Graham Harwood – Director
Neil Johnson – Associate

Reference: 18-1048 Land Off Sutherland Road Contamination Test.doc.nfj
Thursday, 15 February 2018

Mr Keith Shaw
Houghwood
Cottage Farm
Stanley Road
Staffordshire
ST9 9LL

Dear Sir

Re: Proposed New Residence at Land Off Sutherland Road, Longsdon. ST9 9QD

At your request we have completed the Phase1 Preliminary Contaminated Land Risk Assessment for the proposed development.

This report must be read in conjunction with the Phase1 Preliminary Contaminated Land Risk Assessment Report issued as two separate volumes.

SITE SETTING

The development plot comprises a generally rectangular flat rained platform constructed of historically placed quarry waste. The granular fill came from excavation of the adjacent sandstone quarries. It is our understanding that the quarries supplied building stone for the local area.

FINDINGS

At the time of the walkover site inspection, you had completed four shallow trial pits for the infiltration test assessment. The trial pits showed very thin naturally formed organic surface layer composed of decayed leaves populated with moss and grass.

The exposed soils at depth (to 1.0m) comprises the quarry waste of granular fill “sandy fine-coarse gravelly Cobble and small Boulders”. These materials are free draining.

At TP3 there was a light coloured layer at very shallow depth from which a single Environmental Soil (ES) sample was taken.

It was considered that there was a low risk of contamination at the site but to ensure compliance with NPPF the sample recovered was tested to assess contamination risk.

TESTING

The sample recovered was sent to Concept Life Sciences Ltd for the following analytical tests:

Date Received: 01-Feb-2018 **Logged in:** 01-February-2018
Report due: 15-February-2018 **Duration(days):** 10

Project ID	Purchase Order	Project Site	Customer Reference
		Land Off Sutherland Road, Longsdon	18-1048

Soil

Our Number	Sample Type	Sample Class	Sample Condition	Customer Reference	Bottom Depth	Date Sampled	Depth	Time Sampled	MCERTS Preparation (Group)	NFJ Suite 1 (Group)	NFJ Suite 3 (Group)	NFJ Suite 6 (Group)	Retained on 10mm sieve (Grav)	Sample Disposal (N/A)
1	Soil	Sandy Soil	Ok	TP3 ES1	0.2	01-FEB-2018	0.1	11:00	x	x	x	x	x	x

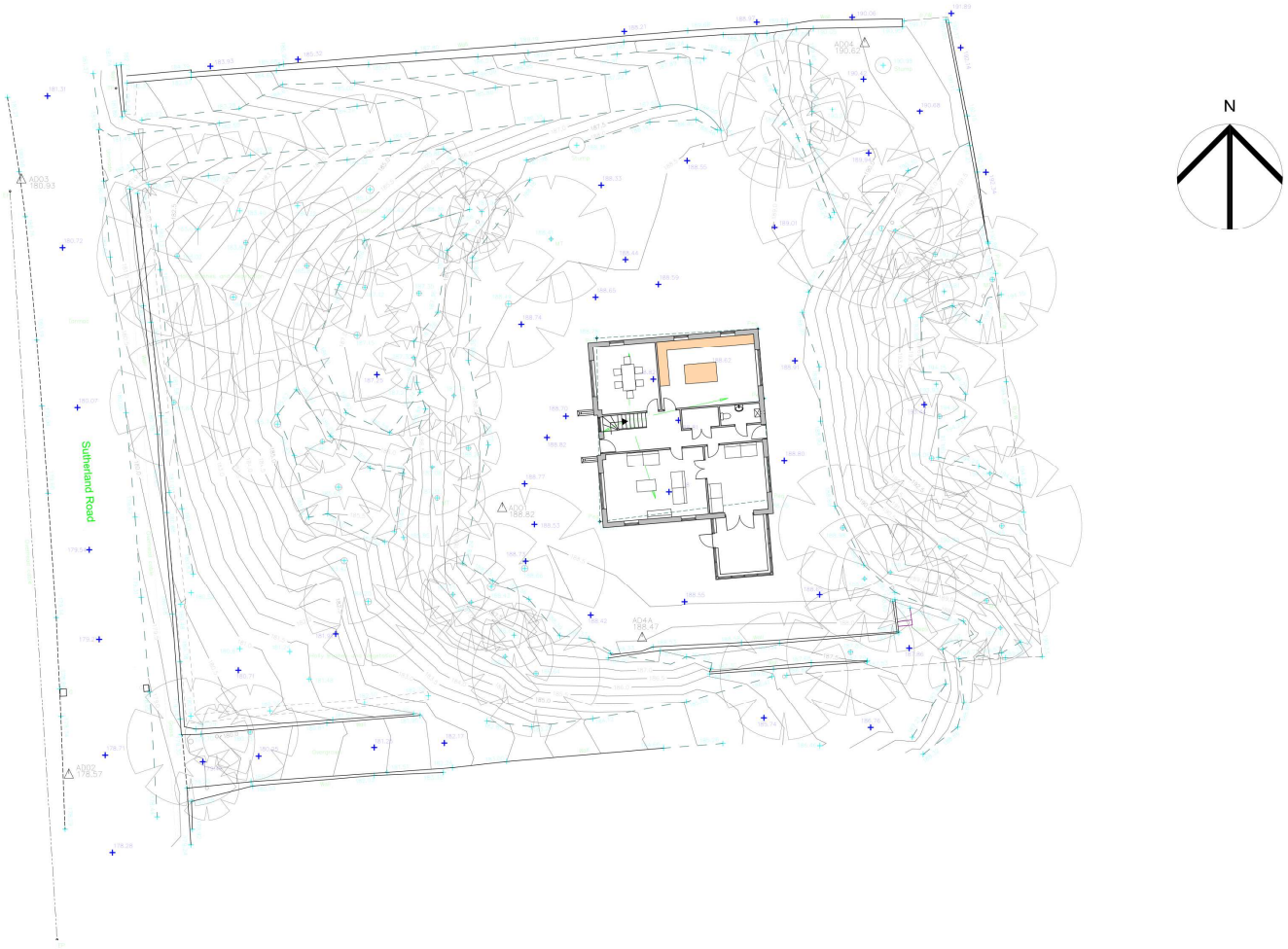
The suites have the following tests:

