Havant BOROUGH COUNCIL

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Mr Chris Rees
Savills
2 Charlotte Place
Southampton SO14 0TB

For: Derwent Developments Ltd

The Town and Country Planning (Development Management Procedure) (England) Order 2010
Grant of Planning Permission

Application Number: APP/13/00804
Site Address: Woodcroft Farm Development Site, Woodcroft Lane, Waterlooville
Proposal: Development of 288 residential units comprising 9 x one bedroom, 110 x two bedroom, 124 x three bedroom and 45 x four bedroom, retention of existing farmhouse, new access road from Eagle Avenue, internal access roads, associated car parking, open space and landscaping and including works to trees under TPO 1931.

Further to your application received on 07 August 2013, which was valid from 03 September 2013, Havant Borough Council, as Local Planning Authority **Grants Planning Permission** for the above proposal in accordance with the submitted plans and particulars as detailed below.

This permission is subject to compliance with:

(i) The plans and other documents submitted with regard to your application; and

(ii) The following conditions:

Conditions:

1 The development hereby permitted shall be begun before the expiration of 3 years from the date on which this planning permission was granted.
Reason: To comply with Section 51 of the Planning and Compulsory Purchase Act 2004.

2 No development hereby permitted shall commence until a Phasing Layout Plan has been submitted to and approved in writing by the Local Planning Authority. The development of the site shall be carried out in accordance with the approved phasing plan. Any amendment to the approved phasing programme must be first agreed in writing by the Local Planning Authority.
Reason: To ensure satisfactory comprehensive development and proper planning of the area.

3 No development hereby permitted shall commence on each phase until plans and particulars specifying the alignment, width, gradient and type of construction proposed for all footways, roads and individual accesses thereto (including all relevant horizontal cross and longitudinal sections) and the related provision to be made for street lighting and for surface water disposal and a programme for the implementation and making up of the same, have been submitted to and approved in writing by the Local Planning Authority. The implementation and making up of the same shall be completed in full accordance with such plans, particulars and

programme as are thus approved by the Local Planning Authority and the Highway Authority.
Reason: To ensure that they are constructed to satisfactory standard and, where appropriate a standard which will enable them to be taken over as publicly maintained highways and having due regard to policies CS16 and CS20 of the Havant Borough Local Plan (Core Strategy) 2011 and the National Planning Policy Framework, March 2012.

4 Construction of the development hereby permitted shall not commence on each phase until plans and particulars specifying the finished levels (above ordnance datum) of both the ground floors of the proposed buildings and the surrounding ground levels in relation to existing ground levels for that phase have first been submitted to and approved in writing by the Local Planning Authority. The development shall be carried out in accordance with these approved details unless otherwise agreed in writing by the Local Planning Authority.
Reason: To ensure that site levels are adequately addressed in the interests of the character and amenity of the area and of neighbours having due regard to policies CS16 of the Havant Borough Local Plan Core Strategy 2011 which forms part of the Local Development Framework, and the National Planning Policy Framework, March 2012.

5 Construction of the development hereby permitted shall not commence on each phase until an Arboricultural Impact Assessment and Method Statement including a pre-development meeting with the Council's Arboriculturalist has been submitted and agreed in writing by the Local Planning Authority. The proposed works shall be carried out in accordance with the approved details.
Reason: To ensure the trees are not adversely affected by the construction of the development and having due regard to policy DM8 of the Havant Borough Local Plan (Core Strategy) which forms part of the Development Plan and National Planning Policy Framework, March 2012.

6 No development shall commence on each phase until a Construction Management Plan and Construction Method Statement to include a pre-commencement meeting with the Local Planning Authority, the routing of construction traffic, site management, hours of working, delivery hours, delivery and construction vehicle parking, materials store, site office, waste management, road cleaning, measures to prevent mud and debris on the highway, storage of chemicals and hydrocarbons and such other matters related to construction of the site, has been submitted to and approved in writing by the Local Planning Authority. The development shall be carried out fully in accordance with the approved Construction Management Plan and Construction Method Statement.
Reason: To ensure that development should not prejudice highway safety nor cause inconvenience to other highway users or result in any other significant harm to the amenity of local residents, or to existing natural features and having due regard to policies DM8, DM10, and CS20 of the Havant Borough Local Plan (Core Strategy) which forms part of the Development Plan and National Planning Policy Framework, March 2012.

7 Construction of the dwellings hereby permitted shall not commence on each phase until samples and details of all external facing and roofing materials shall be submitted to and approved by the Local Planning Authority. Thereafter only such approved materials and finishes shall be used in carrying out the development.
Reason: To ensure the appearance of the development is satisfactory and having due regard to policies CS16 of Havant Borough Local Plan (Core Strategy) 2011 and the National Planning Policy Framework 2012.

8 No development hereby permitted shall commence on each phase until a specification of the materials to be used for the surfacing of all open parts of the site proposed to be hardsurfaced has been submitted to and approved in writing by the Local Planning Authority. The development hereby permitted shall not be brought

into use until the implementation of all such hardsurfacing has been completed in

full accordance with that specification.
Reason: In the interests of the amenities of the locality and having due regard to policy CS16 of the Havant Borough Local Plan (Core Strategy) 2011 and the National Planning Policy Framework 2012.

9 No development hereby permitted shall be commenced on each phase until a detailed soft landscaping scheme for all open parts of the site not proposed to be hardsurfaced, has been submitted to and approved in writing by the Local Planning Authority. Such scheme shall specify the proposed finished ground levels in relation to the existing levels, the distribution and species of ground cover to be planted, the positions, species and planting sizes of the trees and shrubs to be planted and/or retained, and timing provisions for completion of the implementation of all such landscaping works.
The implementation of all such approved landscaping shall be completed in full accordance with such approved timing provisions. Any tree or shrub planted or retained as part of such approved landscaping scheme which dies or is otherwise removed within the first 5 years shall be replaced with another of the same species and size in the same position during the first available planting season.
Reason: To ensure the appearance of the development is satisfactory and having due regard to policies CS16 and DM8 of the Havant Borough Local Plan (Core Strategy) 2011 and the National Planning Policy Framework, March 2012.

10 Construction of the dwellings hereby permitted shall not commence on each phase until plans and particulars specifying the alignment, type, height and, where appropriate, construction materials and design of all proposed screen walls, fences, hedges and other means of enclosure for that phase have been first submitted to and approved in writing by the Local Planning Authority. No dwelling within that phase shall be occupied until completion of the installation of all its screening provision as is thus approved by the Local Planning Authority. At all times thereafter, all of that screening provision shall be retained in a wholly sound and effective condition.
Reason: To safeguard the amenities of the locality and occupiers of neighbouring property and having due regard to policy CS16 of the Havant Borough Local Plan (Core Strategy) 2011 and the National Planning Policy Framework, March 2012.

11 Prior to the commencement of construction within any specified phase or defined area the development approved by this Planning Permission (as may be agreed in writing by the Local Planning Authority), a scheme to deal with the risks associated with contamination of the site shall be submitted to and approved in writing by the Local Planning Authority. That scheme shall include all of the following elements unless specifically excluded in writing by the Local Planning Authority.

1 A scheme of further investigation, based on the previously submitted GeoEnvironmental & Geotechnical report. The scope of the investigation shall be sufficient to:

- confirm the preliminary assessment of the nature and extent of contamination at the site,
- inform an appropriate assessment of the risks to all receptors that may be affected, including controlled waters, and;
- enable the appropriate design of remediation and/or risk mitigation measures (if required).

2 The results of the further investigation and risk assessment (1) and if appropriate, a method statement based on these results giving full details of the remediation and/or risk mitigation measures required, and how they are to be undertaken.

3 A verification report or statement (as appropriate) upon completion of the works set out in (2) [if any], confirming that measures undertaken have been implemented in accordance with the method statement, and have achieved the required performance standards. The verification report / statement shall provide details of any measures necessary for maintenance, further monitoring and reporting.

All elements shall be adhered to unless agreed in writing by the Local Planning Authority.
Reason: To prevent future occupants of proposed residential properties being exposed to unacceptable risks from identified contamination & soil gas associated with automotive repair and landfill activity previously undertaken at the site, and to ensure that the site does not pose an unacceptable risk to the groundwater Source Protection Zone 1; having due regard to policies and proposals E1 of the Hampshire County Structure plan 1996-2011 (Review), and DM10 of the Havant Borough Adopted Core Strategy (2011), and DM17 of the Draft Local Plan (Allocations) 2012.

12 Prior to the commencement of construction of any part of the development approved by this Planning Permission, a protocol for the identification & assessment of any unforeseen ground conditions shall be submitted to and approved in writing by the Local Planning Authority. The provisions of the approved protocol shall be observed throughout the undertaking of all relevant construction activities.
Reason: For the protection of workers and the general public during the development of potentially contaminated land, and to prevent future occupants of proposed residential properties being exposed to unacceptable risks from unidentified &/or unexpected contamination that may be associated with previous activities undertaken at the site; having due regard to policies and proposals E1 of the Hampshire County Structure plan 1996-2011 (Review), and DM10 of the Havant Borough Adopted Core Strategy (2011), and DM17 of the Draft Local Plan (Allocations) 2012.

13 If, during development, contamination not previously identified at the site is found to be present, then no further development (unless otherwise agreed in writing with the Local Planning Authority) shall be carried out until the developer has submitted, and obtained written approval from the Local Planning Authority for an addendum to the Method Statement required under Condition 1, (2). This addendum shall detail how this unexpected contamination shall be dealt with, and the development shall not be carried out other than in accordance with the approved details.
Reason: For the protection of workers and the general public during the development of potentially contaminated land, and to prevent future occupants of proposed residential properties being exposed to unacceptable risks from unidentified &/or unexpected contamination that may be associated with previous activities undertaken at the site; having due regard to policies and proposals E1 of the Hampshire County Structure plan 1996-2011 (Review), and DM10 of the Havant Borough Adopted Core Strategy (2011), and DM17 of the Draft Local Plan (Allocations) 2012.

14 Construction of the buildings hereby permitted shall not commence on each phase until a specification of the provision to be made for the storage and disposal of refuse for that phase has been submitted to and approved in writing by the Local Planning Authority. All service roads should be capable of taking a 26 tonne Refuse Collection Vehicle, and allow vehicle to reverse close to bin store. No bins to be pulled or waste carried more than 25m and no alleys to exceed 20m in length. The dwellings within that phase shall not be occupied until the implementation of such provision for refuse has been completed in full accordance with such an approved specification.
Reason: To safeguard the amenity of the locality and having due regard to policy CS16 of the Havant Borough Core Strategy 2011 which forms part of the Local

Development Framework and National Planning Policy Framework, March 2012.

15 The development hereby permitted shall not commence on each phase until plans and particulars specifying the provision to be made for external lighting of the same has been submitted to and approved in writing by the Local Planning Authority. There shall be no external lighting on the site other than as thereby approved.
Reason: To safeguard the amenities of the locality and having due regard to policies CS16 and DM10 of the Havant Borough Local Plan (Core Strategy) 2011 and the National Planning Policy Framework 2012.

16 No development shall take place until a surface water drainage scheme for the site, based on sustainable drainage principles and an assessment of the hydrological and hydro geological context of the development, has been submitted to and approved in writing by the Local Planning Authority and Southern Water. The drainage strategy should demonstrate the surface water run-off generated up to and including the 100 year critical storm (with an allowance for climate change) will not exceed the run-off from the undeveloped site following the corresponding rainfall event. The scheme shall subsequently be implemented in accordance with the approved details before the development is completed.

Those details shall include:
1. Information about the design storm period and intensity, the method employed to delay and control the surface water discharged from the site and the measures taken to prevent pollution of the receiving groundwater and/or surface waters;
2. A timetable for its implementation; and
3. A management and maintenance plan for the lifetime of the development which shall include the arrangements for adoption by any public body or statutory undertaker, or any other arrangements to secure the operation of the sustainable urban drainage scheme throughout its lifetime.
4. A written summary of the drainage strategy, including supporting calculations.
Reason: To the policy aims of the National Planning Policy Framework (NPPF).

17 No development hereby permitted shall commence on each phase until plans and particulars specifying the layout, depth and capacity of all foul and surface water drains and sewerage disposal including proposed to serve the same, the treatment of existing water courses and ditches and details of any other proposed ancillary drainage works/plant (e.g. pumping stations) for that phase have first been submitted to and approved in writing by the Local Planning Authority and Southern Water. No dwelling or building within that phase shall be occupied until completion of the implementation of its drainage provision in full accordance with such plans and particulars as are thus approved by the Authority.
Reason: To safeguard the amenities of the locality and ensure that all such drainage provision is constructed to an appropriate standard and quality and having due regard to policies CS16 and DM10 of the Havant Borough Local Plan (Core Strategy) which forms part of the Development Plan, and National Planning Policy Framework, March 2012.

18 No development hereby permitted shall commence until the applicant has secured:-

- the implementation of a programme of archaeological work in accordance with a written scheme of investigation which has been submitted by the applicant and approved by the Local Planning Authority in consultation with Hampshire County Council. The approved programme shall be fully adhered to unless otherwise agreed in writing by the Local Planning Authority.
- the implementation of a programme of archaeological mitigation of impacts in accordance with a written scheme of investigation which has been submitted by the applicant and approved by the Local Planning Authority in consultation with Hampshire County Council. The approved programme shall be fully adhered to unless otherwise agreed in writing by the Local Planning Authority.
- Following completion of archaeological fieldwork the production of a report accordance with an approved programme including where appropriate post

-excavation assessment, specialist analysis and reports, publication and public engagement.

Reason: To safeguard the potential archaeological interest of the site and having due regard to policies CS11, DM8 of the Havant Borough Local Plan (Core Strategy) 2011 and the National Planning Policy Framework, March 2012.

19 Prior to commencement, an Ecological Mitigation and Enhancement Scheme for the site shall be submitted for written approval to the Local Planning Authority. This Scheme should include (but not necessarily be restricted to): location, extent and timing of vegetation loss; protected species protection (including results of any updating surveys, details of lighting strategy methods to prevent harm or disturbance); location, extent and composition of habitat creation; location and ongoing management of mitigation features such as new habitat, ponds, bat and bird boxes. Development shall subsequently proceed in accordance with any such approved Plan, with all biodiversity mitigation enhancement features permanently retained in accordance with the approved Plan.

Reason: To conserve and enhance biodiversity in accordance with Local and National Planning Policy.

20 The garages hereby permitted shall be retained and kept available for the parking of cars at all times and shall not be converted to living accommodation without the prior written approval of the Local Planning Authority.

Reason: To ensure the retention of adequate on-site car parking and to discourage parking on the adjoining highway in the interests of highway safety and local amenity and having due regard to policy DM13 of the Havant Borough Local Plan (Core Strategy) 2011 and the National Planning Policy Framework, March 2012.

21 No dwelling shall be occupied until space for the loading, unloading and parking of vehicles and cycles and has been provided within the site, surfaced and marked out in accordance with the approved plans. Such areas shall thereafter be retained and used solely for those purposes.

Reason: In the interests of highway safety and having due regard to policy DM13 of the Havant Borough Local Plan (Core Strategy) 2011 and the National Planning Policy Framework, March 2012.

22 Prior to the first occupation of the dwellings hereby approved, the following details shall be submitted to and approved in writing by the Local Planning Authority:

i) plans showing the external appearance of the pumping station including any form of enclosure to the station;
ii) a scheme for protecting the proposed dwellings from noise and vibration from the pumping station.

The pumping station shall thereafter be constructed and maintained in accordance with the approved details unless otherwise agreed in writing by the Local Planning Authority.

Reason: In the interests of the character and amenity of the area and neighbouring residents having due regard to policy CS16 of the Havant Borough Local Plan Core Strategy which forms part of the Local Development Framework, and the National Planning Policy Framework, March 2012.

23 Notwithstanding the provisions of any Town and Country Planning General Permitted Development Order, no extension, building or structure permitted by Part 1, Classes A/D/E and F of the Town and Country Planning (General Permitted Development) (Amendment) (No.2) England) Order 2008, as amended, shall be erected within the curtilage of the site without the prior written approval of the Local Planning Authority.

Reason: In the interests of the character and amenities of the development having due regard to policy CS16 of the Havant Borough Local Plan Core Strategy 2011 which forms part of the Local Development Framework, and the National Planning

Policy Framework, March 2012.

24 Notwithstanding the provisions of any Town and Country Planning General Permitted Development Order, no alteration to the roof of the dwelling hereby approved including the addition of windows permitted by Part 1, Classes B/C of the Town and Country Planning (General Permitted Development) (Amendment) (No.2) (England) Order 2008, shall be constructed without the prior written approval of the Local Planning Authority.
Reason: In the interests of the character and amenities of the development having due regard to policy CS16 of the Havant Borough Local Plan Core Strategy which forms part of the Local Development Framework, and the National Planning Policy Framework, March 2012.

25 The development hereby permitted shall not commence until a phasing plan for off site highway works has been submitted to and approved in writing by the Local Planning Authority. The off site highway works shall be completed in full accordance with such plans, particulars and programme as are thus approved in writing by the Authority.
Reason: To ensure that the required highway improvements are provided and having due regard to policies CS16 and CS20 of the Havant Borough Local Plan (Core Strategy) 2011 and the National Planning Policy Framework, March 2012.

26 The development hereby permitted shall not commence until a timetable for the re-location of the Bridleway, including details of any temporary or interim measures has been submitted to and approved in writing by the Local Planning Authority. The bridleway diversion shall be completed in full accordance with such plans, particulars and programme as are thus approved in writing by the Authority.
Reason: To ensure the continuation of Bridleway route and having due regard to policies CS16 and CS20 of the Havant Borough Local Plan (Core Strategy) 2011 and the National Planning Policy Framework, March 2012.

27 No dwelling shall be occupied until Car parking provision for that dwelling has been provided in accordance with plan 1924a -1011-m and such provision shall be permanently maintained.
Reason: To ensure the appropriate car parking provision and having due regard to policies CS16 and CS20 of the Havant Borough Local Plan.

28 Woodcroft Lane shall not be used for construction traffic other than for the installation of services for the 5 dwellings proposed with direct access off Woodcroft Lane. Details of those services where vehicular access is required from Woodcroft Lane shall be submitted to and approved in writing by the Local Planning Authority.
Reason: To safeguard the amenities of neighbouring properties and having due regard to policy CS16 of the Havant Borough Local Plan.

29 The development hereby permitted shall not commence until the arrangements, including a programme for delivery, for pedestrian and cycle access to Woodcroft School have been submitted to approved in writing by the Local Planning Authority. Such arrangements to include the provision of a ramp from the site access road to the school land. The arrangements shall be completed in accordance with the approved details and programme for delivery.

Reason: To safeguard the amenities of neighbouring properties and to ensure that full access to the school is available and not obstructed or frustrated during school hours and having due regard to policy CS16 of the Havant Borough Local Plan.

30 The development hereby permitted shall not commence until details of the proposed play equipment have been submitted to and approved in writing by the Local Planning Authority. The play equipment shall be provided and maintained in accordance with the approved details.

Reason: To ensure appropriate provision and having due regard to policy CS16 of the Havant Borough Local Plan.

31 No development shall commence until further details of the footpath and cycleway connections including detailed plans and specifications of the alignment, finished, street furniture and programme of delivery have been submitted to and approved in writing by the Local Planning Authority. The footpath and cycleway connections shall be provided in accordance with the approved details and delivery programme.
Reason: To ensure appropriate provision and having due regard to policy CS16 of the Havant Borough Local Plan and the national Planning Policy Framework.

32 Advanced Nursery Standard tree shall be provided adjacent the length of the new access road off Eagle Avenue in accordance with details to be submitted and approved in writing by the Local Planning Authority. Such details shall specify the proposed finished ground levels, the position, species and planting sizes of the trees and timing provisions for completion of the tree planting works. The implementation of all such approved planting shall be completed in full accordance with the approved details and timings. Any tree planted which dies or is otherwise removed within the first 10 years shall be replaced with another of the same species and size and in the same position during the first available planting season.
Reason: To ensure the appearance of the development is satisfactory and having due regard to policy CS16 of the Havant Borough Local Plan and the National Planning Policy Framework March 2012.

33 No development shall commence until details of the proposed means of controlling access to the emergency access shall have been submitted to and approved in writing by the Local Planning Authority. The agreed details shall be provided prior to the first occupation of the development and permanently maintained thereafter.
Reason: In the interests of the amenities of the occupiers of nearby properties and having due regard to policy CS16 of the Havant Borough Local Plan and the National Planning Policy Framework March 2012.

34 The development hereby permitted shall be carried out in accordance with the following approved plans:

Drg No	Revision	Drawing Title
A-1011	N	Site Layout - Black/White
C-1011	N	Site Layout - Coloured
C-1205	E	Site Sections AA, BB, CC - Coloured
C-1206	D	Site Sections DD, EE, FF - Coloured
C-1207	D	Site Sections GG, HH, JJ - Coloured
C-1208	D	Site Sections KK, LL, MM - Coloured
C-1209	D	Site Sections NN, PP - Coloured
C-1210	B	Site Sections RR, SS & TT - Coloured
C-1211	C	Site Sections UU, VV & WW - Coloured
A-3000	C	Block Type A: Plots 42-45 Plans & Elevations
A-3005	C	Block Type B: Plots 46-47,73-74,79-80, 92-93 Plans & Elevations
A-3010	C	Block Type C: Plots 40-41,90-91,96-97,106-107,129-130,210-211 Plans & Elevations
A-3011	D	Block Type C+: Plots 266-268 Plans & Elevations
A-3015	D	Block Type D: Plots 133-135,136-138,199-201 Plans & Elevations
A-3020	C	Block Type E: Plots 108 -112 Plans & Elevations
A-3025	C	Block Type F: Plots 4-9 Plans & Elevations
A-3030	D	Block Type G: Plots 71-72,197-198 Plans & Elevations
A-3035	D	Block Type H: Plots 232 - 235 Plans & Elevations
A-3040	D	Block Type J: Plots 14-15,100-101,104-105,113-114,125-126,127-128 Plans & Elevations
A-3045	C	Block Type K: Plots 11-13 Plans & Elevations

A-3050	D	Block Type L: Plots 250-251 Plans & Elevations
A-3055	D	Block Type M: Plot 217 Plans & Elevations
A-3060	D	Block Type N: Plot 87 Plans & Elevations
A-3065	D	Block Type P: Plots 117-118,173-174,204-205,212-213,286-287 Plans & Elevations
A-3070	D	Block Type Q: Plots 2-3,214-215,271-272 Plans & Elevations
A-3071	C	Block Type Q+: Plots 252-253 Plans & Elevations
A-3075	D	Block Types R & RR: Plots 88-89,95,102,123-124,243-244 Plans & Elevations
A-3080	D	Block Type S: Plots 49-50,51-52,202-203,206-207,241-242,236-237,238-239 Plans & Elevations
A-3085	C	Block Type T: Plots 16-18,36-38 Plans & Elevations
A-3090	D	Block Type U: 75-78 Plans & Elevations
A-3095	D	Block Type V: Plots 276-280 Plans & Elevations
A-3100	C	Block Type W: Plot 66 Plans & Elevations
A-3105	D	Block Type X: Plots 115,116,171,172,175,178,180,193,194,195, 284,285 Plans & Elevations
A-3110	D	Block Type Y: Plots 10,48,53,94,103,151,170,176,177,196,208,216,269,270,275,281,288 Plans & Elevations
A-3115	D	Block Type Z: Plots 1,39,181,218,240 Plans & Elevations
A-3120	D	Block Type AA: Plots 141-142,145-146,149-150 Plans & Elevations
A-3125	D	Block Type AB: Plots23-25,58-60,63-65,133-135, 136-138,163-165,187-189,190-192 Plans & Elevations
A-3130	E	Block Type AC: Plots 19-22, 54-57, 166-169, 219-222 Plans & Elevations
A-3140	D	Block Type AE: Plots 139,140,147,148 Plans & Elevations
A-3145	D	Block Type AF: Plots 131-132, 143-144, 161-162 Plans & Elevations
A-3155	C	Block Type AH: Plots 61-62 Plans & Elevations
A-3160	D	Block Type AJ: Plots 26-34, 152-160, 223-231 Floor Plans
A-3161	C	Block Type AJ: Plots 26-34, 152-160, 223-231 Elevations
A-3170	D	Block Type AL: Plots 182-186 Floor Plans
A-3171	D	Block Type AL: Plots 182-186 Elevations
A-3175	D	Block Type AM: Plots 67-70, 98,99,273,274 Plans & Elevations
A-3180	D	Block Type AN: Plot 209 Plans & Elevations
A-3185	C	Block Type AP: Plots 119-122 Plans & Elevations
A-3190	D	Garages & Car Ports: Plans & Elevations
A-3191	D	Substation, Cycle, Refuse & Bin Store: Plans & Elevations
A-3210	A	Block Type Z1: Plots 245-249, 282 & 283 Plans & Elevations
A-3215	B	Block Type AQ: Plots 254 - 265 Floor Plans
A-3216	B	Block Type AQ: Plots 254 - 265 Elevations
A-3220	A	Block Type AR: Plots 131 & 132 Floor Plans & Elevations
A-3225	A	Block Type Z2: Plot 35 Floor Plans & Elevations

Reason: - To ensure provision of a satisfactory development.

Other Important Information:

(1) This notice only relates to the decision of Havant Borough Council as Local Planning Authority under the Town and Country Planning Acts. It does not relate to any other application that may be required under the Building Regulations or under any other Act, Regulation, Byelaw or Order where the Council's approval may be needed. For further guidance as to the need for consent under the Building Regulations please phone 023 9244 6573.

(2) Your attention is drawn to the attached information regarding firstly your right to

appeal to the Planning Inspectorate, if you are aggrieved by the Council's decision, and secondly the rights of an owner to, in certain circumstances serve a purchase notice on the Council. See www.planningportal.gov.uk/pcs.

(3) Any failure to adhere to the details of the approved plans, and other documents or to comply with any conditions listed above may lead to enforcement action being taken by the Council. If you wish to depart from the approved details or conditions in any way you should contact the Planning and Development service at the Plaza or by telephoning 023 9244 6015.

(4) A formal application for connection to the public sewerage system is required in order to service this development, please contact:
Atkins Ltd. Anglo St . James House 39A Southgate Street Winchester S023 9HH (tel 01962 858688) or www.southernwater.co.uk

(5) Your attention is drawn to the provisions of Sections 12 &13 of the Hampshire Act 1983 realting to access fro the Fire and rescue Service. You can view a copy of the Act at
www.legislation.gov.uk/ukla/1983/5/pdfs/ukla_19830005_en.pdf

(6) This permission was granted subject to a planning obligation agreement made under Section 106 of the Town & Country Planning Act 1990 dated ..... which requires .....

(7) In accordance with paragraphs 186 and 187 of the NPPF Havant Borough Council (HBC) takes a positive and proactive approach and works with applicants/agents on development proposals in a manner focused on solutions by:

- Offering a pre-application advice service, and
- Updating you of any issues that may arise in the processing of your application and where possible suggesting solutions, and,

In this instance:

- You sought and were provided with pre-application advice,
- You were updated about issues after the initial site visit.

Julia Potter

Julia Potter

05 May 2015

HAVANT BOROUGH COUNCIL

Town & Country Planning Act 1990

Consultation on Planning Application

MEMORANDUM

From:	**Environmental Health**	**To:**	**Development Control**
Our Ref:	**DCS/EH/JPD/131119001**	**Your Ref:**	**[As Application Ref:]**
Ext. No:	**6677**	**Date:**	**19/11/2013**

DC Case Officer: Daphney Haywood
Application Number: APP/13/00804
Site Address: Woodcroft Farm Development Site, Woodcroft Lane, Waterlooville
Proposed Development: Development of 293 residential units comprising 6 x one bedroom, 115 x two bedroom, 132 x three bedroom and 40 x four bedroom, retention of existing farmhouse, new access road from Eagle Avenue, internal access roads, associated car parking, open space and landscaping and including works to trees under TPO 1931.

Observations / Comments:

Further to my previous, informal response to this application; I have now had opportunity to review the Peter Brett Associates site investigation Geo-Environmental & Geotechnical Ground Investigation Report in more detail.

This response will formalise comments made previously with respect to both Air Quality & Ground Contamination, including additional comments with respect to the latter.

Air Quality

I have reviewed the relevant parts of the Traffic & Transportation assessment to determine whether an Air Quality assessment is likely to be required for the proposals.

It appears that the anticipated contribution of the (completed) development to the number of vehicle trips on the local road network is in the order of 10-16% existing traffic flows on Hart Plan Avenue / Eagle Avenue respectively. The flows on these roads are however estimated to be below 10,000 vehicles per day (around 9,000 & 8,000), and the local air quality is not currently considered to be at risk of breaching any NAQS objective values. The basis utilised in the report for the distribution of new vehicle trips on the local road network, is considered to be reasonable and is such that no road section estimated to be carrying >10,000 vehicles per day is impacted by >10% (the screening threshold under NSCA guidance for planning & air quality).

It is noted however that that the proposals appear to include preparatory access roads that would facilitate further development within the East Hampshire district, accessed from the Havant Borough local road network.

If linked to this scheme (i.e. directly associated, and sharing access to the local road network with this development); further proposed development on a scale approximately similar to this application (circa 300 units) is likely to require an air quality assessment to be submitted alongside a wider assessment of the traffic impact upon the local road network.

Any air quality assessment undertaken in future for associated development(s) should account for the new vehicle trips associated with these proposals (if consent is granted), and

should consider 'worst-case' locations of relevant exposure with respect to roads & junctions impacted by road traffic associated with the respective developments (proposed & committed).

On the basis of the current proposals however, *I do not consider that an Air Quality assessment is necessary at this stage.*

Land Contamination

The Peter Brett Associates Geo-Env. & Geo-Tech GI Report (Ref: 21834/030 R02/rev01 – July 2013) concludes that there are no plausible site-wide contamination sources, and that the overall risk of the site is low. The report does however highlight some issues associated with made ground / former landfill (inert construction & demolition wastes), and made ground / vehicle dismantling & repair activities.

The area of landfill presents risks associated with ground stability, soil gas (in particular, Methane & Carbon Dioxide), and the chemical quality of soils. The vehicle storage / service / breaking yard has been positively associated with near surface made ground, hydrocarbons, PAH and metals contamination. Sampling within this area confirms a potentially significant concentration of total hydrocarbons within natural soils (outside the range of the proposed 'confidence' surface scrape), indicating a degree of vertical mobility.

It is notable that despite the status of the site as a source protection zone 1, the leachate / eluate sampling omitted a TPH screen, and omitted the testing of soils from the vehicle dismantling & repair yard. The yard area has returned values statistically indicative of a contamination hot-spot (or separate sample 'population', as might be expected). At this stage, this area has been subject to sampling of relatively limited resolution.

I note that the Environment Agency has not provided any specific comment with respect to the protection of controlled water (groundwater, principle aquifer & SPZ1), in its response to the consultation to this application. This is interpreted to indicate that the Agency considers this landuse to represent a relatively low groundwater risk. I would tend to agree that this landuse is likely to be a low risk to groundwater, based upon a number of factors, as outlined below;

- the shallow nature of the impacted made ground in the area of the vehicle dismantling & repair yard,
- the lack of a bulk source (e.g. fuel or waste oil storage) within the of the vehicle dismantling & repair yard,
- the significant depth to groundwater across the site as a whole, especially in the context of the clayey Lambeth group soils that are likely to have good retardation properties with respect to hydrocarbon contamination,
- the considerable distance to abstraction point (despite the implicit 50-day travel time from the water table, this would only apply to contamination that had reached the groundwater), and;
- the likely level of retardation, attenuation, and dilution that would occur between the site and the potable abstraction.

The eluate results presented within the report relate to the area of landfill, at 2.0m depth, and soils considered likely to be broadly representative of general fill material. Results indicate that no Environmental or Drinking Water Quality Standard (EQS / DWS) is exceeded, and I would therefore agree with the conclusion that there exists a negligible groundwater risk from this source.

The report conclusions focus upon human health risks from direct exposure to shallow contamination (metals, hydrocarbon & PAH), and risks arising from soil gas. Precautionary mitigation measures are proposed, comprising a combination of source removal and barrier methods to separate sources & receptors.

The proposals are based upon several assumptions. The report acknowledges that additional investigation may be required in order to confirm certain parameters to assist with the appropriate specification & design of mitigation measures, and that validation of implemented remedial / risk mitigation measures will be necessary.

I agree that the report indicates a low-negligible risk across the majority of the site, with potentially significant risks associated with landuses confined to relatively well defined areas of the site. Additional work is however considered necessary in the region of the former landfill & vehicle dismantling & repair yard for the purposes outlined above, in line with the report conclusions.

Given the sensitivity of the site (in terms of the proposed residential use, and potential groundwater sensitivities), I would also agree that a formalised contamination discovery strategy (as proposed) should be submitted. This will ensure that any contaminated soils that would not be anticipated on the basis of the available information, but that may nevertheless potentially pose an unacceptable risk, are identified and appropriately dealt with.

Whilst I have no objections to the proposals in principle, it is considered appropriate and proportionate (in line with the conclusions of the Peter Brett Associates report, and comments above) to impose suitable conditions to ensue that the development is safe & suitable for future site residents, and does not prevent the appropriate remediation of soil sources that might affect groundwater quality within a Source Protection Zone 1.

Condition 1

Prior to the commencement of construction within any specified phase or defined area the development approved by this Planning Permission (as may be agreed in writing by the Local Planning Authority), a scheme to deal with the risks associated with contamination of the site shall be submitted to and approved in writing by the Local Planning Authority. That scheme shall include all of the following elements unless specifically excluded in writing by the Local Planning Authority.

1. *A scheme of further investigation, based on the previously submitted GeoEnvironmental & Geotechnical report. The scope of the investigation shall be sufficient to:*

    i) confirm the preliminary assessment of the nature and extent of contamination at the site,
    ii) inform an appropriate assessment of the risks to all receptors that may be affected, including controlled waters, and;
    iii) enable the appropriate design of remediation and/or risk mitigation measures (if required).

2. *The results of the further investigation and risk assessment (1) and if appropriate, a method statement based on these results giving full details of the remediation and/or risk mitigation measures required, and how they are to be undertaken.*

3. *A verification report or statement (as appropriate) upon completion of the works set out in (2) [if any], confirming that measures undertaken have been implemented in accordance with the method statement, and have achieved the required performance standards. The verification report / statement shall provide details of any measures necessary for maintenance, further monitoring and reporting.*

All elements shall be adhered to unless agreed in writing by the Local Planning Authority.

Reason: *To prevent future occupants of proposed residential properties being exposed to unacceptable risks from identified contamination & soil gas associated with automotive repair and landfill activity previously undertaken at the site, and to ensure that the site does not pose an unacceptable risk to the groundwater Source Protection Zone 1; having due regard to policies and proposals E1 of the Hampshire County Structure plan 1996-2011 (Review), and DM10 of the Havant Borough Adopted Core Strategy (2011), and DM17 of the Draft Local Plan (Allocations) 2012*

Condition 2

Prior to the commencement of construction of any part of the development approved by this Planning Permission, a protocol for the identification & assessment of any unforeseen ground conditions shall be submitted to and approved in writing by the Local Planning Authority.

The provisions of the approved protocol shall be observed throughout the undertaking of all relevant construction activities.

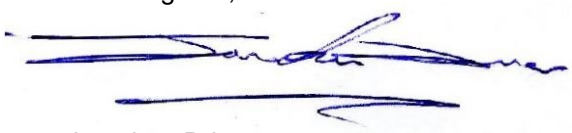
Reason: *For the protection of workers and the general public during the development of potentially contaminated land, and to prevent future occupants of proposed residential properties being exposed to unacceptable risks from unidentified &/or unexpected contamination that may be associated with previous activities undertaken at the site; having due regard to policies and proposals E1 of the Hampshire County Structure plan 1996-2011 (Review), and DM10 of the Havant Borough Adopted Core Strategy (2011), and DM17 of the Draft Local Plan (Allocations) 2012*

Condition 3

If, during development, contamination not previously identified at the site is found to be present, then no further development (unless otherwise agreed in writing with the Local Planning Authority) shall be carried out until the developer has submitted, and obtained written approval from the Local Planning Authority for an addendum to the Method Statement required under Condition 1, (2). This addendum shall detail how this unexpected contamination shall be dealt with, and the development shall not be carried out other than in accordance with the approved details.

