18	73
0.6	71
0.3	63
0.212	56
0.15	48
0.063	38

Soil Fraction	Total Percentage
Cobbles	0
Gravel	26
Sand	36
Silt/Clay	38

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
	24/3/04		24/3/04

Butterley Geotechnical

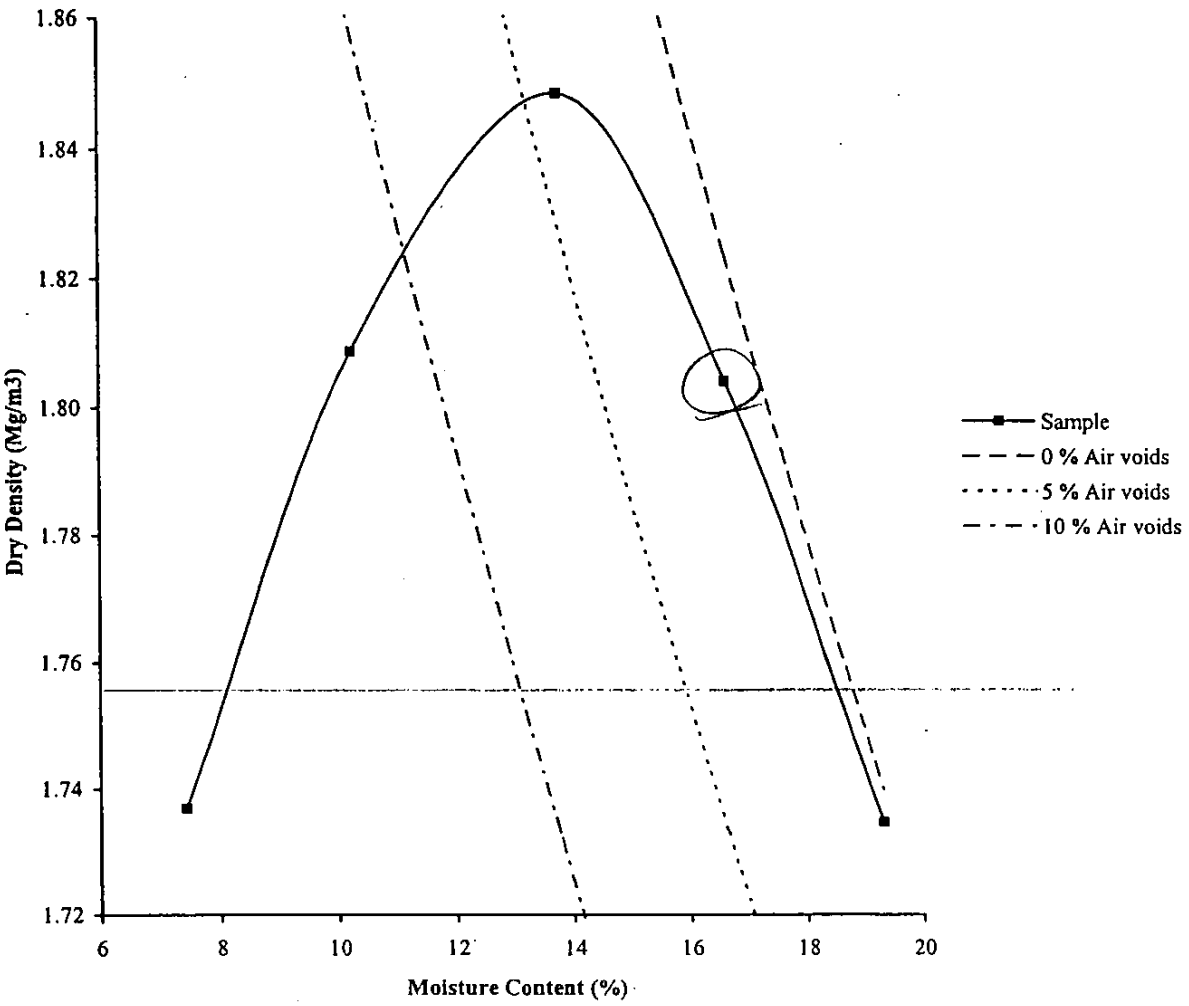
MANOR FARM SEWAGE WORKS, READING.

Contract No.: NL240620

Dry Density /Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : 212 **Depth (m) : 0.60** MG



Initial Moisture Content:	17	Method of Compaction	2.5 Kg Rammer / Separate Sample	
Particle Density (Mg/m3):	2.62	Measured	Material Retained on 37.5 mm Test Sieve (%):	3
Maximum Dry Density (mg/m3):		1.85	Material Retained on 20.0 mm Test Sieve (%):	8
Optimum Moisture Content (%):		14		
Remarks	See summary of soil descriptions.			

Checked By	Date	Approved By	Date
	26/3/04		26/7/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

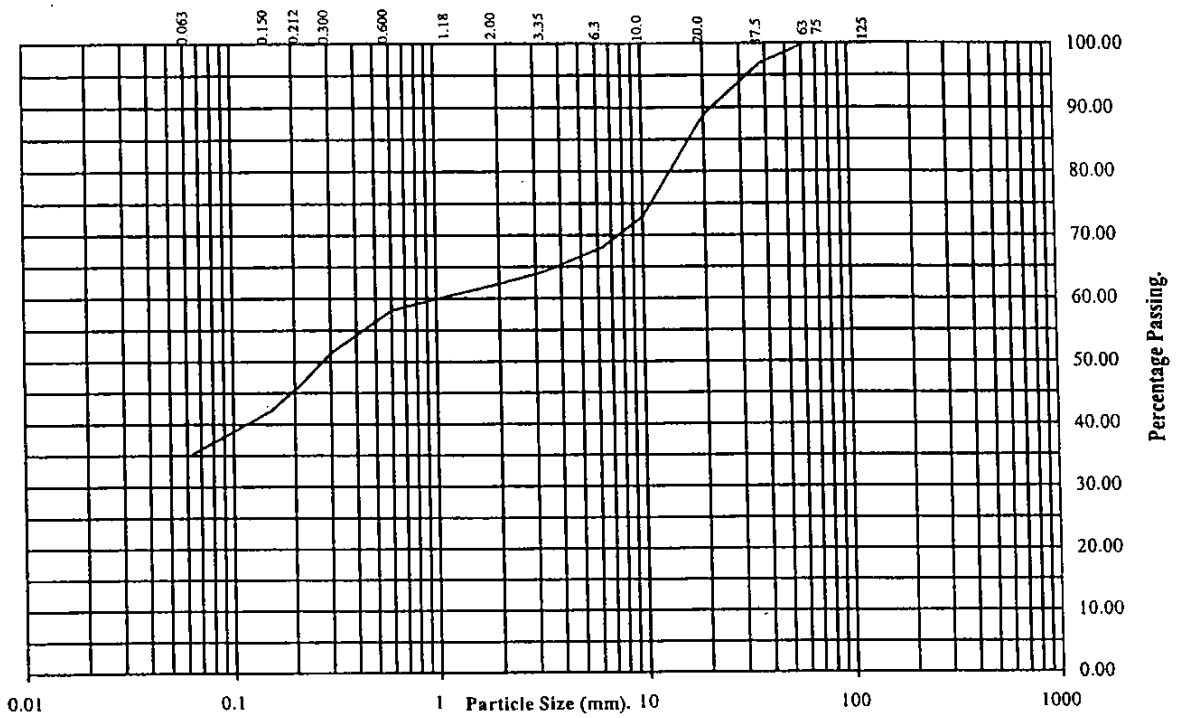
Contract No.
NL240620

PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: 212 **Depth (m):** 0.60 MC1



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	97
20	89
10	73
6.3	68
3.35	64
2	62
1.18	61
0.6	58
0.3	51
0.212	46
0.15	42
0.063	35

Soil Fraction	Total Percentage
Cobbles	0
Gravel	38
Sand	27
Silt/Clay	35

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
	26/3/04		26/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

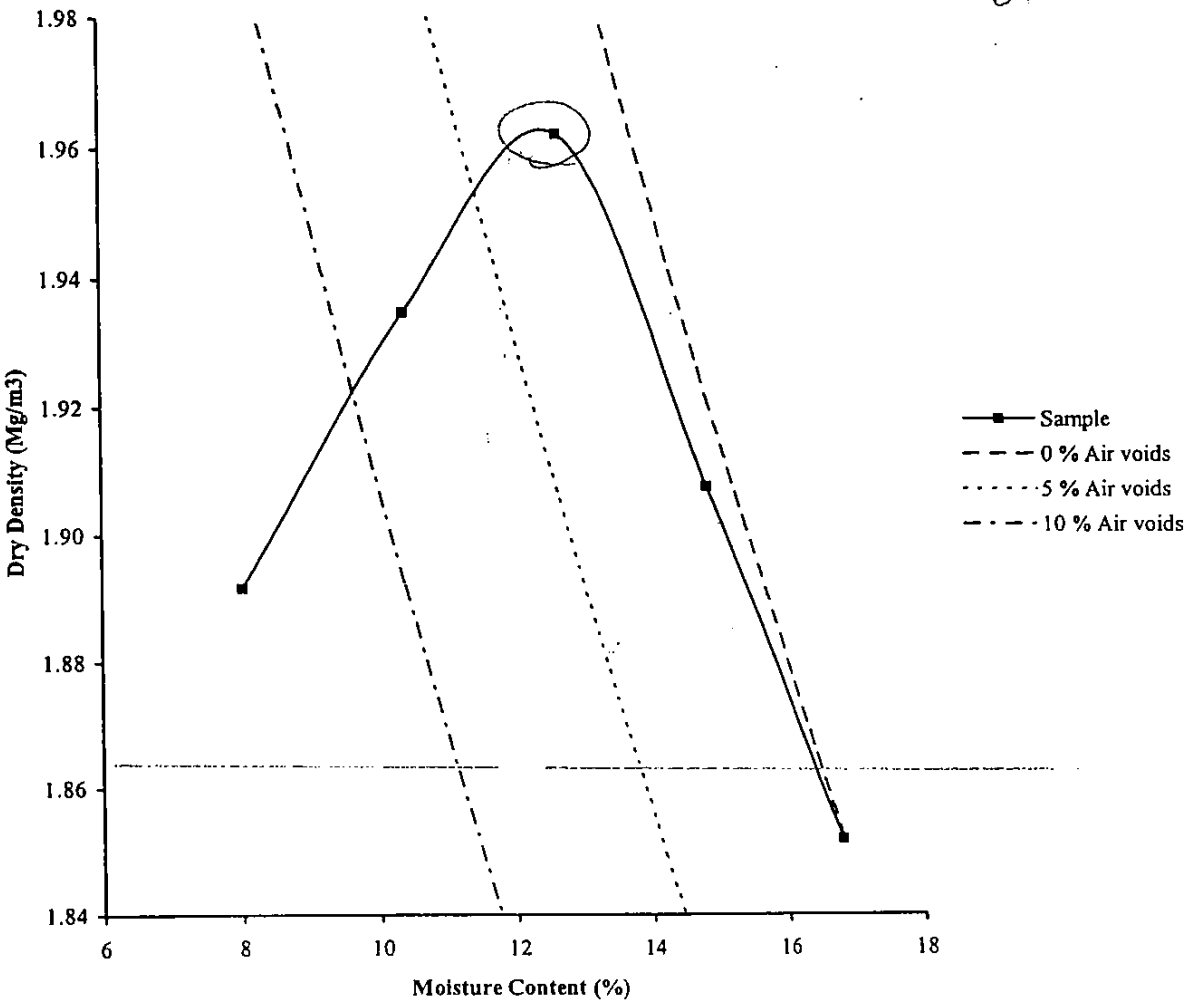
Contract No.:
NL240620

Dry Density /Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : 213 **Depth (m) : 3.20**

Grav



Initial Moisture Content:	13	Method of Compaction	2.5 Kg Rammer / Separate Sample	
Particle Density (Mg/m3):	2.69	Measured	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (mg/m3):		1.96	Material Retained on 20.0 mm Test Sieve (%):	4
Optimum Moisture Content (%):		12		
Remarks	See summary of soil descriptions.			

Checked By	Date	Approved By	Date
	26/5/04		26/5/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

Contract No.
NL240620

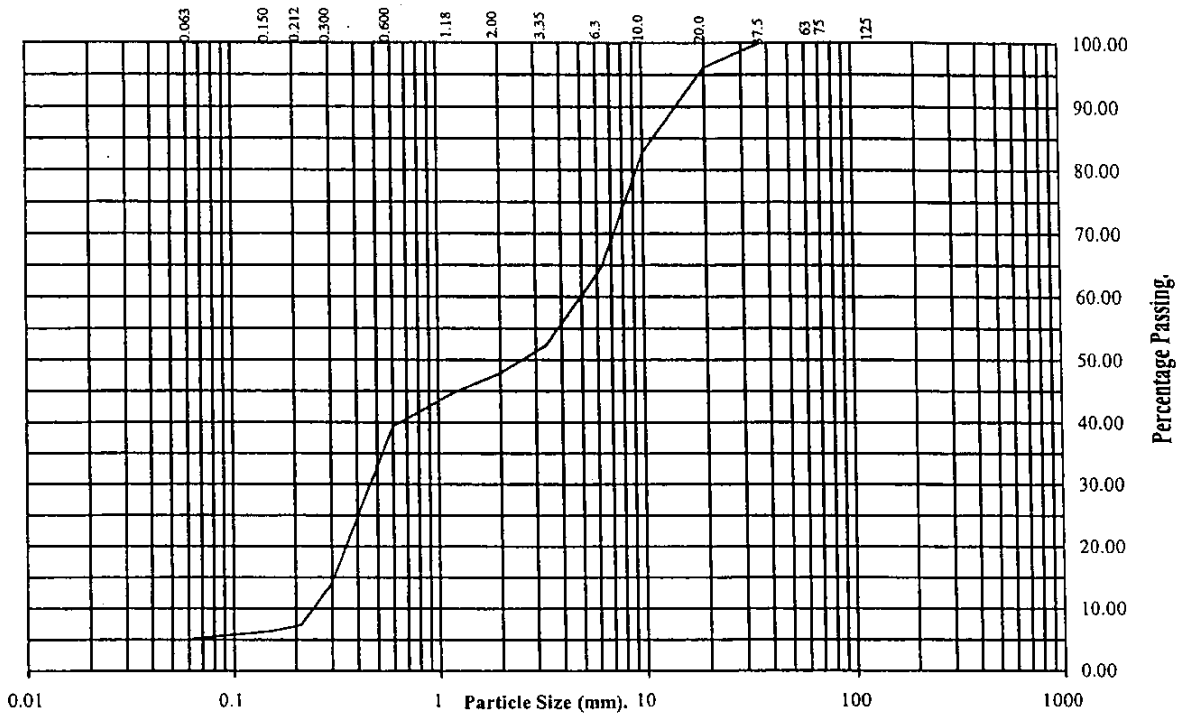
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: 213 **Depth (m):** 3.20

Grav



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	96
10	83
6.3	65
3.35	52
2	48
1.18	45
0.6	39
0.3	14
0.212	7
0.15	6
0.063	5

Soil Fraction	Total Percentage
Cobbles	0
Gravel	52
Sand	43
Silt/Clay	5

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
[signature]	26/5/04	[signature]	26/5/04

Butterley Geotechnical

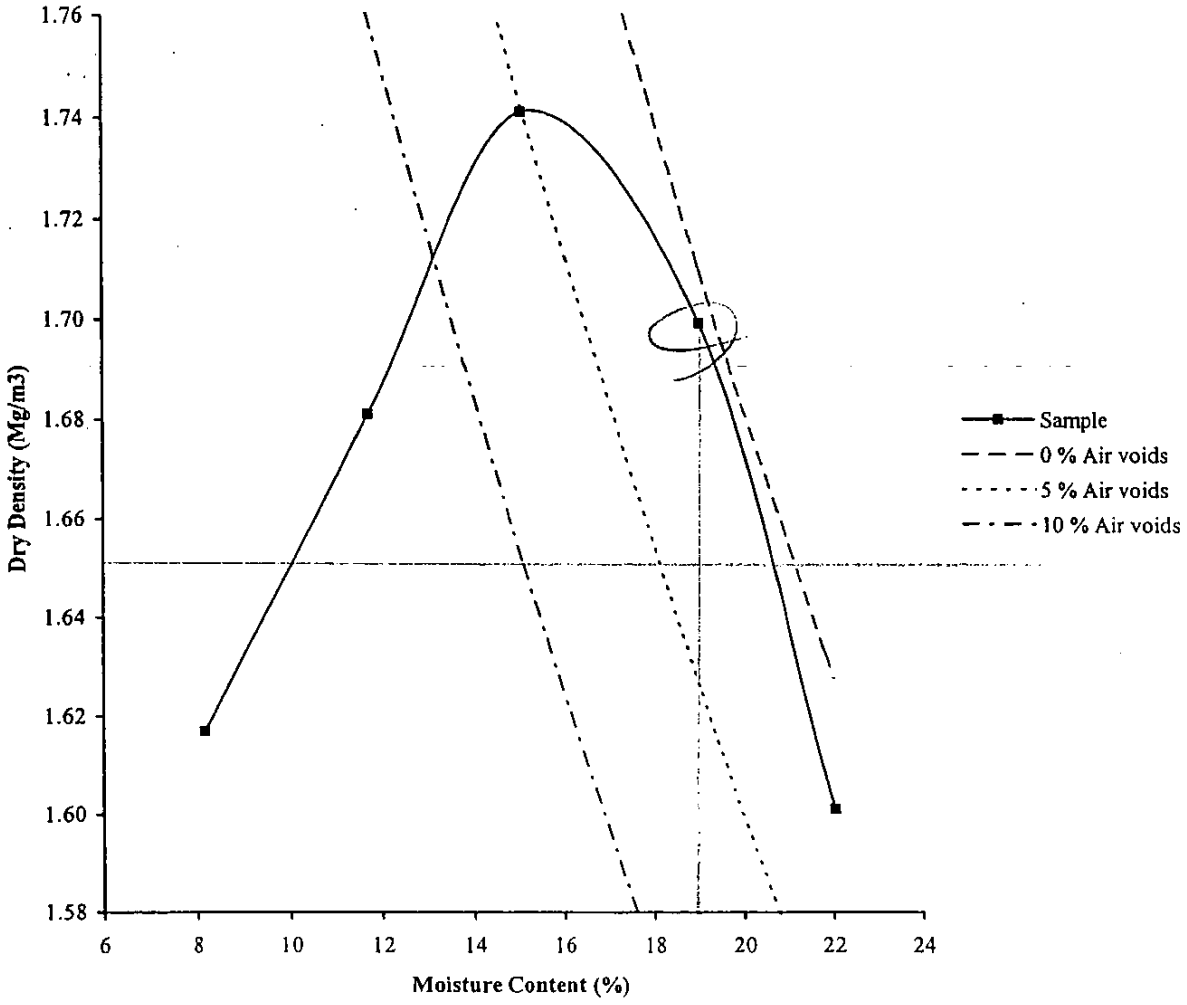
MANOR FARM
SEWAGE WORKS, READING.

Contract No.:
NL240620

Dry Density /Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : 214 **Depth (m) : 0.80** MG



Initial Moisture Content:	19	Method of Compaction	2.5 Kg Rammer / Separate Sample	
Particle Density (Mg/m3):	2.54	Measured	Material Retained on 37.5 mm Test Sieve (%):	3
Maximum Dry Density (mg/m3):		1.74	Material Retained on 20.0 mm Test Sieve (%):	5
Optimum Moisture Content (%):		15		
Remarks	See summary of soil descriptions.			

Checked By	Date	Approved By	Date
	26/3/04		26/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

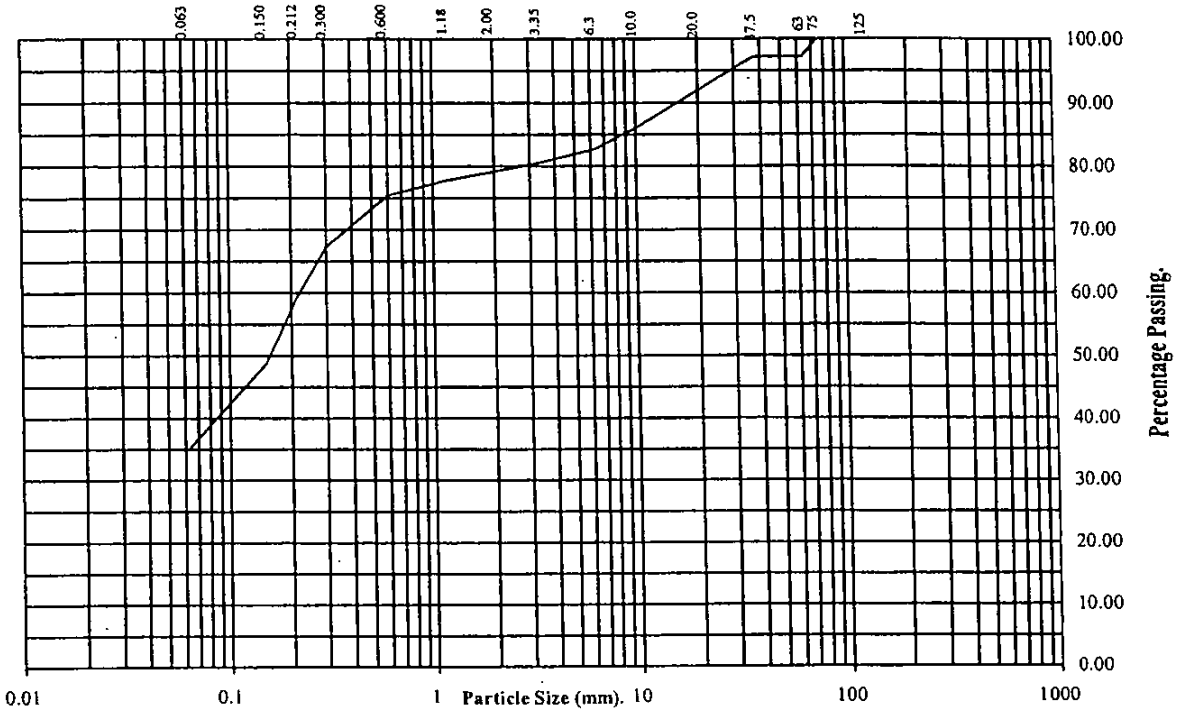
Contract No.
NL240620

PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: 214 **Depth (m):** 0.80 MC1



BS Test Sieve	Percentage Passing
125	100
75	100
63	97
37.5	97
20	92
10	86
6.3	83
3.35	81
2	79
1.18	78
0.6	75
0.3	67
0.212	59
0.15	49
0.063	35

Soil Fraction	Total Percentage
Cobbles	3
Gravel	18
Sand	44
Silt/Clay	35

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
[signature]	26/3/04	[signature]	26/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

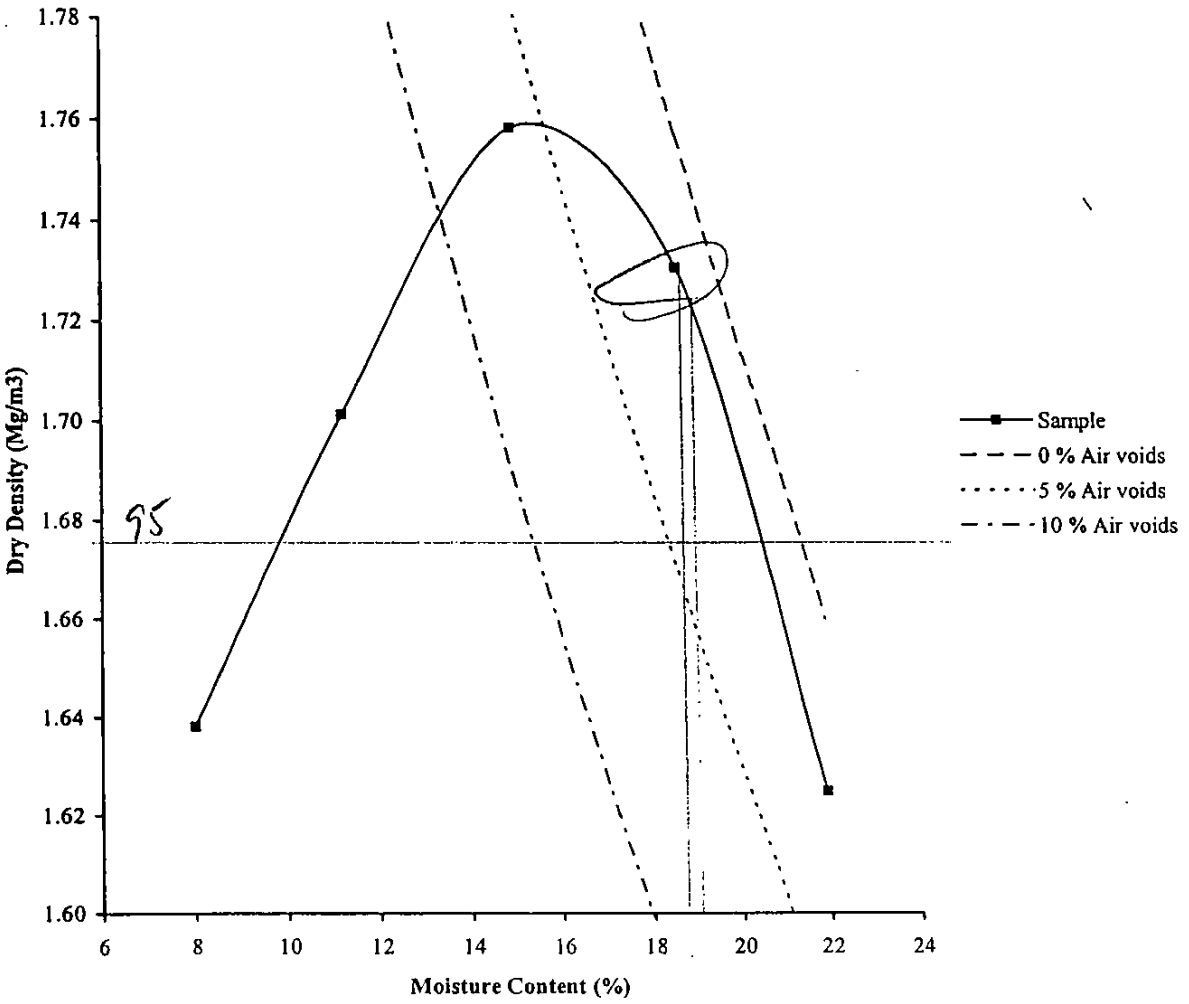
Contract No.:
NL240620

Dry Density /Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : 214 **Depth (m) : 2.40**

MG



Initial Moisture Content:	19	Method of Compaction	2.5 Kg Rammer / Separate Sample	
Particle Density (Mg/m3):	2.61	Measured	Material Retained on 37.5 mm Test Sieve (%):	13
Maximum Dry Density (mg/m3):		1.76	Material Retained on 20.0 mm Test Sieve (%):	7
Optimum Moisture Content (%):		15		
Remarks	See summary of soil descriptions.			

Checked By	Date	Approved By	Date
	26/7/04		26/7/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

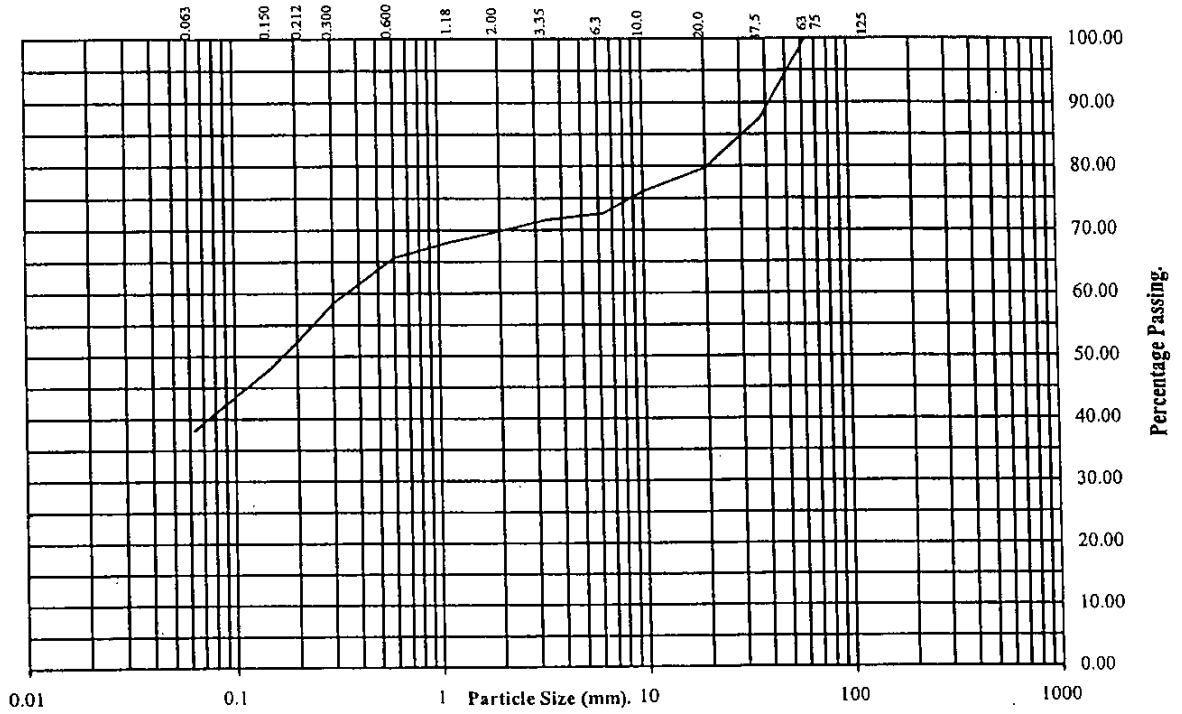
Contract No.
NL240620

PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: 214 **Depth (m):** 2.40 MG



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	87
20	80
10	76
6.3	73
3.35	72
2	70
1.18	68
0.6	66
0.3	58
0.212	53
0.15	48
0.063	38

Soil Fraction	Total Percentage
Cobbles	0
Gravel	30
Sand	32
Silt/Clay	38

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
CB	26/3/04	CB	26/3/04

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MANOR FARM
SEWAGE WORKS, READING.

Contract No.:
NL240620

MOISTURE CONDITION VALUE CALIBRATION
BS1377 : Part 4 : 1990.

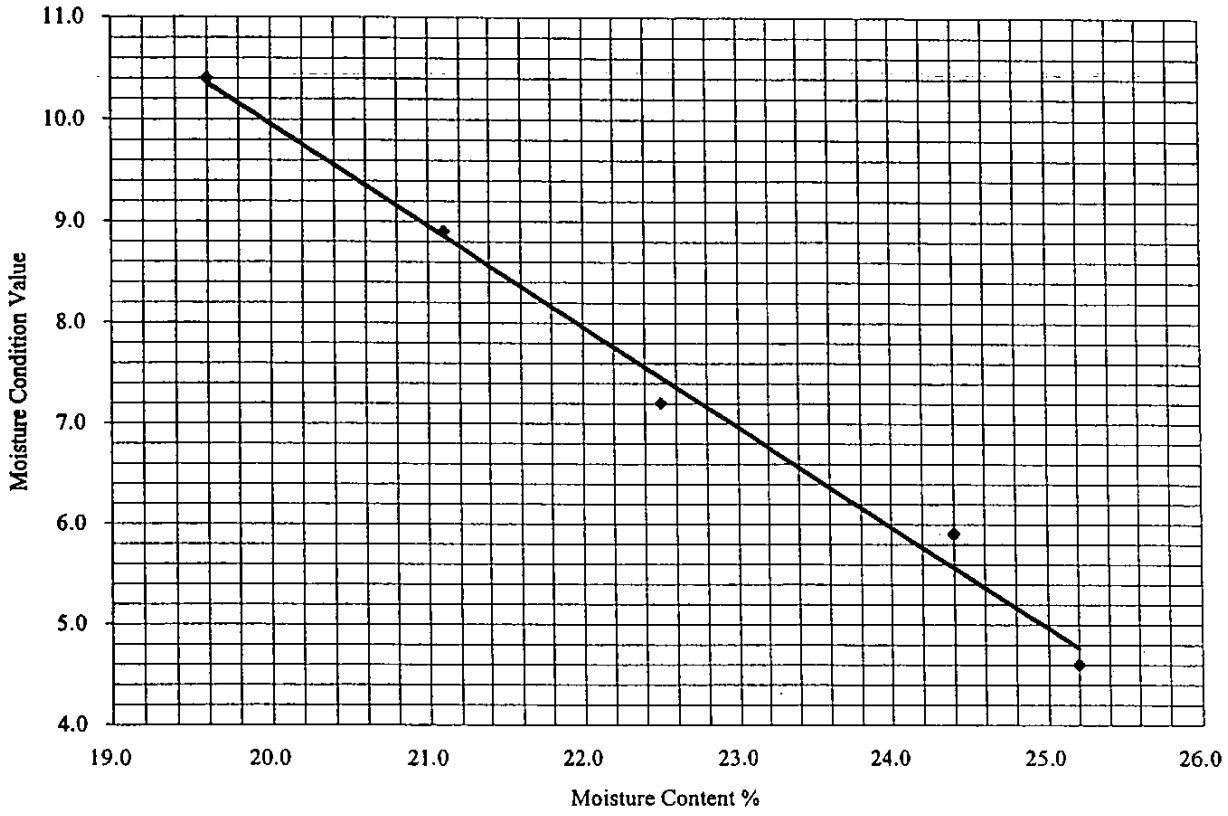
Trial Pit 214 Depth (m): 3.60

MC7

Sample Number:

Sample Type: Bulk

Initial Moisture Content (%).:	24.4
Single/Separate Samples Tested.	Separate
Material Retained on the 20mm BS Test Sieve (%).:	15



Test Results.

Test Number.	1	2	3	4	5
Moisture Content (%).	19.6	21.1	22.5	24.4	25.2
MCV	10.4	8.9	7.2	5.9	4.6

Checked and Approved By

Date 24/5/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING

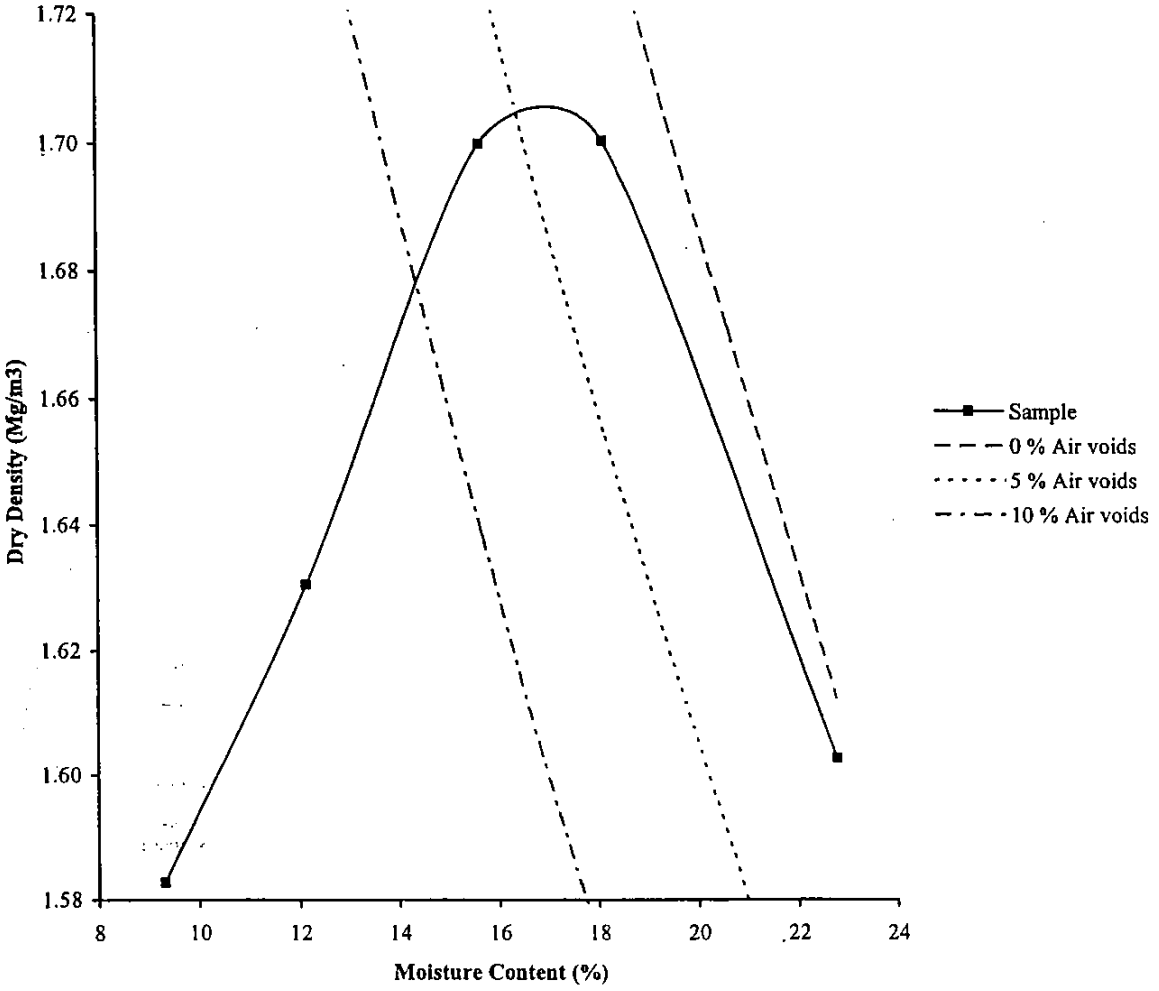
Contract No.:
NL240620

Dry Density /Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : 214 **Depth (m) : 3.60**

MG



Initial Moisture Content:	23	Method of Compaction	2.5 Kg Rammer / Separate Sample		
Particle Density (Mg/m3):	2.55	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (mg/m3):		1.71	Material Retained on 20.0 mm Test Sieve (%):		15
Optimum Moisture Content (%):		17			
Remarks	See summary of soil descriptions.				

Checked By	Date	Approved By	Date
	28/8/04		27/9/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

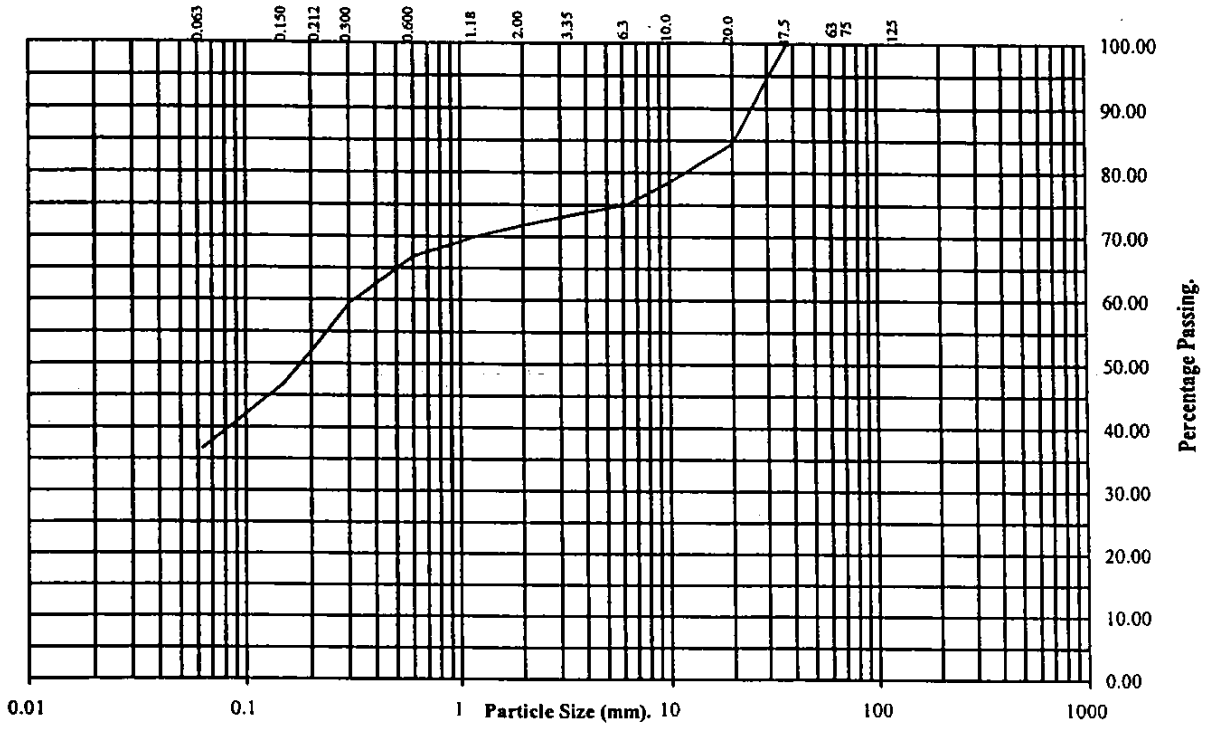
Contract No.
NL240620

PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: 214 **Depth (m):** 3.60 MG



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	85
10	79
6.3	75
3.35	73
2	72
1.18	70
0.6	67
0.3	59
0.212	53
0.15	47
0.063	37

Soil Fraction	Total Percentage
Cobbles	0
Gravel	28
Sand	35
Silt/Clay	37

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
[signature]	24/3/04	[signature]	24/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

Contract No.:
NL240620

MOISTURE CONDITION VALUE CALIBRATION
BS1377 : Part 4 : 1990.

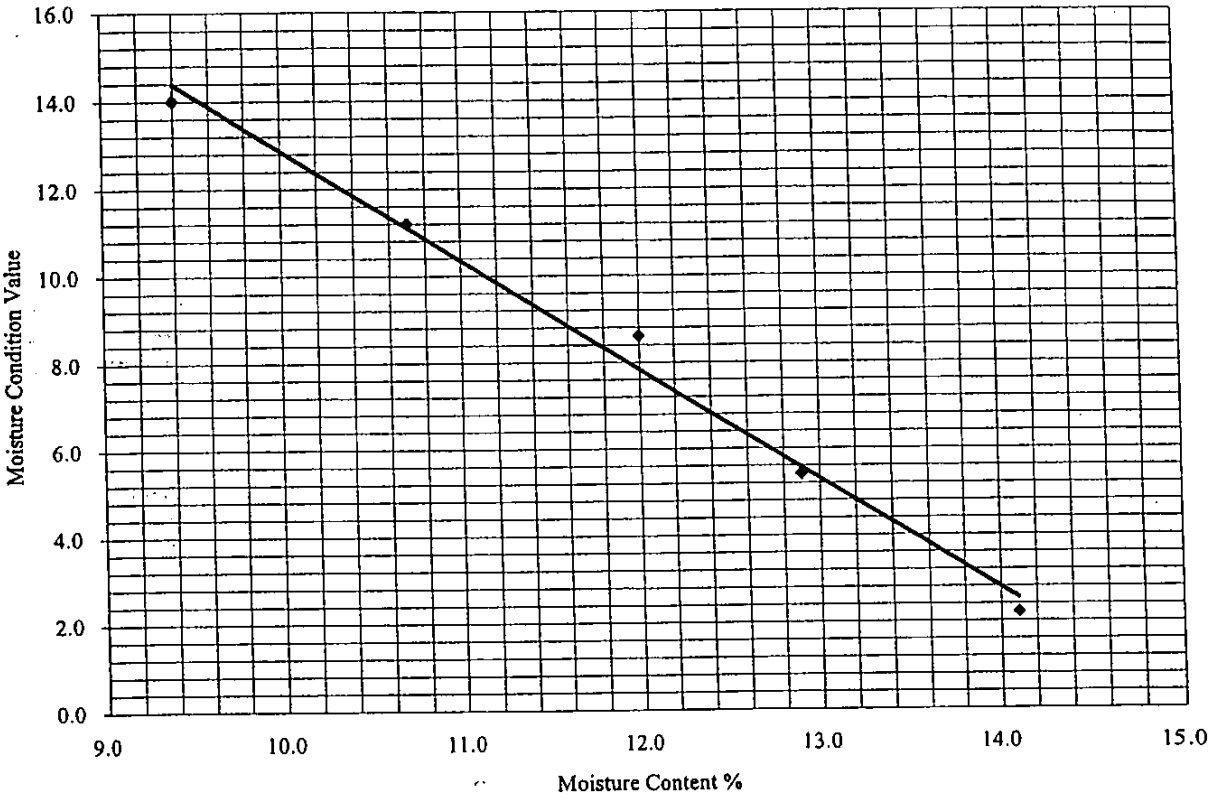
Trial Pit 216 Depth (m): 1.00

Grav

Sample Number:

Sample Type: Bulk

Initial Moisture Content (%).:	12
Single/Separate Samples Tested.	Separate
Material Retained on the 20mm BS Test Sieve (%).:	15



Test Results.

Test Number.	1	2	3	4	5
Moisture Content (%).	9.4	10.7	12.0	12.9	14.1
MCV	14.0	11.2	8.6	5.4	2.2

Checked and Approved By

Date

24/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING

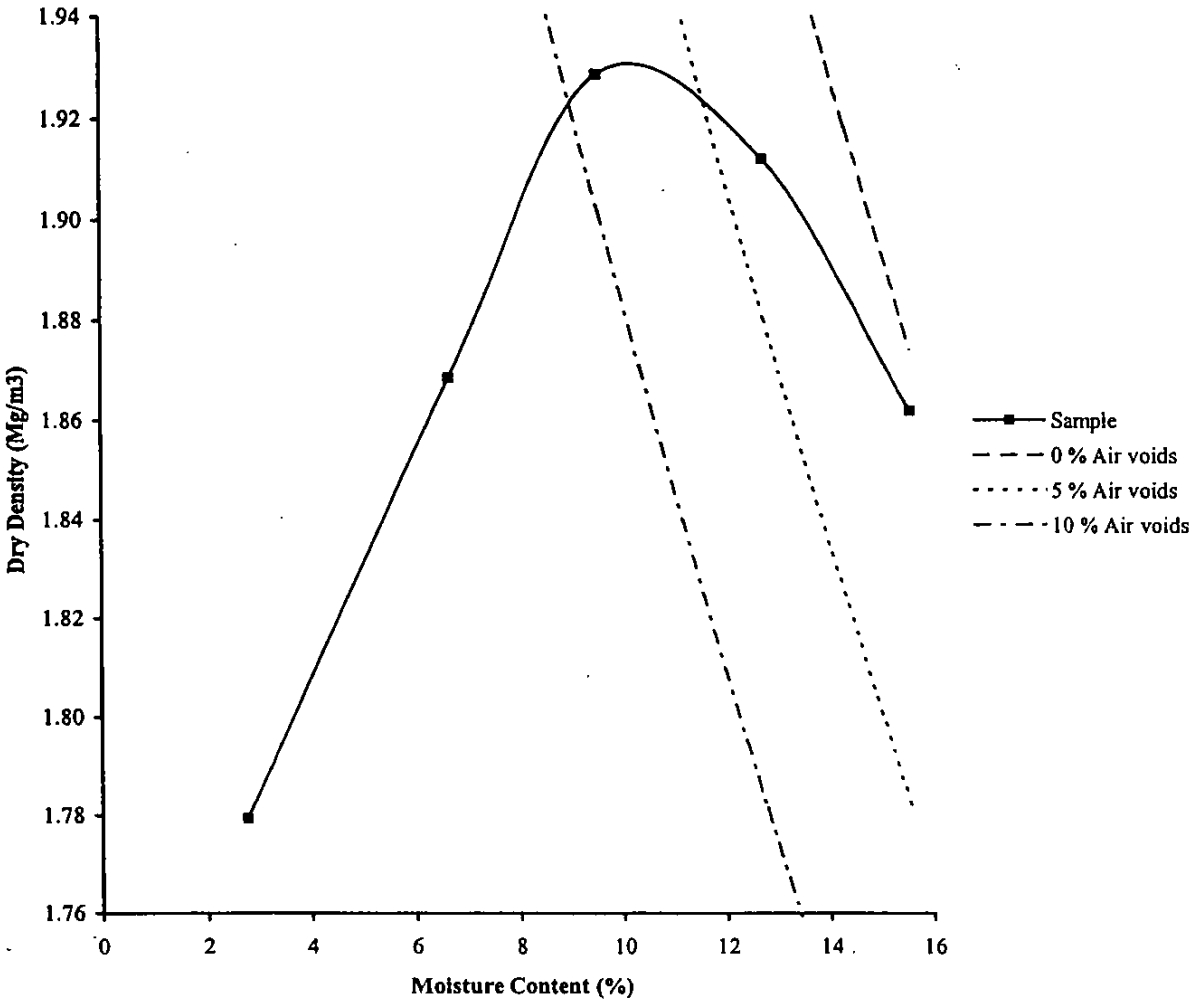
Contract No.:
NL240620

Dry Density /Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : 216 **Depth (m) : 1.00**

Grav



Initial Moisture Content:	13	Method of Compaction	2.5 Kg Rammer / Separate Sample	
Particle Density (Mg/m3):	2.65	Assumed	Material Retained on 37.5 mm Test Sieve (%):	10
Maximum Dry Density (mg/m3):		1.93	Material Retained on 20.0 mm Test Sieve (%):	5
Optimum Moisture Content (%):		10		
Remarks	See summary of soil descriptions.			

Checked By	Date	Approved By	Date
	24/3/04		24/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

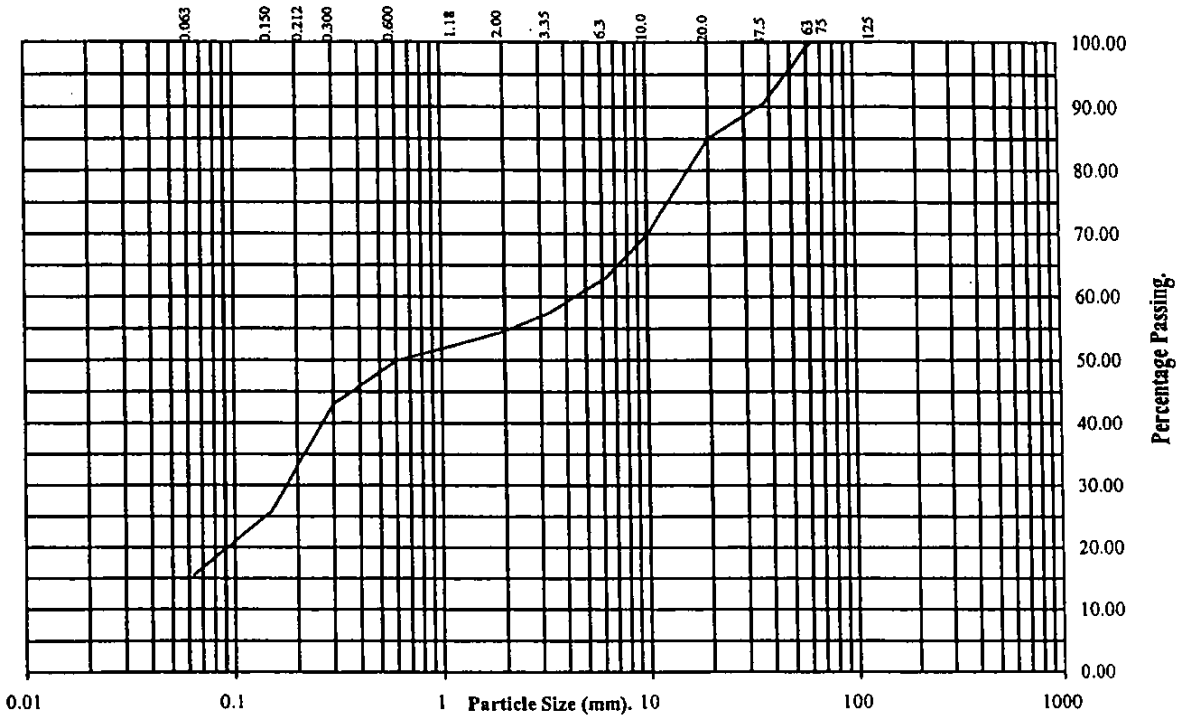
Contract No.
NL240620

PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: 216 **Depth (m):** 1.00 Grav



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	90
20	85
10	70
6.3	63
3.35	58
2	55
1.18	52
0.6	50
0.3	43
0.212	35
0.15	26
0.063	15

Soil Fraction	Total Percentage
Cobbles	0
Gravel	45
Sand	40
Silt/Clay	15

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
[signature]	24/5/04	[signature]	24/5/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

Contract No.:
NL240620

SUMMARY OF SOIL COMPACTION RELATED TESTS

(B.S. 1377 : PART 4 : 1990)

Trial Pit Number	Sample Number	Depth m	Initial Moisture Content %	% Passing 37 mm BS Sieve	% Passing 20 mm BS Sieve	Particle Density Mg/m³	Method of compaction (kg Rammer)	Maximum Dry Density Mg/m³	Minimum Dry Density Mg/m³	Optimum Moisture Content %	C.B.R Value Top %	C.B.R Value Base %	Moisture Condition Value	Remarks
217	MC	1.40	32		15	2.20							17.5	

Sheet 1 of 1.

*: Assumed Particle Density.

THYSSEN GEOTECHNICAL

Compiled by	Date	Checked by	Date	Approved by	Date
	25/3/04		25/3/04		25/3/04

MANOR FARM SEWAGE WORKS, READING.

Contract No. NL240620

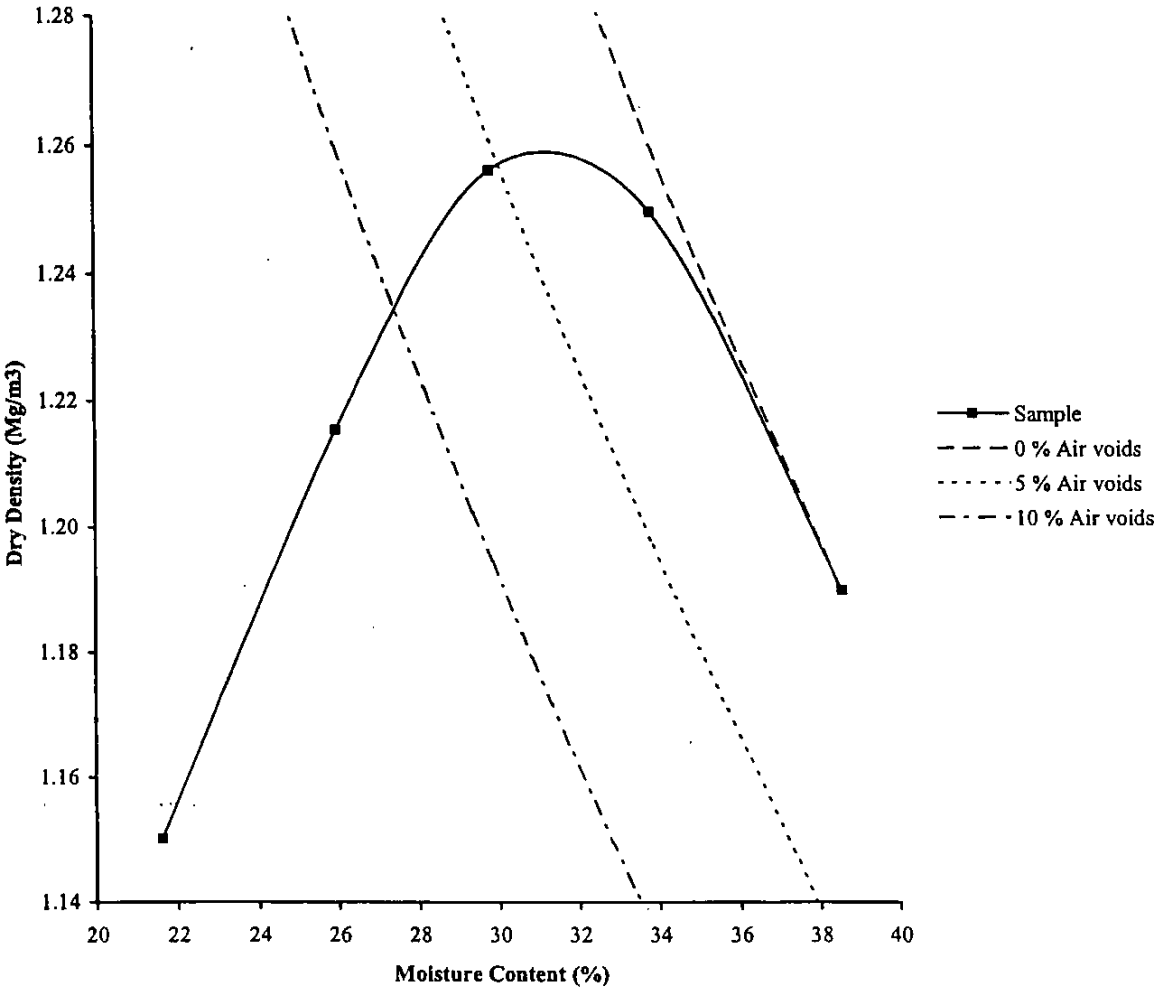
Figure:

Dry Density /Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : 217 **Depth (m) : 1.40**

MC



Initial Moisture Content:	34	Method of Compaction	2.5 Kg Rammer / Separate Sample	
Particle Density (Mg/m3):	2.2	Measured	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (mg/m3):		1.26	Material Retained on 20.0 mm Test Sieve (%):	15
Optimum Moisture Content (%):		31		
Remarks	See summary of soil descriptions.			

Checked By	Date	Approved By	Date
	25/3/04		2/7/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

Contract No.
NL240620

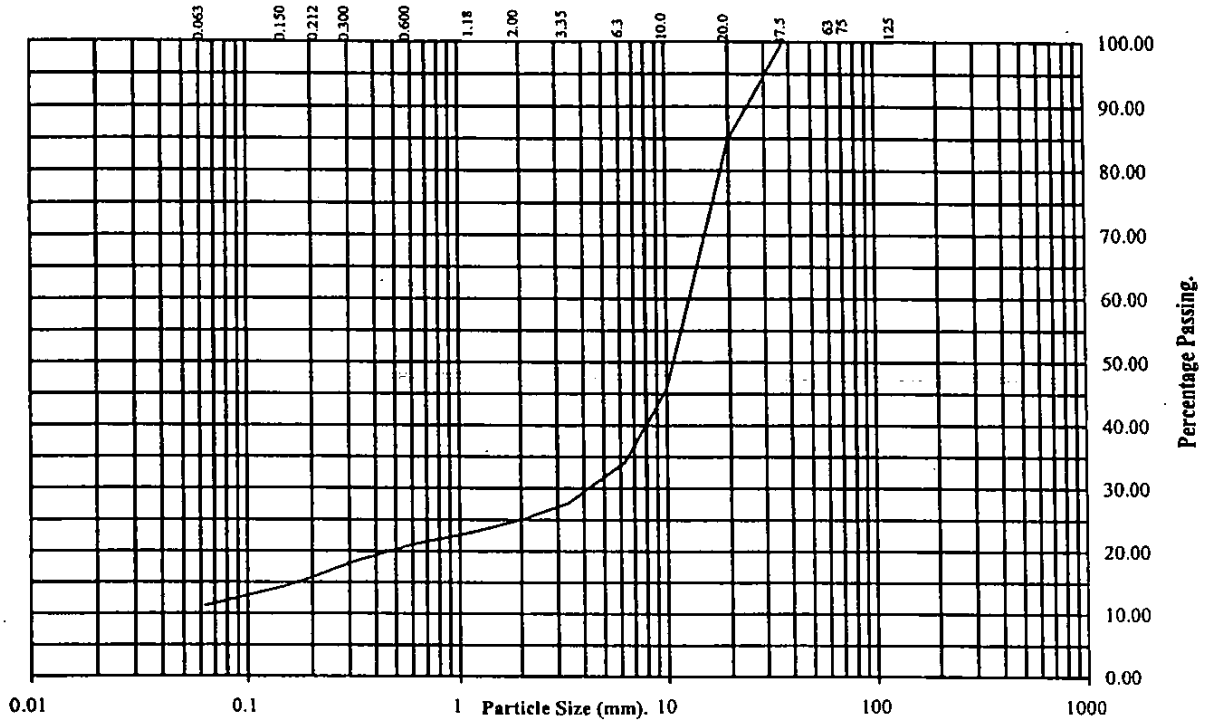
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: 217 **Depth (m):** 1.40

MG



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	85
10	46
6.3	34
3.35	28
2	25
1.18	23
0.6	21
0.3	18
0.212	16
0.15	14
0.063	11

Soil Fraction	Total Percentage
Cobbles	0
Gravel	75
Sand	14
Silt/Clay	11

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
	25/3/04		26/3/04

Butterley Geotechnical

MANOR FARM SEWAGE WORKS, READING.

