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Environmental Consultants

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Our Ref.: TJ2614AR1
Your Ref.: Netherall Gardens (578-EC)

O'Halloran & O'Brien Limited
O'Brien House
197-199 Garth Road
Morden
Surrey
SM4 4NE

7th November 2012

Attention: Enda Cosgrove

Re.: 11 Netherall Gardens, NW3 - Soil Analysis

This letter report provides comments upon the results of chemical laboratory testing for three (3) soil sample(s), detailed within Chemtest Laboratory Test Report No. 209646 dated 26/07/2012, supplied to us by O'Halloran & O'Brien Limited (the client).

1.0 Assessment of Soil Analysis Results

We understand that the site comprises a residential development, from which three soil samples were taken from around the site (beneath the access roadway and in front of the house) along the route of the proposed water supply pipes.

We understand that the samples comprise a brown to grey clay (London Clay).

The testing was undertaken in order to determine the presence of potential organic contamination in the sub-surface soils and determine appropriate pipe construction materials. The materials represented by the samples are also to be excavated to form a service trench to accommodate the water supply pipe and will be excess to requirements on site and will therefore be disposed off site as waste.

As such, an assessment of the likely disposal classification of the materials is required options.

We have assumed that the site investigation and sampling strategy employed by the client was appropriate to obtaining representative samples from the averaging area over which exposure occurs for the exposure scenarios to be considered from appropriate sample depths taking into account factors such as the heterogeneity of soil encountered etc.

We have used the following guidance documents to assess the likely significance of any chemical contaminants present in the samples of materials subjected to analysis by the laboratory:-

- British Standard (2011). Investigation of Potentially Contaminated Sites Code of Practice (BS10175:2001).
- UKWIR (2010). Guidance for the Selection of Water Supply Pipes to be Used in Brownfield Sites (Report 10/WM/03/21).
- CL:AIRE (2009). The EIC/AGS/CL:AIRE Generic Assessment Criteria for Human Health Risk Assessment. (December 2009).
- Environment Agency (2009). CLEA Software (Version 1.06) Handbook & Software (SC050021/SR4, September 2009).
- CIEH & LQM (2009) Generic Assessment Criteria for Human Health Risk Assessment 2nd Edition (Land Quality Press, 2009).
- Environment Agency (2009). Using Soil Guidance Values (SC050021/SGV Introduction, March 2009).
- Environment Agency (2009). Human Health Toxicological Assessment of Contaminants in Soil (SC050021/SR2).
- Environment Agency (2009). Updated Technical Background to the CLEA Model (SC050021/SR3, May 2009).
- HSE (2009). The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (SI 2009 716).
- CIEH & CL:AIRE (2008). Guidance on Comparing Soil Contamination Data with a Critical Concentration.
- Environment Agency (2008). Interpretation of the Definition and Classification of Hazardous Waste (Technical Guidance WM2, 2nd Edition, v2.2 May 2008).
- NHBC & Environment Agency (2008). Guidance for the Safe Development of Housing on Land Affected by Contamination (R&D Publication 66, Volume 1).
- British Standard (2007). Specification for Topsoil and Recommendations for Use (BS3882:2007).
- DEFRA (2007). The Environmental Permitting (England and Wales) Regulations 2007 (SI 2007 3538).
- Environment Agency (2007) How to Find Out if Waste Oil and Wastes That Contain Oil are Hazardous. A Guide to the Hazardous Waste Regulations (HWR08, Version 3.1, June 2007).
- HSE (2007). EH40/2005: Occupational Exposure Limits 2005 (as amended October 2007).
- Environment Agency (2006). Methodology for the Derivation of Remedial Targets for Soil & Groundwater to Protect Water Resources (R&D Technical Report P20).
- BRE (2005). Concrete in Aggressive Ground (BRE Special Digest 1, 3rd Edition 2005).
- Environment Agency (2005). The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soil (Report P5-080/TR3).
- Environment Agency (2005). Guidance on Requirements for Land Contamination Reports (Version 1, July 2005).
- HSE (2005). Approved Supply List (8th Edition, September 2005).
- BRE (2004). Cover Systems for Land Regeneration (March 2004).
- DEFRA & Environment Agency (2004). CLR11: Model Procedures for the Management of Land Contamination.
- MADEP (2002). Characterising Risks Posed by Petroleum Contaminated Sites.
- WRAS (2002). The Selection of Materials for Water Supply Pipes to be Laid in Contaminated Land: Information and Guidance Note 9-04-03 (Issue 1, October 2002).
- NIPHE (2001). Technical Evaluation of Intervention Values for Soil, Sediment and Groundwater (RIVM Report 711701 023).
- Dickinson et al. (2000). Planting Trees on Contaminated Soils: Issues & Guidelines. (Land Contamination & Reclamation, 8 (2), 2000).
- British Standard (1999). Code of Practice for Site Investigations (BS 5930:1999).
- NEPC (1999). Guidelines on Investigation Levels for Soil and Groundwater. (Schedule B1).
- DETR (1998). The Surface Waters (Dangerous Substances) (Classification) Regulations (SI 1998 389).
- MAFF (1998). The Soil Code.
- DoE (1997). The Surface Waters (Fishlife) (Classification) Regulations (SI 1997 1331) (as amended 2003).
- DoE (1996). The Surface Waters (Abstraction for Drinking Water) (Classification) Regulations (SI 1996 3001).
- USEPA (1996). Soil Screening Guidance: Technical Background Document (EPA/540/R95/128).
- Alloway (1995). Heavy Metals in Soils. (2nd Edition).
- DoE (1994). The Surface Waters (River Ecosystem) (Classification) Regulations (SI 1994 1057).
- DoE (1991). Waste Management Paper 27: Landfill Gas. (2nd Edition).
- Eikmann & Kloke (1991). Taken from Land Contamination and Reclamation, 6 (4) (1998).