Reason: *For the protection of workers and the general public during the development of potentially contaminated land, and to prevent future occupants of proposed residential properties being exposed to unacceptable risks from unidentified &/or unexpected contamination that may be associated with previous activities undertaken at the site; having due regard to policies and proposals E1 of the Hampshire County Structure plan 1996-2011 (Review), and DM10 of the Havant Borough Adopted Core Strategy (2011), and DM17 of the Draft Local Plan (Allocations) 2012*

Best Regards,



Jonathan Driver
Environmental Control Officer

Havant Borough Council
Development Control
Civic Offices Civic Centre Road
Havant
Hampshire
PO9 2AX

Our ref: HA/2013/114745/01-L01
Your ref: APP/13/00804

Date: 27 September 2013

Dear Sir/Madam

DEVELOPMENT OF 293 RESIDENTIAL UNITS COMPRISING 6 X ONE BEDROOM, 115 X TWO BEDROOM, 132 X THREE BEDROOM AND 40 X FOUR BEDROOM, RETENTION OF EXISTING FARMHOUSE, NEW ACCESS ROAD FROM EAGLE AVENUE, INTERNAL ACCESS ROADS, ASSOCIATED CAR PARKING, OPEN SPACE AND LANDSCAPING AND INCLUDING WORKS TO TREES UNDER TPO 1931.

WOODCROFT FARM DEVELOPMENT SITE, WOODCROFT LANE, WATERLOOVILLE

Thank you for consulting the Environment Agency on the above application, which was received on 13 September 2013.

Environment Agency Position
We can confirm that the Environment Agency has no objection in principle to the proposed development as submitted, however, we request that the following planning condition be attached to any planning permission granted in order to make the development acceptable.

Planning Condition:

The Environment Agency requests that the following condition be attached to any planning permission granted, and that details in relation to this condition (and on which the Environment Agency would wish to comment) be submitted to and approved by the Local Planning Authority:

No development shall take place until a surface water drainage scheme for the site, based on sustainable drainage principles and an assessment of the hydrological and hydro geological context of the development, has been submitted to and approved in writing by the local planning authority. The drainage strategy should demonstrate the surface water run-off generated up to and including the 100 year critical storm (with an allowance for climate change) will not exceed the run-off from the undeveloped site following the

corresponding rainfall event. The scheme shall subsequently be implemented in accordance with the approved details before the development is completed.

Those details shall include:

1. **Information about the design storm period and intensity, the method employed to delay and control the surface water discharged from the site and the measures taken to prevent pollution of the receiving groundwater and/or surface waters;**
2. **A timetable for its implementation; and**
3. **A management and maintenance plan for the lifetime of the development which shall include the arrangements for adoption by any public body or statutory undertaker, or any other arrangements to secure the operation of the sustainable urban drainage scheme throughout its lifetime.**
4. **A written summary of the drainage strategy, including supporting calculations**

Reason: To prevent the increased risk of flooding, both on and off site, in line with the policy aims of the National Planning Policy Framework (NPPF).

Advice to the Local Planning Authority / Applicant

We recognise that a preliminary surface water drainage scheme has been included in the Woodcroft Farm, Havant Flood Risk Assessment dated July 2013 within application APP/13/00804. However, we have some concerns about the scheme which need to be addressed, and therefore we believe that the above condition is necessary to ensure that surface water runoff from the site is safely managed. These issues include:

- Drainage Network 300 does not appear to be connected to an attenuation pond, and so no water quality treatment is being provided.
- The pond within network 100 appears to be offline rather than online, which will reduce its effectiveness to attenuate runoff
- All the attenuation ponds should have a permanently wet area in order to provide water quality treatment.

Southern Water will need to be in agreement with respect to the discharge of surface water into their assets.

If you have any queries regarding to the information set out above, please contact me on the details below.

Yours faithfully

Miss Verity Giles
Planning Advisor

Direct dial 01794834590
Direct e-mail PlanningSSD@environment-agency.gov.uk

End

Date: 29 October 2013
Our ref: 97496
Your ref: APP/13/00804

Customer Services
Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

T 0300 060 3900

Havant Borough Council
Civic Offices
Civic Centre Road
Havant
Hampshire,
PO9 2AX

BY EMAIL ONLY
Planning.development@havant.gov.uk

Dear Sirs,

Planning consultation: Development of 293 residential units comprising 6 x one bedroom, 115 x two bedroom, 132 x three bedroom and 40 x four bedroom, retention of existing farmhouse, new access road from Eagle Avenue, internal access roads, associated car parking, open space and landscaping and including works to trees under TPO 1931
Location: Woodcroft Farm Development Site, Woodcroft Lane, Waterlooville

Thank you for your consultation on the above dated 10 September 2013 which was received by Natural England on 10 September 2013.

Natural England is a non-departmental public body. Our statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development.

The Wildlife and Countryside Act 1981 (as amended)
The Conservation of Habitats and Species Regulations 2010 (as amended)
The National Park and Access to the Countryside Act 1949

Natural England's comments in relation to this application are provided in the following sections.

Statutory nature conservation sites – no objection
Based upon the information provided, Natural England advises the Council that the proposal is unlikely to affect any statutorily protected sites.

Protected landscapes – no comments
Having reviewed the application Natural England does not wish to comment on this development proposal.

The development however, relates to the South Downs National Park. We therefore advise you to seek the advice of the National Park Authority. Their knowledge of the location and wider landscape setting of the development should help to confirm whether or not it would impact significantly on the purposes of the designation. They will also be able to advise whether the development accords with the aims and policies set out in the National Park management plan.

Protected species
If the LPA is aware of, or representations from other parties highlight the possible presence of a protected or priority species on the site, the authority should request survey information from the applicant before determining the application. The Government has provided advice[1] on priority and protected species and their consideration in the planning system.

Natural England Standing Advice for Protected Species is available on our website to help local planning authorities better understand the impact of development on protected or priority species should they be identified as an issue at particular developments. This also sets out when, following receipt of survey information, the authority should undertake further consultation with Natural England.

We recommend that you consult your in-house or retained ecologist on the implications of this application for protected species and other nature conservation interests.

Local wildlife sites
If the proposal site is on or adjacent to a local wildlife site, eg Site of Nature Conservation Importance (SNCI) or Local Nature Reserve (LNR) the authority should ensure it has sufficient information to fully understand the impact of the proposal on the local wildlife site, and the importance of this in relation to development plan policies, before it determines the application.

Biodiversity enhancements
This application may provide opportunities to incorporate features into the design which are beneficial to wildlife, such as the incorporation of roosting opportunities for bats or the installation of bird nest boxes. The authority should consider securing measures to enhance the biodiversity of the site from the applicant, if it is minded to grant permission for this application. This is in accordance with Paragraph 118 of the National Planning Policy Framework. Additionally, we would draw your attention to Section 40 of the Natural Environment and Rural Communities Act (2006) which states that '*Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity*'. Section 40(3) of the same Act also states that '*conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat*'.

Landscape enhancements
This application may provide opportunities to enhance the character and local distinctiveness of the surrounding natural and built environment; use natural resources more sustainably; and bring benefits for the local community, for example through green space provision and access to and contact with nature. Landscape characterisation and townscape assessments, and associated sensitivity and capacity assessments provide tools for planners and developers to consider new development and ensure that it makes a positive contribution in terms of design, form and location, to the character and functions of the landscape and avoids any unacceptable impacts.

We would be happy to comment further should the need arise but if in the meantime you have any queries please do not hesitate to contact us.

For any queries regarding this letter, for new consultations, or to provide further information on this consultation please send your correspondences to consultations@naturalengland.org.uk.

We really value your feedback to help us improve the service we offer. We have attached a feedback form to this letter and welcome any comments you might have about our service.

[1] Paragraph 98 and 99 of ODPM Circular 06/2005

Yours faithfully

Judy Connell
Customer Service Consultation Team

Havant BOROUGH COUNCIL

Public Service Plaza
Civic Centre Road
Havant
Hampshire PO9 2AX

T 023 9247 4174
F 023 9249 8031

www.havant.gov.uk

Mr Brewer
Savills
2 Charlotte Place
Southampton
SO14 0TB

For: Mr McGuire
Vistry Homes

The Town and Country Planning (Development Management Procedure) (England) Order 2015
Grant of Planning Permission

Application Number: APP/20/00115
Site Address: Woodcroft Farm Development Site, Woodcroft Lane, Waterlooville
Proposal: Application for Non-Material change to Phase 2B (Residential Phase 1B) of planning permission APP/13/00804 to replace former detached farmhouse dwelling with 1No. 4-bed detached dwelling.

Further to your application received on 10 February 2020, which was valid from 11 February 2020 Havant Borough Council, as Local Planning Authority **Grants Planning Permission** for the above proposal in accordance with the submitted plans and particulars as detailed below.

This permission is subject to compliance with:

(i) The plans and other documents submitted with regard to your application; and

(ii) The following conditions:

Conditions:

1 The development hereby permitted shall be carried out in accordance with the following approved plans:

2740-C-1005 Phase 2B (Residential Phase 1B) Site Layout Rev G
2740-C-1006 Masterplan Rev F
2740-C-1008 Facing materials plan Rev D
Westminster Elevations Flint
Westminster floorplans

Reason: - To ensure provision of a satisfactory development.

Other Important Information:

(1) This notice only relates to the decision of Havant Borough Council as Local Planning Authority under the Town and Country Planning Acts. It does not relate to any other application that may be required under the Building Regulations or under any other Act, Regulation, Byelaw or Order where the Council's approval may be needed. For further guidance as to the need for consent under the Building Regulations please phone 023 9244 6571.

(2) Your attention is drawn to the attached information regarding firstly your right to appeal to the Planning Inspectorate, if you are aggrieved by the Council's decision, and secondly the rights of an owner to, in certain circumstances serve a purchase notice on the Council. See www.planningportal.gov.uk/pcs.

(3) Any failure to adhere to the details of the approved plans, and other documents or to comply with any conditions listed above may lead to enforcement action being taken by the Council. If you wish to depart from the approved details or conditions in any way you should contact the Planning and Development service at the Plaza or by telephoning 023 9244 6015.

Simon Jenkins

Simon Jenkins
Interim Director of Regeneration and Place

06 March 2020

Our Ref: APP/20/00115

HAVANT BOROUGH COUNCIL

Town & Country Planning Act 1990

Consultation on Planning Application

MEMORANDUM

From:	**Environmental Health**	**To:**	**Development Control**
Our Ref:	CONS/20/03953	**Your Ref:**	APP/13/00804
EH Case Officer Extn:	44 6677	**Date:**	14 January 2021

DC Case Officer: Daphney Haywood
DC Case Officer Extn: 44 6513
Application Number: APP/13/00804
Site Address: Woodcroft Farm Development Site, Woodcroft Lane, Waterlooville

Proposed Development: Development of 288 residential units comprising 9 x one bedroom, 110 x two bedroom, 124 x three bedroom and 45 x four bedroom, retention of existing farmhouse, new access road from Eagle Avenue, internal access roads, associated car parking, open space and landscaping and including works to trees under TPO 1931 (Approved 5 May 2015) **Request to partially Discharge Condition 11 (30.11.2020)**

Observations / Comments:

I have now had opportunity to review the supporting information in respect of this application. Given the volume of relevant information submitted, it may be helpful to confirm the documentation reviewed, and the scope of the review;

- **GE16943-RSVP-FY-V5.0-AUG20** – reviewed for material amendments relative to previous version(s) reviewed (v.2.0 & v4.0)
- **GE16943-RSVP-CP-V5.0-AUG20** – reviewed in full, not previously submitted, or Environmental Health not previously consulted on report content.
- **GE16943-RSVP-HA-V4.0-AUG20** – reviewed in full, not previously submitted, or Environmental Health not previously consulted on report content. Note; version control sheet indicates that the submitted is v.5.0, document reference remains v.4.0, and MMP / AMP refer to this document as v.4.0.
- **GE18761-AMP-AUG20-V1.0** – reviewed in full
- **GE18761-MMP-NOV20-V2.0** – reviewed in full

Details relate to phase 2B & phase 3 of development ('residential phase' 1B & 2), representing the balance of development consented under base consent APP/13/00804.

I have already provided a brief update to Vistry Southern by email, outlining the principle material issues identified following a review of the above documentation

General

The revisions to site investigations reflect changes to the proposed reduced dig / placement volumes – planning may wish to confirm with the applicant whether any changes to proposed finished ground levels (and related building ridge heights etc.) arise that are material to the

planning consent(/s) being implemented.

GE16943-RSVP-HA-V4.0-AUG20 (REMEDIATION STRATEGY & VERIFICATION PLAN for the land at HORSE ARENA (HA), WOODCROFT FARM)

The CLEA Risk assessment presented includes results from the wider site investigation. It is not specifically stated which samples are included / excluded from the assessment, but it is likely that 'chalk pit & landfill' 'and 'farmyard' areas are excluded (i.e. it is assumed that the dataset comprises the former horse arena ('HA') and all other areas of the wider development site).

Both Arsenic (As) and Beryllium (Be) have been shown to exceed their respective generic assessment criteria (GAC) across this wider dataset, with outliers present at the former HA. In the case of Be, all statistical outliers were associated with the HA area. I have not established whether the same is the case for As.

Alternative statistical assessments (based upon different sample population groupings) are not presented to justify the conclusion that the HA area is the only area affected. I would normally expect the assessment to show;

a) That the estimated 'true' mean concentration (μ) is less than the GAC (critical concentration, or Cc); i.e. μ <Cc, with outliers removed from the dataset, and;
b) That the outliers are grouped / associated and may be segregated into a different conceptual sample population for separate consideration

The report does not present such an assessment, but is nevertheless written with an implicit assumption that such an assessment has been undertaken, that the assessment showed that all outliers are associated with the HA area, and that μ <Cc for a dataset that excludes the results from the HA area. I have not undertaken a statistical check to confirm whether or not this is the case, as this is certainly true for Be, and the statistics are not critical to my principle point of concern.

Outliers for both As & Be exist within the HA area within natural soils. The site conceptual model assumes *"that the most likely cause of the impacted natural soil within the horse arena would be from the imported sand dressing utilised as a cover in this area. Through the use of the area as a horse arena and the disturbance of the cover this may have resulted in a mixing, albeit minimal, of the imported materials with underlying natural soils."*.

The assumption of migration by minimal physical mixing (though use) is inconsistent with outliers being identified in natural soils at depths of 0.8m. The results imply much more significant vertical migration, whether by percolation (dissolution / physical) or via bioturbation.

It is also relevant to highlight that the above-quoted conceptual model assumes that the 'top-dressing' to natural superficial geology is the contaminant source, and that vertical migration has occurred through all intermediate soils, to the depth where contaminants have been identified in shallow geology (i.e. vertical migration via topsoil).

Nevertheless, section 2.4 2) indicates that *'The Topsoil within [the HA] area has not been identified as being impacted by contaminants, so <u>would be suitable for re-use within private gardens and areas of soft landscaping</u>'* (my emphasis). This conclusion is based upon 2 no. samples, and no consideration is given to the incompatibility of those results / this conclusion with the conceptual site model presented. Given;

- The statement at 2.4 2),
- The limited evidence on which it is based, and
- The assumed conceptual model –

There is a risk that significantly contaminated topsoil is relocated from the HA area and placed

on the clean side of a cover system elsewhere on the site. This would place material with concentrations of contaminants above their respective GAC's within the exposure zone (0-300mm depth) in a contamination sensitive area (e.g. private rear garden area). This would represent a very small relevant averaging area, and risks individual plots being capable of being determined to be contaminated land (in the statutory sense) after development. This would be contrary to both local & national policy, and would defeat the purpose of the planning condition.

For this reason, I would expect topsoils from this area of the site to be regarded as contaminated unless post-excavation verification sampling shows the material to be suitable for use. Sufficient samples to support a stand-alone statistical assessment would be required (to demonstrate concentrations to be <GAC), and even where this proves to be the case, it would tend to indicate that the site conceptual model underpinning the design of risk mitigation works is not likely to reflect the true source & migration model. This in turn would undermine confidence in the risk assessment and decisions taken on the basis of that assessment – e.g. cover design, and the spatial extent over which a cover system should be implemented.

I also note that the example cover system shown at section 3.2 shows no separation layer between clean cover material and natural soils, and assumes that the formation level is uncontaminated (text at 3.2). With reference to the depth of identified outliers, it is unclear as to why it may be assumed that the formation level within the HA area is uncontaminated.

Given this, it is considered that the cover specification should either;

- assume that the formation level is contaminated, and provide a physical barrier & deter-to-dig marker layer or
- demonstrate that the GAV is not exceeded within the CLEA relevant zone (0-1.0m below finished ground levels)

To proceed under the assumption proposed risks the same policy conflict as described above, through long-term bioturbation & plant uptake.

I would anticipate the fundamental spatial grouping (i.e. HA area being distinct from the wider site) proving broadly correct, and I note that a precautionary approach has been taken to the plot inclusion of plots within the remedial & risk mitigation method statement for the HA area. I am reasonably comfortable with a precautionary approach being taken to the uncertainty with the conceptual model, and would accept upgrading of the cover system & preclusion of use of topsoil from the HA area above cover systems without specific verification as an alternative to further empirical justifications (if preferred by the applicant).

I am however unable to support the proposed remedial strategy for this area in it's current form. Please note, that affects the phase 3 area only. The above would not raise any objection to a spatially defined discharge of condition 11 pt. 1 & 2 for the Phase 2B area.

GE18761-AMP-AUG20-V1.0 (ASBESTOS MANAGEMENT PLAN for the land at WOODCROFT FARM PHASES 2B & 3)

I have some reservations about the options selected within the CAR decision tool presented at Appendix A of the AMP, and there is a the lack of clarity over the origin of the quoted maximum asbestos quantification result. This notwithstanding, the risk reduction provisions at section 6.0 provide some comfort in the representation of risks within the decision support tool, and the consequential omission of RPE from the list of control measures. Specifically, personal exposure monitoring and 'reassurance' air testing provide the opportunity to monitor the contaminant within the vector medium, and indicate that this risk will be appropriately kept under active review.

Risks are primarily to construction staff, and with reference to para. 183 of the NPPF, it is probably more appropriate to rely upon the HSE as regulator of the Control of Asbestos

Regulations 2012, than it is to treat this as a material planning matter. Residual risks arising from the placement of soils containing asbestos are addressed via the remedial method statements included within the reports listed at the head of this consultation response, relating to the appropriate use of land, and hence being material planning matters.

I raise no objection to the acceptance of the AMP.

GE18761-MMP-NOV20-V2.0 - MATERIALS MANAGEMENT PLAN (MMP) for the land at WOODCROFT FARM PHASES 2B & 3

The Materials Management plan is dependent upon the content of the documents listed. The issues described above in relation to GE16943-RSVP-HA-V4.0-AUG20 are material to the acceptance of the MMP; and will require a response from the applicant (to address the specific & limited objection).

Otherwise, I have no objections to the content of the MMP, and it may be accepted following clarification on the remedial strategy relating to the HA area.

As above, I have no objection to a spatially defined discharge (relating to the phase 2B area) while the applicant considers the appropriate response to the objections raised above in respect of the HA area.

Mr. Jonathan Driver
Environmental Control Officer

Fiona Goode

From: Driver, Jonathan <Jonathan.Driver@havant.gov.uk>
Sent: 16 February 2021 20:04
To: Harry Jackson
Cc: Fiona Goode; Haywood, Daphney
Subject: RE: APP/13/00804 - c.11 Contaminated Land, Remedial Strategy, Verification Plan, and Materials Management Plan (Woodcroft Farm)

Good evening Harry,

Firstly, I would like to confirm that following a review of the […]HA-V6.0-FEB21 document, I have no outstanding concerns, and that I am now able to accept the revised RSVP (and the implicit MMP, in principle). I have drafted revised comments for the current condition-discharge application, however before I send them, I would highlight that the text at 1.1 of the GE16943-RSVP-HA-V6.0-FEB21 report refers to consequentially amended RSVP's for the chalk pit & farm yard area(s) (assumed document ref's [GE16943-]RSVP-CP-V6.0 & [GE16943-]RSVP-FY-V6.0). It is also assumed that the MMP would also have required consequential amendments, and I would assume that the GE18761-MMP-NOV20-V2.0 document has now been superseded by a GE18761-MMP-FEB21-V3.0 version.

For planning purposes – i.e. the discharge of c.11 parts 1 & 2 for the Phase 2B & Phase 3 areas, my expectation is that copies will be required. On the assumption that the revisions have already been done, and that the amendments are consequential in nature (i.e., substitution of superseded figures, and updated document references only), I don't imagine that this will lead to any significant delay. I should be able to turn-around a review fairly quickly; it should simply be a procedural matter to "dot the i's" for the purposes of the planning approval / decision notice.

The planning-need may differ from the pressing need to confirm the Local Authority's 'in principle' acceptance of the MMP for the purposes of the Waste Code of Practice (DoWCoP), but it may equally be that the two are mutually dependent. If the DoWCoP declaration is not dependent upon the planning decision (formal acceptance), then the opening statement in this email may suffice.

I hope that you don't mind my copying both the planning officer & GESL to this email for expedience. Any problems, please let me know.

Best Regards,

Jon

Jonathan Driver
Environmental Control Officer

Havant Borough Council Environmental Health
Public Service Plaza, Civic Centre Road, Havant, Hants PO9 2AX

Tel (Direct Dial): 023 9244 6677
Tel (Mobile) : 07887 951 106
Tel (Team Admin): 023 9244 6670

Email: jonathan.driver@havant.gov.uk

Fiona Goode

From: Wickens, Tom <tom.wickens@environment-agency.gov.uk>
Sent: 03 December 2020 18:47
To: Fiona Goode
Subject: RE: Woodcroft Farm - MMP and Controlled Waters risks

Hi Fiona,

Many apologies, I realised that not got back to you on this.

Just to confirm I have spoken to Johnathan Driver regarding the potential risk to controlled waters, and the elevated Arsenic and Zinc in the soils at depth in one location. He confirmed that as long as the EA and Portsmouth Water are comfortable that there is no unacceptable risk to controlled waters, he would be happy to.

I have also gone the MMP and have no significant issues with the contents.

If it has not yet been finally issued, I would request a couple of small changes/additions, which hopefully would not cause issues.

(1) I would request that no potentially impacted soils or other site won material be deposited within a set distance (c10m) of any sinkhole (thought we may have discussed this at some point but could not spot anything in the MMP.
(2) Just a small change on the form, I should be listed as the GW content instead of Dawn O'Neil.

Kind Regards

Tom

Tom Wickens
Technical Specialist - (Groundwater Quality and Contaminated Land)
Solent and South Downs
Environment Agency

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tom.wickens@environment-agency.gov.uk

Fiona Goode

From: Jennings, Vic <victor.jennings@environment-agency.gov.uk>
Sent: 14 October 2020 15:47
To: Fiona Goode
Cc: Wickens, Tom; Parkinson, Matt
Subject: FW: DOWCOP Woodcroft Farm (Phases 2B and 3), Woodcroft Lane, Lovedean, Hampshire, PO8 9QA (Planning ref - APP/13/00804)

Hi Fiona,

Apologies for the delay in replying.

We have a number of issues regarding the use of DoW CoP at historic landfill sites. The general consensus is that the DoW CoP is not suitable for these activities as the material in a landfill is waste and is not clean naturally occurring.

I will have no objections to the use of the DoWCoP provided;

- All requirements stipulated by my colleagues in the GWHCL team (Tom Wickens cc'd) are adhered to,
- All requirements of the DoWCoP are met and
- Any waste excavated from the landfill will need to be assessed and removed from site and sent to an appropriately permitted facility that can accept that waste.

Please let myself or Matt know if you have any questions.

Kind regards,

Vic Jennings Bsc(Hons) MSc(Eng) MCIWM
Senior Environment Officer
EPR Waste – West
Solent & South Downs Area
20 Manners View, Dodnor, Newport, Isle of Wight. PO30 5FA

From: Fiona Goode [mailto:Fiona.Goode@gesl.net]
Sent: 06 October 2020 12:34
To: Jennings, Vic <victor.jennings@environment-agency.gov.uk>
Cc: Gavin Roberts <gavin.roberts@gesl.net>; Bethany Fairley <Bethany.Fairley@portsmouthwater.co.uk>; Simon Deacon <Simon.Deacon@portsmouthwater.co.uk>; Wickens, Tom <tom.wickens@environment-agency.gov.uk>; Parkinson, Matt <matt.parkinson@environment-agency.gov.uk>
Subject: RE: DOWCOP Woodcroft Farm (Phases 2B and 3), Woodcroft Lane, Lovedean, Hampshire, PO8 9QA (Planning ref - APP/13/00804)

Hi Vic,

Thank you for your response. In answer to your query the majority of material proposed for reuse on this site are to come from the Made Ground located within the Farmyard area of the site. A number of plots have been identified as requiring a reduced dig prior to the installation of a soil cover system in this area.

It is proposed to raise levels within the former landfill area and install a soil cover system within garden areas in this part of the site. During the excavation of foundations within the former landfill area there may be some surplus materials as a results of these excavations, and it is proposed to reuse these beneath proposed soils cover systems in areas of the site already impacted by contaminants and Made Ground materials. However, the majority of plots within the former

landfill area require a piled foundation solution so it is anticipated that only very minimal volumes of Made Ground material from the former landfill area would be proposed for reuse.

Hope this addresses your query however if you need any further information please come back to me.

Many Thanks,

Fiona Goode

MSc, BSc (Hons), FGS, RSoBRA
Senior Consultant Engineer

From: Jennings, Vic <victor.jennings@environment-agency.gov.uk>
Sent: 06 October 2020 12:21
To: Fiona Goode <Fiona.Goode@gesl.net>
Cc: Gavin Roberts <gavin.roberts@gesl.net>; Bethany Fairley <Bethany.Fairley@portsmouthwater.co.uk>; Simon Deacon <Simon.Deacon@portsmouthwater.co.uk>; Wickens, Tom <tom.wickens@environment-agency.gov.uk>; Parkinson, Matt <matt.parkinson@environment-agency.gov.uk>
Subject: RE: DOWCOP Woodcroft Farm (Phases 2B and 3), Woodcroft Lane, Lovedean, Hampshire, PO8 9QA (Planning ref - APP/13/00804)

Dear Fiona,

Thank you for seeking our opinion on the re-use of material at this development site under the Definition of Waste CL:AIRE Code of Practice (DoWCoP).

Please could you clarify if material from the 'former landfill' is to be included within the DoWCoP submission.

I have copied in my colleague Matt Parkinson to this e-mail as this lies within his Teams area (Waste Central).

Kind regards,

Vic Jennings Bsc(Hons) MSc(Eng) MCIWM
Senior Environment Officer
EPR Waste Team – West
Solent & South Downs Area
20 Manners View, Dodnor, Newport, Isle of Wight. PO30 5FA
Tel: 07889448346

From: Wickens, Tom <tom.wickens@environment-agency.gov.uk>
Sent: 02 October 2020 10:40
To: Fiona Goode <Fiona.Goode@gesl.net>
Cc: Gavin Roberts <gavin.roberts@gesl.net>; Simon Deacon <Simon.Deacon@portsmouthwater.co.uk>; Bethany Fairley <Bethany.Fairley@portsmouthwater.co.uk>; Jennings, Vic <victor.jennings@environment-agency.gov.uk>
Subject: [EXTERNAL] RE: DOWCOP Woodcroft Farm (Phases 2B and 3), Woodcroft Lane, Lovedean, Hampshire, PO8 9QA (Planning ref - APP/13/00804)

Hi Fiona,

Apologies for the delay in getting back. I had to take a few day leave, which I needed to extend and have only just been able to get back to work and fully onto our network.

Just to update, I have been discussing some of the issues at this site with Portsmouth Water. They have been going through the documents that you provided and those on the planning portal.

As previously indicated, with respect to protection of the underlying aquifer and associated water supply source, there is no intrinsic reason why this proposal is fundamentally unacceptable. We may however need some additional reassurance with relation to reuse criteria and hotspot discovery protocol, given the exceptional controlled water sensitivity of the location.

From the feedback I have had from Portsmouth Water, I believe that they also feel that there fundamental objection and believe the risks are manageable. They though may also still want to clarify some of the protocol on the reuse.

One other point that I should highlight, is that any discussion would relate solely to the controlled water issues of the uses of this material relating to the location in the inner source protection zone and in the vicinity of karstic features. Rather than the standard reuse issue from a waste perspective. Basically is there any specific controlled water issues with reuse given the groundwater sensitivity of the location rather than are there any fundamental waste issues with reusing this material.

From what I could see the material that you are proposing to reuse are fairly standard (i.e. waste soil /sub soils with a proportion of made ground and some low levels of contaminants, from proposed garden areas).

I do note though that there is an area described as a “former landfill”. The information though indicates that this was a very historic old chalk pit, adjacent to the farm, that appear to have been infilled, for reason unknown a sometime ago. Could see no indication that this was actually ever a registered or permitted landfill. The infill material appears to be primarily sandy clay (possibly just reworked local Lambeth Group from the farm site) containing a certain amount of bricks/wood with small quantities of materials such as ashes or plastic. I need to clarify if there may be any general waste issues with reusing this material under DOWCOP.As I have copied in my colleague Vic Jennings from one of our Waste teams to see if he has any comments.

In term of dates, I am still very much on catch-up so fairly busy next week. I am available though next

Tuesday 6th October, Afternoon.

I am also available on Thursday afternoon and good availability week beginning 12th.

Simon/Bethany would you wish to attend any meeting?

Apologies again in the delay in responding.

Kind Regards

Tom

Tom Wickens
Technical Specialist - (Groundwater Quality and Contaminated Land)
Solent and South Downs
Environment Agency

Romsey Office, Canal Walk, Romsey ,Hampshire,SO51 8DU
Tel - 07867 200775

tom.wickens@environment-agency.gov.uk

It would probably be worth us having an initial talk through some of the above.

Given the issues we work very closely in the area with Portmouth Waters Groundwater Protection team, and believe that they should be made aware of any proposal. Is it ok to forward this e-mail to one of their groundwater specialist?

After any initial talk through, there may be the need to a telecom with relevant parties, to discus the ways that risk can be controlled ,prior to confirming if we can agree to the resuse proposal.

Kind Regards

Tom

Kin

From: Fiona Goode [mailto:Fiona.Goode@gesl.net]
Sent: 01 September 2020 13:45
To: O'Neill, Dawn <dawn.oneill@environment-agency.gov.uk>
Cc: Enquiries, Unit <enquiries@environment-agency.gov.uk>; Parkin, Chris <chris.parkin@environment-agency.gov.uk>
Subject: DOWCOP Woodcroft Farm (Phases 2B and 3), Woodcroft Lane, Lovedean, Hampshire, PO8 9QA (Planning ref - APP/13/00804)

Dear Dawn,

We have previously been in contact with you regarding another site where works were proposed be undertaken under the Definition of Waste Code of Practice (DOWCOP), as such I hope it is ok to contact you directly in this respect.

We have another site we are working on for Vistry Homes Southern who are developing the following site:

Woodcroft Farm (Phases 2B and 3), Woodcroft Lane, Lovedean, Hampshire, PO8 9QA
Planning Ref: APP/13/00804 (Havant Borough Council).

As part of the works on site the developer proposes to re-use c.558m^3 (this figure does not include the required suitably clean materials for the proposed soil cover systems) of materials on the site of origin to include natural soils and Made Ground that is present under the Definition of Waste Code of Practice (DoWCoP) to make up development levels where required and where deemed to be suitable for use. The excavation of the required reduced dig of Made Ground material within specific plots located in the Farmyard area of the site and foundation arising will generate c.312m^3. Therefore it is proposed to re-use this excavated Made Ground material within garden areas, beneath the proposed soil cover system within the Farmyard and Chalk pits areas of the site, where impacted materials have already been identified, where plots have also been identified as requiring levels to be raised to achieve final development levels, and remove the need to import material to the site. In addition, Topsoil from across the entire site has been identified as not being impacted by contaminants therefore it is proposed to reuse this site won Topsoil within proposed private gardens areas and proposed areas of soft landscaping to remove the need to import Topsoil material to site. The Made Ground materials have been identified as containing low levels of contaminants (Beryllium, Dibenzo(a,h)anthracene and Asbestos). As such an acceptance of the Remediation Strategy and Verification Plans and agreement in principal for the re-use of materials under the DOWCOP needs to be obtained from the Environment Agency to allow them to proceed under the DOWCOP. As the majority of the site was deemed not to be impacted by contaminants 3 separate RSVP's have been written to address the 3 distinct impacted areas of the site, these have been attached for review. To date no mobile contaminants have been identified as a risk to controlled waters and a discovery strategy will be in place during the site clearance and development works.

It is our understanding that the Local Authority are unlikely to submit the attached document to the EA for consultation through the planning process due the fact that the EA were not consulted/did not provide any comment in relation to contamination on the original application for the site, and the main risks identified relate to human health as opposed to controlled waters and therefore there is likely they have no remit to consult the EA.

In order to comply with the DOWCOP we need the following from the Environment Agency:

- agreement of the RSVP's and
- agreement of the principal to re-use material submit to the MMP and QP declaration

It is my understanding this needs to come from the Waste team and/or the Contaminated Land team, however as the contact centre are not permitted to give our contact details for the teams directly we would ask that if you are not the correct person to contact for this area could you please forward this email to correct person and copy us in for information please or provide us with a contact who we can consult to obtain agreement.

I look forward to hearing from you and if you need any further information please let me know.

Many thanks in advance for your help.

Kind Regards
Fiona

Fiona Goode

MSc, BSc (Hons), FGS, RSoBRA
Senior Consultant Engineer

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Fiona Goode

From: Simon Deacon <Simon.Deacon@portsmouthwater.co.uk>
Sent: 22 October 2020 16:28
To: Fiona Goode; Wickens, Tom
Cc: Gavin Roberts; Bethany Fairley
Subject: RE: Woodcroft Farm - MMP and Controlled Waters risks

Hi Fiona – apologies for not responding sooner. I am happy with the content of the MMP.

Regards, Simon

Simon Deacon BSc MSc FGS CGeol
Catchment and Environment Manager
Portsmouth Water
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From: Fiona Goode <Fiona.Goode@gesl.net>
Sent: 13 October 2020 12:26
To: Wickens, Tom <tom.wickens@environment-agency.gov.uk>
Cc: Simon Deacon <Simon.Deacon@portsmouthwater.co.uk>; Gavin Roberts <gavin.roberts@gesl.net>
Subject: [EXTERNAL] Woodcroft Farm - MMP and Controlled Waters risks

Hi Tom,

Thank you very much for your time earlier, I think it was a productive meeting.

As discussed please find attached the geotechnical investigation report we carried out which includes a liDAR survey of the site. (The relevant mapping is from page 34).

I've also attached a draft of the MMP for the site for your comment. As agreed, I've copied Simon Deacon of Portsmouth Water in to this email so he can review the draft MMP as well, if required.

With regards to the Arsenic and Nickle which was identified during the site investigation works within one location in the natural soils, the trail pit where the contaminant were identified was TP314. The elevated results were found at a depth of 1.6m bgl with clay material. Arsenic was encountered at 243mg/kg and Nickle at 217mg/kg. The trial pit was excavated to a total depth of 2.5m bgl with clay soils encountered to this depth, chalk was not encountered. The subsequent leachate testing did not identified levels of Arsenic or Nickle above the laboratory limit of detection.

I understand that you will discuss the potential risks to controlled waters and the site investigation works undertaken to date with Jonathan Driver at Havant Borough Council, and come back to us with comments.

I will wait to hear from you with regards to the draft MMP and potential risks to controlled waters.

It may also be necessary for us to arrange a meeting to include Portsmouth Water to discuss the piling proposals on the site within the former landfill/ chalk pit area, but we can deal with this matter you have had a chance to review the draft MMP and all the site investigation information.

Looking forward to getting your feedback soon.

