Solent Road, Havant
PO9 1JH.

Phase 2
Environmental Site Investigation Report
For

Hargreaves

PRIVATE AND CONFIDENTIAL



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1.0 EXECUTIVE SUMMARY

The site is currently occupied by a single, two storey brick built industrial unit, comprising internal offices and a large workshop area, with a yard and vehicle parking area to the west of the building. The site is proposed for redevelopment for commercial / industrial use. The site is considered to be located within a moderate to highly sensitive environmental setting due to residential properties located within the immediate vicinity and the underlying Secondary Aquifer, associated with the superficial deposits. These are underlain by a Principal Aquifer associated with the underlying Chalk.

The site investigation, carried out on the 16th July 2010, comprised the excavation of six window sampler boreholes (up to 5.0m bgl). Furthermore, three groundwater / gas monitoring wells were installed. The site investigation was intended to gain information about the ground conditions on site, to determine the possible existence of an historic tank and to characterise any contamination associated with the previous land use.

The site investigation identified ground conditions generally consisting of Made Ground varying in thickness from 0.2m to 1.20m. The Made Ground typically comprised hardstanding (concrete or tarmac) overlying both granular and cohesive material with flint gravel and fragments of brick and concrete. Superficial deposits were encountered beneath the Made Ground consisting of Alluvium. This comprised a combination of grey organic to very organic gravelly clay; a thin layer of peat (0.1m thick) was identified at a depth of 1.7m bgl in WS2. The Alluvium was encountered in five of the six window sample locations at depths ranging from 0.8m and 1.2m bgl.

Superficial Head Deposits were also encountered within one of the six window samples (WS5) on the northern site boundary at a depth of 0.2m bg. The deposit comprised yellow brown / grey brown sandy gravelly clay. The superficial deposits were underlain by structureless Chalk encountered at depths of between 1.0 and 3.0m bgl, comprising yellow brown / cream, gravelly sandy clay.

The site contact indicated that an underground fuel storage tank was located in the centre of the site. The tank was reportedly emptied by the previous site owners (BT). The site contact was unable to provide further information regarding the tank. A fuel filling point was noted within the yard area. No evidence of any possible associated contamination was identified during site investigation. However, should an underground fuel storage tank be encountered during the redevelopment of the site, it will need to be suitably decommissioned prior to development works being undertaken.

None of the soil samples analysed from either the Made Ground or the natural ground recorded contaminant concentrations above corresponding screening values.

None of the ground water samples analysed recorded contaminant concentrations above corresponding screening values.

Concentrations of TPH in the Made Ground are such that upgraded services or over excavated service corridors may be required.

The results of the ground gas assessment, undertaken in accordance with the guidance as presented within CIRIA C665, indicate that the ground gas regime for the site corresponds with Characteristic Situation 1. CIRIA C665 classifies Characteristic Situation 1 as a very low risk whereby no gas protection measures are required.

A small area of Japanese Knotweed was noted on the western boundary of the site. This will require treatment and management prior to the redevelopment of the site.

Overall, in view of the above, RPS considers the potential risk to current and future site users, the environment and water resources to be **LOW.**

Given that the potential risk of the site is low it is considered that the site is suitable for the proposed redevelopment for commercial / industrial use.

2.0 INTRODUCTION

2.1 Preamble

RPS Health, Safety & Environment (RPS) was commissioned by **Hargreaves** to undertake an environmental intrusive site investigation of a site at Solent Road, Havant, PO9 1JH. The intrusive investigation was followed by a risk assessment to determine the likely redevelopment constraints, risk of future liability, the potential risk to the current and future users of the site and its environs, as well as the wider environment. The suitability of the site for the proposed future development is also taken into consideration.

The information contained within this report is based upon the available information at the time of reporting.

2.2 Site Location and Description

This section of the report is based upon observations made during a site visit on 16th July 2010. The site location and site boundary plans are shown in Appendix A. Selected photos are shown in Appendix B.

The site currently comprises a small metal cutting factory and associated yard and vehicle parking area.

RPS understands that the site is to be redeveloped for continued commercial use.

2.3 The Site

Background

The site is located in the town of Havant, approximately 700m southeast of the train station, at National Grid Reference SU 712 060. It is roughly rectangular in shape and occupies an area of approximately 0.2 ha.

Site Layout

At the time of the visit the site comprised a single two storey brick built industrial unit with internal offices and a large workshop area. A yard and vehicle parking were located to the west of the building. The main access was from Solent Road to the north of the site. The site was previously utilised by British Telecom (BT) as a vehicle depot, a concrete pad associated with a vehicle wash and a separate fuel filling area is located in the centre of the yard area in the west of the site.

Building Structure

The building is a two storey, brick-built structure, and given the age of the premises asbestos containing materials are likely to have been incorporated into the building.

Topography and Surface Cover

The topography of the site was predominantly flat. The yard area was surfaced in a mixture of concrete (in the previous vehicle wash and historic tank area), and tarmac covering the remainder of the site.

Drainage

Surface water drainage was via drains within the hardstanding areas. Two oil / water interceptors were observed during the site walkover in the area of the historic Under Ground Fuel Storage Tank (UST). The interceptors were noted to be in good condition with little oil within the chambers.

Storage/Tanks

Site personnel confirmed that there was a historic UST (unknown volume) located in the centre of the site, it was reported that the tank had been emptied by the previous tenants (BT) 18 years ago.

A large locked storage container was located in the south of the site. It was not possible to gain access to the container during the site visit.

RPS was informed that no diesel back-up generators were present on site.

Waste

The site is currently vacant and, as such, no waste is currently produced. A locked container was located in the south of the site, it was not clear what it contained. A small skip was located in the centre of the site, this contained general waste produced from closing of the premises.

Asbestos

RPS is informed that a previous historical asbestos survey has not been completed for this site. The building was of such an age that asbestos containing materials are considered likely to have been incorporated into building material and a formal inspection prior to any redevelopment works is recommended.

Electricity Sub-Station

No electricity substations or transformers were observed on site.

Visual Contamination

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

Other Issues

A small area of Japanese Knotweed was observed on the western boundary of the site (see Photograph 4, Appendix B). This will require treatment and management prior to the redevelopment of the site.

The Surrounding Area

The site is located in an area of mixed residential, light industrial and commercial land uses. Neighbouring land consists of the following:

North - Small light industrial units.
East - Petrol fuel filling station.
South - Small light industrial units.
West - Residential houses with gardens.

2.4 Site History

Historical Map Review

The following review is based on available past editions of readily available Ordnance Survey (OS) maps. These include scales of 1:1,250, 1:2,500 and 1:10,000 dated 1866 to 2010. Extracts from selected historical maps are given in Appendix A.

On-site Land Use and Features	Dates
The site comprised open greenfield land.	1867 – c. 1972
Then **a small undefined building** (15% of site) was located in the east of the site.	c. 1972 – c. 1981
Then the **building had been extended** (30% of site) into an 'L' shape, the sites current configuration.	c. 1981 - Present

Surrounding Land Uses (250m radius)	Orientation	Distance	Dates	
			From	To
Eight undifferentiated buildings (possibly residential)	West	Adjacent	1867	
A number of small undefined, possibly industrial, units (defined as a Depot in 1961).	South	Adjacent	1953	Present
Electronic Factory	East	Adjacent	1965	c. 1996
Superstore and Petrol Filling Station	East	Adjacent	1996	Present
Small industrial estate comprising Factory (undefined), Warehouse and Plastics Factory. (Unlabelled from 1989)	North	20 – 100m	1965	Present
Small industrial estate including a Factory, Engineering Works, Electronic Factory and Foundry (Unlabelled from 1989)	West	40-250m	1965	Present
Undefined warehouse	East	90m		
Washing Factory	North	110m	1867	c. 1897
Chamois Leather Works	North	110m	1897	
Sewerage Works	Southeast	140m	1932	
Brockhampton Stream	North	165m	1867	
Reservoir	North	170m	1867	
Electroplating Works	East	200m	1973	
Tannery	Northwest	250m	1897	c. 1909
Water Works	Northeast	250m	1932	c. 1953
Parchment Works	Northeast	250m	1897	c. 1932

RPS understands that the site has been operated as a small metal cutting factory since the early 1990s. Prior to this, the site was operated as a BT transport depot. An underground storage tank (reportedly emptied by BT) was reportedly located within the yard area. A vehicle wash down area was also preset at the site.

2.5 Published Geology

Based on British Geological Survey 1:50,000-scale survey sheet No. 316, Fareham, the stratigraphic sequence in the vicinity of the site is as follows:

- Drift deposits comprise a mixture of Head deposits, Aeolian Deposits and Alluvium (Quaternary) - Comprises a combination of sand and gravel, locally with lenses of silt, clay or peat.
- Upper Chalk *(Cretaceous)* - (Lewes Nodular Chalk Formation, Seaford Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation) generally of 350m thickness.

Made Ground

Made Ground may be present across parts of the site as a result of past construction activities.

2.6 Hydrogeology and Hydrology

According to the Environment Agency's website (accessed 29/07.10) the site overlies a Secondary A aquifer associated with the superficial deposits, which, in turn overlies a Principal Aquifer associated with the Upper Chalk Formation.

The site is not located within an Environment Agency designated groundwater Source Protection Zone (SPZ). There are no watercourses within 500m of the site which is classified under the Environment Agency's General Quality Assessment (GQA) scheme. The nearest surface water feature (Brockhampton spring and pond) lies approximately 200m to the north, Hermatage stream is located approximately 220m northeast of the site. In addition, Environment Agency data indicates that the site is not located within an area at risk of flooding.

2.7 Potential Areas of Concern

Based upon the site history, two potential areas of concern were targeted in the site investigation. These being;

1. The potential for a historical tank to be located beneath ground level and any possible contamination associated with the tank.
2. The potential for made ground of unknown origin to be present across the site.

The exploratory hole locations were positioned to obtain maximum information regarding the ground conditions, clarification of the existence of the historic tank and any possible ground contamination associated with the former land use.

3.0 SITE INVESTIGATION

3.1 Objectives

The objectives of the site investigation were to assess:

1. General ground conditions.
2. The contamination status of underlying soils and groundwater.
3. The ground gas regime.

3.2 Description of Works

The intrusive site investigation was carried out on the 16th July 2010 and comprised:

- Six window sample boreholes advanced to a maximum depth of 5.0 metres below ground level (m bgl).
- Collection of samples for chemical analysis.
- Installation of three groundwater / gas monitoring wells.

Boreholes were located externally where possible to obtain maximum information regarding the ground conditions, clarification of the existence of the historic tank and any possible ground contamination associated with the former land use. The rear of the property (east of the site) was inaccessible, no access was provided to the factory building. A borehole location plan is presented in Figure 2. Window Sample logs are presented in Appendix B.

The soil arisings from each hole were carefully examined for visual and olfactory evidence of contamination. Headspace testing was undertaken on site where appropriate for volatile organic compounds (VOCs) using a portable Photo-Ionisation Detector (PID) which responds to a broad range of VOCs. The results are recorded on the borehole logs (in parts per million in air) in Appendix B.

Soil samples were collected in clean jars and tubs for chemical laboratory testing and forwarded to a UKAS accredited laboratory for analysis.

On 21st July 2010, installations were monitored for concentrations of methane, carbon dioxide and oxygen, in addition to atmospheric pressure, flow rate and groundwater levels. Groundwater samples were taken from two of the monitoring wells.

3.3 Laboratory Testing

A total of nine samples of soil and two samples of groundwater were analysed for a range of the following determinands:

Soil organic matter (SOM), asbestos pH, phenols, total cyanide, boron, arsenic, chromium, copper, lead, selenium, zinc, cadmium, mercury, nickel, sulphide, moisture content, benzene, toluene, ethylbenzene, p & m-xylene, o-xylene, Methyl tertiary-butyl ether (MTBE), polyaromatic hydrocarbons (PAHs), and total petroleum hydrocarbons (TPHs).

3.4 Ground Conditions

Geology

The encountered strata in boreholes are listed in Table 2 and described in the following section.

Table 1: Encountered Strata

Strata	Depth to Top of Strata (m bgl)	Thickness (m)
Made Ground	Surface	1.20
Alluvium Head Deposits	0.80 0.2	0.7m– 1.25 2.8
Upper Chalk Formation	1.9 – 3.0	1.0 – 3.1

Made Ground

Made Ground was encountered across the site to depths of up to 1.20m bgl. The Made Ground comprised both granular and cohesive material with fragments of brick, concrete with flint gravel.

Superficial deposits

Alluvium

Encountered in five of the six window sample locations at depths ranging from 0.8m to 1.2m bgl. The superficial deposits comprised a combination of grey organic to very organic gravelly clay; a thin layer of peat (0.1m thick) was identified at a depth of 1.7m bgl in WS2.

Head Deposits

Encountered within one of the six window samples (WS5) on the northern site boundary at a depth of 0.2m bg. The deposit comprised yellow brown / grey brown sandy gravelly clay.

Chalk

Encountered within all of the window sample locations at depths ranging from 1.0m to 3.0m bgl. The deposit comprised structureless Chalk comprised yellow brown / cream / light grey gravelly sandy clay.

Groundwater

Groundwater strikes were identified in the superficial and Chalk deposits. Strikes were identified at depths ranging from approximately 2.0m – 3.0m bgl during drilling.

Following completion of works, groundwater was recorded at a depth ranging from 1.29 m -1.59 m bgl. The groundwater monitoring results are summarised in Table 3 below:

Table 3: Groundwater Monitoring Results

Monitoring Well	Well Screen Depth (m bgl)	Depth to Water (m bgl)
		21st July 2010
WS1	1.0 – 4.0	1.579
WS4	1.0 – 2.5	1.291
WS6	1.0 – 3.5	DRY

Field Evidence of Contamination

No visual or olfactory evidence of any possible contamination associated with the presence of the historic fuel storage tank or the historic use of the site was identified within the soil strata during the site investigation. *In situ* headspace testing carried out using a photo ionisation detector on selected soil samples did not identify any notably elevated concentrations of volatile contaminants across the site.

4.0 ANALYTICAL RESULTS

4.1 Soil Guidelines

Specific screening criteria appropriate for a commercial developement have been derived using CLEA v. 1.06. Screening values have been formulated assuming exposure of 8.3 hours a day inside, and 0.7 hours a day outside the building hours per day and exposure duration of 230 days per year. The age range has been modelled for 17 onwards, consistent with the use of the site as a commercial development. A site specific pH of 8.3 and SOM of 2.71% was used in the model. Further details of the screening criteria are provided in Appendix D.

4.2 Soil Analysis

Analytical data has been assessed against the appropriate Site Specific Assessment Criteria, as outlined in Section 4.1. None of the samples from either the Made Ground or the natural strata were found to contain concentrations of any determinands above the corresponding screening values.

4.3 Groundwater Analysis

Analytical data has been assessed against the UK Drinking Water Standards and Environmental Quality Standards (where necessary). None of the samples were found to contain concentrations of any determinands above the corresponding screening values.

4.4 Ground Gas Monitoring Results

Ground gas monitoring was undertaken on the 21st July 2010. Installations were monitored for concentrations of methane, carbon dioxide and oxygen, in addition to flow rates, and barometric pressure. The results are presented in Appendix E.

No detectable concentrations of methane were recorded at the site. Carbon dioxide was recorded at a maximum concentration of 0.4% v/v within one borehole (WS1). A maximum flow of 0.1l/hr was recorded in one borehole (WS1).

Atmospheric pressure was recorded as 1005mb when the monitoring took place on 21st July 2010.

The CIRIA Report C665 '*Assessing risks posed by hazardous ground gases to buildings*' outlines indicative guideline concentrations for carbon dioxide and methane in association with gas flow rates for which gas protection measures may be required in new residential

or commercial developments. The methodology is most appropriate for a commercial development is based on the Modified Wilson and Card approach that characterises the gas regime into a series of Characteristic Situations (1 to 5), with corresponding indicative gas protection measures.

The results of the ground gas assessment undertaken in accordance with the guidance as presented within CIRIA C665, indicates that the ground gas regime for the site corresponds with Characteristic Situation 1, based on a single monitoring round to date. CIRIA C665 classifies Characteristic Situation 1, as a very low risk, whereby no specific protection measures are required.

5.0 ENVIRONMENTAL RISK ASSESSMENT

The principal aim of this risk assessment is to determine whether there was the potential for contamination to be present, which could impact future site uses/occupiers and the wider environment, significantly constrain the proposed use of the site or affect the development process. The site's suitability for its proposed use has been determined following the guidance outlined in Planning Policy Statement (PPS) 23. This requires an assessment of the potential risks associated with contamination at the site through the identification of significant 'pollutant linkages'.

5.1 Qualitative Risk Assessment

A discussion of the likelihood and significance of environmental risk to potential receptors at the site and in the surrounding area is detailed below.