- Suite 1 – CLEA Metals, Poly Aromatic Hydrocarbons, Cyanide, Phenon Soil Organic Matter and Non Metallic Analytes
- Suite 3 – Total Petroleum Hydrocarbons
- Suite 6 – Asbestos Fibres in Soil.

PROPOSED DEVELOPMENT

The following plan shows the proposed development.

The site development will have the soft landscaped areas on the west and east sides with the gravel surfaced parking area to the north.



SITE PLAN 1:100

wood | goldstraw | yorath
ARCHITECTS QUANTITY SURVEYORS CDM CO-ORDINATORS

Client
MR K SHAW

Project
PROPOSED NEW DWELLING

Scale 1:100 Issue Date 29/01/2018
Size A0

Title
SITE PLAN

Drawing Number 3811-02-03 Revision ID

TEST RESULTS

The assessment is undertaken using the LQM/CIEH Suitable for Use Limits (S4ULs) Generic Assessment Criteria for the CLEA Risk Model of Residential with No Home Grown Vegetables.

The following table summarise the results.

CLEA Metals and Non-Metallic Analytes

	TP3 ES1 0.1-0.2m	N = value is greater than GAC Y = value is less than GAC	6% Soil Organic Material LQM/CIEH
Arsenic	4	Y	40
Barium*	12		
Beryllium	<2	Y	1.7
Boron (water-soluble)	<1	Y	11000
Cadmium	<1	Y	85
Chromium III	3	Y	910
Chromium VI	<1	Y	6
Copper	19	Y	7100
Lead	61	Y	200 SP1010 pC4SL
Mercury	<1	Y	1.2
Nickel	2	Y	180
Selenium	<3	Y	430
Vanadium	5	Y	1200
Zinc	8	Y	40000
SO4(Total) %	0.05	Y	
Sulphide	<10		
Cyanide(Total)	<1	Y	34 AtriskSoil
Phenols(Mono)	<1	Y	2300
pH	**<4.0**	5-9 *	
Soil Organic Matter	8.7		

It can be seen from the summary table that the metals are all less than the LQM/CIEH Suitable for Use Limits (S4ULs) Generic Assessment Criteria.

Of particular note is that the pH of the sample tested has a very low result of less than 4. There is the possibility that the organic material has a naturally high humic acid content giving the strongly acid result.

Poly Aromatic Hydrocarbons

	TP3 ES1 0.1-0.2m	N = value is greater thanGAC Y = value is less than GAC	6% Soil Organic Matter LQM/CIEH	
Naphthalene	<0.1	Y	13	
Acenaphthylene	<0.1	Y	6000	506
Acenaphthene	<0.1	Y	6000	336
Fluorene	<0.1	Y	4500	183
Phenanthrene	<0.1	Y	1500	
Anthracene	<0.1	Y	37000	
Fluoranthene	<0.1	Y	1600	
Pyrene	<0.1	N	3800	
Benzo(a)Anthracene	<0.1	Y	15	
Chrysene	<0.1	N	32	
Benzo(b/k)Fluoranthene	<0.1	Y	4	
	<0.1		110	
Benzo(a)Pyrene	<0.1	Y	3.2	
Indeno(123-cd)Pyrene	<0.1	Y	13	
Dibenzo(ah)Anthracene	<0.1	Y	0.32	
Benzo(ghi)Perylene	<0.1	Y	360	
PAH(total)	<0.1	Note: * Value exceeds saturation Limit shown underlined		

The results are all less than the Laboratory Level of Detection.

