

Over Court Barns
Over Lane
Almondsbury
Bristol BS32 4DF
United Kingdom



C13190-005 Enc.

17 March 2016

David Linton-Clowes
Taylor Wimpey Southern Counties
Colvedene Court
Wessex Business Park
Colden Common
SO21 1WP

By email: david.linton-clowes@taylorwimpey.com

Dear David

Littlehampton Road, Ferring
Verification of removal of PAH contaminated material

In accordance with the approved remediation strategy (13190-R002 Version 3) there is a requirement to remove the ashy Made Ground present from the garden of plots 16 to 20, 27 and 28 as shown on drawing 13190-G007.

Hydrock visited the site to confirm removal of the material and take surface samples from the affected areas. Hydrock visited site on Tuesday 23 February 2016 and can confirm that the PAH contaminated surface material had been removed from the areas identified with orange hatching on the attached plan (13190 - G007 D). The depth of material removed ranged from 0.3m to 0.7m below ground level.

6 representative samples were collected from the reduced level dig. The location of the sampling points are shown drawing 13190-G007 D attached. The samples were dispatched to i2 and scheduled for a standard Hydrock soil suite plus speciated PAH. A copy of the laboratory report (16-11887) is attached.

The laboratory results have been compared to the residential with plant update Generic Acceptance Criteria (GACs) with 1% SOM. No exceedances have been identified.

Photographs of the affected areas and the complete set of chemical results are appended to this letter along with CLEA Assessment spreadsheets showing suitability for use.

As a result of this investigation Hydrock believes that the PAH impacted ashy material been completely removed from the proposed garden areas of the affected locations and they are ready for topsoil.

Once the PAH impacted soil has been placed within the POS there will be a requirement for Hydrock to return to site to verify the installed 600mm engineered cover system in the POS.

Hydrock Consultants Ltd
Registered office: Over Court Barns, Over Lane, Almondsbury, Bristol BS32 4DF
Registered in England & Wales no. 3118932

Birmingham * Bristol * Bristol Central * Camborne * Cardiff * Edinburgh * Gloucester * Guildford * London
Manchester * Manchester Central * Northampton * Plymouth * Sheffield * Stoke-on-Trent * Taunton





We trust that you will find the contents of this letter satisfactory, however should you have any queries, please do not hesitate to contact us.

Yours sincerely

for **Hydrock Consultants Ltd**



Alison Holland

Geo-environmental Technician



Encl:

- Photographs showing gardens after material removal;
- Remediation Plan 13190-G007D;
- i2 results 16-11887; and
- CLEA assessment sheets.

CC

Kevin.macknay@westsussex.gov.uk

Photograph showing Area A after removal of ashy material



Photograph showing Area A removal depth of 0.5 metres



Photograph showing Area B after removal of ashy material



Photograph showing Area B removal depth of 0.5 metres



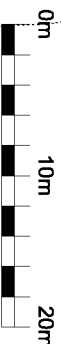
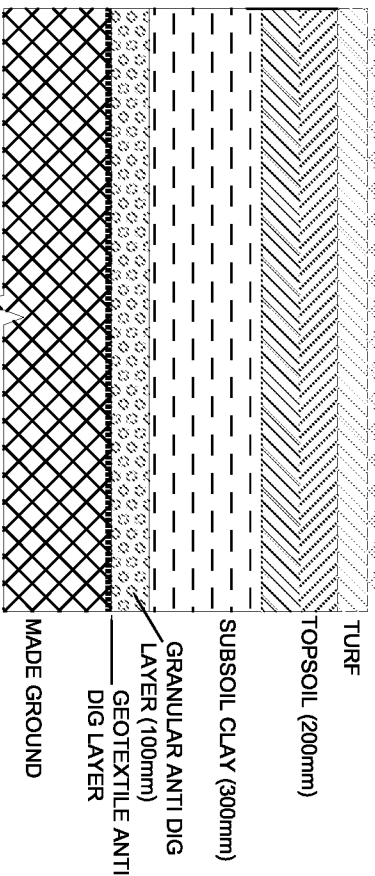