Current Site Users / Occupants

None of the potential contaminants of concern were detected at concentrations above the screening criteria. As a result, the risk to current site users is considered to be **LOW.**

Future Site User / Occupants

It is understood that the site will be redeveloped for continued commercial use. In view of the absence of contamination harmful to human health, the risk to future site users is considered to be **LOW.**

Surface Water

None of the potential contaminants of concern were detected at concentrations above the screening criteria in soils or groundwater. As a result, the risk to current site users is considered to be **LOW.**

Groundwater

None of the potential contaminants of concern were detected at concentrations above the screening criteria. As a result, the risk to groundwater is considered to be **LOW.**

Adjacent Properties

In view of no ground contamination having been identified at the site, the risk of any contaminants migrating to adjacent properties is considered to be **LOW.**

Ecological Receptors – Flora/Fauna

RPS is unaware of any protected / sensitive environmental areas recorded within 500m of the site and no evidence of vegetation distress was observed during the investigation.

A small area of Japanese knotweed was noted on the western boundary of the site, this will require treatment and management prior to the redevelopment of the site.

Overall, the risk to flora and fauna is considered to be **LOW to MODERATE.**

Groundworkers

CLEA V1.06 cannot be used to assess the acute (short term exposure) risk that personnel in close contact with exposed soils may experience during demolition, redevelopment or site maintenance duties. The associated risks can, however, easily be controlled by the use of appropriate personnel protective equipment (disposable coveralls, gloves and particulate/vapour masks) and by adopting high levels of personal hygiene. Providing such measures are taken, the risk to ground workers is considered to be **LOW.**

Infrastructure

Given the current and proposed use of this site as a commercial building the identified ground gas concentrations are considered unlikely to represent a significant risk to the site buildings.

Concentrations of TPH in the Made Ground are such that upgraded services or over excavated service corridors may be required. Therefore, it is recommended that the service provider be consulted at the design stage.

Overall, the risk to infrastructure is considered to be **LOW.**

5.2 Conceptual Model

The potential source-pathway-receptor linkages at the subject site discussed above are summarised below.

Pathway: / Receptor:	Contact / ingestion of Contaminated Soils	Volatilisation (incl. inhalation of dusts / vapours)	Leaching of Contaminants / GW Migration
Current Site Users	**Low**	**Low**	n/a
Future Site Users	**Low**	**Low**	n/a
Ground-workers	**Low**	**Low**	n/a
Adjacent Properties	n/a	**Low**	**Low**
Infrastructure	**Low**	**Low**	**Low**
Groundwater	n/a	**Low**	**Low**
Surface Water	n/a	n/a	**Low**
Ecological Receptors	**Low**		n/a

Key:

High	**High risk**
Mod-High	**Moderate to high risk**
Mod	**Moderate risk**
Low-Mod	**Low to moderate risk**
Low	**Low risk**
n/a	**Not applicable**

The risk assessment is based upon the available information relating to the site. Should ground conditions inconsistent with those outlined in this report be encountered, RPS should be contacted to enable further assessment.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The site investigation identified ground conditions generally consisting of Made Ground varying in thickness from 0.2m to 1.20m. The Made Ground typically comprised hardstanding (concrete or tarmac) overlying both granular and cohesive material with flint gravel and fragments of brick and concrete.

Superficial deposits were encountered beneath the Made Ground consisting of Alluvium which comprised a combination of grey organic to very organic gravelly clay, a thin layer of peat (0.1m thick) was identified at a depth of 1.7m bgl in WS2. The Alluvium was encountered in five of the six window sample locations at depths ranging from 0.8m and 1.2m bgl. Superficial Head Deposits were also encountered within one of the six window samples (WS5) on the northern site boundary at a depth of 0.2m bg. The deposit comprised yellow brown / grey brown sandy gravelly clay. The superficial deposits were underlain by structureless Chalk encountered at depths of between 1.0 and 3.0m bgl, comprising yellow brown / cream, gravelly sandy clay.

The site contact indicated that an underground fuel storage tank was located in the centre of the site. The tank was reportedly emptied and filled by the previous site owners (BT). The site contact was unable to provide further information regarding the tank. A fuel filling point was noted within the yard area. No evidence of any possible associated contamination was identified during site investigation. However, should an underground fuel storage tank be encountered during the redevelopment of the site, it will need to be suitably decommissioned prior to development works being undertaken.

None of the soil samples analysed from either the Made Ground or the natural ground recorded contaminant concentrations above corresponding screening values.

None of the ground water samples analysed recorded contaminant concentrations above the corresponding screening values.

Concentrations of TPH in the Made Ground are such that upgraded services or over excavated service corridors may be required.

The results of the ground gas assessment undertaken in accordance with the guidance as presented within CIRIA C665, preliminary results, based on one monitoring round, indicate that the ground gas regime for the site corresponds with Characteristic Situation 1. CIRIA C665 classifies Characteristic Situation 1 as a very low risk.

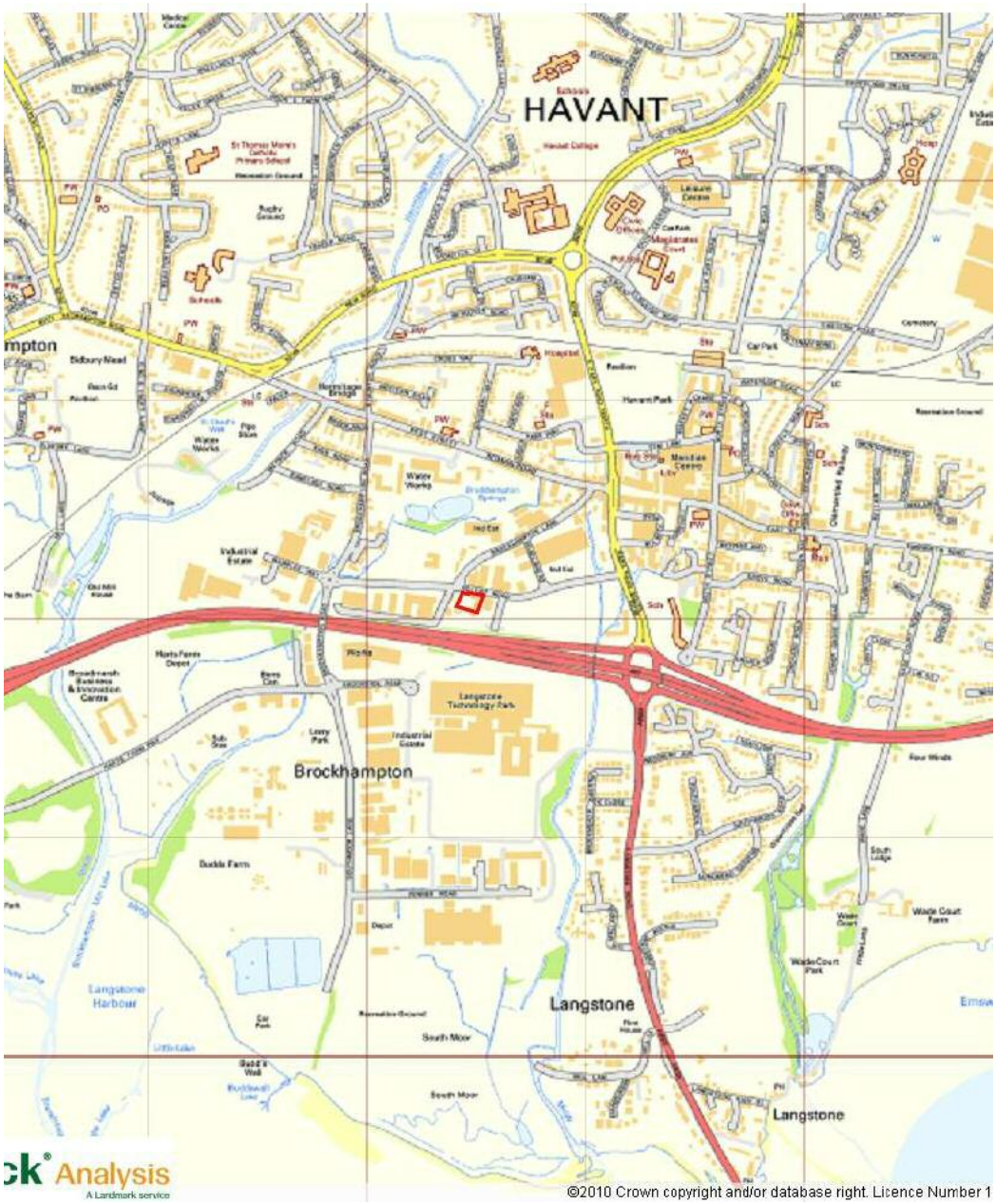
A small area of Japanese Knotweed was noted on the western boundary of the site. This will require treatment and management prior to the redevelopment of the site.

Overall, in view of the above, RPS considers the potential risk to current and future site users, the environment and water resources to be **LOW.**

Given that the potential risk of the site is low it is considered that the site is suitable for the proposed redevelopment for commercial / industrial use.

FIGURES

Figures *2* Pages



Project: Solent Road, Havant

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Figure 1: Site Location Plan

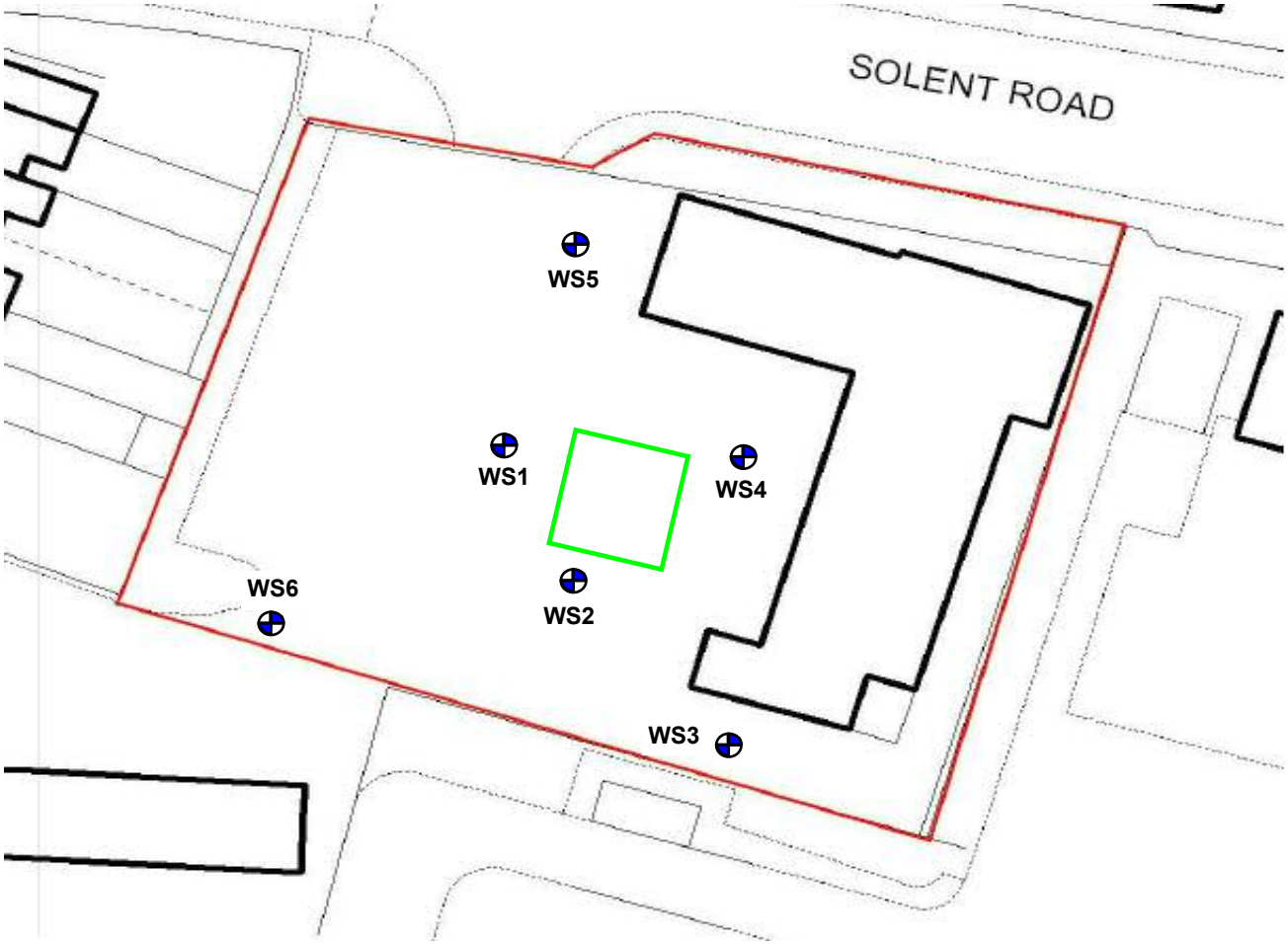
Map Date: Current

Scale: NTS

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Key

WS1 Window Sample Location

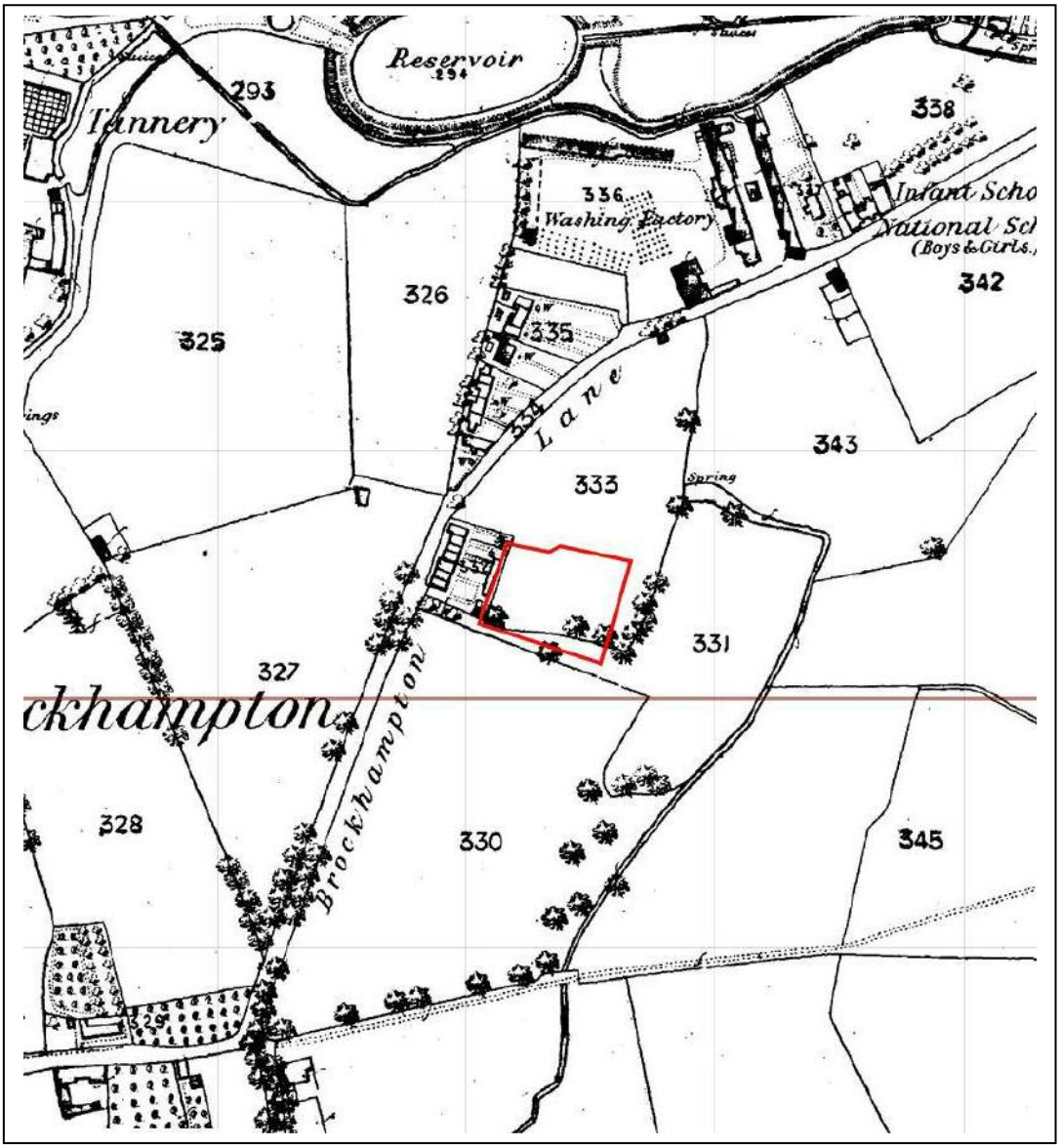
Approximate location of UST

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Figure 2: Window Sample Location Plan