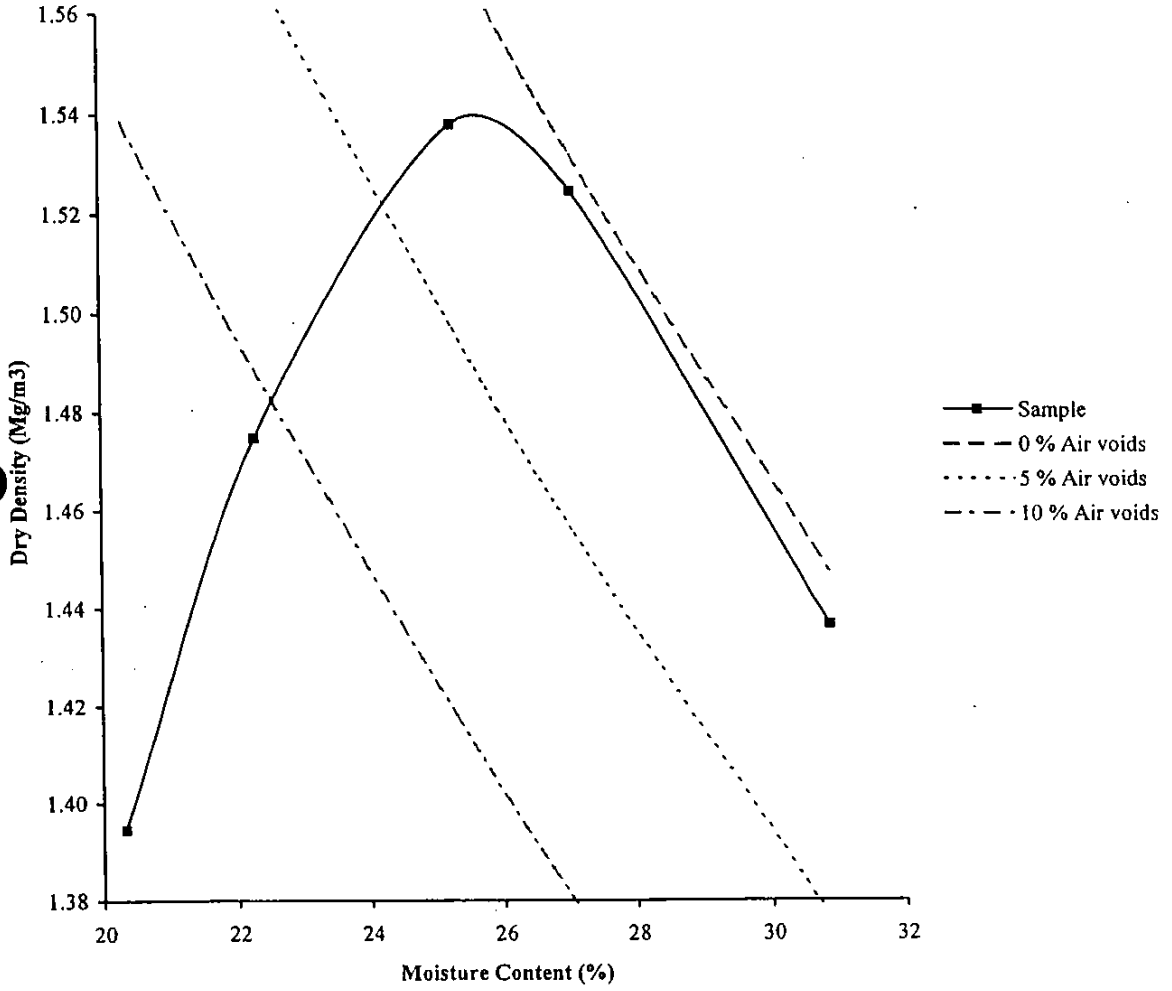
Contract No.: NL240620

Dry Density /Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : 217 **Depth (m) : 3.00**

MG



Initial Moisture Content:	45	Method of Compaction	2.5 Kg Rammer / Separate Sample		
Particle Density (Mg/m3):	2.62	Measured	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (mg/m3):		1.54	Material Retained on 20.0 mm Test Sieve (%):		6
Optimum Moisture Content (%):		25			
Remarks	See summary of soil descriptions.				

Checked By	Date	Approved By	Date
	29/12/04		29/12/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

Contract No.
NL240620

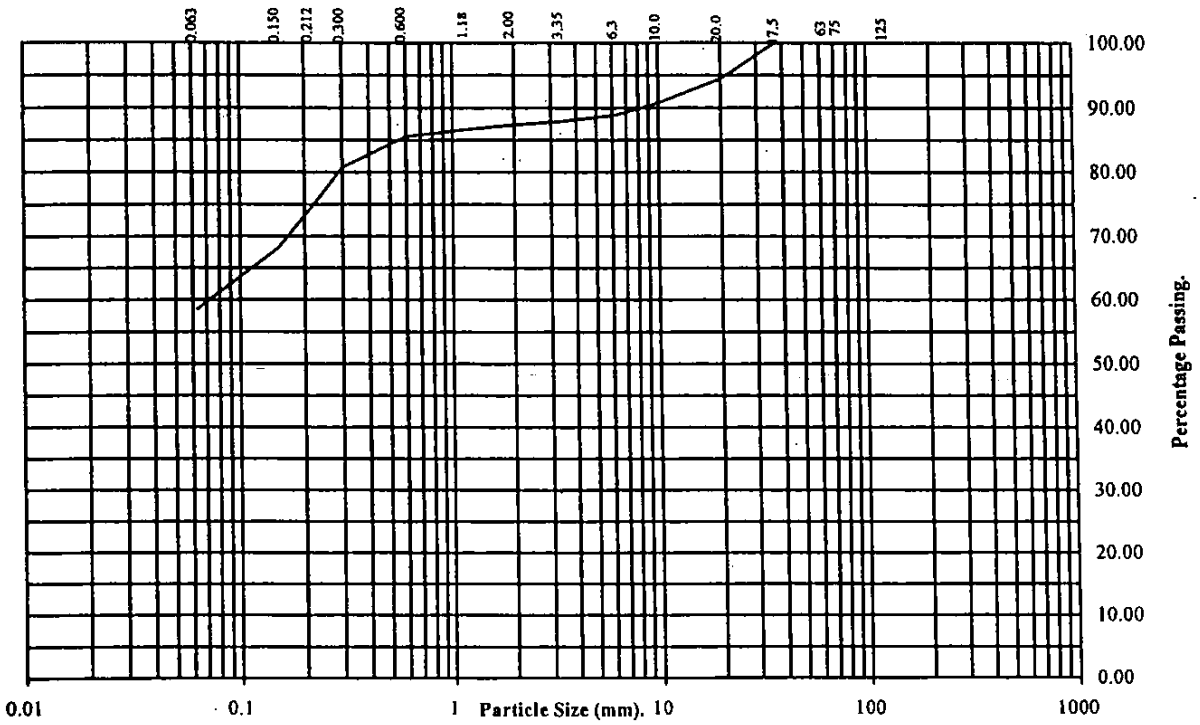
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: 217 **Depth (m):** 3.00

MA



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	94
10	91
6.3	89
3.35	88
2	87
1.18	87
0.6	86
0.3	81
0.212	74
0.15	68
0.063	59

Soil Fraction	Total Percentage
Cobbles	0
Gravel	13
Sand	28
Silt/Clay	59

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
	26/3/04		26/3/04

Butterley Geotechnical

MANOR FARM
SEWAGE WORKS, READING.

Contract No.:
NL240620

APPENDIX D4

FILTER BED MATERIAL GEOTECHNICAL AND CONTAMINATION RESULTS

White Young Green Environmental
R70821 - Reading, Manor Farm STW

Date Sampled		16/03/04	16/03/04	16/03/04	16/03/04
Lab Ref. No:		197154	197155	197156	197157
Customer Ref. No.					
Sample Type		B	B	B	B
Trial Pit / Borehole No.		FB201	FB202	FB203	FB204
Depth (m)					
Hardstanding at Surface (Y/N)					
pH	Value	9.4	10.1	10.2	9.1
PHENOLICS					
Butyl Phenols	mg/kg				
Catechol	mg/kg	<0.1	<0.1	<0.1	<0.1
Cresols (sum)	mg/kg	<0.1	<0.1	<0.1	<0.1
Naphthols	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenol	mg/kg	<0.1	<0.1	<0.1	<0.1
Resorcinol	mg/kg	<0.1	<0.1	<0.1	<0.1
Trimethylphenol	mg/kg	<0.1	<0.1	<0.1	<0.1
Xylenols & Ethylphenols	mg/kg	<0.1	<0.1	<0.1	<0.1
Total Phenols	mg/kg	<0.5	<0.5	<0.5	<0.5
US EPA PRIORITY PAH's					
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(a)Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1
Di-benzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Total US EPA 16 PAH	mg/kg	<0.1	<0.1	<0.1	<0.1
GENERAL INORGANICS					
Complex Cyanide	mg/kg				
Easily Liberatable Cyanide (free)	mg/kg				
Thiocyanate	mg/kg				
Total Cyanide	mg/kg	<1	<1	<1	<1
Sulphide	mg/kg	96.5	130.5	82.7	113.7
Sulphur (free)	mg/kg	750	1210	320	680
Total Sulphate	mg/kg	800	1800	900	5400
Water Soluble Sulphate	mg/kg				2240
Exchangeable Ammonium	mg/kg	37.6	198.1	24.8	25.0
Water Soluble Nitrate	mg/kg				
Water Soluble Nitrite	mg/kg				

White Young Green Environmental
R70821 - Reading, Manor Farm STW

Date Sampled		16/03/04	16/03/04	16/03/04	16/03/04
Lab Ref. No:		197154	197155	197156	197157
Customer Ref. No.					
Sample Type		B	B	B	B
Trial Pit / Borehole No.		FB201	FB202	FB203	FB204
Depth (m)					
Hardstanding at Surface (Y/N)					
HEAVY METALS/METALLOIDS					
Aluminium	mg/kg				
Antimony	mg/kg				
Arsenic	mg/kg	6.7	<5	<5	5.4
Barium	mg/kg				
Beryllium	mg/kg				
Boron (Water Soluble)	mg/kg	2.9	3.2	2.5	4.5
Cadmium	mg/kg	1.0	1.3	2.1	1.8
Chromium (Total)	mg/kg	301	262	160	99
Chromium (Hexavalent)	mg/kg	<2	<2	<2	<2
Cobalt	mg/kg				
Copper	mg/kg	17	15	12	12
Germanium	mg/kg				
Lead	mg/kg	18	15	19	21
Mercury	mg/kg	0.1	<0.1	<0.1	<0.1
Molybdenum	mg/kg				
Nickel	mg/kg	7	10	38	8
Selenium	mg/kg	2.6	3.1	1.9	2.6
Vanadium	mg/kg				
Zinc	mg/kg	58	55	86	72
ESSENTIAL ELEMENTS					
Calcium	mg/kg				
Iron	mg/kg	2120	4840	3120	5610
Magnesium	mg/kg				
Manganese	mg/kg				
Potassium	mg/kg				
Sodium	mg/kg				
TOTAL HYDROCARBONS					
Petroleum Range Organics (C_6-C_{10})	mg/kg				
Diesel Range Organics (C_8-C_{25})	mg/kg				
Hydrocarbon Screen (GC-FID)	mg/kg	<5	<5	<5	<5
Faecal Coliforms	no / g	<100	<100	<100	<100
Faecal Streptococci	no / g	<100	<100	<100	<100
Clostridia	no / g wet wt	<100	400	1600	<100

Determination of The Aggregate Impact Value(AIV).

BS 812 : Part 112 : 1990.

Laboratory Contract Number:	**WL24210**
Location:	**Manor Farm STW Reading**
Client Ref. No.:	**FB201**
Date of Start of Test.:	**8/04/04**
Method of Sampling:	**BS 812: Part 102: 1989**
Sampled By:	**Unknown**
Aggregate Type and Nominal Size:	**10.00-6.30mm**
Test Condition:	**Dry**
Number of Blows:	**14**
Target Specification:	**Not Applicable**

The Average Aggregate Impact Value(AIV):	17

Remarks:
All remaining samples shall be retained for a period of one month from the above date, after which time all samples shall be disposed of.

Approved Signatories: D V Edwards (Regional Laboratory Controller), & L R Evans (Laboratory Co-ordinator).

Determination of The Aggregate Impact Value(AIV).

BS 812 : Part 112 : 1990.

Laboratory Contract Number:	**WL24210**
Location:	**Manor Farm STW Reading**
Client Ref. No.:	**FB202**
Date of Start of Test.:	**8/04/04**
Method of Sampling:	**BS 812: Part 102: 1989**
Sampled By:	**Unknown**
Aggregate Type and Nominal Size:	**10.00-6.30mm**
Test Condition:	**Dry**
Number of Blows:	**14**
Target Specification:	**Not Applicable**

The Average Aggregate Impact Value(AIV):	18

Remarks:
All remaining samples shall be retained for a period of one month from the above date, after which time all samples shall be disposed of.

Approved Signatories: D V Edwards (Regional Laboratory Controller), & L R Evans (Laboratory Co-ordinator).

Determination of The Aggregate Impact Value(AIV).

BS 812 : Part 112 : 1990.

Laboratory Contract Number:	**WL24210**
Location:	**Manor Farm STW Reading**
Client Ref. No.:	**FB203**
Date of Start of Test.:	**8/04/04**
Method of Sampling:	**BS 812: Part 102: 1989**
Sampled By:	**Unknown**
Aggregate Type and Nominal Size:	**10.00-6.30mm**
Test Condition:	**Dry**
Number of Blows:	**14**
Target Specification:	**Not Applicable**

The Average Aggregate Impact Value(AIV):	17

Remarks:
All remaining samples shall be retained for a period of one month from the above date, after which time all samples shall be disposed of.

Approved Signatories: D V Edwards (Regional Laboratory Controller), & L R Evans (Laboratory Co-ordinator).

Determination of The Aggregate Impact Value(AIV).

BS 812 : Part 112 : 1990.

Laboratory Contract Number:	**WL24210**
Location:	**Manor Farm STW Reading**
Client Ref. No.:	**FB204**
Date of Start of Test.:	**8/04/04**
Method of Sampling:	**BS 812: Part 102: 1989**
Sampled By:	**Unknown**
Aggregate Type and Nominal Size:	**10.00-6.30mm**
Test Condition:	**Dry**
Number of Blows:	**14**
Target Specification:	**Not Applicable**

The Average Aggregate Impact Value(AIV):	17

Remarks:
All remaining samples shall be retained for a period of one month from the above date, after which time all samples shall be disposed of.

Approved Signatories: D V Edwards (Regional Laboratory Controller), & L R Evans (Laboratory Co-ordinator).

Determination of Ten Percent Value(TFV).

BS 812 : Part 111 : 1990.

Location:	**Manor Farm STW Reading**
Contract Number:	**WL24210**
Sample Number:	**FB201**
Date tested:	**13/04/04**
Method of Sampling:	**BS 812: Part 102: 1989**
Sampled By:	**Unknown**
Aggregate Type and Nominal Size:	**10-6.30mm**
Test Condition:	**Soaked**
Target Specification:	**N/A**

The Average Ten Percent Fines value(TFV):	**25 Kn**

Remarks:
All remaining samples shall be retained for a period of one month from the above date, after which time all samples shall be disposed of.

Approved Signatories: D V Edwards (Regional Laboratory Manager0
L Evans (Laboratory Technical Co ordinator).
V Williams (Senior Technician)

Determination of Ten Percent Value(TFV).

BS 812 : Part 111 : 1990.

Location:	**Manor Farm STW Reading**
Contract Number:	**WL24210**
Sample Number:	**FB202**
Date tested:	**13/04/04**
Method of Sampling:	**BS 812: Part 102: 1989**
Sampled By:	**Unknown**
Aggregate Type and Nominal Size:	**10-6.30mm**
Test Condition:	**Soaked**
Target Specification:	**N/A**

The Average Ten Percent Fines value(TFV):	**20 Kn**

Remarks:
All remaining samples shall be retained for a period of one month from the above date, after which time all samples shall be disposed of.

Approved Signatories: D V Edwards (Regional Laboratory Manager0
L Evans (Laboratory Technical Co ordinator):
V Williams (Senior Technician)

Determination of Ten Percent Value(TFV).

BS 812 : Part 111 : 1990.

Location:	**Manor Farm STW Reading**
Contract Number:	**WL24210**
Sample Number:	**FB203**
Date tested:	**13/04/04**
Method of Sampling:	**BS 812: Part 102: 1989**
Sampled By:	**Unknown**
Aggregate Type and Nominal Size:	**10-6.30mm**
Test Condition:	**Soaked**
Target Specification:	**N/A**

The Average Ten Percent Fines value(TFV):	**15 Kn**

Remarks:
All remaining samples shall be retained for a period of one month from the above date, after which time all samples shall be disposed of.

Approved Signatories: D V Edwards (Regional Laboratory Manager0
L Evans (Laboratory Technical Co ordinator).
V Williams (Senior Technician)

Determination of Ten Percent Value(TFV).

BS 812 : Part 111 : 1990.

Location:	**Manor Farm STW Reading**
Contract Number:	**WL24210**
Sample Number:	**FB204**
Date tested:	**13/04/04**
Method of Sampling:	**BS 812: Part 102: 1989**
Sampled By:	**Unknown**
Aggregate Type and Nominal Size:	**10-6.30mm**
Test Condition:	**Soaked**
Target Specification:	**N/A**

The Average Ten Percent Fines value(TFV):	**20 Kn**

Remarks:
All remaining samples shall be retained for a period of one month from the above date, after which time all samples shall be disposed of.

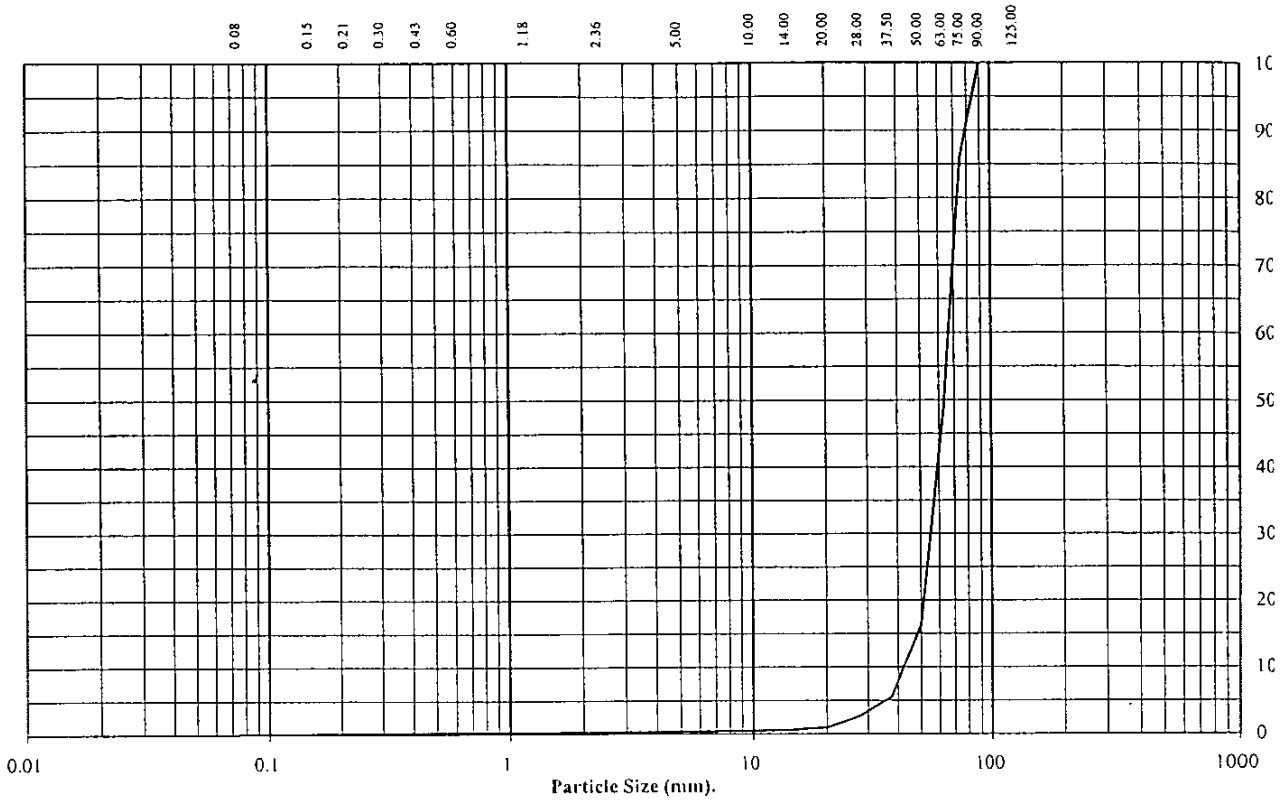
Approved Signatories: D V Edwards (Regional Laboratory Manager0
L Evans (Laboratory Technical Co.ordinator).
V Williams (Senior Technician)

PARTICLE SIZE DISTRUBUTION TEST

BS 812: Section 103.1 :1985

Wet Sieve, Clause 7.2

Sample Number: **FB201**



BS Test Sieve	Percentage Passing
125	100
90	100
75	86
63	49
50	16
37.5	6
28	3
20	1
14	1
10	0
5	0

BS Test Sieve	Percentage Passing
2.36	0
1.18	0
0.6	0
0.425	0
0.3	0
0.212	0
0.15	0
0.075	0

Soil Fraction	Total Percentage
Cobbles	51
Gravel	49
Sand	0
Silt/Clay	0

Remarks:

Checked and Approved By **Date**

Butterley Geotechnical

Manor Farm STW Reading

Contrac

WL24

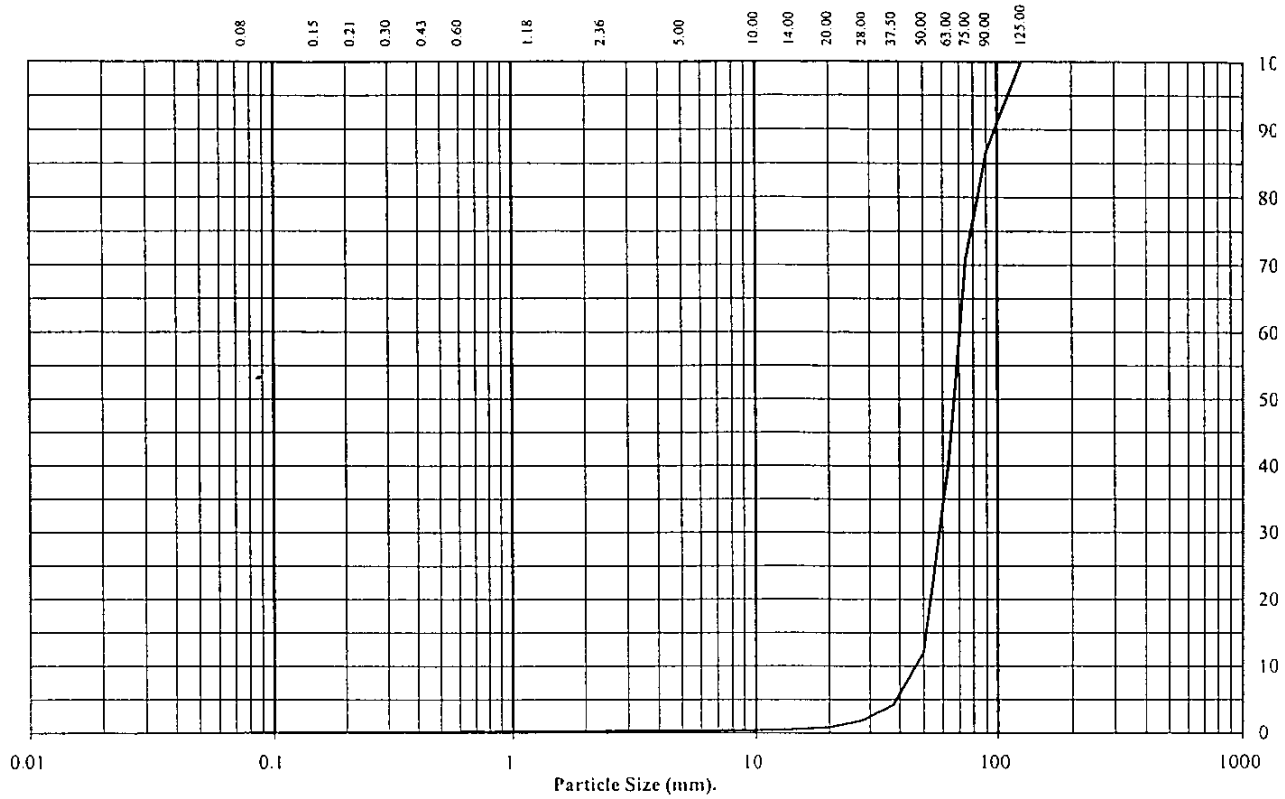
Hynca, Llanelli, Carmarthenshire SA14 9SU

PARTICLE SIZE DISTRUBUTION TEST

BS 812: Section 103.1 :1985

Wet Sieve, Clause 7.2

Sample Number: **FB202**



BS Test Sieve	Percentage Passing
125	100
90	87
75	71
63	40
50	12
37.5	4
28	2
20	1
14	1
10	0
5	0

BS Test Sieve	Percentage Passing
2.36	0
1.18	0
0.6	0
0.425	0
0.3	0
0.212	0
0.15	0
0.075	0

Soil Fraction	Total Percentage
Cobbles	60
Gravel	39
Sand	0
Silt/Clay	0

Remarks:

Checked and Approved By **Date**

Butterley Geotechnical

Manor Farm STW Reading

Contrac

WL24

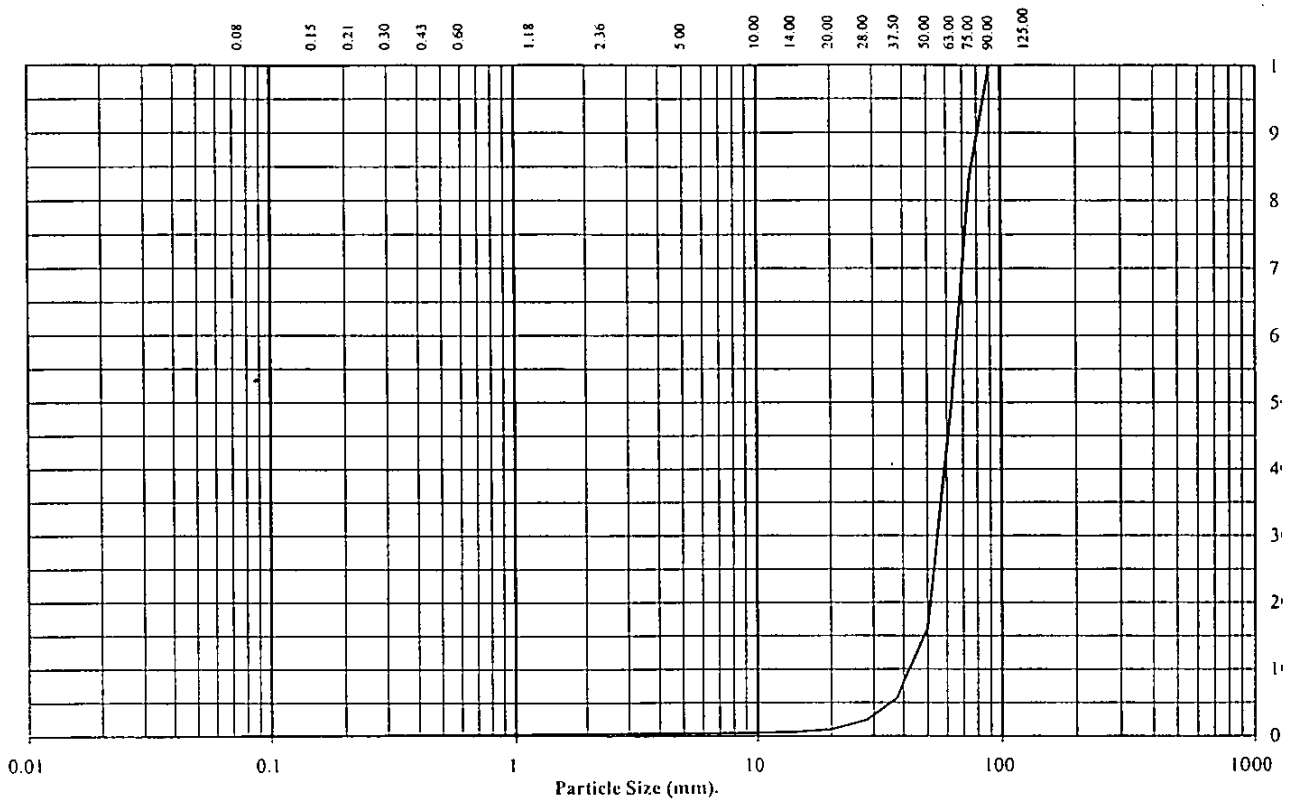
Bynea, Llanelli, Carmarthenshire SA14 9SD

PARTICLE SIZE DISTRUBUTION TEST

BS 812: Section 103.1 :1985

Wet Sieve, Clause 7.2

Sample Number: **FB203**



BS Test Sieve	Percentage Passing
125	100
90	100
75	84
63	50
50	16
37.5	6
28	2
20	1
14	1
10	0
5	0

BS Test Sieve	Percentage Passing
2.36	0
1.18	0
0.6	0
0.425	0
0.3	0
0.212	0
0.15	0
0.075	0

Soil Fraction	Total Percentage
Cobbles	50
Gravel	50
Sand	0
Silt/Clay	0

Remarks:

Checked and Approved By **Date**

Butterley Geotechnical

Contrac

Manor Farm STW Reading

WL24

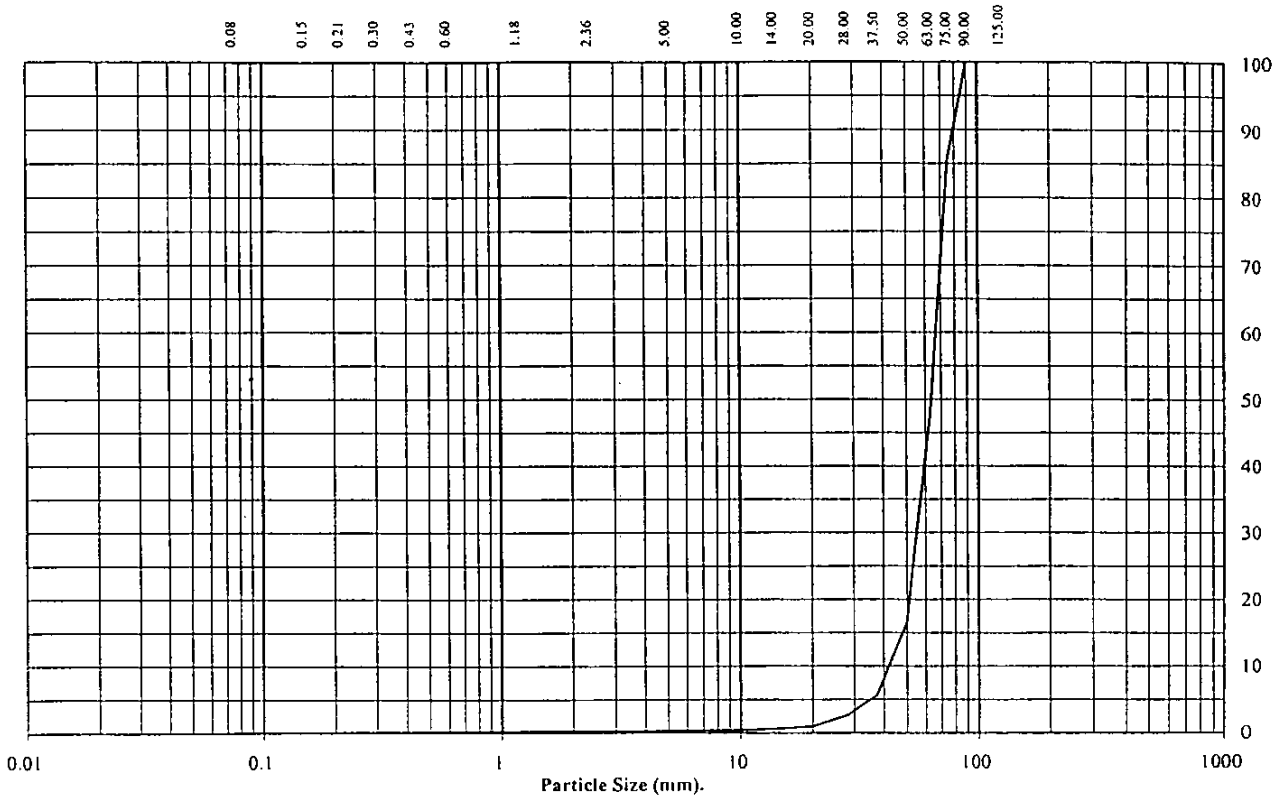
Bynea, Llanelli, Carmarthenshire SA14 9SD

PARTICLE SIZE DISTRUBUTION TEST

BS 812: Section 103.1 :1985

Wet Sieve, Clause 7.2

Sample Number: **FB204**



BS Test Sieve	Percentage Passing
125	100
90	100
75	85
63	48
50	17
37.5	6
28	3
20	1
14	1
10	0
5	0

BS Test Sieve	Percentage Passing
2.36	0
1.18	0
0.6	0
0.425	0
0.3	0
0.212	0
0.15	0
0.075	0

Soil Fraction	Total Percentage
Cobbles	52
Gravel	47
Sand	0
Silt/Clay	0

Remarks:

Checked and Approved By **Date**

Butterley Geotechnical

Manor Farm STW Reading

Contrac

WL2

Bynea, Llanelli, Carmarthenshire SA14 9SU

APPENDIX E

WYGE (2003) INVESTIGATION

APPENDIX E1

LOGS

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London. SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Borehole Number **BH102GC**

Sheet 1 of 2
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Cable Percussion**

Ground Level **41.80mOD**

Start Date 11/07/03
Finish Date 15/07/03

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Topsoil* (MADE GROUND)		41.60	0.20						
Firm orange-brown silty clay with some flint gravel and some fragments of red brick and chalk. (MADE GROUND)							0.50	S,D	
							1.20	C	N=10 (2,2,2,3,2,3)
							1.50	S,B	
		39.60	2.20				2.20	C	N=11(2,3,3,2,3,3)
Firm grey-brown silty clay with some flint gravel and some fragments of red brick and chalk and occasional fragments of glass and metal. (MADE GROUND)							2.50	S,B	
		38.65	3.15				3.20	S,D	N=9 (1,3,2,2,3,2)
Soft very peaty fibrous silty clay. Organic odour. Possible Sewage Sludge. (c) (MADE GROUND)							3.65	D	
. . . at 3.65mwith much decaying plant material		37.80	4.00				4.00	S,D	N=8 (1,2,2,2,2,2)
Soft green-brown silty CLAY with a slight organic odour. (ALLUVIUM)					4.60		4.45	D	
							4.75	D	
. . . at 4.75m with occsional black organic pockets.							5.00	S	N=6 (1,1,1,2,1,2)
							5.45	D	
		36.05	5.75		5.90		5.75	S,B	N=18 (3,3,3,4,5,6)
Medium dense. Orange brown and cream sandy GRAVEL of fine to coarse sub-angular to sub-rounded flint. (VALLEY GRAVEL)					9.90		7.25	S,B	N=25 (3,4,4,6,7,8)
		33.50	8.30				8.50	D	N=20 (3,3,3,5,6,6)
Stiff grey brown CLAY. (READING BEDS)							8.95	D	
. . . at 8.95m with a little sand				9.00 250mm			9.50	D	
		31.80	10.00		10.00		10.00	S,B	N=25 (2,3,5,7,8,7)

Remarks:

Chiselling: Chiselling concrete from 1.90 to 2.15mbgl for 30 minutes.

Installation / Backfill: 50mm diameter HDPE standpipes installed to 20.0 and 8.3mbgl. Discrete response zones sealed between 5.75-8.5 and 15.5-20.0m. Standpipes finished with end caps and gas valves.

Groundwater: Groundwater encountered at 5.90 and 10.0mbgl, rising to 4.6 and 6.9mbgl after 20mins.

Other Observations: * Denotes Driller's Description

JOB NUMBERE3015/05

Logged By PE

Checked By

FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London. SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Borehole Number **BH102GC**

Sheet 2 of 2
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Cable Percussion**

Ground Level **41.80mOD**

Start Date **11/07/03**
Finish Date **15/07/03**

Description	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike	Installation / Backfill	Sample Depth (m)	Sample Type	Notes
Medium dense grey brown fine to medium SAND. (READING BEDS)	31.80	10.00		10.00		10.00	S,B	N=25 (2,3,5,7,8,7)
						10.45	D	
. . . from 10.00 to 10.50m and13. 0 to 13.5m with very occasional small pockets of soft clay.								
						11.50	S,B	N=32 (4,4,7,8,8,9)
. . . below 11.5mgbl, becomes dense.						11.95	D	
						13.00	S,B	N=32 (3,4,5,7,9,11)
						13.45	D	
	27.40	14.40				14.40	S,B	N=47 (5,10,17,30)
Stiff grey-green sandy CLAY with some flint gravel. (READING BEDS)								
	26.80	15.00	15.00 200mm			15.00	S,B	N=19 (8,4,5,5,4,5)
Structured CHALK. Recovered as very weak gravel size fragments of white chalk bound in approximately 30% soft silt matrix. (WHITE CHALK)						15.45	D	
						16.50	S,B	N=44 (6,7,9,12,13,10)
. . . below 16.0m recovered as gravel and cobble size weak fragments of chalk in approximately 20% silt matrix with occasional black angular gravel and cobble size flints.						17.50	U	125 blows No Recovery
						18.00	S,B	N=38 (4,4,7,9,10,12)
						18.45	D	
			19.00 150mm					
						19.55	S	N=40 (5,5,7,10,11,12)
Borehole completed at 20.00mbgl	21.80	20.00				20.00	D	

Remarks:

Chiselling: Chiselling concrete from 1.90 to 2.15mbgl for 30 minutes.
Installation / Backfill: 50mm diameter HDPE standpipes installed to 20.0 and 8.3mbgl. Discrete response zones sealed between 5.75-8.5 and 15.5-20.0m. Standpipes finished with end caps and gas valves.
Groundwater: Groundwater encountered at 5.90 and 10.0mbgl, rising to 4.6 and 6.9mbgl after 20mins.
Other Observations: * Denotes Driller's Description

JOB NUMBERE3015/05
Logged By PE
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FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London. SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Borehole Number **BH102R**

Sheet 1 of 2
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Cable Percussion**

Ground Level **41.78mOD**

Start Date 10/07/03
Finish Date 10/07/03

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
TOPSOIL* (MADE GROUND)		41.68	0.10						
Firm orange-brown silty clay with some flint gravel and some fragments of red bricks and chalk. (MADE GROUND)							0.50	B	
							1.50	B	
		39.48	2.30						
Firm orange-brown silty clay with some flint gravel and some fragments of brick and chalk and occasional fragments of glass and metal. (MADE GROUND)							2.50	B	
		38.48	3.30				3.30	D	
Soft very peaty fibrous silty clay. Organic odour. Possible Sewage Sludge. (c) (MADE GROUND)									
. . . from 3.65-4.0m: with much decaying plant material.		37.78	4.00				4.00	D	
Soft green-grey brown silty CLAY with slightly organic odour. (ALLUVIUM)					4.55				
. . . at 4.75m: with occasional black organic pockets.							4.90	D	
. . . at 5.45: becomes light grey.		36.03	5.75		5.90		5.75	D	
Orange, brown and cream sandy GRAVEL of fine to coarse sub-angular to sub-rounded flint. (VALLEY GRAVEL).					7.00		6.75	D	
		34.03	7.75				7.75	D	
Stiff grey brown CLAY. (READING BEDS)									
. . . from 8.5 to 8.95m: greenish grey.					8.70		8.75	D	
. . . at 8.95m: with a little sand.					9.00				
							9.75	D	
		31.78	10.00		10.00		10.00	D	

Remarks:

Chiselling: Chiselling from 2.10mbgl to 2.30mbgl for 15 mins, and 3.05mbgl to 3.20mbgl for 15mins.

Installation / Backfill: 50mm HDPE standpipe installed to 12.0mbgl. Response zone sealed between 10.0-12.0m. Finished with end cap and gas valve and flush steel cover.

Groundwater: Groundwater encountered at 5.9, 9.0 and 10.0m rising to 4.65, 8.7 and 7.0m respectively after 20 mins.

Other Observations: * Denotes Drillers Description.

JOB NUMBERE3015/05

Logged By PE

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FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London. SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Borehole Number **BH102R**

Sheet 2 of 2
1:50

Project **Reading Gateway**	Client **Kennet Properties Ltd**
Method **Cable Percussion**	Ground Level **41.78mOD**

Start Date **10/07/03**
Finish Date **10/07/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Grey brown fine to medium SAND. (READING BEDS)		31.78	10.00		10.00		10.00	D	
. . . from 10.0 to 10.5 and 13.0 to 13.5m: with very occasional small pockets of soft clay.							11.00	D	
							12.00	D	
							13.00	D	
		27.78	14.00				14.00	D	
Borehole completed at 14.00mbgl									

Remarks:

Chiselling: Chiselling from 2.10mbgl to 2.30mbgl for 15 mins, and 3.05mbgl to 3.20mbgl for 15mins.
Installation / Backfill: 50mm HDPE standpipe installed to 12.0mbgl. Response zone sealed between 10.0-12.0m. Finished with end cap and gas valve and flush steel cover.
Groundwater: Groundwater encountered at 5.9, 9.0 and 10.0m rising to 4.65, 8.7 and 7.0m respectively after 20 mins.
Other Observations: * Denotes Drillers Description.

JOB NUMBERE3015/05
Logged By PE
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FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London. SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Borehole Number **BH103GC**

Sheet 1 of 2
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Cable Percussion**

Ground Level **39.36mOD**

Start Date 09/07/03
Finish Date 11/07/03

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
TOPSOIL* (MADE GROUND)		39.06	0.30						
Clay fill *. (MADE GROUND)		38.76	0.60				0.50	B	
Dark brown / black peaty sandy silty clay with occasional plastic debris and some flint gravel. (MADE GROUND)		37.86	1.50				1.50	B	
Soft orange-brown very gravelly silty sandy clay. Gravel is fine to coarse flint. (MADE GROUND)		37.21	2.15				2.20	B	
Soft to firm grey brown locally slightly peaty silty CLAY. Slightly organic odour. (ALLUVIUM)		36.66	2.70		2.70		2.70	B	
Soft orange-brown and grey silty slightly sandy CLAY with occasional flint gravel. (ALLUVIUM)		36.36	3.00		3.00				
Orange-brown sandy GRAVEL of fine to coarse flint. (VALLEY GRAVEL)		33.36	6.00				3.50	B	
							4.50	B	
Orange-brown medium to coarse SAND. (READING BEDS)		31.56	7.80		6.30		6.10	D	
							7.00	D	
Firm orange-brown, light grey and red mottled silty CLAY. (READING BEDS)		30.46	8.90	8.00 250mm	9.00		8.00	D	
							9.00	D	
Brown-grey silty fine to coarse SAND. (READING BEDS)							10.00	D	

Remarks:

Chiselling: None undertaken.

Installation / Backfill: 50mm HDPE standpipes installed to 6.0 & 18.5m, slotted with geowrap from 3.0 & 14.5m respectively. Gravel filter from 18.5-14.5 and 6.0-3.0m. Bentonite seats from 14.0-13.0, 7.0-6.0, 3.0-2.0m. Grout from 13.0-7.0m. 2 H2.2m. Finished with end caps and gas valves and steel cover.

Groundwater: Groundwater encountered at 3.0 and 9.0m, rising to 2.7 and 8.9mbgl after 20 minutes.

Other Observations: * Denotes driller's description

JOB NUMBERE3015/05

Logged By PE

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FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House; 63 Croydon Road, London. SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Borehole Number **BH103GC**

Sheet 2 of 2
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Cable Percussion**

Ground Level **39.36mOD**

Start Date 09/07/03
Finish Date 11/07/03

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
							10.00	D	
							11.00	D	
							12.00	D	
		26.76	12.60						
Stiff dark grey silty CLAY with some flints. (READING BEDS)							13.00	D	
		25.66	13.70						
Structured CHALK. Recovered as weak fine to coarse gravel and cobble size creamy white fragments of chalk with approximately 20% soft off-white silt matrix. (WHITE CHALK)				14.00 200mm			14.00	D	
							15.00	D	
							16.00	D	
							17.00	D	
				18.00 150mm			18.00	D	
		20.86	18.50						
Borehole completed at 18.50mbgl									

Remarks:

Chiselling: None undertaken.

Installation / Backfill: 50mm HDPE standpipes installed to 6.0 & 18.5m, slotted with geowrap from 3.0 & 14.5m respectively. Gravel filter from 18.5-14.5 and 6.0-3.0m. Bentonite seals from 14.0-13.0, 7.0-6.0, 3.0-2.0m. Grout from 13.0-7.0m, 2.0-0.2m. Finished with end caps and gas valves and steel cover.

Groundwater: Groundwater encountered at 3.0 and 9.0m, rising to 2.7 and 6.3mbgl after 20 minutes.

Other Observations: * Denotes driller's description

JOB NUMBERE3015/05

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FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London. SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Borehole Number **BH104GC**

Sheet 1 of 3
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Cable Percussion**

Ground Level **48.52mOD**

Start Date 07/07/03
Finish Date 09/07/03

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
TOPSOIL. * (FILL)		48.42	0.10				0.30	B	
Firm brown friable sandy clayey silt with occasional flint gravel. (MADE GROUND)							0.50	C	
		47.52	1.00						
Firm orange-brown sandy SILT / CLAY with pockets of orange sand. (LONDON CLAY)							1.20	D	35 blows
							1.20	U	
							1.50	B	
							1.70	D	
							2.00	D	
							2.20	S	N=25 (2,3,4,6,7,8)
. . . at 2.2mbgl, becomes stiff		46.02	2.50				2.50	B	
							2.65	D	
Medium dense yellow brown silty fine SAND. (LONDON CLAY)							3.20	S	N=25 (3,3,5,7,6,7,)
							3.65	D	
		44.52	4.00				4.00	D	50 blows
							4.00	U	
Stiff green grey and red mottled CLAY. (READING BEDS)							4.50	D	
							4.75	D	
. . . at 4.75m silty CLAY				5.00 250mm			5.00	S	N=27 (3,3,5,7,7,8)
. . . at 5.45m friable orange grey SILT.							5.45	D	
							6.00	D	
		41.62	6.90						
Stiff light grey sandy SILT. Sand is fine. (READING BEDS)							7.00	D	
							8.00	D	
. . . at 8.0m becomes light grey and orange clayey SILT.									
		39.52	9.00				9.00	D	
Brown fine SAND. (READING BEDS)									
. . . from 9.0 - 10.0m with pockets of soft grey silty CLAY.							10.00	D	

Remarks:

Chiselling: Chiselling from 23.10mbgl to 23.5mbgl for 30 minutes.

Installation / Backfill: 50mm HPDE standpipes installed to 30.0 & 4.0m, slotted with gravel filter and geowrap from 30.0-25.0 & 4.0-2.5m. Bentonite seals from 25.0-24.0, 5.0-4.0, 2.5-1.5m. Grout from 24.0-5.0m, 1.0-G/L. Finished with end caps and has valves and flush cover.

Groundwater: Groundwater encountered at 17.5mbgl, rising to 13.4mbgl after 20minutes.

Other Observations: * Denotes Driller's Description.

JOB NUMBERE3015/05

Logged By PE

Checked By

FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London. SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Borehole Number **BH104GC**

Sheet 2 of 3
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Cable Percussion**

Ground Level **48.52mOD**

Start Date 07/07/03
Finish Date 09/07/03

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
. . . at 13. m with occasional small pockets of soft grey silty CLAY.				12.00 200mm	13.40		10.00	D	
							11.00	D	
							12.00	D	
							13.00	D	
		34.82	13.70				13.75	D	
Stiff fissured blue grey and brown CLAY . (READING BEDS)									
							14.75	D	
							15.75	D	
. . . at 16.75m becomes hard.							16.75	D	
		31.02	17.50		17.50		17.50	D	
Brown/ grey fine SAND with occasional small pockets of soft silty clay. (READING BEDS)									
							18.50	D	
. . . at 19.5m becoming medium grained.							19.50	D	

Remarks:

Chiselling: Chiselling from 23.10mbgl to 23.5mbgl for 30 minutes.

Installation / Backfill: 50mm HPDE standpipes installed to 30.0 & 4.0m, slotted with gravel filter and geowrap from 30.0-25.0 & 4.0-2.5m. Bentonite seals from 25.0-24.0, 5.0-4.0, 2.5-1.5m. Grout from 24.0-5.0m, 1.0-G/L. Finished with end caps and gas valves and flush cover.

Groundwater: Groundwater encountered at 17.5mbgl, rising to 13.4mbgl after 20minutes.

Other Observations: * Denotes Driller's Description.

JOB NUMBERE3015/05

Logged By PE

Checked By

FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London. SE20 7TS
Tel: 020 8659 9959 Fax. 020 8676 9968

Borehole Number **BH104GC**

Sheet 3 of 3
1:50

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Cable Percussion**

Ground Level **48.52mOD**

Start Date **07/07/03**
Finish Date **09/07/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
							20.50	D	
							21.50	D	
							22.50	D	
		25.42	23.10				23.10	D	
Brown-grey fine sand with many flint cobbles. (READING BEDS)		25.02	23.50				23.50	D	
Firm to stiff dark brown silty CLAY. (READING BEDS)							24.00	D	
. . . at 24.0m becoming sandy clay with many grain size of olite shell fragments and occasional flint gravel.		24.02	24.50						
Structured CHALK. Recovered as grey-white gravel size weak fragments of chalk with some soft white silt matrix. (WHITE CHALK)				25.50 150mm			25.00	D	
							26.00	D	
. . . below 26.0m: with frequent tabular gravel and cobble size fragments. (Structured CHALK)							27.00	D	
							28.00	D	
							29.00	D	
Borehole completed at 30.00mbgl		18.52	30.00				30.00	D	

Remarks:

Chiselling: Chiselling from 23.10mbgl to 23.5mbgl for 30 minutes.

Installation / Backfill: 50mm HPDE standpipes installed to 30.0 & 4.0m, slotted with gravel filter and geowrap from 30.0-25.0 & 4.0-2.5m. Bentonite seals from 25.0-24.0, 5.0-4.0, 2.5-1.5m. Grout from 24.0-5.0m, 1.0-GL. Finished with end caps and gas valves and flush cover.

Groundwater: Groundwater encountered at 17.5mbgl, rising to 13.4mbgl after 20minutes.

Other Observations: * Denotes Driller's Description.

JOB NUMBERE3015/05

Logged By PE

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FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Trial Pit Number **TP.A**

Sheet 1 of 1
1:25

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Mechanical Backhoe Excavator**

Ground Level **39.30mOD**

Start Date **14/07/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Grass over loose light brown gravelly cobbly sandy topsoil with occasional metal and wood debris. Gravel and cobbles are fine to coarse flint, chalk and concrete fragments with occasional re-bar and occasional whole and half bricks. (MADE GROUND)						0.50	D	
		38.70	0.60					
Soft brown and grey gravelly silty sandy clay. Gravel is fine to coarse flint, occasional orange gravel size brick fragments and occasional glass fragments. (MADE GROUND)						1.15	D	
		37.80	1.50			1.50	D	
Soft dark brown gravelly peaty silty clay with organic odour. Possible Sewage Sludge. (c) (MADE GROUND)				2.10 ▼		2.00	D	
. . . at 2.1m, band of soft brown very gravelly sandy clay, wet.						2.10	D	
		37.00	2.30					
Trial Pit Completed at 2.30 mbgl								

Remarks:

Stability: Stable throughout.
Groundwater: Slow ingress of groundwater encountered at 2.1mbgl.

Installation Details: Backfilled with arisings

Other Observations:

Pit Dimensions:
Length: 1.80m
Width: 0.50m
Bearing:
of Long Side: degrees

JOB NUMBERE3015/05
Logged By PE
Checked By

FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Trial Pit Number **TP.B**

Sheet 1 of 1
1:25

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Mechanical Backhoe Excavator**

Ground Level **39.70mOD**

Start Date **14/07/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Grass over soft brown sandy clayey silt topsoil with some flint gravel and some half bricks, brick and ceramic pipe fragments and gravel, cobble and boulder size concrete fragments. (MADE GROUND)						0.50	D	
. . . at 0.4m, concrete boulder 1.2m long, 0.55m wide and 0.23m thick.								
. . . below 0.6m becomes silty clay.		38.70	1.00					
Very soft dark brown and grey peaty silty clay with some rootlets and decaying wood fragments. Organic odour. Possible Sewage Sludge. (c) (MADE GROUND)						1.10	D	
						1.60	D	
		37.90	1.80					
Firm green grey brown sandy silty clay with very occasional flint gravel and fragments of pottery and red brick. (MADE GROUND)		37.70	2.00			2.00	D	
Soft to firm green grey silty CLAY. (ALLUVIUM)		37.50	2.20	2.20 ▼		2.20	D	
Medium dense orange grey and cream medium dense clayey sandy GRAVEL. (RIVER TERRACE DEPOSITS)		37.40	2.30			2.30	B	
Trial Pit Completed at 2.30 mbgl								

Remarks:

Stability: Stable thoughout.
Groundwater: Rapid groundwateer ingress from base of pit at 2.2mbgl.

Installation Details: Backfilled with arisings.

Other Observations:

Pit Dimensions:
Length: 2.00m
Width: 0.50m
Bearing:
of Long Side: degrees

JOB NUMBERE3015/05
Logged By PE
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FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

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Trial Pit Number **TP.C**

Sheet 1 of 1
1:25

Project **Reading Gateway**	Client **Kennet Properties Ltd**
Method **Mechanical Backhoe Excavator**	Ground Level **40.50mOD**
	Start Date **15/07/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Loose brown gravelly silty sandy topsoil with abundant whole and half bricks and fragments of brick and concrete. (MADE GROUND)						0.50	D	
		39.70	0.80					
Soft dark brown silty peaty loamy clay with occasional flint gravel. Possible Sewage Sludge. (c)(MADE GROUND)						1.00	D	
. . . From 1.0-1.2m: With occasional fragments of porous rock, possibly filter bed material. (c)		39.00	1.50					
Soft friable slightly fibrous dark brown very peaty silty clay. Organic odour noted. Possible Sewage Sludge. (c) (MADE GROUND)						1.80	D	
						2.00	B	
		38.20	2.30					
Soft grey-brown silty slightly sandy CLAY. (ALLUVIUM)						2.90	D	
		36.90	3.60					
Soft greenish grey-brown very sandy CLAY. (ALLUVIUM)						3.85	D	
		36.50	4.00					
Soft grey brown silty slightly sandy CLAY. (ALLUVIUM)								
		36.20	4.30			4.30	D	
Trial Pit Completed at 4.30 mbgl								

Remarks:

Stability: Stable
Groundwater: No groundwater encountered

Installation Details: Backfilled with arisings to the surface

Other Observations:

Pit Dimensions:
Length: 2.20m
Width: 0.50m
Bearing:
of Long Side: degrees

JOB NUMBERE3015/05
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FIG. NO.

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Trial Pit Number **TP.D**

Sheet 1 of 1
1:25

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Mechanical Backhoe Excavator**

Ground Level **44.70mOD**

Start Date **14/07/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Grass over loose light brown silty sandy topsoil with much gravel of flint, occasional brick and very occasional plastic fragments. (MADE GROUND)						0.30	D	
. . . At 0.3m: Razor blade.		44.10	0.60					
Loose dark brown gravelly silty sand. Gravel is fragments of brick, concrete and tarmac with some cobble and boulder size fragments. Occasional plastic bags, razor blades, and pockets of sand and sandstone. (MADE GROUND)		43.70	1.00			0.90	D	
Soft dark brown slighlty silty gravelly clay with some (5-10%) refuse material comprising nylon bags, metal, plastic (junction box), plastic bags and occassional glass fragments. Some flint gravel and brick and concrete fragments. Organic odour noted. (MADE GROUND)						1.70	D	
. . . at 2.0m: With occasional concrete boulders with re-inforcing bar, and a piece of copper pipe with insulated copper wire inside. . . . at 2.1m: Piece of black rubber tubing 0.15m diameter, 0.7m long.								
. . . at 2.5m: Fragment of fibre board encountered. Asbestos test found no asbestos. (c)						2.50	D,B	
Trial Pit Completed at 3.00 mbgl		41.70	3.00			3.00	D	

Remarks:

Stability: Stable
Groundwater: No groundwater encountered

Installation Details: Backfilled with arisings.

Other Observations:

Pit Dimensions:
Length: 2.20m
Width: 0.50m
Bearing:
of Long Side: degrees

JOB NUMBERE3015/05
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FIG. NO.

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Trial Pit Number **TP.E**

Sheet 1 of 1
1:25

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Mechanical Backhoe Excavator**

Ground Level **39.20mOD**

Start Date **14/07/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Grass over hard brown very dry and friable sandy silt topsoil with some flint gravel and occasional brick and concrete fragments. (MADE GROUND)		38.80	0.40			0.30	D	
Firm orange-brown gravelly silty sandy clay. Gravel is fine to coarse flint with occasional chalk and concrete fragments. (MADE GROUND)		38.50	0.70			0.60	D	
Soft dark brown / black peaty silty clay. Possible Sewage Sludge. (c) (MADE GROUND)		38.25	0.95	1.05 ▼		0.80	D	
Loose brown orange and cream coarse sub-rounded and sub-angular gravel of flint mixed with some soft brown peaty clay. (MADE GROUND)		38.05	1.15			1.05	B	
Loose orange brown silty sand. Sand is fine and medium. (MADE GROUND)		37.40	1.80			1.35	B	
Soft green grey silty CLAY. (ALLUVIUM)						2.10	D	
. . . below 2.4m: Becomes green grey and brown mottled with pockets of soft grey silt.		36.30	2.90			2.80	B	
Loose orange-brown very gravelly slightly silty SAND. (VALLEY GRAVEL)		35.90	3.30			3.25	B	
Trial Pit Completed at 3.30 mbgl								

Remarks:

Stability: Some instability below 3.1m.
Groundwater: Slow groundwater ingress at 1.05m.

Installation Details: Backfilled with arisings.

Other Observations:

Pit Dimensions:
Length: 2.30m
Width: 0.50m
Bearing:
of Long Side: degrees

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FIG. NO.

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Trial Pit Number **TP.G**

Sheet 1 of 1
1:25

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Hand tools**

Ground Level **46.00mOD**

Start Date **14/07/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Grass over compacted brown silty sandy clay topsoil with occasional brick fragments and some flint gravel. (MADE GROUND)		45.80	0.20			0.10	D	
Soft to firm brown locally grey friable silty sandy clay with occasional flint gravel. (MADE GROUND)						0.50	D	
. . . at 0.5mbgl, 0.25m diameter plastic gas pipe encountered running approx E-W along southern edge of pit. Fine orange sand packed around pipe.						1.00	D	
Trial Pit Completed at 1.10 mbgl		44.90	1.10					

Remarks:

Stability: Stable.
Groundwater: No groundwater encountered

Installation Details: Backfilled with arisings.

Other Observations:

Pit Dimensions:
Length: 0.40m
Width: 0.40m
Bearing:
of Long Side: degrees

JOB NUMBERE3015/05
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FIG. NO.

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Trial Pit Number **TP.H**

Sheet 1 of 1
1:25

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Hand tools**

Ground Level **46.00mOD**

Start Date **11/07/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Grass over soft brown sandy silt topsoil with occasional rootlets and flint gravel. (TOPSOIL)		45.75	0.25			0.10	D	
Firm orange-brown slightly sandy silty clay with some half bricks and gravel size fragments of brick, concrete and chalk. (MADE GROUND) . . . at . 05mbgl, brick / cement cobble encountered						0.50	D	
Trial Pit Completed at 1.00 mbgl		45.00	1.00			1.00	D	

Remarks:

Stability: Dry and stable throughout
Groundwater: No groundwater encountered

Installation Details: Backfilled with arisings.

Other Observations: Excavation terminated at 1.0mbgl due to refusal on concrete obstruction

Pit Dimensions:
Length: 0.60m
Width: 0.40m
Bearing:
of Long Side: degrees

JOB NUMBERE3015/05
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FIG. NO.

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Trial Pit Number **TP.I**

Sheet 1 of 1
1:25

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Hand tools**

Ground Level **44.90mOD**

Start Date **11/07/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Loose brown sandy silty topsoil with rootlets and occasional flint gravel. (TOPSOIL)		44.80	0.10			0.10	D	
Firm orange-brown silty clay with occasional gravel of flint, chalk, concrete and asphalt. (MADE GROUND)						0.50	D	
. . . at 0.5mbgl: Asphalt cobble encountered.								
		43.90	1.00			1.00	D	
Trial Pit Completed at 1.00 mbgl								

Remarks:

Stability: Stable.
Groundwater: No groundwater encountered

Installation Details: Backfilled with arisings.

