Taylors (Hockley) Limited FOUNDRY BUSINESS PARK

The Estate Office, 10A Foundry Business Park, Station Approach, Hockley, Essex. SS5 4HS Tel/Fax: 01702 207262

With Compliments. <u>Attention Leigh Palmer- Planning Department.</u>

As requested, Contamination Report for 07/00256/FUL

Many thanks for your help and advice during this application. I have sent a copy of the report direct to Ben Jones at Building Control for his information.

Kind regards. Paul Taylor

Directors: P E Taylor W P Taylor

Company Secretary: W P Taylor

Company Reg. No 1068606

# FASTRACK GEOTECHNICAL SERVICES

# **Contamination Assessment**

Contamination Assessment

Foundry Business Park Hockley Essex SS5 4HS

Job No. 5046

Date: April 2007

Client: Taylors Ltd.

Directors:

Trevor Ayres IEng AMICE MIWHM John Wilsmer MCIOB Christopher Hines FCCA

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П	Trial Pit Logs
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### Taylors of Hockley, Foundry Business Park, Hockley, Essex SS5 4HS

#### 1.0 INTRODUCTION

In accordance with instructions by Taylors, we visited the site occupied by The Old Foundry on 25<sup>th</sup> April 2007. The purpose of our visit was to carry out an investigation into the ground conditions, with a view to assessing any possible contamination issues impacting upon the site. It is our understanding that site is to be developed as commercial/industrial units.

The exploratory holes carried out during the fieldwork, which investigate only a small volume of the ground in relation to the size of the site, can only provide general indication of site conditions. The comments and opinions expressed within this report are based on the ground conditions revealed by the site works, together with information contained within the desk study and of laboratory test results. There may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which therefore have not been taken into account in this report. These include the existence of localised 'hot spots' of contamination where concentrations may be significantly higher than those encountered.

The opinions in this report concerning any contaminations found and the risks arising there from are based on a simple risk assessment approach and comparison with available guideline values. In addition visual and olfactory assessment has been taken into account. It should be noted that authoritative guideline values are potentially subject to change. The conclusions in this report are based on the guideline values available at the time this report was prepared and no liability can be accepted for the retrospective effects of any changes or amendments to these values.

All ground water readings relate to short term observations and do not allow for variations due to seasonal or other effects.

All depths stated within this report and on the borehole logs are depths below the ground level surrounding the borehole locations.

#### 2.0 SITE SETTING

#### i. Location

The site is located at approximate grid reference TQ841927 just on the left hand side of the business parks main entrance, 100m south west of Hockley Station. The ground is generally flat and lies approximately 50m above sea level.

#### ii. Description

The area of the whole site is approximately 1200m<sup>2</sup> and is currently unoccupied. The majority of the surrounding area is industrial units and offices, but there are a few hoses neighbouring the southern side of the site. The layout of the immediate surrounding area is shown on the Site Plan, Appendix I Sheet 1.

#### iii. Geology

Reference to the 1:50,000 scale geological map of the area (Sheet 258 Southend and Foulness) shows the site to be underlain by London Clay. The site does however lie close to a boundary of an area of Made Ground.

#### iv. Hydrogeology

The London Clay is noted to be a non aquifer. This will mean that the permeability across site will be poor and there could be a possible perched water table within the made ground. The site does not lie within an environment agency source protection zone.

#### v. Hydrology

The flood map shows that the site has minimal risk of flooding as it does not lie on a fluvial or tidal floodplain. The Environment Agency website states that there is a 1 in 1000 or less chance of flooding in extreme flood,

this is based on best current information without the influence of flood defences. The closest water course is a tributary to the Paglesham Reach, 1.5km to the south east.

#### 3.0 FIELDWORK

The site investigation work was carried out on 25<sup>th</sup> April 2007 and comprised of the digging of 3No. trial pits across the site to a maximum depth of 1.50m. The locations of the trial pits carried out are marked on the site plan within Appendix 1 and the logs included as Appendix 2.

Within the trial pits, disturbed samples were taken at depths of 0.30m, 0.50m, 0.70m, 1.00m.

#### 4.0 TRIAL PIT FINDINGS

#### i. Overview

Three trial pits were carried out on site to establish the contamination levels across the site as a whole. The trial pits were excavated to a depth of 1.50m below ground level. All trial pits encountered very similar profiles which matched the expected underlying geology of London Clay.