1.1 Services and Construction Materials

1.2.2 Potable water supplies

In accordance with UKWIR (2010) (Table 3.1 Pipe Selection Table) the concentrations of total petroleum hydrocarbons (TPH), MTBE, BTEX and phenols were all below their respective lower concentration thresholds. As such, based upon the testing undertaken it is considered unlikely that any special precautions will be required and that standard (PE) pipe materials could be used at the site. This should be confirmed with the local water supply company.

1.2 Waste Disposal

If as part of the redevelopment works materials represented by these samples were to be disposed off-site as waste and assuming that the samples and the descriptions of the soils adequately represent the materials onsite requiring disposal we would describe the materials chemically as follows:-

Ref	Depth (mbgl)	Description	Hazardous / Not Hazardous	Likely Disposal Classification
Sample 1	-	No significant contamination	Not Hazardous	Inert or Non-Hazardous
Sample 2	-	No significant contamination	Not Hazardous	Inert or Non-Hazardous
Sample 3	-	No significant contamination	Not Hazardous	Inert or Non-Hazardous

The above classifications should be confirmed with the receiving facility and/or Environment Agency prior to disposal.

Based on the solid analysis undertaken, the concentrations of TPH, polyaromatic hydrocarbons (PAH), MTBE, BTEX and phenols would not be considered hazardous and in the case of TPH, PAH and BTEX were below the respective threshold limits of an inert permitted landfill site. As such, based on the test results provided the soils represented by these samples would not be considered as hazardous for disposal and as such would potentially be considered as inert or non-hazardous for disposal off-site as waste.

Additional testing (e.g. broad suite of potential contaminants and leaching to BS EN 12457-3) to demonstrate compliance with Waste Acceptance Criteria (WAC) in accordance with the Landfill Directive and UK waste management permitting regulations is required to determine whether materials conform to the thresholds of inert (or hazardous) permitted landfill sites and as such allows a differentiation between an inert and non-hazardous classification to be made (e.g. a material that is deemed as not hazardous, but fails the permit threshold for an inert permitted site would by definition be deemed as non-hazardous, whereas materials that are not hazardous and pass the permit threshold for an inert permitted site would be properly classified as inert). Additional testing would therefore be required to make this distinction.

The materials may be may also be physically and chemically suitable for recovery and reuse as specified fill below a restoration layer in a suitable, low risk construction facility complying with appropriate environmental permitting regulations (e.g. U1 use of waste in construction), although may also require additional testing to confirm their suitability.

There is a requirement for waste to be treated before being disposed to landfill. Treatment must be a physical, thermal, chemical or biological process, but can include sorting, and it must change the characteristics of the waste to achieve one of the following:-

1. Reduce its volume.
2. Reduce its hazardous nature.
3. Facilitate its handling.
4. Enhance recovery.

We would recommend that you verify that the material is physically suitable for disposal as waste or recovery at your chosen facility. Materials with a significant deleterious odour or with visual indicators of

contamination, such as being brightly coloured or containing fibrous material should not be disposed at inert waste or exempt facilities. The waste should also not contain any significant quantities of deleterious materials such as paper, plastic, textiles, wood, gypsum and metal. Particular care should be taken to ensure that the material contains no Hazardous Waste such as asbestos or invasive weeds such as Japanese Knotweed. Materials destined for 'general fill' should also not contain significant quantities of organic matter, such as peat, topsoil or vegetation.