Other Observations:

Pit Dimensions:
Length: 0.55m
Width: 0.40m
Bearing:
of Long Side: degrees

JOB NUMBERE3015/05

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FIG. NO.

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Trial Pit Number **TP.J**

Sheet 1 of 1
1:25

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Hand tools**

Ground Level **46.50mOD**

Start Date 10/07/03

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Grass over firm brown very gravelly sandy silt topsoil. Gravel is fine to coarse flint with abundant gravel and cobble size fragments of brick and concrete. (MADE GROUND)						0.10	D	
						0.50	D	
		45.80	0.70					
Firm brown locally red and grey sandy silty clay with occasional flint gravel. (MADE GROUND)						1.00	D	
		45.30	1.20					
Trial Pit Completed at 1.20 mbgl								

Remarks:

Stability: Stable.
Groundwater: No groundwater encountered.

Installation Details: Backfilled with arisings.

Other Observations:

Pit Dimensions:
Length: 0.60m
Width: 0.50m
Bearing:
of Long Side: degrees

JOB NUMBERE3015/05
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FIG. NO.

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Trial Pit Number **TP.K**

Sheet 1 of 1
1:25

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Hand tools**

Ground Level **44.50mOD**

Start Date **11/07/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Grass over soft to firm brown sandy clayey silt topsoil with much gravel of flint, brick and chalk. (MADE GROUND)						0.10	D	
. . . from GL-0.2m: With occasional rootlets.						0.50	D	
		43.85	0.65					
Firm orange-brown silty clay with occasional gravel of flint and chalk fragments. (MADE GROUND)						1.00	D	
		43.45	1.05					
Trial Pit Completed at 1.05 mbgl								

Remarks:

Stability: Stable.
Groundwater: No groundwater encountered

Installation Details: Backfilled with arisings

Other Observations:

Pit Dimensions:
Length: 0.50m
Width: 0.50m
Bearing:
of Long Side: degrees

JOB NUMBERE3015/05

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FIG. NO.

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Trial Pit Number **TP.M**

Sheet 1 of 1
1:25

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Hand tools**

Ground Level **46.60mOD**

Start Date **10/07/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Firm brown sandy clayey silt topsoil. (TOPSOIL)		46.43	0.17					
Firm grey orange and brown silt / clay with occasional flint gravel and plastic and metal fragments. (MADE GROUND)		46.20	0.40			0.30	D	
Trial Pit Completed at 0.40 mbgl								

Remarks:

Stability: Stable.
Groundwater: No groundwater encountered

Installation Details: Backfilled with arisings to the surface

Other Observations: Refusal at 0.4m on concrete boulder or slab.

Pit Dimensions:
Length: 0.55m
Width: 0.40m
Bearing:
of Long Side: degrees

JOB NUMBERE3015/05
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FIG. NO.

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Trial Pit Number **TP.N**

Sheet 1 of 1
1:25

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Hand tools**

Ground Level **50.10mOD**

Start Date **10/07/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Firm brown silty sandy clay with occasional fine to coarse flint gravel and occasional brick and concrete fragments. (MADE GROUND)						0.10	D	
						0.50	D	
						1.00	D	
		49.05	1.05					
Trial Pit Completed at 1.05 mbgl								

Remarks:

Stability: Stable.
Groundwater: No groundwater encountered

Installation Details: Backfilled with arising to the surface

Other Observations:

Pit Dimensions:
Length: 0.50m
Width: 0.40m
Bearing:
of Long Side: degrees

JOB NUMBERE3015/05

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Checked By

FIG. NO.

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Trial Pit Number **TP.O**

Sheet 1 of 1
1:25

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Hand tools**

Ground Level **48.00mOD**

Start Date **11/07/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Grass over loose brown silty sand topsoil with occasional flint gravel and very occasional gravel size brick fragments. (MADE GROUND)		47.90	0.10			0.10	D	
Firm brown silty sandy clay with some flint gravel and some gravel size fragments of concrete and orange and grey brick. (MADE GROUND)						0.50	D	
						1.00	D	
		46.90	1.10					
Trial Pit Completed at 1.10 mbgl								

Remarks:

Stability: Stable.
Groundwater: No groundwater encountered

Installation Details: Backfilled with arisings.

Other Observations:

Pit Dimensions:
Length: 0.60m
Width: 0.50m
Bearing:
of Long Side: degrees

JOB NUMBERE3015/05
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FIG. NO.

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Trial Pit Number **TP.P**

Sheet 1 of 1
1:25

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Hand tools**

Ground Level **46.60mOD**

Start Date **10/07/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft to firm brown sandy clayey silt topsoil with some roots and rootlets and occasional flint gravel . (TOPSOIL)		46.35	0.25			0.10	D	
Firm orange-brown and grey mottled silty clay. (MADE GROUND)						0.50	D	
						1.00	D	
Trial Pit Completed at 1.10 mbgl		45.50	1.10					

Remarks:

Stability: Stable.
Groundwater: No groundwater encountered

Installation Details: Backfilled with arisings to the surface

Other Observations:

Pit Dimensions:
Length: 0.50m
Width: 0.50m
Bearing:
of Long Side: degrees

JOB NUMBERE3015/05
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FIG. NO.

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Trial Pit Number **TP.R**

Sheet 1 of 1
1:25

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Hand tools**

Ground Level **46.00mOD**

Start Date **10/07/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Firm brown slightly sandy silty clay with occasional gravel of flint and brick fragments. (TOP SOIL)		45.65	0.35			0.10	D	
Firm orange brown silty clay with occasional gravel and flint and brick fragments. (MADE GROUND)		44.90	1.10			0.50	D	
						1.00	D	
Trial Pit Completed at 1.10 mbgl								

Remarks:

Stability: Stable.
Groundwater: No groundwater encountered

Installation Details: Backfilled with arisings to surface

Other Observations:

Pit Dimensions:
Length: 0.50m
Width: 4.00m
Bearing:
of Long Side: degrees

JOB NUMBERE3015/05

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Checked By

FIG. NO.

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Trial Pit Number **TP.S**

Sheet 1 of 1
1:25

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Hand tools**

Ground Level **46.00mOD**

Start Date **10/07/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Firm orange-brown sandy clayey silt topsoil with occasional rootlets and plastic refuse. (MADE GROUND)						0.10	D	
		45.55	0.45					
Firm brown silty clay with occasional flint gravel. (MADE GROUND)						0.50	D	
		45.00	1.00			1.00	D	
Trial Pit Completed at 1.00 mbgl								

Remarks:

Stability: Stable.
Groundwater: No groundwater encountered

Installation Details: Backfilled with arisings to the surface

Other Observations:

Pit Dimensions:
Length: 0.40m
Width: 0.40m
Bearing:
of Long Side: degrees

JOB NUMBERE3015/05
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FIG. NO.

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Trial Pit Number **TP.U**

Sheet 1 of 1
1:25

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Hand tools**

Ground Level **39.40mOD**

Start Date **14/07/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Grass over compacted hard friable brown silty sandy clay. Topsoil with abundant flint gravel. (MADE GROUND)						0.10	D	
		38.85	0.55			0.50	D	
Firm brown and orange-brown locally red and grey mottled silty clay with some flint gravel and occasional red brick and chalk fragments. (MADE GROUND)								
		38.40	1.00			1.00	D	
Trial Pit Completed at 1.00 mbgl								

Remarks:

Stability: Stable.
Groundwater: No groundwater encountered

Installation Details: Backfilled with arisings.

Other Observations:

Pit Dimensions:
Length: 0.60m
Width: 0.50m
Bearing:
of Long Side: degrees

JOB NUMBERE3015/05
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FIG. NO.

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Trial Pit Number **TP.T**

Sheet 1 of 1

1:25

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Hand Tools**

Ground Level

Start Date **11/07/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Soft brown sandy silt TOPSOIL with occasional rootlets and occasional flint gravel. (MADE GROUND)			0.20			0.10	D	
Firm orange/brown very friable silty sandy clay with frequent fine to coarse flint gravel and some gravel sized fragments of orange brick, concrete and chalk. (MADE GROUND)						0.50	D	
						1.00	D	
Trial Pit Completed at 1.05 mbgl			1.05					

Remarks:

Stability: Remained stable throughout.

Groundwater: No groundwater encountered.

Installation Details: Backfilled with arisings.

Other Observations:

Pit Dimensions:

Length: 0.55m

Width: 0.40m

Bearing of Long Side: degrees

JOB NUMBER E3015/23

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FIG. NO.

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Trial Pit Number **TP.V**

Sheet 1 of 1
1:25

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Hand tools**

Ground Level **38.30mOD**

Start Date **14/07/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Firm brown silty sandy clay with occasional brick fragments and some rootlets and fine to medium flint gravel. (MADE GROUND)						0.10	D	
						0.50	D	
		37.70	0.60					
Soft grey and orange brown locally dark brown silty clay with occasional flint gravel. (MADE GROUND)						1.00	D	
		37.10	1.20					
Trial Pit Completed at 1.20 mbgl								

Remarks:

Stability: Stable.
Groundwater: No groundwater encountered

Installation Details: Backedfilled with arisings.

Other Observations:

Pit Dimensions:
Length: 0.60m
Width: 0.50m
Bearing:
of Long Side: degrees

JOB NUMBERE3015/05

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FIG. NO.

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Trial Pit Number **TP.W**

Sheet 1 of 1
1:25

Project **Reading Gateway**	Client **Kennet Properties Ltd**
Method **Mechanical Backhoe Excavator**	Ground Level **40.60mOD** Start Date **15/07/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Loose orange brown sandy gravel of whole, half and fragments of brick. (MADE GROUND)						0.70	D	
		39.80	0.80					
Soft greenish greyish brown silty clay with some gravel size fragments of brick, and rounded to sub-angular flint gravel. Occasional black peaty silt pockets with organic odour. Possible Sewage Sludge. (c)(MADE GROUND)						1.40	D	
		38.60	2.00					
Loose dark brown ashy, silty gravelly topsoily sand. Gravel is predominately flint with occasional slag / clinker fragments. Frequent pockets of brown peaty clay with organic odour. Possible Sewage Sludge. (c) (MADE GROUND)				2.40 ▼		2.10	B	
. . . from 2.4-2.6mbgl with much medium and coarse sub-angular and sub-rounded flint gravel. Wet at 2.4mbgl.		38.00	2.60					
Soft green grey brown very silty clay with occasional brick fragments. Occasional pockets of orange sandy silt. (MADE GROUND)						3.00	D	
		37.60	3.00					
Soft green grey silty CLAY with a little brown peaty silt and occasional flint gravel. (ALLUVIUM)				3.80 ▼				
		36.80	3.80			3.80	B	
Trial Pit Completed at 3.80 mbgl								

Remarks:

Stability: Remained stable throughout.
Groundwater: Damp below 2.4m. Slow groundwater ingress at 3.80mbgl.
Installation Details: Backfilled with arisings
Other Observations:

Pit Dimensions:
Length: 2.50m
Width: 0.60m
Bearing:
of Long Side: degrees

JOB NUMBERE3015/05
Logged By PE
Checked By

FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Trial Pit Number **TP.W1**

Sheet 1 of 1
1:25

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Mechanical Backhoe Excavator**

Ground Level **40.60mOD**

Start Date **15/07/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Grass over loose light brown sandy cobbley bouldery gravel of concrete with occasional brick fragments and re-inforcing bar. (MADE GROUND)		40.00	0.60					
Soft dark greenish greyish brown silty slightly sandy clay with some flint gravel. (MADE GROUND)		39.80	0.80					
Trial Pit Completed at 0.80 mbgl								

Remarks:

Stability: Remained stable throughout.
Groundwater: No groundwater encountered.

Installation Details: Backfilled with arisings

Other Observations: Trial pit terminated at 0.8mbgl due to encountering cables running N-S through pit. Re-excavated as TP. W.

Pit Dimensions:
Length: 2.00m
Width: 0.50m
Bearing:
of Long Side: degrees

JOB NUMBERE3015/05
Logged By PE
Checked By

FIG. NO.

White Young Green Environmental

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Trial Pit Number **TP.X**

Sheet 1 of 1
1:25

Project **Reading Gateway**

Client **Kennet Properties Ltd**

Method **Mechanical Backhoe Excavator**

Ground Level **41.00mOD**

Start Date **15/07/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test Depth (m)	Sample Test Type	Notes
Grass over soft sandy silt TOPSOIL with abundant rootlets and occasional flint gravel. (TOP SOIL)		40.90	0.10					
Loose pink brown sandy gravel of granite. (TYPE 1 - MADE GROUND)						0.30	D	
		40.40	0.60					
Soft brown and orange-brown silty slightly sandy clay. (MADE GROUND)						0.70	D	
		40.10	0.90					
Soft dark greenish greyish brown silty sandy clay with pockets of soft light grey and orange clay. Occasional pockets of black fibrous silty clay with an organic odour (Possible Sewage Sludge). Occasional ceramic fragments. (c) (MADE GROUND)						1.60	D	
. . . below 1.7mbgl becomes predominately dark grey with organic odour with pockets of soft light grey sandy silt. Occassional orange gravel size brick fragments.						2.20	B	
		38.50	2.50					
Grey concrete slab. (MADE GROUND)		38.35	2.65					
Soft to firm greenish brown silty clay. (MADE GROUND)		38.20	2.80					
Firm light grey and brown very silty CLAY. (ALLUVIUM)								
		37.80	3.20					
Loose to medium dense light grey silty SAND with occassional pockets of soft grey silty clay. (RIVER TERRACE DEPOSITS)						3.40	B	
		37.50	3.50					
Trial Pit Completed at 3.50 mbgl								

Remarks:

Stability: Stable throughout.
Groundwater: No groundwater encountered.

Installation Details: Backfilled with arisings.

Other Observations:

Pit Dimensions:
Length: 2.30m
Width: 0.50m
Bearing:
of Long Side: degrees

JOB NUMBERE3015/05
Logged By PE
Checked By

FIG. NO.

APPENDIX E2

CONTAMINATION RESULTS

WYGE 2003 - Schedule of Laboratory Contamination Testing

Determinant	Soil No.	Leachate No.	Groundwater No.
Arsenic	26	12	19
Boron	26	12	19
Cadmium	26	12	19
Chromium (Total)	26	12	19
Hexavalent Chromium	18	1	0
Copper	26	12	19
Lead	26	12	19
Mercury	26	12	19
Selenium	26	12	19
Nickel	26	12	19
Zinc	26	12	19
pH	26	12	19
Total Sulphate	26	12	19
Water Soluble Sulphate	2	0	0
Total Cyanide	26	11	19
Exchangeable Ammonium as N	26	12	19
Total Monohydric Phenols	26	12	19
Sulphide	26	12	19
Elemental Sulphur	26	0	0
PAH Screen	26	12	19
Speciated (US EPA) PAH's	26	12	19
PRO	26	12	19
DRO	26	12	19
Total Petroleum Hydrocarbons with RBCA Carbon Banding	10	0	0
Asbestos	1	0	0
Speciated Monohydric Phenols	26	12	19
Organic Matter	0	0	0
Faecal Coliforms	20	0	14
Faecal Streptococci	20	0	14
Alkalinity	0	12	0

WYGE 2003 - Schedule of Additional Laboratory-based Chemistry Testing

Determinant	Soil No.	Leachate No.	Groundwater No.
Chloride	0	1	14
Calcium	0	12	14
Iron	0	12	14
Magnesium	0	12	14
Manganese	0	12	14
Nitrate	0	12	14
Potassium	0	12	14
Sodium	0	12	14
Silicon	0	12	14

Date Sampled										
Lab Ref. No:		174355	174356	174357	174358	174678	174359	174360	174361	174362
Customer Ref. No.										
Sample Type										
Trial Pit / Borehole No.		TPA	TPB	TPC	TPD	TPD	TPD	TPE	TPG	TPI
Depth (m)		1.50	1.10	1.80	0.90	1.70	2.50	0.80	0.50	1.00
Hardstanding at Surface (Y/N)										
* pH	Value	7.7	7.8	7.5	9.2	7.4		7.0	8.0	7.8
* % Loss on Ignition	%									
* % Moisture	%									
* % Stones	%									
* Asbestos	%						<0.001			
*										
* PHENOLICS										
* Butyl Phenols	mg/kg									
* Catechol	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5	<0.5
* Cresols (sum)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5	<0.5
* Naphthols	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5	<0.5
* Phenol	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5	<0.5
* Resorcinol	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5	<0.5
* Trimethylphenol	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5	<0.5
* Xylenols & Ethylphenols	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5	<0.5
*										
* Total Phenols	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5	<0.5
*										
* US EPA PRIORITY PAH's										
* Acenaphthene	mg/kg	<0.5	<0.5	1.4	<0.5	<0.5		<0.5	<0.5	<0.5
* Acenaphthylene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5	<0.5
* Anthracene	mg/kg	<0.5	<0.5	1.3	<0.5	<0.5		<0.5	<0.5	<0.5
* Benzo(a)Anthracene	mg/kg	<0.5	<0.5	<0.5	0.6	<0.5		<0.5	<0.5	<0.5
* Benzo(a)pyrene	mg/kg	<0.5	<0.5	<0.5	0.7	<0.5		<0.5	<0.5	<0.5
Benzo(b)fluoranthene *1	mg/kg									
* Benzo(k)fluoranthene *1	mg/kg	<0.5	<0.5	<0.5	1.0	<0.5		<0.5	<0.5	<0.5
* Benzo(g,h,i)perylene	mg/kg	<0.5	<0.5	<0.5	0.7	<0.5		<0.5	<0.5	<0.5
* Chrysene	mg/kg	<0.5	<0.5	<0.5	0.6	<0.5		<0.5	<0.5	<0.5
Di-benzo(a,h)anthracene *2	mg/kg									
* Indeno(1,2,3-cd)pyrene *2	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5	<0.5
* Fluoranthene	mg/kg	<0.5	1.8	4.1	2.4	<0.5		<0.5	<0.5	<0.5
* Fluorene	mg/kg	<0.5	<0.5	1.8	<0.5	<0.5		<0.5	<0.5	<0.5
* Naphthalene	mg/kg	<0.5	1.0	1.4	<0.5	<0.5		<0.5	<0.5	<0.5
* Phenanthrene	mg/kg	<0.5	0.5	1.8	0.9	<0.5		<0.5	<0.5	<0.5
* Pyrene	mg/kg	<0.5	1.0	3.3	1.8	<0.5		<0.5	<0.5	<0.5
*										
* Total US EPA 16 PAH	mg/kg	<0.5	4.3	15.1	8.7	<0.5		<0.5	<0.5	<0.5
*										
* GENERAL INORGANICS										
* Total Cyanide	mg/kg	<1	<1	<1	<1	<1		2.8	<1	<1
* Sulphide	mg/kg	<2	<2	<2	2.3	<2		<2	<2	<2
* Sulphur (free)	mg/kg	150	470	2150	1370	20		700	30	20
* Total Sulphate	mg/kg	200	100	6100	300	300		4700	200	100
* Water Soluble Sulphate	mg/kg			496				280		
*										
* Exchangeable Ammonium	mg/kg	16.1	35.4	219.0	34.9	15.9		19.1	22.5	15.9

Date Sampled										
Lab Ref. No:		174355	174356	174357	174358	174678	174359	174360	174361	174362
Customer Ref. No.										
Sample Type										
Trial Pit / Borehole No.		TPA	TPB	TPC	TPD	TPD	TPD	TPE	TPG	TPI
Depth (m)		1.50	1.10	1.80	0.90	1.70	2.50	0.80	0.50	1.00
Hardstanding at Surface (Y/N)										
HEAVY METALS/METALLOIDS										
Arsenic	mg/kg	13.7	16.3	5.7	7.3	10.3		15.2	<5	7.6
Boron (Water Soluble)	mg/kg	2.1	2.4	9.5	0.5	1.1		14.9	<0.5	<0.5
Cadmium	mg/kg	1.5	2.3	14.9	1.6	2.9		68.4	<0.5	<0.5
Chromium (Total)	mg/kg	57	80	446	31	58		1432	13	18
Chromium (Hexavalent)	mg/kg	<2	<2	<2	<2	<2		<2		
Copper	mg/kg	65	101	704	50	443		879	13	26
Lead	mg/kg	147	141	200	60	114		473	14	50
Mercury	mg/kg	4.0	1.3	6.5	1.8	1.3		12.4	<0.5	<0.5
Nickel	mg/kg	26	43	105	15	22		271	6	10
Selenium	mg/kg	1.5	1.5	3.4	1.1	1.9		6.2	<0.5	0.5
Zinc	mg/kg	186	240	818	165	230		1927	29	62
TOTAL HYDROCARBONS										
Petroleum Range Organics (C_6-C_{10})	mg/kg	<5	<5	<5	<5	<5		<5	<5	<5
Diesel Range Organics (C_8-C_{28})	mg/kg	<5	<5	130	124	<5		66	<5	<5
Hydrocarbon Screen (GC-FID)	mg/kg									
CONCRETE										
Chloride BS1377 : Part 3 including preparation	mg/kg									
HAC (Rapid determination of High Alumina Ce	mg/kg									
Mix Proportions-Cement/Aggregate Ratio-BS1	mg/kg									
Faecal Coliforms	no / g	<10	<10	<10	<10	<10		<10	<10	<10
Faecal Streptococci	no / g	40	10	<10	20	<10		130	160	<10

*Insufficient sample for analysis

Notes

*1 Benzo(b)fluoranthene & Benzo(k)fluoranthene co-elute (reported as sum)

*2 Di-benzo(a,h)anthracene & Indeno(1,2,3-cd)pyrene co-elute (reported as sum)

Date Sampled										
Lab Ref. No:		174363	174364	174365	174366	174367	174368	174369	174370	174371
Customer Ref. No.										
Sample Type										
Trial Pit / Borehole No.		TPK	TPO	TPP	TPS	TPU	TPX	BH102GC	BH102GC	BH102GC
Depth (m)		1.00	0.50	1.00	1.00	1.40	1.60	5.45	13.45	15.45
Hardstanding at Surface (Y/N)										
• pH	Value	8.0	7.9	7.1	7.5	8.2	7.9	7.9	8.2	8.2
• % Loss on Ignition	%									
• % Moisture	%									
• % Stones	%									
• Asbestos	%									
•										
• PHENOLICS										
• Butyl Phenols	mg/kg									
• Catechol	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
• Cresols (sum)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
• Naphthols	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
• Phenol	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
• Resorcinol	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
• Trimethylphenol	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
• Xylenols & Ethylphenols	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
•										
• Total Phenols	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
•										
• US EPA PRIORITY PAH's										
• Acenaphthene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
• Acenaphthylene	mg/kg	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5
• Anthracene	mg/kg	<0.5	<0.5	<0.5	3.1	<0.5	<0.5	<0.5	<0.5	<0.5
• Benzo(a)Anthracene	mg/kg	<0.5	<0.5	<0.5	8.0	<0.5	<0.5	<0.5	<0.5	<0.5
• Benzo(a)pyrene	mg/kg	<0.5	<0.5	<0.5	7.3	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene *1	mg/kg									
• Benzo(k)fluoranthene *1	mg/kg	<0.5	<0.5	0.5	14.9	<0.5	<0.5	<0.5	<0.5	<0.5
• Benzo(g,h,i)perylene	mg/kg	<0.5	<0.5	<0.5	4.0	<0.5	<0.5	<0.5	<0.5	<0.5
• Chrysene	mg/kg	<0.5	<0.5	0.5	9.3	<0.5	<0.5	<0.5	<0.5	<0.5
Di-benzo(a,h)anthracene *2	mg/kg									
• Indeno(1,2,3-cd)pyrene *2	mg/kg	<0.5	<0.5	0.8	5.2	<0.5	<0.5	<0.5	<0.5	<0.5
• Fluoranthene	mg/kg	<0.5	<0.5	1.1	23.9	<0.5	<0.5	<0.5	<0.5	<0.5
• Fluorene	mg/kg	<0.5	<0.5	<0.5	0.9	<0.5	<0.5	<0.5	<0.5	<0.5
• Naphthalene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
• Phenanthrene	mg/kg	<0.5	<0.5	<0.5	9.4	<0.5	<0.5	<0.5	<0.5	<0.5
• Pyrene	mg/kg	<0.5	<0.5	0.8	20.5	<0.5	<0.5	<0.5	<0.5	<0.5
•										
• Total US EPA 16 PAH	mg/kg	<0.5	<0.5	3.7	107.2	<0.5	<0.5	<0.5	<0.5	<0.5
•										
• GENERAL INORGANICS										
• Total Cyanide	mg/kg	<1	<1	<1	<1	<1	1.9	<1	<1	<1
• Sulphide	mg/kg	<2	<2	<2	<2	<2	<2	<2	<2	<2
• Sulphur (free)	mg/kg	<20	<20	140	250	20	60	100	60	80
• Total Sulphate	mg/kg	100	300	200	1800	300	100	100	200	300
• Water Soluble Sulphate	mg/kg									
•										
• Exchangeable Ammonium	mg/kg	15.9	12.8	19.0	9.7	12.8	9.5	41.6	19.4	6.3

Date Sampled										
Lab Ref. No:		174363	174364	174365	174366	174367	174368	174369	174370	174371
Customer Ref. No.										
Sample Type										
Trial Pit / Borehole No.		TPK	TPO	TPP	TPS	TPU	TPX	BH102GC	BH102GC	BH102GC
Depth (m)		1.00	0.50	1.00	1.00	1.40	1.60	5.45	13.45	15.45
Hardstanding at Surface (Y/N)										
HEAVY METALS/METALLOIDS										
Arsenic	mg/kg	12.0	10.9	<5	13.3	11.4	12.2	10.9	5.6	<5
Boron (Water Soluble)	mg/kg	<0.5	<0.5	2.6	2.0	1.6	3.6	1.9	<0.5	<0.5
Cadmium	mg/kg	<0.5	0.5	2.6	0.7	1.4	4.5	<0.5	<0.5	0.9
Chromium (Total)	mg/kg	33	31	180	25	59	158	72	3	1
Chromium (Hexavalent)	mg/kg	<2	<2	<2	<2	<2	<2	<2		
Copper	mg/kg	26	24	311	74	63	138	48	22	3
Lead	mg/kg	32	25	126	180	106	269	31	<10	<10
Mercury	mg/kg	<0.5	<0.5	2.6	1.2	0.6	3.1	<0.5	<0.5	<0.5
Nickel	mg/kg	20	20	31	22	29	44	52	2	3
Selenium	mg/kg	1.3	0.6	1.7	0.7	1.2	1.3	1.2	<0.5	<0.5
Zinc	mg/kg	58	62	351	172	134	366	96	<10	45
TOTAL HYDROCARBONS										
Petroleum Range Organics (C_8-C_{10})	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5
Diesel Range Organics (C_{11}-C_{28})	mg/kg	<5	16	16	106	<5	28	<5	<5	<5
Hydrocarbon Screen (GC-FID)	mg/kg									
CONCRETE										
Chloride BS1377 : Part 3 including preparation	mg/kg									
HAC (Rapid determination of High Alumina Ce	mg/kg									
Mix Proportions-Cement/Aggregate Ratio-BS1	mg/kg									
Faecal Coliforms	no / g	<10	*	<10	<10	<10	<10	<10		
Faecal Streptococci	no / g	20	*	210	50	130	<10	90		

*Insufficient sample for analysis

Notes
*1 Benzo(b)fluo
*2 Di-benzo(a,h

Date Sampled										
Lab Ref. No:		175239	175240	175241	175242	174376	174377	175243	175244	174380
Customer Ref. No.										
Sample Type										
Trial Pit / Borehole No.		BH102R	BH102R	BH102R	BH103C	BH103C	BH103C	BH104C	BH104C	BH104C
Depth (m)		3.30	4.90	10.00	2.20-2.70	11.00	15.00	*1.70	**10.00	26.00
Hardstanding at Surface (Y/N)										
pH	Value	8.0	7.3	8.9	7.5	8.3	8.4	7.2	8.6	8.3
% Loss on Ignition	%									
% Moisture	%									
% Stones	%									
Asbestos	%									
PHENOLICS										
Butyl Phenols	mg/kg									
Catechol	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cresols (sum)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthols	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenol	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Resorcinol	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trimethylphenol	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylenols & Ethylphenols	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Phenols	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
US EPA PRIORITY PAH's										
Acenaphthene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)Anthracene	mg/kg	0.5	0.6	<0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	mg/kg	0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene *1	mg/kg									
Benzo(k)fluoranthene *1	mg/kg	1.9	1.1	<0.5	2.3	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	mg/kg	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	mg/kg	1.2	0.7	<0.5	1.5	<0.5	<0.5	<0.5	<0.5	<0.5
Di-benzo(a,h)anthracene *2	mg/kg									
Indeno(1,2,3-cd)pyrene *2	mg/kg	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	1.2	0.9	<0.5	1.3	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	mg/kg	0.9	0.8	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	<0.5
Total US EPA 16 PAH	mg/kg	8.3	4.1	<0.5	8.2	<0.5	<0.5	<0.5	<0.5	<0.5
GENERAL INORGANICS										
Total Cyanide	mg/kg	2.3	<1	<1	<1	<1	<1	<1	<1	<1
Sulphide	mg/kg	<2	<2	<2	<2	<2	<2	<2	3.1	<2
Sulphur (free)	mg/kg	80	90	20	60	110	<20	<20	<20	<20
Total Sulphate	mg/kg	100	<100	100	100	200	200	100	<100	100
Water Soluble Sulphate	mg/kg									
Exchangeable Ammonium	mg/kg	80.1	35.1	12.7	6.4	12.7	6.4	104.2	61.0	29.4

Date Sampled										
Lab Ref. No:		175239	175240	175241	175242	174376	174377	175243	175244	174380
Customer Ref. No.										
Sample Type										
Trial Pit / Borehole No.		BH102R	BH102R	BH102R	BH103C	BH103C	BH103C	BH104C	BH104C	BH104C
Depth (m)		3.30	4.90	10.00	2.20-2.70	11.00	15.00	*1.70	**10.00	26.00
Hardstanding at Surface (Y/N)										
HEAVY METALS/METALLOIDS										
Arsenic	mg/kg	13.8	10.0	<5	8.6	<5	<5	26.3	6.5	<5
Boron (Water Soluble)	mg/kg	4.9	2.1	1.0	3.4	<0.5	<0.5	0.9	0.7	0.8
Cadmium	mg/kg	12.2	0.6	<0.5	0.9	<0.5	0.6	0.6	<0.5	<0.5
Chromium (Total)	mg/kg	423	35	5	75	1	<1	53	48	2
Chromium (Hexavalent)	mg/kg	<2	<2		<2			<2	<2	
Copper	mg/kg	194	17	4	27	2	3	18	23	3
Lead	mg/kg	385	22	<10	35	<10	<10	21	24	<10
Mercury	mg/kg	5.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel	mg/kg	79	28	3	39	3	1	31	46	2
Selenium	mg/kg	3.0	0.8	0.9	4.7	0.6	<0.5	1.3	1.6	<0.5
Zinc	mg/kg	692	47	15	139	<10	17	85	77	15
TOTAL HYDROCARBONS										
Petroleum Range Organics (C_6-C_{10})	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5
Diesel Range Organics (C_8-C_{28})	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hydrocarbon Screen (GC-FID)	mg/kg									
CONCRETE										
Chloride BS1377 : Part 3 Including preparation	mg/kg									
HAC (Rapid determination of High Alumina Ce	mg/kg									
Mix Proportions-Cement/Aggregate Ratio-BS1	mg/kg									
Faecal Coliforms	no / g	<10	<10	<10	<10			<10	<10	
Faecal Streptococci	no / g	20	<10	<10	<10			<10	<10	

*Insufficient sample for analysis

Notes
*1 Benzo(b)fluo
*2 Di-benzo(a,h

ENVIRONMENTAL ANALYSIS LABORATORIES

15 Burgess Road, Ivyhouse Lane Industrial Estate, Hastings, East Sussex TN35 4NR
Tel: 01424 444433 Fax: 01424 442299 info@environmentalanalysis.com

ANALYTICAL REPORT No. R67347

Location: Reading Gateway - Eastern Site (Sewage Treatment Works)

Your Job No: E3015

Reporting Date: 8/12/03

CLIENT: White Young Green Environmental

Yeoman House, 63 Croydon Road
London, SE20 7TS

Soils

		TP/BH	TPA	TPB	TPC	TPD	TPD	TPX	BH102GC	BH102R	BH103C	BH104C
		Depth (m)	1.50	1.10	1.80	0.90	1.70	1.60	5.45	4.90	2.20-2.70	*1.70
		Our ref	174355	174356	174357	174358	174678	174368	174369	175240	175242	175243
Aromatic												
C_5 - C_7	(mg/kg) N		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
$>C_7$-C_8	(mg/kg) N		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
$>C_8$-C_{10}	(mg/kg) N		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
$>C_{10}$-C_{12}	(mg/kg) N		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
$>C_{12}$-C_{16}	(mg/kg) N		<5	<5	<5	13	<5	<5	<5	<5	<5	<5
$>C_{16}$-C_{21}	(mg/kg) N		<5	<5	14	10	<5	<5	<5	<5	<5	<5
$>C_{21}$-C_{35}	(mg/kg) N		<5	<5	38	<5	<5	<5	<5	<5	<5	<5
Aliphatic												
C_5 - C_6	(mg/kg) N		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
$>C_6$-C_8	(mg/kg) N		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
$>C_8$-C_{10}	(mg/kg) N		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
$>C_{10}$-C_{12}	(mg/kg) N		<5	<5	6	<5	<5	<5	<5	<5	<5	<5
$>C_{12}$-C_{16}	(mg/kg) N		<5	<5	7	19	<5	<5	<5	<5	<5	<5
$>C_{16}$-C_{21}	(mg/kg) N		<5	<5	23	<5	<5	7	<5	<5	<5	<5
$>C_{21}$-C_{34}	(mg/kg) N		<5	<5	11	<5	<5	9	<5	<5	<5	<5

Descriptions of methods available on request (V8)
Y - UKAS accredited test
N - Non accredited test
n/t = not tested

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Date Sampled									R68226
Lab Ref. No:		179575	179577	179578	179582	179581	179583	179584	AQC
Customer Ref. No.									Lab Std
Sample Type		Water	Water	Water	Water	Water	Water	Water	
Trial Pit / Borehole No.		BH3R	BH6R	BH6C	BH102G	BH102C	BH103G	BH104C	
pH	Value	7.4		10.6		7.1	9.4	7.3	7.7
PHENOLICS									
Catechol	ug/l	<0.5		<0.5		<0.5	3.6	<0.5	
Cresols (sum)	ug/l	<0.5		<0.5		<0.5	11.2	<0.5	
Naphthols	ug/l	<0.5		<0.5		<0.5	2.7	<0.5	
Phenol	ug/l	<0.5		<0.5		<0.5	69.0	<0.5	
Resorcinol	ug/l	<0.5		<0.5		<0.5	<0.5	<0.5	
Trimethylphenol	ug/l	<0.5		<0.5		<0.5	<0.5	<0.5	
Xylenols & Ethylphenols	ug/l	<0.5		<0.5		<0.5	<0.5	<0.5	
Total Phenols	ug/l	<0.5		<0.5		<0.5	86.5	<0.5	277.0
US EPA PRIORITY PAH's									
Acenaphthene	ug/l	<0.2		<0.2		<0.2	<0.2	<0.2	
Acenaphthylene	ug/l	<0.2		<0.2		<0.2	<0.2	<0.2	
Anthracene	ug/l	<0.2		<0.2		<0.2	<0.2	<0.2	
Benzo(a)Anthracene	ug/l	<0.2		<0.2		<0.2	<0.2	<0.2	
Benzo(a)pyrene	ug/l	<0.2		<0.2		<0.2	<0.2	<0.2	14.2
Benzo(b)fluoranthene *1	ug/l	<0.2		<0.2		<0.2	<0.2	<0.2	
Benzo(k)fluoranthene *1	ug/l	<0.2		<0.2		<0.2	<0.2	<0.2	
Benzo(g,h,i)perylene	ug/l	<0.2		<0.2		<0.2	<0.2	<0.2	
Chrysene	ug/l	<0.2		<0.2		<0.2	<0.2	<0.2	
Di-benzo(a,h)anthracene *2	ug/l	<0.2		<0.2		<0.2	<0.2	<0.2	
Indeno(1,2,3-cd)pyrene *2	ug/l	<0.2		<0.2		<0.2	<0.2	<0.2	
Fluoranthene	ug/l	<0.2		<0.2		<0.2	<0.2	<0.2	
Fluorene	ug/l	<0.2		<0.2		<0.2	<0.2	<0.2	
Naphthalene	ug/l	<0.2		<0.2		<0.2	<0.2	<0.2	11.5
Phenanthrene	ug/l	<0.2		<0.2		<0.2	<0.2	<0.2	
Pyrene	ug/l	<0.2		<0.2		<0.2	<0.2	<0.2	
Total US EPA 16 PAH	ug/l	<0.2		<0.2		<0.2	<0.2	<0.2	
GENERAL INORGANICS									
Total Cyanide	ug/l	<5		<5		<5	<5	<5	2337
Sulphide	ug/l	<100		233		113	127	<100	733
Sulphur (free)	ug/l								
Sulphate	ug/l	41423		22839		116555	64248	97767	99635
Exchangeable Ammonium	ug/l	2697		113		962	732	<100	100000
HEAVY METALS/METALLOIDS									
Arsenic	ug/l	<10		<10		<10	33	<10	57
Boron	ug/l	1034		<20		485	587	622	144
Cadmium	ug/l	<1		<1		<1	<1	<1	12
Chromium (Dissolved)	ug/l	<20		<20		<20	<20	<20	55
Copper	ug/l	<5		<5		<5	<5	<5	153
Germanium	ug/l								
Lead	ug/l	<20		<20		<20	<20	<20	35
Mercury	ug/l	<0.1		<0.1		<0.1	<0.1		7.2
Nickel	ug/l	<20		<20		<20	46	68	55
Selenium	ug/l	<10		<10		<10	<10	<10	36
Zinc	ug/l	<50		<50		<50	<50	<50	373
TOTAL HYDROCARBONS									
Petroleum Range Organics (C_6-C_{10})	ug/l	<20		<20		<20	<20	<20	
Diesel Range Organics (C_9-C_{28})	ug/l	<100		<100		<100	<100	<100	
Hydrocarbon Screen (GC-FID)	ug/l								

Date Sampled		31/07/03	31/07/03	31/07/03	01/08/03	01/08/03	31/07/03	31/07/03	01/08/03	01/08/03
Lab Ref. No:		175669	175670	175671	175672	175673	175674	175675	175676	175677
Customer Ref. No.										
Sample Type		Water	Water	Water	Water	Water	Water	Water	Water	Water
Trial Pit / Borehole No.		BH102G	BH102R	BH102C	BH103G	BH103C	BH104G	BH104C	BH3G	BH3R
* pH	Value	7.1	7.2	7.2	9.9	7.3	7.3	7.3	7.1	7.3
* TOC	mg/l									
* Suspended Solids	mg/l									
* Electrical Cond. (µS/cm)	µS/cm									
*										
* PHENOLICS										
* Butyl Phenols	ug/l									
* Catechol	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
* Cresols (sum)	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
* Naphthols	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
* Phenol	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
* Resorcinol	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
* Trimethylphenol	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
* Xylenols & Ethylphenols	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
*										
* Total Phenols	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
*										
* US EPA PRIORITY PAH's										
* Acenaphthene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
* Acenaphthylene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
* Anthracene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
* Benzo(a)Anthracene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
* Benzo(a)pyrene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
* Benzo(b)fluoranthene *1	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
* Benzo(k)fluoranthene *1	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
* Benzo(g,h,i)perylene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
* Chrysene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
* Di-benzo(a,h)anthracene *2	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
* Indeno(1,2,3-cd)pyrene *2	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
* Fluoranthene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
* Fluorene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
* Naphthalene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
* Phenanthrene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
* Pyrene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
*										
* Total US EPA 16 PAH	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
* GENERAL INORGANICS										
* Complex Cyanide	ug/l									
* Easily Liberatable Cyanide (free)	ug/l									
* Thiocyanate	ug/l									
* Total Cyanide	ug/l	<5	<5	8	7	<5	<5	<5	<5	<5
*										
* Sulphide	ug/l	<100	<100	387	<100	<100	<100	<100	<100	<100
* Sulphur (free)	ug/l									
* Sulphate	ug/l	80274	155984	169002	133387	65137	543609	120943	46381	51637
*										
* Chloride	ug/l	97665	129442	202907	170396	101850	72018	46961	81920	121564
* Phosphate	ug/l									
*										
* Exchangeable Ammonium	ug/l	6354	6933	9189	5170	3764	<100	7417	9485	11383
* Nitrate	ug/l	<5000	<5000	<5000	<5000	<5000	322559	19089	13903	<5000
* Nitrite	ug/l									

Date Sampled		31/07/03	31/07/03	31/07/03	01/08/03	01/08/03	31/07/03	31/07/03	01/08/03	01/08/03
Lab Ref. No:		175669	175670	175671	175672	175673	175674	175675	175676	175677
Customer Ref. No.										
Sample Type		Water	Water	Water	Water	Water	Water	Water	Water	Water
Trial Pit / Borehole No.		BH102G	BH102R	BH102C	BH103G	BH103C	BH104G	BH104C	BH3G	BH3R
HEAVY METALS/METALLOIDS										
Aluminium	ug/l									
Antimony	ug/l									
Arsenic	ug/l	<10	<10	<10	31	<10	<10	<10	<10	<10
Barium	ug/l									
Beryllium	ug/l									
Boron	ug/l	887	809	937	784	907	2067	1392	1252	918
Cadmium	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium (Dissolved)	ug/l	<20	<20	<20	<20	<20	<20	<20	<20	<20
Chromium (Hexavalent)	ug/l									
Cobalt	ug/l									
Copper	ug/l	<5	8	7	10	6	11	5	8	<5
Germanium	ug/l									
Lead	ug/l	<20	<20	<20	<20	<20	<20	<20	<20	<20
Mercury	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	ug/l									
Nickel	ug/l	<20	<20	<20	49	26	<20	52	<20	<20
Selenium	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
Vanadium	ug/l									
Zinc	ug/l	<50	<50	65	<50	<50	<50	<50	<50	<50
ESSENTIAL ELEMENTS										
Calcium	ug/l	126000	154000	137000	15000	127000	314000	104000	83300	96000
Iron	ug/l	3026	2520	577	654	486	1319	473	1103	465
Magnesium	ug/l	19900	22800	34000	272	26200	51200	17400	16200	14600
Manganese	ug/l	186	603	226	<10	261	<10	1826	1430	163
Potassium	ug/l	10900	14900	18000	9800	19800	14800	15200	18500	15200
Sodium	ug/l	96200	140000	161000	265000	76400	88100	46300	73200	99700
Silicon	ug/l	8153	6428	6833	7520	7919	9065	5031	8788	10484
MONOAROMATICS										
Benzene	ug/l									
Toluene	ug/l									
Ethylbenzene	ug/l									
Meta & Para Xylene	ug/l									
Ortho Xylene	ug/l									
Total Xylenes	ug/l									
TOTAL HYDROCARBONS										
Petroleum Range Organics (C_6-C_{10})	ug/l	<20	<20	<20	<20	<20	<20	<20	<20	<20
Diesel Range Organics (C_{10}-C_{28})	ug/l	<100	<100	<100	<100	<100	<100	<100	<100	<100
Hydrocarbon Screen (GC-FID)	ug/l									
Faecal Coliforms	no / g	>10000	6800	9	<10	410	<10	18	420	560
Faecal Streptococci	no / g	7300	1900	18	510	20	100	2100	100	2400

Notes

*1 Benzo(b)fluoranthene & Benzo(k)fluoranthene co-elute (reported as sum)

*2 Di-benzo(a,h)anthracene & Indeno(1,2,3-cd)pyrene co-elute (reported as sum)

Date Sampled		31/07/03	01/08/03	01/08/03	01/08/03	01/08/03	AQC
Lab Ref. No:		175678	175679	175680	175681	175682	Lab Standard
Customer Ref. No.							
Sample Type		Water	Water	Water	Water	Water	
Trial Pit / Borehole No.		BH4F	BH6R	BH6C	BH7G	BH7R	
* pH	Value	7.1	7.7	10.1	7.2	7.4	8.1
* TOC	mg/l						
* Suspended Solids	mg/l						
* Electrical Cond. (µS/cm)	µS/cm						
*							
* PHENOLICS							
* Butyl Phenols	ug/l						
* Catechol	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	
* Cresols (sum)	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	
* Naphthols	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	
* Phenol	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	
* Resorcinol	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	
* Trimethylphenol	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	
* Xylenols & Ethylphenols	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	
*							
* Total Phenols	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	267.0
*							
* US EPA PRIORITY PAH's							
* Acenaphthene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	
* Acenaphthylene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	
* Anthracene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	
* Benzo(a)Anthracene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	
* Benzo(a)pyrene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	15.9
* Benzo(b)fluoranthene *1	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	
* Benzo(k)fluoranthene *1	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	
* Benzo(g,h,i)perylene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	
* Chrysene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	
* Di-benzo(a,h)anthracene *2	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	
* Indeno(1,2,3-cd)pyrene *2	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	
* Fluoranthene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	
* Fluorene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	
* Naphthalene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	15.9
* Phenanthrene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	
* Pyrene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	
*							
* Total US EPA 16 PAH	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	
* GENERAL INORGANICS							
* Complex Cyanide	ug/l						
* Easily Liberatable Cyanide (free)	ug/l						
* Thiocyanate	ug/l						
* Total Cyanide	ug/l	8	<5	<5	<5	<5	2107
*							
* Sulphide	ug/l	<100	<100	<100	<100	<100	749
* Sulphur (free)	ug/l						
* Sulphate	ug/l	1080440	89128	24183	106574	53492	101599
*							
* Chloride	ug/l	34336	53625	60410	27282	33038	24664
* Phosphate	ug/l						
*							
* Exchangeable Ammonium	ug/l	<100	<100	761	<100	163	99600
* Nitrate	ug/l	265526	<5000	14916	20709	14668	51057
* Nitrite	ug/l						

Date Sampled		31/07/03	01/08/03	01/08/03	01/08/03	01/08/03	AQC
Lab Ref. No:		175678	175679	175680	175681	175682	Lab Standard
Customer Ref. No.							
Sample Type		Water	Water	Water	Water	Water	
Trial Pit / Borehole No.		BH4F	BH6R	BH6C	BH7G	BH7R	
HEAVY METALS/METALLOIDS							
Aluminium	ug/l						
Antimony	ug/l						
Arsenic	ug/l	<10	<10	<10	<10	<10	56
Barium	ug/l						
Beryllium	ug/l						
Boron	ug/l	3147	433	43	77	406	165
Cadmium	ug/l	<1	<1	<1	<1	<1	11
Chromium (Dissolved)	ug/l	<20	<20	<20	<20	<20	57
Chromium (Hexavalent)	ug/l						
Cobalt	ug/l						
Copper	ug/l	19	<5	8	<5	<5	142
Germanium	ug/l						
Lead	ug/l	<20	<20	<20	<20	<20	34
Mercury	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	6.1
Molybdenum	ug/l						
Nickel	ug/l	37	<20	<20	<20	<20	51
Selenium	ug/l	<10	<10	<10	<10	<10	38
Vanadium	ug/l						
Zinc	ug/l	<50	<50	<50	<50	<50	377
ESSENTIAL ELEMENTS							
Calcium	ug/l	485000	74500	3140	136000	74500	21900
Iron	ug/l	2008	353	184	540	282	
Magnesium	ug/l	47800	43500	757	11000	37400	2580
Manganese	ug/l	<10	1712	<10	30	13	
Potassium	ug/l	19100	17100	13200	2090	12600	1430
Sodium	ug/l	47000	49000	115000	21800	24600	12400
Silicon	ug/l	5448	7230	1634	7094	6779	271
MONOAROMATICS							
Benzene	ug/l						
Toluene	ug/l						
Ethylbenzene	ug/l						
Meta & Para Xylene	ug/l						
Ortho Xylene	ug/l						
Total Xylenes	ug/l						
TOTAL HYDROCARBONS							
Petroleum Range Organics (C_6-C_{10})	ug/l	<20	<20	<20	<20	<20	
Diesel Range Organics (C_{10}-C_{28})	ug/l	<100	<100	<100	<100	<100	
Hydrocarbon Screen (GC-FID)	ug/l						
Faecal Coliforms	no / g	9	430	27	<10	970	
Faecal Streptococci	no / g	610	>10000	>10000	240	280	

Notes
*1 Benzo(b)fluor
*2 Di-benzo(a,h)

Date Sampled								Insufficient Sample	
Lab Ref. No:		174355	174357	174678	174363	174364	174366		174368
Customer Ref. No.									
Sample Type		Leachate	Leachate	Leachate	Leachate	Leachate	Leachate	Leachate	Leachate
Trial Pit / Borehole No.		TPA	TPC	TPD	TPK	TPO	TPS	TPU	TPX
pH	Value	7.8	8.7	7.7	8.0	7.9	7.3		7.3
TOC	mg/l								
Electrical Cond. (µS/cm)	µS/cm								
PHENOLICS									
Butyl Phenols	ug/l								
Catechol	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5
Cresols (sum)	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5
Naphthols	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5
Phenol	ug/l	<0.5	<0.6	<0.5	<0.5	<0.5	<0.5		<0.5
Resorcinol	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5
Trimethylphenol	ug/l	<0.5	<0.6	<0.5	<0.5	<0.6	<0.5		<0.5
Xylenols & Ethylphenols	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5
Total Phenols	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5
US EPA PRIORITY PAH's									
Acenaphthene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Acenaphthylene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Anthracene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Benzo(a)Anthracene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Benzo(a)pyrene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Benzo(b)fluoranthene [*1]	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Benzo(k)fluoranthene [*1]	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Benzo(g,h,i)perylene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Chrysene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Di-benzo(a,h)anthracene [*2]	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Indeno(1,2,3-cd)pyrene [*2]	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Fluoranthene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Fluorene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Naphthalene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Phenanthrene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Pyrene	ug/l	<0.2	<0.2	3.6	<0.2	<0.2	<0.2		<0.2
Total US EPA 16 PAH	ug/l	<0.2	<0.2	3.6	<0.2	<0.2	<0.2		<0.2
GENERAL INORGANICS									
Complex Cyanide	ug/l								
Easily Liberatable Cyanide (free)	ug/l								
Thiocyanate	ug/l								
Total Cyanide	ug/l	8	<5		<5	<5	<5		<5
Sulphide	ug/l	<100	<100	<100	<100	<100	<100		<100
Sulphur (free)	ug/l								
Sulphate	ug/l	77186	251385	53195	37740	21109	118401		60952
Alkalinity	mg/l	51	61	61	71	51	61		56
Chloride	ug/l			6905					
Phosphate	ug/l								
Exchangeable Ammonium	ug/l	484	1013	<100	440	364	494		692
Nitrate	ug/l	22329	330782	48937	15135	28348	18446		36506
Nitrite	ug/l								

Date Sampled								Insufficient	
Lab Ref. No:		174355	174357	174878	174363	174364	174366	Sample	174368
Customer Ref. No.									
Sample Type		Leachate	Leachate	Leachate	Leachate	Leachate	Leachate	Leachate	Leachate
Trial Pit / Borehole No.		TPA	TPC	TPD	TPK	TPO	TPS	TPU	TPX
HEAVY METALS/METALLOIDS									
Arsenic	ug/l	<10	<10	<10	<10	<10	<10		10
Boron	ug/l	185	789	164	51	36	141		496
Cadmium	ug/l	<1	4	<1	<1	<1	<1		<1
Chromium (Dissolved)	ug/l	<20	<20	<20	<20	<20	<20		<20
Chromium (Hexavalent)	ug/l								
Copper	ug/l	24	41	28	11	8	12		24
Germanium	ug/l								
Lead	ug/l	<20	<20	<20	<20	<20	<20		<20
Mercury	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1
Nickel	ug/l	<20	57	<20	<20	<20	<20		<20
Selenium	ug/l	<10	<10	<10	<10	<10	<10		<10
Zinc	ug/l	<50	252	66	<50	<50	<50		<50
ESSENTIAL ELEMENTS									
Calcium	ug/l	162000	172000	40500	25000	20000	51500		46000
Iron	ug/l	235	757	544	304	156	257		273
Magnesium	ug/l	14500	13200	2460	1710	796	2340		2700
Manganese	ug/l	20	555	<10	<10	<10	<10		41
Potassium	ug/l	14500	13000	11000	6660	1200	4790		8260
Sodium	ug/l	11100	10100	5610	3310	863	8880		7480
Silicon	ug/l	4181	4181	2686	3224	3119	2652		2044
TOTAL HYDROCARBONS									
Petroleum Range Organics (C_6-C_{10})	ug/l	<20	<20	<20	<20	<20	<20		<20
Diesel Range Organics (C_9-C_{28})	ug/l	<100	<100	<100	<100	<100	<100		<100
Hydrocarbon Screen (GC-FID)	ug/l								

Notes

*1 Benzo(b)fluoranthene & Benzo(k)fluoranthene co-elute (reported as sum)

*2 Di-benzo(a,h)anthracene & Indeno(1,2,3-cd)pyrene co-elute (reported as sum)

Date Sampled			Insufficient					AQC
Lab Ref. No:		175239	Sample	175242	174376	175243	175244	Lab Standard
Customer Ref. No.								
Sample Type		Leachate	Leachate	Leachate	Leachate	Leachate	Leachate	
Trial Pit / Borehole No.		BH102R	BH102GC	BH103C	BH103C	BH104C	BH104C	
pH	Value	7.2		5.8	8.0	6.7	8.4	7.6
TOC	mg/l							
Electrical Cond. (µS/cm)	µS/cm							
PHENOLICS								
Butyl Phenols	ug/l							
Catechol	ug/l	<0.5		<0.5	<0.5	<0.5	<0.5	
Cresols (sum)	ug/l	<0.5		<0.5	<0.5	<0.5	<0.5	
Naphthols	ug/l	<0.5		<0.5	<0.5	<0.5	<0.5	
Phenol	ug/l	<0.5		<0.5	<0.5	<0.5	<0.5	
Resorcinol	ug/l	<0.5		<0.5	<0.5	<0.5	<0.5	
Trimethylphenol	ug/l	<0.5		<0.5	<0.5	<0.5	<0.5	
Xylenols & Ethylphenols	ug/l	<0.5		<0.5	<0.5	<0.5	<0.5	
Total Phenols	ug/l	<0.5		<0.5	<0.5	<0.5	<0.5	267.0
US EPA PRIORITY PAH's								
Acenaphthene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Acenaphthylene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Anthracene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Benzo(a)Anthracene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Benzo(a)pyrene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Benzo(b)fluoranthene [*1]	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Benzo(k)fluoranthene [*1]	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Benzo(g,h,i)perylene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Chrysene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Di-benzo(a,h)anthracene [*2]	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Indeno(1,2,3-cd)pyrene [*2]	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Fluoranthene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Fluorene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Naphthalene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Phenanthrene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Pyrene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Total US EPA 16 PAH	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
GENERAL INORGANICS								
Complex Cyanide	ug/l							
Easily Liberatable Cyanide (free)	ug/l							
Thiocyanate	ug/l							
Total Cyanide	ug/l	6		<5	<5	<5	<5	2083
Sulphide	ug/l	<100		<100	<100	<100	<100	749
Sulphur (free)	ug/l							
Sulphate	ug/l	58085		315745	31773	21921	25522	102025
Alkalinity	mg/l	41		<20	<20	<20	31	973
Chloride	ug/l							
Phosphate	ug/l							
Exchangeable Ammonium	ug/l	13341		1536	577	342	1159	100330
Nitrate	ug/l	35908		22750	23999	21949	31190	51694
Nitrite	ug/l							

Date Sampled			Insufficient					AQC
Lab Ref. No:		175239	Sample	175242	174376	175243	175244	Lab Standard
Customer Ref. No.								
Sample Type		Leachate	Leachate	Leachate	Leachate	Leachate	Leachate	
Trial Pit / Borehole No.		BH102R	BH102GC	BH103C	BH103C	BH104C	BH104C	
HEAVY METALS/METALLOIDS								
Arsenic	ug/l	36		<10	<10	<10	<10	56
Boron	ug/l	618		708	78	65	42	180
Cadmium	ug/l	2		<1	<1	<1	<1	11
Chromium (Dissolved)	ug/l	32		<20	<20	<20	<20	56
Chromium (Hexavalent)	ug/l	<20						
Copper	ug/l	124		10	7	11	7	141
Germanium	ug/l							
Lead	ug/l	25		<20	<20	<20	<20	35
Mercury	ug/l	0.5		<0.1	<0.1	<0.1	<0.1	6.9
Nickel	ug/l	74		<20	<20	<20	<20	50
Selenium	ug/l	<10		<10	10	<10	<10	40
Zinc	ug/l	98		<50	<50	<50	<50	401
ESSENTIAL ELEMENTS								
Calcium	ug/l	17200		83000	11400	5860	5820	22600
Iron	ug/l	439		423	142	410	104	196
Magnesium	ug/l	1040		5510	985	537	553	2640
Manganese	ug/l	18		852	<10	<10	<10	55
Potassium	ug/l	10800		18500	1490	2200	2920	1520
Sodium	ug/l	12600		12500	2930	1270	5860	12300
Silicon	ug/l	4487		6405	4302	2250	852	299
TOTAL HYDROCARBONS								
Petroleum Range Organics (C_6-C_{10})	ug/l	<20		<20	<20	<20	<20	
Diesel Range Organics (C_6-C_{28})	ug/l	<100		<100	<100	<100	<100	
Hydrocarbon Screen (GC-FID)	ug/l							

Notes

*1 Benzo(b)fluor

*2 Di-benzo(a,h)

Date Sampled								Insufficient Sample	
Lab Ref. No:		174355	174357	174678	174363	174364	174366		174368
Customer Ref. No.									
Sample Type		Leachate	Leachate	Leachate	Leachate	Leachate	Leachate	Leachate	Leachate
Trial Pit / Borehole No.		TPA	TPC	TPD	TPK	TPO	TPS	TPU	TPX
pH	Value	7.6	6.7	7.7	8.0	7.9	7.3		7.3
TOC	mg/l								
Electrical Cond. (µS/cm)	µS/cm								
PHENOLICS									
Butyl Phenols	ug/l								
Catechol	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5
Cresols (sum)	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5
Naphthols	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5
Phenol	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5
Resorcinol	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5
Trimethylphenol	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5
Xylenols & Ethylphenols	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5
Total Phenols	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5
US EPA PRIORITY PAH's									
Acenaphthene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Acenaphthylene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Anthracene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Benzo(a)Anthracene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Benzo(a)pyrene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Benzo(b)fluoranthene *1	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Benzo(k)fluoranthene *1	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Benzo(g,h,i)perylene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Chrysene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Di-benzo(a,h)anthracene *2	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Indeno(1,2,3-cd)pyrene *2	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Fluoranthene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Fluorene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Naphthalene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Phenanthrene	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2
Pyrene	ug/l	<0.2	<0.2	3.5	<0.2	<0.2	<0.2		<0.2
Total US EPA 16 PAH	ug/l	<0.2	<0.2	3.5	<0.2	<0.2	<0.2		<0.2
GENERAL INORGANICS									
Complex Cyanide	ug/l								
Easily Liberatable Cyanide (free)	ug/l								
Thiocyanate	ug/l								
Total Cyanide	ug/l	8	<5		<5	<5	<5		<5
Sulphide	ug/l	<100	<100	<100	<100	<100	<100		<100
Sulphur (free)	ug/l								
Sulphate	ug/l	77186	251385	53195	37740	21109	118401		80952
Alkalinity	mg/l	51	61	61	71	51	61		56
Chloride	ug/l			6905					
Phosphate	ug/l								
Exchangeable Ammonium	ug/l	484	1013	<100	440	364	494		692
Nitrate	ug/l	22329	330782	48937	15135	28348	18446		38506
Nitrite	ug/l								

Date Sampled								Insufficient	
Lab Ref. No:		174355	174357	174676	174363	174364	174366	Sample	174368
Customer Ref. No.									
Sample Type		Leachate	Leachate	Leachate	Leachate	Leachate	Leachate	Leachate	Leachate
Trial Pit / Borehole No.		TPA	TPC	TPD	TPK	TPO	TPS	TPU	TPX
HEAVY METALS/METALLOIDS									
Arsenic	ug/l	<10	<10	<10	<10	<10	<10		10
Boron	ug/l	185	789	184	51	36	141		496
Cadmium	ug/l	<1	4	<1	<1	<1	<1		<1
Chromium (Dissolved)	ug/l	<20	<20	<20	<20	<20	<20		<20
Chromium (Hexavalent)	ug/l								
Copper	ug/l	24	41	28	11	8	12		24
Germanium	ug/l								
Lead	ug/l	<20	<20	<20	<20	<20	<20		<20
Mercury	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1
Nickel	ug/l	<20	57	<20	<20	<20	<20		<20
Selenium	ug/l	<10	<10	<10	<10	<10	<10		<10
Zinc	ug/l	<50	252	86	<50	<50	<50		<50
ESSENTIAL ELEMENTS									
Calcium	ug/l	162000	172000	40500	25000	20000	61500		46000
Iron	ug/l	235	757	544	304	156	257		273
Magnesium	ug/l	14500	13200	2460	1710	796	2340		2700
Manganese	ug/l	20	555	<10	<10	<10	<10		41
Potassium	ug/l	14500	13000	11000	6660	1200	4790		8260
Sodium	ug/l	11100	10100	5610	3310	883	8880		7480
Silicon	ug/l	4181	4181	2686	3224	3119	2652		2044
TOTAL HYDROCARBONS									
Petroleum Range Organics (C_6-C_{10})	ug/l	<20	<20	<20	<20	<20	<20		<20
Diesel Range Organics (C_9-C_{28})	ug/l	<100	<100	<100	<100	<100	<100		<100
Hydrocarbon Screen (GC-FID)	ug/l								