The strata encountered within each of trial pits, along with their depth is recorded below:

Stratum	TP1	TP2	TP3
Black/dark brown, clayey, sandy MADE GROUND with gravel	G.L0.40m	G.L0.45m	G.L0.43m
Orange brown, mottled grey silty CLAY	0.40-1.50m	0.45-1.50m	0.40-1.50m

#### ii. Made Ground

Made Ground was encountered within all three trial pits, to a maximum depth of 0.45m; noted to be sandy and clayey with gravel present.

#### iii. London CLAY

Beneath the Made Ground to the close of each trial pit, an orange brown, mottled grey. silty CLAY was encountered. This clay is noted to be consistent with London Clay geology, as suggested by the geological survey map.

#### iv. Root Activity

No roots below grass level were observed within any of the trial pits.

#### v. Groundwater

None of the trial pits encountered water strikes during excavation. This suggests that in the short term groundwater will lie at a depth greater 1.50m below ground level

It should be noted that comments on groundwater conditions are based on observations made at the time of the investigation (April 2007) and that changes in groundwater levels are likely to arise due to seasonal affects and changes in drainage conditions.

#### 5.0 CONTAMINATION TESTING

#### i. General

The sample analysis suite was selected to take account of the current usage of the site and the potential risks associated with the proposed future site use. Selected samples from the boreholes were sent for contamination testing in order for a preliminary contamination assessment to be conducted on this site. This would then indicate whether further testing and sampling would be required and also give indications as to any liabilities with regard to remediation of the site prior to development.

#### ii. Sampling and Testing:

Six samples in total were tested for a range of contaminants, two from each trial from depths of 0.30m and 0.70m. The contaminants which were tested for were: arsenic, boron, cadmium, chromium, copper, total cyanide, lead, mercury, nickel, pH, monohydric phenols, polyaromatic hydrocarbons (PAH's), selenium, sulphate, sulphide, and zinc.

None of the samples were tested for contaminants such as volatiles, solvents etc, as none of the samples recovered contained any visual or olfactory evidence to suggest such contamination. The results of the testing are included as Appendix 3.

#### iii. Published Guidelines

The recommended guidelines on the levels of contamination within a soil in the UK are the Contaminated Land Reports (CLR7, 8, 9, 10 & 11). These documents are the most up to date guidelines on the issues of contamination. It has been prepared by DEFRA and the Environment Agency to provide regulators, developers, landowners and other interested parties with relevant, appropriate, authoritative and scientifically based information and advice on the assessment of risks arising from the presence of contamination in soils. The CLR reports include priority of contaminants (CLR8), toxicological data and intake values for humans (CLR9), tolerable daily intake amounts (CLR9 tox1-10), contaminated land exposure model (CLR10) and soil guideline vales (CLR 10 SGV 1-10).

The former guidelines, the Interdepartmental Committee on the Redevelopment of Contaminated Land (ICRCL: 1987) guidelines have now been removed along with the Dutch Framework Model and should not be used. However, for the purposes of this report they may provide useful information for contaminants not yet covered by the CLR reports for the purposes of a generic risk assessment.

For the purposes of this development, the contamination test results were compared to the CLEA SGV for commercial/industrial purposes, with plant uptake and for contaminants not covered by CLEA, the ICRCL Use code 1 values, which were the most applicable guidelines for this particular development.

The contamination test results were compared to the following CLEA Soil Guideline Value or, where the contaminant is not covered by the CLEA guidelines, the ICRCL Guideline Threshold Values:

TABLE A CONT	AMINANTS
(Hazardous to health	)
Contaminant	CLEA Threshold (with plant uptake)
Arsenic	500mg/kg
Cadmium	1400mg/kg (pH6)
Chromium	5000mg/kg
Lead	750mg/kg
Mercury	480mg/kg
Nickel	5000mg/kg
Selenium	8000mg/kg

TABLE B CONT Phytotoxic but not normally hazardous health			
Contaminant	Threshold ICRCL		
Boron	3mg/kg		
Copper	130mg/kg		
Zinc	300mg/kg		
PH	>5pH		

TABLE C CON Contam assoc with carbonisation sites	
Contaminant	Threshold ICRCL
Sulphide	250mg/kg
Cyanide total	350mg/kg
РАН	1000mg/kg
Phenols	5mg/kg

#### 6.0 CONTAMINATION TEST RESULTS

#### i. Toxic Metals (former ICRCL Group A Metals)

These contaminants are classified as 'contaminants, which may pose a hazard to health' and include: arsenic, cadmium, chromium, lead, mercury, nickel and selenium. When comparing the samples tested with the CLEA SGV for commercial/industrial use, none of the samples contained levels above the appropriate guideline values. None of the samples tested exceeded guideline levels for Group A contaminants and therefore can be considered uncontaminated with regards to toxic metals.