Many Thanks,

Fiona Goode

MSc, BSc (Hons), FGS, RSoBRA
Senior Consultant Engineer

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Proposed Residential Development, Woodcroft Farm, Waterlooville, Hampshire

Geoenvironmental and Geotechnical Ground Investigation Report

Project Ref: 21834/030

Doc Ref: R02/rev01

July 2013

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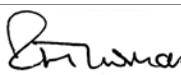
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Project Ref: **21834/030**

Report Title: **Geoenvironmental and Geotechnical Ground Investigation Report**

Doc Ref: **R02/rev01**

Date: **November 2011**

	Name	Position	Signature	Date
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For and on behalf of Peter Brett Associates LLP				

Revision	Date	Description	Prepared	Reviewed	Approved
Rev00	Nov 2011	Draft for Comments	AZ	AD	RHT
Rev01	July 2013	Final for Issue	AZ	AD	RHT

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Summary

This report presents an interpretation of the findings of the geotechnical and geoenvironmental investigation carried out to determine the ground conditions at the site of Woodcroft Farm, Waterlooville. The investigation has been carried out to determine the ground conditions on the site to support the planning application for the proposed development.

The site is located adjacent to the western part of Horndean, near Waterlooville. The site is situated on ground sloping to the southeast with a small valley feature located along the western boundary. Historically the site has been used as a farm with open fields although a chalk pit was infilled with inert waste during the 1970s. Currently the site is occupied by a farm and fields used for grazing horses and a small yard occupied by a vehicle dismantling and repair workshop. There are a number of sinkholes as a result of karstic weathering of the Chalk recorded within the site and the near area.

The investigation revealed that ground conditions in the northwest part of the site comprise Pleistocene Head Deposits overlying Chalk Bedrock. On the south and east parts of the site Lambeth Group clay is present overlying the Chalk, with occasional pockets of superficial Head Deposits present overlying the Lambeth Group. Made Ground was encountered overlying the natural soils in the infilled pit and within the farmyard. Sinkholes associated with karstic weathering of the Chalk and solution feature cavity infills were encountered at a number of locations at the site. Details of the strata are summarised in the following table.

Stratum		Depth to base (m bgl)	Typical Description
Sinkhole and Solution Features Infill		2.5 to 7.5	Variable in composition and comprised clay with variable proportions of sand and gravel and silty sand with some chalk and flint gravel.
Made Ground	Infilled Pit	0.6 to 5.8	Variable in composition and comprised clay with changing proportions of sand, gravel and some timber and organic matter. Locally layers of sandy gravel with cobbles and boulders of concrete and brick up 1.2 m long were found.
	Dismantling Yard	0.5 to 0.6	Variable in composition and comprised clayey gravel and sandy gravelly clay.
Head Deposits		1.4 to 4.2	Typically comprises clay with variable proportions of silt, sand and gravel with pockets and beds of sand and/or gravel with some clay.
Lambeth Group		2.4 to 12.7	Multicoloured clay with some silt and sand partings and locally silt and sand. The clay locally contains red and black round and subrounded flint gravel
Upper Chalk		>15.0 base not proven	White with black specks with occasional orange staining recovered as gravelly sandy chalk silt and a silty chalk gravel and cobbles. Locally the Chalk contained seams <5 mm thick of soft brown clay.

Groundwater level in the Chalk as measured in an existing water well was at about 30 m depth. Perched groundwater table was encountered within the Lambeth Group with groundwater levels measured between 4.1 and 6.5 m below ground level.

As confirmed by the ground investigation there are no site wide plausible pollutant linkages because there are no pollutant sources on most of the site. The exceptions are the infilled pit and the vehicle repair/dismantling areas where locally elevated concentrations of a limited number of heavy metals, PAH and asbestos were identified when screened against assessment criteria for a residential with plant uptake land use.

The concentrations of potential contaminants in the eluate from soils on site are below the Environmental Quality Standards values for surface waters and the UK drinking water quality standards. Hence the risks to groundwater are considered to be negligible and not taken forward.

The presence of slightly impacted soils associated with the Made Ground in the infilled pit and the vehicle dismantling area, will require some form of mitigation / remediation if used for residential purposes. There a number of options with regards to the mitigation measures / remediation. The preferred option should be chosen on the balance between economics, sustainability and a reduction in the level of risk as it currently exists. Alternatively, land use other than residential with gardens can be considered for these areas.

Measured concentrations of ground gases indicate elevated methane and carbon dioxide in the infilled pit and the vehicle dismantling yard. Gas protection measures are required for any proposed structures in these areas.

Given the disturbed nature of the soils within and immediately adjacent to the sinkholes a buffer zone of 10m from the known edge of any untreated sinkhole is recommended for any development including buildings, services or roads. Alternatively, the sinkholes can be stabilised to allow future development.

Undiscovered solution features that can lead to sinkhole formation are a site wide subsidence hazard. Furthermore, the Head Deposits may present a risk of excessive total and/or differential settlement if conventional shallow foundations are adopted, even when solution features or sinkholes are absent. It is recommended that the proposed buildings are founded on re-inforced conventional spread or strip foundations, using a combination of probing at close centres and the design of foundations and/or ground beams to span a potential void are adopted to reduce the risk of structural damage due to subsidence or settlement to an acceptable level. Alternatively, re-inforced concrete raft foundations designed to span a 3 m diameter void can be used. Piled foundations are unlikely to be suitable because of the deep penetrative weathering present in places at the site and the possible presence of deep unconsolidated and variable solution feature infill.

The Made Ground in the infilled pit is unsuitable as a founding medium due to its weak and compressible characteristics. It could remain as public open space, however, if needed for development, the most suitable foundation solution for this area is to excavate and remove the upper 2.0 m of the Made Ground and replacement it with an engineered fill. After backfilling the ground can be used to support a grillage of ground beams or a reinforced raft foundation that can accommodate long term settlement of the infill material below. Alternatively, ground improvement using dynamic compaction may be a suitable technique to provide a base to support structures.

The natural soils on site are likely to be suitable for reuse as engineered fill. The materials are likely to be classified as Class 2A and 2C in accordance with the Series 600 of the Highway Agency Specification for Highway Works. The natural moisture content of the near surface materials is relatively high compared to the optimum moisture content, as such, the near surface materials are likely to require some moisture conditioning prior to compaction.

Surface water drainage using infiltration (soakaways) is not likely to provide a suitable site wide drainage solution to accommodate surface runoff from the development because clay soils predominated at shallow depth over much of the site. Also any soakaways will need to be sited at least 20 m from any structures in case the concentrations of water inflow mobilise solution feature movement. Deep bored soakaways may be suitable however locations should be checked for any evidence of karst features and positions adjusted where possible to avoid solution features.

Additional ground investigation is not likely to be required to support the planning application for redevelopment of the site at this stage. However, additional ground investigations may be required prior to the redevelopment of the site and as part of the detailed design process to confirm the findings of the ground investigation and design any remediation and/or mitigation measures should these would be required with regards to its geoenvironmental conditions, and to deal with the risks associated with subsidence hazard associated with solution features.

The summary contains an overview of the key findings and conclusions. However no reliance should be placed on any part of the summary until the whole of the report has been read

1 Introduction

Peter Brett Associates LLP, PBA, have been retained by Grainger plc, the Client, to carry out a Geotechnical and Geoenvironmental Ground Investigation at the site of Woodcroft Farm, Waterlooville, Hampshire.

Previously a desk study review of readily available published information was carried out to assess the ground conditions on the site and the potential for contamination to be present associated with previous and present uses of the site and the surrounding areas. The report included a qualitative assessment of the geotechnical and geoenvironmental constraints for development. In particular the report identified that a small part of the site had been landfilled with waste parting the past, and that there was a ground stability solution feature hazard at the site. The report was used to inform the design of the ground investigation. The findings of the desk study are presented in a separate report prepared by Peter Brett Associates LLP (PBA, 2010).

The investigation has been carried out to determine the ground conditions on the site to support the planning application for the proposed development. The primary aims of the investigation were to meet the requirements of PPS23: Planning and Pollution Control, Annex 2, Development on Land Affected by Contamination, and PPG14: Development on Unstable Land.

The fieldwork and geotechnical laboratory testing were carried out by Risk Management Ltd acting under instruction of Peter Brett Associates LLP. The factual results of the investigation are presented in a separate report prepared by Risk Management (RML, 2011), with the exception of the Window Sample logging records and the contamination testing certificates, both items of work that were undertaken by PBA.

This report contains the remainder of the factual data, an interpretation of all of the factual information and comments on the ground conditions in relation to the design and construction of the proposed development, together with an assessment of the risk associated with existing contamination in the ground.

Unless stated otherwise, information from previous studies and investigations has not been included in this report and, where referenced, the reports presenting this information should be read in conjunction with this report.

Attention is drawn to the Essential Guidance for Report Readers in **Section 9**, which provides guidance on the context of the report.

2 Site Description

2.1 Site Location, History and Current Use

The site comprises an area of land that forms part of Woodcroft Farm, located adjacent to the western fringes of Horndean, near Waterlooville. This site is located approximately 2 km to the west of Junction 2 the A3(M) Motorway. The site is located at National Grid Reference SU 682 120. The location of the site is shown on a Site Location Plan presented as **Figure 1**.

The site is irregular in shape with overall plan dimensions of about 650 m along the southern boundary by up to 300 m along the western boundary and occupies an area of some 10 hectares. The ground level falls from the highest point located in the northeast part of the site at about 72.5 m OD to a minor valley feature at the southwest part of the site at about 55.5 m OD along the western site boundary. The site is bounded by a recreation ground and a school to the southeast. Residential housing bounds the southern and eastern boundaries of the site. Agricultural farmland, horse paddocks and woodlands bound the site to the north and west.

Available information indicates that from around the 1870s the site and the immediate surrounding area were predominantly undeveloped consisting mainly of agricultural farmland and woodlands. The site comprises six fields and several farm buildings (including a well) named as Woodcroft Farm which are located within the southwestern part of the site. Four chalk pits and a possible pond are marked on the historical maps within the west part of the site, one of the pits is later labelled as a pond. By the 1930s residential development had taken place approximately 200 m to the east of the site. By the 1960s further residential development had taken place adjacent to the eastern site boundary. By the 1970s the chalk pit labelled in Field 2 had been backfilled. According to the Environment Agency records the pit was filled with 'Deposited waste including industrial waste' (LIG, 2010). Anecdotal information from the farm tenant, Mrs Jenny Manson indicates that the pit was backfilled with inert and construction demolition materials. The farm tenant also stated that the area of the infilled pit continued to settle over the years. Cowplain Meadowlands Junior and Infant School was developed adjacent to the southeastern site boundary, with residential premises to the south of the school.

At the time of the investigation the site comprised predominantly a farmyard and 6 fields used as agricultural pastureland for the grazing of horses. Woodcroft Farm farmyard is located within the central western part of the site. The farm comprised 9 sheds, the majority of which were used as stables and for hay and tack storage. Woodcroft Farm farmhouse is located immediately to the south of the farmyard, with gardens extending 15 m to the north of the house and 20 m to the west. A water well was located about 2 m to the north of the house. A small (~1000 litre) disused fuel storage tank (observed to be empty) was located approximately 20 m to the west of the house. A number of outbuildings are located around the house, and are seemingly used as garages/storage. The stables and outbuildings were observed to be of stone blockwork or metal cladding construction with either metal or possible asbestos cement sheet roofs. A yard used for dismantling and repair of cars and other vehicles is located immediately adjacent to a second yard used to store racing cars is located about 20 m northwest of the farmyard.

Further details of the history and present layout of the site are given in the desk study report (PBA, 2010). The layout of the site is shown on a Site Layout Plan presented as **Figure 2**.

2.2 Published Geology

The 1:50 000 scale geological map of the area (BGS, 1998) indicates the solid geology in the vicinity of the site comprises the Lambeth Group (formerly the Woolwich and Reading Beds), which is described as mottled locally sandy clay and overlying the Upper Cretaceous Chalk at depth. The solid geology is shown to overlain by Head Deposits along a small valley located in the central-western part of the site. According to the geological map the Head Deposits comprise sandy silty clay, locally gravelly, chalk and flint. It is possible that due to the topography at the site, Head Deposits derived

from reworking of the Lambeth Group and the Chalk by natural processes may be present in other parts of the site.

The 1:10 000 scale geological map of the area (BGS, 1980) confirms the geology presented on the 1:50 000 scale map. The map also identifies four sinkholes labelled as 'Solution Hollows' located within the western half of the site. A number of other sinkholes are marked beyond the northern and western site boundaries.

2.3 Historical Borehole Records

The British Geological Survey archives contain records of a number of borehole and water wells previously completed in the vicinity of the site. Copies of a number of borehole and well records have been obtained from the archives, these comprise:

a) The record of six boreholes sunk approximately 100 m southeast of the site (BGS, 1975).

b) The record of a water well SU61SE114 sunk on site, approximately 2 m north of the farmhouse (BGS, 1966).

The borehole records indicate that the geology 100 m to the southeast of the site comprise the Lambeth Group underlain by Chalk. A summary of the ground conditions in the historic borehole records is presented in the table below.

Strata	Depth (m)	Description
Lambeth Group	1.8 - 10.5	Multicoloured clay locally sandy with some flint gravel pockets and/or thin layers (<0.8 m thick) of sand.
Chalk	> 11.0 (base not proven)	Recovered as gravel fragments with remoulded matrix and flint nodules. Locally a layer (<1.0 m thick) of hard chalk was encountered at the top.

Groundwater within the Lambeth Group was recorded at a number of boreholes locations between 0.2 and 5.1 m below ground level. This groundwater body is considered to be perched.

The water level in the historic well records indicates that the water level in 1968 within the Chalk varies between 27 m and 42 m depth, typically being around 34 m below ground level.

Copies of these records have been are reproduced in **Appendix 1** and the location of the well is shown on the Site Layout Plan, **Figure 2**.

2.4 Geological Hazards

The geological hazards presented in the Envirocheck Report (LIG, 2010) which have been assembled from data provided by the British Geological Survey and the National Geoscience Information Service.

The potential risks from the majority of geological hazards at the site are negligible or very low with the exception of ground dissolution stability hazards and hazards arising from shrinking or swelling clays which are both classed as Moderate risk. The risk for ground subsidence over karstic weathering hazards is estimated by PBA as High (PBA, 2010).

Ground subsidence over karstic weathering formed by dissolution of chalk is a consequence of a continuing natural process. The surface depressions created are generally referred to as sinkholes. Across the Chalk outcrop sinkholes are associated with the presence of cover deposits, especially those of Tertiary age, such as the Lambeth Group (Edmonds, 2008), and also where Pleistocene Head Deposits are present. A schematic diagram illustrating the proposed development of natural cavities in Chalk is given in **Figure 8**.

Four subsidence features are located within the fields and farmyard to the north of the farmhouse. These features are likely to be associated with karstic weathering of the Chalk. One of the features is located in Field 3 where ground level is about 2 to 3 m lower than that of the surrounding land. This feature is surrounded by mature trees. A second depression feature is located in the centre of Field 4 where the ground is about 1 m below the surrounding land. This feature is surrounded by mature trees. The third feature is located in the north part of Field 4 and here the feature is about 2 to 3 m lower than the surrounding ground. The fourth is located within the farmyard to the east of the stables. This feature is shown in the topographical survey as a pond; at the time of the investigation the feature was dry. This feature is about 2 m lower than the surrounding ground. A ditch connected to the feature is located at the southeast end and a pipe possibly used to discharge storm water into the feature is located within the western end. A small retaining structure along the western face of the feature was noted to show signs of distress.

It is likely that the chalk pit located in Field 1 that was backfilled with waste in 1970s is a man made feature rather than a sinkhole due to its large size and geometry. However, there may have been a smaller sinkhole at this location that provided easy access to the Chalk bedrock for quarrying and at this stage the presence of a sinkhole at this location cannot be ruled out completely.

A search of the PBA Natural Cavities Database indicated that there are five recorded natural cavity features within or adjacent to the site area. This information strongly suggests that the underlying ground is particularly susceptible to karstic weathering in this area, and as such the hazard arising from this type of ground stability feature is likely to be **High**. In addition, to these records, there are over twenty further potential cavity recorded within 250 metres radius of the site boundaries (PBA, 2010).

2.5 Hydrogeology

The published groundwater vulnerability map of the area (NRA, 1995) indicates the Head Deposits are classified as a 'Secondary (undifferentiated)' aquifer. A 'Secondary (undifferentiated)' aquifer has been assigned in cases where the stratum in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.

The Lambeth Group is classified as a 'Secondary A' aquifer. These strata are capable of supporting water supplies at a local rather than regional scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.

The Chalk is classified as a 'Principal Aquifer'. These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

Groundwater vulnerability mapping (NRA, 1995) shows that the soils on the majority of the site are have low leaching potential, where as the soils at the northwest corner of the site are shown to have Intermediate Leaching Potential (I1) (NRA, 1995). Intermediate leaching potential soils have some ability to attenuate diffuse source pollutants and in which non-absorbed diffuse source pollutants and liquid discharges have the potential to move rapidly to underlying strata or to shallow groundwater.

The EA has defined Source Protection Zones (SPZs) for valuable water resources such as wells, boreholes and springs used for public drinking water supply. According to the EA website (2011) the entire site is located within an Inner Source Protection Zone (Zone 1). SPZ1 is defined as the 50 day travel time from any point below the water table to the source.

According to the Envirocheck Report (LIG, 2010) there are two recorded groundwater abstractions located within a 2 km radius of the site from the Chalk. The closest abstraction license is registered to Portsmouth Water Ltd located approximately 1.1 km to the north of the site and is used for potable water supply. It is understood that the Inner SPZ (Zone 1) that underlies the site is in-place to safeguard this abstraction borehole.

The groundwater information available (see **Section 2.3**) suggests it is plausible there are two groundwater bodies beneath the site; one a perched water table within the Lambeth Group at around 5 m below ground level, with the main regional water table being within the Upper Chalk at around 30 m below ground level.

The 1:100 000 scale hydrogeological map of the area (BGS, 1974) indicates that the groundwater levels in the Chalk during October 1973 were at about 30 m below existing ground level. The groundwater is shown to flow to the south and southeast.

2.6 Hydrology

The closest surface water feature to the site an un-named drain located approximately 550 m to the southeast of the site, an un-named pond is located approximately 600 m to the north of the site boundary.

At the time of the investigation, no on-site surface water features were observed including the pond as labelled in the topographical survey and the ditch.

According to the Envirocheck Report (LIG, 2010), there are no licensed surface water abstractions within a 2 km radius of the site boundary.

3 Ground Investigations

3.1 Aim of the Investigation

The aim of the investigation was to confirm the findings of the previous study and provide additional detailed information on the ground conditions within the area of site such that informed decisions on the proposed development of the site can be made. The principal aims of the investigations were to determine:

- The geotechnical characteristics of the ground to provide information for the design of foundations and other engineering works.
- The nature and extent of potential sinkholes present on the site to assess the potential impacts on ground stability.
- The potential contamination of the ground and groundwater to assess the potential impact of any such contaminants on the proposed development, with particular focus on the nature and extent of the infilled pit and the vehicle dismantling area.
- The hydrogeological characteristics of the ground to assess the potential for migration of potential contaminants in the area.
- The nature and extent of ground gases present on the site to assess the potential impact of any such gases on the proposed development.

The ground investigation works carried out are summarised in the following sections. The description of the fieldworks, borehole records, trial pit records, dynamic probing records and geotechnical laboratory testing results are presented in a separate report prepared by Risk Management Limited (RML, 2011) and which should be read in conjunction with this report. The window sampling borehole records, geoenvironmental testing and monitoring records are presented within **Appendices 2, 3** and **4** of this report respectively.

3.2 Fieldwork

The fieldwork for the investigation was carried in accordance with BS5930 (2010). The work was carried out between 22 and 30 August 2011 and comprised the following:

- The sinking of 4 boreholes, designated BH 01 to 04 to provide information on the ground conditions;
- The sinking of 11 window sampling boreholes, designated WS01 to WS11;
- The installation of monitoring wells in selected boreholes to allow monitoring of ground gas concentrations, flows and groundwater levels.
- The sinking of 10 dynamic probing holes, designated P1 to P1; and
- The excavation of 15 trial pits, designated TP 01 to 04, 9 to 11, 13, 14, 17 to 22.

The boreholes were sunk using light cable percussion techniques to between 5.0 and 15.0 m below existing ground level to provide information on ground conditions and to recover samples of the materials encountered for visual examination and laboratory testing. All open derive samples were taken with a thin walled drive sampling system in order to obtain a Class 1 sample of the cohesive soils present for laboratory strength tests in accordance with the requirements of BS EN ISO 22475-1 (2006).

The window sampling boreholes were sunk using a hand held window sampler to between 2.5 and 8.0 m below existing ground level to provide information on the ground conditions and to recover samples of the materials encountered for visual examination and laboratory testing.

On completion a shallow groundwater and ground gas monitoring well was constructed in each of the boreholes and in selected window sampling boreholes. The monitoring wells were constructed with 50 mm diameter in the boreholes and 19 mm in the window sampling boreholes. Well casing and well screen were installed to between 1.0 and 7.0 m below existing ground level to allow monitoring of groundwater levels and ground gas concentrations in the near-surface soils.

The dynamic probes were sunk using a dynamic probing heavy (DPH) rig to between 2.9 and 10.0 m below existing ground levels to provide information on the ground strength profile within the sinkholes.

The trial pits were excavated using a wheeled excavator with 180 degrees backhoe to depths between 2.0 and 4.0 m below existing ground level to provide information on the near surface soils.

The location of each exploratory position was established by RML using a taped distance from known features shown on the site plan. The exploratory hole coordinates were determined by RML by using a taped distance from known features shown on the site plan. The elevation of the exploratory holes was estimated by PBA using the existing topographic survey. The approximate locations of the exploratory positions are shown on **Figure 2**.

3.3 Laboratory Testing

On completion of the fieldwork, a programme of laboratory soils testing was carried out to verify the visual identification and classification, and to determine the physical properties of selected samples of the materials encountered. Samples of soil for laboratory testing were taken from the exploratory holes and selected to be representative of the materials encountered.

In addition, a programme of laboratory chemical tests was carried out on samples of soil to determine the concentrations of a number of potential contaminant.

3.4 Monitoring

Each of the monitoring wells installed in the boreholes as part of the investigation have been monitored to determine the water level and the concentrations of methane, carbon dioxide and oxygen together with gas flow rates and atmospheric pressure. Four monitoring rounds on a weekly basis were carried out between 8 and 28 September 2011.

3.5 Limitations

The locations of the exploratory holes have been selected to provide information on the geotechnical and geoenvironmental conditions on the site and thus to provide information for the design of the foundations and below ground elements of the proposed development and to enable a qualitative assessment to be made of the hazards posed by the existing site conditions to the environment.

Borehole BH01 was scheduled to be drilled to a minimum of 20.0 m below ground level. The borehole was terminated at 5.0 m due to a hard band of chalk immediately below the Lambeth Group Deposits. An additional borehole (BH04) was scheduled to 20.0 m depth, however, due to hard chalk band this borehole terminated at 7.3 m depth.

It should be noted that there may be conditions pertaining to the site which were not disclosed by the investigation and which therefore could not be taken into account in the interpretation of the factual data to determine the ground conditions on the site and the assessment of the geoenvironmental and geotechnical conditions on the site presented in the following **Sections 4.0** to **7.0** of this report.

4 Ground Conditions

4.1 Introduction

The ground conditions, as revealed by the historical borehole records and ground investigation, are in partial agreement with the published geological information and known history of the site. The Head Deposits appear more extensive and thicker in the central and southwest parts of the site than anticipated based on the geological map. In many places the Head Deposits directly overlie the Chalk, while the Lambeth Group is absent. It is likely that periglacial weathering has resulted in removal of the Lambeth Group deposits along the valley feature footprint and resulted in the accumulation of the Head Deposits. Made Ground was locally encountered overlying the natural soils in the infilled pit and within the farmyard.

Details of the soils encountered are given in the following sections and are illustrated on Schematic Geological Sections included as **Figure 3** of this report. The line of the sections is shown on the Site Layout Plan, **Figure 2**. The details of the strata encountered have been determined from the findings of the investigation.

Based on the ground conditions encountered and the historic and current land use the site can be divided into four main Areas (Areas A to D).

- **Area A** – Head Deposits underlain by Chalk.
- **Area B** – Lambeth Group underlain by Chalk and locally overlain by Head Deposits.
- **Area C** – Infilled Pit comprising Made Ground underlain by Chalk and locally by Head Deposits.
- **Area D** – Dismantling and repair car yard comprising a veneer of Made Ground underlain by Head Deposits and Lambeth Group over Chalk.

The four main areas are marked in **Figure 7**. The boundaries shown on the figure for each area are approximate and conjectural.

Where derived values of parameters or characteristic values are suggested in the discussion on ground conditions and geotechnical parameters are given below, reference should be made to the terminology and definitions given in BS EN 1997-1 (2004) and BS EN 1997-2 (2007), as appropriate. The characteristic values of the geotechnical parameters suggested in this report are appropriate for the limit state or limit states likely to be used for the geotechnical design, based on the information available on the structures proposed at the time of writing this report. The actual characteristic values of geotechnical properties for use in design should be determined by the Geotechnical Designer after a further review and taking into consideration the limit states and design methods being used. The process by which final design values are selected should be documented by the Geotechnical Designer in his Geotechnical Design Report. Further guidance on selection of design parameters is given in BS EN 1997-1 (2004) Section 2.4.

4.2 Sinkholes and Sinkhole Infill

Ground subsidence over karstic weathering formed by dissolution of chalk is a consequence of a continuing natural process. The surface depressions created are generally referred to as sinkholes. There are four potential sinkholes that caused by solution features within the Chalk present at the site. For ease of reference from this point in the report the sinkholes at the site are referred to as Sinkhole 1 to Sinkhole 4. The sinkholes are shown and labelled accordingly in **Figure 2**.

Elsewhere on site the geological setting is typically favourable solution feature development and the presence of loose compressible solution feature infill even though there might not be an actual

sinkhole depression at the surface. Such conditions are present in Borehole BH02 where solution feature infill is present within the Chalk between 3.15 and 4.30 m depth. The infill materials comprised silty sand with occasional fragments of chalk. The SPT N values for this borehole ranged from 1 to 13 between ground level and about 10 m depth with values of 1 and 3 within the solution feature infill, these correspond to a very loose relative density insitu. From 10 m depth the SPT N values increased to between 21 and over 50 blows. The profiled of Borehole BH2 illustrates the combined effects of periglacial and dissolution weathering to a depth of 10 m below existing ground level. While a sinkhole does not appear at this location, the ground conditions illustrated by this borehole do indicate favourable conditions for sinkhole development.

Sinkholes 1 and 2

It is likely that Sinkhole 1 and Sinkhole 2 are associated with sinkhole development within the Head Deposits in a paleo-valley feature. It is likely that periglacial weathering (including the release of cold meltwater from frozen ground conditions) has removed the Lambeth Group and interacted with the former karst zone beneath the former Lambeth Group/Chalk interface and underlying subvertical joints in the Chalk to form sinkholes within the irregular Head Deposits/Chalk interface. Deeply penetrating weathering of the Chalk is apparent to at least 10m depth as recorded in BH02.

The dynamic probe blow count in Sinkholes 1 and 2 exhibit very weak deeply penetrating profiles. In Sinkhole 1 the sinkhole infill/Chalk interface is irregular and is between 2.5 and 3.5 m below ground level. In Sinkhole 2, the sinkhole infill/Chalk interface is irregular and is between 4.5 and 7.5 m below ground level. The sinkhole infill is of variable strength and the blow count in the Chalk is indicative of structureless and weak chalk. The sinkhole infill within Sinkholes 1 and 2 comprises of clay with variable proportions of sand and gravel with occasional cobbles. Occasional beds and pockets of sand are also present with changing proportions of clay and gravel and rare cobbles. The gravel and cobbles fractions comprised flint and chalk.

There is no specific evidence of an underlying large scale solution pipe and therefore it is more likely that the hollows have developed as a sinkhole centred over solution widened and infilled subvertical joints that extend to depth in the Chalk and may radially inter-link with other solution cavities associated with bedding planes in the Chalk. Such cavities may be both infilled with low strength sands/clays/gravels or even maybe open and air-filled.

Sinkhole 3

The ground profile in Sinkhole 3 contained Lambeth Group at the surface. Here the sinkhole is likely have developed over a weathering feature associated with a karst horizon in the Chalk that has migrated up to the surface through the Lambeth Group.

Sinkhole 4

At the time of the investigation the possible sinkhole labelled as Sinkhole 4 in the former pond could not be investigated due to limited access.

4.3 Made Ground

4.3.1 Area C – Former Landfill

Made Ground was encountered at all the locations investigated at the infilled pit where landfill materials were placed during the 1970s. The Made Ground (Landfill) was found to be variable in composition and comprised brown grey and black clay with variable proportions of sand and gravel. Locally layers of sandy gravel with some clay were found. The gravel size fraction was typically composed of flint, chalk, brick, concrete, and other rare man-made materials such as metal, glass and plastic. Some timber and organic matter were encountered within the Made Ground. Some of the clay materials within the landfill were noted to have organic odour. The Made Ground within the infilled pit locally contained fragments of concrete and brick sections up to 1.2 m long and 0.2 m thick. The Made

Ground was encountered to between 0.6 m (TP04) to a maximum depth of 5.8 m below ground level (WS02) in the infilled pit.

Visual examination of the clay fraction within the Made Ground indicates the clay is variable in consistency ranging from soft to stiff.

In general, olfactory and visual signs of anthropogenic contamination were not noted in the Made Ground (Landfill). The exception includes a fragment of cement bound tile suspected to contain asbestos that was detected in TP02 within the infilled pit.

4.3.2 Area D – Vehicle Dismantling

Made Ground was encountered at both locations investigated at the dismantling and repair yard. The Made Ground was found to be variable in composition and comprised brown and black clayey gravel and brown sandy gravelly clay. The gravel size fractions were typically composed of flint, brick, and concrete. A layer about 0.1 m thick of off white chalk fragments was encountered at the base of the Made Ground in WS03. The Made Ground was between 0.5 and 0.6 m thick.

The surface at the dismantling and repair yard that was noted to be stained by oils and possibly other hydrocarbons. Slight hydrocarbon odour and grey staining was noted within the Made Ground in WS03.

4.4 Head Deposits

The Head Deposits typically comprise brown, orange and yellow clay with variable proportions of silt, sand and gravel. Locally pockets of sand and/or gravel were present with some clay. The gravel fraction was found to be angular to rounded and composed of flint and chalk.

Where present, the Head Deposits were encountered from the ground level to between 1.2 and 4.2 m depth, predominately on the part of the site shown as Area A on **Figure 7**.

It should be noted that the base of the Head Deposits, when underlain by the Lambeth Group, could not be identified positively as the materials comprised reworked natural deposits similar to and derived from the Lambeth Group materials. As such, the depths to the base of the Head Deposits given above should be used with caution.

Classification Results of classification testing are presented on a Casagrande Chart on **Figure 5**. The results indicate the clay is generally of variable plasticity with measured values of liquid and plastic limit between 25 % and 104%, and 13 % and 27%, respectively, which correspond to plasticity indices between 12 % (low plasticity) and 80 % (extremely high plasticity). Measured values of moisture content are between 11 % and 44 %.

Results of particle size distribution analyses for the Head Deposits indicate the fines content (<63 µm) is between 32 % and 84 % by weight. The samples tested were found to contain sand fraction between 10 % and 25 % and gravel size fraction between 6 % and 44 %. The laboratory results indicate that the Head Deposits tested are cohesive (clay or silt) with variable proportions of sand and gravel fractions.

Compaction Results of moisture content and dry density relationship determined by 2.5 kg rammer laboratory compaction test were carried out on two samples. The results for the tests have optimum moisture content are 10 % and 18 % with corresponding maximum dry density of 2.01 and 1.68 Mg/m^3.

CBR Value of the California Bearing Ratio as determined by a single sample tested on remoulded soaked sample as determined by laboratory for the Head Deposits is about 3%. From empirical correlation using an average plasticity index value of 50, for average construction conditions and high

or low water table a CBR a value of 2.0% (thin pavement) or 2.5% (thick pavement) is recommended for pavement design (TRRL, 1984).

Undrained Shear Strength Visual examination of the material indicates the clay is typically soft and firm in consistency. Measured values of undrained shear strength, as determined by hand shear vane are variable in the range of 30 to 100 kPa of which the higher values were recorded where sand particles were abundantly present.

Measured values of undrained shear strength, as determined by laboratory triaxial testing of 100 mm diameter specimens taken by thin walled driven sampling, are presented as a plot against depth on **Figure 6**. The measured values for two samples are 19 and 73 kPa.

Derived values of undrained shear strength determined using the empirical correlation with SPT N values (Stroud, 1989) are also presented on **Figure 6**. The derived values were determined from the correlation with measured SPT N values using a factor N_c of 4.5 for average plasticity index value of 50 range from 18 to 68 kPa and, have no apparent correlation between strength and increasing depth.

4.5 Lambeth Group

The Lambeth Group was encountered in the exploratory holes located at the southern and eastern parts of the site at the surface or below a veneer of Head Deposits.

The Lambeth Group was found to comprise multicoloured clay with some silt and sand partings and locally lenses of silt and sand. The clay locally also contained red and black round and subrounded flint gravel.

Where encountered, the Lambeth Group was between 0.7 and 12.4 m in thickness and the base was encountered to between 2.4 and 12.7 m below ground level.

Classification Results of classification testing are presented on a Casagrande Chart on **Figure 5**. The results indicate the Lambeth Group clays are generally of variable plasticity with measured values of liquid and plastic limit between 43 % and 108%, and 15 % and 24%, respectively which correspond to plasticity index between 34 % (intermediate plasticity) and 84 % (extremely high plasticity). Measured values of moisture content are between 19 % and 43 %.

Results of particle size distribution analyses for the Lambeth Group indicate the fines content (<63 µm) is between 87 % and 98 % by weight. The samples tested were found to contain a sand fraction between 2 % and 13 %.

Compaction Results of moisture content and dry density relationship determined by 2.5 kg rammer laboratory compaction test on two samples indicate that the optimum moisture content is 17 and 27 % with corresponding maximum dry density of 1.77 and 1.41 Mg/m^3.

CBR Value of the California Bearing Ratio as determined by a single sample tested on remoulded soaked sample as determined by laboratory for the Lambeth Group is about 5 %. From empirical correlation using average plasticity index value of 52, for average construction conditions and high or low water table a CBR value of 2% (thin pavement) or 2.5% (thick pavement) is recommended for pavement design (TRRL, 1984).

Undrained Shear Strength Visual examination indicates that the consistency of the clay is typically firm to stiff and very stiff with depth. Locally the clay was observed to be soft to firm at the near surface. Measured values of undrained shear strength, as determined by hand shear vane are typically in the range of 30 to 100 kPa with a general trend of increasing strength with increasing depth.

Measured values of undrained shear strength, as determined by laboratory triaxial testing of 100 mm diameter specimens taken by a thin walled sampling, are presented as a plot against reduced level on **Figure 6**. The measured values are in the range of 96 to 275 kPa.

Derived values of undrained shear strength determined using the empirical correlation with SPT N values (Stroud, 1989) are also presented on **Figure 6**. The derived values determined from the correlation with measured SPT N values using a factor N_c of 4.5 for average plasticity value of 52,and give a range from 54 kPa at 3.2 m depth to 113 kPa at 11.2 m depth indicating a general trend of increasing strength with increasing depth.

4.6 Upper Chalk

The Upper Chalk was encountered at a number locations across the site. The Chalk was generally white with occasional black specks and orange staining and was recovered as gravelly sandy chalk silt and silty chalk gravel and cobbles. Locally the Chalk contained seams <5 mm thick of soft brown clay. Visual examination of the chalk fragments recovered was variable between extremely weak to strong.

In borehole BH2, the Chalk appeared to be impacted by weathering to about 10 m below ground level. A sand infill was encountered between 3.15 m and 4.30 m depth within the Chalk. This is likely to be an infilled solution cavity.