OS NORTH

Littlehampton Road A 259



PUBLIC OPEN SPACE (POS) COVER DETAIL - CLEAN COVER REQUIREMENTS
(NOT TO SCALE)



Legend

Site boundary

TP09 Trial Pt - Hydrack 2013

TP106 PAH Delineation Pt - Hydrack 2015

WS01 Window Sample Borehole - Hydrack 2015

BH01 Deep Rotary Borehole for falling head tests (deep bore soakaway) - Hydrack 2015

PAH Impacted Made Ground to be removed from the garden areas of Plots 16-20, 27 and 28 and placed in POS

Area of Public Open Space (POS) requiring 600mm engineered clean cover system (see detail inset)

Assumed extent of Japanese knotweed to be excavated for disposal off site. Excavation to be backfilled with PAH impacted material stripped for garden areas from Plots 16-20, 27 and 28

Verification sample location

Notes:

1. Clinker/coal Imported Made Ground typically encountered between 0 and 0.5 mBGL
2. Maximum depth encountered 0.90 mBGL
3. Drawing based on topographical drawing received from Taylor Wimpey Southern. Originally based on Ordnance Survey (c) Crown Copyright 2013. All rights reserved. licence number 100020449.

Rev	Date	Description	By	Ckd
D	17/03/16	Verification sampling points added	AH	AJ
C	08/02/16	Front gardens hatching added	AJ	
B	02/02/16	Landscaping base added	AJ	
A	20/08/15	Initial issue	RSW	AJ

Hydrack

Over Court Barns, Over Lane, Almondsbury,
Bristol BS32 4DE
TEL: 01454 619 533 FAX: 01454 614 125 or visit
www.hydrack.com

This drawing is the copyright of Hydrack Ltd. No liability will be accepted for any amendments to this drawing either printed or digital by parties other than Hydrack.

Client

Taylor Wimpey
Southern Counties

Project

Littlehampton Road, Ferring

Title

REMEDIATION PLAN

Drawn	Checked	Scale at A3	Date	Issue Date
RSW	AJ	1:500	20/08/15	20/08/15

Drawing Status

INFORMATION	
Drawing No.	13190 - G007

Drawing No.

13190 - G007

Revision

D



Andy Jackson

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Analytical Report Number : 16-11887

Project / Site name:	Littlehampton Road , Ferring	Samples received on:	25/02/2016
Your job number:	C13190	Samples instructed on:	25/02/2016
Your order number:	C13190-AH-G3426	Analysis completed by:	02/03/2016
Report Issue Number:	1	Report issued on:	02/03/2016
Samples Analysed:	6 soil samples		

Signed:

Rexona Rahman
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Dr Irma Doyle
Assistant Quality Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

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
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.



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Environmental Science

Analytical Report Number: 16-11887

Project / Site name: Littlehampton Road , Ferring

Your Order No: C13190-AH-G3426

Lab Sample Number	540900	540901	540902	540903	540904
Sample Reference	A1	A6	B1	B4	B6
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	23/02/2016	23/02/2016	23/02/2016	23/02/2016	23/02/2016
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	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	15	19
Total mass of sample received	kg	0.001	NONE	1.1	1.4
				1.2	1.2

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
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General Inorganics

pH	pH Units	N/A	MCERTS	7.9	7.6	7.7	7.7	7.4
Free Cyanide	mg/kg	1	NONE	< 1	< 1	< 1	< 1	< 1
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.018	0.012	0.015	0.011	0.014
Water Soluble Sulphate (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	18.4	11.8	14.5	11.4	14.4
Fraction Organic Carbon (FOC)	N/A	0.00001	NONE	0.0073	0.011	0.010	0.0055	0.0045

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	0.36	1.4	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	0.19	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	0.90	2.2	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	0.85	1.9	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	0.39	0.66	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	0.57	1.0	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	0.42	0.65	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.34	0.59	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	0.34	0.73	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	0.26	0.29	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.31	0.44	< 0.05	< 0.05	< 0.05