Notes

*1 Benzo(b)fluoranthene & Benzo(k)fluoranthene co-elute (reported as sum)

*2 Di-benzo(a,h)anthracene & Indeno(1,2,3-cd)pyrene co-elute (reported as sum)

Date Sampled			Insufficient					AQC
Lab Ref. No:		175239	Sample	175242	174376	175243	175244	Lab Standard
Customer Ref. No.								
Sample Type		Leachate	Leachate	Leachate	Leachate	Leachate	Leachate	
Trial Pit / Borehole No.		BH102R	BH102GC	BH103C	BH103C	BH104C	BH104C	
pH	Value	7.2		6.8	8.0	6.7	8.4	7.6
TOC	mg/l							
Electrical Cond. (µS/cm)	µS/cm							
PHENOLICS								
Butyl Phenols	ug/l							
Catechol	ug/l	<0.5		<0.5	<0.5	<0.5	<0.5	
Cresols (sum)	ug/l	<0.5		<0.5	<0.5	<0.5	<0.5	
Naphthols	ug/l	<0.5		<0.5	<0.5	<0.5	<0.5	
Phenol	ug/l	<0.5		<0.5	<0.5	<0.5	<0.5	
Resorcinol	ug/l	<0.5		<0.5	<0.5	<0.5	<0.5	
Trimethylphenol	ug/l	<0.5		<0.5	<0.5	<0.5	<0.5	
Xylenols & Ethylphenols	ug/l	<0.5		<0.5	<0.5	<0.5	<0.5	
Total Phenols	ug/l	<0.5		<0.5	<0.5	<0.5	<0.5	267.0
US EPA PRIORITY PAH's								
Acenaphthene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Acenaphthylene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Anthracene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Benzo(a)Anthracene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Benzo(a)pyrene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Benzo(b)fluoranthene [*1]	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Benzo(k)fluoranthene [*1]	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Benzo(g,h,i)perylene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Chrysene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Di-benzo(a,h)anthracene [*2]	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Indeno(1,2,3-cd)pyrene [*2]	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Fluoranthene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Fluorene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Naphthalene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Phenanthrene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Pyrene	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
Total US EPA 16 PAH	ug/l	<0.2		<0.2	<0.2	<0.2	<0.2	
GENERAL INORGANICS								
Complex Cyanide	ug/l							
Easily Liberatable Cyanide (free)	ug/l							
Thiocyanate	ug/l							
Total Cyanide	ug/l	6		<5	<5	<5	<5	2083
Sulphide	ug/l	<100		<100	<100	<100	<100	749
Sulphur (free)	ug/l							
Sulphate	ug/l	58085		315745	31773	21921	25522	102025
Alkalinity	mg/l	41		<20	<20	<20	31	973
Chloride	ug/l							
Phosphate	ug/l							
Exchangeable Ammonium	ug/l	13341		1536	577	342	1159	100330
Nitrate	ug/l	35908		22750	23999	21949	31190	51694
Nitrite	ug/l							

Date Sampled			Insufficient				AQC
Lab Ref. No:		175239	Sample	175242	174376	175243	175244	Lab Standard
Customer Ref. No.								
Sample Type		Leachate	Leachate	Leachate	Leachate	Leachate	Leachate	
Trial Pit / Borehole No.		BH102R	BH102GC	BH103C	BH103C	BH104C	BH104C	
HEAVY METALS/METALLOIDS								
Arsenic	ug/l	36		<10	<10	<10	<10	56
Boron	ug/l	518		708	78	65	42	180
Cadmium	ug/l	2		<1	<1	<1	<1	11
Chromium (Dissolved)	ug/l	32		<20	<20	<20	<20	56
Chromium (Hexavalent)	ug/l	<20						
Copper	ug/l	124		10	7	11	7	141
Germanium	ug/l							
Lead	ug/l	25		<20	<20	<20	<20	35
Mercury	ug/l	0.5		<0.1	<0.1	<0.1	<0.1	6.9
Nickel	ug/l	74		<20	<20	<20	<20	50
Selenium	ug/l	<10		<10	10	<10	<10	40
Zinc	ug/l	98		<50	<50	<50	<50	401
ESSENTIAL ELEMENTS								
Calcium	ug/l	17200		83000	11400	5660	5820	22600
Iron	ug/l	439		423	142	410	104	196
Magnesium	ug/l	1040		5510	985	537	553	2640
Manganese	ug/l	18		652	<10	<10	<10	55
Potassium	ug/l	10800		18500	1490	2200	2920	1520
Sodium	ug/l	12600		12500	2930	1270	5860	12300
Silicon	ug/l	4487		8405	4302	2250	852	299
TOTAL HYDROCARBONS								
Petroleum Range Organics (C_6-C_{10})	ug/l	<20		<20	<20	<20	<20	
Diesel Range Organics (C_8-C_{28})	ug/l	<100		<100	<100	<100	<100	
Hydrocarbon Screen (GC-FID)	ug/l							

Notes
*1 Benzo(b)fluor
*2 Di-benzo(a,h)

White Young Green Environmental
LAND GAS AND GROUNDWATER MONITORING RESULTS

White Young Green Environmental

Site Name: Reading East. Sewage Treatment Works **Job No.:** E3015/03

Instruments Used: Ga2000 landgas analyser with flow pod, dual phase dip meter HNU DL101 PID. **Date Sampled:** 30/07/03

Monitoring Engineer: Phil Davies

Installation No.	CH_4 %	CO_2 %	O_2 %	VOC ppm	H_2S ppm	Atmos Pressure m bar	Flow High l/hr	Flow Low l/hr	Air Temp °C	BH Water Temp °C	GL mAOD	Water Depth m	Water Level mAOD	Base Depth m	Water Eh Value	Water pH Value	LNAPL Depth m	DNAPL Depth m	Time	Remarks
BH3G	0.0	1.6	19.1	0.6	-	1011	0.0	0.0	-	-	39.38	3.13	36.25	8.20	-	-	-	-	-	
BH3R	0.0	2.9	17.8	0.6	-	1011	0.0	0.0	-	-	39.27	3.12	36.15	12.90	-	-	-	-	-	
BH4F	0.0	1.2	19.4	0.7	-	1011	0.0	0.0	-	-	48.36	3.25	45.11	3.84	-	-	-	-	-	
BH6C	0.0	2.6	16.6	0.9	-	1010	-	-	-	-	47.85	13.64	34.21	>30	-	-	-	-	-	Freeventing, no cap or gas tap.
BH6R	0.0	0.1	20.5	0.9	-	1010	-	-	-	-	47.93	13.53	34.40	25.50	-	-	-	-	-	Freeventing, no cap or gas tap.
BH7G	0.0	0.0	21.0	0.8	-	1010	0.1	0.0	-	-	47.00	2.97	44.03	7.57	-	-	-	-	-	
BH7R	0.0	0.2	20.8	0.8	-	1010	0.0	0.0	-	-	47.04	12.74	34.30	18.53	-	-	-	-	-	
BH102C	19.7	0.0	4.9	0.8	-	1011	0.0	0.0	-	-	41.80	5.70	36.10	15.76	-	-	-	-	-	
BH102G	0.0	0.0	20.5	0.8	-	1011	0.0	0.0	-	-	41.80	5.62	36.18	8.00	-	-	-	-	-	
BH102R	0.0	0.0	20.7	0.7	-	1011	0.0	0.0	-	-	41.78	5.60	36.18	9.12	-	-	-	-	-	
BH103C	0.0	0.0	20.4	0.6	-	1011	0.0	0.0	-	-	39.36	3.32	36.04	17.27	-	-	-	-	-	
BH103G	0.0	0.0	20.8	0.7	-	1011	0.1	0.0	-	-	39.36	3.80	35.56	5.40	-	-	-	-	-	
BH104C	0.0	0.0	20.5	0.9	-	1011	0.5	0.0	-	-	48.52	13.24	35.28	>30	-	-	-	-	-	
BH104G	0.0	3.4	11.7	0.8	-	1011	0.1	0.0	-	-	48.52	3.27	45.25	4.10	-	-	-	-	-	
Maximum	19.7	3.4	21.0	0.9		1011.0	0.5	0.0				13.6		25.5						
Minimum	0.0	0.0	4.9	0.6		1010.0	0.0	0.0				3.0		3.8						
Average	1.4	0.9	18.2	0.8		1010.7	0.1	0.0				6.6		11.3						

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Background Gas Levels

	CH_4 %	CO_2 %	O_2 %	VOC ppm	Atmos mbar
Before Monitoring	0.0	0.0	21.0	0.7	1011
After Monitoring	0.0	0.0	21.0	0.7	1010

N/A = Measurement not available
ND = Not detected

Atmospheric Pressure Trend (at sea level)
1014 mbar (6am) rising to 1015mbar (12pm) steady to 1015mbar (6pm)
Weather eye, Pickering.
Atmospheric Pressures have not been altitude corrected

Calibration
External Calibration Details (see attached sheet)
Internal Calibration Details (see attached sheet)

White Young Green Environmental
LAND GAS AND GROUNDWATER MONITORING RESULTS

Site Name: Reading East. Sewage Treatment Works **Job No.:** E3015/03

Instruments Used: Ga94 landgas analyser with flow pod, dual phase dip meter, PID. **Date Sampled:** 15/09/03

Monitoring Engineer: Phil Davies

Installation No.	CH_4 %	CO_2 %	O_2 %	VOC ppm	H_2S ppm	Atmos Pressure m bar	Flow High l/hr	Flow Low l/hr	Air Temp °C	BH Water Temp °C	GL mAOD	Water Depth m	Water Level mAOD	Base Depth m	Water Eh Value	Water pH Value	LNAPL Depth m	DNAPL Depth m	Time	Remarks
BH3G	0.0	1.0	19.2	0.6	-	1024	0.0	0.0	-	-	39.38	3.20	36.18	8.20	-	-	-	-	15/09/03	
BH3R	0.0	3.0	18.0	0.6	-	1024	0.0	0.0	-	-	39.27	3.20	36.07	12.90	-	-	-	-	15/09/03	
BH4F	0.0	1.0	19.7	0.6	-	1024	0.0	0.0	-	-	48.36	3.27	45.09	3.84	-	-	-	-	15/09/03	
BH6C	0.0	2.5	17.3	0.6	-	1024	0.0	0.0	-	-	47.85	13.72	34.13	>30	-	-	-	-	15/09/03	
BH6R	0.0	0.0	20.7	0.7	-	1024	0.0	0.0	-	-	47.93	13.60	34.33	25.50	-	-	-	-	15/09/03	
BH7G	0.0	0.0	20.7	0.6	-	1024	0.1	0.0	-	-	47.00	3.33	43.67	7.57	-	-	-	-	15/09/03	
BH7R	0.0	0.0	20.7	0.7	-	1024	0.0	0.0	-	-	47.04	13.00	34.04	18.53	-	-	-	-	15/09/03	
BH102C	20.0	0.0	5.3	0.7	-	1024	0.0	0.0	-	-	41.80	6.00	35.80	15.76	-	-	-	-	15/09/03	
BH102G	0.0	0.0	20.7	0.7	-	1024	0.0	0.0	-	-	41.80	5.53	36.27	8.00	-	-	-	-	15/09/03	
BH102R	0.0	0.0	20.7	0.7	-	1024	0.0	0.0	-	-	41.78	5.55	36.23	9.12	-	-	-	-	15/09/03	
BH103C	0.0	0.0	20.7	0.6	-	1024	0.0	0.0	-	-	39.36	3.30	36.06	17.27	-	-	-	-	15/09/03	
BH103G	0.0	0.0	20.7	0.6	-	1024	0.1	0.0	-	-	39.36	3.87	35.49	5.40	-	-	-	-	15/09/03	
BH104C	0.0	0.0	20.6	0.6	-	1024	0.1	0.0	-	-	48.52	13.30	35.22	>30	-	-	-	-	15/09/03	
BH104G	0.0	3.3	11.0	0.6	-	1024	0.1	0.0	-	-	48.52	3.40	45.12	4.10	-	-	-	-	15/09/03	
Maximum	20.0	3.3	20.7	0.7		1024.0	0.1	0.0				13.7		25.5						
Minimum	0.0	0.0	5.3	0.6		1024.0	0.0	0.0				3.2		3.8						
Average	1.4	0.8	18.3	0.6		1024.0	0.0	0.0				6.7		11.3						

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Background Gas Levels

	CH_4 %	CO_2 %	O_2 %	VOC ppm	Atmos mbar
Before Monitoring	0.0	0.0	20.7	0.3	1024
After Monitoring	0.0	0.0	20.7	0.3	1024

N/A = Measurement not available
ND = Not detected

Atmospheric Pressure Trend (at sea level)

1027mbar (6am) falling to 1026mbar (12pm) falling to 1024mbar (6pm)
Weather eye, Pickering.
Atmospheric Pressures have not been altitude corrected

Calibration

External Calibration Details (see attached sheet)
Internal Calibration Details (see attached sheet)

White Young Green Environmental
LAND GAS AND GROUNDWATER MONITORING RESULTS

Site Name: Reading East. Sewage Treatment Works **Job No.:** E3015/03

Instruments Used: Ga94 landgas analyser with flow pod, dual phase dip meter, PID. **Date Sampled:** 13/10/03

Monitoring Engineer: Phil Davies

Installation No.	CH_4 %	CO_2 %	O_2 %	VOC ppm	H_2S ppm	Atmos Pressure m bar	Flow High l/hr	Flow Low l/hr	Air Temp °C	BH Water Temp °C	GL mAOD	Water Depth m	Water Level mAOD	Base Depth m	Water Eh Value	Water pH Value	LNAPL Depth m	DNAPL Depth m	Time	Remarks
BH3G	0.0	1.3	19.2	0.5	-	1010	0.0	0.0	-	-	39.38	3.10	36.28	8.20	-	-	-	-	13/10/03	
BH3R	0.0	3.2	18.0	0.5	-	1011	0.0	0.0	-	-	39.27	3.09	36.18	12.90	-	-	-	-	13/10/03	
BH4F	0.0	0.7	19.7	0.5	-	1011	0.0	0.0	-	-	48.36	3.22	45.14	3.84	-	-	-	-	13/10/03	
BH6C	0.0	2.7	17.3	0.6	-	1011	0.0	0.0	-	-	47.85	13.57	34.28	>30	-	-	-	-	13/10/03	
BH6R	0.0	0.0	20.8	0.6	-	1010	0.0	0.0	-	-	47.93	13.44	34.49	25.50	-	-	-	-	13/10/03	
BH7G	0.0	0.0	20.8	0.6	-	1010	0.0	0.0	-	-	47.00	2.90	44.10	7.57	-	-	-	-	13/10/03	
BH7R	0.0	0.0	20.8	0.5	-	1010	0.0	0.0	-	-	47.04	12.70	34.34	18.53	-	-	-	-	13/10/03	
BH102C	3.4	0.0	17.4	0.5	-	1010	0.0	0.0	-	-	41.80	5.66	36.14	15.76	-	-	-	-	13/10/03	Freeventing, no cap or gas tap.
BH102G	0.0	0.0	20.8	0.6	-	1010	0.0	0.0	-	-	41.80	5.57	36.23	8.00	-	-	-	-	13/10/03	
BH102R	0.0	0.0	20.8	0.5	-	1011	0.0	0.0	-	-	41.78	5.55	36.23	9.12	-	-	-	-	13/10/03	
BH103C	0.0	0.0	20.8	0.6	-	1011	0.0	0.0	-	-	39.36	3.30	36.06	17.27	-	-	-	-	13/10/03	
BH103G	0.0	0.0	20.8	0.5	-	1011	0.0	0.0	-	-	39.36	3.76	35.60	5.40	-	-	-	-	13/10/03	
BH104C	0.0	0.0	20.8	0.5	-	1010	0.0	0.0	-	-	48.52	13.22	35.30	>30	-	-	-	-	13/10/03	
BH104G	0.0	3.0	12.4	0.5	-	1010	0.0	0.0	-	-	48.52	3.24	45.28	4.10	-	-	-	-	13/10/03	
Maximum	3.4	3.2	20.8	0.6		1011.0	0.0	0.0				13.6		25.5						
Minimum	0.0	0.0	12.4	0.5		1010.0	0.0	0.0				2.9		3.8						
Average	0.2	0.8	19.3	0.5		1010.4	0.0	0.0				6.6		11.3						

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Background Gas Levels

	CH_4 %	CO_2 %	O_2 %	VOC ppm	Atmos mbar
Before Monitoring	0.0	0.0	20.7	0.3	1024
After Monitoring	0.0	0.0	20.7	0.3	1024

N/A = Measurement not available
ND = Not detected

Atmospheric Pressure Trend (at sea level)

xxxx mbar (6am) falling to xxxx mbar (12pm) falling to xxxx mbar (6pm)
Weather eye, Pickering.
Atmospheric Pressures have not been altitude corrected

Calibration

External Calibration Details (see attached sheet)
Internal Calibration Details (see attached sheet)

In Situ Chemistry Data

Project name: Reading Gateway, East Site
Project number: E3015/03
Date: 31 July and 1 August 2003

White Young Green

Date Sampled	Borehole	Redox	Dissolved Oxygen	pH	Temp 0C	Alkalinity (mg/l)	Fe (II) (mg/l)	Fe (III) (mg/l)	Total Fe (mg/l)
7/31/03	BH104G	185	3.54	6.6	20	486	1.21	1.41	2.62
7/31/03	BH104C	227	4.00	7.1	15.8	432	0	0.76	0.76
7/31/03	BH4F	236	4.65	6.7	23	358	0.29	1.51	1.8
7/31/03	BH102G	110	0.31	7.1	15.9	289	1.4	2.54	3.94
7/31/03	BH102C	-52	3.63	7.2	15.4	878	2.13	0.55	2.68
7/31/03	BH102R	-73	0.41	7.7	15	Sample too dark			
8/1/03	BH103G	49	0.16	8.8	15.7	Sample too dark			
8/1/03	BH103C	55	2.50	6.8	16.3	404	0	0.19	0.19
8/1/03	BH3R	-98	1.94	6.4	17	368	0.56	3.1	3.66
8/1/03	BH3G	-75	3.97	6.1	15.1	216	3.85	4.47	8.32
8/1/03	BH6C	5	6.19	7.9	13.6	438	0	0.23	0.23
8/1/03	BH6R	97	3.45	6.5	13.9	364	0.03	2.04	2.07
8/1/03	BH7G	115	3.22	5.7	15.1	402	0.37	1.75	2.12
8/1/03	BH7R	105	4.13	5.9	14.8	380	0	1.4	1.4

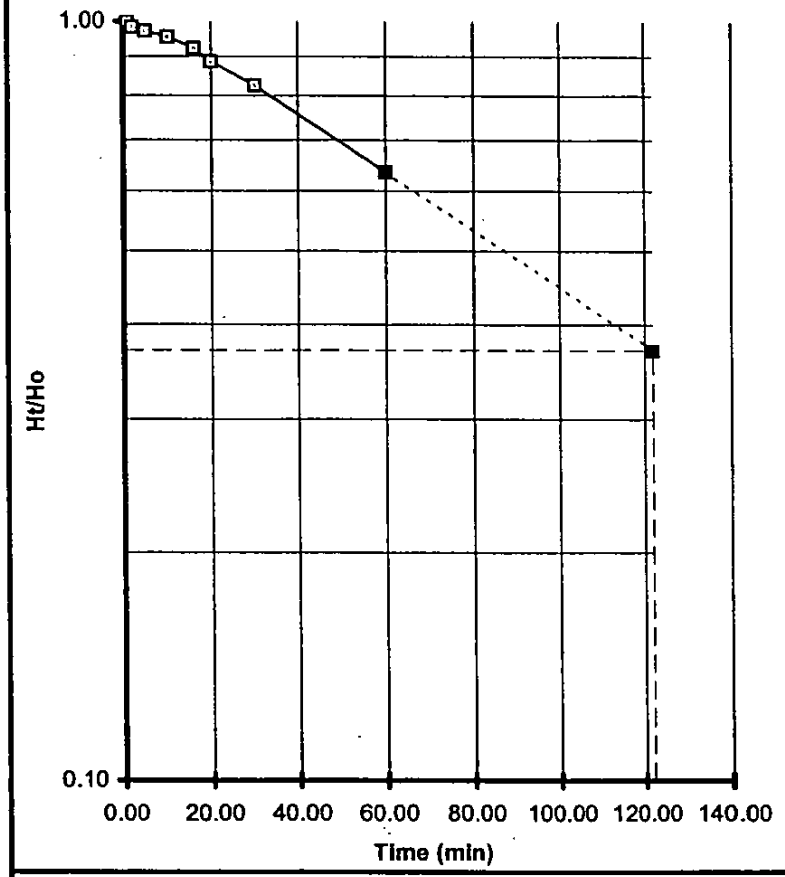
Variable Head Permeability Test Report Sheet

PROJECT No.:	E3015/03
PROJECT NAME:	Reading Gateway
CLIENT:	Kennet Properties
FIGURE No.:	BH104C(A)
Compiled By	PE
Date	29/07/03
Checked By	
Date	

TEST RESPONSE ZONE DETAILS:

Top (mbgl):	12.00
Bottom (mbgl):	12.50
Length (m):	0.50
Diameter (m):	0.200
Initial Standing Water Level (m below top of casing):	2.50
Height of casing or standpipe : above ground level (m)	0.50
Falling or Rising Head Test?	Falling

Elapsed Time (mins)	Depth to Water* (m)	Ht/Ho
1	0.03	1.00
2	0.07	0.98
5	0.1	0.97
10	0.14	0.96
16	0.22	0.92
20	0.31	0.89
30	0.46	0.83
60	0.93	0.64



Cross Sectional Area of Test Zone	A=	0.03142
Shape Factor (Case D)	F=	1.90720
Time to reach Ht/Ho = 0.37 (sec)	T=	7319
Permeability (m/s) Based on interpolation of data	K=	2.25E-06

WHITE YOUNG GREEN ENVIRONMENTAL

White Young Green Environmental

Yeoman House
63 Croydon Road
London SE20 7TS
Tel. 0181 6599959
Fax. 0181 6769968

Comments

* Depth to water below top of casing/standpipe

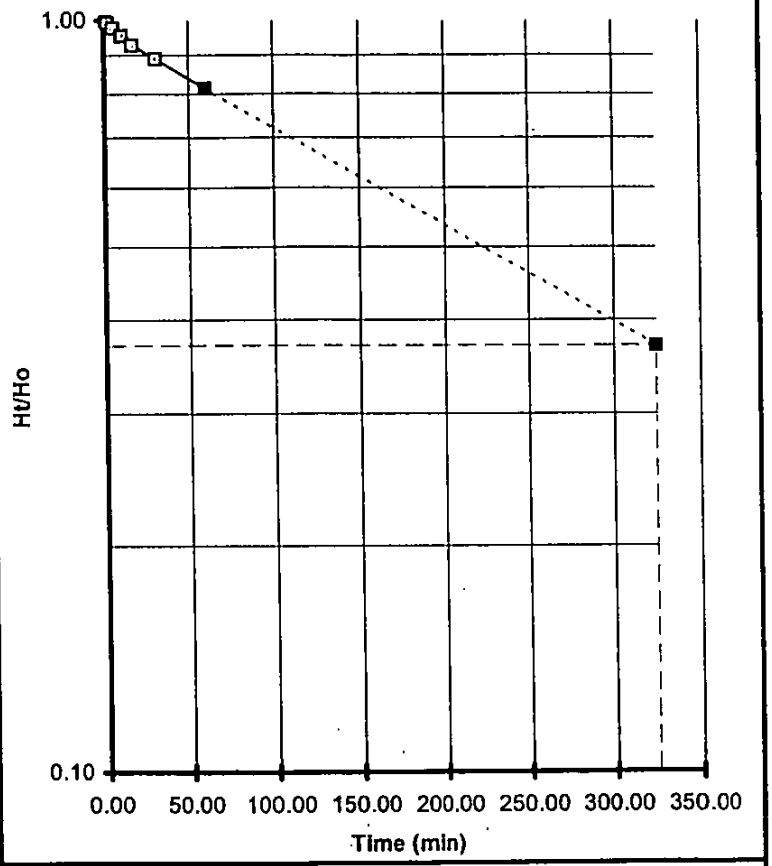
Variable Head Permeability Test Report Sheet

PROJECT No.:	E3015/03
PROJECT NAME:	Reading Gateway
CLIENT:	Kennet Properties
FIGURE No.:	BH102GC
Compiled By	PE
Date	29/07/03
Checked By	
Date	

TEST RESPONSE ZONE DETAILS:

Top (mbgl):	16.50
Bottom (mbgl):	17.00
Length (m):	0.50
Diameter (m):	0.150
Initial Standing Water Level (m below top of casing):	8.30
Height of casing or standpipe : above ground level (m)	0.50
Falling or Rising Head Test?	Falling

Elapsed Time (mins)	Depth to Water* (m)	Ht/Ho
1	0.04	1.00
2	0.09	0.99
5	0.22	0.98
10	0.41	0.96
16	0.63	0.93
30	0.94	0.89
60	1.57	0.81



Cross Sectional Area of Test Zone	A=	0.01767
Shape Factor (Case D)	F=	1.637.19
Time to reach Ht/Ho = 0.37 (sec)	T=	19479
Permeability (m/s) Based on interpolation of data	K=	5.54E-07

WHITE YOUNG GREEN ENVIRONMENTAL

White Young Green Environmental

Yeoman House
63 Croydon Road
London SE20 7TS
Tel. 0181 6599959
Fax. 0181 6769968

Comments

* Depth to water below top of casing/standpipe

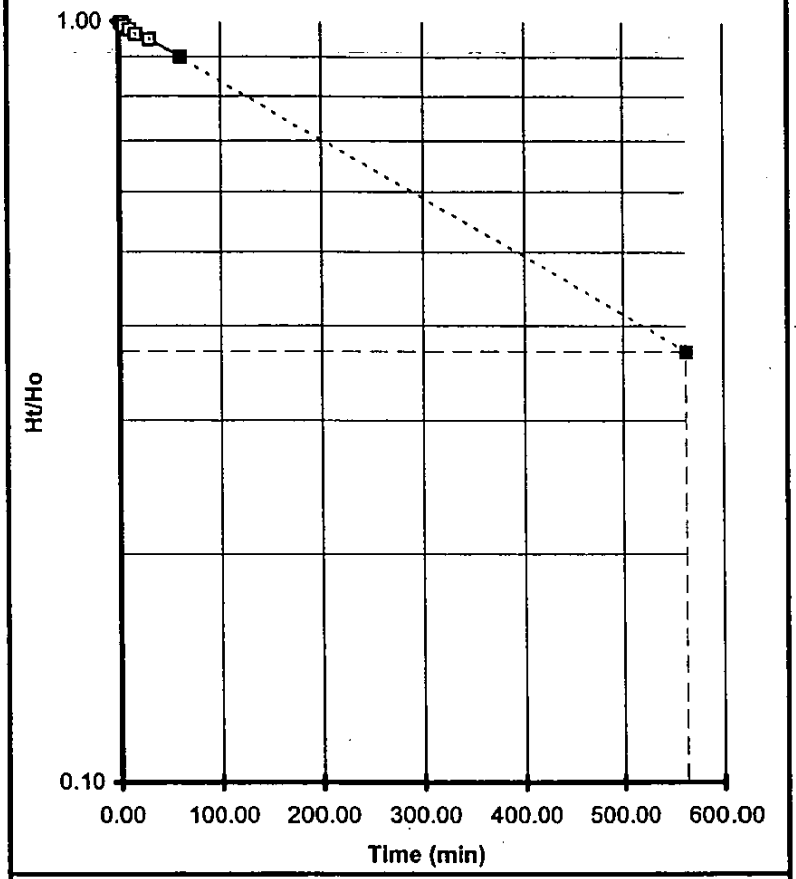
Variable Head Permeability Test Report Sheet

PROJECT No.:	E3015/03
PROJECT NAME:	Reading Gateway
CLIENT:	Kennet Properties
FIGURE No.:	BH104C
Compiled By	PE
Date	29/07/03
Checked By	
Date	

Elapsed Time (mins)	Depth to Water* (m)	Ht/Ho
1	0.03	1.00
2	0.07	1.00
5	0.2	0.99
10	0.33	0.98
16	0.51	0.96
30	0.7	0.95
60	1.35	0.90

TEST RESPONSE ZONE DETAILS:

Top (mbgl):	26.00
Bottom (mbgl):	27.00
Length (m):	1.00
Diameter (m):	0.200
Initial Standing Water Level (m below top of casing):	13.30
Height of casing or standpipe : above ground level (m)	1.00
Falling or Rising Head Test?	Falling



Cross Sectional Area of Test Zone	A=	0.03142
Shape Factor (Case D)	F=	2.71713
Time to reach Ht/Ho = 0.37 (sec)	T=	33828
Permeability (m/s) Based on interpolation of data	K=	3.42E-07

WHITE YOUNG GREEN ENVIRONMENTAL

White Young Green Environmental

Yeoman House
63 Croydon Road
London SE20 7TS
Tel. 0181 6599959
Fax. 0181 6769968

Comments

* Depth to water below top of casing/standpipe

APPENDIX E3

GEOTECHNICAL RESULTS

SUMMARY OF SOIL CLASSIFICATION TESTS

(B.S. 1377 : PART 2 : 1990)

Borehole 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
102GC		3.65	194				319	156	163	100	Extremely high plasticity CE.
102GC		4.75	103				163	63	100	100	Extremely high plasticity CE.
102GC		9.50	23				55	20	35	100	High plasticity CH.
103GC		2.70	37				49	16	33	100	Intermediate plasticity CI.
104GC		1.20	23				44	19	25	100	Intermediate plasticity CI.
104GC		8.00	12				31	14	17	100	Low plasticity CL.
104GC		14.75	22				74	25	49	100	Very high plasticity CV.

SYMBOLS : NP : Non Plastic

* : Liquid Limit and Plastic Limit Wet Sieved.

THYSSEN GEOTECHNICAL

Compiled by	Date	Checked by	Date	Approved by	Date
	29/8/03		20/8/03		20/8/03

READING GATEWAY - EAST.

Contract No NL231217

Client Ref: E3015/03

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
C		2.90	38				56	22	34	95	High plasticity CH.
C		3.65	18				32	14	18	90	Low plasticity CL.
E		2.10	59				119	33	86	100	Extremely high plasticity CE.
W		3.80	84				135	49	86	100	Extremely high plasticity CE.

SYMBOLS : NP : Non Plastic

* : Liquid Limit and Plastic Limit Wet Sieved.

THYSSEN GEOTECHNICAL

Compiled by	Date	Checked by	Date	Approved by	Date
	20/8/08		20/8/07		20/8/07

READING GATEWAY - EAST.

Contract No NL231217

Client Ref: E3015/03

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Trial Pit Number	Sample Number	Depth m	Description of Sample
C		2.90	Brown slightly gravelly slightly sandy silty CLAY.
C		3.65	Greyish brown very sandy silty CLAY.
E		2.10	Brown mottled grey silty organic CLAY.
W		3.80	Brown mottled grey silty organic CLAY.

THYSSEN GEOTECHNICAL

Compiled by	Date	Checked by	Date	Approved by	Date
	20/8/03		20/8/03		20/8/03

READING GATEWAY - EAST.

Contract No NL231217

Client Ref: E3015/03

South Kirkby, Pontefract, WF9 3AP.

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Borehole Number	Sample Number	Depth m	Description of Sample
102GC		3.65	Brown fibrous PEAT.
102GC		4.75	Brown silty organic CLAY.
102GC		7.25	Brown very sandy slightly silty GRAVEL.
102GC		9.50	Greyish brown silty CLAY.
102GC		10.00	Grey slightly gravelly very silty SAND.
103GC		2.70	Brown sandy silty CLAY.
103GC		4.50	Brown very sandy slightly silty GRAVEL.
104GC		1.20	Firm pale brown slightly sandy very silty CLAY.
104GC		4.00	Stiff pale brown mottled grey slightly sandy very silty CLAY.
104GC		8.00	Pale brown very sandy silty CLAY.
104GC		14.75	Brownish grey silty CLAY.

THYSSEN GEOTECHNICAL

Compiled by	Date	Checked by	Date	Approved by	Date
[signature]	29/8/03	[signature]	29/8/03	[signature]	29/8/03

READING GATEWAY - EAST.

Contract No NL231217

Client Ref: E3015/03

READING GATEWAY - EAST

Summary of Chemical Analyses
BS 1377 : Part 3 : 1990

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Test 3 Organic Content % Dry mass	Test 4 Loss on Ignition % Dry mass	Sulphate Content Soil SO_3 (SO_4) % Dry mass	Test 5.5 Sulphate Content 2:1 Water:Soil extract SO_3 (SO_4) g/l	Sulphate Content Groundwater SO_3 (SO_4) g/l	Test 6.3 Carbonate Content (as CO_2) % Dry mass	Test 7.2/7.3 Chloride Content (as Cl) Soil % Dry mass	Chloride Content (as Cl) Groundwater g/l	Test 9 pH Value	! pH Value
BH 102GC	3.65		D	09338/1				0.28 (0.34)					6.4	
BH 102GC	7.25		B	09338/2				0.50 (0.60)					7.1	
BH 102GC	9.50		D	09338/3				0.25 (0.30)					7.5	
BH 103GC	4.50		B	09338/4				0.12 (0.14)					7.3	
BH 104GC	1.20		U	09338/5				0.14 (0.17)					7.6	
BH 104GC	8.00		D	09338/6				0.33 (0.40)					8.4	
BH 104GC	14.75		D	09338/7				0.44 (0.53)					8.5	

Approved By:
Date: 19/8/09

Client Reference: NL231217
Laboratory Reference: 09338

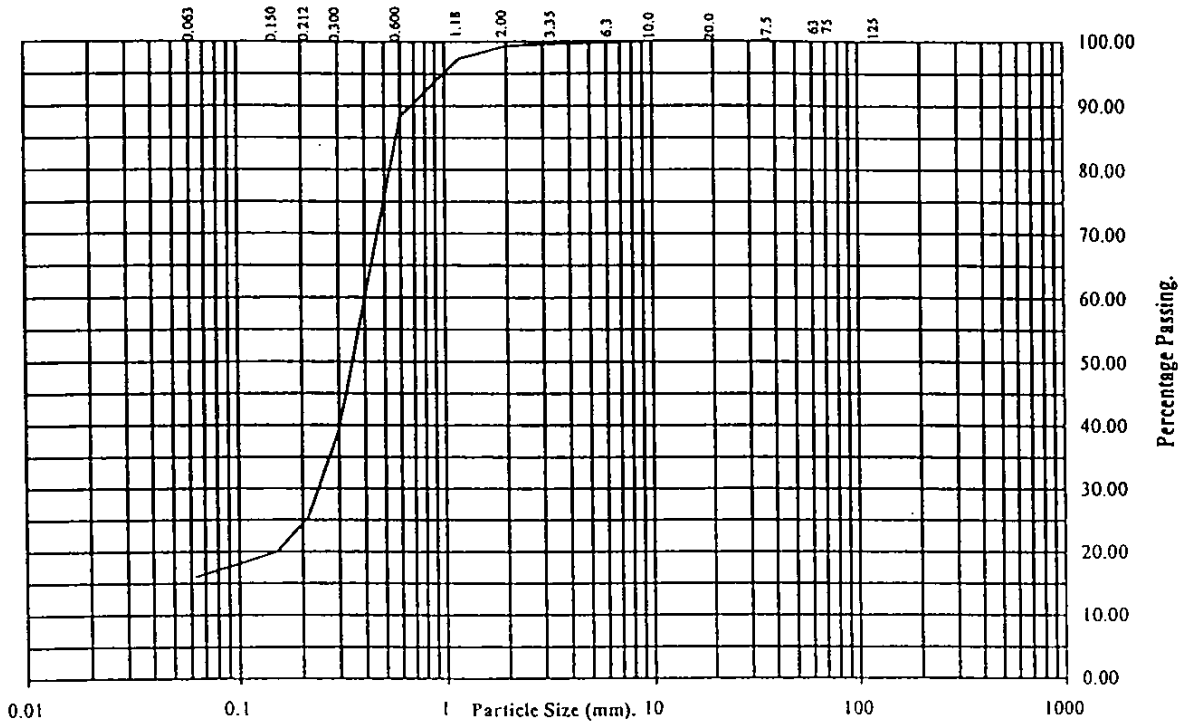
DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Borehole/Sample Number: 102GC **Depth (m):** 10.00



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	99
1.18	97
0.6	88
0.3	39
0.212	25
0.15	20
0.063	16

Soil Fraction	Total Percentage
Cobbles	0
Gravel	1
Sand	83
Silt/Clay	16

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
[signature]	19/8/07	[signature]	19/8/07

THYSSEN GEOTECHNICAL

READING GATEWAY - EAST.

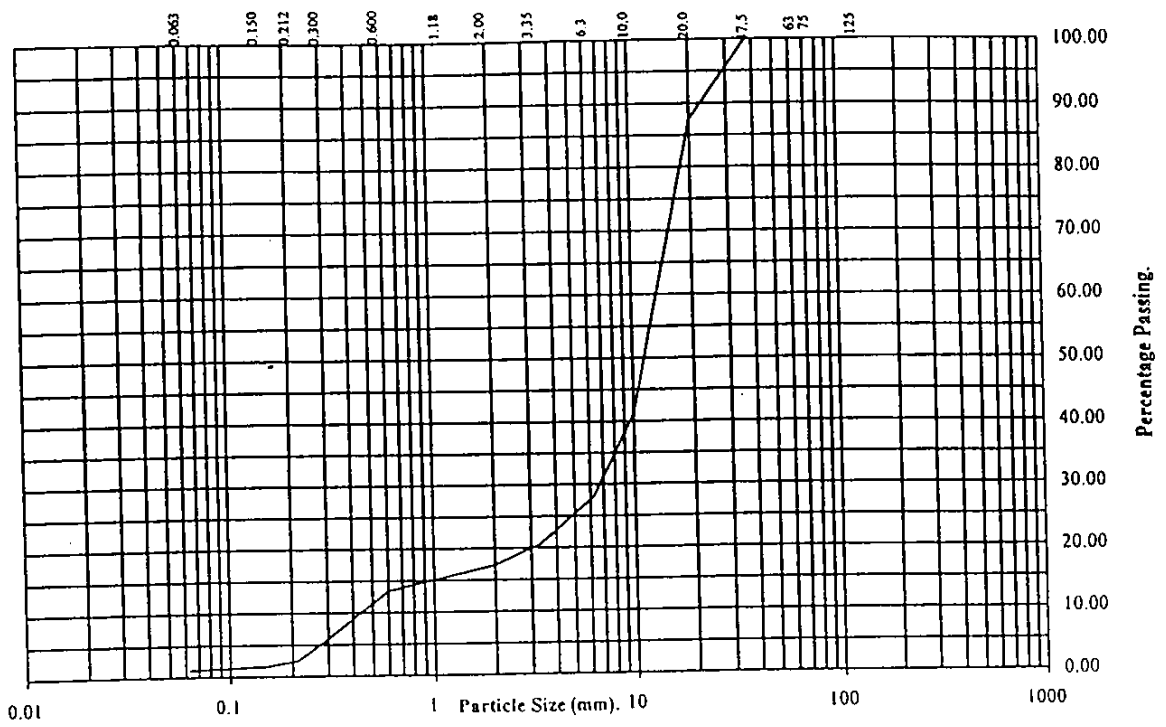
Contract No.: NL231217

PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Borehole/Sample Number: 103GC **Depth (m):** 4.50



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	87
10	41
6.3	28
3.35	21
2	17
1.18	16
0.6	13
0.3	6
0.212	2
0.15	2
0.063	1

Soil Fraction	Total Percentage
Cobbles	0
Gravel	83
Sand	16
Silt/Clay	1

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
	19/8/03		19/8/03.

THYSSEN GEOTECHNICAL

READING GATEWAY - EAST.

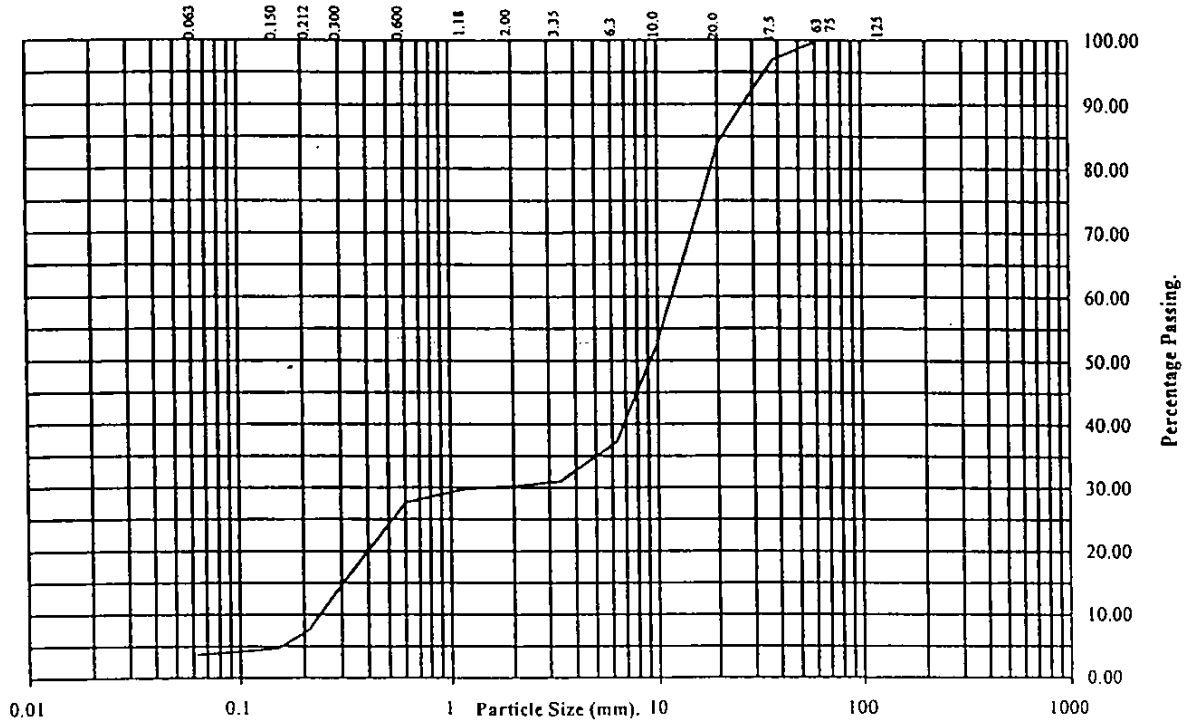
Contract No.: NL231217

PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Borehole/Sample Number: 102GC **Depth (m):** 7.25



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	97
20	84
10	53
6.3	37
3.35	31
2	30
1.18	30
0.6	28
0.3	15
0.212	8
0.15	5
0.063	4

Soil Fraction	Total Percentage
Cobbles	0
Gravel	70
Sand	26
Silt/Clay	4

Remarks:
See summary of soil descriptions.

Checked By	Date	Approved By	Date
RCh	19/8/03	RCh	19/8/03

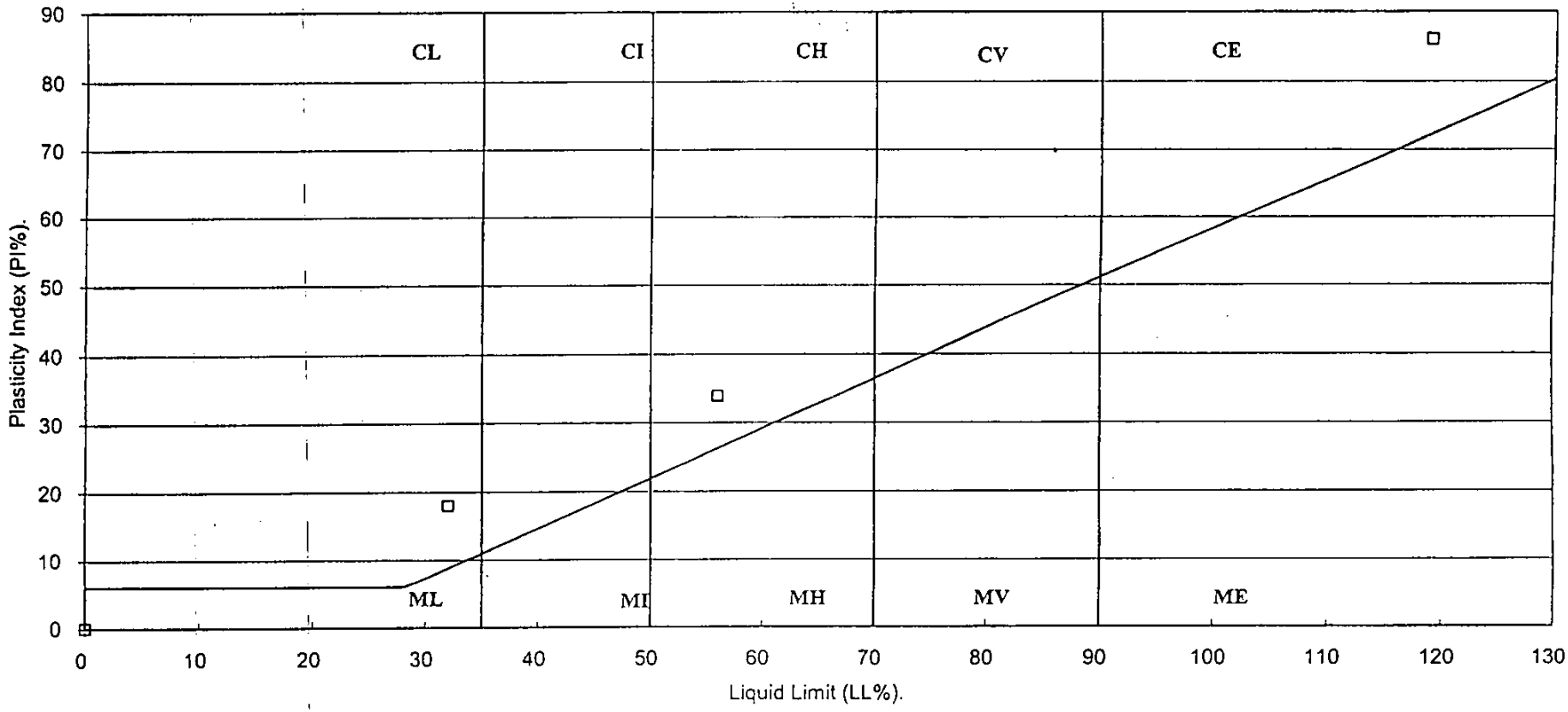
THYSSEN GEOTECHNICAL

READING GATEWAY - EAST.

Contract No.: NL231217

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

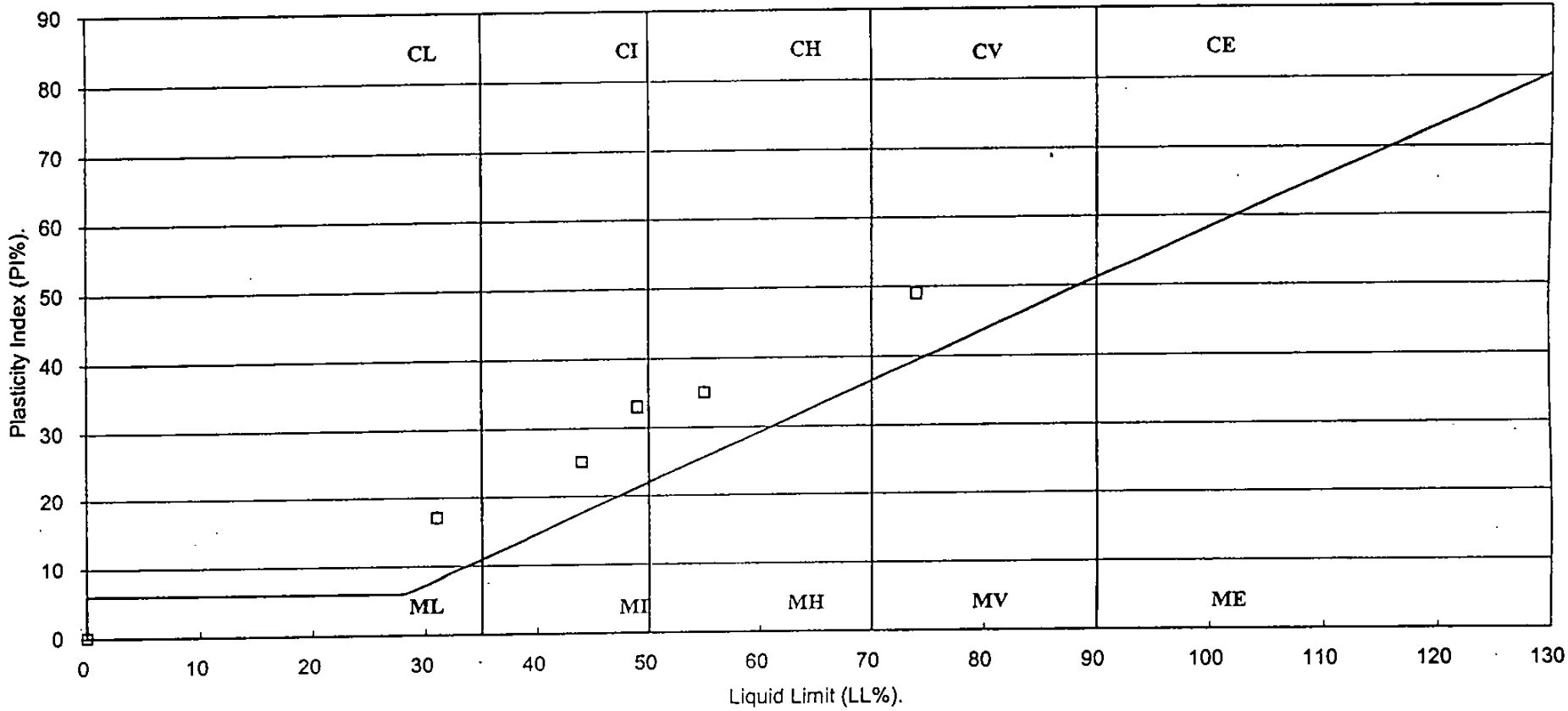
(B.S.5930 : 1999)



	Compiled by	Date	Checked by	Date	Approved by	Date
THYSSEN GEOTECHNICAL		20/8/03		20/8/03		20/8/03
	READING GATEWAY - EAST.				Contract No NL231217	
					Client Ref: E3015/03	

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(B.S.5930 : 1999)



	Compiled by	Date	Checked by	Date	Approved by	Date
THYSSEN GEOTECHNICAL		20/8/03		20/8/03		20/8/03

READING GATEWAY - EAST.

Contract No NL231217

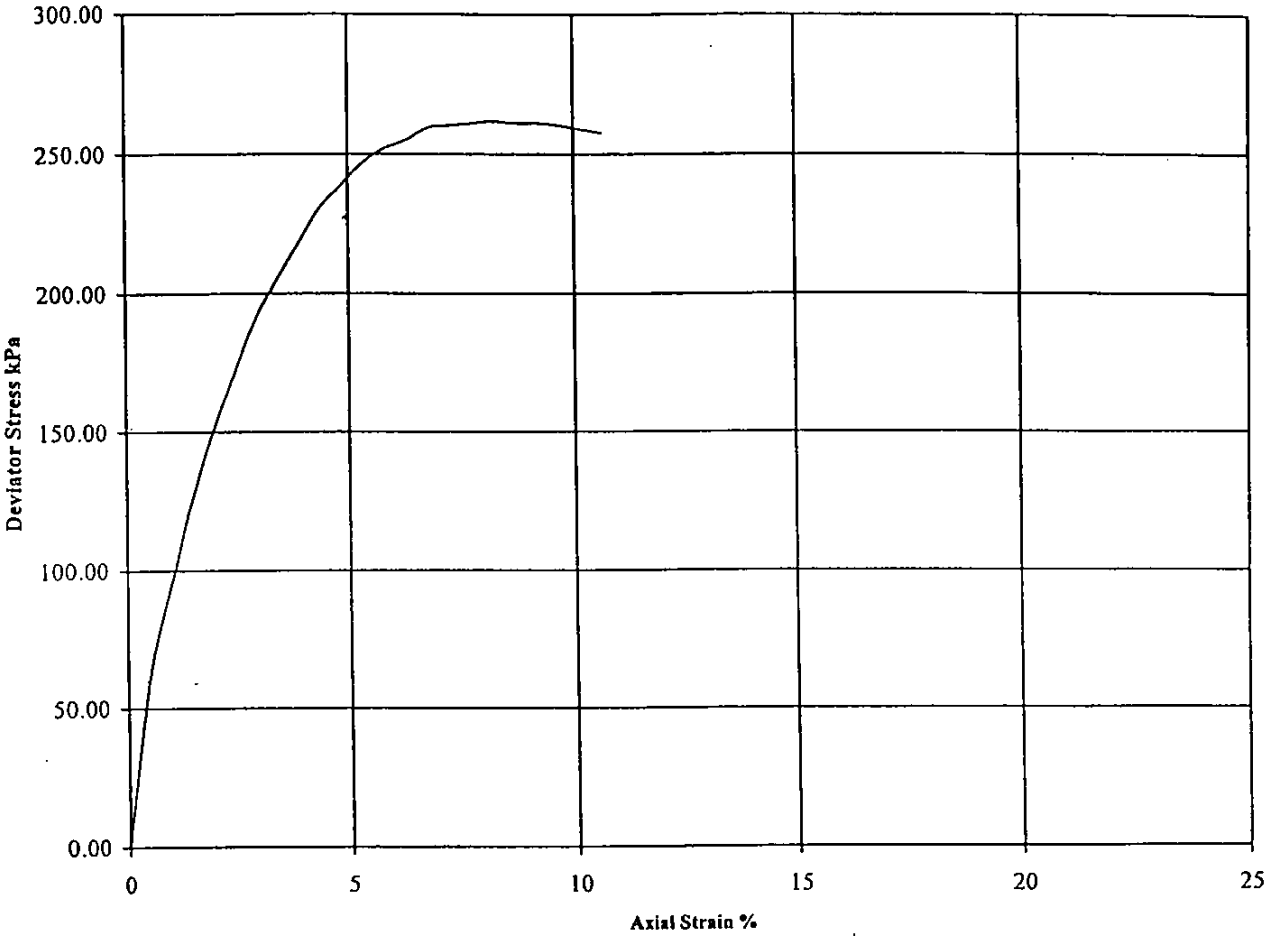
Client Ref: E3015/03

Undrained Shear Strength in Triaxial Compression

without measurement of Pore Pressure

B.S. 1377 : Part7 : Clause 8 : 1991

Borehole / Sample Number: 104GC **Depth (m):** 4.00



Diameter (mm):		102	Height (mm):		207	Test:	100 mm Single Stage.		
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa)	Deviator Stress (kPa)	Cohesion (kPa)	Failure Strain (%)	Mode of Failure	Remarks
A	16.7	2.15	1.84	80	262	131	8.2	Plastic	See summary of soil descriptions.
B									
C									

Checked	Date	Approved	Date
	19/8/07		19/8/07

THYSSEN GEOTECHNICAL

READING GATEWAY - EAST.

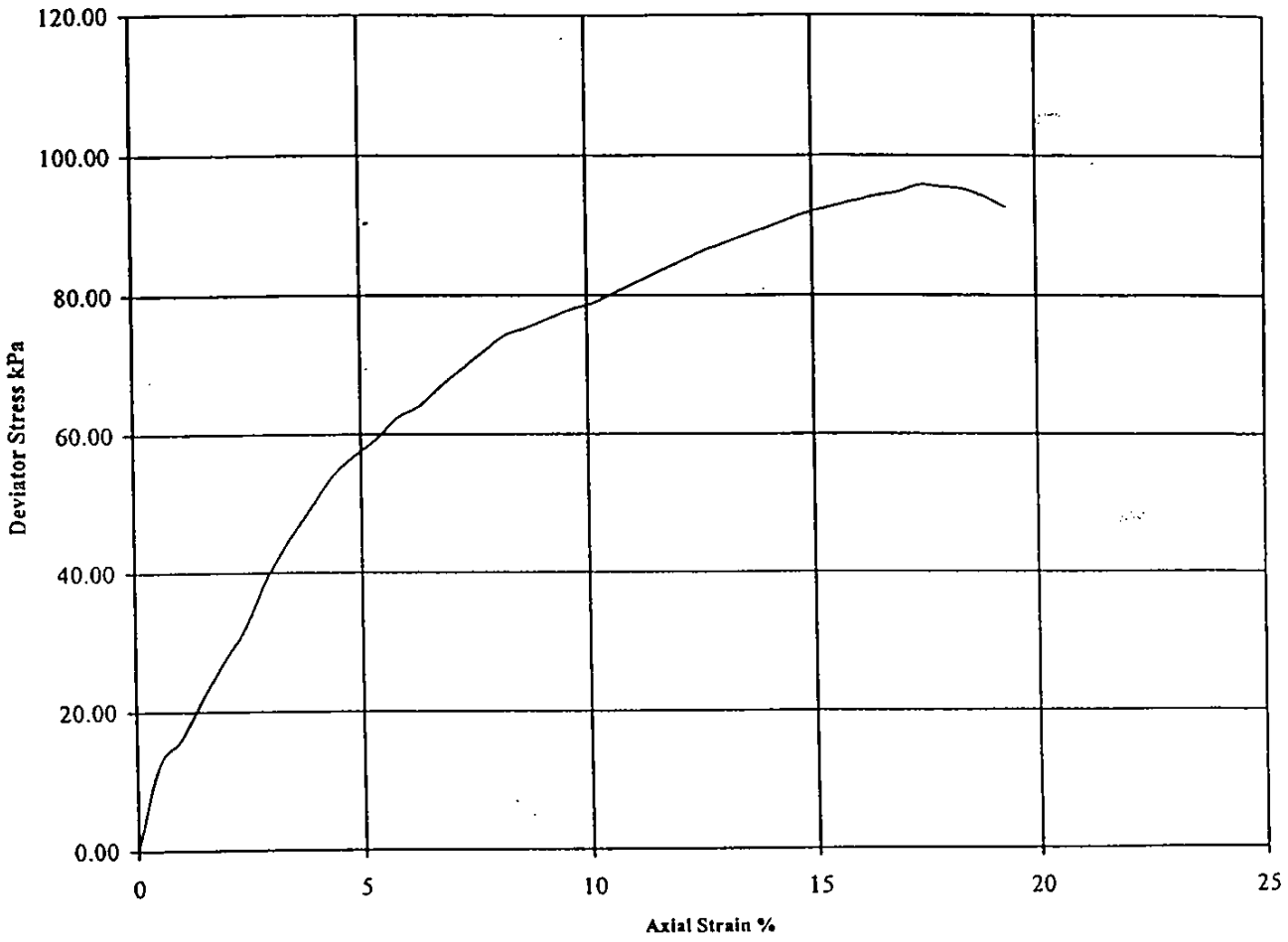
Contract No:
NL231217

Undrained Shear Strength in Triaxial Compression

without measurement of Pore Pressure

B.S. 1377 : Part7 : Clause 8 : 1991

Borehole / Sample Number: 104GC **Depth (m):** 1.20



Diameter (mm):		102	Height (mm):		207	Test:	100 mm Single Stage.		
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa)	Deviator Stress (kPa)	Cohesion (kPa)	Failure Strain (%)	Mode of Failure	Remarks
A	23.0	1.94	1.57	30	96	48	17.4	Brittle	See summary of soil descriptions.
B									
C									

Checked	Date	Approved	Date
	19/8/00		19/8/00

THYSSEN GEOTECHNICAL

READING GATEWAY - EAST.