Values of penetration resistance determined by standard penetration testing are presented as a plot against reduced level on **Figure 4**. The measured values were variable between different locations on site. In Borehole 02, the SPT N values ranged from 3 to 13 between ground level and about 10 m depth, from 10 m depth the SPT N values increased to between 21 and over 50 blows. The low blow count up to 10 m depth is likely to represent karstic weathering profile. The high blow count (>50) is likely to represent a large nodule or a band of flint. The SPT N value within the chalk that was encountered below the Lambeth Group in the other boreholes (Boreholes 01, 03 and 04) was over 50. The high blow count is likely to represent a band of hard chalk not impacted by deep weathering which occurs immediately below the Lambeth Group deposits in this area, as recorded also in a number of historic borehole records.

The base of the Upper Chalk was not proven in any of the exploratory holes during the investigation and the chalk was penetrated during the investigation to a maximum thickness of about 10.7 m corresponding to a depth of 15.0 m and reduced level of about 45.8 m OD.

4.7 Groundwater

During the fieldwork, groundwater entries were not detected at any of the exploratory holes across the site.

The water level in the historic well records indicates that the water level in 1968 within the Chalk varies between 27m and 42m OD, typically being about 34 m below ground level, which is equivalent to about 31 m OD. The water levels in the well were measured during and after the fieldworks and were between 30.1 and 30.2 m below ground level, corresponding to reduced level of about between 29.9 and 29.8 m OD.

On completion of the fieldwork for the investigation, all the monitoring holes were dry with the exception of Borehole BH03 where groundwater levels were recorded between about 4.1 and 6.5 m below ground level, corresponding to reduced levels between about 65.4 and 67.0 m OD. These groundwater levels are considered to be representative of perched groundwater body within the Lambeth Group.

5 Geoenvironmental Conditions

This section of the report discusses the concentrations of potential contaminants and ground gases measured as part of the ground investigation.

5.1 Contamination

5.1.1 Chemical Analysis

Chemical analyses for a range of contaminants including metals, inorganic and organic contaminants that may exist within the site due to its historic and current land use were carried out on a total of 26 samples of soil selected from the Made Ground the natural soils. Chemical analysis was also carried out on 3 soil samples to determine the potential presence of pesticides and herbicides due to the potential use of these chemicals in a working farm. In addition, four soil samples were sent for asbestos screen to establish the potential presence of asbestos within the Made Ground in the infilled pit.

Three soil samples were tested for eluate testing to assess the potential for contaminants to leach out of the soil and impact groundwater. The laboratory terminated the test for one of the samples submitted, due to health and safety procedures because asbestos was detected in the sample tested.

A copy of the testing certificates is reproduced in **Appendix 3**. The results of the soil analyses carried out is summarised on **Table 1** presented after the text of the report.

Given the potential variability of the Made Ground it is possible that localised and unidentified contamination is present on the site.

5.1.2 Contamination Assessment Regime

Soils For initial screening, the results of the geochemical testing on the soils samples have been compared to CLEA SGVs for residential with plant uptake end-use (EA, 2009) as appropriate for the proposed use of the site. Where a CLEA SGV is not available the concentrations were compared against the Land Quality Management Ltd (LQM) Generic Assessment Criteria (GACs) for a residential with plant uptake end-use (CIEH, 2009). Full details of the assessment criteria are given in **Appendix 5**.

5.1.3 Soil Eluate Quality

There are no published soil assessment criteria for protection of Controlled Waters. As such, the results of the geochemical testing on soil eluate samples were compared to Environmental Quality Standards for fresh waters (EA, 2004) and where not available to the more stringent UK Drinking Water Standards (DETR, 2000).

5.1.4 Assessment of Soil Contamination to Impact Human Health

For the samples analysed, the measured concentrations of potential contaminants, as summarised on **Table 1**, are typically below the assessment values appropriate for a land use as residential with plant uptake or a comparable land use.

The exceptions include slightly elevated concentrations of metals (vanadium and zinc), and two samples with elevated concentrations of polycyclic aromatic hydrocarbons (PAH) which were detected in the Made Ground in the infilled pit and in the vehicle dismantling and repair yard.

Vanadium - A total of thirteen soil samples were tested for vanadium, five from the natural soils and eight from the Made Ground. The measured concentrations of vanadium in the natural soil were between 48.2 and 77.3 mg/kg and in the Made Ground between 30.8 and 94.8 mg/kg. The screening

assessment criterion for residential end use for vanadium is 75 mg/kg. Of the two concentrations above the assessment criterion one was recorded in natural soil (BH01 at 0.3 to 0.8 m depth) and one in the Made Ground (WS01 between 0.5 and 1.0 m depth). The sample in the natural soil recorded a slightly elevated concentration (77 mg/kg) and is considered to be a background concentration, as such, vanadium in the natural soil is not taken forward as a potential hazard. The elevated vanadium concentration in the Made Ground statistically is considered to be an outlier of the vanadium population, as such, this is considered to be a 'hot spot' and is carried forward as a potential hazard in Area C.

Zinc - The sample with elevated concentration of the zinc (6120 mg/kg) was sampled in the dismantling and repair yard (WS06 between 0.1 and 0.5 m depth). It is expected that the elevated concentrations of zinc is associated with the man-made materials noted within the Made Ground. As such, the potential for heavy metal to be present in the Made Ground is taken forward as a potential hazard in Area D.

Asbestos - The laboratory identified material containing white asbestos (Chrysotile), in the cement bound tile sample in TP02. In addition, asbestos fibres were identified in a single sample for the soils sent for asbestos screen in TP01. As such, asbestos in Area C is carried forward as a potential hazard.

PAH - Two samples with slightly elevated speciated polycyclic aromatic hydrocarbons (PAH) were detected in the Made Ground. Benzon(a)pyrene was detected at slightly elevated concentration within the Made Ground at the vehicle dismantling and repair yard (WS03 between 0.1 and 0.4 m depth) and indeno(123)pyrene and benzo(ghi)perlyne were detected at slightly elevated concentrations within the Made Ground in the infilled pit (TP02 at 2.0 m depth). As such, PAH is taken forward as a potential hazard in Areas C and D.

5.1.5 Assessment of Soil Eluate Quality

For the samples analysed, the measured concentrations of potential soil eluate contaminants, as summarised on **Table 2**, are within the Environmental Quality Standards none of the tested samples exceeded the relevant assessment criterion. In addition, all the soil eluate samples were within the drinking water standards.

5.2 Aggressiveness of the Ground

5.2.1 Design of Buried Concrete

The measured pH values and concentrations of water soluble sulphate are summarised on the following table.

Strata	pH Value	Water Soluble Sulphate (g/l)
Made Ground	7.6 – 8.5	0.003 - 0.202
Head Deposits	7.2 – 7.8	0.011 - 0.018
Lambeth Group	6.2 - 7.9	0.005 - 0.038
Chalk	8.1 – 8.2	0.022 - 0.033

Based on the results and the procedures outlined in BRE Special Digest 1, 3rd Edition, (BRE, 2005) and assuming static groundwater conditions, the Design Sulphate and Aggressive Chemical Environment for Concrete (ACEC) Classes for the site are DS-1 and AC-1s respectively.

5.2.2 Design of Water Supply Pipes

The concentrations of potential contaminants measured as part of the ground investigations indicate potential contaminants are locally present in Areas C and D at concentrations above background concentrations. Adopting a precautionary approach, it is possible that contamination of the water supply may occur and hence suitable precautions may need to be made in the design and construction of the water supply pipes.

Under the Water Supply (Water Fittings) Regulations (DETR, 1999), the Water Supplier has a statutory duty to ensure that the design and material selection for water supply pipes are suitable and their advice and recommendations should be sought with regard to the water supply pipes for the proposed development. It should be noted that the Water Supplier may require additional testing to be carried out.

5.3 Ground Gases

The concentrations of methane, carbon dioxide and oxygen have been measured on four occasions the gas monitoring wells installed in the boreholes sunk as part of the ground investigation. The measured gas concentrations and steady gas flows are presented in the report in **Appendix 4** and are summarised on the following table.

Gas	Concentration	
	Areas C and D	Areas A and B
Methane (%v/v)	0.0 – 42.5	ND
Carbon Dioxide (%v/v)	3.9 – 17.0	0.8 – 5.4
Oxygen (%v/v)	0.0 – 7.6	6.9 – 21.0
Gas Flow (l/hr)	0.0 – 0.3	0.0 - 0.1
ND denotes below the instrumental detection limit		

Methane was not recorded and carbon dioxide concentrations were typically bellow 5% in Areas A and B. The measured concentrations of ground gases indicate elevated concentrations of carbon dioxide and methane in Areas C and D.

Using the procedure for classifying gassing sites proposed by BS 8485 (2007), Areas A and B would be classified as Charact eristic Situation 1 assuming the measured concentrations of ground gases are representative of the long term equilibrium values. This Situation is representative of ground with a very low potential for gas generation. For Characteristic Situation 1, BS 8485 (2007) advises that gas protection measures are not required.

For Areas C and D the gas data would be classified as Characteristic Situation 3. This situation is characteristic of a site with old landfill or inert waste which produces some methane and/or carbon dioxide gases, however, these are limited in concentrations and/or flows. For Characteristic Situation 3, BS 8485 (2007) advises that gas protection measures are required (see **Section 6.6.1**).

6 Tier 2 Geoenvironmental Risk Assessment

6.1 Introduction

A Tier 1 Preliminary Risk Assessment was carried out as part of the Phase 1 Ground Condition Report (PBA, 2010). The Tier 1 included a conceptual site model (CSM). The CSM describes the types and locations of potential contamination sources, the identification of potential receptors and the identification of potential transport/migration pathways. In addition, a preliminary risk assessment was carried out based on the known historical and current land use at the time. The CSM and the risk assessment can now be updated based on the findings of the ground investigation for the site.

6.2 Hazard Identification

The methodology and criteria used to assess risk adopted by PBA as used within this document is defined within **Appendix 6**.

The risk assessment updates of the Conceptual Site Model and describes the types and locations of identified possible contamination sources. The identification of potential receptors and potential pathways has also been undertaken. For a pollutant linkage to be identified all three elements (i.e. a source, pathway and receptor) must be present.

As confirmed by the ground investigation there are no pollutant sources in Areas A and B and therefore plausible pollutant linkages are not present. As such, there is no identified risk with regards to contamination in these areas. This section assesses the risk associated with contamination only within Areas C and D where a limited and localised contamination hazard has been identified by the ground investigation.

6.2.1 Hazards with the Potential to Impact Human Health

In summary the results of the ground investigations have been assessed using generic criteria and the potential for contaminants to be present on this site as a whole is classed as **Very Low**.

However, the Made Ground associated with the infilled pit and the dismantling and repair yard has been identified as a localised potential hazard in Areas C and D for a residential with plant uptake end use.

The following parameters were taken forward as a potential hazard in the Made Ground:-

- PAH in the Made Ground (Areas C and D);
- Heavy metals in the Made Ground (Zinc in Area D and Vanadium in Area C);
- Asbestos in the Made Ground (Area C); and
- Soil Gas in the Made Ground (Area C and D).

6.2.2 Hazards with the Potential Impact to Controlled Waters

The eluate samples indicated that potential contaminants present within the soil are not likely to leach out and impact controlled waters. Hence the risks to groundwater are considered to be negligible and not taken forward.

6.3 Hazard Assessment

Localised sources of contamination (PAH, heavy metals, asbestos and soil gas) have been indentified associated with the infilled pit (Area C) and with the dismantling and repair yard (Area D) and the

pollutant linkages for these areas are presented in a tabular format in **Table 3** presented after the text of this report.

6.4 Risk Estimation

Risk estimation involves predicting the likely consequence (what degree of harm might result) and the probability that the consequences will arise (how likely the outcome is). A table summarising the estimated risks for the identified pollutant linkages in Areas C and D is presented in **Table 3**.

Based on the information available, there are a number of plausible pollutant linkages, the estimated risks for residential with plant uptake use have been classed as follows:

- Human Health (On-site Current) – **Low**
- Human Health (On-site Future) – **Moderate/Low**
- Human Health (Off site) – **Moderate/Low**
- Human Health (On-site construction) – **Moderate/Low**
- Buildings (On-site future) – **Low** and **Moderate/Low**
- Property (horses current) - **Low**

6.5 Risk Evaluation

Plausible pollutant linkages are determined using professional judgement. If a linkage is considered possible, it is considered that this represents a potentially 'unacceptable risk' and therefore requires further consideration. This may be through remediation or mitigation or through further tiers of investigation and assessment.

Plausible pollutant linkages have been identified for human health, buildings and property. In this instance plausible pollutant linkages have been identified for the PAH, heavy metals, asbestos and ground gas within the Made Ground in Areas C and D. The risk associated with any one linkage is at worse assessed as **Moderate/Low**, using the methodology described in **Appendix 6**.

It is likely that all the linkages can be addressed through mitigation and/or remedial measures. The principles of any remediation are to design a practical scheme which will reduce the risks associated with the ground conditions. In particular measures should be taken to mitigate against potential effects on the proposed redevelopment, site users and construction workers. The remediation works should be designed to achieve an appropriate balance between economics, sustainability and a reduction in the level of risk as it currently exists.

6.6 Conclusions

The results of this Tier 2 Geoenvironmental Risk Assessment confirm that the site soils are unlikely to be impacted by contamination with the exception of localised relatively low concentrations of contamination within the Areas C and D. The majority of the site is considered to have **Very Low** potential for ground contamination to be present.

For Areas C and D where contamination has been identified as a potential hazard, potential pollutant linkages have been identified. The risks associated with each linkage range from **Low** to **Moderate/Low**. A moderate/low risk is classified as follows:-

> *It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be mild/severe, or if any harm were to occur it is more likely that the harm would be relatively mild.*

Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer-term.

It is likely that all the possible linkages can be addressed through an appropriate choice of end use, mitigation and/or remedial measures. The remediation works should be designed to achieve an appropriate balance between economics, sustainability and a reduction in the level of risk as it currently exists.

6.7 Confidence and Uncertainty

CLR 11 requires appropriate range and level of information to be collected. The information quality criteria given in CLR 11 are:-

- Relevant – to the context of the assessment
- Sufficient – for the required level of confidence
- Reliable – reflect the true or likely conditions
- Transparent – in meaning and origin

Whilst the data used in this assessment is considered robust and suitable for purpose, there is some degree of uncertainty due to the potential for unforeseen ground conditions, however, it is considered that if present these will be localised and relatively small in scale.

7 Geotechnical Assessment

7.1 Proposed Development

It is understood from the Masterplan that it is proposed to redevelop the site for residential use consisting of approximately 300 residential units of two and two and a half storeys high with associated infrastructure and roads.

7.2 Known Sinkholes and Subsidence Risk

Given the disturbed nature of the soils within and immediately adjacent to the sinkholes development in these areas may result in significant settlement and structural damage. It is recommended that a development exclusion buffer zone of 10 m from the known edge of any untreated sinkhole is applied for any structure in the vicinity of any development including buildings, services or roads.

Alternatively, the sinkholes can be remediated for future development. Appropriate remedial works include the removal of the loose soil, compaction grouting of the weathered chalk, and backfilling of the depression with engineered fill. The process will require an engineering specification and validation testing. A preliminary cost estimate for the treatment of a sinkhole of this size that exists at the site is in the order of £250,000 per feature.

7.3 Foundations – Areas A, B and D

7.3.1 Possible Foundation Solutions

There is a risk that hitherto undiscovered solution features that can lead to sinkhole formation might be present anywhere on site, without any tell tale surface expression such as a depression. Consequently, future subsidence and settlement of near surface soils into such features would occur beneath conventional foundation types and lead to a risk of structural damage. Such instability could be triggered by extremes of climate, changes to infiltration and drainage due to development, soakaways or leakages etc.

Furthermore, the Head Deposits found predominantly in Area A may present a risk of excessive total and/or differential settlement if conventional shallow foundations are adopted, even when solution features or sinkholes are absent. The reason for this is because the Head Deposits are predominantly unconsolidated and variable in nature and generally of a soft and firm consistency at this site. They contain pockets and/or layers of granular material that could be prone to inundation settlement or piping erosion caused by loss of fines, especially where triggered by leaking drainage. This is because of their sand content and poor state of compaction. Consequently if the Head Deposits were to be used as a founding medium for conventional shallow foundations then future parcel by parcel or plot by plot ground investigation and assessment would be required, to assess foundation design requirements.

Options to deal with the solution feature hazard and variability of the Head Deposits are as follows.

(a) Re-inforced Conventional Spread or Strip Foundations

This solution involves proving the ground beneath the footprint of proposed foundations using the dynamic probing technique, and then designing either re-inforced strip foundation, or a pad and ground beam system to span the likely size of void that might form as the result of ground loss into a feature. PBA experience of sites in similar geology suggests that a combination of probing at, say, 2 m centres and the design of foundation and/or ground beams to span a nominal 2 m diameter void will reduce the risk to an acceptable level, however, different solutions based on other comprises between probing costs and the cost of re-inforcing the foundations and/or ground beams are possible, and this will need to be assessed on a site specific basis.

(b) Re-inforced Raft Foundations

The use of a re-inforced concrete raft foundation designed to span 3 m diameter void is a suitable foundation solution. This spacing width is based on a statistical assessment of the engineering characteristics of sites with a similar geological setting and solution features hazard rating.

7.3.2 Piled Foundations

Piled foundations are unlikely to be suitable because of the deep penetrative weathering present in places at the site (e.g. at Borehole BH02) and the possible presence of deep unconsolidated and variable solution feature infill. These hazards can lead to a loss of lateral support and shaft friction and/or loss in end bearing support below the pile toe. Furthermore, a single pile design to accommodate the variable ground profile will not be possible and a flexible configuration adjusted for each structure or each individual pile based on the driving resistance during installation, may well prove to be impracticable and far uneconomic to implement.

7.3.3 Disturbed Ground

Disturbed ground or otherwise unsuitable soils may be present at the formation level owing to karstic weathering or due to the presence of Made Ground. It is recommended that all bearing surfaces be inspected by a qualified geotechnical engineer prior to constructing the foundations to ensure that the design criteria are achieved. Any soft or loose soil encountered at foundation level should be removed and replaced with well compacted granular fill or foundation concrete.

7.4 Foundations in Area C (Infilled Ground)

The Made Ground is unsuitable as a founding medium due to its weak and compressible characteristics, which may result in shear failure and/or excessive total and differential settlement deformations. Pilling through the Made Ground into the Chalk is not recommended due to the underlying weathering of the Chalk that may result in loss of support below the pile toe. In addition, man made materials may form an obstruction to pilling within the infilled pit. Therefore, the most suitable foundation solution is to excavate and remove the upper 2.0 m of the Made Ground and replacement with an engineered fill. Some of the materials present in the removed soils may be suitable for this purpose after screening, crushing and/or conditioning. After compaction in accordance with an engineering specification and validated by testing the engineered fill can then be used to support a grillage of ground beams or a reinforced raft foundation that can accommodate long term settlement of the infill material below.

Alternatively, ground improvement using dynamic compaction may be a suitable technique to provide a base to support structures. The process involves of dropping a heavy weight repeatedly on the ground at regularly spaced intervals. The impact of the free fall weight creates high energy impact that transmits shock waves through the treated ground. This reduces voids between soil particles resulting in enforced settlement, thus reducing long term settlement.

7.5 Potential for Volumetric Change

In accordance with the guidance given in NHBC (2010), the Head Deposits have low to high shrinkability potential and the Lambeth Group have medium and high shrinkability potential. In accordance with the guidance the minimum depth of the foundations has to be 0.9 m below the proposed level, however, the depth may need to be greater due to the potential for volumetric change as trees, hedgerows or shrubs take moisture from the ground and, in cohesive soils such as clay with medium and high shrinkability potential, this can cause significant volume changes resulting in ground movement. This has the potential to affect foundations and damage the supported structure. In order to minimise this risk, foundations should be designed to accommodate the movement or be taken to a depth where the likelihood of damaging movement is low, however, it is possible that the foundation solutions described in **Section 7.3** (above) will also mitigate this risk. An assessment of the potential influence of any proposed planting and existing trees on the foundations for the proposed buildings should be carried out in accordance with the NHBC guidance.

7.6 Pavement Design

A site wide CBR design value of 2.0% for thin pavement and 2.5 % for thick pavement is suggested for the Head Deposits and Lambeth Group.

Given the potential for ground instability due to the potential karstic weathering it would be prudent for the pavement design (roads/driveways) to incorporate reinforcement, using a high tensile strength geogrid, in the road design sub base. This would help to reduce the potential effect and impact on health and safety should any future collapse occur and excessive differential settlement.

The formation level should be inspected and tested to ensure that the insitu materials and the placed compacted fill have achieved the CBR values on which the design is based. The formation level is required to be proof rolled and any loose or soft material is removed and replaced with acceptable fill material.

7.7 Earthworks

The proposed scheme may include the reuse of the near surface soils as an engineered fill where site levels are required to be amended. The materials observed during the ground investigation along with results from the classification and compaction testing at the site, suggests that the majority of material on the site will be suitable for use as engineered fill for any earthworks required for the proposed development.

The classification and compaction testing identified that the majority of the near surface materials are likely to be classified as cohesive materials (Class 2A) in accordance with the Series 600 of the Highway Agency Specification for Highway Works (HA, 2009). Where higher gravel content exists within the Head Deposits the materials may classified as stony cohesive (Class 2C). The natural moisture content of the near surface materials is relatively high compared to the optimum moisture content. As such, the near surface materials are likely to require some moisture conditioning prior to compaction. The earthworks should be carried out in accordance with an Engineering Specification. It is unlikely that chalk will be used for earthworks, however if used, chalk can degrade and become unsuitable as engineered fill due to wet conditions, disturbance, handling and trafficking.

The proposed scheme may include the reuse the topsoil at the site as top cover. It is likely that the topsoil will be suitable for reuse providing no evidence of visual and/or olfactory signs of contamination is detected during the works. The topsoil should be carefully removed prior to commencement of any excavation work and stockpiled separately for later reuse on or off site. The requirements for handling topsoil are specified in BS 3882 (2007).

7.8 Slope Stability

The proposed scheme may include the reuse of the near surface soils as an engineered fill where site levels are required to be amended. This may result in a number of cut and filled slopes. It is recommended that the long term stability of such slopes will be assessed over the design life of proposed structures. This will be carried out after the integrated earthworks strategy for the site is finalised.

7.9 Infiltration Drainage

Surface water drainage using shallow infiltration (soakaways) is unlikely to provide a complete drainage solution to accommodate surface runoff from the development due to the low permeability nature of the near surface soils over large areas of the site.

In addition, it is not recommended that shallow soakaways are adopted for surface water drainage in areas identified to be sinkholes as shown in **Figure 7**. If shallow soakaways are to be used on site then the soakaway should be a minimum of 20 m distant from a property (CIRIA C574, 2002). Alternatively deep bored soakaways should be considered. However, due to the deep weathering of

the chalk the soakaway bore should be checked for any evidence of karst features by validation investigation such as dynamic probing and positions adjusted where possible to avoid karst features to mitigate ground instability.

8 Outline Remediation Strategy

8.1 Introduction

This report has identified the presence of a localised area with slightly impacted soil associated with the infilled pit and the vehicle dismantling and repair yard, which although considered localised will require some form of mitigation / remediation for residential with plant uptake end use. An outline Remediation Strategy is described for each of the identified Areas in accordance with the recommended mitigation measures and/remediation required. A full options appraisal and detailed remediation strategy is not part of the scope of this report, but will be undertaken in the future if the site comes forward for development.

The specific mitigation measures required related to:

- The risks to site workers associated with ingestion, inhalation or prolonged skin contact of contaminated material.
- The risks to future site users associated with inhalation of ingestion, inhalation or prolonged skin contact of contaminated material.
- The risks to future site users in buildings associated with inhalation of hazardous ground gasses.
- The risks to buildings associated with hazardous ground gases build up to concentrations giving rise to a potential risk of explosion.

8.2 Area C

For the infilled pit there are a number of mitigation measures and/remediation options that can be considered as part of the redevelopment of the site for a residential with gardens (plant uptake) end use and these are discussed below. Alternatively, the infilled pit area can be used for a less sensitive end use such as managed housing, commercial/industrial or public open space, although further risk assessment based on site specific assessment criteria generated for these end uses will be required. The preferred option should be chosen on the balance between economics, sustainability and a reduction in the level of risk as it currently exists.

Source Removal – Excavation of the Made Ground and disposal of the material off site in a suitable facility. It is envisaged that some of the excavated materials are likely to be suitable for reuse on site as engineered fill after segregation, treatment and processing. The remaining void can be backfilled with clean engineered site won materials from foundation and services excavations elsewhere on site. It is estimated that the volume of the Made Ground in the worst case scenario in the infilled pit is about 20 000 m^3, it should be noted that this figure is a preliminary estimate only based on the ground investigation findings using a surface dimensions of 80 m x 85 m and average thickness of 3 m.

Capping – The Made Ground can be separated from future site users by a physical barrier such as a suitable capping thickness of clean soil. It should be noted that the Made Ground (waste) in the infilled pit is not a suitable founding medium for buildings and roads (see **Section 7.4**). As such, ground treatment (dynamic compaction) or excavation of the top 1 to 2 m and replacement with clean engineered fill from other parts of the site may be considered as an appropriate foundation solution. If the later option of excavation and replacement by engineered fill is chosen then the engineered fill is likely to be a suitable capping system to segregate the site users from the Made Ground.

Gas Protection Measures - To mitigate the risk to future users associated with inhalation of hazardous gas and the risk to the proposed buildings of explosion from hazardous gas, gas protection measures are recommended to be adopted in any proposed buildings in Area C. Guidance on typical gas protection measures for a development are detailed by BS 8485 (2007). For a residential

development in soil gas Characteristic Situation 3 (see **Section 5.3**) the BS recommends gas protection measures are installed in buildings. The gas protection measures are required to achieve a specific grade in accordance with the soil gas characteristics and the proposed end used of the building. For private residential properties the BS recommends that gas protection measures are required to score an equivalent of grade 4 to achieve an appropriate gas solution. A combination of the installation of passive sub floor ventilation, floor slabs and the installation of gas protection membrane is recommended for the proposed structures to achieve gas solution grade 4. In addition, appropriate procedures should be adopted to ensure any confined areas are not accessible to the future site users unless they are checked for hazardous gases prior to man-entry. Active ground gas protection measures as part of the development are not deemed to be necessary.

8.3 Area D

Source Removal - The most likely remedial option for the dismantling and repair yard is deemed to be shallow source removal. The primary source (the cars and car parts) will be removed once the site is decommissioned. Any secondary sources are likely to comprise hot spots within the shallow (<0.5 m) thickness of superficial Made Ground present. This can be dealt with by future investigation before any contaminated materials are removed using shallow scrape and visual inspection (confidence scrape) ensuring any potential contaminated soils have been removed. Validation testing should be carried out on the remaining clean materials at the base of the excavation. It is estimated that the volume of impacted soils is relatively small and limited to the near surface Made Ground with an approximate area of 10 m x 30 m and 0.5 m deep.

8.4 Areas C and D

Protection of Site Workers – It is recommended that appropriate health and safety and welfare provisions are in place to protect both the site workers and general public/neighbours. This should include the adoption of relevant procedures in accordance with the current health and safety guidance including those given in 'Protection of workers and the general public during the development of contaminated land' HS(GS)66 (HMSO, 1991).

A protocol for the identification and assessment of any unforeseen ground conditions will be required combined with a briefing of the ground work contractors.

8.5 Future Ground Investigation

Additional investigation is not likely to be required to support the planning application for redevelopment of the site at this stage. However, an additional ground investigation may be required prior to the redevelopment of the site and as part of the detailed design process to confirm the findings of the current investigation and design any remediation and/or mitigation measures should these be required with regards to its geoenvironmental conditions and to deal with the risks associated with subsidence hazard. In addition, the ground investigation may be required for the detailed design of the proposed earthworks, foundations and stability assessment for the proposed development.

9 References

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10 Essential Guidance for Report Readers

This report has been prepared within an agreed timeframe and to an agreed budget that will necessarily apply some constraints on its content and usage. The remarks below are presented to assist the reader in understanding the context of this report and any general limitations or constraints. If there are any specific limitations and constraints they are described in the report text.

1 The opinions and recommendations expressed in this report are based on statute, guidance, and best practice current at the time of its publication. Peter Brett Associates LLP (PBA) does not accept any liability whatsoever for the consequences of any future legislative changes or the release of subsequent guidance documentation, etc. Such changes may render some of the opinions and advice in this report inappropriate or incorrect and we will be pleased to advise if any report requires revision due to changing circumstances, especially those over one year old. Following delivery of any report PBA has no obligation to advise the Client or any other party of such changes or their repercussions.

2 Some of the conclusions in this report may be based on third party data. No guarantee can be given for the accuracy or completeness of any of the third party data used. Historical maps and aerial photographs provide a “snap shot” in time about conditions or activities at the site and cannot be relied upon as indicators of any events or activities that may have taken place at other times.

3 The conclusions and recommendations made in this report and the opinions expressed are based on the information reviewed and/or the ground conditions encountered in exploratory holes and the results of any field or laboratory testing undertaken. There may be ground conditions at the site that have not been disclosed by the information reviewed or by the investigative work undertaken. Such undisclosed conditions cannot be taken into account in any analysis and reporting.

4 Unless specifically stated to the contrary, this report does not purport to be a “Geotechnical Design Report” as defined in Clause 2.8 of Eurocode 7 (Geotechnical Design BS EN 1997-1:2004). Some of the data contained herein and used to support any geotechnical assessment presented in this report may be historical or for other reasons not fully compliant with the requirements of that code.

5 It should be noted that groundwater levels, groundwater chemistry, surface water levels, surface water chemistry, soil gas concentrations and soil gas flow rates can vary due to seasonal, climatic, tidal and man made effects.

6 This report has been written for the sole use of the Client stated at the front of the report in relation to a specific development or scheme. The conclusions and recommendations presented herein are only relevant to the scheme or the phase of project under consideration. This report shall not be relied upon or transferred to any other party without the express written authorisation of PBA. Any such party relies upon the report at its own risk.

7 The interpretation carried out in this report is based on scientific and engineering appraisal carried out by suitably experienced and qualified technical consultants based on the scope of our engagement. We have not taken into account the perceptions of, for example, banks, insurers, other funders, lay people, etc, unless the report has been prepared specifically for that purpose. Advice from other specialists may be required such as the legal, planning and architecture professions, whether specifically recommended in our report or not.

8 Public or legal consultations or enquiries, or consultation with any Regulatory Bodies (such as the Environment Agency, Natural England or Local Authority) have taken place only as part of this work where specifically stated.

WOODCROFT FARM, WATERLOOVILLE
TABLE 1 - SUMMARY OF SOIL CHEMICAL RESULTS
Brightside Soils Using 2011 Asessment Criteria

		Assessment Criteria										MG	MG	MG	MG	MG	MG	CH	MG	MG	MG	HD	LG	HD	LG	LG	HD	LG	HD	HD	MG	MG	MG
												TP 1	TP 1	TP 1	TP 2	TP 2	TP 2	TP 2	TP 3	TP 3	TP 4	TP 4	TP10	TP11	TP13	TP14	TP9	TP 18	BH 1	BH 4	WS 1	WS 1	WS 2
Analyte	**Units**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**0.50-0.50**	**1.1**	**2.2**	**1**	**2**	**2.00-2.80**	**3**	**1.1**	**2**	**0.5**	**1**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.3-0.8**	**0.15- 0.60**	**0.50-1.00**	**2.50-3.00**	**1.50-2.00**
Stones BG 2.6/3.0	%																																
Moisture content at 30 C	%																																
Arsenic as As, dry weight	mg/kg	43	32	640								13.9		14	12.5	13.1		7.81	28.5	19.9	17.6	15.7	7.72	10.5	13.1	6.67		6.73	7.65	11.5	14.4	6.9	13.3
Beryllium as BE, dry weight	mg/kg				55	51	420									0.928				0.0914			0.708			0.578		0.0652	0.692		2.2	0.226	0.253
Boron as B, hot water sol dw	mg/kg				45	291	192000																										
Cadmium as Cd, dry weight	mg/kg	1.8	10	230								0.352		0.0628	0.833	1.18		0.565	0.26	0.0762	0.02	0.0527	0.356	0.304	0.438	0.299		0.02	0.302	0.22	0.271	0.22	0.191
Chromium as Cr, dry weight	mg/kg	34600	3000	30400								39.6		37.9	28.2	27.8		23.2	21.4	31.4	24.3	27.8	34.6	30.2	35.3	28.8		33.5	49.8	13.5	49.9	26	29.7
Copper as Cu, dry weight	mg/kg				524	2330	71700									40.6				14.2			16.6			11.6		13.5	11.4		20.7	16.3	14
Lead as Pb, dry weight	mg/kg	450*	450*	750*								22.5		33.9	270	129		46.7	70	43.5	23.8	14.5	17.1	15.3	13.1	13.4		9.99	18.7	18.9	22.3	26.5	22.9
Mercury as Hg, dry weight	mg/kg	80	170	3600								0.14		0.14	0.14	0.14		0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14		0.14	0.14	0.14	0.14	0.14	0.14
Nickel as Ni, dry weight	mg/kg	230	130	1800								32.7		31.2	23.9	33.4		21.8	10.4	15	10.3	9.97	12.7	8.96	12.8	10.1		7.63	11	4.93	43.1	23.1	21.8
Selenium as Se, dry weight	mg/kg	120	350	13000								1		1	1	1		1	1	1	1	1	1	1	1.02	1		1	1.02	1	1	1.32	1
Vanadium as Vn, dry weight	mg/kg				18	75	3160									42.8				58.4			50.3			48.2		61.9	77.3		94.8	44.1	56.4
Zinc as Zn, dry weight	mg/kg				618	3750	665000									843				75.6			32.1			32.3		16.2	21		93.2	79.6	68.8
Cyanide (Total)	mg/kg																																
Organic matter	%															5.97				2.19			0.85			0.941		0.846	0.972		1.16	1.62	2.16
Phenol, Total	mg/kg			3200				158	316																								
Sulphate (Total) as SO4	%															0.222				0.202			0.014			0.0093		0.005	0.0112		0.0214	0.0919	0.193
pH	pH Units															7.73				7.63			6.25			6.21		7.94	7.76		7.64	8.5	8.51
Benzene								0.04	0.18	57																							
Toluene								60	320	2200																							
Ethylbenzene								45	180	1400																							
Xylene								80	120	1300																							
>C5 to C6 Aliphatic	mg/kg				1700	55	6200																										
>C6 to C8 Aliphatic	mg/kg				5600	160	18000																										
>C8 to C10 Aliphatic	mg/kg				770	46	5100																										
>C10 to C12 Aliphatic	mg/kg				4400	230	24000																										
>C12 to C16 Aliphatic	mg/kg				13000	1700	83000																										
>C16 to C35 Aliphatic	mg/kg				270000	64000	2E+06																										
>C35 to C44 Aliphatic	mg/kg				270000	64000	2E+06																										
Total Aliphatic	mg/kg																																
>C5 to C7 Aromatic	mg/kg				27	130	49000																										
>C7 to C8 Aromatic	mg/kg				51	270	110000																										
>C8 to C10 Aromatic	mg/kg				21	65	8600																										
>C10 to C12 Aromatic	mg/kg				31	160	29000																										
>C12 to C16 Aromatic	mg/kg				57	310	37000																										
>C16 to C21 Aromatic	mg/kg				110	480	28000																										
>C21 TO C35 Aromatic	mg/kg				820	1100	28000																										
>C35 to C44 Aromatic	mg/kg				820	1100	28000																										
Total Aromatic	mg/kg																																
Total EPH Aliphatic/Aromatic	mg/kg																																
TPH by GC (>C6-C10)	mg/kg																																
TPH by GC (>C10 - C20)	mg/kg																																
TPH by GC (>C20-C40)	mg/kg																																
TPH by GC (>C6 - C40)	mg/kg											110		138	207	511		152	238	241	145	35	48.8	42.4	52.1	45		44.2	35	42.7	59.6	78.4	240
TPH (Chromatogram)	TEXT																																
naphthalene	mg/kg				9.9	3.7	480							0.009		0.0753			0.0188														
acenaphthylene	mg/kg				69	400	97000							0.012		0.124			0.0205														
acenaphthene	mg/kg				85	480	98000							0.008		0.0347			0.008														
fluorene	mg/kg				67	380	69000							0.01		0.0572			0.0182														
phenanthrene	mg/kg				38	200	22000							0.0263		0.609			0.117														
anthracene	mg/kg				950	4900	540000							0.016		0.182			0.0361														
fluoranthene	mg/kg				130	460	23000							0.0269		1.41			0.21														
pyrene	mg/kg				270	1000	54000							0.0222		1.33			0.192														
benzo(a)anthracene	mg/kg				5.5	4.7	95							0.014		0.754			0.139														
chrysene	mg/kg				5.8	8	140							0.01		0.913			0.137														
benzo(b)fluoranthene	mg/kg				7.4	6.5	100							0.015		1.5			0.17														
benzo(k)fluoranthene	mg/kg				14	9.6	140							0.014		0.421			0.0874														
benzo(a)pyrene	mg/kg				1.2	0.94	14							0.015		1.09			0.131														
indeno(123cd)pyrene	mg/kg				3.8	3.9	61							0.018		0.807			0.097														
dibenzo(ah)anthracene	mg/kg				1.5	0.86	13							0.023		0.214			0.0583														
benzo(ghi)perylene	mg/kg				120	46	660							0.024		0.98			0.105														
PAH (Total)	mg/kg													0.118		10.5	<10		1.54	<10	<10	<10						<10	<10		<10	<10	<10
PCB (as Aroclors)	mg/kg																		0														
1,2-dichloroethane	mg/kg				0.0083	0.008	1												0														
1,1,1 Trichloroethane (TCA)	mg/kg				110	13	1400												0														
1,1,1,2 Tetrachloroethane	mg/kg				1.9	2.1	260												0														
1,1,2,2 Tetrachloroethane	mg/kg				0.89	2.9	580												0														
Tetrachloroethene (PCE)	mg/kg				3.7	2.1	290												0														
Tetrachloromethane					0.37	0.039	6.6												0														
Tetrachloroethene (TCE)	mg/kg				0.95	0.22	25												0														
Trichlormethane (Chloroform)	mg/kg				0.7	1.3	190												0														
Vinyl Chloride (Chloroethene)	mg/kg				0.001	0.0006	0.081												0														
Asbestos	TEXT												Detected			Not Detected	Detected		Not Detected														
Floride	mg/kg																																
Molybdenum	mg/kg																																