APPENDIX A:
HISTORICAL MAPS

Appendix A - 7 Pages

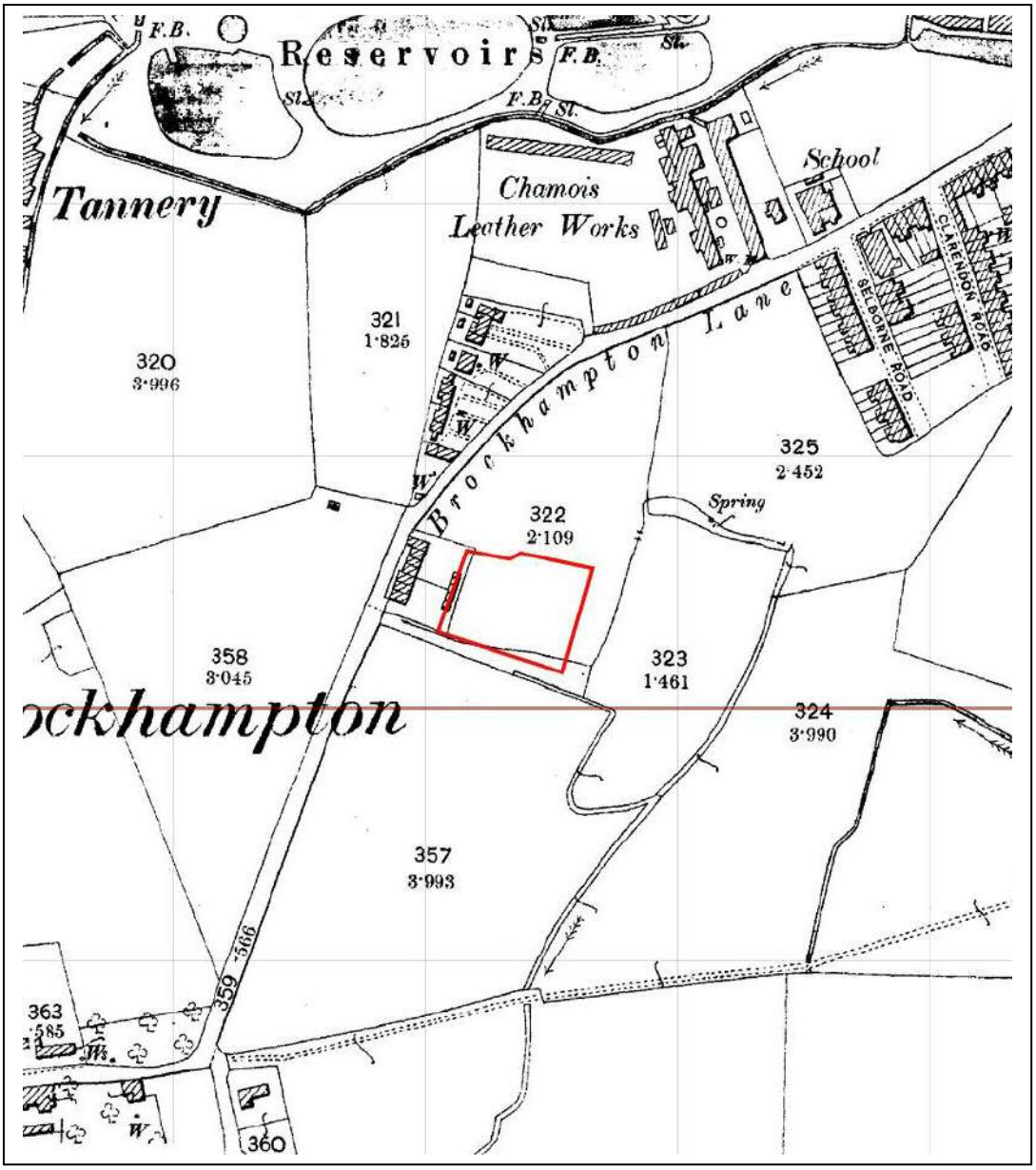


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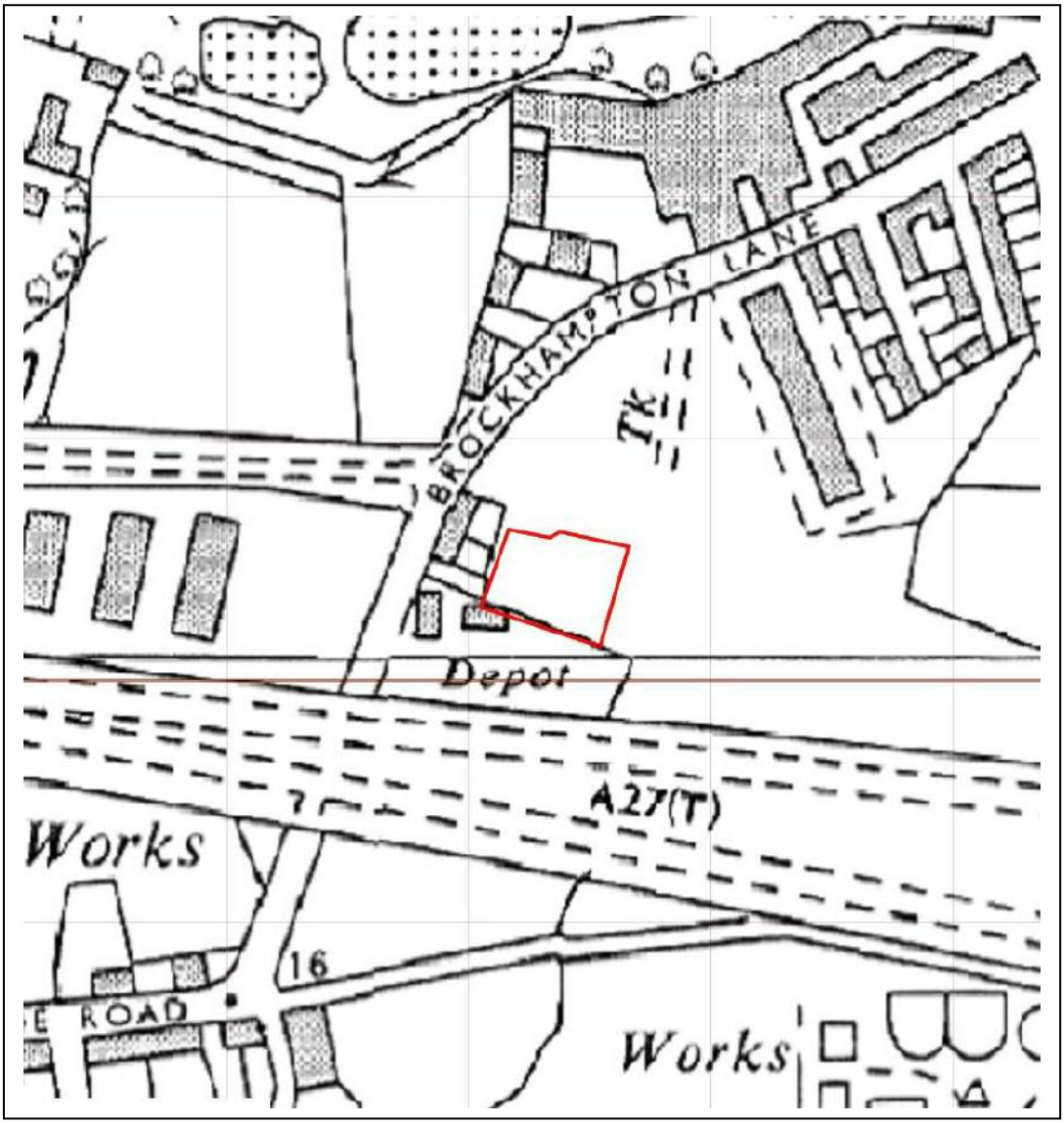


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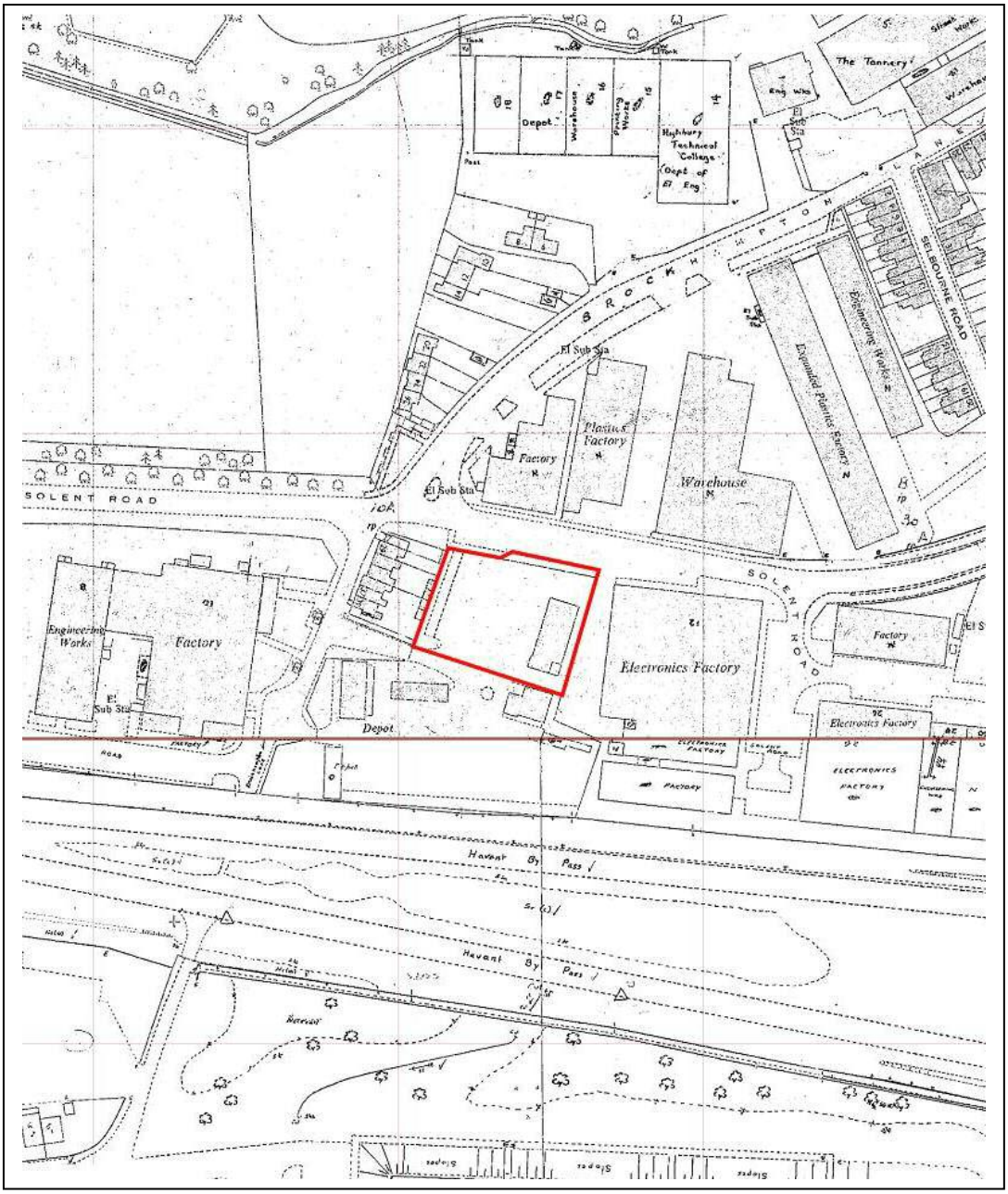


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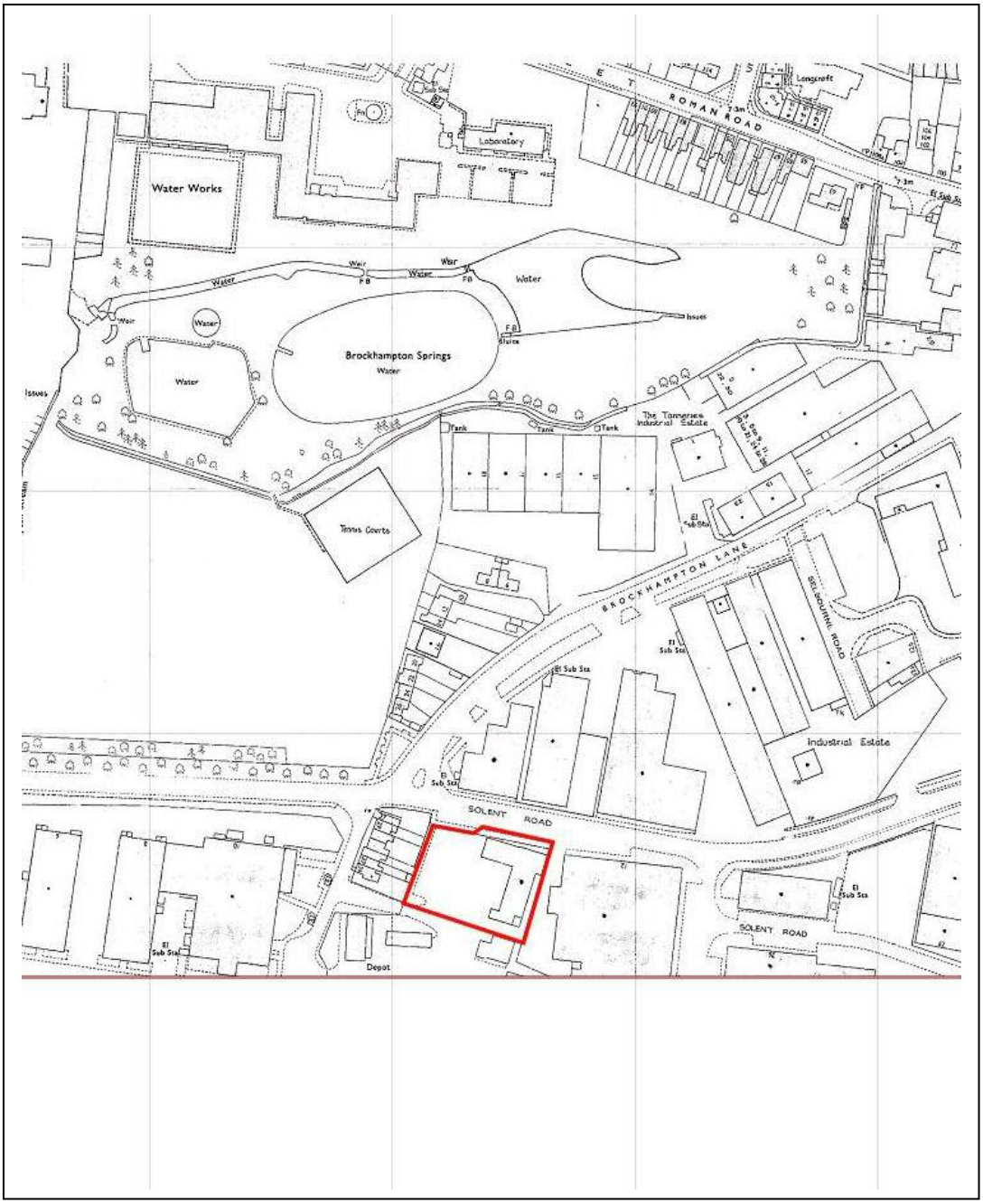


Project:	Solent Road, Havant
Project Ref:	HLEI12725/001R
Map Date:	1977
Scale:	Not to Scale

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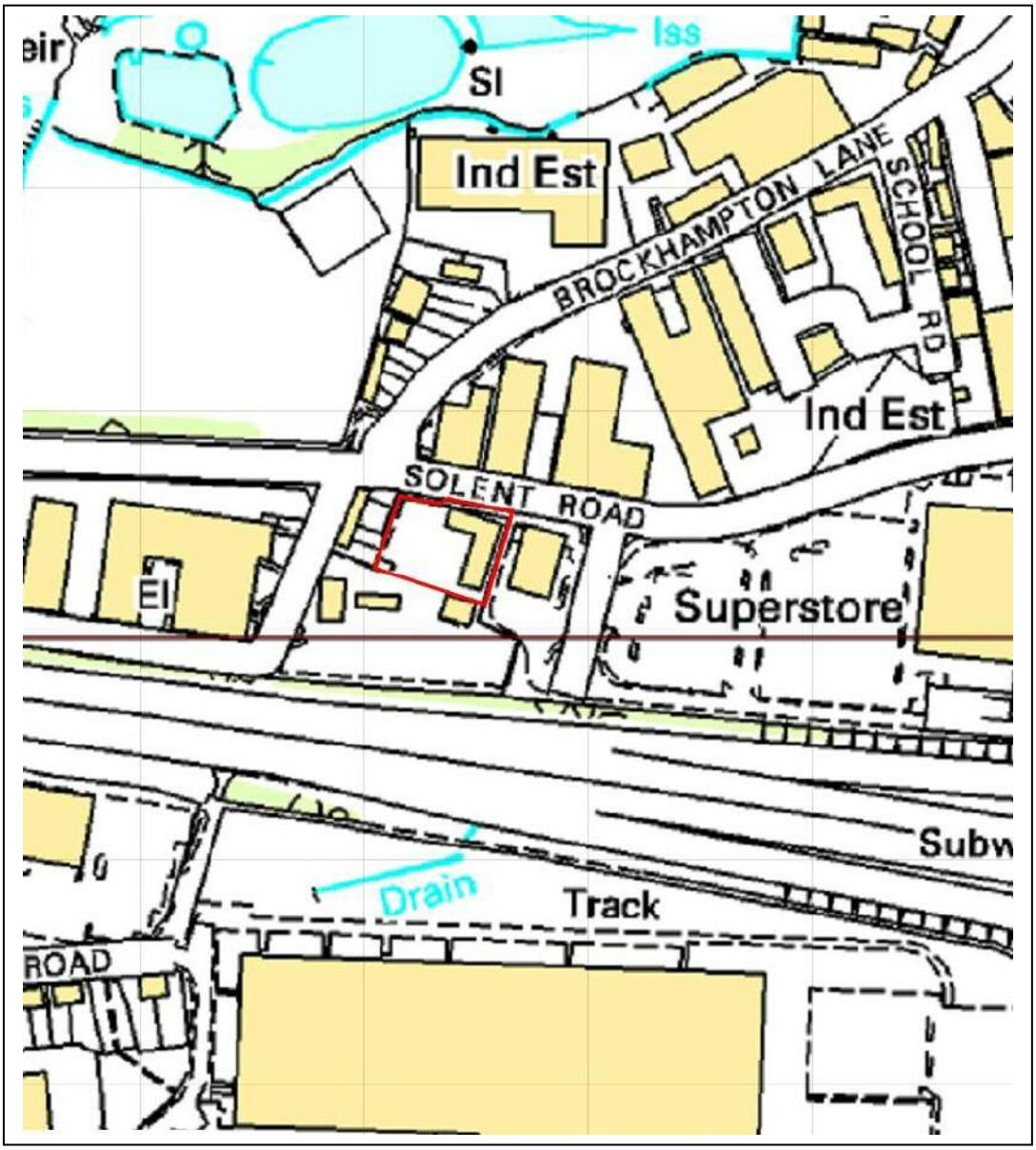