Total PAHs

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	4.74	9.98	< 1.60	< 1.60	< 1.60
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Analytical Report Number: 16-11887

Project / Site name: Littlehampton Road , Ferring

Your Order No: C13190-AH-G3426

Lab Sample Number	540900	540901	540902	540903	540904
Sample Reference	A1	A6	B1	B4	B6
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	23/02/2016	23/02/2016	23/02/2016	23/02/2016	23/02/2016
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied

Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.1	6.4	7.3	6.4	7.7
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.7	0.7	0.7	0.6	0.8
Boron (water soluble)	mg/kg	0.2	MCERTS	1.3	0.4	1.8	< 0.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	21	25	28	25	25
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21	25	28	25	25
Copper (aqua regia extractable)	mg/kg	1	MCERTS	20	22	23	20	18
Lead (aqua regia extractable)	mg/kg	1	MCERTS	24	26	39	21	12
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	16	17	14	17
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	33	35	35	32	40
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	55	64	71	54	49

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

TPH-CWG - Aliphatic > EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic > EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic > EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic > EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic > EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic > EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC16 - EC35	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4

TPH-CWG - Aromatic > EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic > EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic > EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic > EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic > EC12 - EC16	mg/kg	2	MCERTS	< 2.0	2.1	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic > EC16 - EC21	mg/kg	10	MCERTS	< 10	12	< 10	< 10	< 10
TPH-CWG - Aromatic > EC21 - EC35	mg/kg	10	MCERTS	< 10	11	< 10	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4

Analytical Report Number: 16-11887

Project / Site name: Littlehampton Road , Ferring

Your Order No: C13190-AH-G3426

Lab Sample Number				540905				
Sample Reference				B9				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				23/02/2016				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	18				
Total mass of sample received	kg	0.001	NONE	1.2				
Asbestos in Soil								
	Type	N/A	ISO 17025	Not-detected				
General Inorganics								
pH	pH Units	N/A	MCERTS	7.9				
Free Cyanide	mg/kg	1	NONE	< 1				
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.013				
Water Soluble Sulphate (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	13.1				
Fraction Organic Carbon (FOC)	N/A	0.00001	NONE	0.0067				
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10				
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10				
Fluorene	mg/kg	0.1	MCERTS	< 0.10				
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10				
Anthracene	mg/kg	0.1	MCERTS	< 0.10				
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10				
Pyrene	mg/kg	0.1	MCERTS	< 0.10				
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10				
Chrysene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10				
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10				
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10				
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10				
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05				
Total PAHs								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60				



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Environmental Science

Analytical Report Number: 16-11887

Project / Site name: Littlehampton Road , Ferring

Your Order No: C13190-AH-G3426

Lab Sample Number	540905				
Sample Reference	B9				
Sample Number	None Supplied				
Depth (m)	None Supplied				
Date Sampled	23/02/2016				
Time Taken	None Supplied				

Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.9				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.1				
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2				
Chromium (III)	mg/kg	1	NONE	32				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	32				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	24				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	19				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	28				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	49				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	56				

Monoaromatics

Benzene	µg/kg	1	MCERTS	< 1.0				
Toluene	µg/kg	1	MCERTS	< 1.0				
Ethylbenzene	µg/kg	1	MCERTS	< 1.0				
p & m-xylene	µg/kg	1	MCERTS	< 1.0				
o-xylene	µg/kg	1	MCERTS	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0				

Petroleum Hydrocarbons

TPH-CWG - Aliphatic > EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aliphatic > EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aliphatic > EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aliphatic > EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aliphatic > EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aliphatic > EC16 - EC21	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic > EC21 - EC35	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic > EC16 - EC35	mg/kg	10	NONE	< 10				
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4				

TPH-CWG - Aromatic > EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aromatic > EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aromatic > EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aromatic > EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aromatic > EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aromatic > EC16 - EC21	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic > EC21 - EC35	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4				

Analytical Report Number : 16-11887

Project / Site name: Littlehampton Road , Ferring

* 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 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
540900	A1	None Supplied	None Supplied	Brown clay and loam with gravel and vegetation.
540901	A6	None Supplied	None Supplied	Brown clay and loam with vegetation.
540902	B1	None Supplied	None Supplied	Brown clay and loam.
540903	B4	None Supplied	None Supplied	Brown clay and loam.
540904	B6	None Supplied	None Supplied	Light brown clay and loam.
540905	B9	None Supplied	None Supplied	Light brown clay and loam.