Contract No:
NL231217

APPENDIX F

THAMES WATER/ENVIROS-ASPINWALL/SOIL MECHANICS (2000) INVESTIGATION

APPENDIX F1

LOGS

Soil Mechanics

Borehole No. 1673A/9R

Sheet 5 of 5

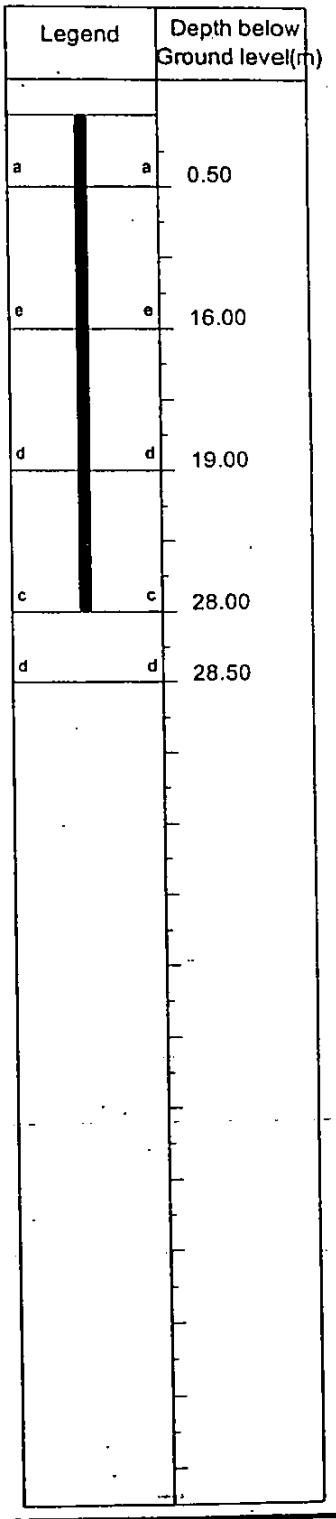
Type of installation Standpipe
Date of installation 02/03/00
Internal diameter of tubing 100 mm
Length of filter 9.00 m
Diameter of filter 150 mm

Location No. 140502
Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level | Coordinates | Date
As sheet 1

Depth (m) From	Depth (m) To	SUMMARY OF INSTALLATION
		Surface protection : Lockable Top Cap.
0.00	0.50	Concrete
0.50	16.00	Bentonite / Cement grout
16.00	19.00	Bentonite seal
0.00	19.00	Plain pipe
9.00	28.00	Gravel filter
28.00	28.00	Instrument tip
19.00	28.00	Slotted pipe
28.00	28.50	Bentonite seal



Concrete
Sand filter
Gravel filter
d Bentonite seal
e Bentonite/cement grout
f Backfill

End coordinates as sheet 1

DETAILS OF INSTRUMENT

Soil Mechanics

Borehole No. 1673A/9R

Location No. 140502

Location

MANOR FARM READING

Carried out for

Thames Water Utilities Limited

Ground Level	Coordinates	Date
	As sheet 1	

Water Level Observations During Boring

Date	Time	Depth of Hole (m)	Depth of Casing (m)	Depth to Water (m)	Remarks
29/02/00	08:30	6.50	2.70	1.82	
01/03/00	07:30	19.00	13.00	12.10	

Water Strike Table

Depth of Strike (m)	Casing Depth (m)	Date	Time	Post Strike Depth (m)	Minutes After Strike	Sealed at (m)	Remarks
19.00	13.00	01/03/00	08:00	12.10	20	27.00	

Logged by DH

Scale 1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/9R

Sheet 3 of 5

Equipment & Methods: As sheet 1

Location No. 140502.

Location: MANOR FARM READING

Carried out for: Thames Water Utilities Limited

Ground Level | Coordinates: As sheet 1 | Date

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
				20.00	D			
				20.50	D			
				21.00	D			
				21.50	D			
				22.00	D			
				22.00 - 22.45	D		S N=28	4,5/5,6,7,10
				22.50	D			
				23.00	D			
As previous description.			(7.90)	23.50	D			
				24.00	D			
				24.00 - 24.45	D		S N=56	6,10/13,19,24,- No recovery.
				24.50	D			
				25.00	D			
				25.50	D			
				26.00	D			
				26.50	D			
y CLAY with white silty partings y 15mm apart, smooth faces, cks with polished surfaces. RMATION].	19.78		26.90	26.90	D			
				27.00	D			
			(0.60)	27.00 - 27.45	U			65 blows 90% Recovery.
CLAY with green silt, shells	19.18		27.50	27.50	D			
				28.00	D			
				27.00 - 28.00	B			
RMATION].			(0.70)					
me grey CHALK. [UPPER CHALK].	18.48		28.20					
DS AT 28.50 m.			(0.30p)	28.20 - 28.50	D			
	18.18		28.50	28.20 - 28.50	D			

Logged by: DH

Scale: 1:50

Fig.

(c) Soil Mechanics 2/or S.A.

Soil Mechanics

Borehole No. 1673A/9R

Sheet 2 of 5

Equipment & Methods	Location No. 140502
As sheet 1	Location: MANOR FARM READING
Carried out for: Thames Water Utilities Limited	Ground Level: — Coordinates: As sheet 1 — Date: —

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample: Type	Sample: No.	Test	Field Records
				10.00	D			
As previous description.			(1.75)	10.50	D			
	35.68		11.00	11.00	D			
Very stiff red brown with grey mottled black fissured sandy CLAY with medium sand partings. [READING FORMATION].			(0.90)	11.00 - 11.45	U			65 blows 75% Recovery.
				11.50	D			
	34.78		11.90	12.00	D			
				12.50	D			
				12.00 - 13.00	B			
				13.00	D			
				13.00 - 13.45	U			60 blows 60% Recovery.
				14.00	D			
				14.50	D			
Very stiff mottled olive grey, brown, red and light grey slightly sandy silty CLAY. [READING FORMATION].				15.00	D			
				14.00 - 15.00	B			
				15.00 - 15.45	U			68 blows
At 16.50m: Very stiff brown with red mottling slightly sandy silty CLAY.			(7.10)	15.50	D			
17.00m: Becoming hard.				16.00	D			
				16.50	D			
				17.00	D			
				17.00	U			70 blows
				17.50	D			
				18.00	D			
				18.50	D			
	27.68		19.00	19.00	D			
grey very silty fine SAND becoming ND from 22.10. FORMATION].			(7.90)	19.00 - 19.50	D			
				19.50 - 19.95	D		S N=58	3,4/6,9,19,24
				20.00	D			

Logged by: DH

Scale: 1:50

Fig

Soil Mechanics

Borehole No. 1673A/9R

Sheet 1 of 5

Equipment & Methods
Hand dug inspection pit to 1.20m. Cable tool boring, 250mm dia to 2.00m. then 200mm dia to 9.00m. then 150mm to 28.50m.

Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level
46.68 m AOD

Coordinates

Date
28/02/00
to 02/03/00

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
MADE GROUND: Dark brown very silty SAND with brick and concrete fragments.	46.68		(0.30)					
	46.38		0.30	0.50	D			
MADE GROUND: Yellowish brown silty slightly sandy CLAY with fragments of brick, clinker chalk and flint. Becoming very sandy CLAY. Sand is medium to coarse.			(1.00)	1.00	D			
	45.38		1.30	1.50	D			
Firm orange brown sandy CLAY with red silty sandy partings with occasional ironstone fragments. [LONDON CLAY FORMATION].			(1.30)	2.00	D			
				2.00 - 2.45	U			30 blows 90% Recovery.
	44.08		2.60					
				3.00	D			
				3.00 - 3.45	U			25 blows 90% Recovery.
Orange brown fine sandy CLAY. [LONDON CLAY FORMATION].			(2.48)	4.00	D			
				4.00 - 4.45	U			35 blows
				4.50	D			
				5.00	D			
	41.60		5.08	5.00 - 5.45	U			65 blows 65% Recovery.
Firm grey brown fine sandy CLAY with occasional shells fragments and pockets of silty sand. [LONDON CLAY FORMATION].				5.50	D			
			(1.42)	6.00	D			
Base: With occasional pebbles.				6.00 - 6.45	U			65 blows
	40.18		6.50	6.50	D			
Very dense yellowish brown with orange mottling fine to coarse SAND with ironstone fragments. [LONDON CLAY FORMATION].			(1.20)	7.00 - 7.45	D	S	N=53	3,6/10,12,15,16
				7.70	D			
	38.98		7.70	8.00	D			
Becoming very stiff grey with red silty fissured CLAY with occasional rounded ironstone fragments. [LONDON CLAY FORMATION].				8.00 - 8.45	U			60 blows 75% Recovery.
			(1.55)	8.00 - 9.00	B			
				9.00 - 9.45	U			65 blows 80% Recovery.
	37.43		9.25					
Stiff dark green grey CLAY. [LONDON CLAY FORMATION].			(1.75)					
				10.00	D			

Logged by
DH

Scale
1:50

Fig.

Standpipe installed to a depth of 28.00m.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/8R

Sheet 5 of 5

Type of installation Standpipe
Date of installation 19/03/00
Internal diameter of tubing 100 mm
Length of filter 11.00 m
Diameter of filter 150 mm

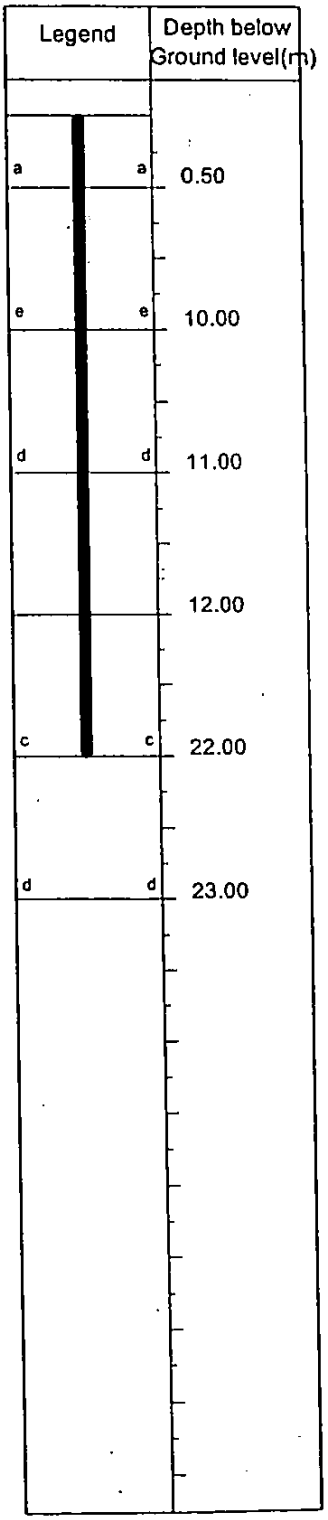
Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level	Coordinates	Date
	As sheet 1	

Depth (m) From	Depth (m) To	SUMMARY OF INSTALLATION
		Surface protection : Lockable Top Cap
0.00	0.50	Concrete
0.50	10.00	Bentonite / Cement grout
10.00	11.00	Bentonite seal
0.00	12.00	Plain pipe
1.00	22.00	Gravel filter
22.00	22.00	Instrument tip
12.00	22.00	Slotted pipe
22.00	23.00	Bentonite seal



a Concrete
b Sand filter
c Gravel filter
d Bentonite seal
e Bentonite/cement grout
f Backfill

Ground level and coordinates as sheet 1

DETAILS OF INSTRUMENT

Soil Mechanics

Borehole No. 1673A/8R

Location No. 140502

Location

MANOR FARM READING

Carried out for

Thames Water Utilities Limited

Ground Level | Coordinates | Date

As sheet 1

Water Strike Table

Depth of Strike (m)	Casing Depth (m)	Date	Time	Post Strike Depth (m)	Minutes After Strike	Sealed at (m)	Remarks
6.50	3.50	16/03/00	08:00	3.90	5	-	
6.50	3.50	16/03/00	08:05	3.80	10	-	
6.50	3.50	16/03/00	08:10	3.75	15	-	
6.50	3.50	16/03/00	08:15	3.75	20	-	

Logged by DH

Scale 1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/8R

Sheet 3 of 5

ənt & Methods

As sheet 1

Location No. 140502

Location MANOR FARM READING

out for
es Water Utilities Limited

Ground Level | Coordinates | Date

As sheet 1

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
evious description.	20.32		(3.70) 20.20	20.20 20.20	D D	48 49		
grey fissured CLAY with bands of sand. DING FORMATION].			(0.80)					
	19.52		21.00	21.20	D	50	S	
				21.20 - 21.58	D	51	50	7,8/11,14,22,3 for 5mm
st[illegible]ark blue grey thinly laminated CLAY fre[illegible]nt shells. [READING FORMATION].			(1.70)					
				22.10 22.10	D D	52 53		
white with grey streaks CHALK putty with asional flint fragments. [UPPER CHALK].	17.82		22.70 (0.30p)	22.70 22.70	D D	54 55		
REHOLE ENDS AT 23.00 m.	17.52		23.00					

Logged by DH

Scale 1:50

Fig.

Soil Mechanics

Borehole No. 1673A/8R

Sheet 2 of 5

ment & Methods: As sheet 1

Location No. 140502

Location: MANOR FARM READING

Carried out for: Thames Water Utilities Limited

Ground Level: As sheet 1

Coordinates:

Date:

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
As previous description.			(0.80)					
	29.72		10.80	10.80	D	25		
				10.80 - 11.25	D	24	S N=35	6,7/8,8,9,10
				11.30 - 11.50	B	26		
				11.80	D	29		
				11.80 - 12.25	U	27		52 blows 3 sinker bars used.
				12.25 - 12.40	D	28		
				12.80	D	32		
				12.80 - 13.25	U	30		54 blows 3 sinker bars used.
				13.25 - 13.40	D	31		
Stiff to very stiff grey brown sandy silty CLAY. [READING FORMATION].			(5.70)	13.80	D	34		
				14.00	D	33		
				14.80 - 15.25	U	35		53 blows 3 sinker bars used.
				15.25	D	37		
				15.25 - 15.40	D	36		
				15.70	D	38		
				15.80	D	39		
				16.00	W	40		
	24.02		16.50	16.50	D	42		
				16.80 - 17.25	D	41	S N=37	4,7/7,8,10,12 No recovery.
				18.00	D	45		
Very dense grey brown fine to medium SAND becoming coarse sand at 19.30m. (Driller notes silty bands). [READING FORMATION].			(3.70)	17.80 - 18.25	D	43	S N=46	4,6/7,9,13,17
				18.30 - 18.80	B	44		
				19.00	D	47		
				19.30 - 19.69	D	46	S 50	8,14/17,28,5 for 10mm,-

Logged by: DH

Scale: 1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/8R

Sheet 1 of 5

Equipment & Methods
and dug inspection pit to 1.20m. Cable tool boring, 250mm
to 4.00m. then 200mm dia to 14.0m. then 150mm dia to
.00m.

Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level
40.52 m AOD

Coordinates

Date
16/03/00
to 19/03/00

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
	40.52							
MADE GROUND: Loose dark brown slightly silty SAND, with fine to medium subangular flint, brick and concrete gravel with rootlets. At 1.40m: Coarse gravel of concrete with wire			(2.10)	0.50 - 1.00	B			
				1.20 - 1.65	B	2	C N=8	2,3/2,2,2,2
MADE GROUND: Firm black slightly gravelly slightly sandy CLAY. Gravel is angular fine flint, brick and concrete with strong organic odour with wood fragments.	38.42		2.10	1.90 - 2.30	B	3		
			(0.70)	2.50 - 2.95	B	4	C N=13	2,2/3,3,3,4
	37.72		2.80					
Firm grey brown silty organic CLAY with soft brown peaty clay and clayey peat. [ALLUVIUM].			(2.20)	3.30 - 3.75	U	5		16 blows 3 sinker bars used.
				3.75 - 3.90	D	6		
				4.00 - 4.45	U	7		18 blows 3 sinker bars used.
				4.60 - 5.05	U	8		18 blows 3 sinker bars used N/RD
				4.60 - 5.05	D	9	S N=9	1,2/2,3,2,2 No recovery.
	35.52		5.00					
Medium dense black slightly gravelly sandy SILT. Gravel is fine to medium subangular, sand is fine to medium. Strong organic odour. [ALLUVIUM].			(1.50)	5.60 - 6.10	B	10		
				6.10 - 6.40	B	11		
				6.40	W	13		
				6.40	W	14		Chemical sample.
	34.02		6.50				C	
Medium dense grey subangular to subrounded fine to coarse flint GRAVEL with some medium and coarse sand. [VALLEY GRAVEL].			(0.60)	6.50 - 6.95	B	12	N=22	3,4/4,6,6,6
	33.42		7.10					
Firm to stiff grey brown sandy silty CLAY. [READING FORMATION].			(0.50)	7.30 - 7.75	U	15		40 blows 3 sinker bars used.
	32.92		7.60	7.80	D	17		
				7.75 - 7.90	D	16		
				8.30 - 8.75	U	18		45 blows 3 sinker bars used.
				8.80	D	20		
Light grey very clayey very silty fine to coarse SAND. (Driller notes stiff clay bands). [READING FORMATION].			(2.40)	8.75 - 8.90	D	19		
				9.30 - 9.75	U	21		45 blows 3 sinker bars used. No recovery.
				9.80	D	22		
				9.90 - 10.35	D	23	S N=37	4,6/8,9,10,10
	30.52		10.00					

Logged by
DH

Scale
1:50

Fig.

SPT carried out between 1.70m and 1.90m, 21.00 and 21.50 and 21.80 and 22.30.
Seepage at 16.00m.
Standpipe installed to a depth of 22.00m.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/8G

Sheet 2 of 2

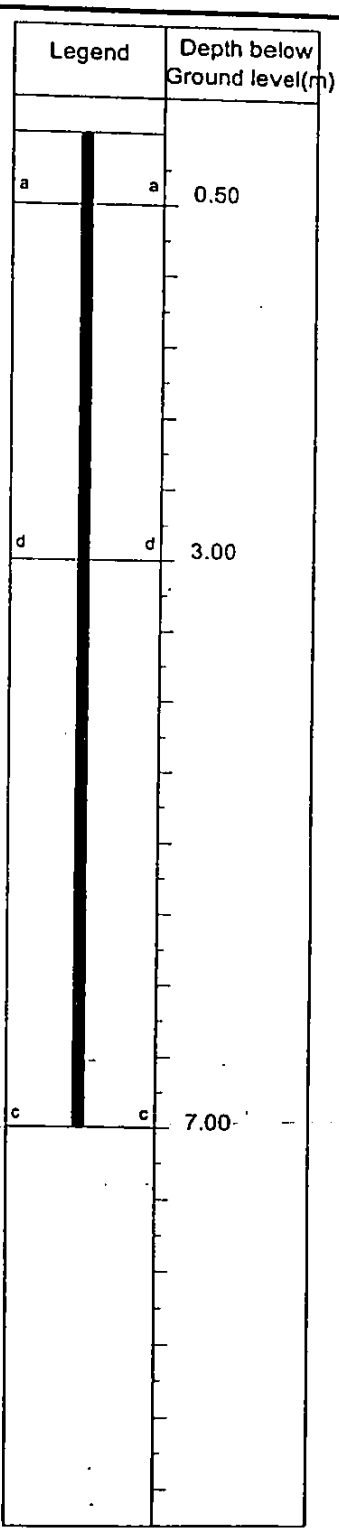
e of installation Standpipe
Date of installation 15/03/00
Internal diameter of tubing 100 mm
Length of filter 4.00 m
Diameter of filter 150 mm

Location No. 140502
Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level | Coordinates | Date
As sheet 1

Depth (m) From	Depth (m) To	SUMMARY OF INSTALLATION
		Surface protection : Stopcock Cover
0.00	0.50	Concrete
0.50	3.00	Bentonite seal
0.00	3.00	Plain pipe
3.00	7.00	Gravel filter
7.00	7.00	Instrument tip
3.00	7.00	Slotted pipe



Key

- Concrete
- Sand filter
- Gravel filter
- d Bentonite seal
- e Bentonite/cement grout
- f Backfill

nd level and coordinates as sheet 1

DETAILS OF INSTRUMENT

Soil Mechanics

Borehole No. 1673A/8G

Sheet 1 of 2

Equipment & Methods
Hand dug inspection pit to 1.20m. Cable tool boring, 200mm dia to 3.00m. then 150mm dia to 7.50m.

Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level
40.52 m AOD

Coordinates

Date
15/03/00
to 16/03/00

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample: Type	Sample: No.	Test	Field Records
MADE GROUND: Loose dark brown slightly silty SAND, with fine to medium subangular flint, brick and concrete gravel with rootlets.	40.52			0.50	D	1		
At 1.40m: Coarse gravel of concrete with wire.			(2.10)	1.50	D	2		
MADE GROUND: Firm black slightly gravelly slightly sandy CLAY. Gravel is angular fine flint, brick and concrete. Strong organic odour with wood fragments. Concrete enccountered between 2.30m and 2.45m.	38.42		2.10					
			(0.60)	2.50	D	3		
Brown sandy CLAY with some tree roots. [ALLUVIUM].	37.82		2.70					
			(0.90)	3.00	D	4		
Medium dense black slightly gravelly sandy SILT. Gravel is fine to medium subangular, Sand is fine to medium. Strong organic odour. [ALLUVIUM].	36.92		3.60	4.00	D	5		
			(2.90)	5.00	D	6		
				6.00	D	7		
Dense to medium dense grey subangular to subrounded fine to medium flint GRAVEL. [VALLEY GRAVEL].	34.02		6.50					
			(0.70)	7.00	D	8		
Firm to stiff grey brown sandy sitly CLAY. [READING FORMATION].	33.32		7.20	7.20	D	9		
BOREHOLE ENDS AT 7.50 m.	33.02		(0.30p) 7.50					

Logged out between 2.30m and 2.45m.
Water at 4.10m and 6.50m.
D samples taken at the same depths as the D samples.
Piezometer installed to a depth of 7.00m.

Logged by
DH

Scale
1:50

(c) Soil Mechanics (Ver 6.1)

Fig.

Soil Mechanics

Borehole No. 1673A/7R

Sheet 5 of 5

Type of installation Standpipe
Date of installation 15/03/00
Internal diameter of tubing 100 mm
Length of filter 9.80 m
Diameter of filter 150 mm

Location No. 140502

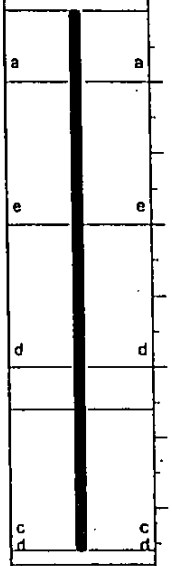
Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level | Coordinates | Date
As sheet 1

Depth (m) From	Depth (m) To	SUMMARY OF INSTALLATION
		Surface protection : Lockable Top Cap
0.00	0.50	Concrete
0.50	13.50	Bentonite / Cement grout
13.50	16.20	Bentonite seal
0.00	16.50	Plain pipe
16.20	26.00	Gravel filter
26.00	26.00	Instrument tip
16.50	26.00	Slotted pipe
26.00	26.10	Bentonite seal

Legend



Depth below Ground level(m)

0.50
13.50
16.20
16.50
26.00
26.10

- Concrete
- Sand filter
- Gravel filter
- d Bentonite seal
- e Bentonite/cement grout
- f Backfill

Ground level and coordinates as sheet 1

DETAILS OF INSTRUMENT

Soil Mechanics

Borehole No. 1673A/7R

Sheet 4 of 5

Location No. 140502

Location

MANOR FARM READING

Carried out for

Thames Water Utilities Limited

Ground Level | Coordinates | Date

As sheet 1

Water Level Observations During Boring

Date	Time	Depth of Hole (m)	Depth of Casing (m)	Depth to Water (m)	Remarks
10/03/00	-	10.50	9.00	DRY	
11/03/00	07:30	10.50	10.50	3.10	
15/03/00	07:30	24.00	24.00	13.05	

Water Strike Table

Depth of Strike (m)	Casing Depth (m)	Date	Time	Post Strike Depth (m)	Minutes After Strike	Sealed at (m)	Remarks
4.45	4.00	10/03/00	-	4.15	5	-	
4.45	4.00	10/03/00	-	4.10	10	-	
4.45	4.00	10/03/00	-	4.01	15	-	
4.45	4.00	10/03/00	-	3.98	20	5.00	
6.50	-	10/03/00	-	4.10	20	7.80	
16.90	-	10/03/00	-	14.52	5	-	
16.90	-	10/03/00	-	13.94	10	-	
16.90	-	10/03/00	-	13.10	15	-	
16.90	-	10/03/00	-	12.64	20	17.50	
19.80	-	10/03/00	-	14.10	20	-	

Logged by DH

Scale 1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/7R

Sheet 3 of 5

Equipment & Methods: As sheet 1

Location No. 140502

Location: MANOR FARM READING

Carried out for: Thames Water Utilities Limited

Ground Level | Coordinates: As sheet 1 | Date

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
				20.00	D	7906	S	
				20.00 - 20.38	D		56	7,11/12,19,25
				21.00 - 21.45	D		S N=53	6,10/14,17,22,-
				21.00 - 22.00	D	7903		
				22.00 - 22.30	D		S 44	5,8/15,29
				22.00 - 23.00	D	7901		
As previous description.			(6.35 pen)	23.00 - 23.30	D		S 48	10,14/21,27
				23.00 - 24.00	D	7899		
				24.00 - 24.30	D		S 53	3,6/9,24,20 for 2mm
				24.00 - 25.00	D	7897		
				25.00 - 26.00	D	7896		
26.10m: Stiff light grey silty CLAY.				26.10	D	7895		
BOREHOLE ENDS AT 26.15 m.	20.89		26.15					

Logged by: DH

Scale: 1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/7R

Sheet 2 of 5

Equipment & Methods: As sheet 1

Location No. 140502

Location: MANOR FARM READING

Carried out for: Thames Water Utilities Limited

Ground Level | Coordinates | Date: As sheet 1

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
As previous description.			(2.60)	10.00	D	7930		
	36.64		10.40	10.50	D	7929		
				11.00	D	7928		
				11.50	D	7927		
				12.00	D	7926		
				12.00 - 12.45	U			50 blows
				12.50	D			
				13.00	D	7923		
				13.50	D	7922		
Hard to very stiff light grey with red mottling silty sandy CLAY, highly fissured with polished surfaces. [READING FORMATION].				14.00	D			
				14.00 - 14.45	U			65 blows
				14.50	D			
At 12.0m: Close fissures become widely spaced with slickensided surfaces.				15.00	D	7918		
			(9.40)	15.50	D	7917		
At 15.50m: Dessicated and becoming very silty CLAY.				16.00	D	7916		
				16.00 - 16.45	U			65 blows
				16.50	D			
16.90m: Brown grey silty SAND.				17.00	D	7913		
				17.50	D	7912		
				18.00	D	7911		
				18.00 - 18.45	U			70 blows 30% Recovery.
				18.50	D			
				19.00	D	7908		
...o dense fine to medium SAND. ...ORMATION].	27.24		19.80	20.00	D	7906		

Logged by: DH

Scale: 1:50

(c) Soil Mechanics (Ver 6.1)

Fig.

Soil Mechanics

Borehole No. 1673A/7R

Sheet 1 of 5

ment & Methods
Hand dug inspection pit to 1.20m. Cable tool boring, 200mm dia to 6.00m. then 150mm dia to 26.10m.

Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level
47.04 m AOD

Coordinates

Date
10/03/00
to 15/03/00

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
MADE GROUND: Dark brown silty SAND. Topsoil with occasional brick and flint gravel.	47.04		(0.25)					
	46.79		0.25					
				0.50	D			
				1.00	D	7956		
			(0.65)	0.00 - 1.00	B	7955		
MADE GROUND: Firm dark brown slightly sandy gravelly CLAY. Gravel is fine to coarse subangular of brick, flint and concrete. Sand is coarse.	46.14		0.90					
				1.50	D	7954		
				2.00	D	7953		
				2.00 - 2.45	U	7952		15 blows 90% Recovery.
				2.50	D	7951		
Soft becoming firm light brown very sandy thinly laminated CLAY with shells. Sand is fine to medium. [LONDON CLAY FORMATION].								
				3.00	D	7950		
				3.00 - 3.45	U			19 blows
1.50m: Becoming firm slightly sandy CLAY. Sand is fine.				3.50	D			
			(5.50)					
3.00m: Very clayey silty SAND with occasional shell fragments and weak ironstone fragments.				4.00	D	7947		
				4.00 - 4.45	U			28 blows 90% Recovery.
4.00m: Firm brown sandy very silty CLAY with occasional green sand shell fragments and weak ironstone fragments.				4.50	D			
				4.70	D	7944		
5.00m: Stiff brown very sandy silty CLAY.				5.00 - 5.45	U			17 blows 90% Recovery.
				5.50	D			
				6.00	D	7941		
				6.00 - 6.45	U			35 blows
	40.64		6.40	6.50	D			
				6.50 - 7.00	D	7938		
Dense orange brown medium SAND with occasional fine to medium ironstone gravel. [LONDON CLAY FORMATION].				7.00 - 7.45	D		S N=49	7,16/22,27,-,-
			(1.40)					
				7.00 - 7.80	D	7936		
	39.24		7.80					
				7.80 - 8.45	U			50 blows 90% Recovery.
Hard very stiff grey with red and brown mottling sandy CLAY with fine sandy partings. Fissures polished. [READING FORMATION].			(2.60)	9.00	D	7933		
				9.00 - 9.45	U			60 blows
9.70m: Blue green grey SAND.				9.50	D			
				10.00	D	7930		

Standpipe installed to a depth of 26.00m.
Casing from 24.00m.

Logged by
DH

Scale
1:50

Fig

Soil Mechanics

Borehole No. 1673A/7G

Sheet 3 of 3

of Installation Standpipe
of Installation 15/03/00
al diameter of tubing 100 mm
h of filter 4.05 m
eter of filter 200 mm

Location No. 140502

Location

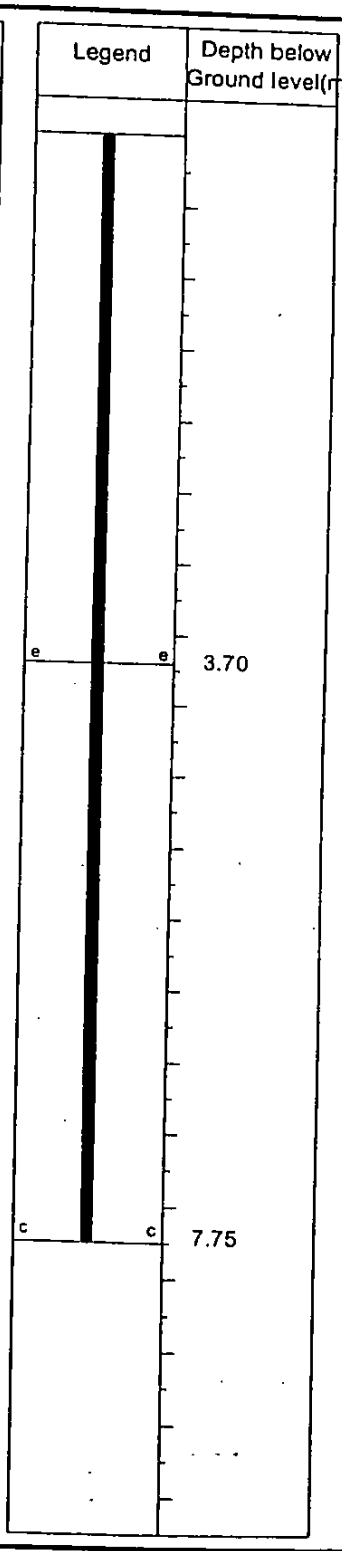
MANOR FARM READING

out for
nes Water Utilities Limited

Ground Level | Coordinates | Date

As sheet 1

Depth (m) From	Depth (m) To	SUMMARY OF INSTALLATION
		Surface protection : Lockable Top Cap
0.00	3.70	Bentonite / Cement grout
0.00	3.70	Plain pipe
3.70	7.75	Gravel filter
7.75	7.75	Instrument tip
3.70	7.75	Slotted pipe



- Concrete
- Sand filter
- Gravel filter
- d Bentonite seal
- e Bentonite/cement grout
- f Backfill

rks
ound level and coordinates as sheet 1

DETAILS OF INSTRUMENT

Soil Mechanics

Borehole No. 1673A/7G

Location No. 140502

Location

MANOR FARM READING

Carried out for

Thames Water Utilities Limited

Ground Level	Coordinates	Date
	As sheet 1	

Water Strike Table

Depth of Strike (m)	Casing Depth (m)	Date	Time	Post Strike Depth (m)	Minutes After Strike	Sealed at (m)	Remarks
5.40	5.00	15/03/00	-	-	-	-	
5.40	5.00	15/03/00	-	3.61	20	7.70	

Logged by

DH

Scale

1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/7G

Sheet 1 of 3

Equipment & Methods
and dug inspection pit to 1.20m. Cable tool boring, 200mm
a to 7.80m.

Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level
47.00 m AOD

Coordinates

Date
15/03/00
to 15/03/00

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample: Type	Sample: No.	Test	Field Records
MADE GROUND: Dark brown silty SAND. Topsoil with occasional brick and flint gravel. becoming dark brown slightly sandy gravelly CLAY. Gravel is fine to coarse subangular of brick, flint and concrete. Sand is coarse.	47.00		(0.95)					
	46.05		0.95	1.00	D			
Soft to firm orange brown very sandy thinly laminated CLAY with shells. Sand is fine to medium. [LONDON CLAY FORMATION].				2.00	D			
At 1.5m: Becoming firm slightly fine sandy CLAY.			(3.95)	3.00	D			
At 2.10m: Clay becomes firm.				4.00	D			
Stiff dark grey fissured slightly fine sandy CLAY with occasional fragmented shells. [LONDON CLAY FORMATION].	42.10		4.90	5.00	D			
			(0.50)					
Grey brown silty SAND.** [LONDON CLAY FORMATION].	41.60		5.40					
			(0.70)	6.00	D			
Medium dense becoming dense orange brown medium SAND with occasional fine to medium ironstone gravel. [LONDON CLAY FORMATION].	40.90		6.10					
			(1.60)	7.00	D			
Very stiff grey with red mottling fissured CLAY with fine sandy partings. Fissures are polished. [READING FORMATION].	39.30		7.70					
BOREHOLE ENDS AT 7.80 m.	39.20		(0.10p) 7.80					

Standpipe installed to a depth of 7.75m.

Logged by
DH

Scale
1:50

Soil Mechanics

Borehole No. 1673A/6C

Sheet 6 of 6

Type of Installation Standpipe
Date of Installation 15/03/00
Internal diameter of tubing 100 mm
Length of filter 10.00 m
Diameter of filter 150 mm

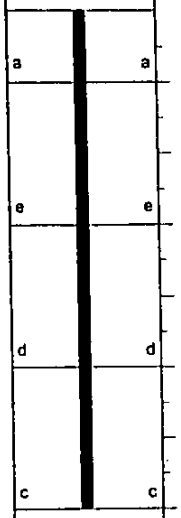
Location No. 140502
Location MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level | Coordinates | Date
As sheet 1

Depth (m) From	Depth (m) To	SUMMARY OF INSTALLATION
		Surface protection : Lockable Top Cap
0.00	0.50	Concrete
0.50	24.30	Bentonite / Cement grout
24.30	27.30	Bentonite seal
0.00	27.30	Plain pipe
27.30	37.30	Gravel filter
37.30	37.30	Instrument tip
27.30	37.30	Slotted pipe
37.30	39.00	Bentonite seal

Legend



Depth below Ground level(m)

0.50
24.30
27.30
37.30
39.00

a Concrete
b Sand filter
c Gravel filter
d Bentonite seal
e Bentonite/cement grout
f Backfill

Remarks
Ground level and coordinates as sheet 1

DETAILS OF INSTRUMENT

Soil Mechanics

Borehole No. 1673A/6C

Sheet 5 of 6

Location No. 140502

Location

MANOR FARM READING

Carried out for

Thames Water Utilities Limited

Ground Level	Coordinates	Date
	As sheet 1	

Water Strike Table

Depth of Strike (m)	Casing Depth (m)	Date	Time	Post Strike Depth (m)	Minutes After Strike	Sealed at (m)	Remarks
4.40	3.00	13/03/00	08:00	4.10	5	-	
4.40	3.00	13/03/00	08:05	3.90	10	-	
4.40	3.00	13/03/00	08:10	3.60	15	-	
4.40	3.00	13/03/00	08:15	3.40	20	-	

Logged by

DH

Scale

1:50

Fig.

Soil Mechanics

Borehole No. 1673A/6C

Sheet 4 of 6

Equipment & Methods: As sheet 1

Location No. 140502

Location: MANOR FARM READING

Carried out for: Thames Water Utilities Limited

Ground Level | Coordinates: As sheet 1 | Date-

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
				30.50 - 30.95	D	7584	S N=21	4,4/4,6,5,6
				32.50 - 32.95	U	7585		
				32.95 - 33.10	D	7586		
CHALK.			(11.70 pen)	34.50 - 34.95	D	7587	S N=26	4,6/6,7,6,7
				36.50 - 36.95	U	7588		
				38.50 - 38.95	B	7589	C N=38	18,26/8,7,10,11
ENDS AT 39.00 m.	8.85		39.00					

Logged by: DH

Scale: 1:50

(c) Soil Mechanics (Ver 6.1)

Fig.

Soil Mechanics

Borehole No. 1673A/6C

Sheet 3 of 6

Equipment & Methods: As sheet 1

Location No. 140502

Location: MANOR FARM READING

Carried out for: Thames Water Utilities Limited

Ground Level | Coordinates | Date: As sheet 1

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
				20.00 - 20.10	D	20		
				21.00 - 21.10	D	21		
				22.00 - 22.10	D	22		
As previous description.			(9.50)	23.00 - 23.10	D	23		
				24.00 - 24.10	D	24		
				25.00 - 25.10	D	25		
	21.95		25.90	26.00 - 26.10	D	26		
[Grey blue silty CLAY with shells and gravel. [READING FORMATION].			(1.40)	26.50 - 26.95	U	27		41 blows
				26.95 - 27.10	D	28		
	20.55		27.30	27.80 - 27.40	D	7581	C	
				27.50 - 27.89	B	7581	50	16,20/26,24 for 15mm,-,- No. 4 penetrated 15mm.
[Chalk: Off white with greyey black flint. CHALK putty with chalk fragments. [CHALK].			(11.70)					
				29.50 - 29.95	U	7583		

Logged by: DH

Scale: 1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/6C

Sheet 2 of 6

ment & Methods: As sheet 1

Location No. 140502

Location: MANOR FARM READING

Carried out for: Thames Water Utilities Limited

Ground Level | Coordinates: As sheet 1 | Date

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
				10.00 - 10.10	D	10		
				11.00 - 11.10	D	11		
				12.00 - 12.10	D	12		
As previous description.			(10.20)	13.00 - 13.10	D	13		
				14.00 - 14.10	D	14		
				15.00 - 15.10	D	15		
				16.00 - 16.10	D	16		
Grey Chalk. READING FORMATION.	31.45		16.40	17.00 - 17.10	D	17		
Dense light grey fine to coarse SAND. [LOWER READING FORMATION].			(9.50)	18.00 - 18.10	D	18		
				19.00 - 19.10	D	19		

Logged by: DH

Scale: 1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/6C

Sheet 1 of 6

Equipment & Methods
Hand dug inspection pit to 1.20m. Cable tool boring, 250mm dia. to 5.00m, then 200mm dia. to 27.50m, then 150mm dia. to 39.00m.

Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level
47.85 m AOD

Coordinates

Date
13/03/00
to 15/03/00

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
MADE GROUND: Orange brown sandy CLAY with flint and limetstone gravel, and roots.	47.85		(0.60)					
	47.25		0.60					
MADE GROUND: Light brown slightly silty slightly clayey gravelly SAND. Gravel is fine subrounded flint, brick, concrete and occasional ash.			(1.50)	1.00 - 1.10	D	1		
	45.75		2.10	2.00 - 2.10	D	2		
Orange brown sandy very silty CLAY. [LONDON CLAY FORMATION].			(2.70)	3.00 - 3.10	D	3		
				4.00 - 4.10	D	4		
	43.05		4.80	5.00 - 5.10	D	5		
Fissured light brown with grey mottling sandy CLAY, weathered. [LONDON CLAY FORMATION].			(1.40)					
				6.00 - 6.10	D	6		
	41.65		6.20					
				7.00 - 7.10	D	7		
Stiff becoming very stiff bluey grey with red mottling silty sandy CLAY. [READING FORMATION].			(10.20)	8.00 - 8.10	D	8		
				9.00 - 9.10	D	9		

Installed to 37.30m.
Slotted between 27.30m and 28.40m, 33.50m and 33.80m, 36.40m and 39.00m.

Logged by
DH

Scale
1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/6R

Sheet 5 of 5

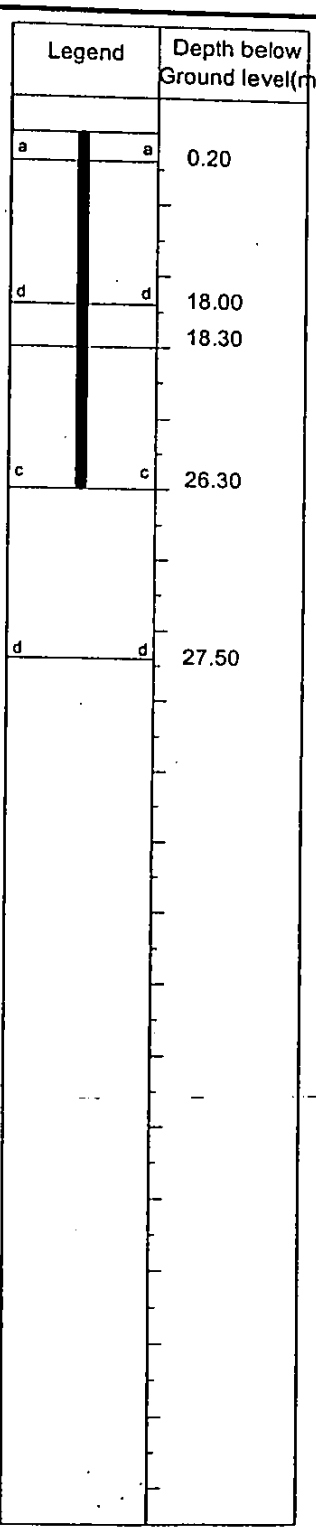
Type of installation Standpipe
Date of installation 06/03/00
Internal diameter of tubing 100 mm
Length of filter 8.30 m
Diameter of filter 150 mm

Location No. 140502
Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level | Coordinates | Date
As sheet 1

Depth (m) From	Depth (m) To	SUMMARY OF INSTALLATION
		Surface protection : Stopcock Cover
0.00	0.20	Concrete
0.20	18.00	Bentonite seal
0.00	18.30	Plain pipe
18.00	26.30	Gravel filter
26.30	26.30	Instrument tip
18.30	26.30	Slotted pipe
26.30	27.50	Bentonite seal



Key

a Concrete
b Sand filter
c Gravel filter
d Bentonite seal
e Bentonite/cement grout
f Backfill

Remarks
Ground level and coordinates as sheet 1

DETAILS OF INSTRUMENT

Soil Mechanics

Borehole No. 1673A/6R

Sheet 4 of 5

Location No. 140502

Location

MANOR FARM READING

Carried out for

Thames Water Utilities Limited

Ground Level | Coordinates | Date

As sheet 1

Water Strike Table

Depth of Strike (m)	Casing Depth (m)	Date	Time	Post Strike Depth (m)	Minutes After Strike	Sealed at (m)	Remarks
4.40	3.00	02/03/00	-	3.84	5	-	
4.40	3.00	02/03/00	-	3.55	10	-	
4.40	3.00	02/03/00	-	3.48	15	-	
4.40	3.00	02/03/00	-	3.48	20	6.15	
15.10	10.00	02/03/00	-	13.58	20	-	
18.30	16.50	02/03/00	-	14.10	10	-	
18.30	16.50	02/03/00	-	14.10	15	-	
18.30	16.50	02/03/00	-	14.10	20	-	

Logged by DH

Scale 1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/6R

Sheet 3 of 5

Equipment & Methods: As sheet 1

Location No. 140502

Location: MANOR FARM READING

Carried out for: Thames Water Utilities Limited

Ground Level | Coordinates: As sheet 1 | Date

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
				20.00 - 20.45	D		S N=29	29 blows 9,10/10,7,6,6
As previous descrition.			(7.40)	21.00 - 21.30	D		S 46	5,15/20,26
				22.00 - 22.23	D		S	12,17/-
Stiff grey silty sandy CLAY.** [READING FORMATION].	25.43		22.50	22.50	D			
	25.03		(0.40) 22.90	23.00	D			
				23.00 - 23.45	D		S N=50	3,4/9,10,14,17 No recovery.
				23.50	D			
				24.00	D			
				24.00 - 24.45	D		S N=70	7,11/14,25,31,-
Dense light grey fine to coarse SAND. [READING FORMATION].			(3.45)	24.50	D			
				25.00	D			
				25.50	D			
				26.00	D			
				26.00 - 26.30	D		S 49	5,8/16,33
	21.58		26.35	26.50	D			
Stiff grey blue silty sandy CLAY with shells and black pebbles. [READING FORMATION].			(0.95)					
				27.00	D			
Structureless white putty CHALK.	20.63		27.30	27.30	D			
BOREHOLE ENDS AT 27.50 m.	20.43		(0.20p) 27.50					

Logged by: DH

Scale: 1:50

Soil Mechanics

Borehole No. 1673A/6R

Sheet 2 of 5

Equipment & Methods: As sheet 1

Location No. 140502

Location: MANOR FARM READING

Carried out for: Thames Water Utilities Limited

Ground Level | Coordinates: As sheet 1 | Date

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
				10.00	D			
				10.00 - 10.45	U			60 blows 90% Recovery.
				10.50	D			
				11.00	D			
				11.50	D			
As previous description.				12.00	D			
				12.00 - 12.45	U			50 blows 95% Recovery.
			(5.60)	12.50	D			
				13.00	D			
14.00m: Becoming light grey.				13.50	D			
				14.00	D			
				13.00 - 14.00	B			
				14.00 - 14.45	U			65 blows
				14.50	D			
				15.00	D			
	32.83		15.10	15.50	D			
Dense light grey fine to coarse SAND. [READING FORMATION].				16.00 - 16.45	D		S N=58	58 blows 5,8/9,11,17,21
				16.50	D			
				17.00	D			
				17.50	D			
18.40m to 18.30m: Stiff blue grey silty sandy CLAY. **			(7.40)					
				18.00	D			
				18.00 - 18.45	U			55 blows 90% Recovery.
				18.50	D			

Logged by: DH

Scale: 1:50

Fig

Soil Mechanics

Borehole No. 1673A/6R

Sheet 1 of 5

Equipment & Methods
Hand dug inspection pit to 1.20m. Cable tool boring, 200mm dia to 8.00m. then 150mm dia to 27.0m.

Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level
47.93 m AOD

Coordinates

Date
02/03/00 to 06/03/00

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
MADE GROUND: Dessicated orange brown sandy CLAY with roots, flint and limestone chippings.	47.93		(0.60)	0.50	D			
	47.33		0.60					
MADE GROUND: Dessicated light brown slightly silty slightly clayey gravelly SAND. Gravel is fine subrounded flint with brick, concrete and occasional ash.			(1.50)	1.00 1.50 2.00 1.00 - 2.00	D D D B			
	45.83		2.10					
Soft to firm orange brown sandy slightly silty CLAY. [LONDON CLAY FORMATION]. 4.30m: Silty mudstone.			(2.30)	2.10 - 2.60 2.60 3.00 3.00 - 3.45 3.50 4.00 4.00 - 4.45	U D D U D D U			28 blows 80% recovery. 20 blows 32 blows
Orange brown slightly sandy CLAY with shell fragments. [LONDON CLAY FORMATION].	43.53		4.40	4.50	D			
	43.13		(0.40) 4.80					
Light brown with grey mottling fissured slightly sandy CLAY, fissures are smooth. [LONDON CLAY FORMATION]. Between 5.00m and 5.50m: Olive brown clayey silty fine to coarse SAND, with a thin layer of weak sandstone.			(1.35)	5.00 5.00 - 5.45 5.50 6.00	D U D D			30 blows
	41.78		6.15	6.00 - 6.45	D	S	N=20	20 blows 1,2/4,5,5,6
Stiff becoming very stiff blue grey with red mottling slightly sandy CLAY with polished shear surfaces. [READING FORMATION].			(2.95)	7.00 7.00 - 7.45 7.50 8.00	D U D D			25 blows
Dense blue grey sandy CLAY to clayey SAND. [READING FORMATION].				8.50 9.00 8.00 - 9.00	D D B			
	38.83		9.10	9.00 - 9.45	U			60 blows No recovery.
Stiff becoming very stiff light brown with red mottling and grey streaks fine sandy CLAY with polished shear surfaces. [READING FORMATION].			(0.40)	9.00 - 9.50	B			
	38.43		9.50	9.50	D			
			(5.60)	10.00	D			

1. Standpipe installed to 26.50m.

Logged by
DH

Scale
1:50

Fig.

(c) Soil Mechanics 0 (or 8 1)

Soil Mechanics

Borehole No. 1673A/6F

Sheet 3 of 3

Type of installation Standpipe
Date of installation 07/03/00
Internal diameter of tubing 100 mm
Length of filter 4.30 m
Diameter of filter 150 mm

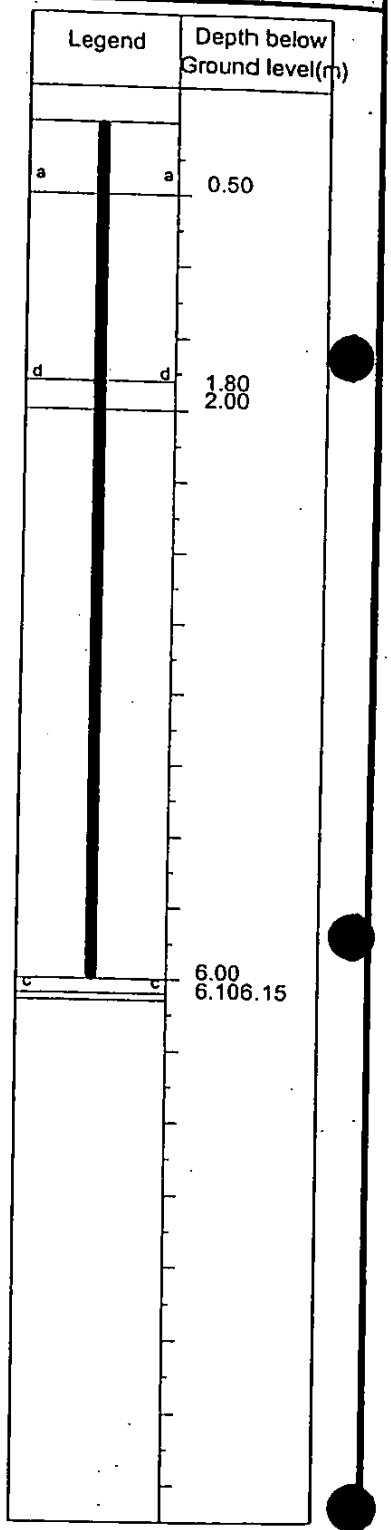
Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level | Coordinates | Date
As sheet 1

Depth (m) From	Depth (m) To	SUMMARY OF INSTALLATION
		Surface protection : Gas Barrel
0.00	0.50	Concrete
0.50	1.80	Bentonite seal
0.00	2.00	Plain pipe
6.00	6.00	Instrument tip
2.00	6.00	Slotted pipe
1.80	6.10	Gravel filter
6.10	6.15	Bentonite seal



Key

a Concrete
b Sand filter
c Gravel filter
d Bentonite seal
e Bentonite/cement grout
f Backfill

Ground level and coordinates as sheet 1

DETAILS OF INSTRUMENT

Soil Mechanics

Borehole No. 1673A/6F

Location No. 140502

Location

MANOR FARM READING

Carried out for

Thames Water Utilities Limited

Ground Level | Coordinates | Date

As sheet 1

Water Strike Table

Depth of Strike (m)	Casing Depth (m)	Date	Time	Post Strike Depth (m)	Minutes After Strike	Sealed at (m)	Remarks
4.60	4.50	07/03/00	08:00	4.10	5	-	
4.60	4.50	07/03/00	08:05	3.92	10	-	
4.60	4.50	07/03/00	08:10	3.00	15	-	
4.60	4.50	07/03/00	08:15	3.45	20	6.15	

Logged by

DH

Scale

1:50

Fig

Soil Mechanics

Borehole No. 1673A/6F

Sheet 1 of 3

Equipment & Methods
Hand dug inspection pit to 1.20m. Cable tool boring. 200mm dia to 4.50m. then 150mm dia to 6.00m.

Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level
47.77 m AOD

Coordinates

Date
07/03/00
to 07/03/00

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
MADE GROUND: Dessicated orange brown sandy CLAY with roots, flint and limestone chippings. At 0.60m: Dessicated light brown slighlty silty slightly clayey gravelly SAND. Gravel is fine sub rounded flint with brick, concrete and occasional ash.	47.77		(2.00)	1.00	D			
	45.77		2.00	2.00	D			
Orange brown sandy very silty CLAY. [LONDON CLAY FORMATION].			(2.40)	3.00	D			
				4.00	D			
Orange brown slightly sandy CLAY with shell fragments. [LONDON CLAY FORMATION].	43.37		4.40 (0.30)					
	43.07		4.70	5.00	D			
Light brown with grey mottling fissured slightly sandy CLAY, fissures are smooth. [LONDON CLAY FORMATION].			(1.45 pen)					
				6.00	D			
BOREHOLE ENDS AT 6.15 m.	41.62		6.15					

Pipe installed to a depth of 6.10m.

Logged by
DH

Scale
1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/5C

Sheet 5 of 5

pe of installation Standpipe
Date of installation 17/03/00
nternal diameter of tubing 100 mm
Length of filter 10.20 m
Diameter of filter 150 mm

Location No. 140502

Location

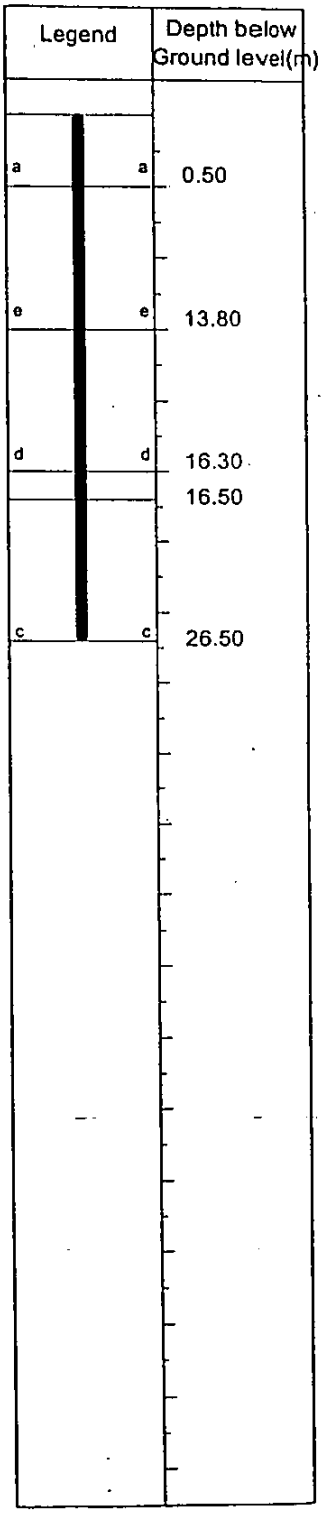
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level | Coordinates | Date

As sheet 1

Depth (m) From	Depth (m) To	SUMMARY OF INSTALLATION
		Surface protection : Lockable Top Cap
0.00	0.50	Concrete
0.50	13.80	Bentonite / Cement grout
13.80	16.30	Bentonite seal
0.00	16.50	Plain pipe
16.30	26.50	Gravel filter
26.50	26.50	Instrument tip
16.50	26.50	Slotted pipe



Key

- a Concrete
- b Sand filter
- c Gravel filter
- d Bentonite seal
- e Bentonite/cement grout
- f Backfill

rks

nd level and coordinates as sheet 1

DETAILS OF INSTRUMENT

Soil Mechanics

Borehole No. 1673A/5C

Sheet 4 of 5

Location No. 140502

Location

MANOR FARM READING

...t for
...s Water Utilities Limited

Ground Level	Coordinates	Date
	As sheet 1	

Water Strike Table

Depth of Strike (m)	Casing Depth (m)	Date	Time	Post Strike Depth (m)	Minutes After Strike	Sealed at (m)	Remarks
3.20	1.00	16/03/00	08:00	2.80	5	-	
3.20	1.00	16/03/00	08:05	2.60	10	-	
3.20	1.00	16/03/00	08:10	2.30	15	-	
3.20	1.00	16/03/00	08:15	2.10	20	-	

Logged by
DH

Scale
1:50

Soil Mechanics

Borehole No. 1673A/5C

Sheet 3 of 5

Equipment & Methods: As sheet 1

Location No. 140502

Location: MANOR FARM READING

Carried out for: Thames Water Utilities Limited

Ground Level: As sheet 1 | Coordinates: As sheet 1 | Date: As sheet 1

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
				20.50 - 20.95	D	7568	S N=25	4,5/5,6,7,7
Recovered as: Off white with greyey black mottled CHALK putty with chalk fragments. [UPPER CHALK].				22.50 - 22.95	U	7569		61 blows
23.40m to 23.70m: Flint.			(9.90 pen)					
24.20m to 24.70m: Flint.				24.50 - 24.95	B	7570		
				26.50 - 26.95	U	7571		81 blows
				27.00 - 27.45	D	7572	S N=36	4,9/9,9,8,10
BOREHOLE ENDS AT 27.50 m.	11.52		27.50					

Logged by: DH

Scale: 1:50

Fig

Soil Mechanics

Borehole No. 1673A/5C

Sheet 2 of 5

Equipment & Methods: As sheet 1

Location No. 140502

Location: MANOR FARM READING

Carried out for: Thames Water Utilities Limited

Ground Level | Coordinates | Date: As sheet 1

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
				10.00 - 10.10	D	10		
				11.00 - 11.10	D	11		
Sa[illegible]ne to medium SAND becoming black sand at 11.00m. At 12.00m - 13.00m black fine to medium sand with black fine gravel sized dense fiberous organic material.			(5.10)	12.00 - 12.10	D	12		
				13.00 - 13.10	D	13		
				14.00 - 14.10	D	14		
	24.52		14.50					
Soft silty CLAY with some chalk pieces.** [READING FORMATION].			(0.90)	15.00 - 15.10	D	15		
	23.62		15.40					
				15.50 - 15.95	U	16		31 blows
Medium dense light grey very chalky SAND with s[illegible]bands of clay.** [READING FORMATION].			(1.10)	16.00 - 16.10	D	16A		
	22.52		16.50					
Recovered as: Off white with greyey black mottled CHALK putty with chalk fragments and flint. [UPPER CHALK].			(1.10)	16.50 - 16.89	B	7566		
	21.42		17.60					
Recovered as: Off white with greyey black mottled CHALK putty with chalk fragments. [UPPER CHALK].			(9.90)	18.50 - 18.95	U	7567		50 blows

Logged by: DH

Scale: 1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/5C

Sheet 1 of 5

Methods
nd dug inspection pit to 1.20m. Cable tool boring, 250mm to 5.00m. then 200mm dia to 20m. then 150mm dia to 27.5m.

Location No. 140502

Location
MANOR FARM READING

rried out for
ames Water Utilities Limited

Ground Level
39.02 m AOD

Coordinates

Date
16/03/00
to 17/03/00

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
	39.02							
IADE GROUND: Dark brown very sandy CLAY with ne crete, brick, clinker and flint gravel.			(3.20)	1.00 - 1.10	D	1		
				2.00 - 2.10	D	2		
				3.00 - 3.10	D	3		
	35.82		3.20					
Grey fine to coarse angular to subrounded flint GRAVEL. [VALLEY GRAVEL].			(1.70)	4.00 - 4.10	D	4		
	34.12		4.90	5.00 - 5.10	D	5		
				6.00 - 6.10	D	6		
Grey fine to medium SAND. [READING FORMATION].			(3.00)	7.00 - 7.10	D	7		
	31.12		7.90	8.00 - 8.10	D	8		
Soft to firm red grey CLAY.** [READING FORMATION].			(1.50)	9.00 - 9.10	D	9		
	29.62		9.40					
Grey fine to medium SAND. [READING FORMATION].			(5.10)					

Remarks
1. Chiselling carried out between 16.5m to 17.6m, 23.4m and 23.7m and 24.2m and 24.7m.
2. 100mm standpipe installed to a depth of 26.50m.