Total Petroleum Hydrocarbons

The Total Petroleum Hydrocarbons value is very low:

Determinand	Method	Test Sample	LOD	Units	
Total Petroleum Hydrocarbons	T8	M105	1	mg/kg	(13) 48

The concentration identified poses minimal risk to the development.

Asbestos Fibres in Soil

Determinand	Method	Test Sample	LOD	Units	
Asbestos ID	T27	AR			N.D.

No Asbestos Fibres in Soil were detected.

CONCLUSIONS

We conclude that the site poses minimal risk to the proposed development.

The tests have identified a very acid result. It is possible the pH result <4 may come from the decomposed vegetation that has formed the soil on the site.

We would comment that for the construction all structural concrete must be isolated from the acid shallow soil, this can be achieved by removing the organic layer over a greater width of the trench. A crush limestone gravel could be placed that will neutralise the pH over time.

We trust the information contained in the reports meets your immediate requirements. Should you need any additional information please do not hesitate to contact us.

Yours faithfully

for GHGCL

Neil Johnson BSc MSc CEng MIoM[3]

Associate Geotechnical Engineer.

CONCEPT LIFE SCIENCES
DELIVERING SCIENCE

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Concept Life Sciences

Certificate of Analysis

Hadfield House
Hadfield Street
Cornbrook
Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: 712906-1

Date of Report: 15-Feb-2018

Customer: Graham Harwood Geotechnical Consulting Limited
7 Stonyhurst Avenue
Bolton
BL1 7ES

Customer Contact: Mr Neil Johnson

Customer Job Reference: 18-1048
Customer Site Reference: Land Off Sutherland Road, Longsdon
Date Job Received at Concept: 01-Feb-2018
Date Analysis Started: 02-Feb-2018
Date Analysis Completed: 15-Feb-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS 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 Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked and authorised by :
Aneta Dybek-Echtermeyer
Customer Service Advisor

Issued by :
Aneta Dybek-Echtermeyer
Customer Service Advisor

Concept Reference: 712906
Project Site: Land Off Sutherland Road, Longsdon
Customer Reference: 18-1048

Soil Analysed as Soil
MCERTS Preparation

Concept Reference	**712906 001**
Customer Sample Reference	**TP3 ES1**
Top Depth	**0.1**
Depth	**0.1**
Bottom Depth	**0.2**
Date Sampled	**01-FEB-2018**
Time Sampled	**11:00**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Retained on 10mm sieve	T2	M40	0.1	%	<0.1
Moisture @105C	T162	AR	0.1	%	**55**

Concept Reference: 712906
Project Site: Land Off Sutherland Road, Longsdon
Customer Reference: 18-1048

Soil Analysed as Soil
NFJ Suite 1

Concept Reference	**712906 001**
Customer Sample Reference	**TP3 ES1**
Top Depth	**0.1**
Depth	**0.1**
Bottom Depth	**0.2**
Date Sampled	**01-FEB-2018**
Time Sampled	**11:00**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Barium	T6	A40	1	mg/kg	**12**
Beryllium	T6	A40	2	mg/kg	<2
Chromium VI	T6	A40	1	mg/kg	<1
Cyanide(Total)	T546	AR	1	mg/kg	<1
pH	T7	AR			<4.0
Phenols(Mono)	T546	AR	1	mg/kg	<1
Soil Organic Matter	T287	A40	0.1	%	**8.7**
SO4(Total)	T6	A40	0.01	%	**0.05**
Sulphide	T4	A40	10	mg/kg	<10
Vanadium	T6	M40	1	mg/kg	**5**

Concept Reference: 712906
Project Site: Land Off Sutherland Road, Longsdon
Customer Reference: 18-1048

Soil Analysed as Soil
ICRCL (Table 3:metals)

Concept Reference	**712906 001**
Customer Sample Reference	**TP3 ES1**
Top Depth	**0.1**
Depth	**0.1**
Bottom Depth	**0.2**
Date Sampled	**01-FEB-2018**
Time Sampled	**11:00**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Arsenic	T6	M40	2	mg/kg	**4**
Boron (water-soluble)	T6	A40	1	mg/kg	<1
Cadmium	T6	M40	1	mg/kg	<1
Chromium	T6	M40	1	mg/kg	**3**
Copper	T6	M40	1	mg/kg	**19**
Lead	T6	M40	1	mg/kg	**61**
Mercury	T6	M40	1	mg/kg	<1
Nickel	T6	M40	1	mg/kg	**2**
Selenium	T6	M40	3	mg/kg	<3
Zinc	T6	M40	1	mg/kg	**8**