Analytical Report Number : 16-11887

Project / Site name: Littlehampton Road , Ferring

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
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
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 (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
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 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	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 (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	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	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
TPH Chromatogram	TPH Chromatogram.	In-house method	L064-PL	D	NONE
TPH in (Soil)	Determination of TPH bands by GC-MS/GC-FID	In-house method, TPH with carbon banding.	L064/076PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS



Analytical Report Number : 16-11887

Project / Site name: Littlehampton Road , Ferring

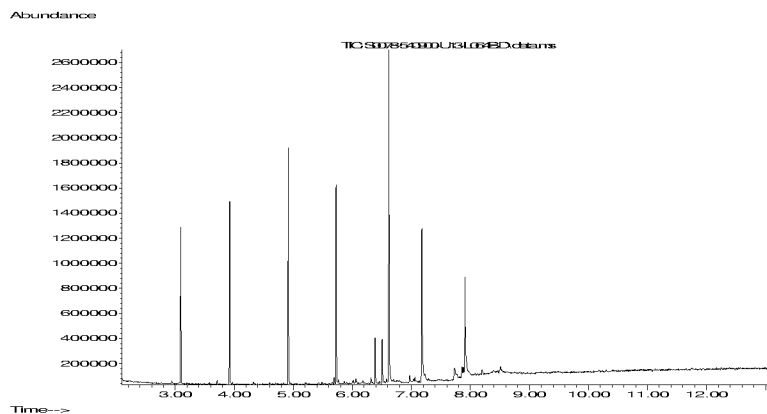
Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

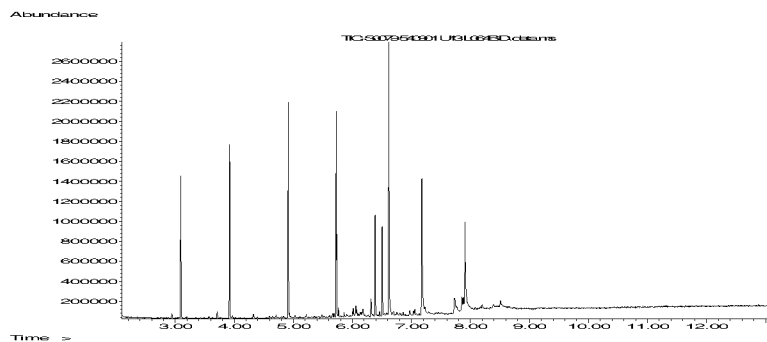
Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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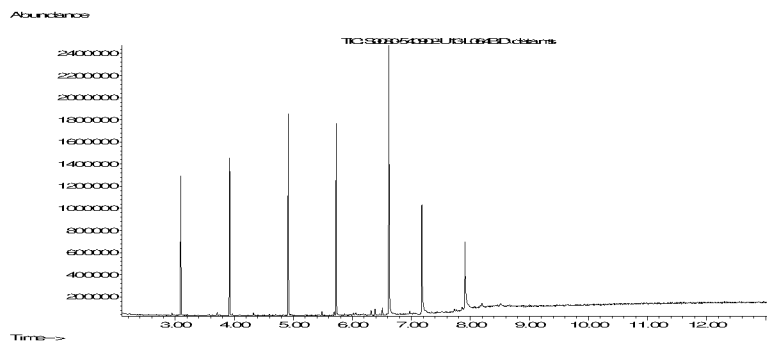
For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