*****

We trust that this report meets your requirements, but please contact us should you require clarification on any of the matters raised. Thank you for your custom and we hope that we can be of further assistance to you in the future.

Paul Brewer
BSc (Hons), MSc, MI Soil Sci, CSci
Senior Environmental Consultant
(for and on behalf of Terragen Environmental Consultants Limited)

2.0 Limitations and Use of the Report

IMPORTANT: This section should be read before reliance is placed on any of the opinions, advice, recommendations or conclusions set out in this report.

a) This report has been prepared for the purpose of providing interpretation on analytical results supplied by the Client pursuant to its appointment of Terragen Environmental Consultants Limited to act as a Consultant.

b) These comments are given in good faith on the basis of the results provided. Terragen Environmental Consultants Limited can bear no responsibility for any inaccuracies that may arise from the laboratory testing.

c) This report does not constitute a qualitative risk assessment of the site or the soils and is not based upon a conceptual site model as we have been provided with insufficient information to establish the existence of potential sources of contamination, plausible pathways, or sensitive receptors and therefore assumes that they exist.

d) The report is unable to comment on the potential risks to controlled waters (groundwater or surface water), although where contaminant concentrations are below relevant threshold criteria in most circumstances it may be considered that the risk is low.

e) We have assumed that the results are representative of the area sampled. This does not imply that they may be considered representative of the site itself. Terragen Environmental Consultants Limited can accept no responsibility for the integrity of the sampling regime.

f) Save for the Client no duty is undertaken or warranty or representation made to any party in respect of the opinions, advice, recommendations or conclusions herein set out.

g) All work carried out in preparing this report has used, and is based upon, our professional knowledge and understanding of the current relevant English and European Community standards, approved codes of practice, technology and legislation.
Changes in the above may cause the opinion, advice, recommendations or conclusions set out in this report to become inappropriate or incorrect. However, in giving its opinions, advice, recommendations and conclusions, Terragen Environmental Consultants Limited has considered pending changes to environmental legislation and regulations of which it is currently aware. Following delivery of this report, we will have no obligation to advise the Client of any such changes, or of their repercussions.

h) Terragen Environmental Consultants Limited acknowledges that it is being retained, in part, because of its knowledge and experience with respect to environmental matters. Terragen Environmental Consultants Limited will consider and analyse all information provided to it in the context of our knowledge and experience and all other relevant information known to us. To the extent that the information provided to us is not inconsistent or incompatible therewith, Terragen Environmental Consultants Limited shall be entitled to rely upon and assume, without independent verification, the accuracy and completeness of such information.

i) The content of this report represents the professional opinion of experienced environmental consultants. Terragen Environmental Consultants Limited does not provide specialist legal advice and the advice of lawyers may be required.

j) In the Summary and Recommendations sections of this report, Terragen Environmental Consultants Limited has set out our key findings and provided a summary and overview of our advice, opinions and recommendations. However, other parts of this report will often indicate the limitations of the information obtained by Terragen Environmental Consultants Limited and therefore any advice, opinions or recommendations set out in the Executive Summary, Summary and Recommendations sections ought not to be relied upon unless they are considered in the context of the whole report.

k) The lack of evidence of the presence of hazardous or harmful materials at the subject property does not guarantee the absence of such materials; rather it indicates only that none were found as a result of the services provided. The services described in this report were performed in accordance with the general practices and procedures accepted in the consulting field.