Logged by
DH

Scale
1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/5R

Sheet 4 of 4

e of installation Standpipe
e of installation 19/03/00
rnal diameter of tubing 100 mm
gth of filter 7.20 m
meter of filter 150 mm

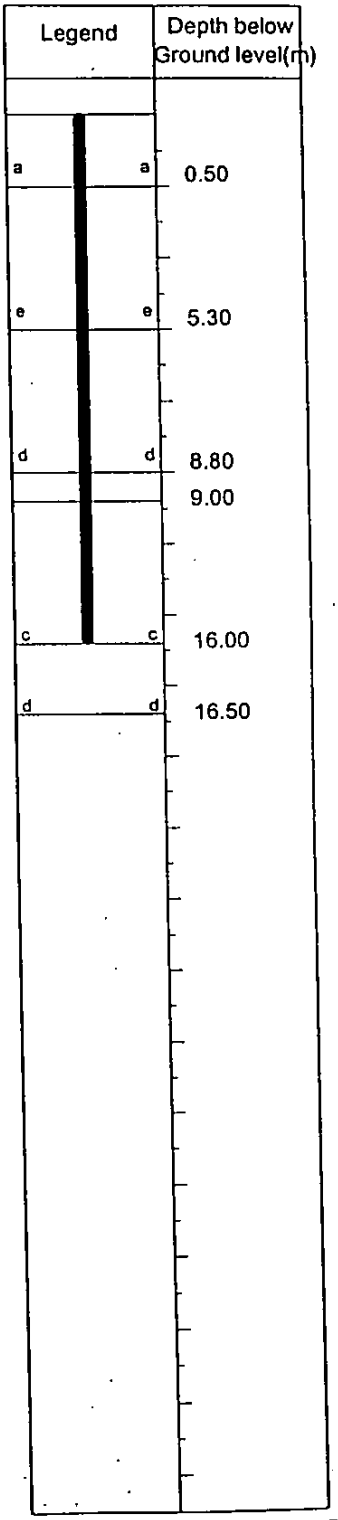
Location No. 140502

Location
MANOR FARM READING

led out for
mes Water Utilities Limited

Ground Level	Coordinates	Date
	As sheet 1	

Depth (m) From	Depth (m) To	SUMMARY OF INSTALLATION
		Surface protection : Lockable Top Cap
0.00	0.50	Concrete
0.50	5.30	Bentonite / Cement grout
5.30	8.80	Bentonite seal
0.00	9.00	Plain pipe
8.80	16.00	Gravel filter
.00	16.00	Instrument tip
9.00	16.00	Slotted pipe
16.00	16.50	Bentonite seal



Key

a	Concrete	d	Bentonite seal
b	Sand filter	e	Bentonite/cement grout
c	Gravel filter	f	Backfill

emarks
ound level and coordinates as sheet 1

DETAILS OF INSTRUMENT

Soil Mechanics

Borehole No. 1673A/5R

Location No. 140502

Location

MANOR FARM READING

Carried out for

Thames Water Utilities Limited

Ground Level | Coordinates | Date

As sheet 1

Water Strike Table

Depth of Strike (m)	Casing Depth (m)	Date	Time	Post Strike Depth (m)	Minutes After Strike	Sealed at (m)	Remarks
3.70	3.50	18/03/00	06:00	3.60	5	-	
3.70	3.50	18/03/00	06:05	3.40	10	-	
3.70	3.50	18/03/00	06:10	3.40	15	-	
3.70	3.50	18/03/00	06:15	3.40	20	-	
5.30	4.40	18/03/00	07:00	4.80	5	-	
5.30	4.40	18/03/00	07:05	4.40	10	-	
5.30	4.40	18/03/00	07:10	4.10	15	-	
5.30	4.40	18/03/00	07:15	4.00	20	-	

Logged by DH

Scale 1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/5R

Sheet 2 of 4

ipment & Methods: As sheet 1

Location No. 140502

Location: MANOR FARM READING

rled out for: ames Water Utilities Limited

Ground Level | Coordinates | Date: As sheet 1

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
				10.00 - 10.45	B	7582	C N=28	3,3/6,6,7,9
				11.40 - 11.85	B	7583	C N=35	4,8/8,8,11,8
rey fine to medium SAND becoming black sand at 1.0								
2.00m to 13.00m black fine to medium sand with ack fine gravel sized dense fiberous organic aterial, possibly lignite.			(5.10)	12.50 - 12.95	D	7590	S N=62	6,18/21,27,2,12
				12.50 - 13.00	B	7591		
				13.50 - 13.91	D	7592	S 50	4,6/8,12,16,14 for 35mm
				13.50 - 14.00	B	7593		
	24.46		14.50	14.50 - 14.95	D	7594	S N=21	3,3/4,4,5,8
				14.50 - 15.00	B	7597		
lue silty CLAY with some chalk and green sand. READING FORMATION].			(1.60)					
				15.50 - 15.95	U	7598		63 blows 70
	22.86		16.10					
ecovered as: Off white with greyey black ottled CHALK putty with chalk fragments. UPPER CHALK].			(0.90 pen)	16.50 - 16.95	D	7599	S N=13	2,4/3,3,4,3
ORSHOLE ENDS AT 17.00 m.	21.96		17.00					

Logged by: DH

Scale: 1:50

(c) Soil Mechanics (Ver 6.1)

Fig.

Soil Mechanics

Borehole No. 1673A/5R

Sheet 1 of 4

Equipment & Methods
Hand dug inspection pit to 1.20m. Cable tool boring, 250mm dia. to 3.50m, then 200mm dia. to 5.30m, then 150mm to 31.50m.

Location No. 140502
Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level
38.96 m AOD

Coordinates

Date
18/03/00 to 19/03/00

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
	38.96							
MADE GROUND: Dark brown very sandy CLAY with some concrete, brick, clinker and flint gravel.				1.00 - 1.10	D	1		
Firm: Soft grey brown slightly sandy CLAY with some fine gravel of brick.			(3.40)	2.00 - 2.10	D	2		
				3.00 - 3.10	D	3		
	35.56		3.40					
Medium dense grey fine to coarse angular to subrounded GRAVEL of flint with some medium and coarse sand. [VALLEY GRAVEL].			(1.50)	3.40 - 3.85	B	7573	C N=26	4,6/6,7,6,7
				4.40 - 4.85	B	7574	C N=29	2,4/5,6,7,11
	34.06		4.90	4.90 - 5.10	B	7575		
				4.90 - 5.35	U	7576		38 blows
				5.35 - 5.50	D	7577		
Dense dark grey slightly silty fine to medium SAND, with occasional fine to medium flint gravel. [READING FORMATION].			(3.00)	6.00 - 6.45	B	7578	C N=33	4,7/7,8,9,9
				7.00 - 7.45	B	7579	C N=33	2,4/6,11;6,10
	31.06		7.90					
Stiff mottled olive brown grey silty CLAY with occasional pockets of sand. (Driller records reddish grey clay). [READING FORMATION].			(1.50)	8.00 - 8.45	U	7580		61 blows
				8.80 - 9.30	B	7581		
Medium dense becoming very dense grey fine to medium SAND with occasional fine flint gravel. [READING FORMATION].	29.56		9.40					
			(5.10)					

100mm standpipe installed to a depth of 16.00m.

Logged by
DH

Scale
1:50

Notes:

(c) Soil Mechanics (Ver 6.1)

Fig.

Soil Mechanics

Borehole No. 1673A/5G

Sheet 3 of 3

e of installation Standpipe
e of Installation 20/03/00
mal diameter of tubing 100 mm
gth of filter 2.10 m
meter of filter 150 mm

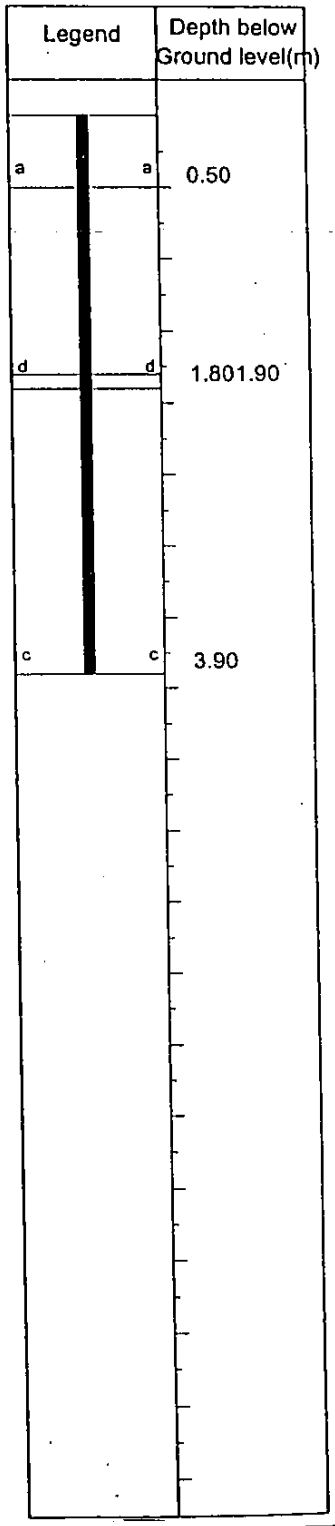
Location No. 140502

Location
MANOR FARM READING

ed out for
mes Water Utilities Limited

Ground Level	Coordinates	Date
	As sheet 1	

Depth (m) From	Depth (m) To	SUMMARY OF INSTALLATION
		Surface protection : Lockable Top Cap
0.00	0.50	Concrete
0.50	1.80	Bentonite seal
0.00	1.90	Plain pipe
1.80	3.90	Gravel filter
1.90	3.90	Slotted pipe
	3.90	Instrument tip



Key

a	Concrete	d	Bentonite seal
b	Sand filter	e	Bentonite/cement grout
c	Gravel filter	f	Backfill

Remarks
1. Ground level and coordinates as sheet 1

DETAILS OF INSTRUMENT

Soil Mechanics

Borehole No. 1673A/5G

Sheet 1 of 3

ment & Methods
Hand dug inspection pit to 1.20m. Cable tool boring, 200mm dia to 4.90m. then 150mm dia to 5.00m.

Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level
38.78 m AOD

Coordinates

Date
20/03/00
to 20/03/00

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
	38.78							
MADE GROUND: Dark brown very sandy CLAY with fine concrete, brick, clinker and flint gravel.			(2.40)	1.00 - 1.10	D	1		
				2.00 - 2.10	D	2		
MADE GROUND: Soft grey brown slightly sandy CLAY with gravel of fine brick.	36.38		2.40					
			(0.40)					
	35.98		2.80					
Grey fine to coarse angular to subrounded flint GRAVEL. [VALLEY GRAVEL].			(2.10)	3.00 - 3.10	D	3		
				4.00 - 4.10	D	4		
Stiff dark grey very sandy CLAY. Sand is fine. [READING FORMATION].								
	33.88		4.90	4.90 - 5.00	D	5		
BOREHOLE ENDS AT 5.00 m.	33.78		(0.10p) 5.00					

...n 1.40m and 2.40m.
...lled to a depth of 3.90m.

Logged by
DH

Scale
1:50

(c) Soil Mechanics (Ver 6.1)

Fig.

Soil Mechanics

Borehole No. 1673A/5F

Sheet 2 of 2

Type of installation Standpipe
Date of installation 20/03/00
Internal diameter of tubing 100 mm
Length of filter 1.70 m
Diameter of filter 200 mm

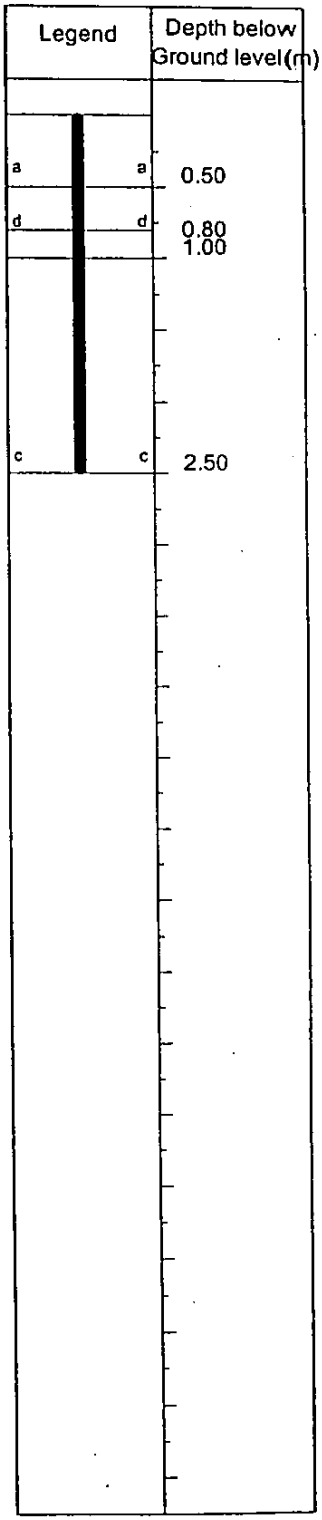
Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level | Coordinates | Date
As sheet 1

Depth (m) From	Depth (m) To	SUMMARY OF INSTALLATION
		Surface protection : Lockable Top Cap
0.00	0.50	Concrete
0.50	0.80	Bentonite seal
0.00	1.00	Plain pipe
0.80	2.50	Gravel filter
1.00	2.50	Slotted pipe
2.50	2.50	Instrument tip



Key

a	Concrete	d	Bentonite seal
b	Sand filter	e	Bentonite/cement grout
c	Gravel filter	f	Backfill

Level and coordinates as sheet 1

DETAILS OF INSTRUMENT

Soil Mechanics

Borehole No. 1673A/5F

Sheet 1 of 2

Equipment & Methods
Hand dug inspection pit to 1.20m. Cable tool boring, 200mm dia to 2.60m.

Location No. 140502
Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level
38.71 m AOD

Coordinates

Date
20/03/00
to 20/03/00

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample: Type	Sample: No.	Test	Field Records
	38.71							
MADE GROUND: Dark brown very sandy CLAY with fine concrete, brick, clinker and flint gravel.			(2.50)	1.00 - 1.10	D	1		
MADE GROUND : Soft grey brown slightly sandy CLAY with gravel of fine brick.				2.00 - 2.10	D	2		
	36.21		2.50	2.50 - 2.60	D	3		
BOREHOLE ENDS AT 2.60 m.	36.11		(0.10p) 2.60					

Remarks
1. 100mm standpipe installed to 2.60m.

Logged by
DH

Scale
1:50

Notes:
Materials

(c) Soil Mechanics (Ver 6.1)

Fig.

Soil Mechanics

Borehole No. 1673A/4R

Sheet 5 of 5

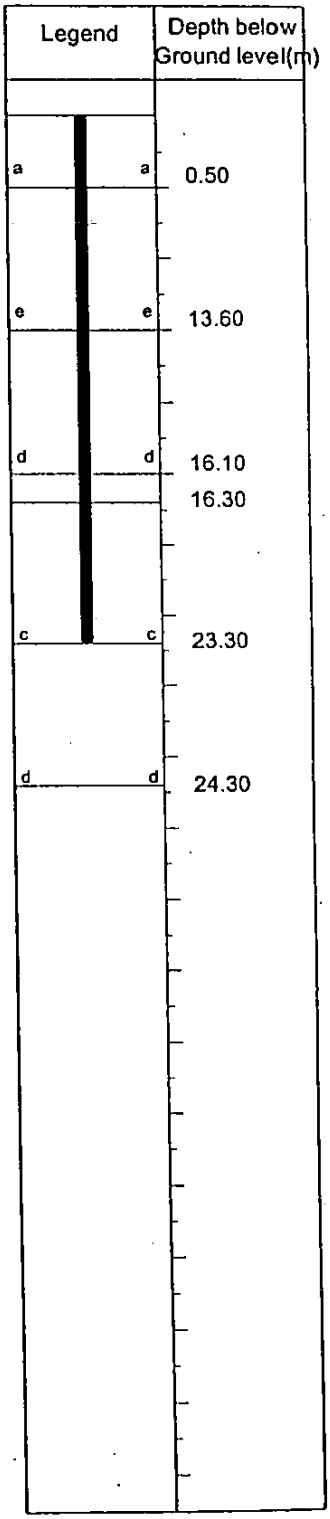
Type of installation Standpipe
Date of installation 15/03/00
Internal diameter of tubing 100 mm
Length of filter 7.20 m
Diameter of filter 150 mm

Location No. 140502
Location MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level | Coordinates | Date
As sheet 1

Depth (m) From	Depth (m) To	SUMMARY OF INSTALLATION
		Surface protection : Stopcock Cover
0.00	0.50	Concrete
0.50	13.60	Bentonite/cement grout
13.60	16.10	Bentonite seal
0.00	16.30	Plain pipe
16.10	23.30	Gravel filter
23.30	23.30	Instrument tip
16.30	23.30	Slotted pipe
23.30	24.30	Bentonite seal



Key

- a Concrete
- b Sand filter
- c Gravel filter
- d Bentonite seal
- e Bentonite/cement grout
- f Backfill

Remarks
1 Ground level and coordinates as sheet 1

DETAILS OF INSTRUMENT

Soil Mechanics

Borehole No. 1673A/4R

Location No. 140502

Location MANOR FARM READING

rried out for
ames Water Utilities Limited

Ground Level | Coordinates | Date

As sheet 1

Water Level Observations During Boring					
Date	Time	Depth of Hole (m)	Depth of Casing (m)	Depth to Water (m)	Remarks
08/03/00 09/03/00		9.00 20.00	9.00 20.00	6.40 14.65	

Water Strike Table							
Depth of Strike (m)	Casing Depth (m)	Date	Time	Post Strike Depth (m)	Minutes After Strike	Sealed at (m)	Remarks
3.50 16.50	3.00 14.50	07/03/00 08/03/00	- -	2.34 13.52	20 20	4.00 -	

Logged by
DH

Scale
1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/4R

Sheet 3 of 5

Equipment & Methods	As sheet 1
Location No.	140502
Location	MANOR FARM READING
Carried out for	ames Water Utilities Limited
Ground Level	
Coordinates	As sheet 1
Date	

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
				20.00	D	7968		
				20.50	D	7966		
s previous description.				21.00	D	7965	S	
: 22.00m: with occasional black fine flint agments				21.00 - 21.45	D		N=53	5,5/9,11,33,- No recovery.
				21.00 - 21.50	B	7964		
			(6.90)					
				22.00	D	7963		
				22.50	D	7962		
lue grey very sandy coarse GRAVEL with obbles. Sand is medium to coarse. Gravel is ounded smooth black flint. READING FORMATION].				23.00	D	7961		
	24.96		23.40	23.50	D	7960		
'ery stiff blue grey very sandy slightly ravelly thinly laminated CLAY with shells. READING FORMATION].	24.76		(0.20) 23.60					
			(0.70)	24.00	D	7959		
				24.00 - 24.45	D		S N=54	9,9/15,17,22,-
Stiff off white with green mottling putty CHALK. [UPPER CHALK].	24.06		24.30					
	23.86		(0.20p) 24.50					
BOREHOLE ENDS AT 24.50 m.								

Logged by: DH

Scale: 1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/4R

Sheet 2 of 5

ment & Methods

As sheet 1

Location No. 140502

Location

MANOR FARM READING

Carried out for

Thames Water Utilities Limited

Ground Level | Coordinates | Date

As sheet 1

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
				10.00	D		S	
				10.00 - 10.45	D		N=42	4,7/7,9,11,15
				10.00 - 10.50	B			
				11.00	D		S	
				11.00 - 11.45	D		N=53	5,6/12,19,22,-
				11.00 - 11.50	B			
As previous description.			(4.10)	12.00	D		S	
				12.00 - 12.45	D		N=46	7,10/21,25,-,-
				12.00 - 12.50	B			
				13.00	D		S	
				13.00 - 13.45	D		N=50	7,11/18,16,16,-
				13.00 - 13.50	B			
				14.00	D			
	34.26		14.10	14.00 - 14.45	D		S N=46	5,5/9,16,21,-
				14.50	D			
Very stiff blue grey very closely fissured CLAY. [READING FORMATION].			(1.50)					
				15.00	D			
				15.00 - 15.45	U			60 blows 85% recovery.
				15.50	D			
	32.76		15.60					
stiff blue grey very sandy CLAY. Sand is [READING FORMATION].			(0.90)	16.00	D			
				16.00 - 16.45	U			55 blows
	31.86		16.50	16.50	D			
				17.00 - 18.00	D	7972		
Dense to very dense blue grey fine to medium SAND. [READING FORMATION].			(6.90)	18.00 - 18.45	D		S	11,17/-,-,-,- N = 50
				19.00	D	7970		
				19.50	D	7969		
				20.00	D	7968		

Logged by DH

Scale 1:50

Fig.

Soil Mechanics

Borehole No. 1673A/4R

Sheet 1 of 5

Equipment & Methods
Hand dug inspection pit to 1.20m. Cable tool boring, 200mm dia to 4.00m. then 150mm dia to 24.50m.

Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level
48.36 m AOD

Coordinates

Date
07/03/00
to 09/03/00

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
MADE GROUND: firm dark brown very sandy slightly gravelly CLAY. Gravel is fine to medium subangular flint.	48.36		(0.30)					
	48.06		0.30	0.50	D			
			(0.65)					
MADE GROUND: Dark brown friable sandy CLAY.	47.41		0.95	1.00	D			
				1.00	D			
0.25m: Friable brown slightly sandy clayey GRAVEL. Gravel is fine to coarse angular to rounded brick, flint and concrete. Sand is coarse.			(0.85)	1.50	D			
	46.56		1.80					
MADE GROUND: Firm dark brown slightly sandy CLAY with brick and clinker fragments.			(0.60)	2.00	D			
				2.00	D			
				2.00 - 2.45	U			25 blows
	45.96		2.40	2.50	D			
Firm becoming stiff light orange brown sandy CLAY with occasional flint gravel. [LONDON CLAY FORMATION].			(1.50)	3.00	D			
				3.00	D			
				3.00 - 3.45	U			28 blows
Medium dense brown clayey SAND with occasional weak ironstone fragments. [LONDON CLAY FORMATION].				3.50	D			
	44.46		3.90	4.00	D			
				4.00	D	S		
Firm orange brown very sandy CLAY. Sand is medium to coarse with occasional fine gravel. Becoming firm slightly sandy CLAY. [LONDON CLAY FORMATION].			(1.00)	4.00 - 4.45	D		N=13	2,1/2,3,4,4
				4.50	D			
	43.46		4.90	5.00	D			
Very stiff dark grey fissured slightly fine sandy CLAY with occasional fragmented shells. [LONDON CLAY FORMATION].			(0.50)	5.00	D			
				5.00 - 5.45	U			30 blows
	42.96		5.40	5.50	D			
Very stiff brown with reddish grey mottling [illegible]ly fissured CLAY with silty sandy laminations. [READING FORMATION].			(1.20)	6.00	D			
				6.00	D			
				6.00 - 6.45	U			60 blows
				6.50	D			
	41.76		6.60					
Stiff yellowish brown with grey mottling, very sandy CLAY with fine sandy grey pockets. [READING FORMATION].			(0.70)	7.00	D			
				7.00	D			
	41.06		7.30					
			(0.40)	7.50	D			
Medium dense becoming dense orange brown medium SAND with occasional fine to medium ironstone [illegible] [READING FORMATION].	40.66		7.70	7.70	D			
				8.00	D			
				8.00 - 8.45	U			95% recovery.
[illegible] mottled grey, olive, red silty sandy [illegible] layers of fine to coarse sand. [illegible] FORMATION].			(1.40)	8.50	D			
				9.00	D			
	39.26		9.10					
[illegible] dense yellow brown fine to medium [illegible] DING FORMATION].			(0.90)					
	38.36		10.00	10.00	D			

[illegible] installed to 23.30m.
[illegible]ing sands.

Logged by
DH

Scale
1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/4F

Sheet 2 of 2

[redacted] of installation Standpipe
[redacted] of installation 10/03/00
Internal diameter of tubing 100 mm
Length of filter 2.50 m
Diameter of filter 200 mm

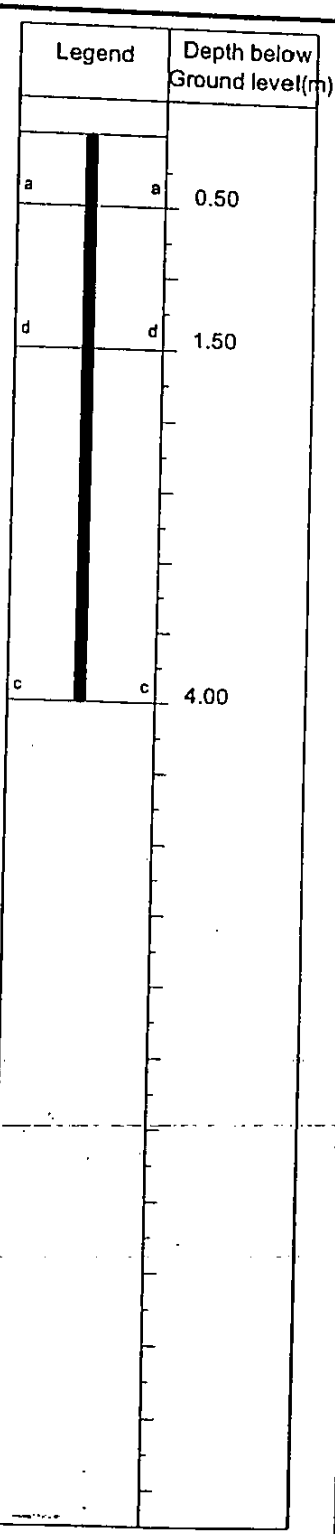
Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level | Coordinates | Date
As sheet 1

Depth (m) From	Depth (m) To	SUMMARY OF INSTALLATION
		Surface protection : Stopcock Cover
0.00	0.50	Concrete
0.50	1.50	Bentonite seal
0.00	1.50	Plain pipe
1.50	4.00	Gravel filter
4.00	4.00	Instrument tip
[redacted]50	4.00	Slotted pipe



Key

a	Concrete	d	Bentonite seal
b	Sand filter	e	Bentonite/cement grout
c	Gravel filter	f	Backfill

Remarks
1: Ground level and coordinates as sheet 1

DETAILS OF INSTRUMENT

Soil Mechanics

Borehole No. 1673A/4F

Sheet 1 of 2

nt & Methods
inspection pit to 1.20m. Cable tool boring, 200mm
0m.

Location No. 140502

Location
MANOR FARM READING

ent for
S Water Utilities Limited

Ground Level
48.36 m AOD

Coordinates

Date
10/03/00
to 10/03/00

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
GROUND: Firm dark brown very sandy gravelly CLAY. Gravel is fine to m subangular flint.	48.36		(0.30)					
	48.06		0.30					
			(1.50)	1.00	D			
GROUND: Firm dark brown slightly sandy with brick and clinker fragments								
	46.56		1.80					
ght range brown sandy CLAY. DO[LAY FORMATION].			(0.50)	2.00	D			
	46.06		2.30					
m dense clayey SAND. DON CLAY FORMATION].			(1.70)	3.00	D			
rown with reddish grey mottling closely ed CLAY with laminations of silty sandy. DING FORMATION].	44.36		4.00	4.00	D			
	44.26		(0.10p)					
EHOLE ENDS AT 4.10 m.			4.10					

lled to 4.00m.

Logged by
DH

Scale
1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/3R

Sheet 4 of 4

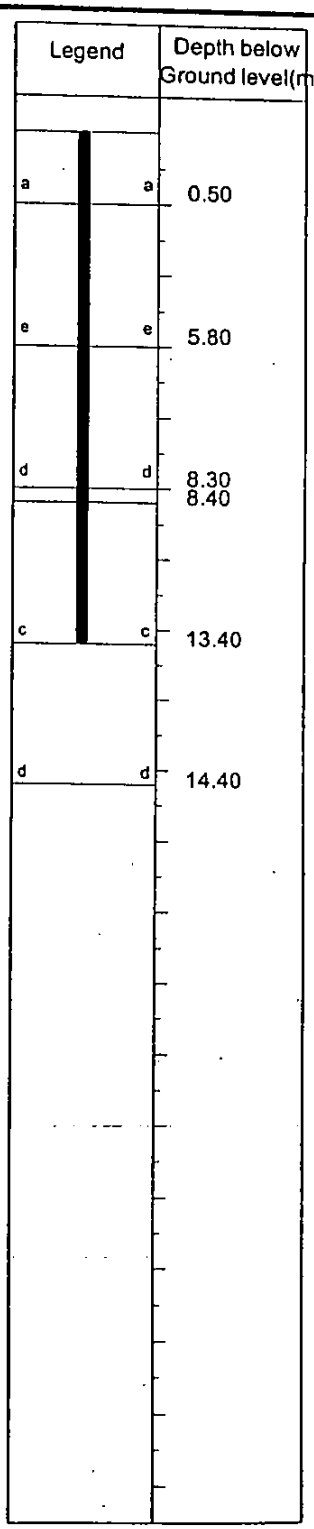
a [redacted]stallation Standpipe
e of installation 03/03/00
nal diameter of tubing 100 mm
gth of filter 5.10 m
neter of filter 200 mm

Location No. 140502
Location
MANOR FARM READING

ed out for
mes Water Utilities Limited

Ground Level | Coordinates | Date
As sheet 1

Depth (m) From	Depth (m) To	SUMMARY OF INSTALLATION
		Surface protection : Stopcock Cover
0.00	0.50	Concrete
0.50	5.80	Bentonite/cement grout
5.80	8.30	Bentonite seal
0.00	8.40	Plain pipe
[redacted]	13.40	Gravel filter
13[redacted]	13.40	Instrument tip
8.40	13.40	Slotted pipe
13.40	14.40	Bentonite seal



y :

a	Concrete	d	Bentonite seal
b	Sand filter	e	Bentonite/cement grout
c	Gravel filter	f	Backfill

marks
Ground level and coordinates as sheet 1

DETAILS OF INSTRUMENT

Soil Mechanics

Borehole No. 1673A/3R

Sheet 3 of 4

Location No. 140502

Location

MANOR FARM READING

out for
ies Water Utilities Limited

Ground Level | Coordinates | Date

As sheet 1

Water Strike Table

Depth of Strike (m)	Casing Depth (m)	Date	Time	Post Strike Depth (m)	Minutes After Strike	Sealed at (m)	Remarks
3.50	3.50	01/03/00	08:00	3.30	5	-	
3.50	3.50	01/03/00	08:05	3.10	10	-	
3.50	3.50	01/03/00	08:10	3.00	15	-	
3.50	3.50	01/03/00	08:15	3.00	20	-	

Logged by DH

Scale 1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/3R

Sheet 2 of 4

ment & Methods: As sheet 1

Location No. 140502

Location: MANOR FARM READING

Carried out for: Thames Water Utilities Limited

Ground Level | Coordinates: As sheet 1 | Date

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
				11.00 - 11.45	B	7166	C N=50	10,8/11,14,16,9
As previous description.			(5.80)					
				12.00 - 12.45	D	7167	S N=38	6,8/7,10,10,11 Water added.
				12.50 - 13.00	B	7168		
				13.00 - 13.45	S	7169	S N=32	3,4/7,7,8,10 Water added.
Soft to firm green grey very sandy glauconitic CLAY with occasional angular cobbles of flint, with white fossil fragments. [READING FORMATION].	25.47		13.80	13.80 - 14.25	U	7170		
			(0.50)	13.80 - 14.25	B	7171	C N=50	8,10/11,14,16,9 Water added.
	24.97		14.30	14.30 - 14.45	D	7172		
Off white structureless putty CHALK with flints. [UPPER CHALK].	24.77		(0.20) 14.50	14.40 - 14.85	D	7173	S N=15	3,4/5,4,3,3 Water added.
CHALK. [UPPER CHALK].			(0.90 pen)					
BOREHOLE ENDS AT 15.40 m.	23.87		15.40					

Logged by: DH

Scale: 1:50

(c) Soil Mechanics (Ver 6.1)

Fig.

Soil Mechanics

Borehole No. 1673A/3R

Sheet 1 of 4

Equipment & Methods
Hand dug inspection pit to 1.20m. Cable tool boring, 250mm dia. to 3.00m, then 200mm dia. to 15.40m.

Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level
39.27 m AOD

Coordinates

Date
01/03/00
to 02/03/00

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample: Type	Sample: No.	Test	Field Records
MADE GROUND: Topsoil, brick and clay fill with some gravel.	39.27		(0.40)					
	38.87		0.40					
Firm brown slightly sandy slightly gravelly CLAY. Gravel is fine subangular to subrounded flint. [ALLUVIUM].				1.00	D	1		
2.00m: Firm brown with black mottling slightly sandy slightly gravelly organic CLAY. Gravel is fine rounded to subrounded.			(2.90)	2.00 - 2.10	D	2		
3.( )m: Becoming soft.				3.00 - 3.10	D	3		
	35.97		3.30					
				3.30 - 3.80	B	4		
				4.00 - 4.10	D	5		
				4.50 - 5.00	B	6		
Light brown very sandy slightly silty GRAVEL. [VALLEY GRAVEL].				5.00 - 5.50	D	7		
			(4.60)					
				6.00 - 6.10	D	9		
				6.00 - 6.50	B	8		
				7.00 - 7.10	D	11		
Firm to stiff dark grey fissured CLAY with bands of sand. [READING FORMATION].				7.50 - 8.00	B	10		
	31.37		7.90					
	31.27		(0.10)					
			8.00	8.00 - 8.45	B	7162	C N=29	8,10/8,4,7,10
Medium dense becoming dense grey fine to medium SAND with a little coarse sand and occasional fine to medium flint gravel. [READING FORMATION].				8.50 - 8.60	D	7163		
				8.80 - 9.25	D	7164	S N=37	3,4/6,8,11,12
			(5.80)					
				9.50 - 9.95	B	7165	C N=48	4,6/5,11,16,16

Remarks
100mm standpipe installed to a depth of 13.40m.

Logged by
DH

Scale
1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/3G

Sheet 3 of 3

Type of installation Standpipe
Date of installation 28/02/00
Internal diameter of tubing 100 mm
Length of filter 4.60 m
Diameter of filter 200 mm

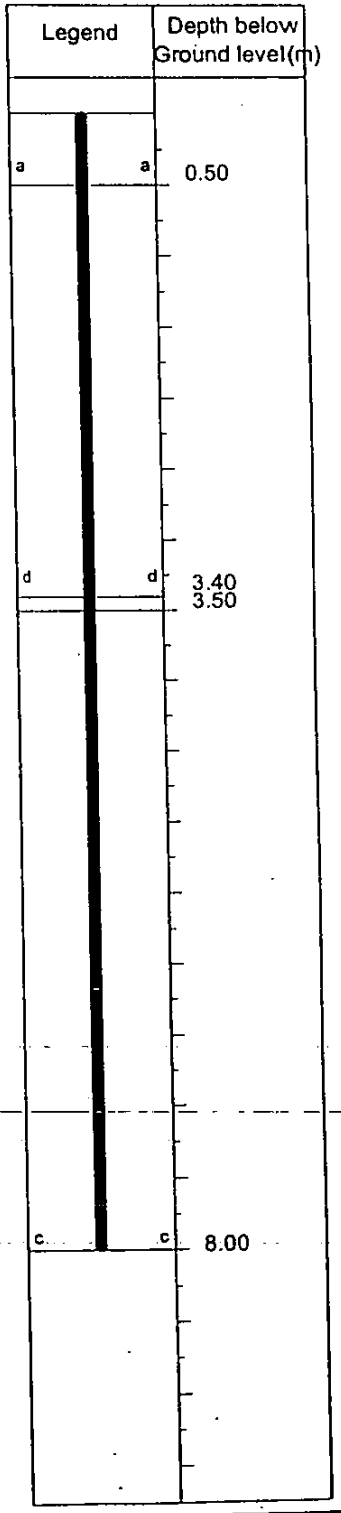
Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level | Coordinates | Date
As sheet 1

Depth (m) From	Depth (m) To	SUMMARY OF INSTALLATION
		Surface protection : Stopcock Cover
0.00	0.50	Concrete
0.50	3.40	Bentonite seal
0.00	3.50	Plain pipe
3.40	8.00	Gravel filter
8.00	8.00	Instrument tip
3.50	8.00	Slotted pipe



Key

a	Concrete	d	Bentonite seal
b	Sand filter	e	Bentonite/cement grout
c	Gravel filter	f	Backfill

d level and coordinates as sheet 1

DETAILS OF INSTRUMENT

Soil Mechanics

Borehole No. 1673A/3G

Location No. 140502

Location

MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level | Coordinates | Date

As sheet 1

Water Level Observations During Boring					
Date	Time	Depth of Hole (m)	Depth of Casing (m)	Depth to Water (m)	Remarks
29/02/00	07:15	3.60	3.60	3.40	

Logged by
DH

Scale
1:50

Fig.

Soil Mechanics

Borehole No. 1673A/3G

Sheet 1 of 3

Equipment & Methods
Hand dug inspection pit to 1.20m. Cable tool boring, 250mm dia to 1.50m. then 200mm dia to 8.00m.

Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level
39.38 m AOD

Coordinates

Date
28/02/00
to 29/02/00

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample: Type	Sample: No.	Test	Field Records
MADE GROUND: Topsoil.**	39.38		(0.20)					
MADE GROUND: Brick and clay fill.**	39.18		0.20 (0.40)					
	38.78		0.60	0.50 - 1.00	B	7151		
Soft to firm brown slightly sandy slightly gravelly CLAY. Gravel is fine subangular to subrounded flint. [ALLUVIUM].				1.20 - 1.70	B	7152		
2.00m: Soft to firm brown with black mottling slightly sandy slightly gravelly organic CLAY. Gravel is fine rounded to subrounded.			(2.80)	2.00 - 2.45	U	7153		10 blows
				2.45 - 2.60	D	7154		
3.00m: Becoming very soft silty CLAY.				3.00 - 3.45	U	7156		14 blows
	35.98		3.40	3.45 - 3.60	D	7157		
				3.60	W	1		
				3.60	W	2		
				3.80 - 4.25	B	7158	C N=5	1,2/1,2,1,1 Water Added.
Medium dense to dense light brown medium to coarse SAND and fine and medium flint GRAVEL. [VALLEY GRAVEL].								
5.00m: Medium and coarse SAND with much fine and medium flint gravel.				5.00 - 5.45	B	7159	C N=27	4,6/6,7,6,8
7.40m: Fine and medium SAND.			(4.40)					
				6.00 - 6.45	B	7160	C N=25	2,2/4,5,6,10
Firm becoming stiff dark grey fissured CLAY with sandy bands. [READING FORMATION].				7.00 - 7.45	B	7161	C N=36	4,8/7,8,11,10 Water Added.
	31.58		7.80	7.80	D	7162		
BOREHOLE ENDS AT 8.00 m.	31.38		(0.20p) 8.00					

Pipe installed to 8.00m.

Logged by
DH

Scale
1:50

Fig.

In accordance ...

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/2C

Sheet 5 of 5

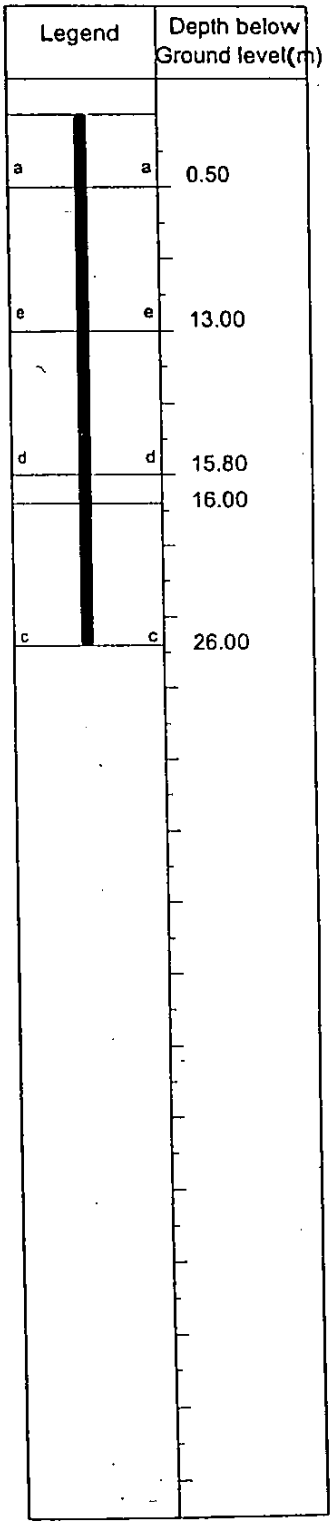
Type of Installation Standpipe
Date of Installation 10/03/00
Internal diameter of tubing 100 mm
Length of filter 10.20 m
Diameter of filter 150 mm

Location No. 140502
Location MANOR FARM READING

Carried out for Thames Water Utilities Limited

Ground Level | Coordinates | Date
As sheet 1

Depth (m) From	Depth (m) To	SUMMARY OF INSTALLATION
		Surface protection : Stopcock Cover
0.00	0.50	Concrete
0.50	13.00	Bentonite/cement grout
13.00	15.80	Bentonite seal
0.00	16.00	Plain pipe
15.80	26.00	Gravel filter
26.00	26.00	Instrument tip
16.00	26.00	Slotted pipe



Key

a	Concrete	d	Bentonite seal
b	Sand filter	e	Bentonite/cement grout
c	Gravel filter	f	Backfill

Remarks
1. Ground level and coordinates as sheet 1

DETAILS OF INSTRUMENT

Soil Mechanics

Borehole No. 1673A/2C

Location No. 140502

Location

MANOR FARM READING

Carried out for

Thames Water Utilities Limited

Ground Level | Coordinates | Date

As sheet 1

Water Strike Table

Depth of Strike (m)	Casing Depth (m)	Date	Time	Post Strike Depth (m)	Minutes After Strike	Sealed at (m)	Remarks
3.30	3.30	08/03/00	-	3.30	5	-	
3.30	3.30	08/03/00	-	3.20	10	-	
3.30	3.30	08/03/00	-	3.20	15	-	
3.30	3.30	08/03/00	-	3.20	20	-	
5.00	5.00	08/03/00	-	4.80	5	-	
5.00	5.00	08/03/00	-	4.60	10	-	
5.00	5.00	08/03/00	-	4.10	15	-	
5.00	5.00	08/03/00	-	4.10	20	-	

Remarks

Logged by DH

Scale 1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/2C

Sheet 3 of 5

Equipment & Methods: As sheet 1

Location No. 140502

Location: MANOR FARM READING

Carried out for: Thames Water Utilities Limited

Ground Level | Coordinates | Date: As sheet 1

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
As previous description.			(6.40)	21.50 - 21.95	S	22		
Recovered as: Off white with grey black mottled CHALK putty with chalk fragments and flint. [UPPER CHALK].	18.35		22.00	22.50 - 22.95	U	7199		71 blows
			(1.60)	22.95 - 23.10	D	7200		
FLINT.**	16.75		23.60 (0.30)					
	16.45		23.90					
Recovered as: Off white with grey black mottled CHALK putty with chalk fragments and flint. [UPPER CHALK].			(2.20 pen)	24.50 - 24.95	D	7201	S N=22	3,3/4,4,7,7
				25.50 - 25.95	U	7202		
BOREHOLE ENDS AT 26.10 m.	14.25		26.10	25.95 - 26.10	D	7203		

Soil Mechanics

Borehole No. 1673A/2C

Sheet 2 of 5

Equipment & Methods: As sheet 1

Location No. 140502

Location: MANOR FARM READING

Carried out for: Thames Water Utilities Limited

Ground Level | Coordinates: As sheet 1 | Date

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
				10.00 - 10.10	D	10		
As previous description.			(4.20)					
				11.00 - 11.10	D	11		
	29.05		11.30					
Stiff blue grey very sandy CLAY with occasional flint fragments. [READING FORMATION].			(1.40)	11.30 - 11.75 11.75 - 11.90 11.30 - 11.90	U D B	12 13 14		61 blows
	27.65		12.70	12.70 - 12.80	D	15		
Dense blue grey fine to medium SAND. [READING FORMATION].			(1.50)					
				13.70 - 13.80	D	16		
Soft to firm very silty CLAY. ** [READING FORMATION].	26.15		14.20					
	25.85		(0.30) 14.50	14.20 - 14.65	U	17		70 blows
Grey fine to medium SAND with occasional black flint. [READING FORMATION].			(0.60)	14.65 - 14.80	D	18		
	25.25		15.10					
Chalk and flints.** [UPPER CHALK].			(0.50)					
	24.75		15.60	15.50 - 15.95	B	19		
Recovered as: Off white with grey black mottled chalk putty with chalk fragments. [UPPER CHALK].			(6.40)	17.50 - 17.95	U	20		
				19.50 - 19.95	B	21		

Remarks

1. Water added and borehole kept full between 10.00m and 22.00m.
2. Chiselling carried out from 14.50m to 15.60m for 1.15hrs.

Logged by: DH

Scale: 1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/2C

Sheet 1 of 5

Equipment & Methods
Hand dug inspection pit to 1.20m. Cable tool boring, 250mm dia to 4.50m. then 200mm dia to 15.5m. then 150mm dia to 26.10m.

Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level
40.35 m AOD

Coordinates

Date
08/03/00
to 10/03/00

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
MADE GROUND: Concrete	40.35		(0.40)					
	39.95		0.40					
MADE GROUND: Firm dark brown very sandy CLAY with fine to coarse flint, brick and concrete, with rootlets.			(2.00)	1.00 - 1.10	D	1		
				2.00 - 2.10	D	2		
	37.95		2.40					
MADE GROUND: Loose ash with some clay.**			(1.00)	3.00 - 3.10	D	3		
	36.95		3.40					
Soft becoming firm grey very plastic organic CLAY with rootlets, organic odour. [ALLUVIUM].			(1.50)	4.00 - 4.10	D	4		
	35.45		4.90	5.00 - 5.10	D	5		
Medium dense very gravelly medium SAND. Gravel is subangular to subrounded fine to medium flint. [ALLEY GRAVEL].			(2.20)	6.00 - 6.10	D	6		
	33.25		7.10	7.00 - 7.10	D	7		
Medium dense grey fine to medium SAND becoming dense. [READING FORMATION].			(4.20)	8.00 - 8.10	D	8		
				9.00 - 9.10	D	9		

Remarks

1. Water added and borehole kept full between 5.00m to 10.00m.
2. 100mm diameter standpipe installed to 26.00m.
3. Chiselling was carried out between 23.6m and 23.9m for 1hr 15mins.

Logged by
DH

Scale
1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/2R

Sheet 3 of 4

Location No. 140502

Location

MANOR FARM READING

Carried out for

Thames Water Utilities Limited

Ground Level | Coordinates | Date

As sheet 1

Water Strike Table

Depth of Strike (m)	Casing Depth (m)	Date	Time	Post Strike Depth (m)	Minutes After Strike	Sealed at (m)	Remarks
3.70	3.00	07/03/00	-	3.60	-	-	
3.70	3.00	07/03/00	-	3.50	5	-	
3.70	3.00	07/03/00	-	3.50	10	-	
3.70	3.00	07/03/00	-	3.50	15	-	
5.10	3.00	07/03/00	-	3.50	20	-	
5.10	3.00	07/03/00	-	4.80	-	-	
5.10	3.00	07/03/00	-	4.70	5	-	
5.10	3.00	07/03/00	-	4.60	10	-	
5.10	3.00	07/03/00	-	4.60	15	-	
15.20	15.20	07/03/00	-	4.50	20	-	
15.20	15.20	07/03/00	-	15.20	-	-	
15.20	15.20	07/03/00	-	14.70	5	-	
15.20	15.20	07/03/00	-	14.10	10	-	
15.20	15.20	07/03/00	-	13.60	15	-	
				12.80	20	-	

Remarks

Logged by DH

Scale 1:50

Notes:

Materials are described in accordance with ...

(c) Soil Mechanics (Ver 6.1)

Fig.

Soil Mechanics

Borehole No. 1673A/2R

Sheet 4 of 4

Type of installation Standpipe
Date of installation 08/03/00
Internal diameter of tubing 100 mm
Length of filter 7.20 m
Diameter of filter 200 mm

Location No. 140502

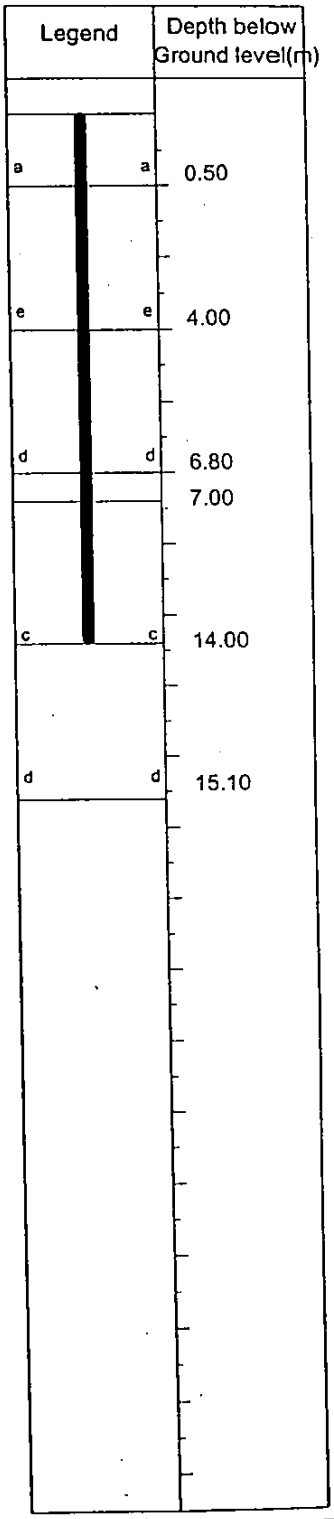
Location: MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level | Coordinates | Date

As sheet 1

Depth (m) From	Depth (m) To	SUMMARY OF INSTALLATION
		Surface protection : Stopcock Cover
0.00	0.50	Concrete
0.50	4.00	Bentonite/ cement grout
4.00	6.80	Bentonite seal
0.00	7.00	Plain pipe
6.80	14.00	Gravel Filter
14.00	14.00	Instrument tip
7.00	14.00	Slotted pipe
14.00	15.10	Bentonite seal



Key

- a Concrete
- b Sand filter
- c Gravel filter
- d Bentonite seal
- e Bentonite/cement grout
- f Backfill

Remarks

1. Ground level and coordinates as sheet 1

DETAILS OF INSTRUMENT

Soil Mechanics

Borehole No. 1673A/2R

Sheet 2 of 4

Equipment & Methods: As sheet 1

Location No. 140502

Location: MANOR FARM READING

Carried out for: Thames Water Utilities Limited

Ground Level | Coordinates | Date: As sheet 1

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
As previous description.			(4.00)	10.20 - 10.65	B	7225	C N=27	3,4/7,6,8,6
Firm olive brown sandy CLAY/SILT becoming very mottled olive grey brown and pale red sandy CLAY with some sandy patches. [READING FORMATION].	29.26		11.20	11.20 - 11.65	B	7224	C N=26	6,6/7,7,6,6
			(1.50)	12.20 - 12.70	U	7225		37 blows Recovery: 100
Dense blue grey fine to medium SAND. [READING FORMATION].	27.76		12.70	13.00 - 13.45	B	7207	C N=40	6,10/12,12,8,8
Very stiff dark grey silty very sandy CLAY with some green sand and occasional flint gravel. [READING FORMATION].	26.36		(1.40) 14.10	14.20 - 14.65	U	7208		51 blows
Grey fine to medium SAND with occasional black flint. [READING FORMATION].	26.06		(0.30) 14.40	14.50 - 15.00	B	7209		
Chalk putty. [UPPER CHALK].	25.26		(0.80) 15.20	15.20 - 15.65	B	7210	C N=15	3,3/4,3,4,4
BOREHOLE ENDS AT 15.70 m.	24.76		(0.50 pen) 15.70					

...m 14.4m to 15.2m.

Logged by: DH

Scale: 1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/2R

Sheet 1 of 4

Equipment & Methods
Hand dug inspection pit to 1.20m. Cable tool boring, 250mm to 3.0m. then 200mm dia to 15.20m.

Location No. 140502
Location MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level 40.46 m AOD
Coordinates
Date 07/03/00 to 08/03/00

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
MADE GROUND: firm dark brown very sandy CLAY with fine to coarse flint, brick, concrete, with rootlets.	40.46		(1.50)	0.50 - 1.00	B	7212		
				1.00 - 1.50	B	7213		
MADE GROUND: Soft black sandy organic CLAY with coarse sand and rootlets. (Driller notes loose ash).	38.96		1.50 (2.10)	2.00 - 2.50	B	7214		
				3.00 - 3.50	B	7215		
SAND with some gravel and clay.** [ALLUVIUM].	36.86		3.60 (0.30)					
Very soft becoming firm grey very plastic organic CLAY with rootlets, organic odour. [ALLUVIUM].	36.56		3.90 (1.20)	4.00 - 4.45	U	7216		21 blows Recovery: 100
				4.45 - 4.60	D	7217		
	35.36		5.10	5.10 - 5.20	D	7218		
Medium dense light brown very gravelly fine to medium and coarse SAND. Gravel is subangular to subrounded fine to coarse flint. [VALLEY GRAVEL].			(2.10)	5.20 - 5.65	B	7219	C N=18	2,2/4,4,6,4
				6.20 - 6.65	B	7220	C N=16	4,5/4,3,5,4
	33.26		7.20	7.20 - 7.65	B	7221	C N=51	8,10/10,11,14,16
Very dense becoming medium dense grey fine to medium SAND. [READING FORMATION].			(4.00)	8.20 - 8.65	B	7222	C N=50	4,6/11,16,18,5
				9.20 - 9.65	B	7223	C N=27	4,7/6,6,7,8

Remarks
1: Standpipe installed to 14.00m.

Logged by DH
Scale 1:50
Fig.

(c) Soil Mechanics (Ver 6.1)

described in accordance with ... 18/04/00 09:58:43

Soil Mechanics

Borehole No. 1673A/2G

Location No. 140502

Location

MANOR FARM READING

Carried out for

Thames Water Utilities Limited

Ground Level | Coordinates | Date

As sheet 1

Water Strike Table

Depth of Strike (m)	Casing Depth (m)	Date	Time	Post Strike Depth (m)	Minutes After Strike	Sealed at (m)	Remarks
3.30	1.00	10/03/00	-	3.20	5	-	
3.30	1.00	10/03/00	-	3.10	10	-	
3.30	1.00	10/03/00	-	3.10	15	-	
3.30	1.00	10/03/00	-	3.10	20	-	
4.90	1.00	10/03/00	-	4.40	5	-	
4.90	1.00	10/03/00	-	4.30	10	-	
4.90	1.00	10/03/00	-	4.10	15	-	
4.90	1.00	10/03/00	-	4.10	20	-	

Logged by DH

Scale 1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/2G

Sheet 3 of 3

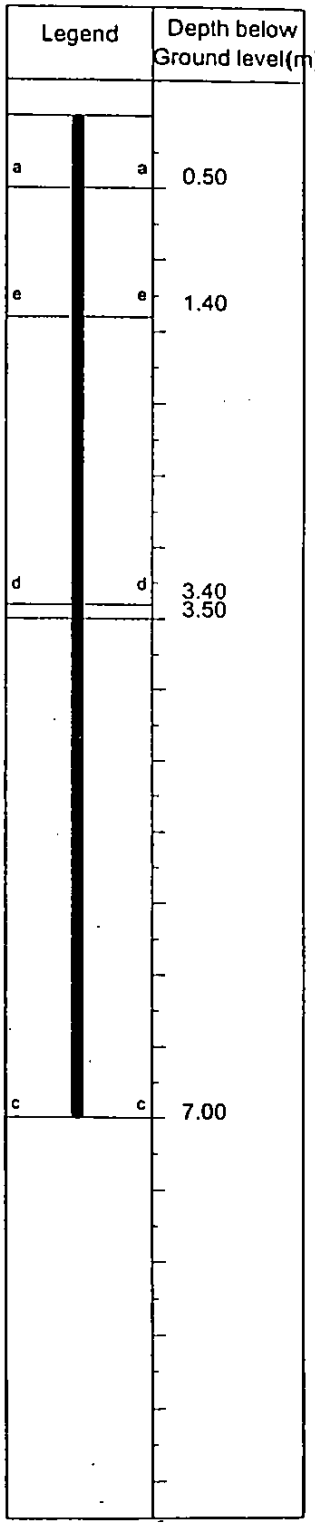
Type of installation Standpipe
Date of installation 10/03/00
Internal diameter of tubing 100 mm
Length of filter 3.60 m
Diameter of filter 150 mm

Location No. 140502
Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level | Coordinates | Date
As sheet 1

Depth (m) From	Depth (m) To	SUMMARY OF INSTALLATION
		Surface protection : Lockable Top Cap
0.00	0.50	Concrete
0.50	1.40	Bentonite / Cement grout
1.40	3.40	Bentonite seal
0.00	3.50	Plain pipe
3.40	7.00	Gravel filter
7.00	7.00	Instrument tip
3.50	7.00	Slotted pipe



Key

a	Concrete	d	Bentonite seal
b	Sand filter	e	Bentonite/cement grout
c	Gravel filter	f	Backfill

Remarks
1. Ground level and coordinates as sheet 1

DETAILS OF INSTRUMENT

Soil Mechanics

Borehole No. 1673A/2G

Sheet 1 of 3

Equipment & Methods
Hand dug inspection pit to 1.20m. Cable tool boring, 200mm dia to 3.10m, then 150mm dia to 8.00m.

Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level
40.40 m AOD

Coordinates

Date
10/03/00
to 10/03/00

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
MADE GROUND: Firm dark brown very sandy CLAY with fine to coarse flint, brick and concrete, with rootlets.	40.40		(2.80)	1.00 - 1.10	D	1		
				2.00 - 2.10	D	2		
MADE GROUND: Loose ash and clay fill material **	37.60		2.80 (0.60)	3.00 - 3.10	D	3		
Soft becoming firm grey very plastic organic CLAY with rootlets, organic odour. [ALLUVIUM].	37.00		3.40 (1.40)	4.00 - 4.10	D	4		
Medium dense very gravelly medium SAND. Gravel is subangular to subrounded fine to medium flint. [...EY GRAVEL].	35.60		4.80 (2.20)	4.80 - 4.90 5.00 - 5.10	D D	5 6		
				6.00 - 6.10	D	7		
Medium dense grey fine to medium SAND becoming dense. [READING FORMATION].	33.40		7.00 (0.10p)					
BOREHOLE ENDS AT 7.10.m.	33.30		7.10					

1. 150mm standpipe installed to a depth of 7.00m.

Logged by
DH

Scale
1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/2F

Sheet 3 of 3

Type of installation Standpipe
Date of installation 13/03/00
Internal diameter of tubing 100 mm
Length of filter 2.10 m
Diameter of filter 200 mm

Location No. 140502

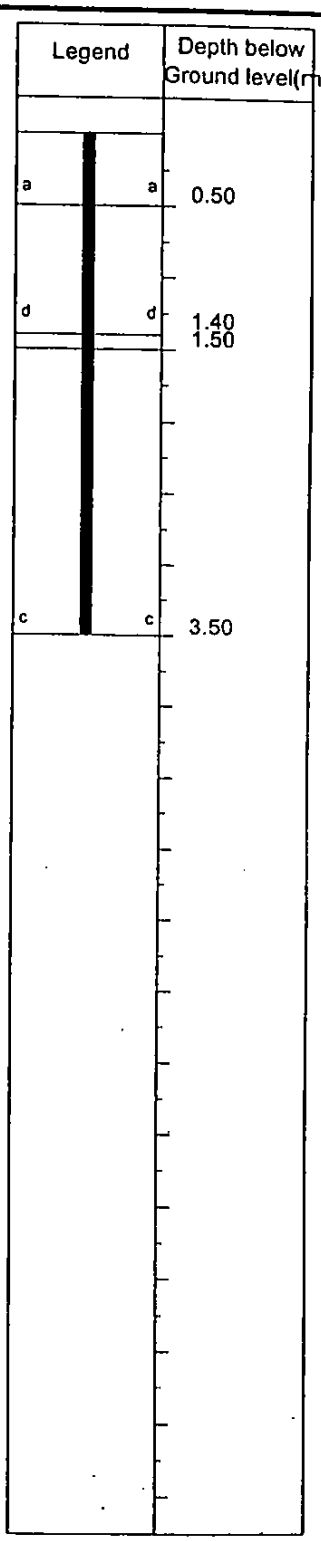
Location MANOR FARM READING

Carried out for Thames Water Utilities Limited

Ground Level | Coordinates | Date

As sheet 1

Depth (m) From	Depth (m) To	SUMMARY OF INSTALLATION
		Surface protection : Stopcock Cover
0.00	0.50	Concrete
0.50	1.40	Bentonite seal
0.00	1.50	Plain pipe
1.40	3.50	Gravel filter
3.50	3.50	Instrument tip
1.50	3.50	Slotted pipe



Key

a	Concrete	d	Bentonite seal
b	Sand filter	e	Bentonite/cement grout
c	Gravel filter	f	Backfill

Remarks

1. Ground level and coordinates as sheet 1

DETAILS OF INSTRUMENT

Soil Mechanics

Borehole No. 1673A/2F

Sheet 2 of 3

Location No. 140502

Location

MANOR FARM READING

rried out for
names Water Utilities Limited

Ground Level | Coordinates | Date

As sheet 1

Water Strike Table

Depth of Strike (m)	Casing Depth (m)	Date	Time	Post Strike Depth (m)	Minutes After Strike	Sealed at (m)	Remarks
3.30	1.00	13/03/00	08:00	3.20	5	-	
3.30	1.00	13/03/00	08:05	3.10	10	-	
3.30	1.00	13/03/00	08:10	3.00	15	-	
3.30	1.00	13/03/00	08:15	3.00	20	-	

Logged by
DH

Scale
1:50

Fig.

tes:

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(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/2F

Sheet 1 of 3

Equipment & Methods
Hand dug inspection pit to 1.20m. Cable tool boring, 200mm dia to 3.50m.