Project:	Solent Road, Havant
Project Ref:	HLEI12725/001R
Map Date:	1989
Scale:	Not to Scale

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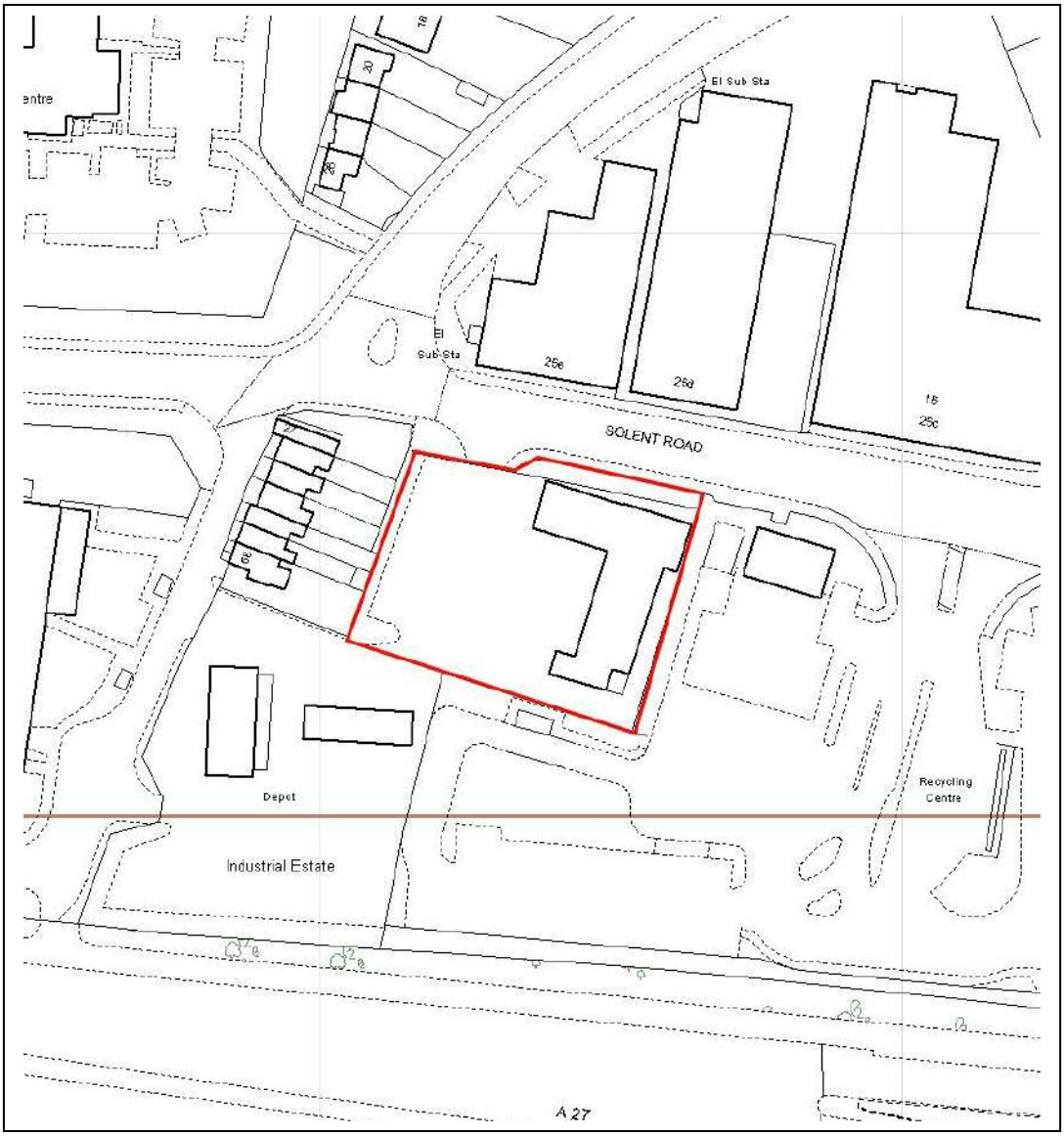


Project:	Solent Road, Havant
Project Ref:	HLEI12725/001R
Map Date:	2000
Scale:	Not to Scale

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Project:	Solent Road, Havant
Project Ref:	HLEI12725/001R
Map Date:	2010
Scale:	Not to Scale

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APPENDIX B:
PHOTOGRAPHS

Appendix B - 3 Pages

Photo 1: The main site building view from west to east.



Photo 2: The yard and previous vehicle wash down area, view from north to south.



Photo 3: Part of the main building and the northern site boundary.



Photo 4: A clump of Japanese Knotweed on the western site boundary.



Photo 5: One of the interceptors on site.



Photo 6: The internal workshop area.



APPENDIX C:
CERTIFICATES OF CHEMICAL ANALYSIS

Appendix C - 7 Pages

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i2 Analytical Ltd.
Building 19,
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WD25 9XX

t: 01923 67 00 20
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Analytical Report Number : 10-23747

Project / Site name:	Havant	**Samples received on:**	21/07/2010
Your job number:	HLEI12725	**Samples instructed on:**	19/07/2010
Your order number:		**Analysis completed by:**	03/08/2010
Report Issue Number:	1	**Report issued on:**	03/08/2010
Samples Analysed:	10 soil samples		

Signed:

Dr Claire Stone
UK Quality Manager
For & on behalf of i2 Analytical Ltd.

Signed:

David Ashworth
UK Technical Manager
For & on behalf of i2 Analytical Ltd.

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 10-23747

Project / Site name: Havant

Lab Sample Number				152313	152314	152315	152316	152317
Sample Reference				WS1	WS1	WS2	WS2	WS3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20-0.30	1.00-1.30	0.30-0.40	2.50-3.00	0.40-0.60
Date Sampled				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	26	54	35	31	< 0.1
Moisture Content	%	N/A	NONE	7.8	14	10	8.6	14
Total mass of sample received	kg	0.001	NONE	1.8	1.3	N/A	1.2	1.8
Fibrous Material (Screen)	P/A	N/A	NONE	N/A	N/A	Absent	N/A	N/A
General Inorganics								
pH	pH Units	N/A	MCERTS	9.7	8.1	N/A	8.4	8.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	N/A	< 1.0	< 1.0
Water Soluble Sulphate as SO_4 (2:1)	g/l	0.0025	ISO 17025	0.71	1.4	N/A	0.016	0.23
Water Soluble Sulphate as SO_4 (2:1)	mg/kg	2.5	ISO 17025	710	1400	N/A	16	230
Sulphide	mg/kg	1	NONE	< 1.0	17	N/A	< 1.0	15
Organic Matter	%	0.1	MCERTS	0.5	2.6	N/A	0.5	1.0
Total Phenols								
Total Phenols (monohydric)	mg/kg	2	MCERTS	< 2.0	< 2.0	N/A	< 2.0	< 2.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	N/A	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	N/A	< 0.20	< 0.20
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	N/A	< 0.10	< 0.10
Fluorene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	N/A	< 0.20	< 0.20
Phenanthrene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	N/A	< 0.20	< 0.20
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	N/A	< 0.10	< 0.10
Fluoranthene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	N/A	< 0.20	< 0.20
Pyrene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	N/A	< 0.20	< 0.20
Benzo(a)anthracene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	N/A	< 0.20	< 0.20
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	N/A	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	N/A	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	N/A	< 0.20	< 0.20
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	N/A	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	N/A	< 0.20	< 0.20
Dibenz(a,h)anthracene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	N/A	< 0.20	< 0.20
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	N/A	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.6	< 1.6	N/A	< 1.6	< 1.6
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	ISO 17025	3.0	38	N/A	< 1.0	8.1
Boron (water soluble)	mg/kg	0.2	MCERTS	1.5	1.2	N/A	< 0.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	N/A	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	NONE	< 1.2	< 1.2	N/A	< 1.2	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	4.7	25	N/A	4.0	6.6
Copper (aqua regia extractable)	mg/kg	1	MCERTS	3.8	18	N/A	3.3	29
Lead (aqua regia extractable)	mg/kg	2	MCERTS	9.4	31	N/A	2.7	230
Mercury (aqua regia extractable)	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	N/A	< 0.3	0.4
Nickel (aqua regia extractable)	mg/kg	2	MCERTS	4.5	13	N/A	4.3	6.8
Selenium (aqua regia extractable)	mg/kg	1	ISO 17025	< 1.0	< 1.0	N/A	2.1	< 1.0
Zinc (aqua regia extractable)	mg/kg	2	MCERTS	12	140	N/A	16	120

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Analytical Report Number: 10-23747

Project / Site name: Havant

Lab Sample Number				152313	152314	152315	152316	152317
Sample Reference				WS1	WS1	WS2	WS2	WS3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20-0.30	1.00-1.30	0.30-0.40	2.50-3.00	0.40-0.60
Date Sampled				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	N/A	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	N/A	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	N/A	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	N/A	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	N/A	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	N/A	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH7 - Aliphatic >C5 - C6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	N/A	< 0.1	< 0.1
TPH7 - Aliphatic >C6 - C8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	N/A	< 0.1	< 0.1
TPH7 - Aliphatic >C8 - C10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	N/A	< 0.1	< 0.1
TPH7 - Aliphatic >C10 - C12	mg/kg	1	MCERTS	< 1.0	< 1.0	N/A	< 1.0	11
TPH7 - Aliphatic >C12 - C16	mg/kg	2	MCERTS	< 2.0	< 2.0	N/A	< 2.0	5.2
TPH7 - Aliphatic >C16 - C21	mg/kg	8	MCERTS	< 8.0	< 8.0	N/A	< 8.0	< 8.0
TPH7 - Aliphatic >C21 - C34	mg/kg	8	MCERTS	< 8.0	< 8.0	N/A	< 8.0	320
TPH7 - Aliphatic (C5 - C34)	mg/kg	10	MCERTS	< 10	< 10	N/A	< 10	340
TPH7 - Aromatic >C5 - C7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	N/A	< 0.1	< 0.1
TPH7 - Aromatic >C7 - C8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	N/A	< 0.1	< 0.1
TPH7 - Aromatic >C8 - C10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	N/A	< 0.1	< 0.1
TPH7 - Aromatic >C10 - C12	mg/kg	1	MCERTS	< 1.0	< 1.0	N/A	< 1.0	< 1.0
TPH7 - Aromatic >C12 - C16	mg/kg	2	MCERTS	< 2.0	< 2.0	N/A	< 2.0	< 2.0
TPH7 - Aromatic >C16 - C21	mg/kg	10	MCERTS	< 10	< 10	N/A	< 10	< 10
TPH7 - Aromatic >C21 - C35	mg/kg	10	MCERTS	< 10	< 10	N/A	< 10	< 10
TPH7 - Aromatic (C5 - C35)	mg/kg	10	MCERTS	< 10	< 10	N/A	< 10	< 10

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Analytical Report Number: 10-23747

Project / Site name: Havant

Lab Sample Number				152318	152319	152320	152321	152322
Sample Reference				WS4	WS4	WS5	WS6	WS6
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40-0.60	1.90-2.20	0.40-0.70	0.30-0.60	1.20-1.50
Date Sampled				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	35	< 0.1	29	37	< 0.1
Moisture Content	%	N/A	NONE	11	53	9.3	10	29
Total mass of sample received	kg	0.001	NONE	1.4	1.3	1.3	1.3	1.3
Fibrous Material (Screen)	P/A	N/A	NONE	Absent	N/A	N/A	N/A	N/A
General Inorganics								
pH	pH Units	N/A	MCERTS	9.0	7.8	8.0	8.0	7.7
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO_4 (2:1)	g/l	0.0025	ISO 17025	0.89	0.71	0.13	0.097	0.95
Water Soluble Sulphate as SO_4 (2:1)	mg/kg	2.5	ISO 17025	890	710	130	97	950
Sulphide	mg/kg	1	NONE	1.2	25	< 1.0	< 1.0	15
Organic Matter	%	0.1	MCERTS	0.6	11	0.7	0.7	6.8
Total Phenols								
Total Phenols (monohydric)	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Phenanthrene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.2	MCERTS	3.9	1.4	< 0.20	< 0.20	< 0.20
Pyrene	mg/kg	0.2	MCERTS	3.1	0.91	< 0.20	< 0.20	< 0.20
Benzo(a)anthracene	mg/kg	0.2	MCERTS	1.3	0.77	< 0.20	< 0.20	< 0.20
Chrysene	mg/kg	0.05	MCERTS	1.3	0.55	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	1.5	0.69	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.2	MCERTS	0.58	< 0.20	< 0.20	< 0.20	< 0.20
Benzo(a)pyrene	mg/kg	0.1	MCERTS	1.1	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Dibenz(a,h)anthracene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	13	4.4	< 1.6	< 1.6	< 1.6
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	ISO 17025	8.8	6.5	8.0	12	1.4
Boron (water soluble)	mg/kg	0.2	MCERTS	1.9	6.0	< 0.2	< 0.2	1.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.5	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	NONE	< 1.2	2.0	< 1.2	< 1.2	6.3
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	14	13	19	20	15
Copper (aqua regia extractable)	mg/kg	1	MCERTS	15	21	10	11	16
Lead (aqua regia extractable)	mg/kg	2	MCERTS	55	110	30	11	14
Mercury (aqua regia extractable)	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	2	MCERTS	8.1	14	9.5	11	10
Selenium (aqua regia extractable)	mg/kg	1	ISO 17025	< 1.0	3.0	< 1.0	< 1.0	1.8
Zinc (aqua regia extractable)	mg/kg	2	MCERTS	43	63	33	34	28

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Analytical Report Number: 10-23747

Project / Site name: Havant

Lab Sample Number				152318	152319	152320	152321	152322
Sample Reference				WS4	WS4	WS5	WS6	WS6
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40-0.60	1.90-2.20	0.40-0.70	0.30-0.60	1.20-1.50
Date Sampled				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH7 - Aliphatic >C5 - C6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aliphatic >C6 - C8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aliphatic >C8 - C10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aliphatic >C10 - C12	mg/kg	1	MCERTS	< 1.0	30	< 1.0	< 1.0	< 1.0
TPH7 - Aliphatic >C12 - C16	mg/kg	2	MCERTS	< 2.0	21	< 2.0	< 2.0	< 2.0
TPH7 - Aliphatic >C16 - C21	mg/kg	8	MCERTS	< 8.0	14	< 8.0	< 8.0	< 8.0
TPH7 - Aliphatic >C21 - C34	mg/kg	8	MCERTS	< 8.0	130	< 8.0	< 8.0	< 8.0
TPH7 - Aliphatic (C5 - C34)	mg/kg	10	MCERTS	< 10	200	< 10	< 10	< 10

TPH7 - Aromatic >C5 - C7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aromatic >C7 - C8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aromatic >C8 - C10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aromatic >C10 - C12	mg/kg	1	MCERTS	2.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH7 - Aromatic >C12 - C16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH7 - Aromatic >C16 - C21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH7 - Aromatic >C21 - C35	mg/kg	10	MCERTS	16	< 10	< 10	< 10	< 10
TPH7 - Aromatic (C5 - C35)	mg/kg	10	MCERTS	21	< 10	< 10	< 10	< 10

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The results included within the report are representative of the samples submitted for analysis.

#REF!

#REF!

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and topsoil/loam soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content

of a sample is calculated as the % weight of the stones not passing a 2 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
152313	WS1	None Supplied	0.20-0.30	Beige gravelly sand with stones.
152314	WS1	None Supplied	1.00-1.30	Light grey clay and sand with stones.
152315	WS2	None Supplied	0.30-0.40	Light brown clay and sand with stones.
152316	WS2	None Supplied	2.50-3.00	Beige clay and sand with stones.
152317	WS3	None Supplied	0.40-0.60	Red gravelly sand with brick.
152318	WS4	None Supplied	0.40-0.60	Light brown sandy clay with brick and stones.
152319	WS4	None Supplied	1.90-2.20	Brown silt with vegetation.
152320	WS5	None Supplied	0.40-0.70	Light brown clay and sand with stones.
152321	WS6	None Supplied	0.30-0.60	Light brown clay and sand with stones.
152322	WS6	None Supplied	1.20-1.50	Brown clay.