O'Halloran & O'Brien
O'Brien House
197-199 Garth Road
Morden
SM4 4NE

FAO Martin Carey

LABORATORY TEST REPORT

Results of analysis of 3 samples
received 18 July 2012

Nertherall Gardens

Report Date
26 July 2012

Login Batch No					209646		
Chemtest LIMS ID					AH54138	AH54139	AH54140
Sample ID					Sample 1	Sample 2	Sample 3
Sample No							
Sampling Date					Not Provided	Not Provided	Not Provided
Depth							
Matrix					*SOIL*	*SOIL*	*SOIL*
SOP↓	Determinand↓	CAS No↓	Units↓	*			
2675	TPH aliphatic >C5-C6		mg kg-¹	N	< 0.1 ¹	< 0.1 ¹	< 0.1 ¹
	TPH aliphatic >C6-C8		mg kg-¹	N	< 0.1 ¹	< 0.1 ¹	< 0.1 ¹
	TPH aliphatic >C8-C10		mg kg-¹	N	< 0.1 ¹	< 0.1 ¹	< 0.1 ¹
	TPH aliphatic >C10-C12		mg kg-¹	M	< 1 ¹	< 1 ¹	< 1 ¹
	TPH aliphatic >C12-C16		mg kg-¹	M	< 1 ¹	< 1 ¹	< 1 ¹
	TPH aliphatic >C16-C21		mg kg-¹	M	< 1 ¹	< 1 ¹	< 1 ¹
	TPH aliphatic >C21-C35		mg kg-¹	M	< 1 ¹	< 1 ¹	< 1 ¹
	TPH aliphatic >C35-C44		mg kg-¹	N	< 1 ¹	< 1 ¹	< 1 ¹
	TPH aromatic >C5-C7		mg kg-¹	N	< 0.1 ¹	< 0.1 ¹	< 0.1 ¹
	TPH aromatic >C7-C8		mg kg-¹	N	< 0.1 ¹	< 0.1 ¹	< 0.1 ¹
	TPH aromatic >C8-C10		mg kg-¹	N	< 0.1 ¹	< 0.1 ¹	< 0.1 ¹
	TPH aromatic >C10-C12		mg kg-¹	M	< 1 ¹	< 1 ¹	< 1 ¹
	TPH aromatic >C12-C16		mg kg-¹	M	< 1 ¹	< 1 ¹	< 1 ¹
	TPH aromatic >C16-C21		mg kg-¹	M	< 1 ¹	< 1 ¹	< 1 ¹
	TPH aromatic >C21-C35		mg kg-¹	M	< 1 ¹	< 1 ¹	< 1 ¹
	TPH aromatic >C35-C44		mg kg-¹	N	< 1 ¹	< 1 ¹	< 1 ¹
	Total Petroleum Hydrocarbons		mg kg-¹	N	< 10 ¹	< 10 ¹	< 10 ¹
2701	PAH (total EPA 16)		mg kg-¹	M	10	5.5	9.2
2760	Methyl tert-butyl ether	1634044	µg kg-¹	N	< 1 ¹	< 1 ¹	< 1 ¹
	Benzene	71432	µg kg-¹	M	< 1.0 ¹	< 1.0 ¹	< 1.0 ¹
	Toluene	108883	µg kg-¹	M	< 1.0 ¹	< 1.0 ¹	< 1.0 ¹
	Ethylbenzene	100414	µg kg-¹	M	< 1.0 ¹	< 1.0 ¹	< 1.0 ¹
	m- & p-Xylene	1330207	µg kg-¹	U	< 1.0 ¹	< 1.0 ¹	< 1.0 ¹

¹No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised and will not be accredited (UKAS/MCerts)

All tests undertaken between 18/07/2012 and 25/07/2012

* Accreditation status

This report should be interpreted in conjuction with the notes on the accompanying cover page.