#### ii. Phytotoxic Contaminants (former ICRCL Group B Metals)

These are contaminants, which are phytotoxic (i.e. toxic to plants but not normally considered hazardous to human health). They include: boron, copper, and zinc. At present there are no CLEA SGVs for these contaminants and therefore for this generic risk assessment we have compared the results to the guideline threshold levels set by the ICRCL committee. The guideline threshold levels set by the ICRCL committee. The guideline threshold levels set by the ICRCL committee were not exceeded by any of the samples. With regard to phytotoxic contaminants, one sample showed elevated levels of one contaminant, and one level that matched guideline values:

**Boron:** the sample at 0.70m depth within trial pit 3 recorded a level of boron at 3mg/kg of soil, this matches the guideline level for boron according to CLEA.

**Zinc:** From trial pit 3 at 0.70m depth an elevated level of zinc was recorded, showing 400mg/kg of soil, above the CLEA guideline of 300mg/kg of soil.

#### iii. Organic Contaminants (formerly ICRCL Group C)

These are contaminants normally associated with former coal carbonisation sites, they include; cyanide, pH, phenols, polyaromatic hydrocarbons, sulphate, sulphide, sulphur and thiocyanate. The guideline threshold levels set by the ICRCL committee were not exceeded by any of the samples. None of the samples tested recorded elevated levels of these contaminants and is therefore considered uncontaminated with respect to Organic contaminants.

#### iv. Qualitative Risk Assessment

In assessing the risk to future users of the site from the presence of contamination, then a contamination linkage must be identified. This linkage relates strongly to the source, pathway and receptor models, which are commonly used in risk assessments for contamination of a site. The contamination linkage is controlled by the intended use of the site, with regard to the location of the building, areas of hardstanding and landscaped areas along with the nature and level of any contamination on site.

The receptors identified are future users of the site – Humans. The proposed development is commercial/industrial units. All the samples were below current CLEA SGVs and former ICRCL threshold guidelines. These values are based upon the site being used as a commercial/industrial development, with the potential for plant uptake and assuming that the critical receptor is an adult human.

The results from the contamination testing show that one sample exceeds and one matches the SGVs for a commercial/industrial development. Given the information above we consider the risk to human health to be very low and as such remediation in the form of mixing of the subsoil in the area of trial pit 3 may be prudent in order to dilute the slight excess in zinc.

Remediation will not be required beneath the footprint of the building or beneath permanent hard standings (i.e. roads, access ways, car parking etc). All material excavated should be taken to a suitably licensed facility. Copies of the contamination testing for the materials being removed should be provided to the landfill operators in order for them to classify the soil. Any imported material to the site should be suitably certificated to prove it is clean and uncontaminated.

#### v. Construction Workers

Based on the results of the contamination testing, we would suggest that the risk to construction workers on this site is low across most of the site. Even though some samples were slightly over the CLEA SGV's for residential purposes (where people will come into contact with the soil), risk to site workers tends to be

significantly less due to lack of any long term exposure. However, as with all sites where contamination is or may be present, standard Health and Safety measures should be applied with high standards of personal hygiene. Washing facilities should be provided and used prior to eating or smoking. Safety clothing and equipment should be used (i.e. masks, gloves etc). In dry weather exposed materials may need to be damped down to prevent material becoming airborne. As with all sites which contain areas, which cannot be investigated, any suspected contamination exposed during construction should be fully investigated.

#### vi. Underground Services & Construction

The concentration of Polyaromatic Hydrocarbons and phenols were not elevated in any of the samples tested, therefore there is unlikely to be an impact upon water pipes or the curing of concrete.

#### x. Flora & Fauna

Copper and Zinc are not considered to be harmful to human health but may be phytotoxic or toxic to plants. Levels of the phytotoxic contaminant zinc were found to be elevated within one of the samples. Therefore there would be minimal threat to plants, however due to the proposed industrial use of the site, should plants not be a factor, this elevated level is negligible.

#### xi. Contamination Assessment Summary

The desk study highlighted two possible sources of contamination affecting the site; the neighbouring electric works and made ground beneath the site. The made ground beneath the site was not found to be above current guidelines for commercial/industrial land use. In summary, from the findings of this contamination assessment, that given that there is minimal threat from contamination to human end users, we would suggest that at present it would be not be necessary to carry out any remediation method.