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The results included within the report are representative of the samples submitted for analysis.

#REF!

#REF!

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073S-PL	W	MCERTS
Fibrous Material in soil screening	Visual screening of samples for fibrous material.	In-house method based on HSG 248	L050-PL	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L068-PL	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L038-PL	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L019-UK	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L066-PL	W	MCERTS
Organic matter in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L023-PL	D	MCERTS
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L005-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Stones not passing through a 2 mm sieve is determined gravimetrically and reported as a percentage of the dry weight. Sample results are not corrected for the stone content of the sample.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by extraction with water followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L038-PL	D	ISO 17025
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L067-PL	W	MCERTS
TPHCWG (Soil)	Determination of pentane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 10-23757

Project / Site name:	HLEI 12725	**Samples received on:**	22/07/2010
Your job number:		**Samples instructed on:**	22/07/2010
Your order number:		**Analysis completed by:**	05/08/2010
Report Issue Number:	1	**Report issued on:**	05/08/2010
Samples Analysed:	2 water samples		

Signed:

Dr Claire Stone
UK Quality Manager
For & on behalf of i2 Analytical Ltd.

Signed:

David Ashworth
UK Technical Manager
For & on behalf of i2 Analytical Ltd.

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting

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Analytical Report Number: 10-23757

Project / Site name: HLEI 12725

Lab Sample Number				152360	152361			
Sample Reference				WS1	WS4			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				None Supplied	None Supplied			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH units	N/A	ISO 17025	7.3	7.6			
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10			
Sulphate as SO_4	µg/l	100	NONE	180000	110000			
Sulphide	µg/l	5	NONE	< 5.0	< 5.0			
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10			
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	ISO 17025	< 0.2	< 0.2			
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	10	ISO 17025	< 10	< 10			
Boron (dissolved)	µg/l	10	NONE	140	160			
Cadmium (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5			
Chromium (hexavalent)	µg/l	10	NONE	< 10	< 10			
Chromium (dissolved)	µg/l	1	ISO 17025	3.0	2.1			
Copper (dissolved)	µg/l	3	ISO 17025	4.3	7.0			
Lead (dissolved)	µg/l	5	ISO 17025	< 5.0	< 5.0			
Mercury (dissolved)	µg/l	1.5	ISO 17025	< 1.5	< 1.5			
Nickel (dissolved)	µg/l	1	ISO 17025	2.7	< 1.0			
Selenium (dissolved)	µg/l	10	ISO 17025	< 10	< 10			
Zinc (dissolved)	µg/l	1	ISO 17025	23	14			

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Analytical Report Number: 10-23757

Project / Site name: HLEI 12725

Lab Sample Number				152360	152361			
Sample Reference				WS1	WS4			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				None Supplied	None Supplied			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0			
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0			
Petroleum Hydrocarbons								
TPH7 - Aliphatic >C5 - C6	µg/l	10	NONE	< 10	< 10			
TPH7 - Aliphatic >C6 - C8	µg/l	10	NONE	< 10	< 10			
TPH7 - Aliphatic >C8 - C10	µg/l	10	NONE	< 10	< 10			
TPH7 - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10			
TPH7 - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10			
TPH7 - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10			
TPH7 - Aliphatic >C21 - C34	µg/l	10	NONE	< 10	< 10			
TPH7 - Aliphatic (C5 - C34)	µg/l	10	NONE	< 10	< 10			
TPH7 - Aromatic >C5 - C7	µg/l	10	NONE	< 10	< 10			
TPH7 - Aromatic >C7 - C8	µg/l	10	NONE	< 10	< 10			
TPH7 - Aromatic >C8 - C10	µg/l	10	NONE	< 10	< 10			
TPH7 - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10			
TPH7 - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10			
TPH7 - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10			
TPH7 - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10			
TPH7 - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10			

U/S = Unsuitable Sample I/S = Insufficient Sample

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#REF!

#REF!

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron in water	Determination of boron by acidification followed by ICP-OES.	In-house method based on MEWAM	L039-UK	W	NONE
BTEX and MTBE in water	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW	In-house method based on USEPA8260	L036-UK	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L026-UK	W	NONE
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW PW	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-UK	W	ISO 17025
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
pH in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L005-PL	W	ISO 17025
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in hexane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L070-UK	W	ISO 17025
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES.	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-UK	W	NONE
Sulphide in water	Determination of sulphide in water by ion selective electrode.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L010-UK	W	NONE
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L067-PL	W	ISO 17025
TPH7 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-UK	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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APPENDIX D:
SITE SPECIFIC ASSESSMENT CRITERIA

Appendix D -17 Pages

CLEA Software Version 1.06

Report generated	05-Aug-10
Report title	Solent Road, Havant
Created by	TB at RPS

RESULTS

Environment Agency

		Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?	
		oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal
1	Arsenic	6.35E+02	6.95E+02	NR	1.00	0.91	NR	NR	No	No
2	Cadmium	3.99E+02	3.87E+02	2.30E+02	0.41	0.59	1.00	NR	Yes	No
3	Chromium (III)	3.31E+05	3.34E+04	3.04E+04	0.09	0.91	1.00	NR	No	No
4	Chromium (VI)	2.01E+03	3.48E+01	3.42E+01	0.02	0.98	1.00	NR	No	No
5	Lead	7.11E+03	4.96E+04	6.22E+03	0.87	0.13	1.00	NR	No	No
6	Mercury, inorganic	4.41E+03	2.09E+04	3.64E+03	0.83	0.17	1.00	NR	No	No
7	Nickel	2.22E+04	1.79E+03	NR	0.07	1.00	NR	NR	No	No
8	Selenium	1.30E+04	NR	NR	1.00	NR	NR	NR	No	No
9	Copper	1.78E+05	9.60E+04	7.17E+04	0.25	0.75	1.00	NR	Yes	No
10	Zinc	6.67E+05	2.09E+08	6.65E+05	1.00	0.00	1.00	NR	Yes	No
11	Acenaphthene	1.10E+05	9.03E+05	9.78E+04	0.89	0.11	1.00	1.54E+02 (sol)	No	No
12	Acenaphthylene	1.10E+05	8.23E+05	9.68E+04	0.88	0.12	1.00	2.32E+02 (sol)	No	No
13	Anthracene	5.49E+05	2.23E+07	5.36E+05	0.98	0.02	1.00	3.16E+00 (vap)	No	No
14	Benz[a]anthracene	2.52E+02	1.49E+02	9.37E+01	0.37	0.63	1.00	4.64E+00 (sol)	No	No
15	Benzo[a]pyrene	3.66E+01	2.31E+01	1.42E+01	0.39	0.61	1.00	2.47E+00 (vap)	No	No
16	Benzo[b]fluoranthene	2.60E+02	1.64E+02	1.01E+02	0.39	0.61	1.00	3.29E+00 (sol)	No	No
17	Benzo[ghi]perylene	1.66E+03	1.08E+03	6.55E+02	0.39	0.61	1.00	4.17E-02 (vap)	No	No
18	Benzo[k]fluoranthene	3.66E+02	2.32E+02	1.42E+02	0.39	0.61	1.00	1.86E+00 (sol)	No	No
19	Chrysene	3.66E+02	2.24E+02	1.39E+02	0.38	0.62	1.00	1.19E+00 (vap)	No	No
20	Dibenz[ah]anthracene	3.29E+01	2.10E+01	1.28E+01	0.39	0.61	1.00	1.06E-02 (vap)	No	No

Environment Agency

		Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?	
		oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal
21	Fluoranthene	2.29E+04	2.77E+06	2.27E+04	0.99	0.01	1.00	5.13E+01 (vap)	No	No
22	Fluorene	7.31E+04	1.01E+06	6.82E+04	0.93	0.07	1.00	8.34E+01 (sol)	No	No
23	Indeno[123-cd]pyrene	1.57E+02	9.80E+01	6.04E+01	0.38	0.62	1.00	1.66E-01 (vap)	No	No
24	Naphthalene	3.64E+04	1.30E+03	1.26E+03	0.03	0.97	1.00	2.03E+02 (sol)	No	No
25	Phenanthrene	2.28E+04	1.05E+06	2.23E+04	0.98	0.02	1.00	9.73E+01 (sol)	No	No
26	Pyrene	5.49E+04	6.58E+06	5.44E+04	0.99	0.01	1.00	5.96E+00 (vap)	No	No
27										
28										
29										
30										

Environment Agency

		Soil Distribution				Media Concentrations													
		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
		%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
1	Arsenic	99.9	0.1	0.0	100.0	6.35E+02	NR	3.18E+02	7.63E-06	4.32E-06	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
2	Cadmium	99.5	0.5	0.0	100.0	2.30E+02	NR	1.15E+02	2.77E-06	1.57E-06	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
3	Chromium (III)	100.0	0.0	0.0	100.0	3.04E+04	NR	1.52E+04	3.65E-04	2.07E-04	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
4	Chromium (VI)	97.0	3.0	0.0	100.0	3.42E+01	NR	1.71E+01	4.11E-07	2.33E-07	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
5	Lead	100.0	0.0	0.0	100.0	6.22E+03	NR	3.11E+03	7.47E-05	4.23E-05	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
6	Mercury, inorganic	99.9	0.1	0.0	100.0	3.64E+03	NR	1.82E+03	4.38E-05	2.48E-05	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
7	Nickel	99.9	0.1	0.0	100.0	1.79E+03	NR	8.94E+02	2.15E-05	1.22E-05	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
8	Selenium	98.9	1.1	0.0	100.0	1.30E+04	NR	6.51E+03	1.56E-04	8.87E-05	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
9	Copper	99.5	0.5	0.0	100.0	7.17E+04	NR	3.59E+04	8.62E-04	4.89E-04	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
10	Zinc	98.6	1.4	0.0	100.0	6.65E+05	NR	3.33E+05	8.00E-03	4.53E-03	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
11	Acenaphthene	98.5	1.5	0.0	100.0	9.78E+04	1.99E+03	4.89E+04	1.18E-03	6.66E-04	1.32E-01	7.62E-02	4.32E-02	NA	NA	NA	NA	NA	NA
12	Acenaphthylene	98.1	1.9	0.0	100.0	9.68E+04	1.89E+03	4.84E+04	1.16E-03	6.59E-04	1.44E-01	8.57E-02	4.86E-02	NA	NA	NA	NA	NA	NA
13	Anthracene	99.4	0.6	0.0	100.0	5.36E+05	1.09E+03	2.68E+05	6.44E-03	3.65E-03	1.14E-01	2.53E-01	1.44E-01	NA	NA	NA	NA	NA	NA
14	Benz[a]anthracene	100.0	0.0	0.0	100.0	9.37E+01	2.43E-03	4.69E+01	1.13E-06	6.38E-07	3.05E-07	1.11E-05	6.28E-06	NA	NA	NA	NA	NA	NA
15	Benzo[a]pyrene	100.0	0.0	0.0	100.0	1.42E+01	1.23E-05	7.08E+00	1.70E-07	9.64E-08	1.78E-09	1.28E-06	7.23E-07	NA	NA	NA	NA	NA	NA
16	Benzo[b]fluoranthene	100.0	0.0	0.0	100.0	1.01E+02	1.25E-04	5.03E+01	1.21E-06	6.85E-07	1.75E-08	9.99E-06	5.66E-06	NA	NA	NA	NA	NA	NA
17	Benzo[ghi]perylene	100.0	0.0	0.0	100.0	6.55E+02	2.86E-04	3.28E+02	7.87E-06	4.46E-06	3.84E-08	3.23E-05	1.83E-05	NA	NA	NA	NA	NA	NA
18	Benzo[k]fluoranthene	100.0	0.0	0.0	100.0	1.42E+02	1.06E-04	7.10E+01	1.71E-06	9.67E-07	1.54E-08	1.19E-05	6.72E-06	NA	NA	NA	NA	NA	NA
19	Chrysene	99.9	0.1	0.0	100.0	1.39E+02	5.11E-04	6.94E+01	1.67E-06	9.46E-07	6.83E-08	1.94E-05	1.10E-05	NA	NA	NA	NA	NA	NA
20	Dibenz[ah]anthracene	100.0	0.0	0.0	100.0	1.28E+01	2.36E-05	6.40E+00	1.54E-07	8.72E-08	3.10E-09	9.24E-07	5.24E-07	NA	NA	NA	NA	NA	NA

Environment Agency

		Soil Distribution				Media Concentrations													
		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
		%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
21	Fluoranthene	99.8	0.2	0.0	100.0	2.27E+04	4.98E+00	1.13E+04	2.72E-04	1.54E-04	6.00E-04	5.77E-03	3.27E-03	NA	NA	NA	NA	NA	NA
22	Fluorene	98.8	1.2	0.0	100.0	6.82E+04	6.27E+02	3.41E+04	8.20E-04	4.65E-04	5.25E-02	4.65E-02	2.64E-02	NA	NA	NA	NA	NA	NA
23	Indeno[123-cd]pyrene	100.0	0.0	0.0	100.0	6.04E+01	9.04E-05	3.02E+01	7.26E-07	4.11E-07	1.26E-08	6.47E-06	3.67E-06	NA	NA	NA	NA	NA	NA
24	Naphthalene	94.9	5.1	0.0	100.0	1.26E+03	7.77E+02	6.28E+02	1.51E-05	8.55E-06	1.70E-02	2.39E-03	1.35E-03	NA	NA	NA	NA	NA	NA
25	Phenanthrene	99.4	0.6	0.0	100.0	2.23E+04	3.67E+01	1.12E+04	2.68E-04	1.52E-04	4.01E-03	1.06E-02	6.02E-03	NA	NA	NA	NA	NA	NA
26	Pyrene	99.8	0.2	0.0	100.0	5.44E+04	1.20E+01	2.72E+04	6.54E-04	3.71E-04	1.46E-03	1.47E-02	8.34E-03	NA	NA	NA	NA	NA	NA
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		Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
		Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
1	Arsenic	2.86E-04	0.00E+00	1.42E-05	1.83E-06	0.00E+00	0.00E+00	0.00E+00	94.70	0.00	4.69	0.61	0.00	0.00	0.00	0.00
2	Cadmium	1.04E-04	0.00E+00	1.71E-07	6.63E-07	0.00E+00	1.91E-04	2.86E-07	49.69	0.00	0.08	0.32	0.00	0.00	49.77	0.14
3	Chromium (III)	1.37E-02	0.00E+00	0.00E+00	8.73E-05	0.00E+00	8.60E-04	3.86E-06	93.49	0.00	0.00	0.60	0.00	0.00	5.88	0.03
4	Chromium (VI)	1.54E-05	0.00E+00	0.00E+00	9.84E-08	0.00E+00	9.57E-05	0.00E+00	49.84	0.00	0.00	0.32	0.00	0.00	49.84	0.00
5	Lead	2.80E-03	0.00E+00	0.00E+00	1.79E-05	0.00E+00	3.71E-04	4.29E-07	87.77	0.00	0.00	0.56	0.00	0.00	11.65	0.01
6	Mercury, inorganic	1.64E-03	0.00E+00	0.00E+00	1.05E-05	0.00E+00	1.43E-05	0.00E+00	98.51	0.00	0.00	0.63	0.00	0.00	0.86	0.00
7	Nickel	8.05E-04	0.00E+00	6.64E-06	5.14E-06	0.00E+00	1.86E-03	8.57E-07	49.10	0.00	0.41	0.31	0.00	0.00	49.82	0.05
8	Selenium	5.86E-03	0.00E+00	0.00E+00	3.75E-05	0.00E+00	5.00E-04	8.57E-07	91.59	0.00	0.00	0.59	0.00	0.00	7.83	0.00
9	Copper	3.23E-02	0.00E+00	0.00E+00	2.06E-04	0.00E+00	1.00E-01	9.71E-06	49.83	0.00	0.00	0.32	0.00	0.00	49.83	0.01
10	Zinc	3.00E-01	0.00E+00	0.00E+00	1.91E-03	0.00E+00	3.86E-01	3.43E-05	49.84	0.00	0.00	0.32	0.00	0.00	49.84	0.01
11	Acenaphthene	4.40E-02	0.00E+00	9.45E-03	2.81E-04	6.22E-03	1.40E-05	3.57E-07	73.39	0.00	15.76	0.47	10.16	0.21	0.02	0.00
12	Acenaphthylene	4.36E-02	0.00E+00	9.36E-03	2.79E-04	6.78E-03	2.00E-06	1.57E-07	72.64	0.00	15.59	0.46	11.07	0.23	0.00	0.00
13	Anthracene	2.41E-01	0.00E+00	5.18E-02	1.54E-03	5.66E-03	1.14E-06	1.57E-07	80.35	0.00	17.25	0.51	1.75	0.14	0.00	0.00
14	Benz[a]anthracene	4.22E-05	0.00E+00	9.06E-06	2.70E-07	3.21E-08	8.57E-07	1.57E-07	81.84	0.00	17.57	0.52	0.03	0.04	0.00	0.00
15	Benzo[a]pyrene	6.37E-06	0.00E+00	1.37E-06	4.07E-08	2.16E-09	1.57E-06	8.57E-08	81.87	0.00	17.58	0.52	0.00	0.03	0.00	0.00
16	Benzo[b]fluoranthene	4.53E-05	0.00E+00	9.72E-06	2.89E-07	1.71E-08	1.57E-06	1.86E-07	81.87	0.00	17.58	0.52	0.00	0.03	0.00	0.00
17	Benzo[ghi]perylene	2.95E-04	0.00E+00	6.33E-05	1.88E-06	5.44E-08	8.57E-07	1.43E-07	81.88	0.00	17.58	0.52	0.00	0.01	0.00	0.00
18	Benzo[k]fluoranthene	6.39E-05	0.00E+00	1.37E-05	4.08E-07	2.00E-08	1.29E-06	1.00E-07	81.87	0.00	17.58	0.52	0.00	0.02	0.00	0.00
19	Chrysene	6.25E-05	0.00E+00	1.34E-05	4.00E-07	3.48E-08	1.57E-06	2.43E-07	81.86	0.00	17.57	0.52	0.00	0.04	0.00	0.00
20	Dibenz[ah]anthracene	5.76E-06	0.00E+00	1.24E-06	3.68E-08	1.65E-09	5.71E-07	4.71E-07	81.88	0.00	17.58	0.52	0.00	0.02	0.00	0.00