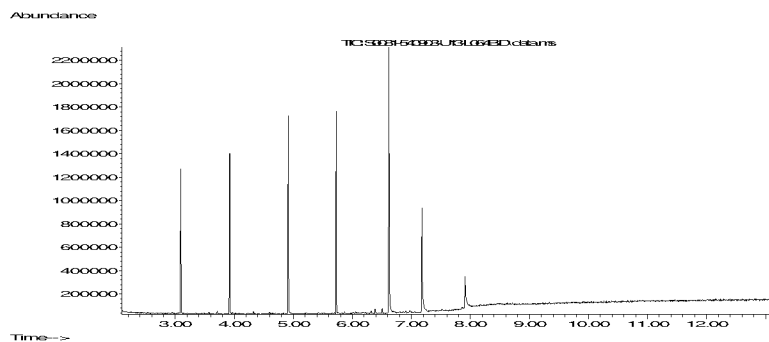
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

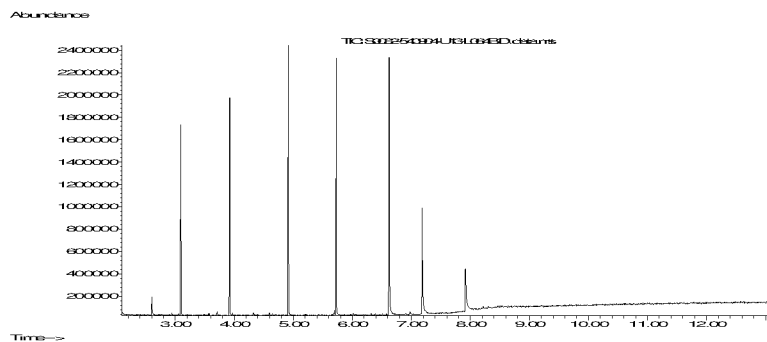
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