#### 7.0 CERTIFICATION

Although the boreholes were positioned to give a spread across the site, it is impossible to give total coverage across a site, especially one which contains buildings, hardstandings and obstructions. Therefore areas exist on the site where investigations were not carried out. Such areas are generally only exposed during the construction stage. Should any areas of potential contamination be identified during construction, further testing may be required.

Responsibility cannot be accepted for variation in ground conditions between and around exploratory points not revealed by the data or at the time of the investigation. The report may suggest an opinion on the nature of the strata or conditions between exploratory points and below the maximum depth of investigation. However, this is for guidance only and no liability can be accepted for its accuracy.

The conclusions and recommendations given within this report are based upon the stated development plans for the site. If the site is to be developed for a more or less sensitive use then a different interpretation may be appropriate. This report relies upon the co-operation of other organisations and the free availability of information and total access. No responsibility can therefore, be accepted for conditions arising from information, which was not available to the investigation team as a result of information being withheld or access prevented.

This report refers to ICRCL guideline values which have now been withdrawn. For contaminants not included within the current CLEA guidelines a Site Specific Risk Assessment is required to determine acceptable levels of contamination on a particular site. However, a Site Specific Risk Assessment was not within our remit and therefore was not carried out as part of this work. The ICRCL values included within this report are for guidance on former levels of acceptable contamination and are unlikely to conform to current regulations.

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We hope that this is satisfactory for you requirements. If you have any queries please do not hesitate from contacting us.

Yours faithfully

Martin Rush BSc Msc FGS For and on behalf of FASTRACK GEOTECHNICAL SERVICES

## APPENDIX I Site Plan



# APPENDIX II Trial Hole Findings







## APPENDIX III Contamination Test Results

11-05-07;02:24PM;01373552923

# **Scientific Analysis Laboratories**

Report Number:	101012-1
Date of Report:	11-May-2007
Client:	Fastrack Geotechnical Services, Churchill House Sopwith Crescent Hurricane Way Wickford. SS11 8YU
Client Contact:	Ms Lara Payne
<b>Client Job Reference:</b>	5046
<b>Client Site Reference:</b>	Taylors Foundry Business Park, Flockley
Client Purchase Order:	
Date Job Received at SAL:	27-Apr-2007
Date Analysis Started:	30-Apr-2007
Date Analysis Completed:	11-May-2007

The results reported relate to samples received at the laboratory

Opinions and interpretations expressed herein are outside the scope of UKAS or MCERTS accreditation This report should not be reproduced except in full without the written approval of the laboratory Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used in this report: W: Analysis was performed at another SAL Laboratory S: Analysis was sub-contracted N: Analysis is not UKAS accredited U: Analysis is UKAS accredited M: Analysis is MCERTS accredited

Report checked and authorised by:

Miss Claire Brown Project Manager



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### Index to caveats used in this report

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Value	Description
AR	As Received
A40	Air Dried <40C

Produced by: Scientific Analysis Laboratories Ltd. 3 Crittall Drive, Springwood Industrial Estate, Braintree, Essex. CM7 2RT

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SAL Reference: 101012 Project Site: Taylors Foundry Business Park, Flockley Customer Reference: 5046

Soil Analysed as Soil Braintree ICRCL

·				eference	101012 006
	Custome	er San			TP 3 0.7m
			Test	Sample	A40
Determinant	Technique	LOD	Units	Symbol	
Arsenic	ICP/OES (SIM) (Aqua Regia Extraction)	2.0	mg/kg	U	29
Boron (water-soluble)	ICP-OES (Sim)	1	mg/kg	N	3
Cadmium	ICP/OES (SIM) (Aqua Regia Extraction)	0.1	mg/kg	U	0.7
Chromium	ICP-OES(Aqua Regia Extraction)	0.5	mg/kg	U	41
Copper	ICP-OES(Aqua Regia Extraction)	1.0	mg/kg	U	120
Lead	ICP/OES (SIM) (Aqua Regia Extraction)	0.5	mg/kg	U	450
Mercury	ICP/OES (SIM) (Aqua Regia Extraction)	0.5	mg/kg	U	0.8
Nickel	ICP/OES (SIM) (Aqua Regia Extraction)	0.5	mg/kg	U	31
pН	Probe			U	8.0
Selenium	ICP/OES (SIM) (Aqua Regia Extraction)	1	mg/kg	U	<1
(Water Soluble) Sulphate ion expressed as SO4	2:1 Extraction/ICP-OES (TRL 447 T1)	0.01	g/l	U	0.10
Sulphide	Colorimetry	10	mg/kg	N	<10
Sulphur (Total)	ICP/OES	0.01	%	N	0.13
Zinc	ICP/OES (SIM) (Aqua Regia Extraction)	0.5	mg/kg	U	400