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		Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
		Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
21	Fluoranthene	1.02E-02	0.00E+00	2.19E-03	6.52E-05	3.70E-05	5.00E-06	1.20E-06	81.61	0.00	17.52	0.52	0.22	0.08	0.04	0.01
22	Fluorene	3.07E-02	0.00E+00	6.59E-03	1.96E-04	2.49E-03	8.43E-06	1.37E-06	76.77	0.00	16.48	0.49	6.04	0.19	0.02	0.00
23	Indeno[123-cd]pyrene	2.72E-05	0.00E+00	5.84E-06	1.74E-07	1.11E-08	1.43E-06	1.29E-07	81.87	0.00	17.58	0.52	0.00	0.03	0.00	0.00
24	Naphthalene	5.65E-04	0.00E+00	1.21E-04	3.61E-06	7.88E-04	1.00E-04	4.00E-05	34.92	0.00	7.50	0.22	48.46	0.24	6.18	2.47
25	Phenanthrene	1.01E-02	0.00E+00	2.16E-03	6.43E-05	2.02E-04	2.20E-05	7.40E-06	80.38	0.00	17.26	0.51	1.48	0.14	0.18	0.06
26	Pyrene	2.45E-02	0.00E+00	5.26E-03	1.57E-04	9.14E-05	5.00E-06	9.29E-07	81.63	0.00	17.53	0.52	0.22	0.08	0.02	0.00
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		Oral Health Criteria Value ($\mu g\ kg^{-1}\ BW\ day^{-1}$)		Inhalation Health Criteria Value ($\mu g\ kg^{-1}\ BW\ day^{-1}$)		Oral Mean Daily Intake ($\mu g\ day^{-1}$)	Inhalation Mean Daily Intake ($\mu g\ day^{-1}$)	Air-water partition coefficient (K_{aw}) ($cm^3\ cm^{-3}$)	Coefficient of Diffusion in Air ($m^2\ s^{-1}$)	Coefficient of Diffusion in Water ($m^2\ s^{-1}$)	log K_{oc} ($cm^3\ g^{-1}$)	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor ($g\ g^{-1}$ DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
1	Arsenic	ID	0.3	ID	0.002	NR	NR	NR	NR	NR	NR	NR	0.03	0.5	1	1	1
2	Cadmium	TDI	0.36	TDI	0.0014	13.4	0.02	NR	NR	NR	NR	NR	0.001	0.5	1	1	1
3	Chromium (III)	TDI	150	TDI	0.1	60.2	0.27	NR	NR	NR	NR	NR	0	0.5	0	1	1
4	Chromium (VI)	TDI	1	ID	0.0001	6.7	NR	NR	NR	NR	NR	NR	0	0.5	0	1	1
5	Lead	TDI	3.57	TDI	0.143	26	0.03	NR	NR	NR	NR	NR	0	0.5	0	1	1
6	Mercury, inorganic	TDI	2	TDI	0.06	1	0	NR	NR	NR	NR	NR	0	0.5	1	1	1
7	Nickel	TDI	12	TDI	0.006	130	0.06	NR	NR	NR	NR	NR	0.005	0.5	1	1	1
8	Selenium	TDI	6.4	NR	0	35	0.06	NR	NR	NR	NR	NR	0	0.5	1	1	1
9	Copper	TDI	160	TDI	0.286	7000	0.68	NR	NR	NR	NR	NR	0	0.5	0	1	1
10	Zinc	TDI	600	TDI	600	27000	2.4	NR	NR	NR	NR	NR	0	0.5	0	1	1
11	Acenaphthene	TDI	60	TDI	60	0.98	0.025	7.59E-04	5.85E-06	4.70E-10	3.37	4.03	0.13	0.5	1	1	1
12	Acenaphthylene	TDI	60	TDI	60	0.14	0.011	5.68E-04	5.97E-06	4.82E-10	3.26	3.91	0.13	0.5	1	1	1
13	Anthracene	TDI	300	TDI	300	0.08	0.011	1.81E-04	5.36E-06	4.36E-10	3.75	4.5	0.13	0.5	1	1	1
14	Benz[a]anthracene	ID	0.138	ID	0.00048	0.06	0.011	3.16E-05	4.60E-06	3.80E-10	4.89	5.91	0.13	0.5	1	1	1
15	Benzo[a]pyrene	ID	0.02	ID	0.00007	0.11	0.006	1.76E-06	4.38E-06	3.67E-10	5.11	6.18	0.13	0.5	1	1	1
16	Benzo[b]fluoranthene	ID	0.142	ID	0.0005	0.11	0.013	2.05E-06	4.38E-06	3.62E-10	5.02	6.08	0.13	0.5	1	1	1
17	Benzo[ghi]perylene	ID	0.909	ID	0.0032	0.06	0.01	2.86E-06	4.22E-06	3.56E-10	5.62	6.81	0.13	0.5	1	1	1
18	Benzo[k]fluoranthene	ID	0.2	ID	0.0007	0.09	0.007	1.74E-06	4.36E-06	3.62E-10	5.17	6.26	0.13	0.5	1	1	1
19	Chrysene	ID	0.2	ID	0.0007	0.11	0.017	3.18E-06	4.57E-06	3.77E-10	4.74	5.73	0.13	0.5	1	1	1
20	Dibenz[ah]anthracene	ID	0.018	ID	0.000063	0.04	0.033	5.40E-06	4.08E-06	3.40E-10	5.27	6.38	0.13	0.5	1	1	1

		Oral Health Criteria Value	(µg kg^{-1} BW day^{-1})	Inhalation Health Criteria Value	(µg kg^{-1} BW day^{-1})	Oral Mean Daily Intake (µg day^{-1})	Inhalation Mean Daily Intake (µg day^{-1})	Air-water partition coefficient (K_{aw}) (cm^3 cm^{-3})	Coefficient of Diffusion in Air (m^2 s^{-1})	Coefficient of Diffusion in Water (m^2 s^{-1})	log K_{oc} (cm^3 g^{-1})	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor (g g^{-1} DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
21	Fluoranthene	TDI	12.5	TDI	12.5	0.35	0.084	6.29E-05	5.01E-06	4.11E-10	4.26	5.13	0.13	0.5	1	1	1
22	Fluorene	TDI	40	TDI	40	0.59	0.096	4.12E-04	5.58E-06	4.47E-10	3.45	4.13	0.13	0.5	1	1	1
23	Indeno[123-cd]pyrene	ID	0.086	ID	0.0003	0.1	0.009	2.05E-06	4.17E-06	3.51E-10	4.94	5.97	0.13	0.5	1	1	1
24	Naphthalene	TDI	20	TDI	0.86	7	2.8	6.62E-03	6.52E-06	5.16E-10	2.81	3.34	0.13	0.5	1	1	1
25	Phenanthrene	TDI	12.5	TDI	12.5	1.54	0.518	1.43E-04	5.34E-06	4.32E-10	3.74	4.5	0.13	0.5	1	1	1
26	Pyrene	TDI	30	TDI	30	0.35	0.065	5.64E-05	5.01E-06	4.15E-10	4.21	5.08	0.13	0.5	1	1	1
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		Soil-to-water partition coefficient ($cm^3\ g^{-1}$)	Vapour pressure (Pa)	Water solubility ($mg\ L^{-1}$)	Soil-to-plant concentration factor for green vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for root vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for herbaceous fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for shrub fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tree fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)
1	Arsenic	5.00E+02	NR	1.25E+06	0.00043 fw	0.0004 fw	0.00023 fw	0.00033 fw	0.0002 fw	0.0011 fw
2	Cadmium	1.00E+02	NR	1.62E+06	0.052 fw	0.029 fw	0.031 fw	0.016 fw	0.0031 fw	0.0014 fw
3	Chromium (III)	4.80E+03	NR	5.85E+05	0.00003 fw	0.00003 fw	0.00003 fw	0.00003 fw	0.00003 fw	0.00003 fw
4	Chromium (VI)	1.80E+01	NR	2.30E+06	0.0002 fw	0.0001 fw	0.0001 fw	0.09 fw	0.0003 fw	0.09 fw
5	Lead	3.00E+03	NR	0.00E+00	model	model	model	model	model	model
6	Mercury, inorganic	5.00E+02	NR	7.40E+04	0.0038 fw	0.0069 fw	0.0043 fw	0.001 fw	0.0011 fw	0.001 fw
7	Nickel	5.00E+02	NR	2.50E+06	0.0038 fw	0.0043 fw	0.0019 fw	0.0025 fw	0.0025 fw	0.0034 fw
8	Selenium	5.00E+01	NR	2.17E+06	0.0108 fw	0.00364 fw	0.00083 fw	0.00271 fw	0.003 fw	0.003 fw
9	Copper	1.00E+02	NR	1.38E+06	0.0206 fw	0.0206 fw	0.0206 fw	0.0233 fw	0.0206 fw	0.0206 fw
10	Zinc	3.80E+01	NR	4.32E+06	0.054 fw	0.054 fw	0.054 fw	0.143 fw	0.054 fw	0.054 fw
11	Acenaphthene	3.68E+01	7.37E-02	4.11E+00	model	model	model	model	model	model
12	Acenaphthylene	2.86E+01	7.08E-02	7.95E+00	model	model	model	model	model	model
13	Anthracene	8.84E+01	8.49E-05	5.60E-02	model	model	model	model	model	model
14	Benz[a]anthracene	1.22E+03	1.24E-06	3.80E-03	model	model	model	model	model	model
15	Benzo[a]pyrene	2.02E+03	2.00E-08	3.80E-03	model	model	model	model	model	model
16	Benzo[b]fluoranthene	1.65E+03	6.34E+08	2.00E-03	model	model	model	model	model	model
17	Benzo[ghi]perylene	6.55E+03	1.55E-10	2.60E-04	model	model	model	model	model	model
18	Benzo[k]fluoranthene	2.32E+03	1.64E-08	8.00E-04	model	model	model	model	model	model
19	Chrysene	8.64E+02	4.52E-08	2.00E-03	model	model	model	model	model	model
20	Dibenz[ah]anthracene	2.93E+03	1.66E-10	6.00E-04	model	model	model	model	model	model

		Soil-to-water partition coefficient ($cm^3 g^{-1}$)	Vapour pressure (Pa)	Water solubility ($mg L^{-1}$)	Soil-to-plant concentration factor for green vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for root vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for herbaceous fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for shrub fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tree fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)
21	Fluoranthene	2.86E+02	1.31E-04	2.30E-01	model	model	model	model	model	model
22	Fluorene	4.43E+01	1.56E-02	1.86E+00	model	model	model	model	model	model
23	Indeno[123-cd]pyrene	1.37E+03	2.12E-09	2.00E-04	model	model	model	model	model	model
24	Naphthalene	1.01E+01	2.31E+00	1.90E+01	model	model	model	model	model	model
25	Phenanthrene	8.64E+01	2.82E-03	1.12E+00	model	model	model	model	model	model
26	Pyrene	2.55E+02	1.53E-05	1.30E-01	model	model	model	model	model	model
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CLEA Software Version 1.06

Report generated	05-Aug-10
Report title	Solent Road, Havant
Created by	TB at RPS

RESULTS

Environment Agency

		Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?	
		oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal
1	Aliphatics (C5-C6)	4.77E+06	2.86E+04	2.85E+04	0.00	1.00	1.00	5.74E+02 (sol)	Yes	Yes
2	Aliphatics (>C6-C8)	4.77E+06	8.75E+04	8.71E+04	0.01	0.99	1.00	3.43E+02 (sol)	Yes	Yes
3	Aliphatics (>C8-C10)	9.53E+04	2.51E+04	2.32E+04	0.14	0.86	1.00	2.05E+02 (vap)	Yes	Yes
4	Aliphatics (>C10-C12)	9.53E+04	1.26E+05	7.17E+04	0.60	0.40	1.00	1.28E+02 (vap)	Yes	Yes
5	Aliphatics (>C12-C16)	9.53E+04	1.02E+06	9.30E+04	0.95	0.05	1.00	6.41E+01 (sol)	Yes	Yes
6	Aliphatics (>C16-C35)	1.86E+06	NR	NR	1.00	NR	NR	2.30E+01 (sol)	Yes	No
7	Aromatics (EC5-EC7)	4.25E+05	3.05E+05	1.78E+05	0.42	0.58	1.00	2.88E+03 (sol)	No	No
8	Aromatics (>EC7-EC8)	4.25E+05	7.92E+05	2.77E+05	0.65	0.35	1.00	2.22E+03 (vap)	No	No
9	Aromatics (>EC8-EC10)	3.81E+04	4.27E+04	2.68E+04	0.54	0.46	1.00	1.64E+03 (vap)	Yes	Yes
10	Aliphatics (>C10-C12)	9.53E+04	1.26E+05	7.17E+04	0.60	0.40	1.00	1.28E+02 (vap)	Yes	Yes
11	Aromatics (>EC12-EC16)	3.81E+04	1.27E+06	3.79E+04	0.99	0.02	1.00	4.56E+02 (sol)	Yes	Yes
12	Aromatics (>EC16-EC21)	2.83E+04	NR	NR	1.00	NR	NR	1.45E+02 (vap)	Yes	No
13	Aromatics (>EC21-EC35)	2.84E+04	NR	NR	1.00	NR	NR	1.31E+01 (sol)	Yes	No
14										
15	Benzene	5.53E+02	3.06E+02	1.97E+02	0.36	0.64	1.00	2.88E+03 (sol)	No	No
16	Ethylbenzene	1.91E+05	2.28E+05	1.04E+05	0.54	0.46	1.00	1.36E+03 (vap)	No	No
17	Toluene	4.25E+05	7.92E+05	2.77E+05	0.65	0.35	1.00	2.22E+03 (vap)	No	No
18	Xylene, m-	3.43E+05	8.06E+04	6.53E+04	0.19	0.81	1.00	1.65E+03 (vap)	No	No
19	Xylene, o-	3.43E+05	8.52E+04	6.82E+04	0.20	0.80	1.00	1.26E+03 (sol)	No	No
20	Xylene, p-	3.43E+05	7.72E+04	6.30E+04	0.18	0.82	1.00	1.52E+03 (sol)	No	No

Environment Agency

		Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?	
		oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal
21										
22	Phenol	1.54E+06	3.63E+04	3.55E+04	0.02	0.98	1.00	1.02E+05 (vap)	No	No
23	2-Chlorophenol	4.49E+03	3.99E+04	4.04E+03	0.90	0.10	1.00	1.48E+05 (sol)	No	No
24	Pentachlorophenol	1.44E+03	8.01E+03	1.31E+03	0.91	0.09	1.00	4.36E+01 (vap)	No	No
25										
26										
27										
28										
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30										