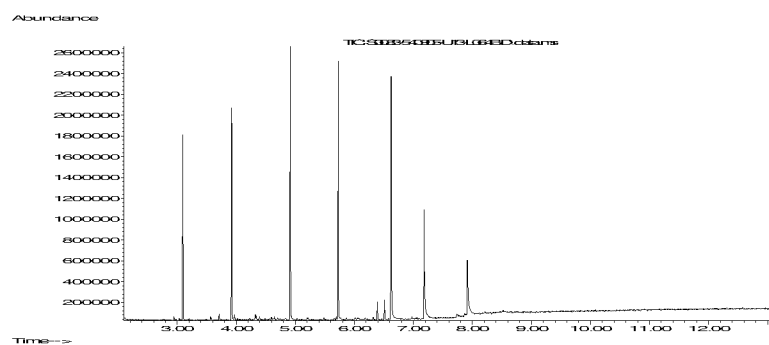




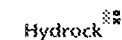






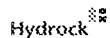


Assessment of Chemicals of Potential Concern to Human Health



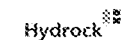
Chemical of Potential Concern	All values in mg/kg unless otherwise stated					Soil Type		MG	MG	MG	MG	MG	MG						
	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	US ₉₅	Location & Depth	A1 0	A6 0	B1 0	B4 0	B6 0						
								Result of Significance Test											
Arsenic	1	6	6.4	8.9	0	37	8.9659537	POTENTIALLY SUITABLE FOR USE	7.1	6.4	7.3	6.4	7.7	8.9					
Beryllium	0.06	6	0.6	1.1	0	73	1.0783719	POTENTIALLY SUITABLE FOR USE	0.7	0.7	0.7	0.6	0.8	1.1					
Boron	0.2	6	0.2	1.8	0	300	1.9644819	POTENTIALLY SUITABLE FOR USE	1.3	0.4	1.8	0.2	0.2	0.9					
Cadmium	0.2	6	0.2	0.2	0	14	0.2	POTENTIALLY SUITABLE FOR USE	0.2	0.2	0.2	0.2	0.2	0.2					
Chromium (III)	1	6	19.8	30.8	0	890	31.364178	POTENTIALLY SUITABLE FOR USE	19.8	23.8	26.8	23.8	23.8	30.8					
Chromium (VI)	1.2	6	1.2	1.2	0	6.1	1.2	POTENTIALLY SUITABLE FOR USE	1.2	1.2	1.2	1.2	1.2	1.2					
Copper	1	6	18	24	0	2500	25.133495	POTENTIALLY SUITABLE FOR USE	20	22	23	20	18	24					
Lead	1	6	12	39	0	200	39.529549	POTENTIALLY SUITABLE FOR USE	24	26	39	21	12	19					
Mercury, inorganic	0.3	6	0.3	0.3	0	170	0.3	POTENTIALLY SUITABLE FOR USE	0.3	0.3	0.3	0.3	0.3	0.3					
Nickel	1	6	14	28	0	130	26.935341	POTENTIALLY SUITABLE FOR USE	16	16	17	14	17	28					
Selenium	1	6	1	1	0	360	1	POTENTIALLY SUITABLE FOR USE	1	1	1	1	1	1					
Vanadium	1	6	32	49	0	410	48.628267	POTENTIALLY SUITABLE FOR USE	33	35	35	32	40	49					
Zinc	1	6	49	71	0	3900	72.290943	POTENTIALLY SUITABLE FOR USE	55	64	71	54	49	56					
Cyanide (free)	1	6	1	1	0	790	1	POTENTIALLY SUITABLE FOR USE	1	1	1	1	1	1					
Phenol (total)	1	6	1	1	0	290	1	POTENTIALLY SUITABLE FOR USE	1	1	1	1	1	1					
Acenaphthene	0.1	6	0.1	0.1	0	220	0.1	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1					
Acenaphthylene	0.1	6	0.1	0.1	0	180	0.1	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1					
Anthracene	0.1	6	0.1	0.19	0	2400	0.1804	POTENTIALLY SUITABLE FOR USE	0.1	0.19	0.1	0.1	0.1	0.1					
Benzo(a)anthracene	0.1	6	0.1	0.66	0	4.2	0.6608343	POTENTIALLY SUITABLE FOR USE	0.39	0.66	0.1	0.1	0.1	0.1					
Benzo(a)pyrene	0.1	6	0.1	0.73	0	1.5	0.701136	POTENTIALLY SUITABLE FOR USE	0.34	0.73	0.1	0.1	0.1	0.1					
Benzo(b)fluoranthene	0.1	6	0.1	0.65	0	7.6	0.6652748	POTENTIALLY SUITABLE FOR USE	0.42	0.65	0.1	0.1	0.1	0.1					
Benzo(ghi)perylene	0.05	6	0.05	0.44	0	64	0.4658945	POTENTIALLY SUITABLE FOR USE	0.31	0.44	0.05	0.05	0.05	0.05					
Benzo(k)fluoranthene	0.1	6	0.1	0.59	0	12	0.5854793	POTENTIALLY SUITABLE FOR USE	0.34	0.59	0.1	0.1	0.1	0.1					
Chrysene	0.05	6	0.05	1	0	7.7	1.0126362	POTENTIALLY SUITABLE FOR USE	0.57	1	0.05	0.05	0.05	0.05					
Dibenz(a,h)anthracene	0.1	6	0.1	0.1	0	1.1	0.1	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1					
Fluoranthene	0.1	6	0.1	2.2	0	290	2.1037867	POTENTIALLY SUITABLE FOR USE	0.9	2.2	0.1	0.1	0.1	0.1					
Fluorene	0.1	6	0.1	0.1	0	170	0.1	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1					
Indeno(1,2,3,cd)pyrene	0.1	6	0.1	0.29	0	4.3	0.3200718	POTENTIALLY SUITABLE FOR USE	0.26	0.29	0.1	0.1	0.1	0.1					
Naphthalene	0.05	6	0.05	0.05	0	2.2	0.05	POTENTIALLY SUITABLE FOR USE	0.05	0.05	0.05	0.05	0.05	0.05					
Phenanthrene	0.1	6	0.1	1.4	0	97	1.2855805	POTENTIALLY SUITABLE FOR USE	0.36	1.4	0.1	0.1	0.1	0.1					
Pyrene	0.1	6	0.1	1.9	0	620	1.8375338	POTENTIALLY SUITABLE FOR USE	0.85	1.9	0.1	0.1	0.1	0.1					
Asbestos identified	Y/N							NO	NO	NO	NO	NO	NO	NO					
FOC (dimensionless)	0.0075 (mean)							0.0073	0.011	0.01	0.0055	0.0045	0.0067						
SOM (calculated)	1.29% (mean)							1.26%	1.90%	1.72%	0.95%	0.78%	1.16%						
pH (su)	7.7 (mean)							7.9	7.6	7.7	7.7	7.4	7.9						
Risk parameter: Human health - residential with plant uptake (1%SOM);										Legend: Values in blue are at or below the laboratory reporting limit (where a single value is indicated) and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.									
Data set: SOIL										Values in red are equal to, or greater than, the generic assessment criterion (GAC) or +ve asbestos ID.									
Client: Taylor Wimpey										MG denotes Made Ground									
Site: Littlehampton Rd Ferring										NAT denotes natural ground									
Job no.: C13190																			
Lab. report no(s): 16-11887																			