Assessment Criteria

A - Soil Guideline Value (SGV) for Allotments
B - SGV for Residential with Plant Uptake
C - SGV for Commercial/Industrial
D - LQM Generic Assessment Criteria (GAC) for Allotments
E - LQM GAC for Residential with Plant Uptake
F - LQM GAC for Commercial/Industrial
G - Contaminated Land Working Group (CLWG) GAC for Allotments
H - CLWG GAC for Residential with Plant Uptake
I - CLWG GAC for Commercial/Industrial
J - PBA Site Specific Screening Value

*Lead - Soil Guideline Value 2002

NOTES

MG - Made Ground
HD - Head Deposits
LG - Lambeth Group
CH - Chalk

WOODCROFT FARM, WATERLOOVILLE
TABLE 1 - SUMMARY OF SOIL CHEMICAL RESULTS
Brightside Soils Using 2011 Asessment Criteria

		Assessment Criteria										MG	HD	MG	HD	MG	LG	HD
												WS 3	WS 3	WS 4	WS 4	WS 6	WS 6	WS 11
Analyte	**Units**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	0.10-0.40	0.70-1.00	0.10-0.30	0.70-1.00	0.10- 0.50	0.80-1.00	0.20-0.50
Stones BG 2.6/3.0	%																	
Moisture content at 30 C	%																	
Arsenic as As, dry weight	mg/kg	43	32	640								6.22		10.4		21.1		14.4
Beryllium as BE, dry weight	mg/kg				55	51	420					0.754		0.616		0.396		0.904
Boron as B, hot water sol dw	mg/kg				45	291	192000											
Cadmium as Cd, dry weight	mg/kg	1.8	10	230								0.368		0.47		2.79		0.579
Chromium as Cr, dry weight	mg/kg	34600	3000	30400								14.5		28.1		19.8		27.3
Copper as Cu, dry weight	mg/kg				524	2330	71700					65.1		21.6		56.9		7.73
Lead as Pb, dry weight	mg/kg	450*	450*	750*								98.4		72.2		170		17.1
Mercury as Hg, dry weight	mg/kg	80	170	3600								0.14		0.14		0.14		0.14
Nickel as Ni, dry weight	mg/kg	230	130	1800								8.33		15.7		15.1		32.3
Selenium as Se, dry weight	mg/kg	120	350	13000								1		1		1		1.36
Vanadium as Vn, dry weight	mg/kg				18	75	3160					31		39.5		30.8		52.8
Zinc as Zn, dry weight	mg/kg				618	3750	665000					135		124		6120		52.9
Cyanide (Total)	mg/kg																	
Organic matter	%											3.95		4.55		2.36		1.55
Phenol, Total	mg/kg			3200				158	316									
Sulphate (Total) as SO4	%											0.145		0.0031		0.0816		0.0182
pH	pH Units											8.51		8.22		8.35		7.15
Benzene								0.04	0.18	57		0.01		0.01		0.01		
Toluene								60	320	2200		0.002		0.002		0.002		
Ethylbenzene								45	180	1400		0.003		0.003		0.003		
Xylene								80	120	1300		0.009		0.009		0.009		
>C5 to C6 Aliphatic	mg/kg				1700	55	6200					0.0255		0.01		0.01		
>C6 to C8 Aliphatic	mg/kg				5600	160	18000					0.03		0.01		0.01		
>C8 to C10 Aliphatic	mg/kg				770	46	5100					0.01		0.01		0.01		
>C10 to C12 Aliphatic	mg/kg				4400	230	24000					0.0133		0.01		0.01		
>C12 to C16 Aliphatic	mg/kg				13000	1700	83000					12.4		2.12		1.58		
>C16 to C35 Aliphatic	mg/kg				270000	64000	2E+06					641.8		209.06		197.76		
>C35 to C44 Aliphatic	mg/kg				270000	64000	2E+06					260		1.36		31.9		
Total Aliphatic	mg/kg											611		16		232		
>C5 to C7 Aromatic	mg/kg				27	130	49000					0.01		0.01		0.01		
>C7 to C8 Aromatic	mg/kg				51	270	110000					0.01		0.01		0.01		
>C8 to C10 Aromatic	mg/kg				21	65	8600					0.01		0.01		0.01		
>C10 to C12 Aromatic	mg/kg				31	160	29000					0.01		0.01		0.01		
>C12 to C16 Aromatic	mg/kg				57	310	37000					28.1		8.75		2.99		
>C16 to C21 Aromatic	mg/kg				110	480	28000					128		8.21		7.11		
>C21 TO C35 Aromatic	mg/kg				820	1100	28000					733		38		53.8		
>C35 to C44 Aromatic	mg/kg				820	1100	28000					734		17		20.2		
Total Aromatic	mg/kg											1620		71.9		84.1		
Total EPH Aliphatic/Aromatic	mg/kg											2230		88		316		
TPH by GC (>C6-C10)	mg/kg																	
TPH by GC (>C10 - C20)	mg/kg																	
TPH by GC (>C20-C40)	mg/kg																	
TPH by GC (>C6 - C40)	mg/kg												42.8		35		420	55.9
TPH (Chromatogram)	TEXT																	
naphthalene	mg/kg				9.9	3.7	480					0.227		0.0273		0.0275		
acenaphthylene	mg/kg				69	400	97000					0.513		0.0313		0.0167		
acenaphthene	mg/kg				85	480	98000					1.8		0.008		0.008		
fluorene	mg/kg				67	380	69000					1.25		0.01		0.01		
phenanthrene	mg/kg				38	200	22000					3.46		0.0782		0.105		
anthracene	mg/kg				950	4900	540000					1.52		0.0638		0.0304		
fluoranthene	mg/kg				130	460	23000					11.3		0.165		0.289		
pyrene	mg/kg				270	1000	54000					11.1		0.155		0.266		
benzo(a)anthracene	mg/kg				5.5	4.7	95					6.16		0.117		0.156		
chrysene	mg/kg				5.8	8	140					5.84		0.106		0.169		
benzo(b)fluoranthene	mg/kg				7.4	6.5	100					9.75		0.206		0.289		
benzo(k)fluoranthene	mg/kg				14	9.6	140					3.39		0.0561		0.1		
benzo(a)pyrene	mg/kg				1.2	0.94	14					8.31		0.112		0.201		
indeno(123cd)pyrene	mg/kg				3.8	3.9	61					4.33		0.105		0.135		
dibenzo(ah)anthracene	mg/kg				1.5	0.86	13					1.38		0.0316		0.0412		
benzo(ghi)perylene	mg/kg				120	46	660					5.91		0.175		0.179		
PAH (Total)	mg/kg											76.2	<10	1.43	<10	2	<10	<10
PCB (as Aroclors)	mg/kg											0						
1,2-dichloroethane	mg/kg				0.0083	0.008	1					0.01				0.005		
1,1,1 Trichloroethane (TCA)	mg/kg				110	13	1400					0.014				0.007		
1,1,1,2 Tetrachloroethane	mg/kg				1.9	2.1	260					0.02				0.01		
1,1,2,2 Tetrachloroethane	mg/kg				0.89	2.9	580					0.02				0.01		
Tetrachloroethene (PCE)	mg/kg				3.7	2.1	290					0						
Tetrachloromethane					0.37	0.039	6.6					0						
Tetrachloroethene (TCE)	mg/kg				0.95	0.22	25					0.01				0.005		
Trichlormethane (Chloroform)	mg/kg				0.7	1.3	190					0						
Vinyl Chloride (Chloroethene)	mg/kg				0.001	0.0006	0.081					0.02				0.01		
Asbestos	TEXT																	
Floride	mg/kg																	
Molybdenum	mg/kg																	

Assessment Criteria

A - Soil Guideline Value (SGV) for Allotments
B - SGV for Residential with Plant Uptake
C - SGV for Commercial/Industrial
D - LQM Generic Assessment Criteria (GAC) for Allotments
E - LQM GAC for Residential with Plant Uptake
F - LQM GAC for Commercial/Industrial
G - Contaminated Land Working Group (CLWG) GAC for Allotments
H - CLWG GAC for Residential with Plant Uptake
I - CLWG GAC for Commercial/Industrial
J - PBA Site Specific Screening Value

*Lead - Soil Guideline Value 2002

Potential Contaminant		Measured Values			Critical	Outlier Test		Assessment Values							
		Number of Tests	Minimum	Maximum	Concentration	Critical Value	Number Exceeding	EQS Freshwater		Exceeding No	Exceeding Cc	UK Drinking Water		Exceeding No	Exceeding Cc
Arsenic	µg/l	2	0.6	3.1	9.6	-	-	50	(1)	0	-	10	(2)	0	-
Cadmium	µg/l	2	0.1	0.1	-	-	-	5	(1)	0	-	5	(2)	0	-
Chromium	µg/l	2	2.3	3.3	6.0	-	-	20	(1)	0	-	50	(2)	0	-
Lead	µg/l	2	0.1	0.7	2.2	-	-	10	(1)	0	-	50	(2)	0	-
Mercury	µg/l	2	0.01	0.01	-	-	-	1	(1)	0	-	1	(2)	0	-
Selenium	µg/l	2	1.1	1.2	1.3	-	-	-		-	-	10	(2)	0	-
Copper	µg/l	2	1.7	2.1	3.3	-	-	10	(1)	0	-	2000	(2)	0	-
Nickel	µg/l	2	0.6	2.8	8.7	-	-	150	(1)	0	-	20	(2)	0	-
Zinc	µg/l	2	0.6	2.4	7.3	-	-	75	(1)	0	-	-		-	-
Sulphate (Water Soluble)	mg/l	2	4	90	321	-	-	-		-	-	250	(2)	0	-
PAH	mg/l	2	0.1	0.1	-	-	-	-		-	-	0.1	(2)	0	-
pH	pH µnits	2	7.9	8.2	9.0	-	-	9	(1)	0	-	10	(2)	0	-
Total Alkalinity	mg/l	2	271	630	1584	-	-	-		-	-	-		-	-
Electrical conductivity	µS/cm	2	124.0	360.0	987.1	-	-	-		-	-	2500	(2)	0	-

Notes

(1) Denotes EQS values for freshwater

(2) Denotes UK Drinking Water Standards

EPH Denotes Extractable Petroleum Hydrocarbons

PAH Denoted Polynuclear Aromatic Hydrocarbons

X Denotes Critical Concentration (Cc) exceeding assessment value

Critical Concentration is the concentration which the actual mean concentration will be below 19 times out of 20

Critical Value is the concentration above which values may be outliers of the data set. Critical Concentrations are determined including values exceeeding Outlier Test

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Client grainger

SUMMARY OF CHEMICAL ANALYSIS OF WATER SAMPLES
ELUATE SAMPLES

WOODCROFT FARM, WATERLOOVILLE

Date	November 2011
A4 Scale	nts
Drawn	az
Checked	ad
Table	**2**

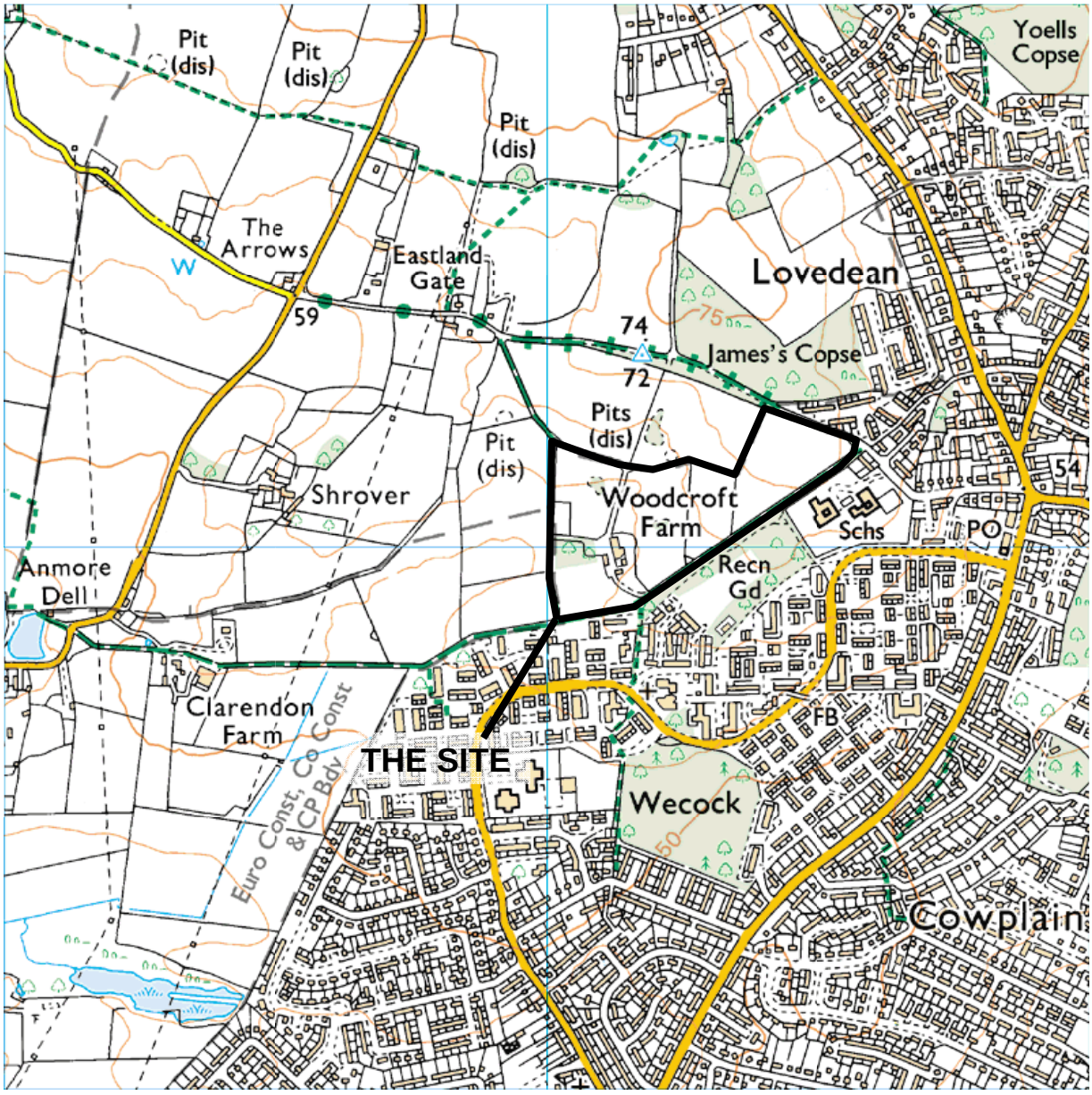
WOODCROFT FARM, WATERLOOVILLE
TABLE 3

Pollutant Linkages, Risk Estimation and Hazard Classification

Receptor	Present (Y/N) & Sensitivity Value	Pathway	Present (Y/N)	EPH & Solvent	PAH	Metals	Inorganic	Biocides	Radioactivity	Ground Gas	Consequence (Hazard Classification x Sensitivity)	Probability	Estimated Risk
Human Health - On-Site Current Users		Ingestion of fruit or vegetable leaf or roots	Y	X	√	√	√	X	X	X	MILD 9=(3x3)	Low likelihood	Low
		Ingestion of contaminated drinking water	N										
		Ingestion of water / sediments when swimming	N										
		Ingestion of soil/dust indoors	Y	X	√	√	√	X	X	X	MILD 9=(3x3)	Low likelihood	Low
		Ingestion of soil/dust outdoors	Y	X	√	√	√	X	X	X	MILD 9=(3x3)	Low likelihood	Low
		Inhalation of particles (dust / soil) indoor and outdoor	Y	X	√	√	√	X	X	X	MILD 9=(3x3)	Low likelihood	Low
		Inhalation of vapours/gases – outdoor	Y	X	√	√	√	X	X	√	MILD 9=(3x3)	Low likelihood	Low
		Inhalation of vapours/gases - indoor	Y	X	√	√	√	X	X	√	MILD 9=(3x3)	Low likelihood	Low
		Dermal absorption via direct contact with soil	Y	X	√	√	√	X	X	X	MILD 9=(3x3)	Low likelihood	Low
	(Y) 3	Dermal absorption via waters (swimming / showering)	Y	X	√	√	√	X	X	X	MILD 9=(3x3)	Low likelihood	Low
Human Health - On-Site Future User		Ingestion of fruit or vegetable leaf or roots	Y	X	√	√	√	X	X	X	MEDIUM 15=(5x3)	Low likelihood	Moderate/Low
		Ingestion of contaminated drinking water	N										
		Ingestion of water / sediments when swimming	N										
		Ingestion of soil/dust indoors	Y	X	√	√	√	X	X	X	MEDIUM 15=(5x3)	Low likelihood	Moderate/Low
		Ingestion of soil/dust outdoors	Y	X	√	√	√	X	X	X	MEDIUM 15=(5x3)	Low likelihood	Moderate/Low
		Inhalation of particles (dust / soil) indoor and outdoor	Y	X	√	√	√	X	X	X	MEDIUM 15=(5x3)	Low likelihood	Moderate/Low
		Inhalation of vapours/gases – outdoor	Y	X	√	√	√	X	X	√	MEDIUM 15=(5x3)	Low likelihood	Moderate/Low
		Inhalation of vapours/gases - indoor	Y	X	√	√	√	X	X	√	MEDIUM 15=(5x3)	Low likelihood	Moderate/Low
		Dermal absorption via direct contact with soil	Y	X	√	√	√	X	X	X	MEDIUM 15=(5x3)	Low likelihood	Moderate/Low
	(Y) 5	Dermal absorption via waters (swimming / showering)	Y	X	√	√	√	X	X	X	MEDIUM 15=(5x3)	Low likelihood	Moderate/Low
Human Health - Off-Site		Ingestion of fruit or vegetable leaf or roots	Y	X	√	√	√	X	X	X	MEDIUM 15=(5x3)	Low likelihood	Moderate/Low
		Ingestion of contaminated drinking water	N										
		Ingestion of water / sediments when swimming	N										
		Ingestion of soil/dust indoors	Y	X	√	√	√	X	X	X	MEDIUM 15=(5x3)	Low likelihood	Moderate/Low
		Ingestion of soil/dust outdoors	Y	X	√	√	√	X	X	X	MEDIUM 15=(5x3)	Low likelihood	Moderate/Low
		Inhalation of particles (dust / soil) indoor and outdoor	Y	X	√	√	√	X	X	X	MEDIUM 15=(5x3)	Low likelihood	Moderate/Low
		Inhalation of vapours – outdoor	Y	X	√	√	√	X	X	√	MEDIUM 15=(5x3)	Low likelihood	Moderate/Low
		Inhalation of vapours - indoor	Y	X	√	√	√	X	X	√	MEDIUM 15=(5x3)	Low likelihood	Moderate/Low
		Dermal absorption via direct contact with soil	Y	X	√	√	√	X	X	X	MEDIUM 15=(5x3)	Low likelihood	Moderate/Low
	(Y) 5	Dermal absorption via waters (swimming / showering)	N	X	√	√	√	X	X	X	MEDIUM 15=(5x3)	Low likelihood	Moderate/Low
Human Health - Construction/ Maintenance Workers*		Ingestion of soil/dust indoors	Y	X	√	√	√	X	X	X	MILD 6=(2x3)	Likely	Moderate/Low
		Ingestion of soil/dust outdoors	Y	X	√	√	√	X	X	X	MILD 6=(2x3)	Likely	Moderate/Low
		Inhalation of particles (dust / soil) outdoor	Y	X	√	√	√	X	X	X	MILD 6=(2x3)	Likely	Moderate/Low
		Inhalation of vapours – outdoor	Y	X	X	X	√	X	X	√	MILD 6=(2x3)	Likely	Moderate/Low
		Inhalation of vapours - indoor	Y	X	X	X	√	X	X	√	MILD 6=(2x3)	Likely	Moderate/Low
	(Y) 2	Dermal absorption via direct contact with soil	Y	X	√	√	√	X	X	X	MILD 6=(2x3)	Likely	Moderate/Low
Groundwater		Leaching	Y	X	X	X	X	X	X	X			
	(Y) 5	Migration via natural or anthropogenic	Y	X	X	X	X	X	X	X			
Surface Water		Direct runoff or discharges from pipes											
		Indirect via recharge from groundwater (hydraulic flow)											
	N	Deposition of wind blown dust											
Buildings		Direct contact	Y	X	√	√	√	X	X	X	Minor 6=(2x3)	Low likelihood	Low
	(Y) 2	Explosion due to gas migration via natural or anthropogenic	Y	X	X	X	X	X	X	√	Medium 12=(3x4)	Low likelihood	Moderate/Low
Ecological Systems		Direct deposition of particles / dust - wind blown or flood											
		Indirect - through watering											
		Inhalation of gases/vapours or particulates/dust by animals											
	N	Ingestion of of vegetation / water / soil by animals											
Property		Direct deposition via wind or flood	Y	X	√	√	√	X	X	X	Minor 6=(2x3)	Low likelihood	Low
		Indirect through watering	Y	X	√	√	√	X	X	X	Minor 6=(2x3)	Low likelihood	Low
		Inhalation of gas / vapour / particulates / dust by animals	Y	X	√	√	√	X	X	√	Minor 6=(2x3)	Low likelihood	Low
	(Y) 2	Ingestion of vegetation / water / soil by animals	Y	X	√	√	√	X	X	X	Minor 6=(2x3)	Low likelihood	Low

NOTES
* It is assumed that construction workers will undergo appropriate heath and safety training and wear personal protective equipment in conjunction with appropriate hygene facilities.
Risk estimation establishes the magnitude and probability of the possible consequences (what degree of harm might result and how likely).
The criteria for classifying probability and consequence are set out in Tables 3 and 4 of the PBA methodology.
Green text highlights one or more elements of the Pollutant Linkage are missing and therefore eliminated

The risks estimated in this table are assessed only for the Made Ground in the ifilled Pit and the breakers yard.



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National Grid Reference	SU 681 119
Coordinates	N50:54:12 W1:01:57
Nearest Post Code	PO8 9QA

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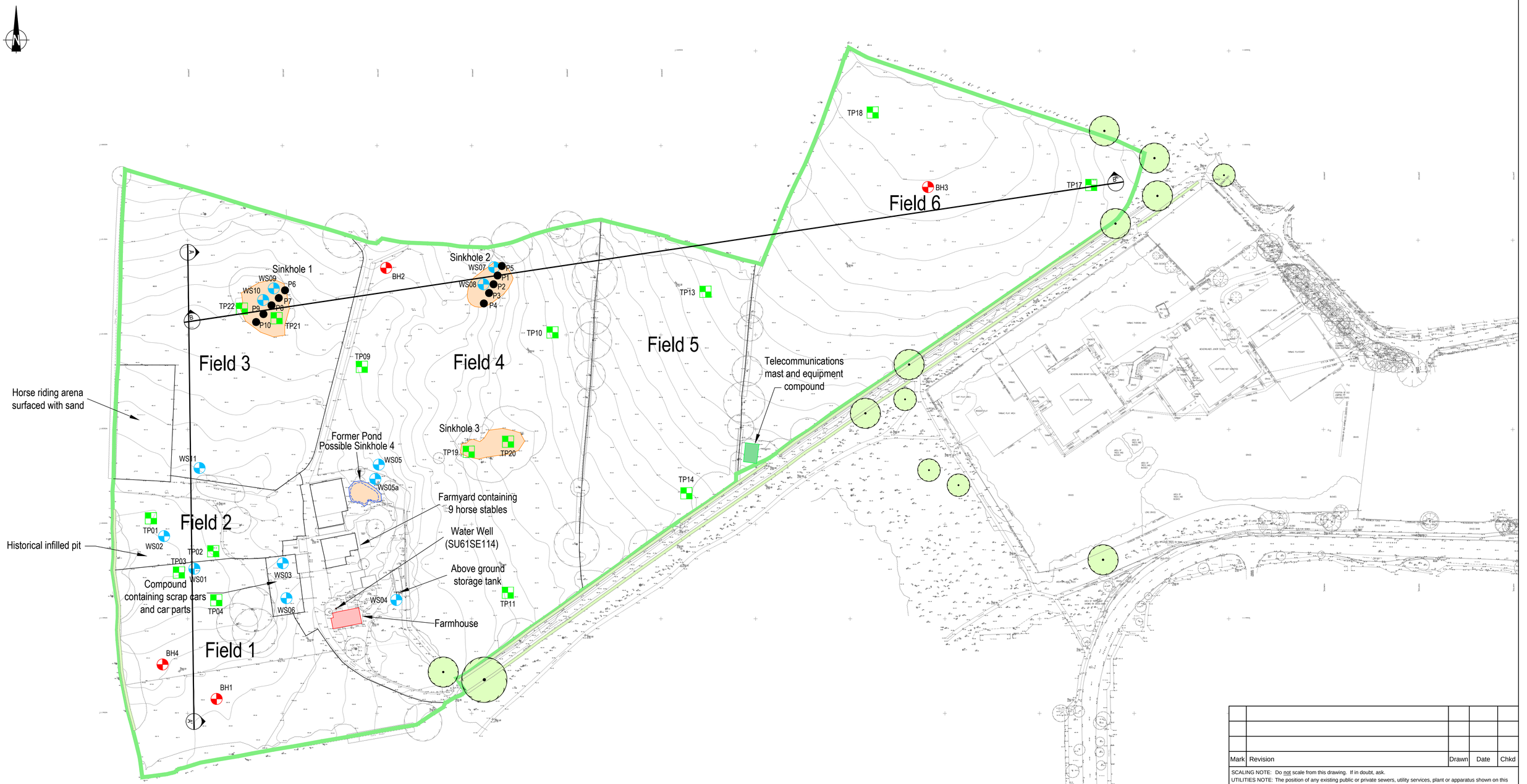
Client: grainger

SITE LOCATION PLAN

WOODCROFT FARM, WATERLOOVILLE

Date	Oct 2011
A4 Scale	1:12 500
Drawn	az
Checked	ad
Figure	1

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KEY

- Site boundary for Zone A
- Sinkholes
- Cross Section Line

Exploratory Holes

- Cable Percussion Boreholes
- Trial Pits
- Window Sample
- Dynamic Probe

Mark	Revision	Drawn	Date	Chkd

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UTILITIES NOTE: The position of any existing public or private sewers, utility services, plant or apparatus shown on this drawing is believed to be correct, but no warranty to this is expressed or implied. Other such plant or apparatus may also be present but not shown. The Contractor is therefore advised to undertake his own investigation where the presence of any existing sewers, services, plant or apparatus may affect his operations.

Drawing Issue Status

Woodcroft Farm, Waterlooville

Site Layout Plan

Client

grainger

Date of 1st Issue: 28.10.2011	Drawn by: DJM
A1 Scale: 1:1000	Checked by: AZ
Drawing Number: Figure 2	Revision: -

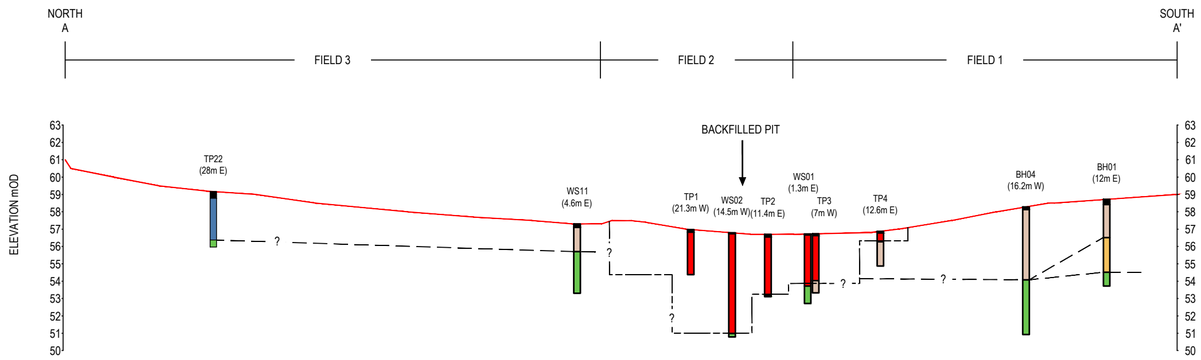
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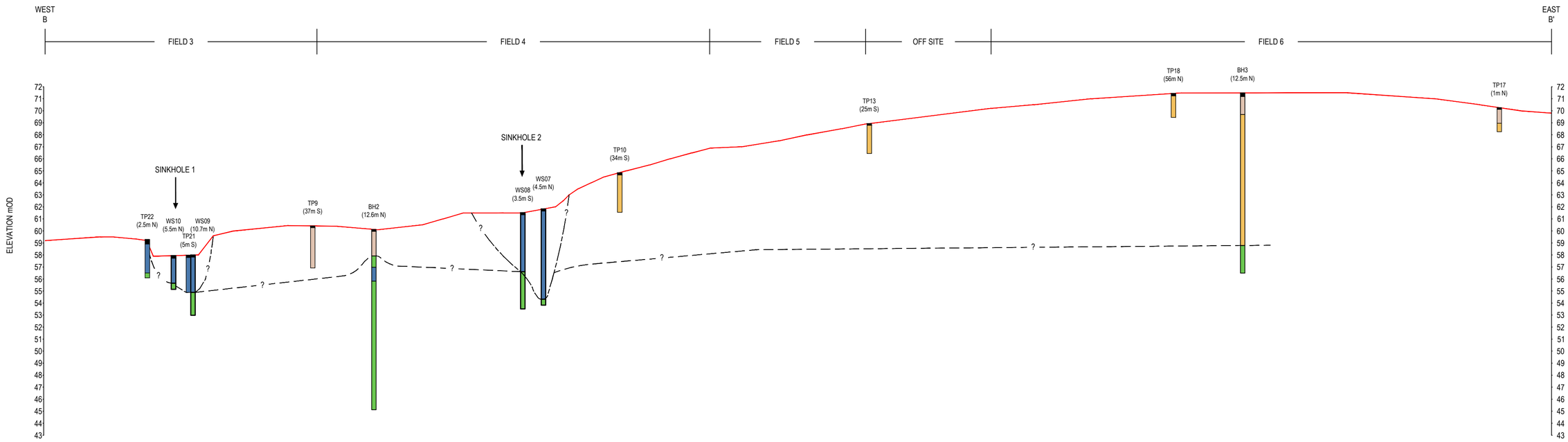


KEY

- Made Ground
- Head Deposits
- Lambeth Group
- Upper Chalk
- Sinkhole/Solution Feature Infill
- TP17 (1m N) — Exploratory Hole Reference (Offset)
- Ground Level
- Indicative Geological Boundary

NOTE:
Offset is measured from the line of section to the centre of the exploratory hole (See Figure 2). It indicates the distance and offset direction.