Environment Agency

		Soil Distribution				Media Concentrations													
		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
		%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
1	Aliphatics (C5-C6)	79.9	3.4	16.8	100.0	2.85E+04	3.74E+07	1.43E+04	3.43E-04	1.94E-04	5.41E+01	1.97E+00	1.11E+00	NA	NA	NA	NA	NA	NA
2	Aliphatics (>C6-C8)	93.7	0.9	5.5	100.0	8.71E+04	3.73E+07	4.35E+04	1.05E-03	5.93E-04	5.39E+01	3.43E+00	1.94E+00	NA	NA	NA	NA	NA	NA
3	Aliphatics (>C8-C10)	98.8	0.1	1.1	100.0	2.32E+04	2.00E+06	1.16E+04	2.79E-04	1.58E-04	2.90E+00	4.11E-01	2.33E-01	NA	NA	NA	NA	NA	NA
4	Aliphatics (>C10-C12)	99.8	0.0	0.2	100.0	7.17E+04	1.22E+06	3.58E+04	8.61E-04	4.88E-04	1.77E+00	5.63E-01	3.19E-01	NA	NA	NA	NA	NA	NA
5	Aliphatics (>C12-C16)	100.0	0.0	0.0	100.0	9.30E+04	1.88E+05	4.65E+04	1.12E-03	6.33E-04	2.72E-01	2.52E-01	1.43E-01	NA	NA	NA	NA	NA	NA
6	Aliphatics (>C16-C35)	100.0	0.0	0.0	100.0	1.86E+06	2.21E+05	9.32E+05	2.24E-02	1.27E-02	3.19E-01	1.22E+00	6.92E-01	NA	NA	NA	NA	NA	NA
7	Aromatics (EC5-EC7)	65.6	33.5	0.9	100.0	1.78E+05	1.27E+07	8.89E+04	2.14E-03	1.21E-03	1.75E+01	2.79E+00	1.58E+00	NA	NA	NA	NA	NA	NA
8	Aromatics (>EC7-EC8)	85.2	14.4	0.4	100.0	2.77E+05	8.44E+06	1.38E+05	3.32E-03	1.88E-03	1.04E+01	2.67E+00	1.51E+00	NA	NA	NA	NA	NA	NA
9	Aromatics (>EC8-EC10)	97.7	2.1	0.1	100.0	2.68E+04	2.66E+05	1.34E+04	3.22E-04	1.83E-04	4.01E-01	1.65E-01	9.33E-02	NA	NA	NA	NA	NA	NA
10	Aliphatics (>C10-C12)	99.8	0.0	0.2	100.0	7.17E+04	1.22E+06	3.58E+04	8.61E-04	4.88E-04	1.77E+00	5.63E-01	3.19E-01	NA	NA	NA	NA	NA	NA
11	Aromatics (>EC12-EC16)	99.3	0.7	0.0	100.0	3.79E+04	6.01E+03	1.89E+04	4.55E-04	2.58E-04	1.56E-02	4.04E-02	2.29E-02	NA	NA	NA	NA	NA	NA
12	Aromatics (>EC16-EC21)	99.8	0.2	0.0	100.0	2.83E+04	8.85E+01	1.42E+04	3.40E-04	1.93E-04	8.18E-04	1.31E-02	7.41E-03	NA	NA	NA	NA	NA	NA
13	Aromatics (>EC21-EC35)	100.0	0.0	0.0	100.0	2.84E+04	3.56E-01	1.42E+04	3.42E-04	1.94E-04	4.65E-06	4.28E-03	2.43E-03	NA	NA	NA	NA	NA	NA
14																			
15	Benzene	65.6	33.5	0.9	100.0	1.97E+02	1.41E+04	9.85E+01	2.37E-06	1.34E-06	1.94E-02	3.09E-03	1.75E-03	NA	NA	NA	NA	NA	NA
16	Ethylbenzene	92.6	7.2	0.2	100.0	1.04E+05	1.90E+06	5.19E+04	1.25E-03	7.07E-04	2.12E+00	7.33E-01	4.15E-01	NA	NA	NA	NA	NA	NA
17	Toluene	85.2	14.4	0.4	100.0	2.77E+05	8.44E+06	1.38E+05	3.32E-03	1.88E-03	1.04E+01	2.67E+00	1.51E+00	NA	NA	NA	NA	NA	NA
18	Xylene, m-	93.3	6.6	0.2	100.0	6.53E+04	8.86E+05	3.26E+04	7.84E-04	4.45E-04	1.00E+00	3.99E-01	2.26E-01	NA	NA	NA	NA	NA	NA
19	Xylene, o-	92.4	7.5	0.2	100.0	6.82E+04	8.65E+05	3.41E+04	8.20E-04	4.65E-04	9.90E-01	4.06E-01	2.30E-01	NA	NA	NA	NA	NA	NA
20	Xylene, p-	92.7	7.2	0.2	100.0	6.30E+04	8.89E+05	3.15E+04	7.57E-04	4.29E-04	1.01E+00	3.94E-01	2.23E-01	NA	NA	NA	NA	NA	NA

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		Soil Distribution				Media Concentrations													
		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
		%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
21																			
22	Phenol	70.7	29.3	0.0	100.0	3.55E+04	1.60E+02	1.77E+04	4.26E-04	2.42E-04	2.11E-02	1.39E-01	7.90E-02	NA	NA	NA	NA	NA	NA
23	2-Chlorophenol	91.7	8.3	0.0	100.0	4.04E+03	4.96E+01	2.02E+03	4.85E-05	2.75E-05	6.02E-03	8.03E-03	4.55E-03	NA	NA	NA	NA	NA	NA
24	Pentachlorophenol	93.8	6.2	0.0	100.0	1.31E+03	8.25E-01	6.53E+02	1.57E-05	8.90E-06	1.09E-04	1.91E-03	1.08E-03	NA	NA	NA	NA	NA	NA
25																			
26																			
27																			
28																			
29																			
30																			

Environment Agency

		Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
		Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
1	Aliphatics (C5-C6)	1.28E-02	0.00E+00	2.12E-03	8.20E-05	2.50E+00	1.43E+95	1.43E+95	0.26	0.00	0.04	0.00	49.64	0.06	0.30	49.70
2	Aliphatics (>C6-C8)	3.92E-02	0.00E+00	6.47E-03	2.50E-04	2.49E+00	1.43E+95	1.43E+95	0.77	0.00	0.13	0.00	48.98	0.11	0.90	49.10
3	Aliphatics (>C8-C10)	1.04E-02	0.00E+00	1.73E-03	6.68E-05	1.34E-01	1.43E+95	1.43E+95	3.57	0.00	0.59	0.02	45.59	0.23	4.16	45.84
4	Aliphatics (>C10-C12)	3.23E-02	0.00E+00	5.33E-03	2.06E-04	8.23E-02	1.43E+95	1.43E+95	13.44	0.00	2.22	0.09	33.88	0.38	15.65	34.35
5	Aliphatics (>C12-C16)	4.19E-02	0.00E+00	6.91E-03	2.68E-04	1.30E-02	1.43E+95	1.43E+95	33.76	0.00	5.58	0.22	10.12	0.33	39.34	10.66
6	Aliphatics (>C16-C35)	8.39E-01	0.00E+00	1.39E-01	5.36E-03	1.67E-02	1.43E+95	0.00E+00	41.97	0.00	6.93	0.27	0.73	0.10	50.00	0.00
7	Aromatics (EC5-EC7)	8.00E-02	0.00E+00	1.32E-02	5.11E-04	8.12E-01	4.29E-05	2.86E-03	8.80	0.00	1.45	0.06	88.87	0.50	0.00	0.31
8	Aromatics (>EC7-EC8)	1.24E-01	0.00E+00	2.06E-02	7.96E-04	4.86E-01	1.43E-04	7.43E-03	19.48	0.00	3.22	0.12	75.32	0.68	0.02	1.16
9	Aromatics (>EC8-EC10)	1.21E-02	0.00E+00	1.99E-03	7.72E-05	1.88E-02	1.43E+95	1.43E+95	18.34	0.00	3.03	0.12	28.11	0.41	21.37	28.63
10	Aliphatics (>C10-C12)	3.23E-02	0.00E+00	5.33E-03	2.06E-04	8.23E-02	1.43E+95	1.43E+95	13.44	0.00	2.22	0.09	33.88	0.38	15.65	34.35
11	Aromatics (>EC12-EC16)	1.70E-02	0.00E+00	2.81E-03	1.09E-04	7.83E-04	1.43E+95	1.43E+95	41.07	0.00	6.78	0.26	1.73	0.16	47.85	2.15
12	Aromatics (>EC16-EC21)	1.28E-02	0.00E+00	2.11E-03	8.15E-05	5.90E-05	1.43E+95	0.00E+00	42.51	0.00	7.02	0.27	0.13	0.07	50.00	0.00
13	Aromatics (>EC21-EC35)	1.28E-02	0.00E+00	2.11E-03	8.18E-05	7.19E-06	1.43E+95	0.00E+00	42.66	0.00	7.05	0.27	0.00	0.02	50.00	0.00
14																
15	Benzene	8.87E-05	0.00E+00	1.46E-05	5.67E-07	9.01E-04	0.00E+00	0.00E+00	8.83	0.00	1.46	0.06	89.16	0.50	0.00	0.00
16	Ethylbenzene	4.67E-02	0.00E+00	7.71E-03	2.99E-04	9.90E-02	7.14E-05	1.86E-03	30.00	0.00	4.95	0.19	62.85	0.77	0.05	1.19
17	Toluene	1.24E-01	0.00E+00	2.06E-02	7.96E-04	4.86E-01	1.43E-04	7.43E-03	19.48	0.00	3.22	0.12	75.32	0.68	0.02	1.16
18	Xylene, m-	2.94E-02	0.00E+00	4.85E-03	1.88E-04	4.68E-02	1.57E-04	2.00E-03	35.25	0.00	5.82	0.23	55.33	0.78	0.19	2.40
19	Xylene, o-	3.07E-02	0.00E+00	5.07E-03	1.96E-04	4.63E-02	1.57E-04	2.00E-03	36.38	0.00	6.01	0.23	54.04	0.78	0.19	2.37
20	Xylene, p-	2.83E-02	0.00E+00	4.68E-03	1.81E-04	4.72E-02	1.57E-04	2.00E-03	34.35	0.00	5.67	0.22	56.37	0.78	0.19	2.42

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		Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
		Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
21																
22	Phenol	1.60E-02	0.00E+00	7.91E-03	1.02E-04	1.20E-03	5.00E-03	5.71E-04	51.93	0.00	25.73	0.33	3.16	0.74	16.26	1.86
23	2-Chlorophenol	1.82E-03	0.00E+00	7.50E-04	1.16E-05	2.91E-04	1.43E-04	1.43E-05	60.04	0.00	24.79	0.38	9.17	0.43	4.72	0.47
24	Pentachlorophenol	5.88E-04	0.00E+00	2.43E-04	3.76E-06	8.12E-06	8.43E-05	6.71E-05	62.63	0.00	25.86	0.40	0.53	0.33	8.98	1.27
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		Oral Health Criteria Value ($\mu g\ kg^{-1}\ BW\ day^{-1}$)		Inhalation Health Criteria Value ($\mu g\ kg^{-1}\ BW\ day^{-1}$)		Oral Mean Daily Intake ($\mu g\ day^{-1}$)	Inhalation Mean Daily Intake ($\mu g\ day^{-1}$)	Air-water partition coefficient (K_{aw}) ($cm^3\ cm^{-3}$)	Coefficient of Diffusion in Air ($m^2\ s^{-1}$)	Coefficient of Diffusion in Water ($m^2\ s^{-1}$)	log K_{oc} ($cm^3\ g^{-1}$)	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor ($g\ g^{-1}$ DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
1	Aliphatics (C5-C6)	TDI	5000	TDI	5000	9.99E+99	9.99E+99	2.10E+01	1.00E-05	1.00E-09	2.91	3.31	0.1	0.5	10	1	1
2	Aliphatics (>C6-C8)	TDI	5000	TDI	5000	9.99E+99	9.99E+99	2.73E+01	1.00E-05	1.00E-09	3.58	4.13	0.1	0.5	10	1	1
3	Aliphatics (>C8-C10)	TDI	100	TDI	290	9.99E+99	9.99E+99	4.15E+01	1.00E-05	1.00E-09	4.48	5.22	0.1	0.5	10	1	1
4	Aliphatics (>C10-C12)	TDI	100	TDI	290	9.99E+99	9.99E+99	6.44E+01	1.00E-05	1.00E-09	5.38	6.3	0.1	0.5	10	1	1
5	Aliphatics (>C12-C16)	TDI	100	TDI	290	9.99E+99	9.99E+99	1.71E+02	1.00E-05	1.00E-09	6.73	7.94	0.1	0.5	10	1	1
6	Aliphatics (>C16-C35)	TDI	2000	NR	0	9.99E+99	NR	1.07E+03	1.00E-05	1.00E-09	8.76	10.39	0.1	0.5	10	1	1
7	Aromatics (EC5-EC7)	TDI	223	TDI	1400	3	200	1.16E-01	8.77E-06	6.64E-10	1.83	2.13	0.1	0.5	10	1	1
8	Aromatics (>EC7-EC8)	TDI	223	TDI	1400	10	520	1.15E-01	7.78E-06	5.88E-10	2.31	2.73	0.1	0.5	10	1	1
9	Aromatics (>EC8-EC10)	TDI	40	TDI	60	9.99E+99	9.99E+99	2.53E-01	1.00E-05	1.00E-09	3.2	3.69	0.1	0.5	10	1	1
10	Aliphatics (>C10-C12)	TDI	100	TDI	290	9.99E+99	9.99E+99	6.44E+01	1.00E-05	1.00E-09	5.38	6.3	0.1	0.5	10	1	1
11	Aromatics (>EC12-EC16)	TDI	40	TDI	60	9.99E+99	9.99E+99	1.26E-02	1.00E-05	1.00E-09	3.7	4.29	0.1	0.5	10	1	1
12	Aromatics (>EC16-EC21)	TDI	30	NR	NR	9.99E+99	NR	6.95E-04	1.00E-05	1.00E-09	4.15	4.82	0.1	0.5	10	1	1
13	Aromatics (>EC21-EC35)	TDI	30	NR	NR	9.99E+99	NR	2.48E-05	1.00E-05	1.00E-09	5.1	5.95	0.1	0.5	10	1	1
14																	
15	Benzene	ID	0.29	ID	1.4	NR	NR	1.16E-01	8.77E-06	6.64E-10	1.83	2.13	0.1	0.5	10	1	1
16	Ethylbenzene	TDI	100	TDI	220	5	130	1.39E-01	7.04E-06	5.31E-10	2.65	3.15	0.1	0.5	10	1	1
17	Toluene	TDI	223	TDI	1400	10	520	1.15E-01	7.78E-06	5.88E-10	2.31	2.73	0.1	0.5	10	1	1
18	Xylene, m-	TDI	180	TDI	60	11	140	1.12E-01	7.03E-06	5.31E-10	2.69	3.2	0.1	0.5	10	1	1
19	Xylene, o-	TDI	180	TDI	60	11	140	9.20E-02	7.01E-06	5.31E-10	2.63	3.12	0.1	0.5	10	1	1
20	Xylene, p-	TDI	180	TDI	60	11	140	1.07E-01	7.04E-06	5.31E-10	2.65	3.15	0.1	0.5	10	1	1

		Oral Health Criteria Value ($\mu g\ kg^{-1}\ BW\ day^{-1}$)		Inhalation Health Criteria Value ($\mu g\ kg^{-1}\ BW\ day^{-1}$)		Oral Mean Daily Intake ($\mu g\ day^{-1}$)	Inhalation Mean Daily Intake ($\mu g\ day^{-1}$)	Air-water partition coefficient (K_{aw}) ($cm^3\ cm^{-3}$)	Coefficient of Diffusion in Air ($m^2\ s^{-1}$)	Coefficient of Diffusion in Water ($m^2\ s^{-1}$)	log K_{oc} ($cm^3\ g^{-1}$)	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor ($g\ g^{-1}$ DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
21																	
22	Phenol	TDI	700	TDI	10	350	40	8.35E-06	7.90E-06	6.36E-10	1.92	1.48	0.3	0.5	1	1	1
23	2-Chlorophenol	TDI	3	TDI	3	10	1	8.00E-05	7.14E-06	5.71E-10	2.58	2.15	0.25	0.5	1	1	1
24	Pentachlorophenol	TDI	1	TDI	0.14	5.9	4.7	5.55E-06	5.17E-06	4.21E-10	2.72	5.07	0.25	0.5	1	1	1
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Environment Agency

		Soil-to-water partition coefficient ($cm^3\ g^{-1}$)	Vapour pressure (Pa)	Water solubility ($mg\ L^{-1}$)	Soil-to-plant concentration factor for green vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for root vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for herbaceous fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for shrub fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tree fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)
1	Aliphatics (C5-C6)	1.28E+01	2.19E+04	3.59E+01	model	model	model	model	model	model
2	Aliphatics (>C6-C8)	5.98E+01	3.45E+03	5.37E+00	model	model	model	model	model	model
3	Aliphatics (>C8-C10)	4.75E+02	3.20E+02	4.27E-01	model	model	model	model	model	model
4	Aliphatics (>C10-C12)	3.77E+03	3.21E+01	3.39E-02	model	model	model	model	model	model
5	Aliphatics (>C12-C16)	8.44E+04	1.53E+00	7.59E-04	model	model	model	model	model	model
6	Aliphatics (>C16-C35)	9.04E+06	2.38E-02	2.54E-06	model	model	model	model	model	model
7	Aromatics (EC5-EC7)	1.06E+00	6.24E+03	1.78E+03	model	model	model	model	model	model
8	Aromatics (>EC7-EC8)	3.21E+00	1.73E+03	5.90E+02	model	model	model	model	model	model
9	Aromatics (>EC8-EC10)	2.49E+01	3.20E+02	6.46E+01	model	model	model	model	model	model
10	Aliphatics (>C10-C12)	3.77E+03	3.21E+01	3.39E-02	model	model	model	model	model	model
11	Aromatics (>EC12-EC16)	7.88E+01	1.14E+00	5.75E+00	model	model	model	model	model	model
12	Aromatics (>EC16-EC21)	2.22E+02	5.62E-03	6.53E-01	model	model	model	model	model	model
13	Aromatics (>EC21-EC35)	1.98E+03	1.61E-06	6.61E-03	model	model	model	model	model	model
14										
15	Benzene	1.06E+00	6.24E+03	1.78E+03	model	model	model	0.00E+00	0.00E+00	model
16	Ethylbenzene	7.02E+00	5.53E+02	1.80E+02	model	model	model	0.00E+00	0.00E+00	model
17	Toluene	3.21E+00	1.73E+03	5.90E+02	model	model	model	0.00E+00	0.00E+00	model
18	Xylene, m-	7.70E+00	4.95E+02	2.00E+02	model	model	model	0.00E+00	0.00E+00	model
19	Xylene, o-	6.70E+00	3.86E+02	1.73E+02	model	model	model	0.00E+00	0.00E+00	model
20	Xylene, p-	7.02E+00	4.75E+02	2.00E+02	model	model	model	0.00E+00	0.00E+00	model

Environment Agency

		Soil-to-water partition coefficient ($cm^3\ g^{-1}$)	Vapour pressure (Pa)	Water solubility ($mg\ L^{-1}$)	Soil-to-plant concentration factor for green vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for root vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for herbaceous fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for shrub fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tree fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)
21										
22	Phenol	1.31E+00	1.15E+01	8.41E+04	model	model	model	0.00E+00	0.00E+00	model
23	2-Chlorophenol	5.98E+00	3.36E+01	2.27E+04	model	model	model	model	model	model
24	Pentachlorophenol	8.25E+00	2.43E-04	1.40E+01	model	model	model	model	model	model
25										
26										
27										
28										
29										
30										

APPENDIX E:
FIELD MONITORING RECORDS

Appendix E - 1 Page

Ground Gas Monitoring Results

The groundwater wells were monitored for methane, carbon dioxide and oxygen concentrations on 21st July. The results are recorded below:

Ground Gas Concentrations on 21st July 2010

BH ID	Flow Rate (l/hr)		Methane (% vol)		Carbon Dioxide (% vol)		Oxygen (% vol)	PID (ppm)	
	Peak	Steady	Peak	Steady	Peak	Steady		Peak	Steady
WS1	0.1	0.1	0.0	0.0	0.4	0.4	16.4	1.31	1.0
WS4	0.0	0.0	0.0	0.0	0.0	0.0	19.9	2.1	2.1
WS6	0.0	0.0	0.0	0.0	0.0	0.0	16.3	0.0	0.0

Atm. Pressure – 1005mb.