Assessment of Chemicals of Potential Concern to Plant Life



Chemical of Potential Concern	All values in mg/kg unless otherwise stated					Soil Type			Location & Depth							
	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	US ₉₅	Result of Significance Test	MG A1 0	MG A6 0	MG B1 0	MG B4 0	MG B6 0	MG B9 0		
Arsenic	1	6	6.4	8.9	0	250	8.965954	POTENTIALLY SUITABLE FOR USE	7.1	6.4	7.3	6.4	7.7	8.9		
Boron	0.2	6	0.2	1.8	0	3	1.964482	POTENTIALLY SUITABLE FOR USE	1.3	0.4	1.8	0.2	0.2	0.9		
Chromium (III)	1	6	19.8	30.8	0	400	31.36418	POTENTIALLY SUITABLE FOR USE	19.8	23.8	26.8	23.8	23.8	30.8		
Chromium (VI)	1.2	6	1.2	1.2	0	25	1.2	POTENTIALLY SUITABLE FOR USE	1.2	1.2	1.2	1.2	1.2	1.2		
Copper	1	6	18	24	0	135	25.13349	POTENTIALLY SUITABLE FOR USE	20	22	23	20	18	24		
Nickel	1	6	14	28	0	75	26.93534	POTENTIALLY SUITABLE FOR USE	16	16	17	14	17	28		
Zinc	1	6	49	71	0	300	72.29094	POTENTIALLY SUITABLE FOR USE	55	64	71	54	49	56		
pH (su)	Mean															
	7.7								7.9	7.6	7.7	7.7	7.4	7.9		
Risk parameter: Plant life pH 7 Data set: SOIL Client: Taylor Wimpey Site: Littlehampton Rd Ferring Job no.: C13190 Lab. report no(s).: 16-11887 Legend: Values in blue are at or below the laboratory reporting limit (where a single value is indicated) and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate. Values in red are equal to, or greater than, the generic assessment criterion (GAC). MG denotes Made Ground NAT denotes natural ground																