Horizontal Scale 1:1000
Vertical Scale 1:250



Woodcroft Farm, Waterlooville

Schematic Sections A-A' & B-B'

Client: grainger

Date	Drawn by
28.10.2011	DJM
A2 Scale: H 1:1000 V 1:250	Checked by: AZ

Figure Number: 3

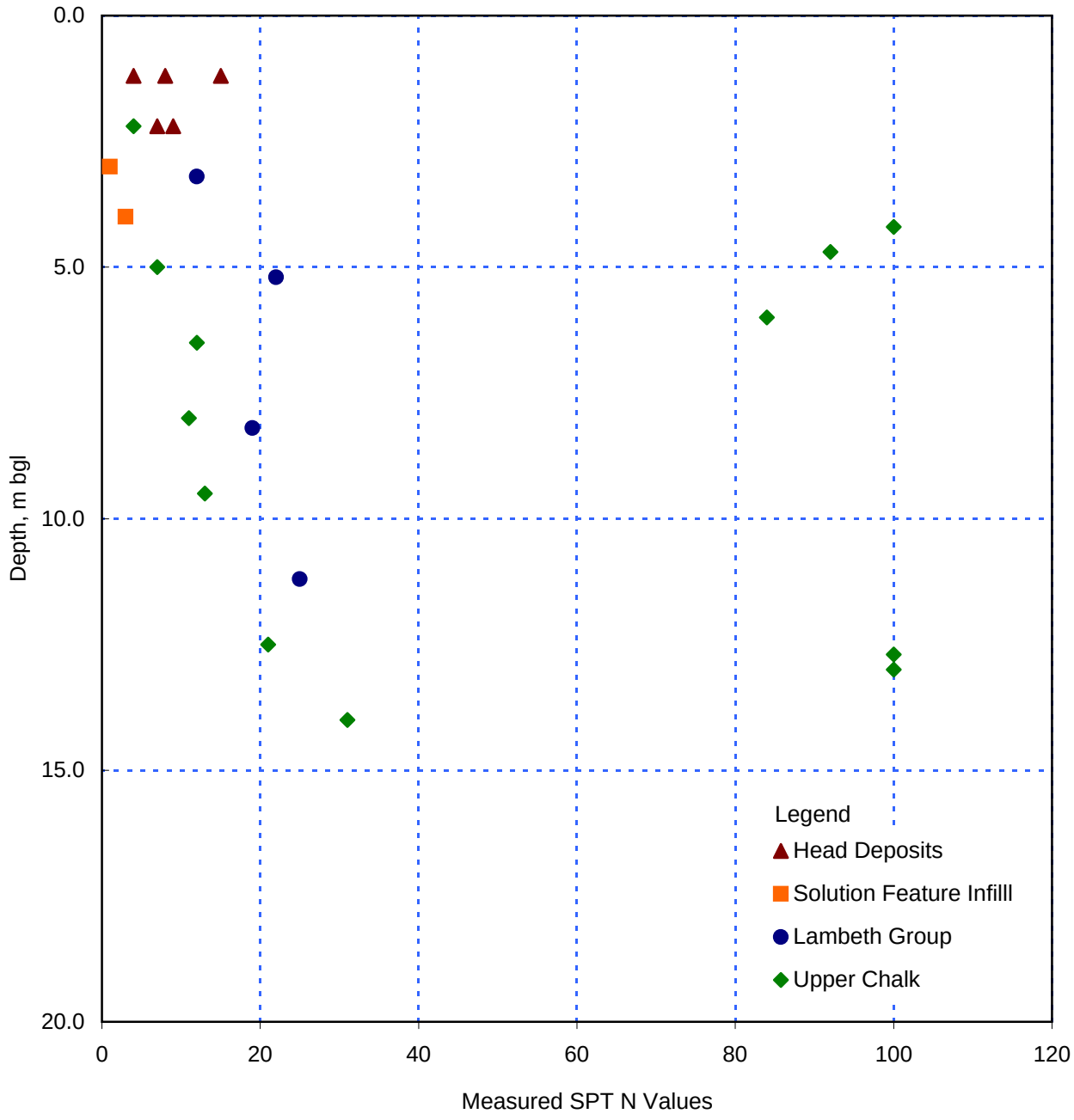
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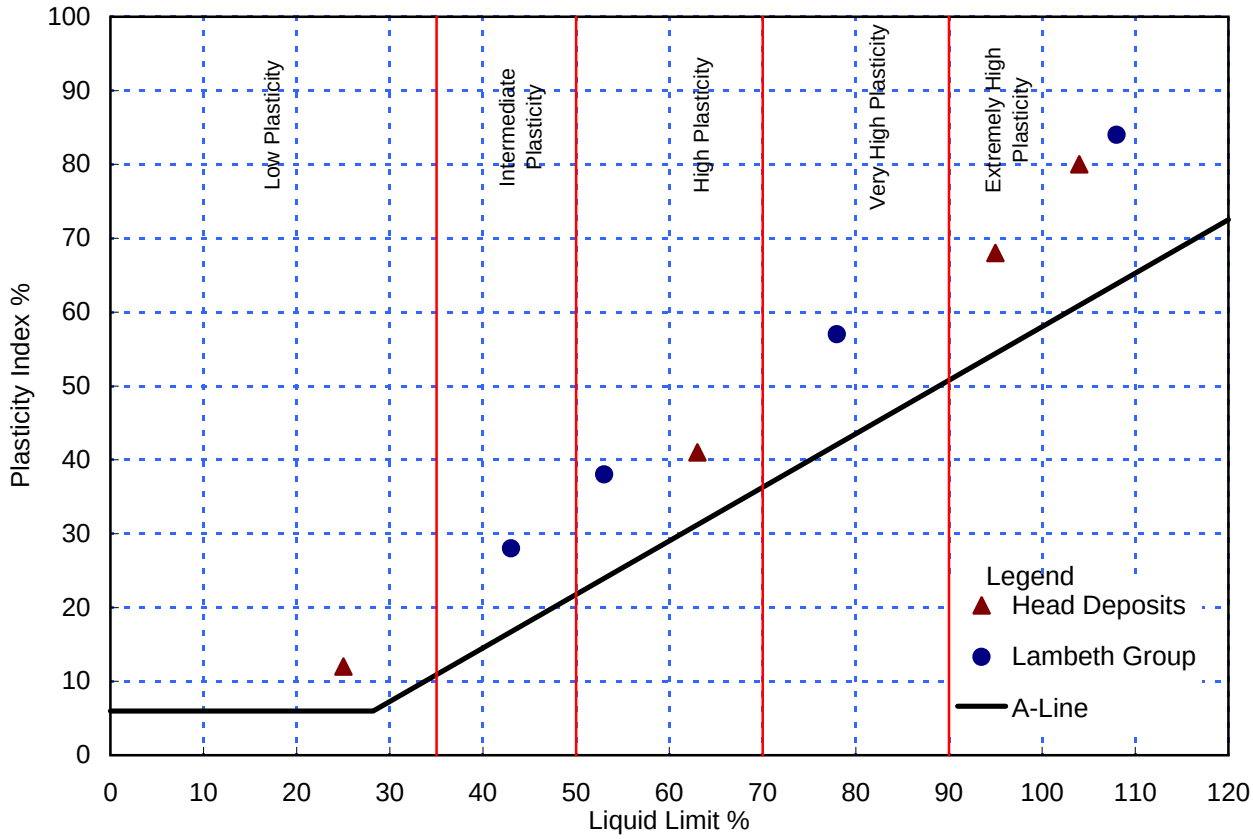
File Location: j:\21834 woodcroft farm\030 geo\03 cad & graphics\cad\dwgs\figure 3 - geological cross sections.dwg



Note: SPT N values have not been corrected for overburden pressure
SPT N values shown over 50 have been extrapolated using the penetration length

pba peterbrett Caversham Bridge House, Waterman Place, Reading, RG1 8DN Tel 0118 950 0761 Fax 0118 959 7499	Client grainger	**STANDARD PENETRATION TESTS** **WOODCROFT FARM, WATERLOOVILLE**	Date November 2011 A4 Scale nts Drawn az Checked AD Figure **4**

J:\21834 Woodcroft Farm\030 Geo\04 Data\Geo lab\[geo2_strength.xls]SPTPlot depth



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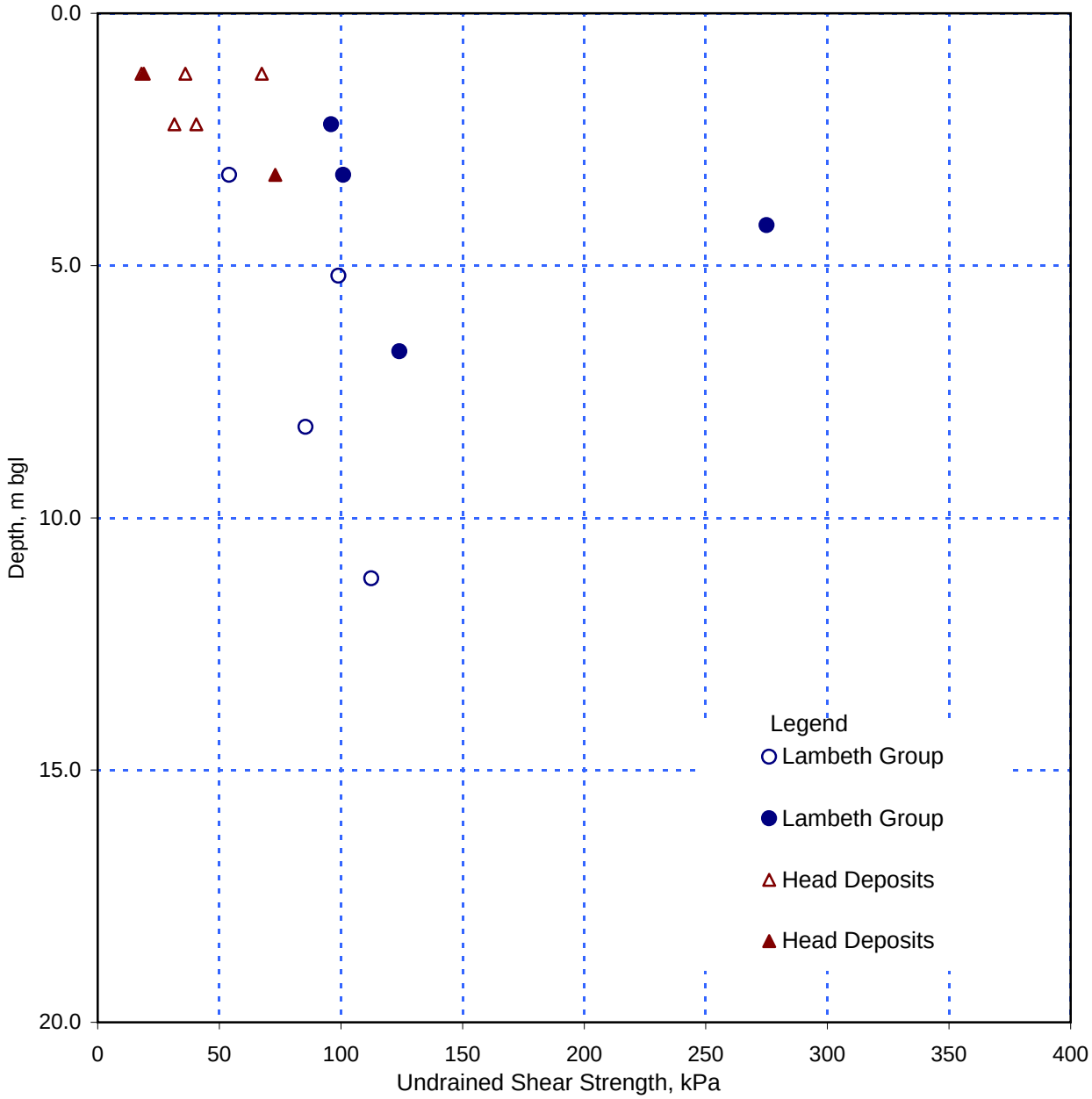
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ATTERBERG LIMITS

WOODCROFT FARM, WATERLOOVILLE

Date	November 2011
A4 Scale	nts
Drawn	az
Checked	ad
Figure	5

J:\21834 Woodcroft Farm\030 Geo\04 Data\Geo lab\[geo2_atterbergs01.xls]atterberg



Note: Open symbols denote values of undrained shear strength determined using the empirical correlation with SPT N values (Stroud, 1989) with a factor N_c of 4.5

Closed symbols denote values of undrained shear strength determined by laboratory triaxial testing of UT100 mm diameter specimens

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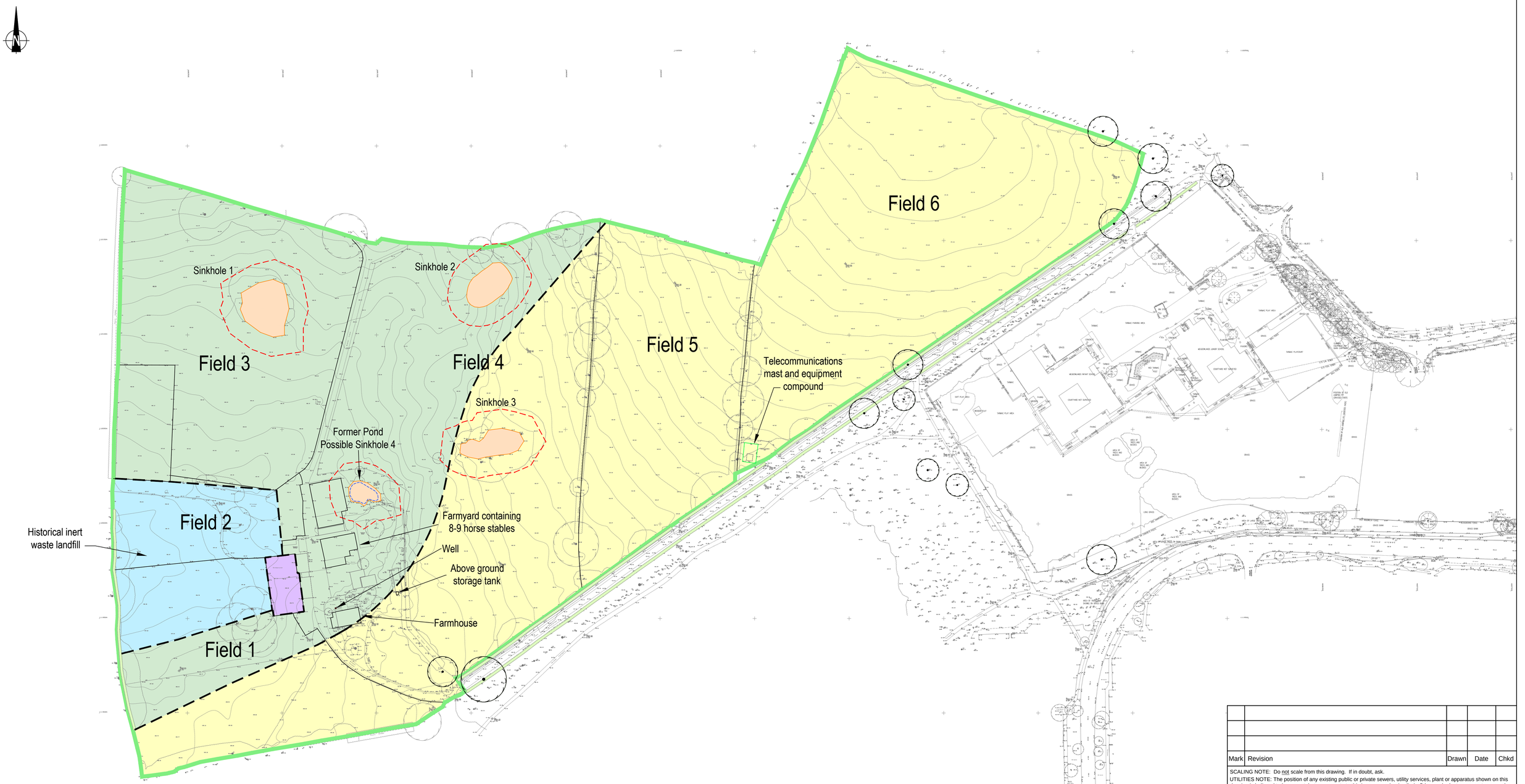
Client: grainger

UNDRAINED SHEAR STRENGTH

WOODCROFT FARM, WATERLOOVILLE

Date	November 2011
A4 Scale	nts
Drawn	az
Checked	AD
Figure	**6**

J:\21834 Woodcroft Farm\030 Geo\04 Data\Geo lab\[geo2_strength.xls]SuPlot depth



KEY

- Site boundary
- Approximate Area boundary

	Ground Conditions	Engineering Solution
Area A	Head Deposits underlain by Chalk	Reinforced conventional spread/strip footings with proving the ground using dynamic probing technique or Reinforced raft or grillage of ground beams foundation. (refer to Section 7.3)
Area B	Lambeth Group underlain by Chalk, locally with Head Deposits	Reinforced conventional spread/strip footings with proving the ground using dynamic probing technique or Reinforced raft or grillage of ground beams foundation. (refer to Section 7.3)
Area C	Made Ground underlain by Chalk (Infilled Pit)	Excavate upper 2m and replace with engineer fill or Dynamic compact prior to reinforced raft foundation or grillage of ground beams (refer to Section 7.4). Protection gas measures to be incorporated in structures (refer to Section 6.6).
Area D	Made Ground underlain by Head Deposits and Chalk (Vehicle Dismantling Yard)	Remove identified impacted soil and use Reinforced conventional spread/strip footings with proving the ground using dynamic probing technique or Reinforced raft or grillage of ground beams foundation. (refer to Section 7.3)
Sinkhole	Sinkhole Infill	10m Buffer Zone around Sinkhole where development should be avoided, unless remedial treatment is carried out.

Notes:
Reinforcing geogrids to be incorporated into road design.

Mark	Revision	Drawn	Date	Chkd

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Drawing Issue Status

Woodcroft Farm, Waterlooville

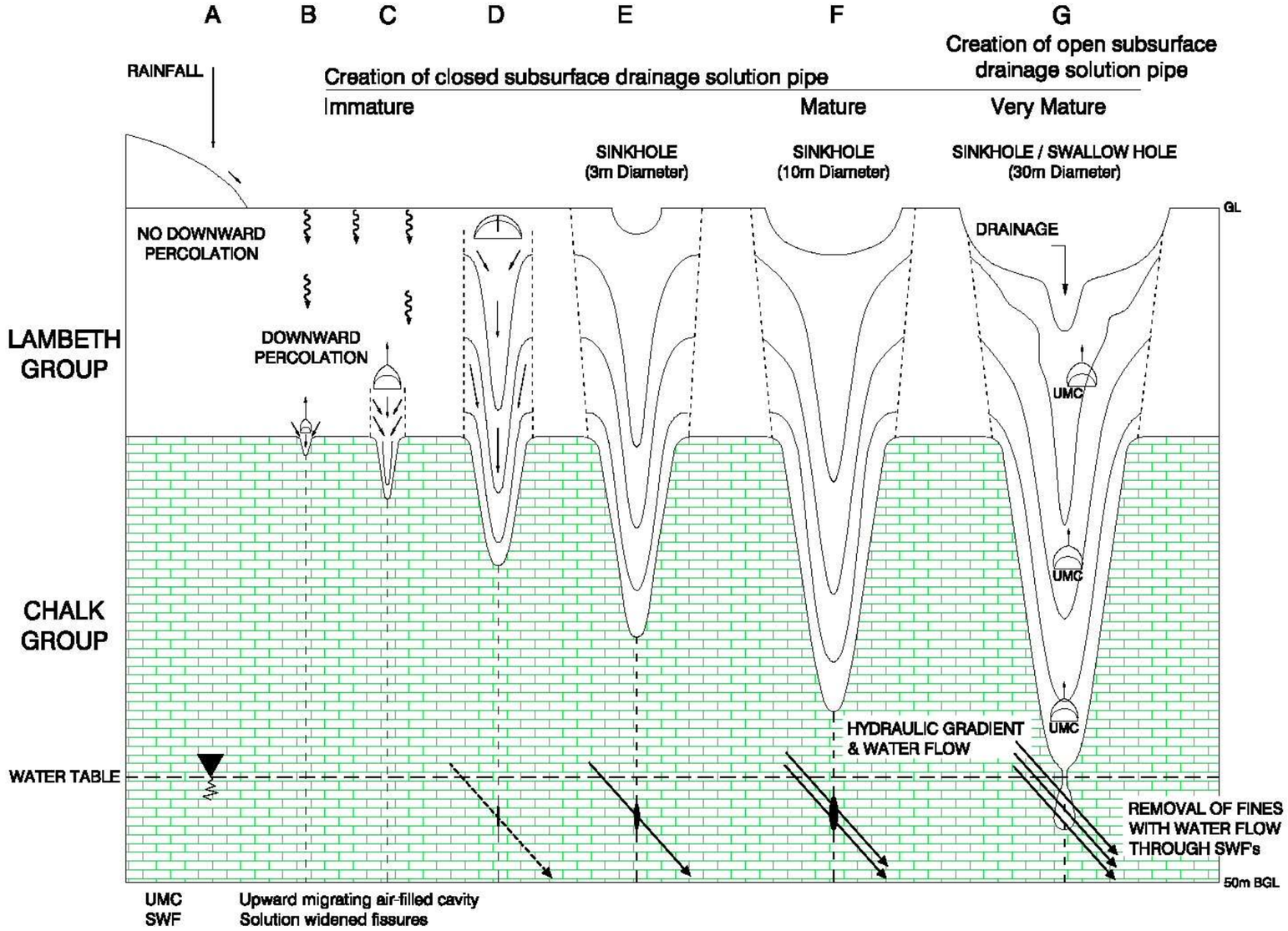
Preliminary Ground Condition Constraints Plan

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Date of 1st Issue: 28.10.2011	Drawn by: DJM
A1 Scale: 1:1000	Checked by: AZ
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Note
The figure is reproduced from the paper 'Karst and mining geohazards with particular reference to the Chalk outcrop, England' By C.D. Edmonds. Published in the Quarterly Journal of Engineering Geology and Hydrogeology 2008; v. 41; p. 261-278.

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Client
grainger

PROPOSED DEVELOPMENT OF NATURAL CAVITIES IN CHALK

WOODCROFT FARM, WATERLOOVILLE

Date	Nov 2011
A3 Scale	NTS
Drawn	az
Checked	az
Figure	**8**

Department of the Environment
CIVIL ENGINEERING LABORATORY Cardington

Investigation No. FGE / 185

Appendix A
Sheet No. 2

37 M R Q's

LOVEDEAN
(HMS Mercury)

BOREHOLE LOG

SU61SE/12A
N.G.R. 687.120
1":316

Borehole No. 1
Ground Level 61·5 m O.D
Date 5th - 7th February 1975

Note:-
Standpipe inserted to 6m. Borehole grouted with bentonite/cement mix to depth of 1·0m

Description of Strata	Legend	Sample	Depth (m)	O.D. (m)
TOPSOIL: turf and organic CLAY with stones.	T		℄	61·5
CLAY: variegated in light brown and grey, with small stones (READING BEDS - Type C)			0·5	61·0
			0·8	60·7
			1·0 (approx)	60·5
CLAY: variegated in red, brown and grey. Nearly vertical curved slickensided fissure present in U100 at 2·0 - 2·5m (READING BEDS - Type C)			1·3	60·2
			2·0	59·5
			2·5	59·0
CLAY/SILT: sandy, variegated in yellow-brown, red and grey. 3·0 - 3·5m sandy SILT with scattered clay patches. (READING BEDS - Type CS)			3·0	58·5
			3·5	58·0
			4·5	57·0
			5·0	56·5
CLAY: variably sandy, variegated in brown and grey, becoming dark grey in parts. Partings (usually thin) and patches of sand are present throughout. Ferruginous nodules occur between 6·0m and 6·5m (READING BEDS - Type CS)			5·5	56·0
			7·0	54·5
			7·5	54·0
			8·5	53·0
SAND: orange-brown, slightly clayey/silty, with small stones (READING BEDS - Type S)			8·7 (approx)	52·8
			9·0	52·5
CLAY: sandy and gravelly (Flints) grey/brown, with chalky streaks. (READING BEDS - Type CG)		B5	9·5	52·0
			9·7	51·8
			10·0	51·5

Remarks

Water levels in standpipe

8/2/75	dry	24/2/75	4·9m
9/2/75	5·5m	25/2/75	4·9m
10/2/75	5·4m	26/2/75	5·0m
11/2/75	5·1m	2/7/75	4·3m
12/2/75	5·3m		
13/2/75	3·2m		
14/2/75	3·2m		
15/2/75	3·1m		
16/2/75	3·2m		
17/2/75	1·3m		
18/2/75	4·8m		
19/2/75	4·7m		
20/2/75	5·0m		
21/2/75	4·9m		
22/2/75	5·0m		
23/2/75	5·0m		

▽ 4·3m

Water entry 5·5m

contd.

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[SU61SE BJ 12 A-G]

Department of the Environment	Investigation No.	Appendix A
CIVIL ENGINEERING LABORATORY Cardington	FGE / 185	Sheet No. 3

37 M R Q's

LOVEDEAN
(HMS Mercury)

BOREHOLE LOG

SU 61 SE | 12 A
N.G.R. 687. 120 1": 316

Borehole No. 1 contd

Ground Level

Date

Note:-

Description of Strata	Legend	Sample	Depth (m)	O.D. (m)	Remarks
CLAY: gravelly (flints), grey-brown, with pockets of orange-brown sand. (READING BEDS – Type C G)			10·0	51·5	
CHALK: remoulded with sand pockets (resembles GRADE V)		I	10·5	51·0	
			10·6	50·9	UPPER CHALK
CHALK: rubbly. Also 'pipe' containing clay and sand with flints. (resembles GRADE IV)			10·8	50·7	
			11·0	50·5	End of borehole

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[SU61SE BJ 12 A-G]

Department of the Environment
CIVIL ENGINEERING LABORATORY Cardington

Investigation No. FGE / 185

Appendix A

Sheet No. 4

37 M R Q's

LOVEDEAN
(HMS Mercury)

BOREHOLE LOG

SU 61 SE / 12 B
N.G.R. 687.120 1":316

Borehole No. 2

Ground Level 60·7 m O.D

Date 8th - 10th February 1975

Note:-
Standpipe inserted to 6m. Borehole grouted with bentonite / cement mix to depth of 1·0m

Description of Strata	Legend	Sample	Depth (m)	O.D. (m)	Remarks
					Water levels in standpipe
TOPSOIL: turf and organic CLAY	T		0	60·7	11/2/75 5·0m 25/2/75 3·8m
CLAY: with stones, grey - green changing to brown and grey variegated at approx. 1·0m (READING BEDS - Type C)			0·5	60·2	12/2/75 5·2m 26/2/75 3·9m
			0·8	59·9	13/2/75 5·3m 2/7/75 4·1m
			1·3	59·4	14/2/75 5·4m
CLAY: sandy, mottled brown/yellow (READING BEDS - Type CS)			1·5	59·2	15/2/75 5·1m
			2·0	58·7	16/2/75 4·0m
					17/2/75 4·0m
					18/2/75 4·1m
					19/2/75 4·0m
					20/2/75 4·0m
					21/2/75 4·0m
					22/2/75 3·9m
CLAY: variegated in red, brown and grey, becoming dark purple / brown or dark grey / brown between 4·5m and 5·0m. Occasional silt layers and pockets of brown sand are present between 4·5m and 5·0m. Plant remains noted at 5·0m. (READING BEDS - Type C)			3·0	57·7	23/2/75 4·0m
			3·5	57·2	24/2/75 3·3m
					▼ 4·1m
			4·5	56·2	
			5·0	55·7	← Water Entry 5·0m
			5·5	55·2	
CLAY: dark grey, possibly slightly organic. Gypsum crystals present at 6·5m. (READING BEDS - Type C)			6·0	54·7	
			6·5	54·2	
			6·9	53·8	
CLAY: sandy, orange - brown / grey (READING BEDS - Type CS)			7·5	53·2	
CLAY: sandy and gravelly (flints), Patches of gypsum crystals and traces of chalk are present. (READING BEDS - Type CG			8·2	52·5	chisel employed
CHALK: hard and indurated, with brown clay.			8·5	52·2	
CHALK: buff, resembling rubbly chalk in matrix of remoulded chalk Flints present (up to 120mm seen) (resembles GRADE V → GRADE IV)		SG	8·7	52·0	no flints in SPT sample
			9·5	51·2	UPPER CHALK
CHALK: buff, rubbly, with patches of brown clay - possibly a 'pipe' (resembles GRADE IV		133	9·7	51·0	flints present in SPT sample
			10·0	50·7	End of borehole

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[SU61SE BJ 12 A-G]

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CIVIL ENGINEERING LABORATORY Cardington

37 M R Q's

LOVEDEAN
(HMS Mercury)

BOREHOLE LOG

SU61SE/12c 1":316
N.G.R. 687.120

Borehole No. 3

Ground Level 61.0m O.D

Date 11th – 13th February 1975

Note:- Standpipe inserted to 6.0m. Borehole grouted with bentonite/cement mix to depth of 1.0m

Description of Strata	Legend	Sample	Depth (m)	O.D. (m)
			℄	61.0
TOPSOIL: turf and organic sandy CLAY with flints.	T		0.6 (approx)	60.4
CLAY: variegated in brown and grey, with a few small flints. Patches of organic clay with roots etc. between 1.5m and 2.0m. (MADE GROUND)			0.8	60.2
			1.3	59.7
			2.0	59.0
			2.1	58.9
CLAY: variegated in yellow, orange-brown and grey. Thin sandy streaks/partings present at 4.0m. Large flint at 4.6 – 4.8m. Limit of made or disturbed ground marked by well-defined inclined surface in U100 sample at 2.1m. (READING BEDS – Type C)			2.5	58.5
			3.5	57.5
			4.0	57.0
			4.8	56.2
CLAY: sandy, brown/grey (READING BEDS – Type CS)			5.0	56.0
			5.3 (approx)	55.7
CLAY: dark grey-brown, probably slightly organic. Stones and concentration of gypsum present at 5.8 – 6.0m (READING BEDS – Type C)			5.5	55.5
CLAY: sandy and slightly chalky, yellow-brown (READING BEDS – Type CS)			6.2	54.8
CLAY: gravelly (flints), light brown/grey (READING BEDS – Type CG)			6.5	54.5
			7.2	53.8
CHALK: rubble consisting of hard and indurated chalk with some brown clay matrix.			8.0	53.0
CHALK: buff/brown, remoulded, clayey, with flints and fragments of hard chalk. (resembles GRADE V)			8.5	52.5
CHALK: rubbly, cream to buff. Joints 10mm wide. Patches of brown and grey clay between 9.0m and 9.5m (resembles GRADE IV			9.0	52.0
			9.5	51.5
CHALK: hard and rather brittle, blocky, cream, no flints present. (GRADE I)		147	9.7	51.3
			10.0	51.0

Remarks

Water levels in Standpipe

14/2/75	5.6m	2/7/75	4.6m
15/2/75	5.1m		
16/2/75	4.3m		
17/2/75	4.2m		
18/2/75	4.0m		
19/2/75	3.9m		
20/2/75	3.8m		
21/2/75	3.9m		
22/2/75	3.9m		
23/2/75	3.8m		
24/2/75	3.8m		
25/2/75	3.9m		
26/2/75	3.9m		

4.6m

Water entry 6.0m (slow seepage)

chiselling not required

UPPER CHALK

End of borehole

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[SU61SE BJ 12 A-G]

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CIVIL ENGINEERING LABORATORY Cardington

Investigation No. FGE / 185

Appendix A
Sheet No. 6

37 M R Q's

LOVEDEAN
(HMS Mercury)

BOREHOLE LOG

SU61SE 12 D 1":316
N.G.R. 687.120

Borehole No. 4
Ground Level 57.3 m O.D
Date 18th - 20th February 1975

Note:- Standpipe inserted to depth of 3.0m. Bottom of borehole grouted up to 3.0m Top of borehole grouted from surface to depth of 1.0m with bentonite/cement mix.

Description of Strata	Depth (m)	O.D. (m)	Remarks
TOPSOIL: turf and organic CLAY with stones.	0	57.3	
CLAY: grey/brown (READING BEDS - Type C)	0.4	56.9	
SAND: light grey, slightly silty/clayey (READING BEDS - Type S)	0.8	56.5	
	1.0 (approx)	56.3	
CLAY: variegated in red, brown, and grey. (READING BEDS - Type C)	1.3	56.0	
	2.5	54.8	
	3.0	54.3	
CLAY: gravelly (flints), variegated. (READING BEDS - Type CG)	3.4	53.9	
	4.0	53.3	* SPT attempted - no penetration chisel employed
CHALK: hard and indurated, with flints.	4.1	53.2	
	4.4	52.9	
CHALK: cream, rubbly. Joints quite closely spaced with brown staining. (resembles GRADE IV	4.5	52.8	UPPER CHALK
	5.0	52.3	End of borehole
Inclusions of grey clay occur in the chalk at 5.0m.			

Water levels in standpipe

21/2/75	dry	26/2/75	dry
22/2/75	dry	2/7/75	dry
23/2/75	dry		
24/2/75	dry		
25/2/75	dry		

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[SU61SE BJ 12 A-G]

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37 M R Q's

LOVEDEAN
(HMS Mercury)

BOREHOLE LOG

SU61SE/12 E 1":316
N.G.R. 687.120

Borehole No. 5
Ground Level 59.1 m O.D
Date 14th - 16th February 1975

Note:- Standpipe inserted to 6m. Borehole grouted with bentonite/cement mix to depth of 1.0m.

Description of Strata	Legend	Sample	Depth (m)	O.D. (m)	Remarks
TURF			0.1	59.1 / 59.0	
CLAY: gravelly, variegated in brown and grey. (READING BEDS ? - Type CG)					0.5m MADE GROUND ?
			1.0	58.1	Water entry 0.4m (probably surface water)
CLAY: variegated in brown and grey. (READING BEDS - Type C)		4	1.1	58.0	
CLAY: sandy, variegated in grey, brown and red. Partings of brown/grey clayey sand are present. Flints present between 2.0m and 2.5m. (READING BEDS - Type CG)			2.0	57.1	
			2.5	56.6	
			3.0	56.1	
CLAY: variegated in red, brown and grey. (READING BEDS - Type C)			4.0	55.1	
			4.5	54.6	
CLAY: gravelly (flints), brown/grey. Flints seen up to 100mm size (READING BEDS - Type CG)			5.5	53.6	
CHALK: rubble consisting of hard chalk & flints with clay.			6.3	52.8	chiselling not required
			6.5	52.6	
CHALK: rubbly, with flints and patches of brown clay. (resembles GRADE IV		147	6.7	52.4	flints present in SPT sample
			8.0	51.1	(approx) UPPER CHALK
CHALK: rubbly to blocky, but with some joints open to 10mm and filled with remoulded chalk. Many flints are present including a large one at 9.8m (resembles GRADE III)			8.5	50.6	
			9.0	50.1	
		*	10.0	49.1	SPT attempted - no penetration * (large flint in sample)
					End of borehole

Water levels in standpipe			
17/2/75	0.2m		
18/2/75	0.2m		
19/2/75	0.2m		
20/2/75	0.2m		
21/2/75	0.2m		
22/2/75	0.2m		
23/2/75	0.2m		
24/2/75	0.2m		
25/2/75	0.2m		
26/2/75	0.2m		
2/7/75	0.5m		

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Appendix A
Sheet No. 8

37 MRQ's

LOVEDEAN
(HMS Mercury)

BOREHOLE LOG

SU 61 SE 12 F 1":316
N.G.R. 687.120

Borehole No. 6
Ground Level 58·1 m O.D
Date 20th - 22nd February 1975

Note:- Standpipe inserted to depth of 8·5m. Bottom of borehole grouted up to 8·5m Top of borehole grouted from surface to depth of 1·0m with bentonite/cement mix.

Description of Strata	Legend	Sample	Depth (m)	O.D. (m)	Remarks
TOPSOIL: turf and organic CLAY			0·0	58·1	
CLAY: brown/grey sandy with stones (MADE GROUND)			0·4	57·7	
SAND: yellow-brown, gravelly and clayey. (MADE GROUND)			0·6	57·5	
CLAY: sandy, variegated in grey, brown and red. (READING BEDS - Type CS)		16	1·0	57·1	
CLAY: variegated in red, yellow and grey. Dark red concretions present. (READING BEDS - Type C)			1·1	57·0	
CLAY: sandy, brown/grey, with small stones. (READING BEDS - Type CS)			1·7 (approx)	56·4	
CLAY: variegated in red, grey and brown. (READING BEDS - Type C)			2·0	56·1	
CLAY: gravelly (flints), brown/grey. (READING BEDS - Type CG)			2·5	55·6	
CHALK: hard and indurated, with some brown clay. Possibly rubbly below 4·7m		*	3·5	54·6	
CHALK: cream, rubbly, with patches of buff/brown clay and remoulded chalk below 6·0m. Frequent flints present. (resembles GRADE IV)			4·0	54·1	
CHALK: cream, rubbly to blocky with flints. Joints about 60 mm apart. (resembles GRADE III		45	4·2	53·9	
			4·5	53·6	
			4·7	53·4	
			5·2	52·9	
			5·5	52·6	
			6·0	52·1	
			7·0	51·1	
			7·2	50·9	
			8·5	49·6	
			9·0	49·1	
			10·0	48·1	

Water levels in standpipe

23/2/75	5·2 m
24/2/75	5·0 m
25/2/75	5·0 m
26/2/75	4·9 m
2/7/75	Dry (to 7·7m)

* SPT attempted no penetration chiselling not required.

UPPER CHALK

(approx)

no flints present in SPT sample

Water Entry 7·5m

End of borehole

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Appendix A

Sheet No. 9

37 MRQ's

LOVEDEAN
(HMS Mercury)

BOREHOLE LOG

SU61SE 12 F 1":316
N.G.R. 687. 120

Borehole No. 6 contd

Ground Level

Date

Note:-

Description of Strata	Legend	Sample	Depth (m)	O.D. (m)	Remarks
CHALK: cream, blocky with a few flints. (resembles GRADE III)		51	10·0 – 10·2 – 10·5	48·1 – 47·9 – 47·6	UPPER CHALK (contd.)
					End of borehole

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[SU61SE BJ 12 A-G]

Department of the Environment

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Investigation No. FGE/185

Sheet No. 10

37 M R Q's

LOVEDEAN
(HMS Mercury)

BOREHOLE LOG

SU61SE/12 A 1":316
N.G.R. 687.120

Borehole No. 7

Ground Level 55·9 m O.D

Date 17th - 18th February 1975

Note:- Standpipe inserted to 6m. Borehole grouted with bentonite / cement mix to depth of 1·5m.