- Not recorded

Groundwater

The wells were monitored for groundwater on one occasion. Depths to groundwater during each monitoring visit are presented in the following table:

Borehole ID	Relative Level (m ASD)	Depth to Groundwater
		21st July 2010
		m bgl
WS1	N/A	1.579
WS4	N/A	1.291
WS6	N/A	DRY

m ASD - metres Above Site Datum

m bgl - metres below ground level

- - borehole dry

APPENDIX F:
BOREHOLE LOGS

Appendix F - 6 Pages

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Borehole No
WS1
Sheet 1 of 1

Project No.:		Scale
HLEI12725		1:50
Project Name: Solent Road, Havant	Location: Havant	Excavation Method:	Logged By: TB
Client: Hargreaves	Dates: 16/07/2010	Level:	Boring Diameter: (mm)	Checked By:

Installation Details	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Test Result	Depth (m)	Level (m ASD)	Legend	Stratum Description
					0.05			Asphalt (MADE GROUND)
		0.25 0.20-0.30	0.0ppm ES	0.0ppmV	0.50			Loose, grey brown gravelly SAND. Gravel is medium to coarse, angular to subrounded of mixed lithology. (MADE GROUND)
					0.80			Grey brown, sandy CLAY with brick and concrete fragments. (MADE GROUND)
		1.00 1.00-1.30	0.0ppm ES	0.0ppmV	1.00			Red brick fragments. (MADE GROUND)
					1.30			Recovered as: Structureless CHALK composed of light grey, slightly gravelly SILT. Gravel is subrounded, fine to medium of flint. (UPPER CHALK FORMATION - Grade Dm)
		1.70 1.70-2.00	0.0ppm ES	0.0ppmV				Recovered as: Structureless CHALK composed of grey, very gravelly SILT. Gravel is subrounded, fine to medium of flint. (UPPER CHALK FORMATION - Grade Dm)
	▽				2.30			Recovered as: Structureless CHALK composed of grey, sandy gravelly SILT. Gravel is fine to coarse angular to subrounded flint. Wet. (UPPER CHALK FORMATION - Grade Dm)
		2.60 2.60-2.80	0.0ppm ES	0.0ppmV	2.60			Recovered as: Structureless CHALK composed of light grey, gravelly SILT. Gravel is fine to coarse angular to subangular flint. Moist. (UPPER CHALK FORMATION - Grade Dm)
		3.50 3.50-4.00	0.0ppm ES	0.0ppmV				
					4.00			End of Borehole at 4.00 m

Type Results

Excavation Remarks: No visual or olfactory evidence of contamination.

Groundwater Remarks: Groundwater encountered at 2.3m bgl

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Borehole No
WS2
Sheet 1 of 1

Project No.:		Scale
HLEI12725		1:50

Project Name:	Location:	Excavation Method:		Logged By
Solent Road, Havant	Havant			TB
Client:	**Dates:**	**Level:**	**Boring Diameter:** (mm)	**Checked By**
Hargreaves	16/07/2010			

Installation Details	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Test Result	Depth (m)	Level (m ASD)	Legend	Stratum Description
					0.05			Asphalt (MADE GROUND)
		0.30 0.30-0.40	0.0ppm ES	0.0ppmV	0.30			Yellow grey / grey sandy GRAVEL. Sand is coarse. Gravel is medium to coarse angular to subangular flint. (MADE GROUND)
		0.90 0.90-1.30	0.0ppm ES	0.0ppmV	0.80			Orange brown gravelly CLAY. Gravel is fine to coarse angular to subangular flint with brick fragments. (MADE GROUND) . 0.7-0.8m single red brick.
		1.60 1.60-2.00	0.0ppm ES	0.0ppmV	1.70 1.80			Soft grey brown CLAY with some roots, rootlets and small pieces of wood. (ALLUVIUM) Becoming lighter grey at 1.4m bgl. Firm pseudo-fibrous brown PEAT. (PEAT)
		2.50 2.50-3.00	0.0ppm ES	0.0ppmV	2.50			Soft grey organic CLAY. With some roots, rootlets and preudo-firbrous organic matter. (ALLUVIUM)
	▽	3.40 3.40-3.60	0.0ppm ES	0.0ppmV				Recovered as: Structureless CHALK composed of grey/yellow slightly gravelly sandy SILT. Gravel is fine to coarse angular to subangular flint. (UPPER CHALK FORMATION - Grade Dm) Becoming wet at 3.0m bgl.
		4.60 4.60-5.00	0.0ppm ES	0.0ppmV	4.50			Recovered as: Structureless CHALK composed of cream slightly gravelly SILT. Gravel is fine to medium subangular flint. (UPPER CHALK FORMATION - Grade Dm)
					5.00			End of Borehole at 5.00 m
			Type	Results				

Excavation Remarks: No visual or olfactory evidence of contamination.

Groundwater Remarks: Groundwater encountered at 3.0m bgl

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Borehole No
WS3
Sheet 1 of 1

Project No.:		Scale
HLEI12725		1:50

Project Name:	Location:	Excavation Method:		Logged By
Solent Road, Havant	Havant			TB
Client:	**Dates:**	**Level:**	**Boring Diameter:** (mm)	**Checked By**
Hargreaves	16/07/2010			

Installation Details	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Test Result	Depth (m)	Level (m ASD)	Legend	Stratum Description
					0.05			Asphalt (MADE GROUND)
					0.30			Light grey concrete. (MADE GROUND)
		0.40	0.0ppm	0.0ppmV				Brown CLAY with alternating bands of red brick fragements and weak concrete (MADE GROUND)
		0.40-0.80	ES					
		1.25	0.0ppm	0.0ppmV	1.20			Grey brown gravelly organic CLAY with some medium sized fibrous and pseudo-fibrous organic material. Gravel is fine to medium subangular flint. (ALLUVIUM)
		1.25-1.45	ES		1.45			Grey brown clayey GRAVEL. Gravel is fine to coarse angular to subangular flint. (ALLUVIUM)
		1.90	0.0ppm	0.0ppmV	1.90			Recovered as: Structureless CHALK composed of pale yellow / cream gravelly sandy SILT. Gravel is fine to coarse aubangular flint. (UPPER CHALK FORMATION - Grade Dm)
	▽	1.90-2.30	ES		2.20			Large volume of water within the window sample tube.
		2.50	0.0ppm	0.0ppmV				Recovered as: Structureless CHALK composed of yellow / yellow brown sandy clayey GRAVEL. Gravel is fine to coarse subangular flint. Very wet. (UPPER CHALK FORMATION - Grade Dm)
		2.50-3.00	ES					
		3.50	0.0ppm	0.0ppmV				
		3.50-4.00	ES					
		4.50	0.0ppm	0.0ppmV				
		4.50-5.00	ES					
					5.00			End of Borehole at 5.00 m
			Type	Results				

Excavation Remarks: No visual or olfactory evidence of contamination.

Groundwater Remarks: Groundwater encountered at 2.0m bgl.

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Borehole No
WS4
Sheet 1 of 1

Project No.:		Scale
HLEI12725		1:50

Project Name:	Location:	Excavation Method:		Logged By
Solent Road, Havant	Havant			TB
Client:	**Dates:**	**Level:**	**Boring Diameter:** (mm)	**Checked By**
Hargreaves	16/07/2010			

Installation Details	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Test Result	Depth (m)	Level (m ASD)	Legend	Stratum Description
					0.00			Poor quality concrete underlain by loose grey subangular to subrounded aggregate. (MADE GROUND)
		0.40 0.40-0.60	0.0ppm ES	0.0ppmV	0.40			Yellow brown gravelly CLAY. Gravel is fine to coarse angular to subrounded of mixed lithology with fragments of brick and concrete. (MADE GROUND) Concrete encountered at 0.6-0.65m bgl. Red brick at 0.7-0.8m bgl
		1.00 1.00-1.40	0.0ppm ES	0.0ppmV	0.80			Grey brown spongy pseudo-fibrous organic CLAY. (ALLUVIUM)
		1.90 1.90-2.20	0.0ppm ES	0.0ppmV	1.60 1.80			Grey brown gravelly CLAY. Gravel is fine to medium subangular flint with some roots, rootlets and psuedo-fibrous organic matter. (ALLUVIUM)
		2.50 2.50-3.00	0.0ppm ES	0.0ppmV	2.50 2.70			Grey brown gravelly CLAY. Gravel is fine to medium angular to subrounded flint. (ALLUVIUM) Grey clayey SAND. (ALLUVIUM)
		3.50 3.50-4.00	0.0ppm ES	0.0ppmV				Recovered as: Structureless CHALK composed of yellow / grey clayey sandy GRAVEL. Gravel is fine to coarse subangular flint. (UPPER CHALK FORMATION - Grade Dm)
					4.00			End of Borehole at 4.00 m
			Type	Results				

Excavation Remarks: No visual or olfactory evidence of contamination.

Groundwater Remarks: Groudnwater encouneterd at approximately 2.0m bgl.

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Borehole No
WS5
Sheet 1 of 1

Project No.: HLEI12725			Scale 1:50
Project Name: Solent Road, Havant	Location: Havant	Excavation Method:	Logged By TB
Client: Hargreaves	Dates: 16/07/2010	Level: / Boring Diameter: (mm)	Checked By

Installation Details	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Test Result	Depth (m)	Level (m ASD)	Legend	Stratum Description
					0.05			Asphalt (MADE GROUND)
					0.20			Poor quality concrete and aggregate. (MADE GROUND)
		0.40	0.0ppm	0.0ppmV				Yellow brown sandy gravelly CLAY. Gravel is fine to coarse angular to subangular flint. (HEAD DEPOSITS)
		0.40-0.70	ES					
					0.95			Grey brown sandy gravelly CLAY with occasional organic matter. (ALLUVIUM)
		1.40	0.0ppm	0.0ppmV	1.40			Yellow brown gravelly CLAY. Gravel is fine to coarse angular flint. (HEAD DEPOSITS)
		1.40-1.80	ES					Gravel content decreased at 1.6m bgl.
					1.80			
		2.00	0.0ppm	0.0ppmV	2.00			Yellow brown gravelly CLAY. Gravel is medium to coarse angular to subangular flint. (HEAD DEPOSITS)
		2.00-2.20	ES					
					2.30			Yellow brown, sandy clayey GRAVEL. Sand is coarse. Gravel is fine to coarse subangular flint. Moist. (HEAD DEPOSITS)
		2.50	0.0ppm	0.0ppmV	2.60			Grey CLAY. Moist (HEAD DEPOSITS)
		2.50-3.00	ES					
					3.00			Grey slightly gravelly CLAY. Gravel is fine to medium subangular flint. Moist (HEAD DEPOSITS)
								Slight increase in gravel content.
		3.50	0.0ppm	0.0ppmV				Recovered as: Structureless CHALK composed of light yellow sandy gravelly SILT. Gravel is fine to medium subangular flint. Moist. (UPPER CHALK FORMATION - Grade Dm)
		3.50-4.00	ES					
					4.00			End of Borehole at 4.00 m
			Type	Results				

Excavation Remarks: No visual or olfactory evidence of contamination.

Groundwater Remarks: Groundwater not encountered.

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Borehole No
WS6
Sheet 1 of 1

Project No.: HLEI12725			Scale 1:50
Project Name: Solent Road, Havant	Location: Havant	Excavation Method:	Logged By TB
Client: Hargreaves	Dates: 16/07/2010	Level: / Boring Diameter: (mm)	Checked By

Installation Details	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Test Result	Depth (m)	Level (m ASD)	Legend	Stratum Description
					0.05			Asphalt (MADE GROUND)
		0.30 0.30-0.60	0.0ppm ES	0.0ppmV	0.30			Weak concrete overlying a subbase of gravelly sand and aggregate. Gravel is coarse angular aggregate. (MADE GROUND)
					0.95			Yellow brown gravelly CLAY with brick and concrete fragments. Gravel is fine to coarse angular to subangular mixed lithology. (MADE GROUND)
		1.20 1.20-1.50	0.0ppm ES	0.0ppmV				Grey brown gravelly organic CLAY with some medium sized fibrous and pseudo-fibrous organic material. Gravel is fine to medium subangular flint. (ALLUVIUM)
		1.90 1.90-2.00	0.0ppm ES	0.0ppmV				
					2.20			Recovered as: Structureless CHALK composed of soft slightly gravelly sandy SILT. Gravel is fine to medium subangular flint. (UPPER CHALK FORMATION - Grade Dm) Becoming firm @ 2.4m bgl. Becoming damp and soft from 2.6m bgl.
	▽	2.60 2.60-3.00	0.0ppm ES	0.0ppmV				
					3.00			Recovered as: Structureless CHALK composed of cream sandy gravelly SILT. Gravel is fine to medium subangular flint. Wet. (UPPER CHALK FORMATION - Grade Dm)
		3.50 3.50-4.00	0.0ppm ES	0.0ppmV				
					4.00			End of Borehole at 4.00 m
			Type	Results				

1 2 3 4 5 6 7 8 9

Excavation Remarks: No visual or olfactory evidence of contamination.

Groundwater Remarks: Groundwater encountered at approximately 3.0m bgl.

HoleBASE III (Bd 408) Standard Borehole Log v1 dated 28th Mar 03

APPENDIX G:
SITE INVESTIGATION GENERAL NOTES

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SITE INVESTIGATIONS - GENERAL NOTES

1. The assessments made in this report are based on the ground conditions as revealed by intrusive investigations, together with the results of any field or laboratory testing or chemical analysis undertaken and other relevant data, which may have been obtained including previous site investigations. In any event, ground contamination often exists as small discrete areas of contamination ("hot spots") and there can be no certainty that any or all such areas have been located and/or sampled.

2. There may be special conditions appertaining to the site, which have not been taken into account in the report. The assessment may be subject to amendment in the light of additional information becoming available.

3. Where any data supplied by the Client or from other sources, including that from previous site investigations, have been used it has been assumed that the information is correct. No responsibility can be accepted by RPS Companies for inaccuracies within the data supplied by other parties.

4. Whilst the report may express an opinion on possible ground conditions between or beyond trial pit or borehole locations, or on the possible presence of features based on either visual, verbal or published evidence this is for guidance only and no liability can be accepted for the accuracy thereof.

5. Comments on groundwater conditions are based on observations made at the time of the investigation unless otherwise stated. Groundwater conditions may vary due to seasonal or other effects.

6. This report is prepared and written in the context of the agreed scope of work and should not be used in a different context. Furthermore, new information, improved practices and changes in legislation may necessitate a re-interpretation of the report in whole or part after its original submission.

7. The copyright in the written materials shall remain the property of the RPS Company but with a royalty-free perpetual licence to the client deemed to be granted on payment in full to the RPS Company by the client of the outstanding amounts.

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9. These terms apply in addition to the RPS Group "Standard Terms of Business" (or in addition to another written contract which may be in place instead thereof) unless specifically agreed in writing. (In the event of a conflict between these terms and the said Standard Terms of Business the said Standard Terms of Business shall prevail). In the absence of such a written contract the Standard Terms of Business will apply.