Location No. 140502
Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level
40.47 m AOD

Coordinates

Date
13/03/00
to 13/03/00

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample: Type	Sample: No.	Test	Field Records
	40.47							
MADE GROUND: Firm dark brown very sandy CLAY with fine to coarse flint, brick and concrete, with rootlets.			(2.80)	1.00 - 1.10	D	1		
				2.00 - 2.10	D	2		
MADE GROUND: Loose ash and clay fill material. **	37.67		2.80					
Soft becoming firm grey very plastic organic CLAY with rootlets, organic odour. [ALLUVIUM].			(0.60)	3.00 - 3.10	D	3		
	37.07		3.40	3.40 - 3.50	D	4		
BOREHOLE ENDS AT 3.50 m.	36.97		(0.10p) 3.50					

Remarks
1. 100mm standpipe installed to 3.50m.

Logged by
DH

Scale
1:50

Fig.

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/1R

Sheet 4 of 4

Type of installation Standpipe
Date of installation 17/03/00
Internal diameter of tubing 100 mm
Length of filter 5.20 m
Diameter of filter 150 mm

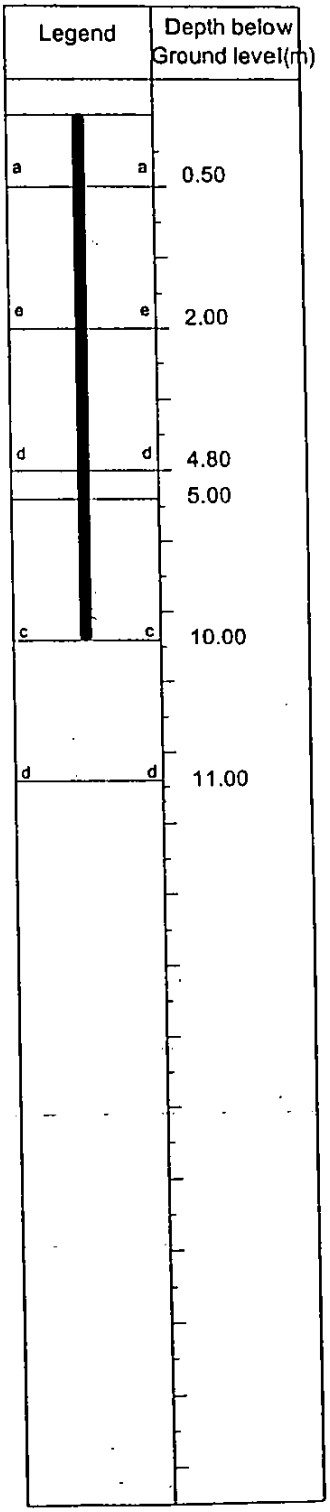
Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level	Coordinates	Date
	As sheet 1	

Depth (m) From	Depth (m) To	SUMMARY OF INSTALLATION
		Surface protection : Lockable Top Cap
0.00	0.50	Concrete
0.50	2.00	Bentonite / Cement grout
2.00	4.80	Bentonite seal
0.00	5.00	Plain pipe
4.80	10.00	Gravel filter
10.00	10.00	Instrument tip
5.00	10.00	Slotted pipe
10.00	11.00	Bentointe seal



Key

a	Concrete	d	Bentonite seal
b	Sand filter	e	Bentonite/cement grout
c	Gravel filter	f	Backfill

Remarks
1. Ground level and coordinates as sheet 1

DETAILS OF INSTRUMENT

Soil Mechanics

Borehole No. 1673A/1R

Sheet 3 of 4

Location No. 140502

Location

MANOR FARM READING

Carried out for

Thames Water Utilities Limited

Ground Level | Coordinates | Date

As sheet 1

Water Strike Table

Depth of Strike (m)	Casing Depth (m)	Date	Time	Post Strike Depth (m)	Minutes After Strike	Sealed at (m)	Remarks
3.00	2.00	16/03/00	-	2.10	20	-	
6.40	6.00	16/03/00	-	2.94	20	-	

Remarks

Logged by

DH

Scale

1:50

Fig

Notes

Soil Mechanics

Borehole No. 1673A/1R

Sheet 1 of 4

Equipment & Methods
Hand dug inspection pit to 1.20m. Cable tool boring 200mm dia. to 4.40m. then 150mm dia. to 11.50m.

Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level
38.82 m AOD

Coordinates

Date
16/03/00
to 17/03/00

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
	38.82							
				0.50	D	7893		
MADE GROUND: Brown becoming dark brown very sandy CLAY with fine to medium subangular to subrounded brick, flint and concrete gravel.			(1.70)	1.00	D	7892		
				1.50	D	7891		
	37.12		1.70	1.70 - 2.00	D	7890		
MADE GROUND: Stiff dark brown remoulded CLAY with black peaty inclusions.			(0.95)	2.00 - 2.45	D		S N=1	1,-/-,1,-,-
				2.50	D	7888		
	36.17		2.65					
Firm grey slightly gravelly CLAY. Gravel is fine subangular to subrounded flint. [ALLUVIUM].			(0.95)	3.00	D	7887	C N=11	2,2/2,4,2,3
				3.00 - 3.45	B			
				3.00 - 3.50	B	7886		
	35.22		3.60					
Medium dense grey brown clayey very sandy GRAVEL. Gravel is fine to coarse subangular to subrounded flint. [VALLEY GRAVEL].			(0.80)	3.60 - 4.00	B	7884		
				4.00 - 4.45	B		C N=10	2,1/1,2,3,4
From 4.00m becoming a sandy very silty clay with some fine to medium flint gravel.				4.00 - 4.50	B			
	34.42		4.40	4.50	D	7882		
Stiff blue grey mottled brown CLAY with fine sandy partings at 5.00m. [READING FORMATION].			(1.20)	5.00	D	7881		
				5.00 - 5.45	U			25 blows No recovery.
	33.22		5.60					
Light grey silty CLAY. [READING FORMATION].			(0.80)	6.00	D	7879		
				6.00 - 6.45	U			25 blows 90% Recovery.
	32.42		6.40					
Grey white coarse SAND.** [READING FORMATION].			(0.30)					
	32.12		6.70					
Firm stiff grey CLAY with fine sandy partings [READING FORMATION].			(0.50)	7.00	D			
	31.62		7.20	7.00 - 7.45	D		S N=15	1,2/3,2,5,5
				8.00 - 8.45	D		S N=15	2,2/2,3,4,6
Medium dense grey medium to coarse SAND. [READING FORMATION].			(3.10)	8.00 - 9.00	D	7874		
				9.00 - 9.45	D		S N=17	2,2/3,3,5,6
				9.50	D	7872		
				10.00	D	7871		

Installed to a depth of 10.00m.

Logged by
DH

Scale
1:50

Fig.

Soil Mechanics

Borehole No. 1673A/1R

Sheet 2 of 4

Equipment & Methods: As sheet 1	Location No. 140502 Location: MANOR FARM READING
Carried out for: Thames Water Utilities Limited	Ground Level: As sheet 1 · Coordinates: As sheet 1 · Date: As sheet 1

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample: Type	Sample: No.	Test	Field Records
As previous sheet.			(3.10)	10.00	D	7871		
				10.30	D	7869	S	
	28.52		10.30	10.00 - 10.45	D		N=12	2,2/2,3,3,4
Dark grey very sandy CLAY. Sand is fine. (Driller records green silty sand and black flint pebbles). [READING FORMATION].			(0.60)					
	27.92		10.90	11.00	D	7868		
Coarse sand band overlying white blocky CHALK at 11.10m. [UPPER CHALK].			(0.60 pen)	11.00 - 11.45	D		S N=9	2,1/2,1,3,3
	27.32		11.50					
BOREHOLE ENDS AT 11.50 m.								

Remarks

Logged by: DH

Scale: 1:50

Fig.

Notes: Methods described in ...

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/1G

Sheet 2 of 2

Type of installation Standpipe
Date of installation 17/03/00
Internal diameter of tubing 100 mm
Length of filter 3.00 m
Diameter of filter 200 mm

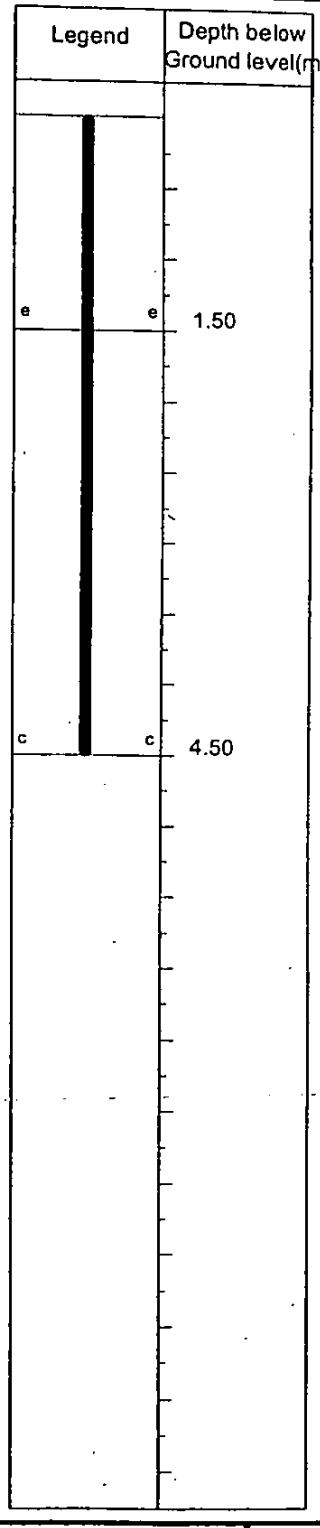
Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level | Coordinates | Date
As sheet 1

Depth (m) From	Depth (m) To	SUMMARY OF INSTALLATION
		Surface protection : Lockable Top Cap
0.00	1.50	Bentonite
0.00	1.50	Plain pipe
1.50	4.50	Gravel filter
4.50	4.50	Instrument tip
1.50	4.50	Slotted pipe



Key

a	Concrete	d	Bentonite seal
b	Sand filter	e	Bentonite/cement grout
c	Gravel filter	f	Backfill

Remarks
1. Ground level and coordinates as sheet 1

DETAILS OF INSTRUMENT

Soil Mechanics

Borehole No. 1673A/1G

Sheet 1 of 2

Equipment & Methods
Hand dug inspection pit to 1.20m. Then cable tool boring in 200mm dia. to 4.50m.

Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level
38.90 m AOD

Coordinates

Date
17/03/00
to 17/03/00

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
MADE GROUND: Brown becoming dark brown very sandy CLAY, with fine to medium subangular to subrounded brick, flint, and concrete gravel.	38.90		(1.75)	1.00	D	1		
MADE GROUND: Stiff dark brown remoulded CLAY with black ashy mottling.	37.15		1.75 (0.95)	2.00	D	2		
Soft grey slightly gravelly CLAY. Gravel is fine subangular to subrounded flint. [ALLUVIUM].	36.20		2.70 (0.90)	3.00	D	3		
Grey brown clayey very sandy GRAVEL. Gravel is fine to medium subangular to subrounded. [VALLEY GRAVEL].	35.30		3.60 (0.80)	4.00 4.00	D D	4 4		
Stiff blue grey weathered CLAY. [READING FORMATION].	34.50 34.40		4.40 (0.10p) 4.50	4.50	D	5		
BOREHOLE ENDS AT 4.50 m.								

Remarks
1. 100mm standpipe installed to a depth of 4.50m.

Logged by
DH

Scale
1:50

Fig.

Notes

(c) Soil Mechanics (Ver 6.1)

Soil Mechanics

Borehole No. 1673A/1F

Sheet 2 of 2

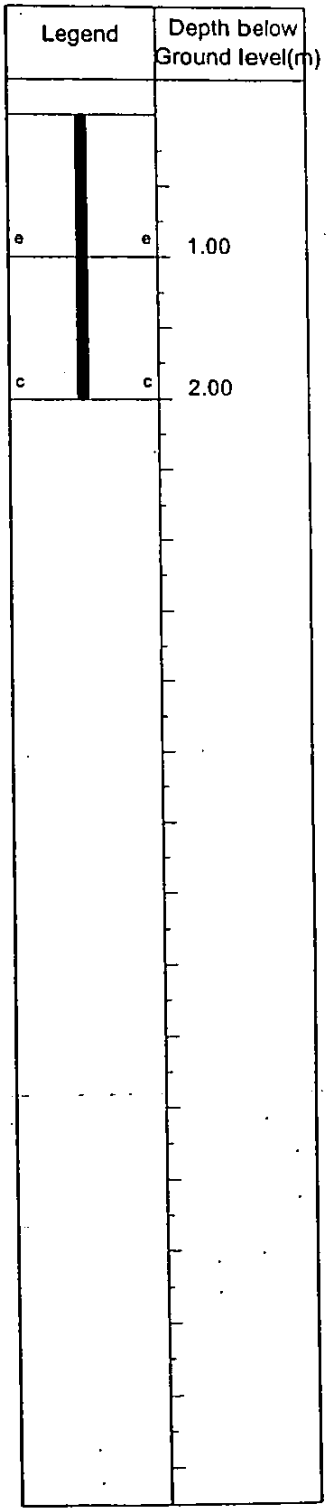
Type of installation Standpipe
Date of installation 17/03/00
Internal diameter of tubing 100 mm
Length of filter 1.00 m
Diameter of filter 200 mm

Location No. 140502
Location MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level | Coordinates | Date
As sheet 1

Depth (m) From	Depth (m) To	SUMMARY OF INSTALLATION
		Surface protection : Lockable Top Cap
0.00	1.00	Bentonite
0.00	1.00	Plain pipe
1.00	2.00	Gravel filter
2.00	2.00	Insturment tip
1.00	2.00	Slotted pipe



Key

a	Concrete	d	Bentonite seal
b	Sand filter	e	Bentonite/cement grout
c	Gravel filter	f	Backfill

Remarks
1. Ground level and coordinates as sheet 1

DETAILS OF INSTRUMENT

Soil Mechanics

Borehole No. 1673A/1F

Sheet 1 of 2

Equipment & Methods
Hand dug inspection pit to 1.20m. Then cable tool boring 200mm dia. to 2.00m.

Location No. 140502

Location
MANOR FARM READING

Carried out for
Thames Water Utilities Limited

Ground Level
38.84 m AOD

Coordinates

Date
17/03/00
to 17/03/00

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample: Type	Sample: No.	Test	Field Records
	38.84							
MADE GROUND: Brown becoming dark brown very sandy CLAY with fine to medium subangular to subrounded brick, flint and concrete gravel.			(1.70)	1.00	D	1		
MADE GROUND: Black very sandy ash with fragments of flint, brick and metal foil.	37.14		1.70 (0.30p)					
BOREHOLE ENDS AT 2.00 m.	36.84		2.00	2.00	D	2		

Installed to a depth of 2.00m.

Logged by
DH

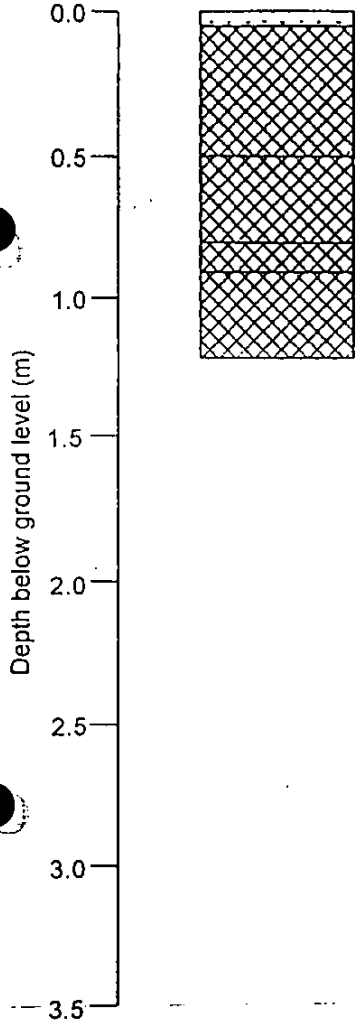
Scale
1:50

(c) Soil Mechanics (Ver 6.1)

Fig.

DOCUMENT REF: EMG/GG/7/ 1673 A

ENVIROSASPINWALL	TRIAL PIT LOG	TP 1673A/10
Client: Thames Water Utilities Ltd	CA No: TH0210021A	Sheet 1 of 1
	Ground Level - 40.462 m A.O.D approx.	Grid Ref.: 471305.071E 170892.968N
Project: Reading Waste World		Excavation Method: Hand excavated
Location: Reading		Weather: Fine



Depth (m)	DESCRIPTION
0.05 m	Grass and topsoil.
	Dense pink crushed brick and concrete 'Type 1' material (MADE GROUND).
0.5 m	Firm dark brown/grey sandy CLAY with occasional medium gravels of flint (possibly re-worked) (MADE GROUND).
0.8 m	
0.9 m	Dense yellow slightly silty SAND (MADE GROUND).
1.2 m	Firm dark brown silty CLAY with occasional fine gravels of brick (MADE GROUND).
	END OF TRIAL PIT 1.2 m

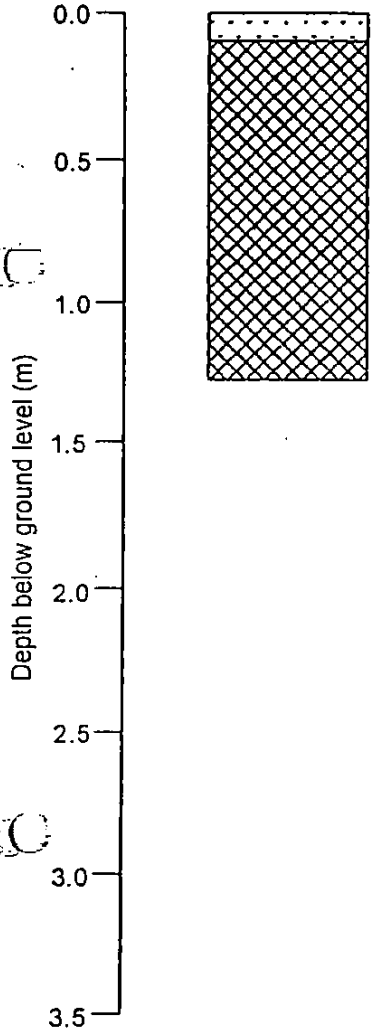
Scale: 1:25

Remarks:	Water: None
	Stability: Good
	Time trench open: 20 mins

Sample:	1	2						Logged by: JHa
Depth:	0.5 m	1.2 m						
Type:	D	D						Date: 14.03.00
Test:	✓	✓						

DOCUMENT REF: EHG/GS/R/ 1673. A

ENVIROSASPINWALL	TRIAL PIT LOG	TP1673A/11
Client: Thames Water Utilities Ltd	CA No: TH0210021A	Sheet 1 of 1
	Ground Level - 45.823 m A.O.D approx	Grid Ref.: 471377.552E 170846.079N
Project: Reading Waste World	Excavation Method: Hand excavated	
Location: Reading	Weather: Fine	



DESCRIPTION

Grass and topsoil.

Firm light brown very sandy CLAY with abundant medium to coarse gravels of flint and brick and occasional large pieces of tarmacadum (MADE GROUND).

END OF TRIAL PIT 1.3 m

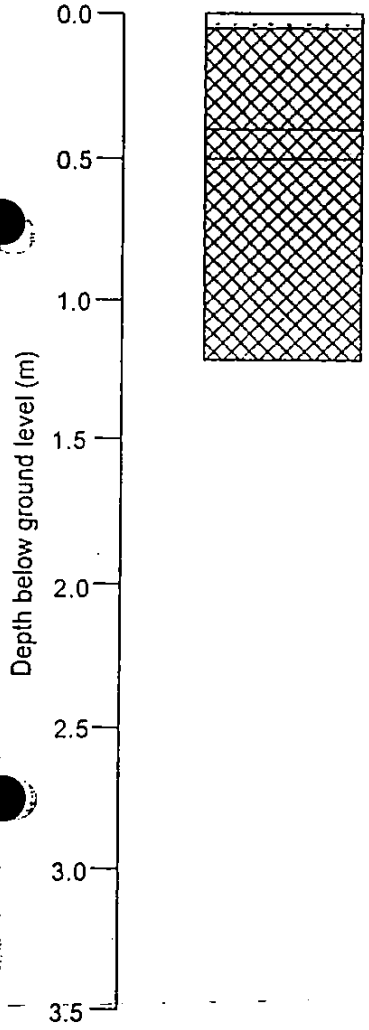
Scale: 1:25

Remarks:	Water: None
	Stability: Good
	Time trench open: 20 mins

Sample:	1	2						Logged by: JHa
Depth:	0.5 m	1.2 m						
Type:	D	D						Date: 14.03.00
Test:	✓	✓						

DOCUMENT REF: EMG/GS/R/ 1673 A

ENVIROSASPINWALL	TRIAL PIT LOG	TP 1673A/12
Client: Thames Water Utilities Ltd	CA No: TH0210021A	Sheet 1 of 1
	Ground Level - 45.210 m A.O.D approx.	Grid Ref.: 471356.654E 170680.436N
Project: Reading Waste World	Excavation Method: Hand excavated	
Location: Reading	Weather: Fine	



Depth (m)	DESCRIPTION
0.05 m	Grass and topsoil.
0.4 m	Firm light brown CLAY with abundant rootlets and occasional fine to coarse gravels of flint (MADE GROUND).
0.5 m	Tarmacadum horizon (Old road?) (MADE GROUND).
1.2 m	Dense light brown slightly silty SAND with occasional fine to medium gravels of brick and flint (Road sub-base?)

END OF TRIAL PIT 1.2 m

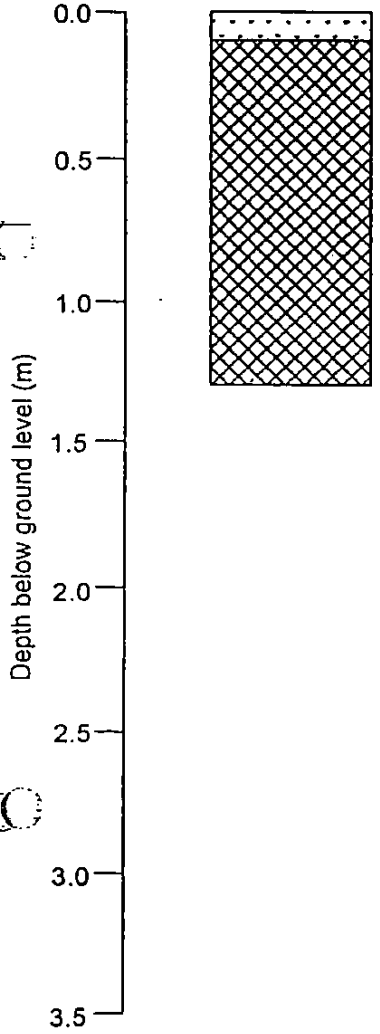
Scale: 1:25

Remarks:	Water: None
	Stability: Good
	Time trench open: 20 mins

Sample:	1	2						Logged by: JHa
Depth:	0.5 m	1.2 m						
Type:	D	D						Date: 14.03.00
Test:	✓	✓						

DOCUMENT REF: ENG/GG/R/ 1673.A

ENVIROSASPINWALL	TRIAL PIT LOG	TP 1673A/13
Client: Thames Water Utilities Ltd	CA No: TH0210021A	Sheet 1 of 1
	Ground Level - 45.256 m A.O.D approx.	Grid Ref.: 471309.950E 170665.864N
Project: Reading Waste World	Excavation Method: Hand excavated	
Location: Reading	Weather: Fine	



Depth (m)	DESCRIPTION
0.1 m	Grass and topsoil.
1.3 m	Firm dark brown sandy CLAY with occasional rootlets and medium to coarse gravels of brick becoming firm blue mottled brown reworked CLAY (MADE GROUND).
	END OF TRIAL PIT 1.3 m

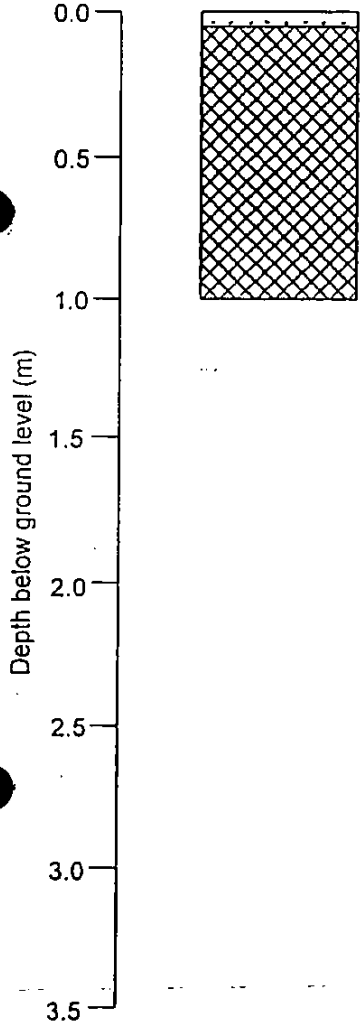
Scale: 1:25

Remarks:	Water: None
	Stability: Good
	Time trench open: 20 mins

Sample:	1	2						Logged by: JHa
Depth:	0.5 m	1.3 m						
Type:	D	D						Date: 14.03.00
Test:	✓	✓						

DOCUMENT REF: ENG/GG/R/ 1673 A

ENVIROSASPINWALL knowledge innovation solutions	TRIAL PIT LOG	TP 1673A/14
Client: Thames Water Utilities Ltd	CA No: TH0210021A	Sheet 1 of 1
	Ground Level - 42.035 m A.O.D approx.	Grid Ref.: 471308.458E 170678.897N
Project: Reading Waste World	Excavation Method: Hand excavated	
Location: Reading	Weather: Fine	



DESCRIPTION

Grass and topsoil.

Firm dark brown silty SAND with occasional rootlets and rare medium to coarse gravels of concrete (MADE GROUND).

END OF TRIAL PIT 1.0 m

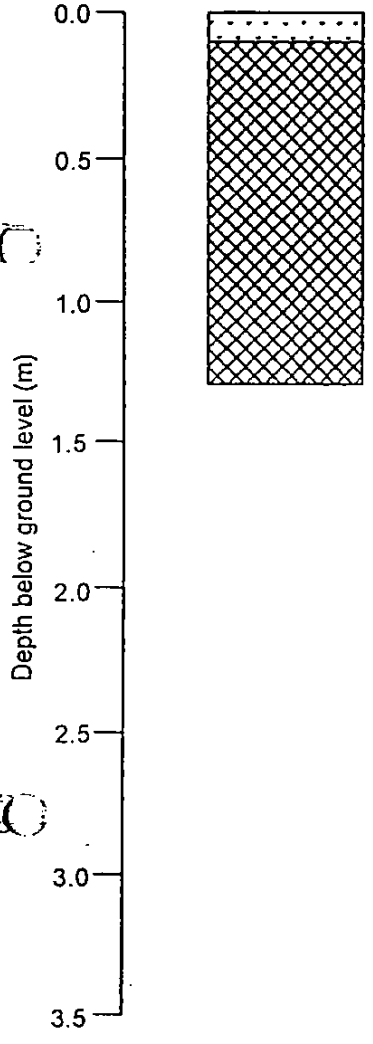
Scale: 1:25

Remarks: Concrete obstruction @ 1.0 m.	Water: None
	Stability: Good
	Time trench open: 20 mins

Sample:	1	2						Logged by: JHa
Depth:	0.5 m	1.0 m						
Type:	D	D						Date: 14.03.00
Test:	✓	✓						

DOCUMENT REF: ENG/GS/R/ 1673 A

ENVIROSASPINWALL	TRIAL PIT LOG	TP 1673A/15
Client: Thames Water Utilities Ltd	CA No: TH0210021A	Sheet 1 of 1
	Ground Level - 41.32 m A.O.D approx.	Grid Ref.: 471162.492E 170683.053N
Project: Reading Waste World	Excavation Method: Hand excavated	
Location: Reading	Weather: Fine	



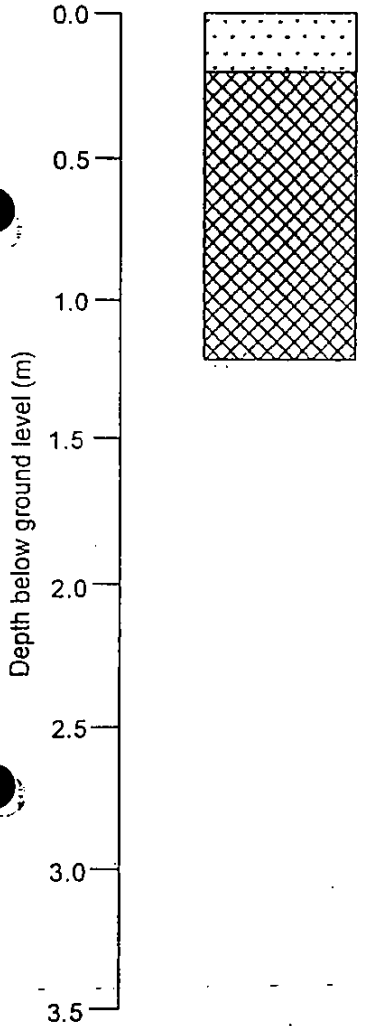
Scale: 1:25

Remarks:	Water: None
	Stability: Good
	Time trench open: 20 mins

Sample:	1	2						Logged by: JHa
Depth:	0.5 m	1.2 m						
Type:	D	D						Date: 14.03.00
Test:	✓	✓						

DOCUMENT REF: ENG/GG/RJ 1673 A

ENVIROSASPINWALL	TRIAL PIT LOG	TP 1673A/16
Client: Thames Water Utilities Ltd	CA No: TH0210021A	Sheet 1 of 1
	Ground Level - 44.826 m A.O.D approx.	Grid Ref.: 471222.052E 170455.031N
Project: Reading Waste World	Excavation Method: Hand excavated	
Location: Reading	Weather: Fine	



DESCRIPTION

Weeds and topsoil.

Firm light brown silty SAND with abundant rootlets and occasional fine to coarse gravels of concrete and flint and rare boulders of concrete (MADE GROUND).

END OF TRIAL PIT 1.2 m

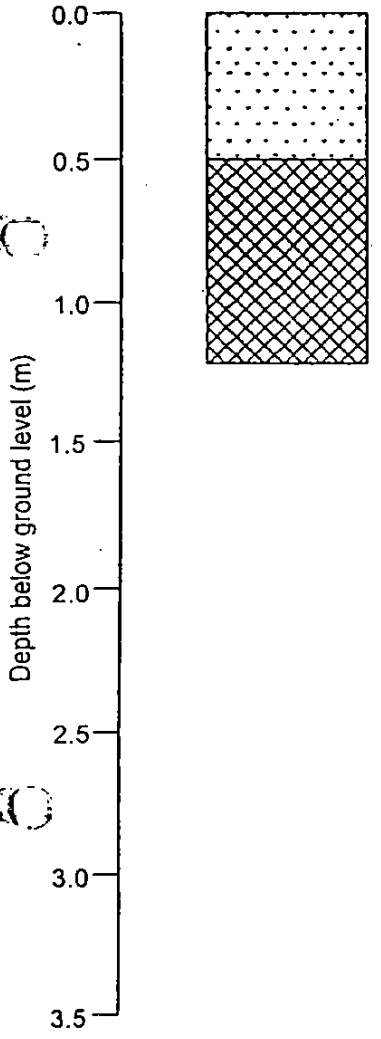
Scale: 1:25

Remarks:	Water: None
	Stability: Good
	Time trench open: 20 mins

Sample:	1	2						Logged by: JHa
Depth:	0.5 m	1.2 m						
Type:	D	D						Date: 14.03.00
Test:	✓	✓						

DOCUMENT REF: ENG/GS/R/ 1673 A

ENVIROSASPINWALL	TRIAL PIT LOG	TP 1673A/17
Client: Thames Water Utilities Ltd	CA No: TH0210021A	Sheet 1 of 1
	Ground Level - 46.958 m A.O.D approx.	Grid Ref.: 471332.968E 170536.518N
Project: Reading Waste World	Excavation Method: Hand excavated	
Location: Reading	Weather: Fine	



DESCRIPTION

Grass and topsoil.

Firm dark brown silty SAND with occasional fine to medium gravels of flint becoming firm to stiff blue mottled red/orange reworked CLAY (MADE GROUND).

END OF TRIAL PIT 1.2 m

Scale: 1:25

Remarks:

Water: None

Stability: Good

Time trench open: 20 mins

Sample:	1	2						Logged by: JHa
Depth:	0.5 m	1.1 m						
Type:	D	D						Date: 14.03.00
Test:	✓	✓						

APPENDIX F2

CONTAMINATION RESULTS

Metals results from chalk samples

SAMPLE DESCRIPTION		BH2C 16.0-16.1m	BH2C 18.0-18.1m	BH2C 20.0m	BH6C 28.0m	BH6C 32.0m	BH6C 34.0m	BH5C 18.0m	BH5C 22.0m
Tag Number		70907522	70907523	70907529	70907578	70907580	70907581	70907610	70907612
Lab Number		C185809	C185810	C186050	C186591	C186592	C186593	C187515	C187516
As - Arsenic	mg/Kg	7.1	5.5	5.1	6.44	6.28	5.75	10.97	10.95
Ba - Barium	mg/Kg	13.3	12.2	17.0	8.85	9.79	9.31	11.8	11.5
Cd - Cadmium	mg/Kg	LT 0.30	0.39	0.32	0.30	LT 0.30	LT 0.30	LT 0.30	LT 0.30
Cr - Chromium	mg/Kg	5.6	LT 3	9.5	LT 3	LT 3	3	LT 3	LT 3
Cu - Copper	mg/Kg	LT 4	LT 4	LT 4	LT 4	LT 4	LT 4	LT 4	LT 4
Hg - Mercury	mg/Kg	LT 0.10	LT 0.10	LT 0.10	LT 0.10	LT 0.10	LT 0.10	LT 0.10	LT 0.10
Mo - Molybdenum	mg/Kg	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3
Ni - Nickel	mg/Kg	LT 3	LT 3	3.7	3.07	4.8	LT 3	LT 3	LT 3
Pb - Lead	mg/Kg	LT 7	LT 7	LT 7	LT 7	LT 7	LT 7	LT 7	LT 7
Sb - Antimony	mg/Kg	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5
Se - Selenium	mg/Kg	993.0	970.0	430.0	0.45	0.43	0.45	0.527	0.737
Zn - Zinc	mg/Kg	19.7	17.0	13.4	28.78	43	34.1	14	13.9
WS Boron	mg/Kg	0.1	1.3	1.6	2.6	0.9	LT 0.1	0.2	0.9
Hexavalent Chrome	mg/Kg	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2

Metals results from Made Ground samples

SAMPLE DESCRIPTION		BH6R 1.0-2.0m	BH6F 1.0m	BH4F 1.0m	H2F 1.0-1.1m	H2F 3.0-3.1m	TP16 0.5m	TP16 1.2m	TP17 0.5m	TP13 0.5m
Tag Number		70907498	70907502	70907524	70907536	70907538	70907541	70907542	70907543	70907545
Lab Number		C185060	C185287	C186047	C186182	C186184	C186286	C186287	C186288	C186290
As - Arsenic	mg/Kg	9.64	20.9	12.6	14.84	10.22	8.89	9.08	11.2	9.62
Ba - Barium	mg/Kg	19.43	45.6	41.2	236.42	216.85	50.76	55.93	49.98	60.26
Cd - Cadmium	mg/Kg	LT 0.30	0.6	0.4	6.82	10.51	0.38	0.33	0.38	0.49
Cr - Chromium	mg/Kg	29.30	21.9	51.1	204.8	256.1	28.7	25.5	38.6	31
Cu - Copper	mg/Kg	10.90	24.1	16.9	159.3	185.7	14.6	12.6	15.9	91.3
Hg - Mercury	mg/Kg	LT 0.10	0.8	LT 0.10	1.72	1.86	0.23	0.21	LT 0.10	0.21
Mo - Molybdenum	mg/Kg	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3
Ni - Nickel	mg/Kg	16.39	16.6	25.8	54.6	72.9	16.3	15.1	26.1	18
Pb - Lead	mg/Kg	LT 7	69.5	13.5	207.2	176	22.6	18.6	30.7	33
Sb - Antimony	mg/Kg	LT 1.5	0.2	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5
Se - Selenium	mg/Kg	1.41	0.5	512.0	450	598	0.43	0.43	0.43	0.43
Zn - Zinc	mg/Kg	42.90	69.9	56.5	407	521	52	50.6	68.1	63.8
WS Boron	mg/Kg	LT 0.1	0.2	3.0	5.7	6.6	1.9	1.8	2.1	0.5
Hexavalent Chrome	mg/Kg	29.30	0.2	0.1	0.2	0.1	0.1	0.1	LT 0.1	LT 0.1

Metals results from Made Ground samples

SAMPLE DESCRIPTION		TP13 1.3m	TP15 1.2m	TP15 1.2m	TP14 0.5m	TP14 1.0m	TP11 0.5m	TP11 1.2m	TP10 0.5m	TP10 1.2m
Tag Number		70907546	70907547	70907548	70907549	70907550	70907551	70907552	70907553	70907554
Lab Number		C186291	C186292	C186293	C186294	C186295	C186296	C186297	C186298	C186299
As - Arsenic	mg/Kg	11.19	9.45	10.91	10.53	7.51	6.27	7.29	11.76	9
Ba - Barium	mg/Kg	29.06	69.17	172.71	44.97	54.17	39.03	52.53	165.83	55.07
Cd - Cadmium	mg/Kg	0.4	0.47	0.5	0.58	0.35	0.34	0.46	1.35	LT 0.30
Cr - Chromium	mg/Kg	37.6	25.7	32.7	34	50.4	21.8	24.2	14.9	53
Cu - Copper	mg/Kg	9.3	15.1	16.2	14.3	14.5	6.7	17.2	9.3	21.1
Hg - Mercury	mg/Kg	LT 0.10	0.12	LT 0.10	LT 0.10	LT 0.10	0.12	0.18	0.16	0.78
Mo - Molybdenum	mg/Kg	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3
Ni - Nickel	mg/Kg	15.4	14.9	21.6	20.5	22.7	18.4	15.9	6.4	19.1
Pb - Lead	mg/Kg	12.6	31.2	24.3	17.5	16.4	22.7	176	57.2	47
Sb - Antimony	mg/Kg	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5
Se - Selenium	mg/Kg	0.43	0.43	0.43	0.43	0.45	0.43	0.43	0.43	0.43
Zn - Zinc	mg/Kg	28	52	61.1	50.8	50.2	53.7	66.4	113.1	93
WS Boron	mg/Kg	2.2	1.4	2.9	2	2.5	1.1	1.3	1	3.9
Hexavalent Chrome	mg/Kg	LT 0.1	0.1	0.1	LT 0.1	0.1	0.1	0.1	LT 0.1	LT 0.1

Metals results from Made Ground samples

SAMPLE DESCRIPTION		TP12 0.5m	TP12 1.2m	BH7G 1.0m	BH8G 0.5m	BH8G 1.5m	BH8G 2.5m	BH1F 1.0m	BH1F 2.0m	BH5G 2.4m
Tag Number		70907556	70907558	70907572	70907582	70907583	70907584	70907606	70907607	70907622
Lab Number		C186301	C186303	C186586	C186594	C186595	C186596	C187269	C187270	C187525
As - Arsenic	mg/Kg	9.91	8.69	7.02	13.02	11.96	14.44	24.98	36.65	26.42
Ba - Barium	mg/Kg	84.11	45.91	27.33	90.58	74.79	100.23	1125.01	194.48	56.74
Cd - Cadmium	mg/Kg	0.34	0.32	LT 0.30	LT 0.30	0.32	0.38	68.69	1.95	0.69
Cr - Chromium	mg/Kg	35.7	24.1	18.1	27.6	42	31.8	759.6	70	46.3
Cu - Copper	mg/Kg	22.4	12.3	6.6	23.3	16.9	23.2	698.8	51.5	81.9
Hg - Mercury	mg/Kg	0.26	LT 0.10	LT 0.10	0.17	LT 0.10	0.14	12.2	0.8	0.27
Mo - Molybdenum	mg/Kg	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3	5.05	LT 3	LT 3
Ni - Nickel	mg/Kg	17.7	13.1	8.7	15.9	20	20.6	83.9	39.6	19.8
Pb - Lead	mg/Kg	40.6	35.8	10.5	100.2	34.2	40.5	794.9	81.6	29.3
Sb - Antimony	mg/Kg	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	28.02	1.93	LT 1.5
Se - Selenium	mg/Kg	0.43	0.43	0.43	0.43	0.43	0.473	4.77	5.586	1.244
Zn - Zinc	mg/Kg	69.7	48.7	32.8	99.8	149.4	100.7	2735.4	214.8	62.9
WS Boron	mg/Kg	1.4	1.3	3.4	1.4	2.5	2.4	7.9	9.5	4.1
Hexavalent Chrome	mg/Kg	0.1	0.1	0.2	0.2	0.1	LT 0.1	LT 0.1	0.1	0.2

Metals results from Made Ground samples

SAMPLE DESCRIPTION		BH5F 2.0m	BH5F 1.5m	BH5F 1.0m	BH9R 0-1.3m
Tag Number		70907626	70907627	70907629	70907290
Lab Number		C187528	C187529	C187531	C184396
As - Arsenic	mg/Kg	14.92	14.23	16.89	18.23
Ba - Barium	mg/Kg	59.18	130.05	117.96	224.91
Cd - Cadmium	mg/Kg	LT 0.30	2.18	1.06	2.37
Cr - Chromium	mg/Kg	32.9	199.7	80.9	117.4
Cu - Copper	mg/Kg	16.2	47.1	36.8	109.5
Hg - Mercury	mg/Kg	0.17	0.64	0.42	1.4
Mo - Molybdenum	mg/Kg	LT 3	LT 3	LT 3	10.76
Ni - Nickel	mg/Kg	22.6	34.6	31.8	41
Pb - Lead	mg/Kg	12.8	86	55.9	153
Sb - Antimony	mg/Kg	LT 1.5	LT 1.5	LT 1.5	4.56
Se - Selenium	mg/Kg	2.435	2.062	1.91	0.452
Zn - Zinc	mg/Kg	60.6	226.1	149.9	326.4
WS Boron	mg/Kg	6.4	4.2	3.8	2.1
Hexavalent Chrome	mg/Kg	LT 0.1	LT 0.1	0.1	LT 0.1

Metals results from Alluvium/Gravels samples

SAMPLE DESCRIPTION		BH2R 7.0-7.1m	BH2G 3.4m	BH2G 4.8m	BH2G 5.8m	BH2F 3.5m	BH8G 4.0m	BH8G 6.0m	BH1G 3.0m
Tag Number		70907520	70907532	70907533	70907534	70907539	70907586	70907588	70907595
Lab Number		C185807	C186179	C186180	C186181	C186185	C186597	C186598	C187262
As - Arsenic	mg/Kg	3.1	14.35	10.4	6.67	23.98	7.99	11.05	25.91
Ba - Barium	mg/Kg	LT 5	106.96	52.7	20	329.1	132.97	31.5	185.44
Cd - Cadmium	mg/Kg	LT 0.30	0.7	LT 0.30	LT 0.30	1.8	LT 0.30	LT 0.30	0.52
Cr - Chromium	mg/Kg	3.5	45.9	30.8	19.8	91.2	72.9	24	56.9
Cu - Copper	mg/Kg	LT 4	23.6	14.7	7.1	122.2	20.9	11.5	29.1
Hg - Mercury	mg/Kg	LT 0.10	0.1	0.16	LT 0.10	3.13	0.1	LT 0.10	0.15
Mo - Molybdenum	mg/Kg	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3
Ni - Nickel	mg/Kg	4.6	39.3	17.7	14.2	45.9	34.3	18.9	55.7
Pb - Lead	mg/Kg	LT 7	16.1	21.1	14.3	435.1	11.2	LT 7	19.3
Sb - Antimony	mg/Kg	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5
Se - Selenium	mg/Kg	1233.0	592	430	430	855	1.127	0.593	1.539
Zn - Zinc	mg/Kg	11.6	53.5	45.1	23.6	336	114.9	63	68.9
WS Boron	mg/Kg	0.6	5.3	2.8	1.6	7.5	7.4	4.7	4.6
Hexavalent Chrome	mg/Kg	0.2	0.2	0.2	0.2	LT 0.1	LT 0.1	0.1	LT 0.1

Metals results from Alluvium/Gravels samples

SAMPLE DESCRIPTION		BH1G 3.5-4.0m	BH5G 3.8m	BH3R 3.3-3.8	BH3R 6.0-6.5	H3R 7.5-8.0m
Tag Number		70907597	70907624	70907746	70907748	70907749
Lab Number		C187263	C187527	C184638	C184639	C186314
As - Arsenic	mg/K	12.17	20.85	18.23	15.23	2.79
Ba - Barium	mg/K	10.9	10.37	224.91	49.36	LT 5
Cd - Cadmium	mg/K	0.42	0.38	2.37	0.46	LT 0.30
Cr - Chromium	mg/K	11.8	49.2	117.40	54.80	5.9
Cu - Copper	mg/K	LT 4	5	109.50	16.90	LT 4
Hg - Mercury	mg/K	LT 0.10	LT 0.10	1.40	LT 0.10	LT 0.10
Mo - Molybdenum	mg/K	LT 3	LT 3	10.76	LT 3	LT 3
Ni - Nickel	mg/K	7.4	31.4	41.00	19.20	6.5
Pb - Lead	mg/K	LT 7	LT 7	153.00	12.30	LT 7
Sb - Antimony	mg/K	LT 1.5	LT 1.5	4.56	LT 1.5	LT 1.5
Se - Selenium	mg/K	0.51	0.589	0.45	2.54	0.43
Zn - Zinc	mg/K	15.2	22.6	326.40	25.80	62.4
WS Boron	mg/K	2.6	0.2	2.10	4.30	1.1
Hexavalent Chrome	mg/K	0.2	LT 0.1	LT 0.1	0.10	LT 0.1

Metals results from London Clay samples

SAMPLE DESCRIPTION		BH9R 6.5m	BH6F 3.0m	BH6F 6.0m	BH4F 2.0m	BH4F 3.0m	BH7G 2.0m	BH7G 3.0m	BH7G 5.0m	BH7G 6.0m
Tag Number		70907490	70907504	70907507	70907525	70907526	70907573	70907574	70907576	70907577
Lab Number		C184887	C185289	C185290	C186048	C186049	C186587	C186588	C186589	C186590
As - Arsenic	mg/Kg	3.69	14.2	13.8	13.0	9.4	9.16	12.81	37.39	15.01
Ba - Barium	mg/Kg	LT 5	36.8	20.9	27.9	28.1	39.21	LT 5	40.24	LT 5
Cd - Cadmium	mg/Kg	LT 0.30	0.5	LT 0.30	0.3	LT 0.30	LT 0.30	LT 0.30	1.36	LT 0.30
Cr - Chromium	mg/Kg	3.90	26.1	24.3	30.6	29.6	39.1	38.4	42.2	29.6
Cu - Copper	mg/Kg	LT 4	8.6	8.5	10.5	9.6	12.3	13.8	21.6	9.4
Hg - Mercury	mg/Kg	LT 0.10	LT 0.10	LT 0.10	LT 0.10	LT 0.10	LT 0.10	LT 0.10	LT 0.10	LT 0.10
Mo - Molybdenum	mg/Kg	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3
Ni - Nickel	mg/Kg	3.70	21.8	14.2	21.1	18.6	25.2	25.8	31.9	21.1
Pb - Lead	mg/Kg	LT 7	8.4	LT 7	8.0	11.3	7.6	LT 7	8.4	LT 7
Sb - Antimony	mg/Kg	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5
Se - Selenium	mg/Kg	0.45	0.5	1.0	430.0	430.0	0.43	0.43	0.43	0.43
Zn - Zinc	mg/Kg	0.00	38.1	41.5	47.1	47.0	80.7	65.5	73.9	75.3
WS Boron	mg/Kg	LT 0.1	0.3	LT 0.1	2.5	8.8	1.6	0.9	1.6	0.9
Hexavalent Chrome	mg/Kg	3.90	0.1	LT 0.1	0.1	0.1	0.1	0.1	0.1	0.1

Metals results from London Clay samples

SAMPLE DESCRIPTION		BH9R 3.0m
Tag Number		70907752
Lab Number		C184888
As - Arsenic	mg/Kg	23.00
Ba - Barium	mg/Kg	49.36
Cd - Cadmium	mg/Kg	0.64
Cr - Chromium	mg/Kg	20.60
Cu - Copper	mg/Kg	8.10
Hg - Mercury	mg/Kg	LT 0.10
Mo - Molybdenum	mg/Kg	LT 3
Ni - Nickel	mg/Kg	11.85
Pb - Lead	mg/Kg	LT 7
Sb - Antimony	mg/Kg	LT 1.5
Se - Selenium	mg/Kg	0.65
Zn - Zinc	mg/Kg	24.50
WS Boron	mg/Kg	1.10
Hexavalent Chrome	mg/Kg	20.60

BH9?

Metals results from Reading Beds samples

SAMPLE DESCRIPTION		BH6R 8.0-9.0	BH6R 13.0-14	BH4R 10.5-11	BH2R 12.0m	BH2R 14.0m	BH4R 13.0-13	BH4R 18.0m	BH19R 10.0m	BH4R 20.5-21.0m
Tag Number		70907499	70907501	70907510	70907514	70907515	70907516	70907517	70907518	70907519
Lab Number		C185057	C185056	C185493	C185495	C185496	C185497	C185498	C185499	C185806
As - Arsenic	mg/Kg	10.84	15.58	4.5	6.9	55.2	5.0	4.6	5.4	4.6
Ba - Barium	mg/Kg	8.29	82.19	17.9	30.6	21.3	10.0	6.0	11.7	LT 5
Cd - Cadmium	mg/Kg	LT 0.30	LT 0.30	LT 0.30	LT 0.30	1.2	LT 0.30	LT 0.30	LT 0.30	LT 0.30
Cr - Chromium	mg/Kg	14.70	23.90	19.5	22.6	45.3	11.3	4.7	12.6	LT 3
Cu - Copper	mg/Kg	5.70	24.60	7.3	15.6	7.2	5.5	LT 4	6.5	LT 4
Hg - Mercury	mg/Kg	LT 0.10	0.54	LT 0.10	LT 0.10	LT 0.10	LT 0.10	LT 0.10	LT 0.10	LT 0.10
Mo - Molybdenum	mg/Kg	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3
Ni - Nickel	mg/Kg	8.94	14.10	29.1	24.0	29.9	32.5	6.7	39.9	LT 3
Pb - Lead	mg/Kg	LT 7	71.30	LT 7	15.0	LT 7	LT 7	LT 7	LT 7	LT 7
Sb - Antimony	mg/Kg	LT 1.5	2.45	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5
Se - Selenium	mg/Kg	0.45	0.45	1181.0	1056.0	1243.0	877.0	461.0	1357.0	1108.0
Zn - Zinc	mg/Kg	17.50	529.70	36.0	40.2	65.2	34.0	11.4	35.6	14.8
WS Boron	mg/Kg	LT 0.1	1.30	2.9	2.2	2.2	1.7	0.9	1.1	LT 0.1
Hexavalent Chrome	mg/Kg	14.70	23.90	0.2	0.1	0.2	0.1	LT 0.1	0.1	0.2

Metals results from Reading Beds samples

SAMPLE DESCRIPTION		BH2R 9.0-9.1	BH7R 9.0m	BH7R 11.0m	BH7R 13.0m	BH7R 18.0m	7R 22.0-23.0	BH7G 7.8m	BH1R 10.5m	BH8R 7.7m
Tag Number		70907521	70907559	70907562	70907564	70907569	70907571	70907592	70907598	70907599
Lab Number		C185808	C186304	C186306	C186307	C186308	C186309	C187260	C187264	C187265
As - Arsenic	mg/Kg	3.5	8.87	17.01	6.2	3.97	4.84	11.42	45.52	3.17
Ba - Barium	mg/Kg	5.5	17.14	58.69	34.7	23.14	5.37	44.35	20.26	10.94
Cd - Cadmium	mg/Kg	LT 0.30	0.55	LT 0.30	LT 0.30	LT 0.30	LT 0.30	0.41	1.24	LT 0.30
Cr - Chromium	mg/Kg	3.2	24.4	71.2	47.1	29.1	4	47.8	59.2	12.2
Cu - Copper	mg/Kg	LT 4	9	30.3	27.9	8.3	LT 4	16.1	7.5	LT 4
Hg - Mercury	mg/Kg	LT 0.10	LT 0.10	LT 0.10	LT 0.10	LT 0.10	LT 0.10	LT 0.10	LT 0.10	LT 0.10
Mo - Molybdenum	mg/Kg	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3
Ni - Nickel	mg/Kg	3.9	10.8	42.4	22.3	30.6	7.9	18.2	43.4	4.5
Pb - Lead	mg/Kg	LT 7	8.7	22.8	10.2	LT 7	LT 7	LT 7	LT 7	LT 7
Sb - Antimony	mg/Kg	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5
Se - Selenium	mg/Kg	925.0	0.43	2.361	1.102	0.43	0.43	3.748	1.446	0.45
Zn - Zinc	mg/Kg	19.6	65.4	87	43.3	41.8	0	49.2	86.6	13.6
WS Boron	mg/Kg	LT 0.1	1.2	11.5	2.8	4.2	0.9	3.9	2.4	LT 0.1
Hexavalent Chrome	mg/Kg	LT 0.1	0.1	LT 0.1	LT 0.1	0.1	0.2	0.1	0.1	LT 0.1

Metals results from Reading Beds samples

SAMPLE DESCRIPTION		BH8R 9.8m	BH8R 11.8m	BH8R 15.8m	BH8R 16.5m	BH5R 6.0m	BH5R 7.5m	BH5R 10.5m	BH5R 12.0m	BH5R 13.5m
Tag Number		70907601	70907603	70907605	70907608	70907613	70907614	70907616	70907617	70907618
Lab Number		C187266	C187267	C187268	C187514	C187517	C187518	C187519	C187520	C187521
As - Arsenic	mg/Kg	7.12	8.8	26.64	14.74	30.85	9.64	18.78	18.95	22.58
Ba - Barium	mg/Kg	15.11	33.61	31.29	13.24	6.47	LT 5	7.42	8.05	LT 5
Cd - Cadmium	mg/Kg	LT 0.30	LT 0.30	0.54	0.56	0.94	LT 0.30	0.36	0.48	0.48
Cr - Chromium	mg/Kg	18.6	36.3	41.1	10.2	23.8	4.1	6	6.1	4.6
Cu - Copper	mg/Kg	11.2	14.9	26.9	4.7	LT 4	LT 4	LT 4	LT 4	LT 4
Hg - Mercury	mg/Kg	LT 0.10	LT 0.10	LT 0.10	LT 0.10	LT 0.10	LT 0.10	LT 0.10	LT 0.10	LT 0.10
Mo - Molybdenum	mg/Kg	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3	LT 3
Ni - Nickel	mg/Kg	9.3	26.4	47.3	20.3	51.3	36.2	29.6	30.1	11.6
Pb - Lead	mg/Kg	7.2	7.3	25.8	LT 7	LT 7	LT 7	LT 7	LT 7	LT 7
Sb - Antimony	mg/Kg	LT 1.5	LT 1.5	0.29	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5	LT 1.5
Se - Selenium	mg/Kg	0.647	0.74	4.27	0.89	0.869	0.498	0.498	0.45	0.45
Zn - Zinc	mg/Kg	25.6	51.6	89.5	31.1	32.6	15.4	15	14.4	0
WS Boron	mg/Kg	2.6	7.5	7.9	1.7	0.3	0.4	0.6	0.7	0.4
Hexavalent Chrome	mg/Kg	LT 0.1	0.1	LT 0.1	0.2	0.2	0.2	0.2	LT 0.1	0.2

Metals results from Reading Beds samples

SAMPLE DESCRIPTION		BH8R 19.0m	BH1R 7.0m	BH1R 6.0m	BH9R 8-9m
Tag Number		70907619	70907620	70907621	70907291
Lab Number		C187522	C187523	C187524	C184395
As - Arsenic	mg/Kg	22.06	33.65	18.32	15.23
Ba - Barium	mg/Kg	6.86	22.36	28.91	49.36
Cd - Cadmium	mg/Kg	0.47	0.78	0.39	0.46
Cr - Chromium	mg/Kg	5.8	22.3	27.8	54.8
Cu - Copper	mg/Kg	LT 4	11.2	15.3	16.9
Hg - Mercury	mg/Kg	LT 0.10	LT 0.10	LT 0.10	LT 0.10
Mo - Molybdenum	mg/Kg	LT 3	LT 3	LT 3	LT 3
Ni - Nickel	mg/Kg	12.2	32.4	41.8	19.2
Pb - Lead	mg/Kg	LT 7	LT 7	LT 7	12.3
Sb - Antimony	mg/Kg	LT 1.5	LT 1.5	LT 1.5	LT 1.5
Se - Selenium	mg/Kg	0.575	1.119	0.842	2.539
Zn - Zinc	mg/Kg	15.9	53	62.5	25.8
WS Boron	mg/Kg	0.6	2.3	0.7	4.3
Hexavalent Chrome	mg/Kg	0.2	0.2	0.1	0.1

Inorganics and organics results from chalk samples

SAMPLE DESCRIPTION		BH2C 16.0-16.1m	BH2C 18.0-18.1m	BH2C 20.0m	BH6C 28.0m	BH6C 32.0m	BH6C 34.0m	BH5C 18.0m	BH5C 22.0m
pH		8.8	8.8	8.8	8.8	8.8	8.9	8.7	8.7
Total Cyanide	mg/Kg	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1
Free Cyanide (if total > 5mg/Kg)		-	-	-	-	-	-	-	-
Thiocyanate	mg/Kg	LT 0.4	LT 0.4	LT 0.4	LT 0.4	LT 0.4	LT 0.4	LT 0.4	LT 0.4
Total Phenols (color)	mg/Kg	LT 30	LT 30	LT 30	LT 30	LT 30	LT 30	LT 30	LT 30
Total Sulphate	mg/Kg	3496.0	3806.0	4245.0	4638	4627	4671	4629	4324
Sulphide	mg/Kg	1.6	1.7	-	-	-	2.78	3	2.24
Chloride	mg/Kg	27.0	28.0	28.0	41	27	34	48	48
Ammonia - KCl extr	mg/Kg	LT 1	LT 1	LT 1	5.11	3.54	1.53	1.27	LT 1
Wat Sol Sulphate	mg/Kg	<DL	<DL	40.0	111	85	67	280	79
Dry Matter	%	73.2	76.7	72.3	75.28	75.6	78.78	77.09	76.49
DRO	mg/kg	70.00	42.00	33.00	11.00	15.00	15.00	21.00	99.00
VOC		ND	ND	ND	ND	ND	ND	ND	ND
SVOC	ug/kg	2726	781	2044	2321	580	385	2483	3430
	ug/kg	659	301	642	529	294	385	1497	678
PCB's	ug/kg	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
PAH's	ug/kg	3772	10	17	111	320	48	63	29
Elemental Sulphur	mg/kg	<50	<50	<50	<50	<50	<50	<50	<50
TOC on soil	%	0.22	0.04	0.06	0.05	0.35	0.03	0.05	0.07
Asbestos P/A - all samples		0	0	0	0	0	0	0	0
Asbestos id (10% total)		0	0	0	0	0	0	0	0
Asbestos quantify (10% tot)		0	0	0	0	0	0	0	0