Assessment of Chemicals of Potential Concern to Human Health



All values in mg/kg unless otherwise stated								Soil Type	MG	MG	MG	MG	MG	MG			
								Location & Depth	A1	A6	B1	B4	B6	B9			
Chemical of Potential Concern	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	US ₉₅	Result of Significance Test	0	0	0	0	0	0			
Aliphatics EC5-EC6	0.1	6	0.1	0.1	0	42	0.1	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1			
Aliphatics >EC6-EC8	0.1	6	0.1	0.1	0	100	0.1	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1			
Aliphatics >EC8-EC10	0.1	6	0.1	0.1	0	27	0.1	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1			
Aliphatics >EC10-EC12	1	6	1	1	0	48	1	POTENTIALLY SUITABLE FOR USE	1	1	1	1	1	1			
Aliphatics >EC12-EC16	2	6	2	2	0	24	2	POTENTIALLY SUITABLE FOR USE	2	2	2	2	2	2			
Aliphatics >EC16-EC35	10	6	10	10	0	65000	10	POTENTIALLY SUITABLE FOR USE	10	10	10	10	10	10			
Aliphatics >EC35-EC44	8.4	6	8.4	8.4	0	65000	8.4	POTENTIALLY SUITABLE FOR USE	8.4	8.4	8.4	8.4	8.4	8.4			
Aromatics EC5-EC7	0.1	6	0.1	0.1	0	73	0.1	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1			
Aromatics >EC7-EC8	0.1	6	0.1	0.1	0	130	0.1	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1			
Aromatics >EC8-EC10	0.1	6	0.1	0.1	0	35	0.1	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1			
Aromatics >EC10-EC12	1	6	1	1	0	75	1	POTENTIALLY SUITABLE FOR USE	1	1	1	1	1	1			
Aromatics >EC12-EC16	2	6	2	2.1	0	150	2.089333	POTENTIALLY SUITABLE FOR USE	2	2.1	2	2	2	2			
Aromatics >EC16-EC21	10	6	10	12	0	260	11.78667	POTENTIALLY SUITABLE FOR USE	10	12	10	10	10	10			
Aromatics >EC21-EC35	10	6	10	11	0	1100	10.89333	POTENTIALLY SUITABLE FOR USE	10	11	10	10	10	10			
Aromatics >EC35-EC44	8.4	6	8.4	8.4	0	1100	8.4	POTENTIALLY SUITABLE FOR USE	8.4	8.4	8.4	8.4	8.4	8.4			
ADDITIVITY CHECK								HAZARD QUOTIENTS FOR EACH FRACTION									
								Aliphatics EC5-EC6	0.002	0.002	0.002	0.002	0.002	0.002			
								Aliphatics >EC6-EC8	0.001	0.001	0.001	0.001	0.001	0.001			
Considered additive								Aliphatics >EC8-EC10	0.004	0.004	0.004	0.004	0.004	0.004			
								Aliphatics >EC10-EC12	0.021	0.021	0.021	0.021	0.021	0.021			
								Aliphatics >EC12-EC16	0.083	0.083	0.083	0.083	0.083	0.083			
								Aliphatics >EC16-EC35	0.000	0.000	0.000	0.000	0.000	0.000			
								Aliphatics >EC35-EC44	0.000	0.000	0.000	0.000	0.000	0.000			
								Aromatics EC5-EC7	0.001	0.001	0.001	0.001	0.001	0.001			
								Aromatics >EC7-EC8	0.001	0.001	0.001	0.001	0.001	0.001			
Considered additive								Aromatics >EC8-EC10	0.003	0.003	0.003	0.003	0.003	0.003			
								Aromatics >EC10-EC12	0.013	0.013	0.013	0.013	0.013	0.013			
								Aromatics >EC12-EC16	0.010	0.014	0.013	0.013	0.010	0.013			
Considered additive								Aromatics >EC16-EC21	0.038	0.046	0.038	0.038	0.038	0.038			
								Aromatics >EC21-EC35	0.008	0.010	0.008	0.008	0.008	0.008			
								Aromatics >EC35-EC44	0.008	0.008	0.008	0.008	0.008	0.008			
								Hazard Index for all C8-C16	0.108	0.168	0.108	0.108	0.108	0.108			
								Hazard Index for all C8-C18	0.038	0.030	0.030	0.030	0.030	0.030			
								Hazard Index for all C16-C25	0.048	0.058	0.048	0.048	0.048	0.048			
Risk parameter: Human health - residential with plant uptake (1%SO ₅)																	
Data set: SOIL																	
Client: Taylor Wimpey																	
Site: Littlehampton Rd Ferring																	
Job no.: C13190																	
Lab. report no(s): 16-11887																	
Legend: Main table values in blue are at or below the laboratory reporting limit (where a single value is indicated) and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.																	
Main table values in red are equal to, or greater than, the generic assessment criterion (GAC).																	
MG denotes Made Ground																	
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