Description of Strata	Legend	Sample	Depth (m)	O.D. (m)	Remarks
			0	55·9	
TOPSOIL : turf and grey CLAY with stones	T		0·4	55·6	
CLAY : variegated in red, brown and yellow. (READING BEDS - Type C)			0·8	55·1	
			1·3	54·6	
			1·8	54·1	
CHALK : remoulded and mixed with brown clay. Frequent flints including large ones (resembles GRADE V)		125	2·2	53·7	Flints present in S.P.T. sample
			2·7	53·2	(approx)
CHALK : buff to cream, rubbly, with brown staining. Flints present. Appears softened between 3·5m and 4·5m (resembles GRADE IV)			3·0	52·9	
			3·5	52·4	
			4·5	51·4	UPPER CHALK
CHALK : cream, rubbly to blocky, with flints. Appears softened between 5·0m and 5·5m. (resembles GRADE III			5·0	50·9	
			6·0	49·9	
CHALK : cream, blocky, but some brown-staining is present. (resembles GRADE II		113	6·2	49·7	no flints in S.P.T. sample
			6·5	49·4	End of borehole
			10·0		

Water levels in standpipe			
19/2/75	dry		
20/2/75	dry		
21/2/75	dry		
22/2/75	dry		
23/2/75	dry		
24/2/75	dry		
25/2/75	dry		
26/2/75	dry		
2/7/75	dry		

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[SU61SE BJ 12 A-G]

SU61 SE/32

NGR 6890 1208 Sheet 1 of 1

BOREHOLE LOG

KEY

- ● Disturbed Sample
- ↕ Bulk Disturbed Sample
- ▮ 105 mm Undisturbed Sample
- | Standard Penetration Test
- △ Water Sample

Date started 20.7.82 Date completed 20.7.82.

Scheme LOVE DEAN LANE, HAVANT.

Location AT JUNCTION OF MILTON ROAD AND LOVE DEAN LANE

Borehole No 1 Ground Level

Sample No	Sample Type	Sample Depth m.	Section	Depth above O.D. or below Ground Level	Thickness of Stratum m.	Description of Soil	Penetration Test Pen'tn mm.	Penetration Test No. of Blow
					1.2	Topsoil, flint and brick fragments. (FILL)		
1	●	1.2		1.2				
2					2.2	Stiff brown silty CLAY matrix with fine and medium and locally coarse GRAVEL fragments, being more clayey below 2.50m. (VALLEY GRAVEL)	305	10
3	●	1.7						
		2.0						
4							305	12
5	●	2.5						
		3.0						
6							305	15
				3.4				
7	●	3.5		3.5 End of borehde.	0.1 pen'd	Stiff pale brown calcareous SILT with some firm brown silty CLAY and medium soft CHALK fragments (<10mm) (HEAD)		

HEAD

1. Borehole remained dry during boring

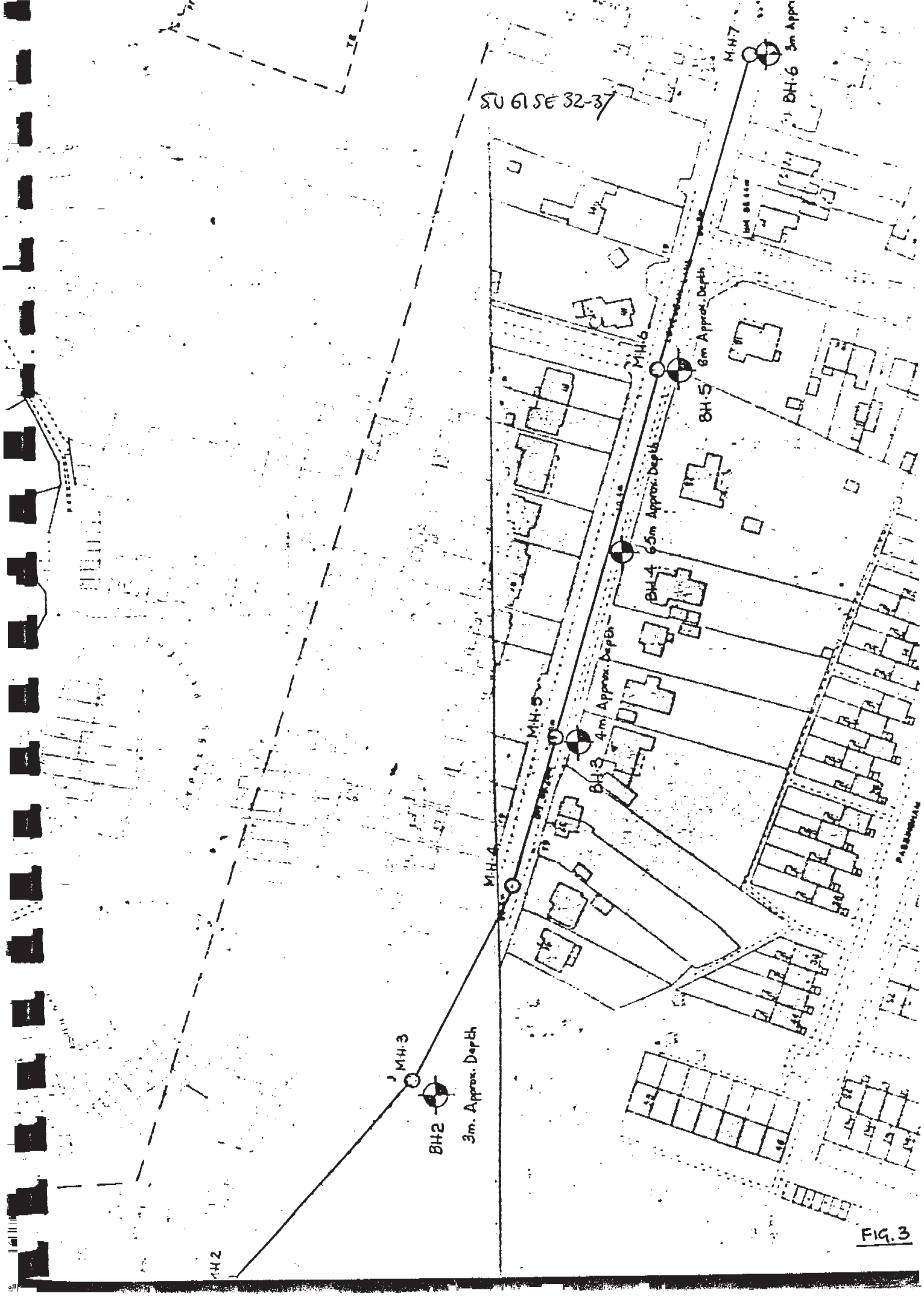
SOUTH EASTERN SOILS LTD

Scale 1:50

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[SU61SE BJ 32 .]



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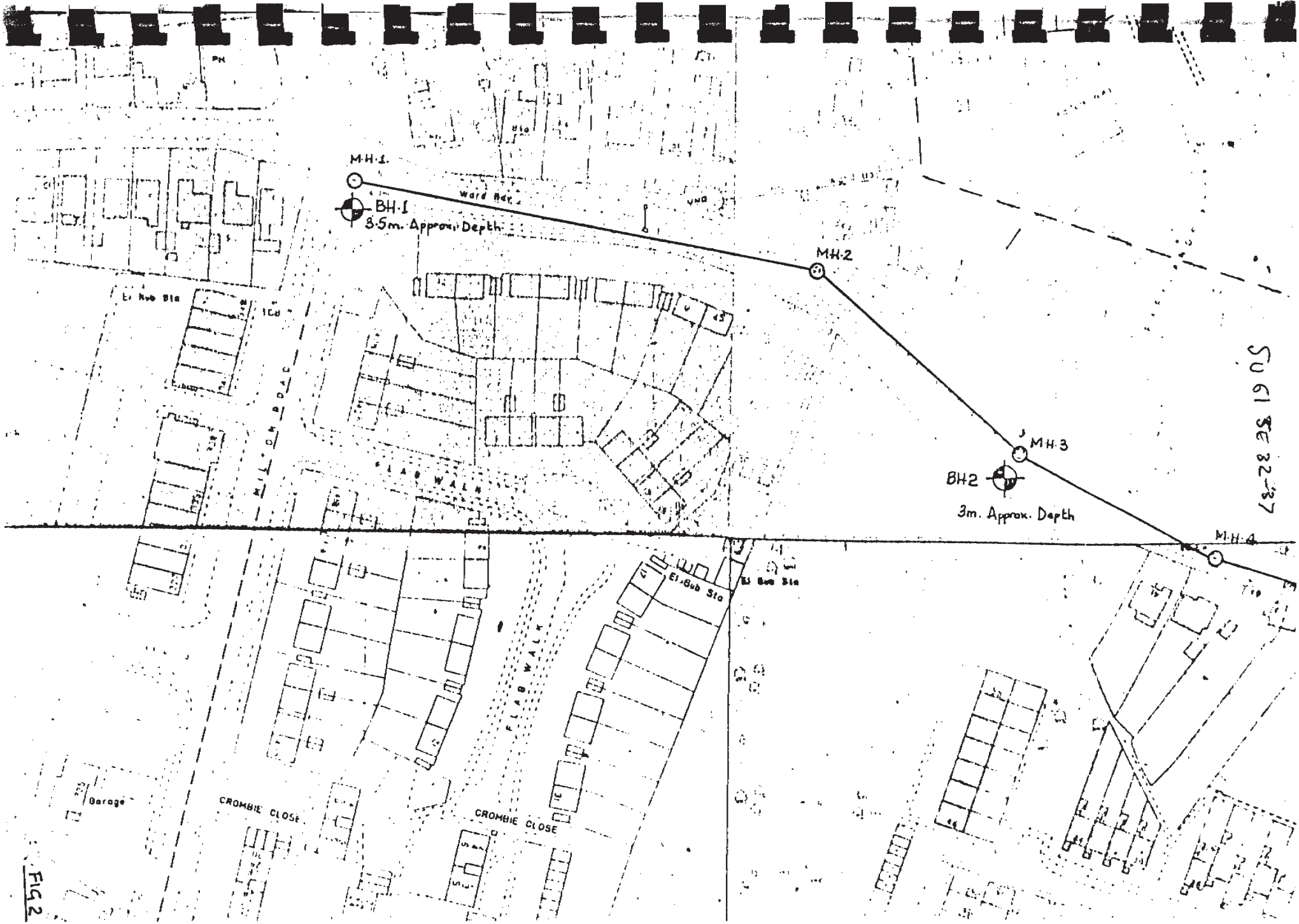


FIG 2

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RECORD OF WELL (SHAFT OR BORE)

For Survey use only SU 61/37 N. 316/267

Licence No.

EXACT SITE OF WELL

At Woodcroft Farm SU 6812 1195

Town or Village Cosham Cowplain

County Hants Six-inch quarter sheet 68 SW/W

For Observation Well Portsmouth Water Co. State whether owner, tenant, builder, contractor, consultant, etc.:—

Address (if different from above)

Level of ground surface above sea-level (O.D.) 198·78 ft. *

If well-top is not at ground level, state how far .. {above: / below; ..... ft.

SHAFT 104·56 ft.; diameter ..... ft.; Full details of headings (dimensions and directions)

BORE ..... ft.; diameter of bore: at top ..... ins.; at bottom ..... ins.

Full details of permanent lining tubes (position, length, diameter, plain, slotted etc.)

TEST CONDITIONS

Water struck at depths of ..... ft. below well-top.

Rest level of water ..... ft. above / below well-top. Suction at ..... ft. Yield on ..... hours' / days' test pumping at ..... galls. per ..... with depression to ..... ft. below well-top.

Recovery to rest-level in ..... mins. / hours Capacity of pump ..... g.p.h. Date of measurements .....

NORMAL CONDITIONS

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type ..... Motive power .....

Capacity ..... gallons per hour. Suction at ..... ft.

Amount pumped ..... galls. per day. Estimated consumption ..... galls. per week.

Well made by ..... Date of well .....

Information from .....

ADDITIONAL NOTES

ANALYSIS (please attach copy if available)

Sited by ⊙ on 6" Hants 68 SW/W. mh 6/9/57

Data Bank

Visited – Concrete cover over well, with access hole 8" square. Suitable for recorder installation. YMS Dec. '65.

Automatic water level recorder installed 11:3:66 Kemp

Visited and levelled. Reorder well top = ground level = +196.41 O.D (N)

Recorder datum + 198.26 O.D (N) 7.10.66 ASR.

Recorder removed 12.9.68. Access hole covered by concrete slab. M.I.B.

LOG OF STRATA OVERLEAF.

Geological Survey and Museum, South Kensington, London, S.W.7.		Section 6.	Date Received	1" O.S. Map No.	Site marked on 1" Map	(use symbol) on 6" Map

(1527) Dd574/W437583 12,000 8/54 JC&S Gp689

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[SU61SE BJ 114 .]

(*For Survey use only*) GEOLOGICAL CLASSIFICATION	NATURE OF STRATA If measurements start below ground surface, state how far ..	THICKNESS		DEPTH	
		Feet ..	Inches ..	Feet	Inches

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ADDN INFO.

Reference Su61/37

316/267

WDU No. SU6137
Southern WA (Hants) No. 552

Portsmouth Water Company
Observation Well.

Ref No: Portsmouth No. 28
Woodcroft Farm, Cowplain, Havant.

Well head at +60·588 m A.OD.

Monthly water levels available in Manual Water Level file

IGS recorder installed 11-MAR-1966, removed 12-SEP-1968

DMT 27-SEP-1979

Data Bank

CODE 18-77

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SU61/37 316/267

STATION ..... WOODCROFT FARM .....

DATUM POINT ..... O.D. ..... 198·78' .....

Date and Time	Water Level Ft.	Rate G.P.H.	Notes	Date and Time	Water Level Ft.	Rate G.P.H.	Notes
4·2·53	105·8	—	Ft. to O.D.	30·3·55	110·0	—	Ft. to O.D.
4·3·53	107·1			27·4·55	107·0		
1·4·53	106·0			25·5·55	105·6		
29·4·53	102·4			22·6·55	104·4		
27·5·53	101·5			20·7·55	102·6		
17·6·53	100·4			17·8·55	101·3		
22·7·53	99·9			14·9·55	100·0		
19·8·53	99·6			12·10·55	99·8		
16·9·53	99·3			9·11·55	106·0		
21·10·53	99·0			7·12·55	101·0		
11·11·53	103·2			4·1·56	107·7		
9·12·53	99·9			1·2·56	122·8		
6·1·54	99·8			29·2·56	113·3		
10·2·54	106·5			28·3·56	108·4		
3·3·54	107·5			25·4·56	105·4		
31·3·54	106·5			23·5·56	102·8		
28·4·54	105·0			20·6·56	100·6		
2·6·54	103·0			18·7·56	99·9		
23·6·54	104·0			15·8·56	99·2		
21·7·54	101·7			12·9·56	101·1		
18·8·54	102·0			10·10·56	99·2		
15·9·54	100·8			7·11·56	99·1		
13·10·54	100·8			5·12·56	96·8		
10·11·54	107·2			2·1·57	104·0		
8·12·54	115·7			30·1·57	105·8		
5·1·55	119·0						
2·2·55	119·4						
2·3·55	115·0						
23·3·55	110·0						

Data Bank

Continued.

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[SU61SE BJ 114 .]

Su61/37 316

STATION ..... Woodcroft Farm .....

DATUM POINT ..... O.D. 198.78' .....

267

Date and Time	Water Level Ft.	In.	Rate G.P.H.	Notes	Date and Time	Water Level Ft.	In.	Rate G.P.H.	Notes
2·1·57	104·	0	—	Ft. To O.D.	28·1·59	116·	6		
30·1·57	105·	8			25·2·59	111·	1		
27·2·57	115·	0			25·3·59	108·	6		
27·3·57	110·	9			22·4·59	107·	5		
24·4·57	110·	3			20·5·59	104·	8		
22·5·57	106·	5			18·6·59	103·	0		
17·7·57	101·	5			15·7·59	101·	2		
14·8·57	99·	8			13·8·59	100·	4		
11·9·57	99·	6			10·9·59	99·	5		
9·10·57	98·	6			7·10·59	99·	0		
6·11·57	103·	8			4·11·59	99·	3		
4·12·57	99·	4			2·12·59	102·	6		
1·1·58	101·	9			30·12·59	121·	0		
29·1·58	110·	2			27·1·60	124·	0		
26·2·58	—				24·2·60	122·	0		
26·3·58	108·	5			23·3·60	120·	5		
23·4·58	106·	5			20·4·60	112·	5		
21·5·58	104·	0			18·5·60	108·	1		
18·6·58	102·	4			15·6·60	104·	5		
16·7·58	101·	0			13·7·60	102·	4		
13·8·58	99·	7			10·8·60	101·	5		
10·9·58	100·	3			7·9·60	103·	2		
8·10·58	108·	6			5·10·60	115·	4		
5·11·58	112·	1							
3·12·58	106·	9							
31·12·58	112·	5							

Data Bank

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Station ....Woodcroft...Farm.....

Datum point ..... O.D. ...198.78..

.....

Observation well during test on .../.....

SU61/37
316/267

Date and Time	Water Level ft	Rate G.P.H.	Notes	Date and Time	Water Level ft	Rate G.P.H.	Notes
2·11·60	131·3		R.W.L. to O.D.	20·2·63	106·0		R.W.L. to O.D
30·11·60	139·1			20·3·63	114·8		
28·12·60	138·8			17·4·63	115·8		
26·1·61	134·5			15·5·63	112·6		
22·2·61	133·1			12·6·63	107·0		
22·3·61	123·5			10·7·63	104·5		
19·4·61	115·8			7·8·63	102·1		
17·5·61	113·5						
14·6·61	109·4						
12·7·61	106·1						
9·8·61	103·7						
6·9·61	101·8						
4·10·61	100·6						
1·11·61	100·1						
29·11·61	100·0						
27·12·61	101·7						
24·1·62	117·8						
21·2·62	107·7						
21·3·62	106·2						
18·4·62	105·5						
16·5·62	103·0						
13·6·62	101·7						
11·7·62	100·4						
8·8·62	100·2						
5·9·62	99·4						
3·10·62	101·3						
31·10·62	99·2						
28·11·62	103·3						

JW

Data Book

Station ....Woodcroft...Farm.....

Datum point ..... O.D. ...198.78..

.....

Observation well during test on .../.....

SU 61/37

316/267

Date and Time	Water Level ft	Rate G.P.H.	Notes	Date and Time	Water Level ft	Rate G.P.H.	Notes
2·11·60	131·3		R.W.L. to O.D.	20·2·63	106·0		R.W.L. to O.D
30·11·60	139·1			20·3·63	114·8		
28·12·60	138·8			17·4·63	115·8		
26·1·61	134·5			15·5·63	112·6		
22·2·61	133·1			12·6·63	107·0		
22·3·61	123·5			10·7·63	104·5		
19·4·61	115·8			7·8·63	102·1		
17·5·61	113·5						
14·6·61	109·4						
12·7·61	106·1						
9·8·61	103·7						
6·9·61	101·8						
4·10·61	100·6						
1·11·61	100·1						
29·11·61	100·0						
27·12·61	101·7						
24·1·62	117·8						
21·2·62	107·7						
21·3·62	106·2						
18·4·62	105·5						
16·5·62	103·0						
13·6·62	101·7						
11·7·62	100·4						
8·8·62	100·2						
5·9·62	99·4						
3·10·62	101·3						
31·10·62	99·2						
28·11·62	103·3						

JW

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Contd. WORKING SHEET 1967

I.G.S. REF. NO. 316/267

SITE. WOODCROFT. LOVEDEAN

(O.D) + 198.26

Date	R.W.L. at beginning of trace	Rising trace	Falling trace	Weekly W.L. (below datum)	Weekly W.L. (O.D.)	Weekly W.L. to +140 O.D.	Weekly W.L. to
2-7	94.16		1.00	95.16	103.10	-36.90	
9			1.55	95.71	102.55	-37.45	
16			2.25	96.41	101.85	-38.15	
23	96.77		0.30	97.07	101.19	-38.81	
30			0.80	97.57	100.69	-39.31	
6-8			1.20	97.97	100.29	-39.71	
13			1.60	98.37	99.89	-40.11	
20	98.40		0.20	98.60	99.66	-40.34	
27			0.55	98.95	99.31	-40.69	
3-9			0.85	99.25	99.01	-40.99	
10			1.25	99.65	98.61	-41.39	
17	99.80		0.10	99.90	98.36	-41.64	
24			0.25	100.05	98.21	-41.79	
1-10			0.25	100.05	98.21	-41.79	
8			0.30	100.10	98.16	-41.84	
15	99.34	1.65		97.69	100.57	-39.43	
22		5.10		94.24	104.02	-35.98	
29		8.30		91.04	107.22	-32.78	
5-11		17.60		91.74	106.52	-33.48	
12	No visits made due to Foot & Mouth outbreak						
19							
26							
3-12							
10							
17							
24							
31							

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[SU61SE BJ 114 .]

SU 61/37

WORKING SHEET 1968

I.G.S. Ref. No. 316/267

Site WOODCROFT

Measuring point (O.D.) 198·26

Date	R.W.L. at beginning of trace	Rising trace	Falling trace	Weekly W.L. (below datum)	Weekly W.L. (O.D.)	Weekly W.L. to +140 O.D.	Weekly W.L. to
7 - 1							
14	No visits made - due to Foot & Mouth outbreak						
21							
28							
4 - 2	89·97	0·00		89·97	108·29	-31·71	
11		1·40		88·57	109·69	-30·31	
18		2·30		87·67	110·59	-29·41	
25		0·45		89·52	108·74	-31·26	
3 - 3	90·10		0·45 E	90·55 E	107·71 E	-32·29 E	
10			1·30 E	91·40 E	106·86 E	-33·14 E	
17			2·20 E	92·30 E	105·96 E	-34·04 E	
24			3·05 E	93·15 E	105·11 E	-34·89 E	
31							
7 - 4							
14							
21							
28							
5 - 5							
12							
19							
26							
2 - 6							
9							
16							
23							
30							

Over .....

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Contd. WORKING SHEET 1968

Date	R.W.L. at beginning of trace	Rising trace	Falling trace	Weekly W.L. (below datum)	Weekly W.L. (O.D.)	Weekly W.L. to +140 O.D.	Weekly W.L. to
7 - 7							
14							
21							
28							
4 - 8							
11							
18							
25							
1 - 9							
8							
15							
22							
29							
6 - 10							
13							
20							
27							
3 - 11							
10							
17							
24							
1 - 12							
8							
15							
22							
29							

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SU 61/37

WORKING SHEET 1968

I.G.S. REF. NO. 316/267

SITE Woodcroft, Lovedean.

MEASURING POINT (O.D) 60.430 metres

Date	No. of drum revs.	Correction to trace datum	Trace datum	Rising trace	Falling trace	Weekly water level (below datum)
31 Mar.			28.502		0.12	28.622
7 Apr.					0.21	28.712
14					0.47	28.972
21				0.03		28.472
28			28.872		0.01	28.882
5 May				0.68		28.192
12				1.08		27.792
19				0.25		28.622
26			28.918	0.56		28.358
2 June					0.15	29.068
9					0.04	28.958
16					0.42	29.338
23			29.457		0.01	29.467
30	1	- 1.25		0.55		27.657
7 July				0.50		28.957
14	1	- 1.25		0.22		27.987
21			28.497		0.66	29.157
28					0.95	29.447
4 Aug.					1.11	29.607
11	1	+1.25			0.02	29.767
18			29.819		0.04	29.859
25					0.13	29.949
1 Sept.					0.19	30.009
8					0.29	30.109
15						
22		Recorder	Removed	12-9-68		
29						
6 Oct.						
13						
20						
27						
3 Nov.						
10						
17						
24						
1 Dec.						
8						
15						
22						
29						

Maximum recorded level ..... metres below datum. Date .....

Minimum recorded level ..... metres below datum. Date .....

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[SU61SE BJ 114 .]

316/SU61/37
267

SOUTHERN WATER AUTHORITY
formerly:

HRA well no 552

RWL	+ 29.90 M	=	+ 98'	OD	Oct 72
	+ 30.20 M	=	+ 99'	OD	April 73
	Dry	Oct 73			

Inf^m HRA Report on Well Surveys Jan 75 LW.

Data Bank 8/78

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[SU61SE BJ 114 .]

Project	Date		Window Sample No.
Woodcroft Farm, Waterlooville	26-08-11		**WS01**
Job No: 21834/030	Ground Level (m OD): 56.60		
Client: Grainger plc	Coordinates (OS National Grid): 468053.5 , 111976.4	All dimensions in metres Scale 1:40	Sheet: 1 of 1

SAMPLES/TESTS/PROGRESS						Water	STRATA			
Sample Depth (m)	Sample Type	Test Depth (m)	Test Type	Test Result	Window Run (Size(mm))		Legend	Depth (Thickness) (m)	DESCRIPTION	Instrument/ Backfill
					0 - 1 (70) 100% rec			(0.05) 0.05	Topsoil	
0.50	S							(1.05)	MADE GROUND: Firm brown slightly sandy and gravelly clay. Gravel is angular and subangular of flint, chalk and fragments of brick.	
					1 - 2 (70) 100% rec			1.10		
									MADE GROUND: Soft brown and grey slightly sandy, gravelly clay. Gravel is angular to subrounded fine to coarse of flint, chalk, and fragments of brick. Organic odour. Between 1.1 and 1.6m: Frequent fragments of very weak chalk. Between 2.2 and 3.0m: Grey staining and organic odour.	
					2 - 4 (60) 80% rec			(1.90)		
2.50	S							3.00		
								(0.80)	Structureless CHALK composed of cream slightly gravelly sandy silt with pockets <60 mm thick of brown soft clay. Clasts are fine to coarse, subrounded extremely and very weak, low-density, off white with black specks and occasional orange staining. (Upper Chalk Formation, Grade Dm)	
								3.80		
								(0.20) 4.00	Recovered as structureless CHALK composed of slightly sandy silty gravel. Gravel is fine to coarse, subangular, very weak, low and medium density, off white with black specks. (Upper Chalk Formation, Grade Dc)	
									End of Borehole at 4m	

GENERAL REMARKS:

1. Groundwater was not encountered during drilling.
2. On completion a 19mm HDPE standpipe was installed in the borehole, fitted with a gas valve and completed with a flush cover.

KEY
S - Geoenvironmental sample

WATER:

Strike: m

Standing: m

Flow:

Contractor	Method/ Plant Used	Logged By	Checked By
Risk Management Limited	H. H. Window Sampler	az	ad

PBA STD WS LOG 21834 WS LOGS.GPJ AGS3_ALL.GDT 2/11/11

Project	Woodcroft Farm, Waterlooville	Date	26-08-11		Window Sample No. **WS02**
Job No	21834/030	Ground Level (m OD)	56.50		
Client	Grainger plc	Coordinates (OS National Grid)	468037.5 , 111993.7	All dimensions in metres Scale 1:40	Sheet 1 of 1

SAMPLES/TESTS/PROGRESS						Water	STRATA			
Sample Depth (m)	Sample Type	Test Depth (m)	Test Type	Test Result	Window Run (Size(mm))		Legend	Depth (Thickness) (m)	DESCRIPTION	Instrument/ Backfill
0.15	S				0 - 1 (70) 100% rec			(0.05) 0.05	Topsoil	
								(0.75)	MADE GROUND: Soft brown slightly sandy and gravelly clay. Gravel is angular and subangular fine to coarse of flint, rare extremely weak chalk and fragments of brick and rare charcoal.	
								0.80		
					1 - 2 (70) 100% rec			(0.40) 1.20	MADE GROUND: Brown and grey sandy gravel. Gravel is fragments of brick and concrete.	
1.50	S								MADE GROUND: Soft and firm brown and grey slightly gravelly sandy clay with pockets of organic matter. Gravel is angular fine to coarse of brick, concrete and chalk. Organic odour.	
					2 - 4 (60) 80% rec					
2.50	S									
								(4.00)		
					4 - 6 (60) 80% rec					
5.20	S							5.20		
								(0.60)	Firm slightly gravelly sandy CLAY. Gravel is subrounded fine to coarse of white very weak chalk. (Possible Made Ground))	
								5.80		
								(0.20) 6.00	Recovered as structureless CHALK composed of slightly sandy silty gravel. Gravel is fine to coarse, subangular, very weak, low and medium density, off white with black specks. (Upper Chalk Formation, Grade Dc)	
									End of Borehole at 6m	

GENERAL REMARKS:

1. Groundwater was not encountered during drilling.
2. On completion a 19mm HDPE standpipe was installed in the borehole, fitted with a gas valve and completed with a flush cover.

KEY
S - Geoenvironmental sample

WATER:

Strike: m

Standing: m

Flow:

Contractor	Method/ Plant Used	Logged By	Checked By
Risk Management Limited	H. H. Window Sampler	az	ad

PBA STD WS LOG 21834 WS LOGS.GPJ AGS3_ALL.GDT 2/11/11

Project	Woodcroft Farm, Waterlooville	Date	30-08-11		Window Sample No. **WS03**
Job No	21834/030	Ground Level (m OD)	58.10		
Client	Grainger plc	Coordinates (OS National Grid)	468100.2 , 111979.4	All dimensions in metres Scale 1:40	Sheet 1 of 1

SAMPLES/TESTS/PROGRESS						Water	STRATA			
Sample Depth (m)	Sample Type	Test Depth (m)	Test Type	Test Result	Window Run (Size(mm))		Legend	Depth (Thickness) (m)	DESCRIPTION	Instrument/ Backfill
0.10	S				0 - 1 (75) 100% rec			(0.10) 0.10	MADE GROUND: Brown very clayey gravel. Gravel is angular fine to coarse of flint and fragments of brick.	
								(0.30) 0.40	MADE GROUND: Black clayey gravelly sand. Gravel is angular fine to coarse of flint and fragments of clinker and brick. Slight hydrocarbon odour.	
0.70	S							(0.10) 0.50	MADE GROUND: Off white with grey staining gravel. Gravel is subangular and subrounded fine to coarse of chalk.	
					1 - 2 (75) 100% rec			(1.20)	Soft brown slightly gravelly CLAY. Gravel subangular fine to coarse of flint. (Head Deposits)	
1.50	S							1.70		
					2 - 4 (50) 70% rec			(1.60)	Soft to firm brown grey CLAY. (Possible Lambeth Group)	
								3.30		
								(0.70)	Structureless CHALK composed of soft cream slightly gravelly sandy silt. Gravel is fine to coarse, subrounded extremely and very weak, low-density, off white with black specks. (Upper Chalk Formation, Grade Dm)	
								4.00	End of Borehole at 4m	

GENERAL REMARKS:

1. Groundwater was not encountered during drilling.
2. On completion a 19mm HDPE standpipe was installed in the borehole, fitted with a gas valve and completed with a flush cover.

KEY
S - Geoenvironmental sample

WATER:

Strike: m

Standing: m

Flow:

Contractor	Method/ Plant Used	Logged By	Checked By
Risk Management Limited	H. H. Window Sampler	az	ad

PBA STD WS LOG 21834 WS LOGS.GPJ AGS3_ALL.GDT 2/11/11

Project	Woodcroft Farm, Waterlooville	Date	30-08-11		Window Sample No. **WS04**
Job No	21834/030	Ground Level (m OD)	60.10		
Client	Grainger plc	Coordinates (OS National Grid)	468160.2 , 111959.9	All dimensions in metres Scale 1:40	Sheet 1 of 1

SAMPLES/TESTS/PROGRESS						Water	STRATA			
Sample Depth (m)	Sample Type	Test Depth (m)	Test Type	Test Result	Window Run (Size(mm))		Legend	Depth (Thickness) (m)	DESCRIPTION	Instrument/ Backfill
0.10	S				0 - 1 (75) 100% rec			(0.05) 0.05	Topsoil	
								(0.25) 0.30	MADE GROUND: Soft brown slightly gravelly sandy clay. Gravel is subangular and subrounded fine to coarse of chalk and fragments of brick.	
0.70	S							(0.70) 1.00	Soft brown slightly gravelly sandy CLAY. Gravel is subangular fine to coarse of flint. (Head Deposits)	
					1 - 2 (75) 100% rec			(0.70) 1.70	Firm brown gravelly CLAY. Gravel is subrounded fine to coarse of flint. (Head Deposits)	
1.70	S							(1.30) 3.00	Stiff red mottled blue CLAY. (Lambeth Group)	
					2 - 3 (60) 100% rec				End of Borehole at 3m	

GENERAL REMARKS:

1. Groundwater was not encountered during drilling.
2. On completion a 19mm HDPE standpipe was installed in the borehole, fitted with a gas valve and completed with a flush cover.

KEY
S - Geoenvironmental sample

WATER:

Strike: m

Standing: m

Flow:

Contractor	Method/ Plant Used	Logged By	Checked By
Risk Management Limited	H. H. Window Sampler	az	ad

PBA STD WS LOG 21834 WS LOGS.GPJ AGS3_ALL.GDT 2/11/11

Project	Woodcroft Farm, Waterlooville	Date	22-08-11		Window Sample No. **WS05**
Job No	21834/030	Ground Level (m OD)	59.10		
Client	Grainger plc	Coordinates (OS National Grid)	468150.9 , 112031.5	All dimensions in metres Scale 1:40	Sheet 1 of 1

SAMPLES/TESTS/PROGRESS						Water	STRATA			
Sample Depth (m)	Sample Type	Test Depth (m)	Test Type	Test Result	Window Run (Size(mm))		Legend	Depth (Thickness) (m)	DESCRIPTION	Instrument/ Backfill
								(0.20) 0.20	Topsoil	
								(1.70) 1.90	Brown orange slightly clayey SAND with occasional pockets < 40 mm in diameter of soft sandy clay. (Head Deposits)	
								(1.90) 3.80	Firm slightly sandy and gravelly CLAY. Gravel is subangular fine to coarse of flint. (Head Deposits)	
								(0.20) 4.00	Structureless CHALK composed of soft cream slightly gravelly sandy silt. Gravel is fine to coarse, subrounded extremely and very weak, low-density, off white with black specks. (Upper Chalk Formation, Grade Dm)	
									End of Borehole at 4m	

GENERAL REMARKS:

1. Groundwater was not encountered during drilling.
2. On completion a 19mm HDPE standpipe was installed in the borehole, fitted with a gas valve and completed with a flush cover.

KEY
S - Geoenvironmental sample

WATER:

Strike: m

Standing: m

Flow:

Contractor	Method/ Plant Used	Logged By	Checked By
Risk Management Limited	H. H. Window Sampler	az	ad

PBA STD WS LOG 21834 WS LOGS.GPJ AGS3_ALL.GDT 2/11/11

Project	Woodcroft Farm, Waterlooville	Date	22-08-11		Window Sample No. **WS05A**
Job No	21834/030	Ground Level (m OD)	58.95		
Client	Grainger plc	Coordinates (OS National Grid)	468149.1 , 112023.9	All dimensions in metres Scale 1:40	Sheet 1 of 1

SAMPLES/TESTS/PROGRESS						Water	STRATA			Instrument/ Backfill
Sample Depth (m)	Sample Type	Test Depth (m)	Test Type	Test Result	Window Run (Size(mm))		Legend	Depth (Thickness) (m)	DESCRIPTION	
					0 - 1 (75) 100% rec			(0.15) 0.15	Topsoil	
								(1.25) 1.40	Brown clayey SAND / sandy CLAY with rare gravel. Gravel is subrounded medium and coarse of flint. (Head Deposits) Below 1.0 m: clayey sand.	
					1 - 2 (75) 100% rec			(0.40) 1.80	Firm brown orange and grey slightly sandy and sandy CLAY. (Head Deposits)	
					2 - 4 (60) 75% rec			(0.70) 2.50	Cream CHALK recovered as silty gravel. Gravel is fine to coarse, subrounded extremely and very weak, low-density, off white with black specks. Rare Flint nodules. (Upper Chalk Formation, Grade Dm)	
									End of Borehole at 2.5m	

GENERAL REMARKS:

1. Groundwater was not encountered during drilling.
2. Hole was refused at 2.5 m.
3. On completion the hole was backfilled with arisings.