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SAL Reference: 101012 Project Site: Taylors Foundry Business Park, Flockley Customer Reference: 5046

Soil Analysed as Soil Braintree ICRCL

	101012 001	101012 002	101012 003	101012 004	101012 005				
	TP 1 0.3m	TP 1 0.7m	TP 2 0.5m	TP 2 1.0m	TP 3 0.3m				
1801			Test	Sample	A40	A40	A40	A40	A40
Determinant	Technique	LOD	Units	Symbol					
Arsenic	ICP/OES (SIM) (Aqua Regia Extraction)		mg/kg	of the local division in which the local division in which the local division in which the local division in t	3.9	14	16	10	13
Boron (water-soluble)	ICP-OES (Sim)	1	mg/kg	N	1	1	1	1	1
Cadmium	ICP/OES (SIM) (Aqua Regia Extraction)	0.1	mg/kg	U	0.1	0.1	0.2	<0.1	0.1
Chromium	ICP-OES(Aqua Regia Extraction)	0.5	mg/kg	U	6.3	64	37	46	46
Copper	ICP-OES(Aqua Regia Extraction)	1.0	mg/kg	υ	14	30	48	13	15
Lead	ICP/OES (SIM) (Aqua Regia Extraction)	0.5	mg/kg	υ	210	29	150	16	18
Mercury	ICP/OES (SIM) (Aqua Regia Extraction)	0.5	mg/kg	U	<0.5	<0.5	0.5	<0.5	<0.5
Nickel	ICP/OES (SIM) (Aqua Regia Extraction)	0.5	mg/kg	U	5.6	38	19	14	14
pH	Probe	-		Ų	9.0	8.6	7.6	8.0	7.8
Selenium	ICP/OES (SIM) (Aqua Regia Extraction)	1	mg/kg	U	<1	<1	<1	<1	<1
(Water Soluble) Sulphate ion expressed as SO4	2:1 Extraction/ICP-OES (TRL 447 T1)	0.01	g/l	υ	0.13	0.18	0.05	0.08	0.06
Sulphide	Colorimetry	10	mg/kg	N	<10	<10	<10	<10	<10
Sulphur (Total)	ICP/OES	0.01	%	N	0.02	0.04	0.03	0.02	0.02
Zinc	ICP/OES (SIM) (Aqua Regia Extraction)	0.5	mg/kg	Ű	40	81	110	50	57

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SAL Reference: 101012 Project Site: Taylors Foundry Business Park, Flockley Customer Reference: 5046

Soil

Analysed as Soil

**New Group** 

SAL Reference						101012 002	101012 003	101012 004	101012 005
	Custome	r San	-		0.3m	TP 1 0.7m	TP 2 0.5m	TP 2 1.0m	TP 3 0.3m
			Test	Sample	AR	AR	AR	AR	AR
Determinant	Technique	LOD	Units	Symbol	and the second second second	inter and interesting the			
Cyanide (Total)	Colorimetry	1	mg/kg	the second se	<1	<1	<1	<1	<1
Phenois (Total-Mono)	Colorimetry (CE)	0.5	mg/kg	THE OWNER OF TAXABLE PARTY.	<0.5	<0.5	<0.5	<0.5	<0.5
Polyaromatic Hydrocarbons (Total)	GC/FID (SE)	10	mg/kg	N	<10	<10	<10	<10	<10

SAL Reference: 101012 Project Site: Taylors Foundry Business Park, Flockley Customer Reference: 5046

Soil

Analysed as Soil

**New Group** 

	SAL Reference						
	Custome	r San	nple Re	ference	TP 3 0.7		
			Test	Sample	AR		
Determinant	Technique	LOD	Units	Symbol			
Cyanide (Total)	Colorimetry	1	mg/kg	transmitter and the second	<1		
Phenols (Total-Mono)	Colorimetry (CE)	0.5			<0.5		
Polyaromatic Hydrocarbons (Total)	GC/FID (SE)	No. of Concession, name of	mg/kg		<10		

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