Concept Reference: 712906
Project Site: Land Off Sutherland Road, Longsdon
Customer Reference: 18-1048

Soil Analysed as Soil
PAH US EPA 16 (B and K split)

Concept Reference	**712906 001**
Customer Sample Reference	**TP3 ES1**
Top Depth	**0.1**
Depth	**0.1**
Bottom Depth	**0.2**
Date Sampled	**01-FEB-2018**
Time Sampled	**11:00**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Naphthalene	T207	M105	0.1	mg/kg	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1
PAH(total)	T207	M105	0.1	mg/kg	<0.1

Concept Reference:	712906
Project Site:	Land Off Sutherland Road, Longsdon
Customer Reference:	18-1048

Soil Analysed as Soil

NFJ Suite 3

Concept Reference	**712906 001**
Customer Sample Reference	**TP3 ES1**
Top Depth	**0.1**
Depth	**0.1**
Bottom Depth	**0.2**
Date Sampled	**01-FEB-2018**
Time Sampled	**11:00**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Total Petroleum Hydrocarbons	T8	M105	1	mg/kg	(13) **48**

Concept Reference:	712906
Project Site:	Land Off Sutherland Road, Longsdon
Customer Reference:	18-1048

Soil Analysed as Soil

Suite H8

Concept Reference	**712906 001**
Customer Sample Reference	**TP3 ES1**
Top Depth	**0.1**
Depth	**0.1**
Bottom Depth	**0.2**
Date Sampled	**01-FEB-2018**
Time Sampled	**11:00**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Asbestos ID	T27	AR			N.D.

Index to symbols used in 712906-1

Value	Description
A40	Assisted dried < 40C
AR	As Received
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
N.D.	Not Detected
13	Results have been blank corrected.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Asbestos testing was subcontracted to REC Asbestos.

Method Index

Value	Description
T8	GC/FID
T7	Probe
T2	Grav
T162	Grav (1 Dec) (105 C)
T207	GC/MS (MCERTS)
T287	Calc TOC/0.58

T4	Colorimetry
T27	PLM
T546	Colorimetry (CF)
T6	ICP/OES

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Barium	T6	A40	1	mg/kg	U	001
Beryllium	T6	A40	2	mg/kg	U	001
Chromium VI	T6	A40	1	mg/kg	N	001
Cyanide(Total)	T546	AR	1	mg/kg	M	001
pH	T7	AR			M	001
Phenols(Mono)	T546	AR	1	mg/kg	M	001
Soil Organic Matter	T287	A40	0.1	%	N	001
SO4(Total)	T6	A40	0.01	%	N	001
Sulphide	T4	A40	10	mg/kg	N	001
Vanadium	T6	M40	1	mg/kg	M	001
Arsenic	T6	M40	2	mg/kg	M	001
Boron (water-soluble)	T6	A40	1	mg/kg	N	001
Cadmium	T6	M40	1	mg/kg	M	001
Chromium	T6	M40	1	mg/kg	M	001
Copper	T6	M40	1	mg/kg	M	001
Lead	T6	M40	1	mg/kg	M	001
Mercury	T6	M40	1	mg/kg	M	001
Nickel	T6	M40	1	mg/kg	M	001
Selenium	T6	M40	3	mg/kg	M	001
Zinc	T6	M40	1	mg/kg	M	001
Naphthalene	T207	M105	0.1	mg/kg	M	001
Acenaphthylene	T207	M105	0.1	mg/kg	U	001
Acenaphthene	T207	M105	0.1	mg/kg	M	001
Fluorene	T207	M105	0.1	mg/kg	M	001
Phenanthrene	T207	M105	0.1	mg/kg	M	001
Anthracene	T207	M105	0.1	mg/kg	U	001
Fluoranthene	T207	M105	0.1	mg/kg	M	001
Pyrene	T207	M105	0.1	mg/kg	M	001
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	001
Chrysene	T207	M105	0.1	mg/kg	M	001
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	001
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	001
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	001
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	001
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	001
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	001
PAH(total)	T207	M105	0.1	mg/kg	U	001
Total Petroleum Hydrocarbons	T8	M105	1	mg/kg	M	001
Retained on 10mm sieve	T2	M40	0.1	%	N	001
Moisture @105C	T162	AR	0.1	%	N	001
Asbestos ID	T27	AR			SU	001

Trial Pit Locations

TP1

TP2

TP3
(sampled)