Inorganics and organics results from Made Ground samples

SAMPLE DESCRIPTION		BH6R 1.0-2.0m	BH6F 1.0m	BH4F 1.0m	H2F 1.0-1.1m	H2F 3.0-3.1m	TP16 0.5m	TP16 1.2m	TP17 0.5m	TP13 0.5m
pH		8.5	8.2	8.1	8.2	8	8.3	8.3	8.3	8.5
Total Cyanide	mg/Kg	LT 1	LT 1	LT 1	1.99	9.6	LT 1	LT 1	LT 1	LT 1
Free Cyanide (if total > 5mg/Kg)		-	-	-	-	LT 5	-	-	-	-
Thiocyanate	mg/Kg	5.6	LT 0.4	LT 0.4	LT 0.4	LT 0.4	LT 0.4	LT 0.4	LT 0.4	LT 0.4
Total Phenols (color)	mg/Kg	LT 30	2.53	LT 30	1.15	0.94	0.5	0.47	0.4	0.49
Total Sulphate	mg/Kg	294	829	163	1376	1240	312	323	118	207
Sulphide	mg/Kg	4.5	1.65	1.7	5.52	7.79	8.36	24	-	1.11
Chloride	mg/Kg	13	49	21	71	92	40	33	484	6
Ammonia - KCl extr	mg/Kg	LT 1	LT 1	LT 1	22.6	228	LT 1	LT 1	LT 1	LT 1
Wat Sol Sulphate	mg/Kg	110	164	75	455	302	202	255	<DL	<DL
Dry Matter	%	81.41	88.12	85.3	74.83	70.16	89.72	85.58	79.42	88.58
DRO	mg/kg	83	23	98	546	804	43	107	71	62
VOC			ND	ND	ND	ND	ND	ND	ND	ND
SVOC	ug/kg		5085	6915	41854	17021	9124	23081	10067	7695
	ug/kg		1113	1097	9607	3731	4584	10727	4261	3082
PCB's	ug/kg		<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
PAH's	ug/kg	472	4044	299	28970	22161	12522	4173	10823	9437
Elemental Sulphur	mg/kg		<50		<50	<50	<50	<50	<50	<50
TOC on soil	%		0.48	-	17.86	2.31	0.67	0.54	0.47	0.37
Asbestos P/A - all samples		0	0	0	0	0	0	0	0	0
Asbestos id (10% total)		0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0

Inorganics and organics results from Made Ground samples

SAMPLE DESCRIPTION		TP13 1.3m	TP15 1.2m	TP15 1.2m	TP14 0.5m	TP14 1.0m	TP11 0.5m	TP11 1.2m	TP10 0.5m	TP10 1.2m
pH		8.6	8.5	9.6	8.6	8.6	8.3	8.5	8.6	7.7
Total Cyanide	mg/Kg	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1
Free Cyanide (if total > 5mg/Kg)		-	-	-	-	-	-	-	-	-
Thiocyanate	mg/Kg	11.1	6.3	LT 0.4	35.8	5	LT 0.4	LT 0.4	LT 0.4	LT 0.4
Total Phenols (color)	mg/Kg	0.44	0.61	1.9	0.53	0.56	1.45	0.74	0.56	0.6
Total Sulphate	mg/Kg	333	232	1522	199	133	242	173	3648	408
Sulphide	mg/Kg	-	3.57	9.39	-	-	1.83	-	10.4	7.83
Chloride	mg/Kg	LT 1	4	13	4	8	9	LT 1	33	12
Ammonia - KCl extr	mg/Kg	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	385
Wat Sol Sulphate	mg/Kg	1820	123	770	158	130	274	26	<DL	415
Dry Matter	%	84.9	87.87	85.57	82.41	79.91	79.08	88.38	94.46	78.57
DRO	mg/kg	29.00	126.00	402.00	110.00	138.00	649.00	263.00	147.00	145.00
VOC		ND	ND	ND	ND	ND	ND	ND	ND	ND
SVOC	ug/kg	8399	15673	70176	6916	20441	99348	38390	15803	7719
	ug/kg	3756	4465	19955	1771	4606	20152	9837	3731	1003
PCB's	ug/kg	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
PAH's	ug/kg	7575	29597	160935	9786	22578	292305	97144	10002	8544
Elemental Sulphur	mg/kg	<50	<50	<50	<50	<50	<50	<50	<50	56
TOC on soil	%	0.24	1.11	1.82	0.26	0.15	1.48	0.72	0.53	1.21
Asbestos P/A - all samples		0	0	0	0	0	0	0	0	0
Asbestos id (10% total)		0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0

Inorganics and organics results from Made Ground samples

SAMPLE DESCRIPTION		TP12 0.5m	TP12 1.2m	BH7G 1.0m	BH8G 0.5m	BH8G 1.5m	BH8G 2.5m	BH1F 1.0m	BH1F 2.0m	BH5G 2.4m
pH		9.3	8	8	8.5	10.5	8.4	7.4	7.6	7.8
Total Cyanide	mg/Kg	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	75.1	LT 1	LT 1
Free Cyanide (if total > 5mg/Kg)		-	-	-	-	-	-	LT 5	-	-
Thiocyanate	mg/Kg	7.8	LT 0.4	LT 0.4	LT 0.4	LT 0.4	LT 0.4	10.2	LT 0.4	LT 0.4
Total Phenols (color)	mg/Kg	5.91	0.79	LT 30	LT 30	LT 30	LT 30	0.42	0.58	LT 30
Total Sulphate	mg/Kg	665	66	159	2682	2262	1982	3193	1786	514
Sulphide	mg/Kg	7.98	2.32	-	2.44	3.18	4.11	12	2.1	1.46
Chloride	mg/Kg	17	13	13	58	80	61	222	47	53
Ammonia - KCl extr	mg/Kg	LT 1	LT 1	LT 1	5.72	2.58	11.1	424	29.4	4.37
Wat Sol Sulphate	mg/Kg	260	<DL	38	3380	1210	1510	870	730	149
Dry Matter	%	90.86	85.37	86.06	87.05	81.16	76.22	60.35	52.13	77.53
DRO	mg/kg	874.00	21.00	16.00	19.00	30.00	1647.00	7868.00	220.00	41.00
VOC		ND	ND	ND	ND	ND	ND	ND	ND	ND
SVOC	ug/kg	234778	10707	943	1271	38542	7505	65177	14308	1727
	ug/kg	58047	3129	508	539	10745	1724	11947	5718	338
PCB's	ug/kg	<DL	<DL	<DL	<DL	<DL	<DL	8754155<D	<DL	<DL
PAH's	ug/kg	595163	34107	548	6613	11226	22963	20116	97	1568
Elemental Sulphur	mg/kg	<50	<50	<50	<50	<50	<50	121	116	<50
TOC on soil	%	1.57	0.83	0.34	0.98	1.04	1.55	7.96	4.46	1.18
Asbestos P/A - all samples		0	0	0	0	0	0	0	0	0
Asbestos id (10% total)		0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0

Inorganics and organics results from Made Ground samples

SAMPLE DESCRIPTION		BH5F 2.0m	BH5F 1.5m	BH5F 1.0m	H9R 0-1.3m
pH		8	7.8	7.9	8.2
Total Cyanide	mg/Kg	LT 1	LT 1	LT 1	LT 1
Free Cyanide (if total > 5mg/Kg)		-	-	-	-
Thiocyanate	mg/Kg	6.8	8.3	7.6	5.4
Total Phenols (color)	mg/Kg	LT 30	0.44	0.5	LT 30
Total Sulphate	mg/Kg	820	1382	1560	1171
Sulphide	mg/Kg	1.51	5.53	3.45	1.16
Chloride	mg/Kg	88	LT 1	38	29
Ammonia - KCl extr	mg/Kg	6.45	28.2	LT 1	2.93
Wat Sol Sulphate	mg/Kg	484	568	775	207
Dry Matter	%	77.28	70.11	76.01	79.66
DRO	mg/kg	36.00	276.00	314.00	419.00
VOC		ND	ND	ND	
SVOC	ug/kg	2813	29760	17154	
	ug/kg	609	9939	3207	
PCB's	ug/kg	<DL	<DL	<DL	
PAH's	ug/kg	563	3943	5678	3590
Elemental Sulphur	mg/kg	<50	<50	<50	<50
TOC on soil	%	1.73	2.05	1.5	1.62
Asbestos P/A - all samples		0	0	0	0
Asbestos id (10% total)		0	0	0	0
		0	0	0	0

Inorganics and organics results from Alluvium/Gravels samples

SAMPLE DESCRIPTION		BH2R 7.0-7.1m	BH2G 3.4m	BH2G 4.8m	BH2G 5.8m	BH2F 3.5m	BH8G 4.0m	BH8G 6.0m	BH1G 3.0m
pH		9.1	7.7	8.2	8.5	7.9	8.3	7.5	7.1
Total Cyanide	mg/Kg	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1
Free Cyanide (if total > 5mg/Kg)		-	-	-	-	-	-	-	-
Thiocyanate	mg/Kg	LT 0.4	LT 0.4	LT 0.4	LT 0.4	6.3	7.6	LT 0.4	LT 0.4
Total Phenols (color)	mg/Kg	LT 30	0.5	LT 30	0.41	0.79	LT 30	LT 30	1.91
Total Sulphate	mg/Kg	56.0	3418	1408	506	1122	1350	25045	1007
Sulphide	mg/Kg	-	2.52	5.25	2.7	7.5	1.99	6.77	3.3
Chloride	mg/Kg	29.0	137	98	85	160	251	680	85
Ammonia - KCl extr	mg/Kg	4.7	134	31.3	11.3	263	34.7	24.7	11.3
Wat Sol Sulphate	mg/Kg	<DL	136	112	47	133	356	1530	556
Dry Matter	%	84.2	59.37	81.75	72.88	60.99	57.6	66.48	63.53
DRO	mg/kg	37.00	100.00	69.00	98.00	498.00	415.00	318.00	9.00
VOC		ND	ND	ND	ND	ND	ND	ND	ND
SVOC	ug/kg	0	8464	5862	7494	27506	14753	11757	8332
	ug/kg	<0.001	1332	1263	1468	6470	3900	2406	1569
PCB's	ug/kg	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
PAH's	ug/kg	15	614	400	573	14453	868	112	85
Elemental Sulphur	mg/kg	<50	65	52	<50	84	59	145	87
TOC on soil	%	0.08	1.63	0.22	0.23	6.04	2.31	2.91	0.65
Asbestos P/A - all samples		0	0	0	0	0	0	0	0
Asbestos id (10% total)		0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0

Inorganics and organics results from Alluvium/Gravels samples

SAMPLE DESCRIPTION		BH1G 3.5-4.0m	BH5G 3.8m	BH3R 3.3-3.	BH3R 6.0-6.	H3R 7.5-8.0m
pH		8.2	8.2	8.20	8.80	9.1
Total Cyanide	mg/K	LT 1	LT 1	LT 1	LT 1	LT 1
Free Cyanide (if total > 5mg/Kg)		-	-	-	-	-
Thiocyanate	mg/K	LT 0.4	LT 0.4	5.40	LT 0.4	LT 0.4
Total Phenols (color)	mg/K	LT 30	LT 30	LT 30	LT 30	0.44
Total Sulphate	mg/K	483	15016	1171.00	524.00	105.5
Sulphide	mg/K	1.39	1.93	1.16	-	-
Chloride	mg/K	48	196	29.00	18.00	37
Ammonia - KCl extr	mg/K	2.63	3.36	2.93	1.75	5.38
Wat Sol Sulphate	mg/K	142	599	207.00	94.00	338
Dry Matter	%	93.06	91.84	79.66	79.82	82.01
DRO	mg/kg	15.00	34.00	79.00	75.00	32.00
VOC						ND
SVOC	ug/kg	5092	2757			0
	ug/kg	1111	681			<0.001
PCB's	ug/kg	<DL	<DL			<DL
PAH's	ug/kg	37	51	1416	113	458
Elemental Sulphur	mg/kg	<50	<50	<50	<50	<50
TOC on soil	%	0.05	0.07	0.17	0.06	0.04
Asbestos P/A - all samples		0	0	0	0	0
Asbestos id (10% total)		0	0	0	0	0
		0	0	0	0	0

Inorganics and organics results from London Clay samples

SAMPLE DESCRIPTION		BH9R 6.5m	BH6F 3.0m	BH6F 6.0m	BH4F 2.0m	BH4F 3.0m	BH7G 2.0m	BH7G 3.0m	BH7G 5.0m	BH7G 6.0m
pH		9.20	8.3	8.6	7.2	7.4	7.9	8.3	8.1	8.6
Total Cyanide	mg/Kg	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1
Free Cyanide (if total > 5mg/Kg)		-	-	-	-	-	-	-	-	-
Thiocyanate	mg/Kg	5.80	LT 0.4	LT 0.4	LT 0.4	LT 0.4	LT 0.4	LT 0.4	LT 0.4	LT 0.4
Total Phenols (color)	mg/Kg	LT 30	1.5	LT 30	LT 30	LT 30	LT 30	LT 30	LT 30	LT 30
Total Sulphate	mg/Kg	LT 1	79.0	638.0	77.0	89.0	81	311	15368	4802
Sulphide	mg/Kg	-	3.8	1.8	-	-	-	-	-	-
Chloride	mg/Kg	35.00	17.0	21.0	13.0	12.0	12	11	90	41
Ammonia - KCl extr	mg/Kg	9.23	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1
Wat Sol Sulphate	mg/Kg	221.00	75.0	131.0	110.0	105.0	<DL	107	478	193
Dry Matter	%	80.14	83.4	78.7	80.4	81.5	83.7	78.73	81.06	81.09
DRO	mg/kg	IS		55.00	55.00	62.00	15.00	15.00	12.00	14.00
VOC				ND	ND	ND	ND	ND	ND	ND
SVOC	ug/kg	IS		1203	1727	3977	1200	366	1135	1266
	ug/kg	IS		654	429	849	324	193	333	374
PCB's	ug/kg	IS		<DL	<DL	<DL	<DL	<DL	<DL	<DL
PAH's	ug/kg	IS		16	58	139	94	46	176	24
Elemental Sulphur	mg/kg	-	-	<50	<50	<50	<50	<50	<50	<50
TOC on soil	%	-	-	0.12	0.24	0.25	0.12	0.15	0.86	0.09
Asbestos P/A - all samples		0	0	0	0	0	0	0	0	0
Asbestos id (10% total)		0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0

Inorganics and organics results from London Clay samples

SAMPLE DESCRIPTION		BH9R 3.0m
pH		8.30
Total Cyanide	mg/Kg	LT 1
Free Cyanide (if total > 5mg/Kg)		-
Thiocyanate	mg/Kg	LT 0.4
Total Phenols (color)	mg/Kg	LT 30
Total Sulphate	mg/Kg	182.00
Sulphide	mg/Kg	1.65
Chloride	mg/Kg	58.00
Ammonia - KCl extr	mg/Kg	69.80
Wat Sol Sulphate	mg/Kg	69.00
Dry Matter	%	73.43
DRO	mg/kg	IS
VOC		
SVOC	ug/kg	IS
	ug/kg	IS
PCB's	ug/kg	IS
PAH's	ug/kg	IS
Elemental Sulphur	mg/kg	-
TOC on soil	%	-
Asbestos P/A - all samples		0
Asbestos id (10% total)		0
		0

Inorganics and organics results from Reading Beds samples

SAMPLE DESCRIPTION		BH6R 8.0-9.	BH6R 13.0-1	BH4R 10.5-1	BH2R 12.0m	BH2R 14.0m	BH4R 13.0-1	BH4R 18.0m	BH19R 10.0	BH4R 20.5-21.0m
pH		8.70	7.90	8.8	8.6	8.6	8.6	8.7	8.7	8.7
Total Cyanide	mg/Kg	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1
Free Cyanide (if total > 5mg/Kg)		-	-	-	-	-	-	-	-	-
Thiocyanate	mg/Kg	LT 0.4	6.60	6.7	LT 0.4	LT 0.4	8.4	5.1	LT 0.4	LT 0.4
Total Phenols (color)	mg/Kg	LT 30	LT 30	LT 30	0.5	LT 30	LT 30	LT 30	LT 30	LT 30
Total Sulphate	mg/Kg	1732.00	440.00	LT 1	1162.0	11289.0	61.0	228.0	LT 1	576.0
Sulphide	mg/Kg	1.85	1.47	1.4	1.7	1.2	1.5	-	1.2	-
Chloride	mg/Kg	42.00	28.00	12.0	43.0	202.0	4.0	32.0	32.0	27.0
Ammonia - KCl extr.	mg/Kg	LT 1	1.95	2.0	4.7	4LT 1	35.2	5.4	43.7	3.LT 12
Wat Sol Sulphate	mg/Kg	79.00	184.00	228.0	93.0	575.0	768.0	227.0	223.0	14.0
Dry Matter	%	85.89	86.62	81.0	82.2	83.0	84.5	78.9	84.0	84.0
DRO	mg/kg	17.00	37.00	142.00	45.00	48.00	30.00	26.00	58.00	31.00
VOC				ND	ND	ND	ND	ND	ND	ND
SVOC	ug/kg			1055	453	240	528	4543	232	4615
	ug/kg			709	123	240	232	815	232	949
PCB's	ug/kg			<DL	<DL	<DL	<DL	<DL	<DL	<DL
PAH's	ug/kg	40	99	240	51	507	73	9	12	12
Elemental Sulphur	mg/kg			<50	<50	<50	<50	<50	<50	<50
TOC on soil	%			0.05	0.15	0.21	0.05	0.03	0.06	0.05
Asbestos P/A - all samples		0	0	0	0	0	0	0	0	0
Asbestos id (10% total)		0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0

Inorganics and organics results from Reading Beds samples

SAMPLE DESCRIPTION		BH2R 9.0-9.	BH7R 9.0m	H7R 11.0m	H7R 13.0m	H7R 18.0m	7R 22.0-23.0	BH7G 7.8m	H1R 10.5m	BH8R 7.7m
pH		9.1	8.7	8.6	8.6	9	8.9	8.6	8.6	8.1
Total Cyanide	mg/Kg	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1
Free Cyanide (if total > 5mg/Kg)		-	-	-	-	-	-	-	-	-
Thiocyanate	mg/Kg	LT 0.4	LT 0.4	10.3	LT 0.4	8.4	LT 0.4	LT 0.4	5.7	5.5
Total Phenols (color)	mg/Kg	LT 30	1.27	0.82	0.62	0.57	0.42	LT 30	1.86	LT 30
Total Sulphate	mg/Kg	35.0	1153	300.5	99	60.6	1114.7	256	9691	296
Sulphide	mg/Kg	1.8	-	3.21	-	-	-	-	1.14	2.24
Chloride	mg/Kg	33.0	23	13	7	14	38	47	180	18
Ammonia - KCl extr	mg/Kg	4.9	2.37	7.59	5.86	4.59	1.LT 17	1.38	58.7	42
Wat Sol Sulphate	mg/Kg	<DL	428	36	<DL	86	184	173	487	283
Dry Matter	%	84.5	86.31	79.42	83.48	84.4	80.7	77.95	81.73	85.68
DRO	mg/kg	42.00	30.00	35.00	48.00	25.00	69.00	137.00	13.00	11.00
VOC		ND	ND	ND	ND	ND	ND	ND	ND	ND
SVOC	ug/kg	273	12973	845	1658	5680	2487	1833	2742	1723
	ug/kg	198	5119	526	1033	2084	654	553	847	449
PCB's	ug/kg	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
PAH's	ug/kg	443	4708	12006	5130	2905	116	26	28	0
Elemental Sulphur	mg/kg	<50	<50	<50	<50	<50	<50	<50	<50	<50
TOC on soil	%	0.09	0.04	0.16	0.05	0.14	0.08	0.11	0.31	0.06
Asbestos P/A - all samples		0	0	0	0	0	0	0	0	0
Asbestos id (10% total)		0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0

Inorganics and organics results from Reading Beds samples

SAMPLE DESCRIPTION		BH8R 9.8m	H8R 11.8m	H8R 15.8m	H8R 16.5m	BH5R 6.0m	BH5R 7.5m	H5R 10.5m	H5R 12.0m	H5R 13.5m
pH		8.7	9	8.7	8.9	8.6	8.8	8.8	8.8	9
Total Cyanide	mg/Kg	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1	LT 1
Free Cyanide (if total > 5mg/Kg)		-	-	-	-	-	-	-	-	-
Thiocyanate	mg/Kg	LT 0.4	6.2	LT 0:4	LT 0.4	LT 0.4	LT 0.4	LT 0.4	LT 0.4	LT 0.4
Total Phenols (color)	mg/Kg	LT 30	LT 30	1.19	LT 30	LT 30	LT 30	LT 30	LT 30	LT 30
Total Sulphate	mg/Kg	993	109	602	896	5798	1080	3860	4021	5121
Sulphide	mg/Kg	1.37	-	-	1.42	4.51	1.6	1.04	1.09	1.28
Chloride	mg/Kg	24	51	99	48	75	93	72	109	116
Ammonia - KCl extr	mg/Kg	28.2	11.7	1LT 1.5	7.88	2.64	2.78	8.LT 14	8.22	4.62
Wat Sol Sulphate	mg/Kg	263	274	104	131	256	126	140	160	120
Dry Matter	%	81.09	83.83	80.8	84.59	84.76	78.62	80.7	79.03	80.28
DRO	mg/kg	14.00	24.00	19.00	16.00	26.00	30.00	43.00	43.00	31.00
VOC		ND	ND	ND	ND	ND	ND	ND	ND	ND
SVOC	ug/kg	1084	4184	136	1994	4270	2338	10291	19583	4193
	ug/kg	343	682	136	1052	1140	462	4937	6506	1468
PCB's	ug/kg	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
PAH's	ug/kg	16	27	27	62	44	39	53	88	17
Elemental Sulphur	mg/kg	<50	<50	<50	<50	<50	<50	<50	<50	<50
TOC on soil	%	0.22	0.13	0.16	0.05	0.17	0.06	0.1	0.11	0.05
Asbestos P/A - all samples		0	0	0	0	0	0	0	0	0
Asbestos id (10% total)		0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0

Inorganics and organics results from Reading Beds samples

SAMPLE DESCRIPTION		BH8R 19.0m	BH1R 7.0m	BH1R 6.0m	BH9R 8-9m
pH		8.1	8.4	8.1	8.8
Total Cyanide	mg/Kg	LT 1	LT 1	LT 1	LT 1
Free Cyanide (if total > 5mg/Kg)		-	-	-	-
Thiocyanate	mg/Kg	LT 0.4	LT 0.4	LT 0.4	LT 0.4
Total Phenols (color)	mg/Kg	LT 30	LT 30	0.83	LT 30
Total Sulphate	mg/Kg	2717	7224	1230	524
Sulphide	mg/Kg	4.79	1.61	1.89	-
Chloride	mg/Kg	58	39	45	18
Ammonia - KCl extr	mg/Kg	26.3	15.2	3.67	1.75
Wat Sol Sulphate	mg/Kg	95	166	125	94
Dry Matter	%	84.37	83.86	79.61	79.82
DRO	mg/kg	28.00	39.00	100.00	98.00
VOC		ND	ND	ND	
SVOC	ug/kg	5483	13949	19471	
	ug/kg	1967	5876	6965	
PCB's	ug/kg	<DL	<DL	<DL	
PAH's	ug/kg	23	71	129	197
Elemental Sulphur	mg/kg	<50	<50	<50	<50
TOC on soil	%	0.03	0.71	0.35	0.16
Asbestos P/A - all samples		0	0	0	0
Asbestos id (10% total)		0	0	0	0
		0	0	0	0

Groundwater Quality Data

5

Groundwater results from Fill boreholes

Sample description		BH1F	BH5F
Tag Number		70907313	70907316
Lab Number		C188112	C188114
As - Arsenic	µg/l	1.70	1.50
B - Boron	µg/l	1545.00	1105.00
Ba - Barium	µg/l	50.00	50.00
Ca - Calcium	mg/l	339.00	174.00
Cd - Cadmium	µg/l	LT 0.5	LT 0.5
Cr - Chromium	µg/l	22.00	17.00
Cu - Copper	µg/l	20.00	LT 20
Fe - Iron	µg/l	193.00	485.00
Hg - Mercury	µg/l	0.10	LT 0.05
K - Potassium	mg/l	24.30	13.20
Mg - Magnesium	mg/l	19.70	12.80
Mn - Manganese	µg/l	683.00	33.00
Mo - Molybdenium	µg/l	LT 5	LT 5
Na - Sodium	mg/l	115.30	153.40
Ni - Nickel	µg/l	25.00	8.00
Pb - Lead	µg/l	LT 5	LT 5
Sb - Antimony	µg/l	2.50	0.80
Se - Selenium	µg/l	2.20	2.90
Zn - Zinc	µg/l	91.00	44.00

Groundwater results from Fill boreholes

Sample description		BH1F	BH5F
Tag Number		70907313	70907316
Lab Number		C188112	C188114
pH		7.00	8.40
Total Cyanide	µg/l	8.00	6.00
(Free Cyanide) - no de	µg/l	-	-
Ammonia - N	mg/l	2.46	1.26
Nitrite - N	mg/l	0.41	0.49
TON	mg/l	16.40	13.40
Sulphate	mg/l	369.30	241.10
Total P	mg/l	0.09	0.11
Alkalinity	mg/l	528.00	267.00
Chloride	mg/l	137.00	170.00
BOD	mg/l	2.00	LT 1
COD	mg/l	70.80	85.10
E.Conductivity	µS/cm	1768.00	1365.00
TOC	mg/l	19.70	IS
DRO	µg/l	102.00	
VOC		0	0
SVOC (Scan)		0	
		0	
Total Phenols GC-MS	µg/l	0.00	
PAH's	µg/l	0.0120	
Benzo(ghi)Perylene		LT 0.010	
Benzo(a)Pyrene		0.012	
Benzo(b)Fluoranthene		LT 0.010	
Benzo(k)Fluoranthene		LT 0.010	
Fluoranthene		LT 0.010	
Indeno1,2,3,-cdPyrene		LT 0.010	
Plate Count (22°C, 72hrs)		0.00	410000.00
Plate Count (37°C, 48hrs)		300.00	140000.00
Total Coliforms		GT 2419	GT 2419
Escherichia coli		549.00	GT 2419

Groundwater results from London Clay boreholes

Sample description		BH7G	BH6F	BH4F
Tag Number		70907297	70907306	70907307
Lab Number		C187901	C187896	C188046
As - Arsenic	µg/l	LT 1	1.40	1.10
B - Boron	µg/l	97.00	<65	2065.00
Ba - Barium	µg/l	17.00	49.00	43.00
Ca - Calcium	mg/l	175.00	208.00	185.00
Cd - Cadmium	µg/l	LT 0.5	LT 0.5	LT 0.5
Cr - Chromium	µg/l	5.00	15.00	15.00
Cu - Copper	µg/l	LT 20	LT 20	LT 20
Fe - Iron	µg/l	115.00	177.00	129.00
Hg - Mercury	µg/l	LT 0.05	LT 0.05	LT 0.05
K - Potassium	mg/l	1.70	3.00	10.90
Mg - Magnesium	mg/l	9.10	20.70	14.40
Mn - Manganese	µg/l	88.00	307.00	44.00
Mo - Molybdenium	µg/l	LT 5	LT 5	LT 5
Na - Sodium	mg/l	30.00	23.60	151.70
Ni - Nickel	µg/l	LT 4.4	LT 4.4	9.00
Pb - Lead	µg/l	LT 5	LT 5	LT 5
Sb - Antimony	µg/l	LT 0.8	LT 0.8	LT 0.8
Se - Selenium	µg/l	0.80	1.20	1.80
Zn - Zinc	µg/l	LT 18	LT 18	46.00

Groundwater results from London Clay boreholes

Sample description		BH7G	BH6F	BH4F
Tag Number		70907297	70907306	70907307
Lab Number		C187901	C187896	C188046
pH		7.30	7.50	8.00
Total Cyanide	µg/l	LT 5	LT 5	6.00
(Free Cyanide) - no d	µg/l	-	-	-
Ammonia - N	mg/l	LT 0.1	LT 0.1	0.48
Nitrite - N	mg/l	LT 0.1	LT 0.1	2.27
TON	mg/l	1.90	1.50	40.40
Sulphate	mg/l	102.30	279.20	208.70
Total P	mg/l	LT 0.025	LT 0.025	0.03
Alkalinity	mg/l	367.00	334.00	219.00
Chloride	mg/l	44.00	41.00	151.00
BOD	mg/l	LT 1	2.00	2.00
COD	mg/l	LT 10	LT 10	36.40
E.Conductivity	µS/cm	838.00	1022.00	1438.00
TOC	mg/l	2.00	2.60	9.70
DRO	µg/l	335.00	568.00	2857.00
VOC		0	0	0
SVOC (Scan)		0	0	259
		0	0	32
Total Phenols GC-MS	µg/l	0.00	0.00	0.00
PAH's	µg/l			
Benzo(ghi)Perylene		LT 0.010	LT 0.010	LT 0.010
Benzo(a)Pyrene		LT 0.005	LT 0.005	LT 0.005
Benzo(b)Fluoranthene		LT 0.010	LT 0.010	LT 0.010
Benzo(k)Fluoranthene		LT 0.010	LT 0.010	LT 0.010
Fluoranthene		LT 0.010	LT 0.010	LT 0.010
Indeno1,2,3,-cdPyrene		LT 0.010	LT 0.010	LT 0.010
Plate Count (22°C, 72hrs)		180000.00	320000.00	940000.00
Plate Count (37°C, 48hrs)		0.00	2000.00	70000.00
Total Coliforms		326.00	770.00	GT 2419
Escherichia coli		0.00	1.00	1300.00

Groundwater results from Gravel boreholes

Sample description		BH3G	BH2G	BH1G	BH8G	BH5G
Tag Number		70907229	70907235	70907300	70907310	70907317
Lab Number		C186343	C186720	C187898	C188048	C188115
As - Arsenic	µg/l	7.80	8.50	5.90	17.60	5.10
B - Boron	µg/l	1410.00	868.00	1066.00	309.00	1332.00
Ba - Barium	µg/l	35.00	71.00	103.00	80.00	128.00
Ca - Calcium	mg/l	153.00	292.00	365.00	354.00	277.00
Cd - Cadmium	µg/l	LT 0.5	LT 0.5	LT 0.5	LT 0.5	LT 0.5
Cr - Chromium	µg/l	LT 5	LT 5	29.00	LT 5	14.00
Cu - Copper	µg/l	20.00	39.00	LT 20	LT 20	LT 20
Fe - Iron	µg/l	2458.00	12151.00	13499.00	33700.00	385.00
Hg - Mercury	µg/l	LT 0.05	LT 0.05	LT 0.05	LT 0.05	LT 0.05
K - Potassium	mg/l	15.40	19.00	21.00	18.30	21.60
Mg - Magnesium	mg/l	15.00	25.30	24.10	35.90	36.70
Mn - Manganese	µg/l	657.00	1814.00	1248.00	2430.00	1006.00
Mo - Molybdenium	µg/l	LT 5	LT 5	LT 5	LT 5	LT 5
Na - Sodium	mg/l	141.10	149.30	98.30	119.30	133.20
Ni - Nickel	µg/l	8.00	50.00	27.00	8.00	14.00
Pb - Lead	µg/l	LT 5	LT 5	6.00	LT 5	LT 5
Sb - Antimony	µg/l	LT 0.8	LT 0.8	1.30	LT 0.8	1.60
Se - Selenium	µg/l	2.70	3.90	1.10	4.30	4.60
Zn - Zinc	µg/l	LT 18	38.00	31.00	87.00	LT 18

Groundwater results from Gravel boreholes

Sample description		BH3G	BH2G	BH1G	BH8G	BH5G
Tag Number		70907229	70907235	70907300	70907310	70907317
Lab Number		C186343	C186720	C187898	C188048	C188115
pH		7.90	7.10	6.90	7.00	7.00
Total Cyanide	µg/l	6.00	9.00	9.00	LT 5	LT 5
(Free Cyanide) - no d	µg/l	-	-	-	-	-
Ammonia - N	mg/l	10.81	17.33	4.30	1.87	1.58
Nitrite - N	mg/l	0.17	LT 0.1	0.54	LT 0.1	0.11
TON	mg/l	0.00	0.00	1.50	0.00	3.00
Sulphate	mg/l	79.90	170.00	483.90	256.10	305.00
Total P	mg/l	2.56	0.13	0.21	LT 0.025	0.96
Alkalinity	mg/l	514.00	823.00	620.00	860.00	623.00
Chloride	mg/l	151.00	166.00	95.00	129.00	100.00
BOD	mg/l	LT 1	LT 1	LT 1	1.00	LT 1
COD	mg/l	30.00	110.00	76.50	197.00	58.30
E.Conductivity	µS/cm	1318.00	1922.00	1804.00	1915.00	1622.00
TOC	mg/l	13.00	36.00	17.70	32.00	17.70
DRO		213.00	581.00	132.00	91.00	63.00
VOC		0	0	0	0	0
SVOC (Scan)		443	305	0	0	0
		57	76	0	0	0
Total Phenols GC-MS	µg/l	0	0	0.00	0.00	0.00
PAH's	µg/l					
Benzo(ghi)Perylene		LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010
Benzo(a)Pyrene		LT 0.005	LT 0.005	LT 0.005	LT 0.005	LT 0.005
Benzo(b)Fluoranthene		LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010
Benzo(k)Fluoranthene		LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010
Fluoranthene		LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010
Indeno1,2,3,-cdPyrene		LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010
Plate Count (22°C, 72hrs)				1060000.00	16400.00	180000.00
Plate Count (37°C, 48hrs)				30000.00	6500.00	40000.00
Total Coliforms				GT 2419	31.00	GT 2419
Escherichia coli				517.00	3.00	GT 2419

Groundwater results from Reading Beds boreholes

Sample description		BH9R	BH3R	BH2R	BH4R	BH7R	BH1R	BH6R	BH8R	BH5R
Tag Number		70907225	70907227	70907233	70907237	70907295	70907299	70907304	70907309	70907315
Lab Number		C186341	C186342	C186709	C186713	C187899	C187900	C187895	C188047	C188113
As - Arsenic	µg/l	LT 1	6.60	2.10	6.30	LT 1	3.50	2.40	1.10	1.80
B - Boron	µg/l	652.00	3267.00	900.00	1910.00	315.00	835.00	569.00	724.00	1060.00
Ba - Barium	µg/l	97.00	90.00	15.00	52.00	67.00	13.00	54.00	81.00	49.00
Ca - Calcium	mg/l	122.00	181.00	115.00	203.00	187.00	149.00	156.00	130.00	108.00
Cd - Cadmium	µg/l	LT 0.5	LT 0.5	LT 0.5	LT 0.5	LT 0.5	LT 0.5	LT 0.5	0.00	LT 0.5
Cr - Chromium	µg/l	LT 5	LT 5	2LT 5	11.00	5.00	LT 5	9.00	LT 5	LT 5
Cu - Copper	µg/l	LT 20	LT 20	LT 20	35.00	LT 20	LT 20	LT 20	LT 20	LT 20
Fe - Iron	µg/l	2223.00	4600.00	3491.00	4132.00	2580.00	2509.00	4242.00	4830.00	65.00
Hg - Mercury	µg/l	LT 0.05	LT 0.05	LT 0.05	LT 0.05	LT 0.05	LT 0.05	LT 0.05	LT 0.05	LT 0.05
K - Potassium	mg/l	15.70	24.90	10.90	21.30	13.10	13.70	13.30	24.50	12.90
Mg - Magnesium	mg/l	68.80	29.30	11.30	28.10	68.40	13.10	58.80	67.10	20.80
Mn - Manganese	µg/l	135.00	428.00	298.00	2088.00	366.00	483.00	322.00	139.00	102.00
Mo - Molybdenium	µg/l	LT 5	LT 5	14.68	LT 5	LT 5	LT 5	LT 5	LT 5	LT 5
Na - Sodium	mg/l	96.50	222.20	129.10	100.60	103.20	138.60	55.90	106.30	130.20
Ni - Nickel	µg/l	6.00	11.00	121.00	59.00	12.00	9.00	21.00	LT 4.4	LT 4.4
Pb - Lead	µg/l	LT 5	LT 5	LT 5	LT 5	LT 5	LT 5	LT 5	LT 5	LT 5
Sb - Antimony	µg/l	LT 0.8	LT 0.8	LT 0.8	LT 0.8	LT 0.8	1.20	LT 0.8	LT 0.8	0.90
Se - Selenium	µg/l	2.10	5.10	1.10	1.30	3.50	5.30	1.60	1.90	1.30
Zn - Zinc	µg/l	LT 18	LT 18	LT 18	66.00	215.00	49.00	80.00	94.00	LT 18

Groundwater results from Reading Beds boreholes

Sample description		BH9R	BH3R	BH2R	BH4R	BH7R	BH1R	BH6R	BH8R	BH5R
Tag Number		70907225	70907227	70907233	70907237	70907295	70907299	70907304	70907309	70907315
Lab Number		C186341	C186342	C186709	C186713	C187899	C187900	C187895	C188047	C188113
pH		7.70	7.80	7.40	7.00	7.10	7.30	7.10	7.30	7.60
Total Cyanide	µg/l	LT 5	7.00	LT 5	LT 5	LT 5	5.00	LT 5	5.00	LT 5
(Free Cyanide) - no d	µg/l	-	-	-	-	-	-	-	-	-
Ammonia - N	mg/l	1.17	22.15	8.83	14.22	0.80	11.50	1.00	19.77	4.30
Nitrite - N	mg/l	LT 0.1	LT 0.1	LT 0.1	0.18	0.13	0.30	LT 0.1	LT 0.1	0.15
TON	mg/l	0.00	0.00	0.00	2.30	0.00	1.20	0.00	0.00	1.30
Sulphate	mg/l	133.50	83.90	78.30	286.40	93.80	159.30	128.20	99.60	132.50
Total P	mg/l	LT 0.025	1.77	2.89	LT 0.025	LT 0.025	2.08	LT 0.025	LT 0.025	2.85
Alkalinity	mg/l	547.00	765.00	411.00	498.00	556.00	450.00	499.00	625.00	260.00
Chloride	mg/l	109.00	195.00	112.00	79.00	163.00	111.00	108.00	118.00	116.00
BOD	mg/l	LT 1	LT 1	5.00	LT 1	LT 1	LT 1	LT 1	2.00	LT 1
COD	mg/l	16.60	35.10	30.60	42.70	11.40	16.10	LT 10	30.90	12.20
E.Conductivity	µS/cm	1313.00	1839.00	1106.00	1460.00	1509.00	1255.00	1206.00	1450.00	1099.00
TOC	mg/l	6.40	13.00	10.20	15.20	8.30	8.80	3.70	14.30	5.90
DRO		149.00	186.00	168.00	194.00	103.00	106.00	107.00	123.00	136.00
VOC		0	0	0	0	0	0	0	0	0
SVOC (Scan)		179	575	0	0	0	0	0	0	0
		29	73	0	0	0	0	0	0	0
Total Phenols GC-M	µg/l	0	0	0	0	0.00	0.00	0.00	0.00	0.00
PAH's	µg/l									
Benzo(ghi)Perylene		LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010
Benzo(a)Pyrene		LT 0.005	LT 0.005	LT 0.005	LT 0.005	LT 0.005	LT 0.005	LT 0.005	LT 0.005	LT 0.005
Benzo(b)Fluoranthene		LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010
Benzo(k)Fluoranthene		LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010
Fluoranthene		LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010
Indeno1,2,3,-cdPyrene		LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010	LT 0.010
Plate Count (22°C, 72hrs)						550000.00	1590000.00	50000.00	210000.00	770000.00
Plate Count (37°C, 48hrs)						11200.00	0.00	4100.00	90000.00	70000.00
Total Coliforms						236.00	GT 2419	435.00	37.00	435.00
Escherichia coli						5.00	120.00	0.00	2.00	108.00

Groundwater results from chalk boreholes

Sample description		SHOBH	BH2C	BH6C	BH5C
Tag Number		70907199	70907231	70907302	70907312
Lab Number		C186043	C186722	C187894	C188111
As - Arsenic	µg/l	LT 1	LT 1	1.00	LT 1
B - Boron	µg/l	538	282.00	615.00	533.00
Ba - Barium	µg/l	152	84.00	58.00	39.00
Ca - Calcium	mg/l	132	127.00	143.00	106.00
Cd - Cadmium	µg/l	LT 0.5	LT 0.5	LT 0.5	LT 0.5
Cr - Chromium	µg/l	LT 5	LT 5	LT 5	LT 5
Cu - Copper	µg/l	LT 20	49.00	LT 20	LT 20
Fe - Iron	µg/l	2572	1828.00	2695.00	102.00
Hg - Mercury	µg/l	LT 0.05	LT 0.05	LT 0.05	LT 0.05
K - Potassium	mg/l	11.6	5.90	10.40	9.70
Mg - Magnesium	mg/l	43.1	15.90	20.20	29.10
Mn - Manganese	µg/l	96	182.00	267.00	78.00
Mo - Molybdenium	µg/l	LT 5	LT 5	LT 5	LT 5
Na - Sodium	mg/l	67.7	35.30	76.40	61.10
Ni - Nickel	µg/l	6	LT 4.4	7.00	LT 4.4
Pb - Lead	µg/l	LT 5	LT 5	LT 5	LT 5
Sb - Antimony	µg/l	128.1	LT 0.8	LT 0.8	LT 0.8
Se - Selenium	µg/l	1.9	0.90	1.50	0.90
Zn - Zinc	µg/l	LT 18	LT 18	LT 18	322.00

Groundwater results from chalk boreholes

Sample description		SHOBH	BH2C	BH6C	BH5C
Tag Number		70907199	70907231	70907302	70907312
Lab Number		C186043	C186722	C187894	C188111
pH		7.3	7.30	7.10	7.30
Total Cyanide	µg/l	LT 5	LT 5	LT 5	LT 5
(Free Cyanide) - no d	µg/l	-	-	-	-
Ammonia - N	mg/l	5.687	1.51	5.50	3.90
Nitrite - N	mg/l	LT 0.1	LT 0.1	LT 0.1	LT 0.1
TON	mg/l	LT 1	0.00	0.00	0.00
Sulphate	mg/l	78.4	62.90	95.30	103.20
Total P	mg/l	0.083	LT 0.025	0.05	0.28
Alkalinity	mg/l	485	325.00	430.00	334.00
Chloride	mg/l	96	46.00	84.00	78.00
BOD	mg/l	LT 1	LT 1	LT 1	LT 1
COD	mg/l	18.8	18.40	LT 10	LT 10
E.Conductivity	µS/cm	1159	770.00	1025.00	929.00
TOC	mg/l	8.3	5.20	6.30	0.30
DRO		160.00	128.00	218.00	91.00
VOC		0	0	0	0
SVOC (Scan)		25	0	0	0
		25	0	0	0
Total Phenols GC-MS	µg/l	0	0	0.00	0.00
PAH's	µg/l				
Benzo(ghi)Perylene		LT 0.010	LT 0.010	LT 0.010	LT 0.010
Benzo(a)Pyrene		LT 0.005	LT 0.005	LT 0.005	LT 0.005
Benzo(b)Fluoranthene		LT 0.010	LT 0.010	LT 0.010	LT 0.010
Benzo(k)Fluoranthene		LT 0.010	LT 0.010	LT 0.010	LT 0.010
Fluoranthene		LT 0.010	LT 0.010	LT 0.010	LT 0.010
Indeno1,2,3,-cdPyrene		LT 0.010	LT 0.010	LT 0.010	LT 0.010
Plate Count (22°C, 72hrs)				70000.00	350000.00
Plate Count (37°C, 48hrs)				3600.00	30000.00
Total Coliforms				2.00	24.00
Escherichia coli				0.00	4.00

Leachate results

TP10 1.2m

SAMPLE DESCRIPTION		BH6 F 2.0m	BH4F 1.2m	BH2F 2.0-2.1	TP17 1.1m	TP15 1.2m	TP14 1.0m	TP11 1.2m	~~TP16 1.0m~~	TP12 1.2m	BH7G 1.0m	BH8G 0.5m	BH8G 2.5m	BH1G 1.0m	BH5G 1.0m	H5F 1.5m
Tag Number		70907503	70907528	70907537	70907544	70907547	70907550	70907552	70907555	70907558	70907572	70907582	70907584	70907593	70907623	70907627
Lab Number		C185288	C186051	C186183	C186289	C186292	C186295	C186297	C186300	C186303	C186586	C186594	C186596	C187261	C187526	C187529
As - Arsenic	ug/l	7.4	1.8	4.3	1.8	4.8	1.2	4.6	5.6	5.7	3.2	6.1	4.6	22.8	4	<1.0
B - Boron	ug/l	193	144	256	175	1369	2500	1347	3511	1324	130	1369	2384	334	296	4219
Ba - Barium	ug/l	5	14	9	20	69.17	54.17	52.53	53.56	45.91	53	20	2	47	31	15
Ca - Calcium	mg/l	23	22	24	22	18	20	24	26	17	24	155	57	55	48	42
Cd - Cadmium	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	8.8	0.9	1.1
Cr - Chromium	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	24	6	57	10	30
Cu - Copper	ug/l	< 20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	418	50	34
Fe - Iron	ug/l	1951	731	240	723	692	115	1342	734	2241	2622	142	250	1408	1208	4065
Hg - Mercury	ug/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.08	0.06	0.05	0.08	<0.05	<0.05	1.92	0.09	<0.05
K - Potassium	mg/l	5.3	1.6	4.5	3.6	4.5	3.9	1.5	9.1	1	3.1	6.9	5	4.7	4.7	4.6
Mg - Magnesium	mg/l	1.3	1	1.6	1.9	<1.0	1.1	<1.0	<1.0	<1.0	1.1	3	3.4	1.7	4.4	3.7
Mn - Manganese	ug/l	63	16	38	22	47	<3	35	97	79	151	26	42	206	436	328
Mo - Molybdenium	ug/l	<5	<5	7.57	<5	<5	<5	<5	<5	<5	<5	11.13	6.46	72.78	6.08	<5
Na - Sodium	mg/l	< 5	<5	5.9	<5	<5	7.5	<5	<5	<5	<5	7	6.9	<5	8.8	5
Ni - Nickel	ug/l	<4	<4	6	<4	<4	<4	<4	<4	<4	<4	<4	<4	114	28	15
Pb - Lead	ug/l	21	<5	5	10	7	<5	20	15	15	11	<5	<5	128	10	<5
Sb - Antimony	ug/l	2.1	1.5	4.7	1.7	1.8	1.2	2.3	2.9	2.1	1.3	4.7	3	36.7	3.3	5.7
Se - Selenium	ug/l	<0.8	1	1.6	1.6	1.2	1.4	1.2	1.6	0.9	0.8	2.3	2.2	7.1	3.8	<0.8
Zn - Zinc	ug/l	28	<18	<18	37	<18	<18	38	30	20	74	<18	<18	496	54	45
pH		8.1	8.1	7.9	8.1	8	8.3	8.1	8	8	8	8.4	8.1	7.6	8	8.2
Total Cyanide	µg/l	<5	<5	8	<5	<5	<5	<5	17	<5	<5	<5	<5	64	19	18
Ammonia - N	mg/l	0.363	0.205	0.314	< 0.2	<0.2	<0.2	<0.2	58.535	<0.2	<0.2	1.02	2.032	4.103	1.022	1.096
Sulphate	mg/l	< 10	<10	36.5	19.8	40.2	58.7	12.9	118.4	<10	17	1515.6	486.4	88.3	<10	<10
Total P	mg/l	1.77	0.28	0.41	0.267	0.601	0.586	0.811	0.655	1.605	0.948	0.185	0.244	3.385	0.567	0.262
Alkalinity	mg/l	28	46	45	38	34	37	79	51	27	22	38	54	57	104	111
Chloride	mg/l	7	<5	< 5	27	<5	<5	<5	14	6	6	26	20	24	<5	<5
Thiocyanate	mg/l	< 0.3	<0.3	< 0.3	0.4	0.3	1.4	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	1	1.1	0.4
Dry Solids	%	85.94	NR	NR	NR	-	-	-	-	-	-	-	-	NR	NR	NR
Total Inorganic P	µg/l	2043	311	423	404	621	710	1012	787	1625	1282	194	239	2959	515	354
Hydrocarbons Diss	mg/l	NR													IS	IS
Phenols	µg/l	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Risk Assessment Sensitivity Runs 6

Risk Assessment Sensitivity Runs *continued*

BASELINE CONDITIONS

Ammoniacal Nitrogen

Infiltration	4.6	mg/l
Inflow Quality		
Reading Beds	10	mg/l
Chalk	1.5	mg/l

Scenario	Description	Reading Formation	Chalk	Reading Formation	Chalk
Original		9.42	2.78	9.42	2.78
1	Horizontal permeability in gravels * / 10	9.42	2.78	9.42	6.59
2	Horizontal permeability in Reading Formation * / 10	9.94	2.87	7.05	2.40
3	Horizontal permeability in Chalk * / 10	9.42	1.65	9.42	6.72
4	Flow front in Reading Formation +- 20%	9.51	2.80	9.29	2.76
5	Flow front in Chalk +- 20%	9.42	2.60	9.42	3.04
6	Gravel bed thickness max - min	9.42	2.78	9.42	2.78
7	Reading Formation thickness max - min	9.60	2.81	9.42	2.78
8	Horizontal hydraulic gradient in gravels +- 20%	9.42	2.78	9.42	2.78
9	Horizontal hydraulic gradient in Reading Formation +- 20%	9.51	2.80	9.29	2.76
10	Horizontal hydraulic gradient in Chalk +- 20%	9.42	2.60	9.42	3.04
11	Background concentration in gravels +- 20%	9.42	2.78	9.42	2.78
12	Background concentration in Reading Formation +- 20%	11.20	3.07	7.63	2.49
13	Background concentration in Chalk +- 20%	9.42	3.03	9.42	2.53
14	Vertical permeability in Reading Formation * / 10	7.05	5.16	9.94	1.66
15	Vertical permeability in Chalk * / 10	9.42	2.78	9.42	2.78
16	Contamination from 0.5 to whole site	8.75	3.86	9.29	3.02
17	Vertical hydraulic gradient in Reading Formation +- 20%	9.32	2.97	9.53	2.57
18	Vertical hydraulic gradient in Chalk +- 20%	9.42	2.78	9.42	2.78
19	Percoaltion - max -> min measured	9.42	2.78	9.42	2.78
20	Contaminant concentration +- 20%	9.52	2.80	9.32	2.77
21	Contaminant concentration +- 50%	9.67	2.82	9.17	2.74
		11.20	6.72		
		7.05	1.65		

Risk Assessment Sensitivity Runs *continued*

BASELINE CONDITIONS

Ammoniacal Nitrogen

Infiltration	4.6	mg/l
Inflow Quality		
Reading Beds	10	mg/l
Chalk	4.8	mg/l

Scenario	Description	Reading Formation	Chalk	Reading Formation	[illegible]
Original		9.42	5.55	9.42	5.55
1	Horizontal permeability in gravels * / 10	9.42	5.55	9.42	7.77
2	Horizontal permeability in Reading Formation * / 10	9.94	5.63	7.05	5.16
3	Horizontal permeability in Chalk * / 10	9.42	4.89	9.42	7.84
4	Flow front in Reading Formation +- 20%	9.51	5.56	9.29	5.53
5	Flow front in Chalk +- 20%	9.42	5.44	9.42	5.70
6	Gravel bed thickness max - min	9.42	5.55	9.42	5.55
7	Reading Formation thickness max - min	9.60	5.58	9.42	5.55
8	Horizontal hydraulic gradient in gravels +- 20%	9.42	5.55	9.42	5.55
9	Horizontal hydraulic gradient in Reading Formation +- 20%	9.51	5.56	9.29	5.53
10	Horizontal hydraulic gradient in Chalk +- 20%	9.42	5.44	9.42	5.70
11	Background concentration in gravels +- 20%	9.42	5.55	9.42	5.55
12	Background concentration in Reading Formation +- 20%	11.20	5.84	7.63	5.26
13	Background concentration in Chalk +- 20%	9.42	6.35	9.42	4.74
14	Vertical permeability in Reading Formation * / 10	7.05	6.28	9.94	4.90
15	Vertical permeability in Chalk * / 10	9.42	5.55	9.42	[illegible]
16	Contamination from 0.5 to whole site	8.75	6.09	9.29	[illegible]
17	Vertical hydraulic gradient in Reading Formation +- 20%	9.32	5.65	9.53	[illegible]
18	Vertical hydraulic gradient in Chalk +- 20%	9.42	5.55	9.42	5.55
19	Percoaltion - max -> min measured	9.42	5.55	9.42	5.55
20	Contaminant concentration +- 20%	9.52	5.56	9.32	5.53
21	Contaminant concentration +- 50%	9.67	5.59	9.17	5.51
		11.20	7.84		
		7.05	4.74		

Risk Assessment Sensitivity Runs *continued*

BASELINE CONDITIONS

Ammoniacal Nitrogen

Infiltration	4.6	mg/l
Inflow Quality		
Reading Beds	15	mg/l
Chalk	4.8	mg/l

Scenario	Description	Reading Formation	Chalk	Reading Formation	Chalk
Original		13.88	6.27	13.88	6.27
1	Horizontal permeability in gravels * / 10	13.88	6.27	13.88	10.64
2	Horizontal permeability in Reading Formation * / 10	14.88	6.43	9.32	5.53
3	Horizontal permeability in Chalk * / 10	13.88	4.97	13.88	10.79
4	Flow front in Reading Formation +- 20%	14.05	6.30	13.64	6.23
5	Flow front in Chalk +- 20%	13.88	6.06	13.88	6.57
6	Gravel bed thickness max - min	13.88	6.27	13.88	6.27
7	Reading Formation thickness max - min	14.24	6.33	13.88	6.27
8	Horizontal hydraulic gradient in gravels +- 20%	13.88	6.27	13.88	6.27
9	Horizontal hydraulic gradient in Reading Formation +- 20%	14.05	6.30	13.64	6.23
10	Horizontal hydraulic gradient in Chalk +- 20%	13.88	6.06	13.88	6.57
11	Background concentration in gravels +- 20%	13.88	6.27	13.88	6.27
12	Background concentration in Reading Formation +- 20%	16.56	6.71	11.20	5.84
13	Background concentration in Chalk +- 20%	13.88	7.08	13.88	5.47
14	Vertical permeability in Reading Formation * / 10	9.32	7.78	14.88	4.99
15	Vertical permeability in Chalk * / 10	13.88	6.27	13.88	6.27
16	Contamination from 0.5 to whole site	12.59	7.34	13.64	6.52
17	Vertical hydraulic gradient in Reading Formation +- 20%	13.69	6.47	14.09	6.04
18	Vertical hydraulic gradient in Chalk +- 20%	13.88	6.27	13.88	6.27
19	Percoaltion - max -> min measured	13.88	6.27	13.88	6.27
20	Contaminant concentration +- 20%	13.98	6.29	13.78	6.26
21	Contaminant concentration +- 50%	14.13	6.31	13.63	6.23
		16.56	10.79		
		9.32	4.97		

Risk Assessment Sensitivity Runs *continued*

BASELINE CONDITIONS

Ammoniacal Nitrogen

Infiltration	39.5 (99%ile)	mg/l
Inflow Quality		
Reading Beds	15	mg/l
Chalk	4.8	mg/l

Scenario	Description	Reading Formation	Chalk	Reading Formation	Chalk
Original		17.63	6.88	17.63	6.88
1	Horizontal permeability in gravels * / 10	17.63	6.88	17.63	13.05
2	Horizontal permeability in Reading Formation * / 10	15.29	6.50	28.39	8.62
3	Horizontal permeability in Chalk * / 10	17.63	5.04	17.63	13.26
4	Flow front in Reading Formation +- 20%	17.23	6.81	18.21	6.97
5	Flow front in Chalk +- 20%	17.63	6.58	17.63	7.30
6	Gravel bed thickness max - min	17.63	6.88	17.63	6.88
7	Reading Formation thickness max - min	16.79	6.74	17.63	6.88
8	Horizontal hydraulic gradient in gravels +- 20%	17.63	6.88	17.63	6.88
9	Horizontal hydraulic gradient in Reading Formation +- 20%	17.23	6.81	18.21	6.97
10	Horizontal hydraulic gradient in Chalk +- 20%	17.63	6.58	17.63	7.30
11	Background concentration in gravels +- 20%	17.63	6.88	17.63	6.88
12	Background concentration in Reading Formation +- 20%	20.31	7.31	14.96	6.45
13	Background concentration in Chalk +- 20%	17.63	7.68	17.63	6.07
14	Vertical permeability in Reading Formation * / 10	28.39	20.34	15.29	5.[illegible]
15	Vertical permeability in Chalk * / 10	17.63	6.88	17.63	6.[illegible]
16	Contamination from 0.5 to whole site	20.67	9.97	18.21	7.[illegible]
17	Vertical hydraulic gradient in Reading Formation +- 20%	18.09	7.30	17.15	6.45
18	Vertical hydraulic gradient in Chalk +- 20%	17.63	6.88	17.63	6.88
19	Percoaltion - max -> min measured	17.63	6.88	17.63	6.88
20	Contaminant concentration +- 20%	18.48	7.02	16.78	6.74
21	Contaminant concentration +- 50%	19.76	7.22	15.51	6.54
		28.39	20.34		
		14.96	5.00		

Risk Assessment Sensitivity Runs *continued*

BASELINE CONDITIONS

Ammoniacal Nitrogen

Infiltration	58.5 mg/l (maximum)
Inflow Quality	
Reading Beds	10 mg/l
Chalk	4.8 mg/l

Scenario	Description	Reading Formation	Chalk	Reading Formation	Chalk
Original		15.21	6.49	15.21	6.49
1	Horizontal permeability in gravels * / 10	15.21	6.49	15.21	11.49
2	Horizontal permeability in Reading Formation * / 10	10.58	5.74	36.50	9.94
3	Horizontal permeability in Chalk * / 10	15.21	5.00	15.21	11.66
4	Flow front in Reading Formation +- 20%	14.42	6.36	16.35	6.67
5	Flow front in Chalk +- 20%	15.21	6.24	15.21	6.83
6	Gravel bed thickness max - min	15.21	6.49	15.21	6.49
7	Reading Formation thickness max - min	13.55	6.22	15.21	6.49
8	Horizontal hydraulic gradient in gravels +- 20%	15.21	6.49	15.21	6.49
9	Horizontal hydraulic gradient in Reading Formation +- 20%	14.42	6.36	16.35	6.67
10	Horizontal hydraulic gradient in Chalk +- 20%	15.21	6.24	15.21	6.83
11	Background concentration in gravels +- 20%	15.21	6.49	15.21	6.49
12	Background concentration in Reading Formation +- 20%	17.00	6.78	13.43	6.20
13	Background concentration in Chalk +- 20%	15.21	7.29	15.21	5.68
14	Vertical permeability in Reading Formation * / 10	36.50	25.69	10.58	4.91
15	Vertical permeability in Chalk * / 10	15.21	6.49	15.21	6.49
16	Contamination from 0.5 to whole site	21.22	10.15	16.35	7.05
17	Vertical hydraulic gradient in Reading Formation +- 20%	16.12	6.93	14.26	6.07
18	Vertical hydraulic gradient in Chalk +- 20%	15.21	6.49	15.21	6.49
19	Percoaltion - max -> min measured	15.21	6.49	15.21	6.49
20	Contaminant concentration +- 20%	16.47	6.69	13.96	6.28
21	Contaminant concentration +- 50%	18.36	7.00	12.07	5.98
		36.50	25.69		
		10.58	4.91		

Risk Assessment Sensitivity Runs *continued*

DEMOLITION PHASE

Ammoniacal Nitrogen

Infiltration	15	mg/l
Area of Site	50	%
Inflow Quality		
Reading Beds	15	mg/l
Chalk	4.8	mg/l

Scenario	Description	Reading Formation	Chalk	Reading Formation	Chalk
Original		13.73	13.61	13.73	13.61
1	Horizontal permeability in gravels * / 10	13.73	13.61	13.73	13.61
2	Horizontal permeability in Reading Formation * / 10	11.13	11.04	14.84	14.70
3	Horizontal permeability in Chalk * / 10	13.73	12.63	13.73	13.72
4	Flow front in Reading Formation +- 20%	13.55	13.43	13.93	13.81
5	Flow front in Chalk +- 20%	13.73	13.59	13.73	13.63
6	Gravel bed thickness max - min	13.73	13.61	13.73	13.61
7	Reading Formation thickness max - min	13.29	13.17	13.73	13.61
8	Horizontal hydraulic gradient in gravels +- 20%	13.73	13.61	13.73	13.61
9	Horizontal hydraulic gradient in Reading Formation +- 20%	13.55	13.43	13.93	13.81
10	Horizontal hydraulic gradient in Chalk +- 20%	13.73	13.59	13.73	13.63
11	Background concentration in gravels +- 20%	13.73	13.61	13.73	13.61
12	Background concentration in Reading Formation +- 20%	14.24	14.11	13.22	13[illegible]
13	Background concentration in Chalk +- 20%	13.73	13.61	13.73	13.[illegible]
14	Vertical permeability in Reading Formation * / 10	13.73	13.61	12.82	12.30
15	Vertical permeability in Chalk * / 10	13.73	13.67	13.73	12.63
16	Contamination from 0.5 to whole site	14.27	14.21	13.73	13.61
17	Vertical hydraulic gradient in Reading Formation +- 20%	13.73	13.61	13.73	13.61
18	Vertical hydraulic gradient in Chalk +- 20%	13.73	13.63	13.73	13.58
19	Percoaltion - max -> min measured	14.25	14.13	12.57	12.46
20	Contaminant concentration +- 20%	15.96	15.82	11.49	11.39
21	Contaminant concentration +- 50%	19.32	19.15	8.14	8.07
		19.32	19.15		
		8.14	8.07		