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Morden
SM4 4NE

FAO Martin Carey

LABORATORY TEST REPORT

Results of analysis of 3 samples
received 18 July 2012

Nertherall Gardens

Report Date
26 July 2012

					209646		
					AH54138	AH54139	AH54140
					Sample 1	Sample 2	Sample 3
					Not Provided	Not Provided	Not Provided
					SOIL	*SOIL*	*SOIL*
2760	o-Xylene	95476	µg kg-¹	U	< 1.0 ¹	< 1.0 ¹	< 1.0 ¹
2900	2-sec-Butyl-4,6-dinitrophenol	88857	mg kg-¹	N	<0.2	<0.2	<0.2
	4-Chloro-3-methylphenol	59507	mg kg-¹	N	<0.2	<0.2	<0.2
	2-Chlorophenol	95578	mg kg-¹	N	<0.2	<0.2	<0.2
	2,4-Dichlorophenol	120832	mg kg-¹	N	<0.2	<0.2	<0.2
	2,6-Dichlorophenol	87650	mg kg-¹	N	<0.2	<0.2	<0.2
	2,4-Dimethylphenol	105679	mg kg-¹	N	<0.2	<0.2	<0.2
	2,4-Dinitrophenol	51285	mg kg-¹	N	<0.2	<0.2	<0.2
	2-Methyl-4,6-dinitrophenol	534521	mg kg-¹	N	<0.2	<0.2	<0.2
	2-Methylphenol	95487	mg kg-¹	N	<0.2	<0.2	<0.2
	3-Methylphenol	108394	mg kg-¹	N	<0.2	<0.2	<0.2
	4-Methylphenol	106445	mg kg-¹	N	<0.2	<0.2	<0.2
	2-Nitrophenol	88755	mg kg-¹	N	<0.2	<0.2	<0.2
	4-Nitrophenol	100027	mg kg-¹	N	<0.2	<0.2	<0.2
	Pentachlorophenol	87865	mg kg-¹	N	<0.2	<0.2	<0.2
	Phenol	108952	mg kg-¹	N	<0.2	<0.2	<0.2
	2,3,4,5-Tetrachlorophenol	4901513	mg kg-¹	N	<0.2	<0.2	<0.2
	2,3,4,6-Tetrachlorophenol	58902	mg kg-¹	N	<0.2	<0.2	<0.2
	2,3,5,6-Tetrachlorophenol	935955	mg kg-¹	N	<0.2	<0.2	<0.2
	2,3,4-Trichlorophenol	15950660	mg kg-¹	N	<0.2	<0.2	<0.2
	2,3,5-Trichlorophenol	933788	mg kg-¹	N	<0.2	<0.2	<0.2
	2,3,6-Trichlorophenol	933755	mg kg-¹	N	<0.2	<0.2	<0.2
	2,4,5-Trichlorophenol	95954	mg kg-¹	N	<0.2	<0.2	<0.2
	2,4,6-Trichlorophenol	88062	mg kg-¹	N	<0.2	<0.2	<0.2

¹No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised and will not be accredited (UKAS/MCerts)

All tests undertaken between 18/07/2012 and 25/07/2012

* Accreditation status

This report should be interpreted in conjuction with the notes on the accompanying cover page.

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Morden
SM4 4NE

FAO Martin Carey

LABORATORY TEST REPORT

Results of analysis of 3 samples
received 18 July 2012

Nertherall Gardens

Report Date
26 July 2012

					209646		
					AH54138	AH54139	AH54140
					Sample 1	Sample 2	Sample 3
					Not Provided	Not Provided	Not Provided
					SOIL	*SOIL*	*SOIL*
2900	3,4,5-Trichlorophenol	609198	mg kg-[1]	N	<0.2	<0.2	<0.2

[1]No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised and will not be accredited (UKAS/MCerts)

All tests undertaken between 18/07/2012 and 25/07/2012

* Accreditation status

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Chemtest
The right chemistry to deliver results

Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070

O'Halloran & O'Brien
O'Brien House
197-199 Garth Road
Morden
SM4 4NE

FAO Martin Carey
26 July 2012

Dear Martin Carey

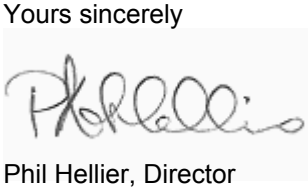
Test Report Number **209646**
Your Project Reference **Nertherall Gardens**

Please find enclosed the results of analysis for the samples received 18 July 2012.

All soil samples will be retained for a period of one month and all water samples will be retained for 7 days following the date of the test report. Should you require an extended retention period then please detail your requirements in an email to customerservices@chemtest.co.uk. Please be aware that charges may be applicable for extended sample storage.

If you require any further assistance, please do not hesitate to contact the Customer Services team.

Yours sincerely



Phil Hellier, Director

UKAS TESTING
2183

ISO 14001 sira UKAS ENVIRONMENTAL MANAGEMENT

Notes to accompany report:

- *The sign < means 'less than'*
- *Tests marked 'U' hold UKAS accreditation*
- *Tests marked 'M' hold MCertS (and UKAS) accreditation*
- *Tests marked 'N' do not currently hold UKAS accreditation*
- *Tests marked 'S' were subcontracted to an approved laboratory*
- *n/e means 'not evaluated'*
- *i/s means 'insufficient sample'*
- *u/s means 'unsuitable sample'*
- *Comments or interpretations are beyond the scope of UKAS accreditation*
- *The results relate only to the items tested*
- *All results are expressed on a dry weight basis*
- *The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, phenols*
- *For all other tests the samples were dried at < 37°C prior to analysis*
- *Uncertainties of measurement for the determinands tested are available upon request*
- *None of the test results included in this report have been recovery corrected*