WATER:

Strike: m

Standing: m

Flow:

Contractor	Method/ Plant Used	Logged By	Checked By
Risk Management Limited	H. H. Window Sampler	az	ad

PBA STD WS LOG 21834 WS LOGS.GPJ AGS3_ALL.GDT 2/11/11

Project	Woodcroft Farm, Waterlooville	Date	30-08-11		Window Sample No. **WS06**
Job No	21834/030	Ground Level (m OD)	58.50		
Client	Grainger plc	Coordinates (OS National Grid)	468102.3 , 111960.9	All dimensions in metres Scale 1:40	Sheet 1 of 1

SAMPLES/TESTS/PROGRESS						Water	STRATA			
Sample Depth (m)	Sample Type	Test Depth (m)	Test Type	Test Result	Window Run (Size(mm))		Legend	Depth (Thickness) (m)	DESCRIPTION	Instrument/ Backfill
0.10	S				0 - 1 (75) 100% rec			(0.60) 0.60	MADE GROUND: Soft brown slightly sandy and gravelly clay. Gravel is angular fine to coarse of flint and fragments of brick and concrete.	
0.80	S				1 - 2 (75) 100% rec			(1.60)	Soft to firm with depth grey mottled red and brown CLAY. (Lambeth Group)	
					2 - 2.4 (50) 100% rec			2.20		
					2.4 - 2.6 (40) 100% rec			(0.20) 2.40 (0.10) 2.50 (0.10) 2.60	Firm grey and orange gravelly CLAY. Gravel is rounded medium and coarse of red flint pebbles. (Lambeth Group)	
									Cream clayey SAND with 1 no. cobble. Cobble is subrounded of flint.	
									Recovered as structureless CHALK composed of slightly sandy silty gravel. Gravel is fine to coarse, subangular, very weak, low and medium density, off white with black specks. (Upper Chalk Formation, Grade Dc)	
									End of Borehole at 2.6m	

GENERAL REMARKS:

1. Groundwater was not encountered during drilling.
2. Hole was refused at 2.6 m.
3. On completion a 19mm HDPE standpipe was installed in the borehole, fitted with a gas valve and completed with a flush cover.

KEY
S - Geoenvironmental sample

WATER:

Strike: m

Standing: m

Flow:

Contractor	Method/ Plant Used	Logged By	Checked By
Risk Management Limited	H. H. Window Sampler	az	ad

PBA STD WS LOG 21834 WS LOGS.GPJ AGS3_ALL.GDT 2/11/11

Project	Woodcroft Farm, Waterlooville	Date	22-08-11		Window Sample No. **WS07**
Job No	21834/030	Ground Level (m OD)	61.50		
Client	Grainger plc	Coordinates (OS National Grid)	468211.9 , 112135.7	All dimensions in metres Scale 1:40	Sheet 1 of 2

SAMPLES/TESTS/PROGRESS						Water	STRATA			Instrument/ Backfill
Sample Depth (m)	Sample Type	Test Depth (m)	Test Type	Test Result	Window Run (Size(mm))		Legend	Depth (Thickness) (m)	DESCRIPTION	
					0 - 1 (75) 100% rec			(0.15) 0.15	Topsoil	
								(0.25) 0.40	Firm brown friable sandy CLAY with rare gravel. Gravel is subrounded fine to coarse of flint. (Head Deposits)	
					1 - 2 (75) 100% rec			(2.60)	Soft to firm orange with grey mottling slightly sandy CLAY. Occasional calcareous nodules <10 mm in diameter. (Head Deposits)	
					2 - 4 (60) 90% rec			3.00		
								(0.80) 3.80	Soft to firm grey orange slightly gravelly, sandy CLAY. Gravel is subrounded fine to coarse of flint. (Solution Feature Infill)	
					4 - 6 (50) 75% rec			(2.10) 5.90	Orange brown clayey SAND with occasional pockets <40 mm of sandy clay and rare gravel. Gravel is fine to coarse subrounded of flint. (Solution Feature Infill)	
					6 - 8 (40) 50% rec			(1.60) 7.50	Soft and very soft with depth grey brown slightly gravelly, sandy CLAY. Gravel is subrounded fine to coarse of flint.(Solution Feature Infill)	
								(0.50) 8.00	Structureless CHALK composed of soft cream slightly gravelly silt. Gravel is fine to coarse, subrounded extremely and very weak, low-density, off white with black specks. (Upper Chalk Formation, Grade Dm)	

GENERAL REMARKS:

1. Groundwater was not encountered during drilling.
2. On completion the hole was backfilled with arisings.

WATER:

Strike: m

Standing: m

Flow:

Contractor	Method/ Plant Used	Logged By	Checked By
Risk Management Limited	H. H. Window Sampler	az	ad

Project	Woodcroft Farm, Waterlooville	Date	22-08-11		Window Sample No. WS07
Job No	21834/030	Ground Level (m OD)	61.50		
Client	Grainger plc	Coordinates (OS National Grid)	468211.9 , 112135.7	All dimensions in metres Scale 1:40	Sheet 2 of 2

SAMPLES/TESTS/PROGRESS						Water	STRATA			Instrument/ Backfill
Sample Depth (m)	Sample Type	Test Depth (m)	Test Type	Test Result	Window Run (Size(mm))		Legend	Depth (Thickness) (m)	DESCRIPTION	
									End of Borehole at 8m	

GENERAL REMARKS:

1. Groundwater was not encountered during drilling.
2. On completion the hole was backfilled with arisings.

WATER:

Strike: m

Standing: m

Flow:

Contractor	Method/ Plant Used	Logged By	Checked By
Risk Management Limited	H. H. Window Sampler	az	ad

PBA STD WS LOG 21834 WS LOGS.GPJ AGS3_ALL.GDT 2/11/11

Project	Woodcroft Farm, Waterlooville	Date	22-08-11		Window Sample No. **WS08**
Job No	21834/030	Ground Level (m OD)	60.70		
Client	Grainger plc	Coordinates (OS National Grid)	468206.3 , 112126.7	All dimensions in metres Scale 1:40	Sheet 1 of 1

SAMPLES/TESTS/PROGRESS						Water	STRATA			Instrument/ Backfill
Sample Depth (m)	Sample Type	Test Depth (m)	Test Type	Test Result	Window Run (Size(mm))		Legend	Depth (Thickness) (m)	DESCRIPTION	
							(0.15)	0.15	Topsoil	
							(0.35)	0.50	Firm to soft brown slightly gravelly sandy CLAY. Gravel subangular fine to coarse of flint. (Solution Feature Infill)	
							(0.60)	1.10	Firm to soft orange slightly sandy CLAY with few pockets of black silt. (Solution Feature Infill)	
							(0.70)	1.80	Orange slightly clayey SAND with rare gravel. Sand is mainly coarse gravel is subrounded fine to coarse of flint. (Solution Feature Infill)	
							(1.30)	3.10	Firm grey slightly sandy and gravelly CLAY. Gravel is subangular fine to coarse of flint. Rare calcareous nodules <20 mm in diameter. (Solution Feature Infill)	
							(1.80)	4.90	Soft brown slightly sandy and gravelly CLAY with pockets <0.5 m in diameter of structureless off white CHALK composed of slightly gravelly silt. Gravel is rare e flint and occasional extremely weak chalk. (Solution Feature Infill)	
							(3.10)	8.00	Structureless CHALK composed of soft white with orange staining slightly gravelly and gravelly silt. Gravel is fine to coarse, subrounded extremely and very weak, low-density, off white with black specks. (Upper Chalk Formation, Grade Dm)	
									End of Borehole at 8m	

GENERAL REMARKS:

1. Groundwater was not encountered during drilling.
3. On completion the hole was backfilled with arisings.

WATER:

Strike: m

Standing: m

Flow:

Contractor	Method/ Plant Used	Logged By	Checked By
Risk Management Limited	H. H. Window Sampler	az	ad

PBA STD WS LOG 21834 WS LOGS.GPJ AGS3_ALL.GDT 2/11/11

Project	Woodcroft Farm, Waterlooville	Date	22-08-11		Window Sample No. **WS09**
Job No	21834/030	Ground Level (m OD)	58.20		
Client	Grainger plc	Coordinates (OS National Grid)	468095.5 , 468095.5	All dimensions in metres Scale 1:40	Sheet 1 of 1

SAMPLES/TESTS/PROGRESS						Water	STRATA			
Sample Depth (m)	Sample Type	Test Depth (m)	Test Type	Test Result	Window Run (Size(mm))		Legend	Depth (Thickness) (m)	DESCRIPTION	Instrument/ Backfill
					0 - 1 (75) 100% rec		(0.15)	0.15	Topsoil	
							(0.35)	0.50	Firm brown slightly sandy and gravelly CLAY. Gravel is subrounded fine to coarse of flint. (Solution Feature Infill)	
					1 - 3 (60) 65% rec		(2.40)	2.90	Firm brown slightly sandy gravelly CLAY. Gravel is fine to coarse subrounded extremely weak chalk and subangular flint. (Solution Feature Infill)	
					3 - 5 (50) 85% rec		(0.20)	3.10	Firm brown and cream gravelly CLAY. Gravel is subrounded fine to coarse of extremely weak chalk. (Solution Feature Infill)	
							(1.90)	5.00	Structureless CHALK composed of soft white with orange staining slightly gravelly and gravelly silt. Occasional seams <5 mm thick of soft brown clay. Gravel is fine to coarse, subrounded extremely and very weak, low-density, off white with black specks. (Upper Chalk Formation, Grade Dm)	
									End of Borehole at 5m	

GENERAL REMARKS:

1. Groundwater was not encountered during drilling.
2. Borehole refused at 5.0 m.
3. On completion the hole was backfilled with arisings.

WATER:

Strike: m

Standing: m

Flow:

Contractor	Method/ Plant Used	Logged By	Checked By
Risk Management Limited	H. H. Window Sampler	az	ad

PBA STD WS LOG 21834 WS LOGS.GPJ AGS3_ALL.GDT 2/11/11

Project	Woodcroft Farm, Waterlooville	Date	22-08-11		Window Sample No. **WS10**
Job No	21834/030	Ground Level (m OD)	57.40		
Client	Grainger plc	Coordinates (OS National Grid)	468089.9 , 112118.4	All dimensions in metres Scale 1:40	Sheet 1 of 1

SAMPLES/TESTS/PROGRESS						Water	STRATA			Instrument/ Backfill
Sample Depth (m)	Sample Type	Test Depth (m)	Test Type	Test Result	Window Run (Size(mm))		Legend	Depth (Thickness) (m)	DESCRIPTION	
					0 - 1 (75) 100% rec			(0.20) 0.20	Topsoil	
								(0.60) 0.80	Soft to firm brown orange slightly sandy and sandy CLAY with rare flint gravel. (Solution Feature Infill)	
					1 - 2 (75) 100% rec			(1.50) 2.30	Soft to firm, brown slightly sandy, gravelly CLAY. Gravel is subrounded fine to coarse of extremely weak white chalk and rare flint. (Solution Feature Infill)	
					2 - 2.8 (60) 100% rec			(0.50) 2.80	Structureless CHALK composed of soft white slightly gravelly silt. Gravel is fine to coarse, subrounded extremely and very weak, low-density, off white with black specks. (Upper Chalk Formation, Grade Dm)	
									End of Borehole at 2.8m	

GENERAL REMARKS:

1. Groundwater was not encountered during drilling.
2. Borehole refused at 2.8 m.
3. On completion the hole was backfilled with arisings.

WATER:

Strike: m

Standing: m

Flow:

Contractor	Method/ Plant Used	Logged By	Checked By
Risk Management Limited	H. H. Window Sampler	az	ad

PBA STD WS LOG 21834 WS LOGS.GPJ AGS3_ALL.GDT 2/11/11

Project	Woodcroft Farm, Waterlooville	Date	22-08-11		Window Sample No. **WS11**
Job No	21834/030	Ground Level (m OD)	57.50		
Client	Grainger plc	Coordinates (OS National Grid)	468056.2 , 112029.7	All dimensions in metres Scale 1:40	Sheet 1 of 1

SAMPLES/TESTS/PROGRESS						Water	STRATA			
Sample Depth (m)	Sample Type	Test Depth (m)	Test Type	Test Result	Window Run (Size(mm))		Legend	Depth (Thickness) (m)	DESCRIPTION	Instrument/ Backfill
					0 - 1 (75) 100% rec			(0.20) 0.20	Topsoil	
0.50	S								Soft to firm slightly sandy, gravelly CLAY with rare cobbles. Gravel is subrounded medium and coarse of flint. (Head Deposits)	
1.00	S				1 - 2 (75) 100% rec			(1.30) 1.50		
								(0.10) 1.60	Brown cream SAND. Sand is fine to coarse.	
					2 - 4 (60) 100% rec			(2.40) 4.00	Recovered as structureless CHALK composed of slightly sandy silty gravel. Gravel is fine to coarse, subangular, very weak, low and medium density, off white with black specks. (Upper Chalk Formation, Grade Dc)	
									End of Borehole at 4m	

GENERAL REMARKS:

1. Groundwater was not encountered during drilling.
2. On completion a 19mm HDPE standpipe was installed in the borehole, fitted with a gas valve and completed with a flush cover.

KEY
S - Geoenvironmental sample

WATER:

Strike: m

Standing: m

Flow:

Contractor	Method/ Plant Used	Logged By	Checked By
Risk Management Limited	H. H. Window Sampler	az	ad

PBA STD WS LOG 21834 WS LOGS.GPJ AGS3_ALL.GDT 2/11/11

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Attention: Arie Zamler

CERTIFICATE OF ANALYSIS

Date:	19 September 2011
Customer:	H_PBRETT_REA
Sample Delivery Group (SDG):	110831-47
Your Reference:	21834/030
Location:	Woodcroft Farm, Waterlooville
Report No:	150822

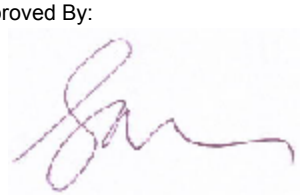
This report has been revised and directly supersedes 149065 in its entirety.

We received 33 samples on Wednesday August 31, 2011 and 24 of these samples were scheduled for analysis which was completed on Monday September 19, 2011. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
4200333	BH 1		0.30 - 0.80	25/08/2011
4200335	BH 4		0.15 - 0.60	25/08/2011
4200337	TP 1		0.50 - 0.50	25/08/2011
4200341	TP 1		2.20 - 2.20	25/08/2011
4200336	TP 18		0.50 - 0.50	26/08/2011
4200342	TP 2		0.50 - 0.50	26/08/2011
4200344	TP 2		1.00 - 1.00	26/08/2011
4200346	TP 2		2.00 - 2.00	26/08/2011
4200347	TP 2		2.00 - 2.80	26/08/2011
4200348	TP 2		3.00 - 3.00	26/08/2011
4200303	TP 3		0.50 - 0.50	25/08/2011
4200304	TP 3		1.10 - 1.10	25/08/2011
4200305	TP 3		2.00 - 2.00	25/08/2011
4200306	TP 3		3.40 - 3.40	25/08/2011
4200308	TP 4		0.50 - 0.50	25/08/2011
4200309	TP 4		1.00 - 1.00	25/08/2011
4200311	TP 4		2.00 - 2.00	25/08/2011
4200325	WS 1		0.50 - 1.00	26/08/2011
4200328	WS 1		2.50 - 3.00	26/08/2011
4200317	WS 11		0.20 - 0.50	30/08/2011
4200329	WS 2		0.15 - 0.50	26/08/2011
4200330	WS 2		1.50 - 2.00	26/08/2011
4200331	WS 2		2.50 - 3.00	26/08/2011
4200332	WS 2		5.20 - 5.50	26/08/2011
4200318	WS 3		0.10 - 0.40	30/08/2011
4200319	WS 3		0.70 - 1.00	30/08/2011
4200320	WS 3		1.50 - 1.70	30/08/2011
4200312	WS 4		0.10 - 0.30	30/08/2011
4200313	WS 4		0.70 - 1.00	30/08/2011
4200316	WS 4		1.70 - 2.00	30/08/2011
4200321	WS 6		0.10 - 0.50	30/08/2011
4200322	WS 6		0.80 - 1.00	30/08/2011

Only received samples which have had analysis scheduled will be shown on the following pages.

ALcontrol Laboratories

Validated

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

SOLID

Results Legend

- X — **Test**
- N — **No Determination Possible**

Lab Sample No(s)			4200333		4200337	4200339	4200341	4200325		4200328		4200344	4200346		4200347	4200348	4200330		4200304	4200305		4200318			4200319	4200335	4200308	4200309	4200312			4200313	4200321			4200322	4200317		4200336	
Customer Sample Reference			BH 1		TP 1	TP 1	TP 1	WS 1		WS 1		TP 2	TP 2		TP 2	TP 2	WS 2		TP 3	TP 3		WS 3			WS 3	BH 4	TP 4	TP 4	WS 4			WS 4	WS 6			WS 6	WS 11		TP 18	
AGS Reference																																								
Depth (m)			0.30 - 0.80		0.50 - 0.50	1.10 - 1.10	2.20 - 2.20	0.50 - 1.00		2.50 - 3.00		1.00 - 1.00	2.00 - 2.00		2.00 - 2.80	3.00 - 3.00	1.50 - 2.00		1.10 - 1.10	2.00 - 2.00		0.10 - 0.40			0.70 - 1.00	0.15 - 0.60	0.50 - 0.50	1.00 - 1.00	0.10 - 0.30			0.70 - 1.00	0.10 - 0.50			0.80 - 1.00	0.20 - 0.50		0.50 - 0.50	
Container			1kg TUB	250g Amber Jar (AL	250g Amber Jar (AL	250g Amber Jar (AL	250g Amber Jar (AL	1kg TUB	250g Amber Jar (AL	1kg TUB	250g Amber Jar (AL	250g Amber Jar (AL	1kg TUB	250g Amber Jar (AL	1kg TUB	250g Amber Jar (AL	1kg TUB	250g Amber Jar (AL	250g Amber Jar (AL	1kg TUB	250g Amber Jar (AL	1kg TUB	250g Amber Jar (AL	60g VOC (ALE215)	250g Amber Jar (AL	250g Amber Jar (AL	250g Amber Jar (AL	250g Amber Jar (AL	1kg TUB	250g Amber Jar (AL	60g VOC (ALE215)	250g Amber Jar (AL	1kg TUB	250g Amber Jar (AL	60g VOC (ALE215)	250g Amber Jar (AL	1kg TUB	250g Amber Jar (AL	1kg TUB	250g Amber Jar (AL
Anions by Kone (soil)	All	NDPs: 0 Tests: 11		X					X		X			X				X			X		X							X				X				X		X
Anions by Kone (w)	All	NDPs: 0 Tests: 2											X							X																				
Asbestos Identification (Soil)	All	NDPs: 0 Tests: 4				X								X	X				X																					
CEN Readings	All	NDPs: 0 Tests: 2											X							X																				
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2											X							X																				
EPH by FID	All	NDPs: 0 Tests: 19		X	X		X		X		X	X		X		X		X	X		X				X	X	X	X				X				X		X		X
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 3																					X							X				X						
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 3																					X							X				X						
GRO by GC-FID (S)	All	NDPs: 0 Tests: 4				X																		X							X				X					
Mercury Dissolved	All	NDPs: 0 Tests: 2											X							X																				
Metals by iCap-OES (Soil)	Arsenic	NDPs: 0 Tests: 19		X	X		X		X		X	X		X		X		X	X		X		X			X	X	X		X				X				X		X
	Beryllium	NDPs: 0 Tests: 11		X					X		X			X				X			X		X							X				X				X		X
	Cadmium	NDPs: 0 Tests: 19		X	X		X		X		X	X		X		X		X	X		X		X			X	X	X		X				X				X		X
	Chromium	NDPs: 0 Tests: 19		X	X		X		X		X	X		X		X		X	X		X		X			X	X	X		X				X				X		X
	Copper	NDPs: 0 Tests: 11		X					X		X			X				X			X		X							X				X				X		X

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

SOLID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			4200333	BH 1		0.30 - 0.80	1kg TUB
			4200337	TP 1		0.50 - 0.50	250g Amber Jar (AL
			4200339	TP 1		1.10 - 1.10	250g Amber Jar (AL
			4200341	TP 1		2.20 - 2.20	250g Amber Jar (AL
			4200325	WS 1		0.50 - 1.00	1kg TUB
			4200328	WS 1		2.50 - 3.00	250g Amber Jar (AL
			4200344	TP 2		1.00 - 1.00	250g Amber Jar (AL
			4200346	TP 2		2.00 - 2.00	1kg TUB
			4200347	TP 2		2.00 - 2.80	250g Amber Jar (AL
			4200348	TP 2		3.00 - 3.00	250g Amber Jar (AL
			4200330	WS 2		1.50 - 2.00	250g Amber Jar (AL
			4200304	TP 3		1.10 - 1.10	250g Amber Jar (AL
			4200305	TP 3		2.00 - 2.00	1kg TUB
			4200318	WS 3		0.10 - 0.40	250g Amber Jar (AL
			4200319	WS 3		0.70 - 1.00	250g Amber Jar (AL
			4200335	BH 4		0.15 - 0.60	250g Amber Jar (AL
			4200308	TP 4		0.50 - 0.50	250g Amber Jar (AL
			4200309	TP 4		1.00 - 1.00	250g Amber Jar (AL
			4200312	WS 4		0.10 - 0.30	1kg TUB
			4200313	WS 4		0.70 - 1.00	250g Amber Jar (AL
			4200321	WS 6		0.10 - 0.50	250g Amber Jar (AL
			4200322	WS 6		0.80 - 1.00	250g Amber Jar (AL
			4200317	WS 11		0.20 - 0.50	250g Amber Jar (AL
			4200336	TP 18		0.50 - 0.50	250g Amber Jar (AL
Metals by iCap-OES (Soil)	Lead	NDPs: 0 Tests: 19	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Mercury	NDPs: 0 Tests: 19	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Nickel	NDPs: 0 Tests: 19	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Selenium	NDPs: 0 Tests: 19	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Vanadium	NDPs: 0 Tests: 11	X			X	X		X			X		X	X				X			X		X	X	X	X
	Zinc	NDPs: 0 Tests: 11	X			X	X		X			X		X	X				X			X		X	X	X	X
OC, OP Pesticides and Triazine Herb	All	NDPs: 0 Tests: 1																									X
PAH by GCMS	All	NDPs: 0 Tests: 6				X					X			X			X				X			X			
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 2								X			X														
PAH Value of soil	All	NDPs: 0 Tests: 14	X				X	X	X			X		X		X	X	X	X			X		X	X	X	X
pH	All	NDPs: 0 Tests: 11	X			X	X		X		X		X		X		X				X		X		X		X
pH Value	All	NDPs: 0 Tests: 2								X			X														
Sample description	All	NDPs: 0 Tests: 23	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Semi Volatile Organic Compounds	All	NDPs: 0 Tests: 2														X							X				
Total Organic Carbon	All	NDPs: 0 Tests: 11	X				X		X			X		X		X						X		X		X	X

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

SOLID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			4200333	BH 1		0.30 - 0.80	1kg TUB
			4200337	TP 1		0.50 - 0.50	250g Amber Jar (AL
			4200339	TP 1		1.10 - 1.10	250g Amber Jar (AL
			4200341	TP 1		2.20 - 2.20	250g Amber Jar (AL
			4200325	WS 1		0.50 - 1.00	1kg TUB
			4200328	WS 1		2.50 - 3.00	250g Amber Jar (AL
			4200344	TP 2		1.00 - 1.00	250g Amber Jar (AL
			4200346	TP 2		2.00 - 2.00	1kg TUB
			4200347	TP 2		2.00 - 2.80	250g Amber Jar (AL
			4200348	TP 2		3.00 - 3.00	1kg TUB
			4200330	WS 2		1.50 - 2.00	250g Amber Jar (AL
			4200304	TP 3		1.10 - 1.10	1kg TUB
			4200305	TP 3		2.00 - 2.00	250g Amber Jar (AL
			4200318	WS 3		0.10 - 0.40	1kg TUB
			4200319	WS 3		0.70 - 1.00	250g Amber Jar (AL
			4200335	BH 4		0.15 - 0.60	250g Amber Jar (AL
			4200308	TP 4		0.50 - 0.50	250g Amber Jar (AL
			4200309	TP 4		1.00 - 1.00	250g Amber Jar (AL
			4200312	WS 4		0.10 - 0.30	1kg TUB
			4200313	WS 4		0.70 - 1.00	250g Amber Jar (AL
			4200321	WS 6		0.10 - 0.50	250g Amber Jar (AL
			4200322	WS 6		0.80 - 1.00	250g Amber Jar (AL
			4200317	WS 11		0.20 - 0.50	250g Amber Jar (AL
			4200336	TP 18		0.50 - 0.50	250g Amber Jar (AL
TPH CWG GC (S)	All	NDPs: 0 Tests: 3					X X X
VOC MS (S)	All	NDPs: 0 Tests: 2					X X

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
4200333	BH 1	0.30 - 0.80	Light Brown	Clay	<0.063 mm	Stones	Vegetation
4200335	BH 4	0.15 - 0.60	Light Brown	Clay Loam	<0.063 mm	Vegetation	None
4200337	TP 1	0.50 - 0.50	Light Brown	Clay	<0.063 mm	Stones	Coal fragments
4200339	TP 1	1.10 - 1.10	Light Brown	Silty Clay Loam	0.063 - 0.1 mm	Stones	None
4200341	TP 1	2.20 - 2.20	Grey	Sandy Clay	0.063 - 0.1 mm	Stones	Vegetation
4200344	TP 2	1.00 - 1.00	Light Brown	Sandy Clay Loam	0.063 - 0.1 mm	Stones	None
4200346	TP 2	2.00 - 2.00	Dark Brown	Silty Clay	0.063 - 0.1 mm	Stones	None
4200348	TP 2	3.00 - 3.00	Dark Brown	Sandy Clay Loam	0.063 - 0.1 mm	Stones	None
4200304	TP 3	1.10 - 1.10	Dark Brown	Silty Clay	0.063 - 0.1 mm	None	None
4200305	TP 3	2.00 - 2.00	Dark Brown	Silty Clay Loam	0.063 - 0.1 mm	None	None
4200308	TP 4	0.50 - 0.50	Dark Brown	Sandy Clay	0.063 - 0.1 mm	Stones	None
4200309	TP 4	1.00 - 1.00	Light Brown	Sandy Clay	0.1 - 2 mm	Stones	N/A
4200336	TP 18	0.50 - 0.50	Beige	Clay	<0.063 mm	Vegetation	Stones
4200325	WS 1	0.50 - 1.00	Light Brown	Clay	<0.063 mm	Vegetation	None
4200328	WS 1	2.50 - 3.00	Dark Brown	Sandy Clay	0.1 - 2 mm	Stones	N/A
4200330	WS 2	1.50 - 2.00	Dark Brown	Silty Clay	0.063 - 0.1 mm	Stones	Vegetation
4200318	WS 3	0.10 - 0.40	Dark Brown	Sand	0.1 - 2 mm	Stones	None
4200319	WS 3	0.70 - 1.00	Light Brown	Clay	<0.063 mm	None	None
4200312	WS 4	0.10 - 0.30	Dark Brown	Sandy Clay Loam	0.063 - 0.1 mm	Vegetation	Stones
4200313	WS 4	0.70 - 1.00	Yellow	Clay	<0.063 mm	Vegetation	None
4200321	WS 6	0.10 - 0.50	Dark Brown	Sandy Clay	0.1 - 2 mm	Stones	Vegetation
4200322	WS 6	0.80 - 1.00	Light Brown	Silty Clay Loam	0.063 - 0.1 mm	None	None
4200317	WS 11	0.20 - 0.50	Light Brown	Clay Loam	<0.063 mm	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	BH 1	BH 4	TP 1	TP 1	TP 2	TP 2
			Depth (m)	0.30 - 0.80	0.15 - 0.60	0.50 - 0.50	2.20 - 2.20	1.00 - 1.00	2.00 - 2.00
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	25/08/2011	25/08/2011	25/08/2011	25/08/2011	26/08/2011	26/08/2011
			Date Received	31/08/2011	31/08/2011	31/08/2011	31/08/2011	31/08/2011	31/08/2011
			SDG Ref	110831-47	110831-47	110831-47	110831-47	110831-47	110831-47
			Lab Sample No.(s)	4200333	4200335	4200337	4200341	4200344	4200346
			AGS Reference						
EPH Surrogate % recovery**	%	TM061		92.2 § M	92.5 § M	91.2 § M	98.5 § M	95.1 § M	99 § M
EPH Range >C10 - C40	<35 mg/kg	TM061		<35 § M	42.7 § M	110 § M	138 § M	207 § M	511 § M
Soil Organic Matter (SOM)	<0.35 %	TM132		0.972 #					5.97 #
pH	1 pH Units	TM133		7.76 M					7.73 § M
Arsenic	<0.6 mg/kg	TM181		7.65 M	11.5 M	13.9 M	14 M	12.5 M	13.1 M
Beryllium	<0.01 mg/kg	TM181		0.692 M					0.928 M
Cadmium	<0.02 mg/kg	TM181		0.302 M	0.22 M	0.352 M	0.0628 M	0.833 M	1.18 M
Chromium	<0.9 mg/kg	TM181		49.8 M	13.5 M	39.6 M	37.9 M	28.2 M	27.8 M
Copper	<1.4 mg/kg	TM181		11.4 M					40.6 M
Lead	<0.7 mg/kg	TM181		18.7 M	18.9 M	22.5 M	33.9 M	270 M	129 M
Mercury	<0.14 mg/kg	TM181		<0.14 M	<0.14 M	<0.14 M	<0.14 M	<0.14 M	<0.14 M
Nickel	<0.2 mg/kg	TM181		11 M	4.93 M	32.7 M	31.2 M	23.9 M	33.4 M
Selenium	<1 mg/kg	TM181		1.02 #	<1 #	<1 #	<1 #	<1 #	<1 #
Vanadium	<0.2 mg/kg	TM181		77.3 #					42.8 #
Zinc	<1.9 mg/kg	TM181		21 M					843 M
Polyaromatic hydrocarbons, Total	<10 mg/kg	TM213		<10	<10			<10	
Soluble Sulphate 2:1 extract as SO4 BRE	<0.003 g/l	TM243		0.0112 M					0.222 M

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	TP 2	TP 3	TP 3	TP 4	TP 4	TP 18
			Depth (m)	3.00 - 3.00	1.10 - 1.10	2.00 - 2.00	0.50 - 0.50	1.00 - 1.00	0.50 - 0.50
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	26/08/2011	25/08/2011	25/08/2011	25/08/2011	25/08/2011	26/08/2011
			Date Received	31/08/2011	31/08/2011	31/08/2011	31/08/2011	31/08/2011	31/08/2011
			SDG Ref	110831-47	110831-47	110831-47	110831-47	110831-47	110831-47
			Lab Sample No.(s)	4200348	4200304	4200305	4200308	4200309	4200336
			AGS Reference						
EPH Surrogate % recovery**	%	TM061		89.9 § M	98.4 § M	94.3 § M	97.4 § M	99.8 § M	99.8 § M
EPH Range >C10 - C40	<35 mg/kg	TM061		152 § M	238 § M	241 § M	145 § M	<35 § M	44.2 § M
Soil Organic Matter (SOM)	<0.35 %	TM132				2.19 #			0.846 #
pH	1 pH Units	TM133				7.63 M			7.94 M
Arsenic	<0.6 mg/kg	TM181		7.81 M	28.5 M	19.9 M	17.6 M	15.7 M	6.73 M
Beryllium	<0.01 mg/kg	TM181				0.0914 M			0.0652 M
Cadmium	<0.02 mg/kg	TM181		0.565 M	0.26 M	0.0762 M	<0.02 M	0.0527 M	<0.02 M
Chromium	<0.9 mg/kg	TM181		23.2 M	21.4 M	31.4 M	24.3 M	27.8 M	33.5 M
Copper	<1.4 mg/kg	TM181				14.2 M			13.5 M
Lead	<0.7 mg/kg	TM181		46.7 M	70 M	43.5 M	23.8 M	14.5 M	9.99 M
Mercury	<0.14 mg/kg	TM181		<0.14 M	<0.14 M	<0.14 M	<0.14 M	<0.14 M	<0.14 M
Nickel	<0.2 mg/kg	TM181		21.8 M	10.4 M	15 M	10.3 M	9.97 M	7.63 M
Selenium	<1 mg/kg	TM181		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Vanadium	<0.2 mg/kg	TM181				58.4 #			61.9 #
Zinc	<1.9 mg/kg	TM181				75.6 M			16.2 M
Polyaromatic hydrocarbons, Total	<10 mg/kg	TM213				<10	<10	<10	<10
Soluble Sulphate 2:1 extract as SO4 BRE	<0.003 g/l	TM243				0.202 M			0.005 M

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	WS 1	WS 1	WS 2	WS 3	WS 3	WS 4
			Depth (m)	0.50 - 1.00	2.50 - 3.00	1.50 - 2.00	0.10 - 0.40	0.70 - 1.00	0.10 - 0.30
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	26/08/2011	26/08/2011	26/08/2011	30/08/2011	30/08/2011	30/08/2011
			Date Received	31/08/2011	31/08/2011	31/08/2011	31/08/2011	31/08/2011	31/08/2011
			SDG Ref	110831-47	110831-47	110831-47	110831-47	110831-47	110831-47
			Lab Sample No.(s)	4200325	4200328	4200330	4200318	4200319	4200312
			AGS Reference						
EPH Surrogate % recovery**	%	TM061		96.6 § M	97.3 § M	91.5 § M		96.7 § M	
EPH Range >C10 - C40	<35 mg/kg	TM061		59.6 § M	78.4 § M	240 § M		42.8 § M	
Soil Organic Matter (SOM)	<0.35 %	TM132		1.16 #	1.62 #	2.16 #	3.95 #		4.55 #
pH	1 pH Units	TM133		7.64 M	8.5 M	8.51 M	8.51 M		8.22 M
Arsenic	<0.6 mg/kg	TM181		14.4 M	6.9 M	13.3 M	6.22 M		10.4 M
Beryllium	<0.01 mg/kg	TM181		2.2 M	0.226 M	0.253 M	0.754 M		0.616 M
Cadmium	<0.02 mg/kg	TM181		0.271 M	0.22 M	0.191 M	0.368 M		0.47 M
Chromium	<0.9 mg/kg	TM181		49.9 M	26 M	29.7 M	14.5 M		28.1 M
Copper	<1.4 mg/kg	TM181		20.7 M	16.3 M	14 M	65.1 M		21.6 M
Lead	<0.7 mg/kg	TM181		22.3 M	26.5 M	22.9 M	98.4 M		72.2 M
Mercury	<0.14 mg/kg	TM181		<0.14 M	<0.14 M	<0.14 M	<0.14 M		<0.14 M
Nickel	<0.2 mg/kg	TM181		43.1 M	23.1 M	21.8 M	8.33 M		15.7 M
Selenium	<1 mg/kg	TM181		<1 #	1.32 #	<1 #	<1 #		<1 #
Vanadium	<0.2 mg/kg	TM181		94.8 #	44.1 #	56.4 #	31 #		39.5 #
Zinc	<1.9 mg/kg	TM181		93.2 M	79.6 M	68.8 M	135 M		124 M
Polyaromatic hydrocarbons, Total	<10 mg/kg	TM213		<10	<10	<10		<10	
Soluble Sulphate 2:1 extract as SO4 BRE	<0.003 g/l	TM243		0.0214 M	0.0919 M	0.193 M	0.145 M		0.0031 M

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	WS 4	WS 6	WS 6	WS 11		
			Depth (m)	0.70 - 1.00	0.10 - 0.50	0.80 - 1.00	0.20 - 0.50		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Sampled	30/08/2011	30/08/2011	30/08/2011	30/08/2011		
			Date Received	31/08/2011	31/08/2011	31/08/2011	31/08/2011		
			SDG Ref	110831-47	110831-47	110831-47	110831-47		
			Lab Sample No.(s)	4200313	4200321	4200322	4200317		
			AGS Reference						
EPH Surrogate % recovery**	%	TM061		96.5 § M		102 § M	96.2 M		
EPH Range >C10 - C40	<35 mg/kg	TM061		<35 § M		420 § M	55.9 M		
Soil Organic Matter (SOM)	<0.35 %	TM132			2.36 #		1.55 #		
pH	1 pH Units	TM133			8.35 M		7.15 M		
Arsenic	<0.6 mg/kg	TM181			21.1 M		14.4 M		
Beryllium	<0.01 mg/kg	TM181			0.396 M		0.904 M		
Cadmium	<0.02 mg/kg	TM181			2.79 M		0.579 M		
Chromium	<0.9 mg/kg	TM181			19.8 M		27.3 M		
Copper	<1.4 mg/kg	TM181			56.9 M		7.73 M		
Lead	<0.7 mg/kg	TM181			170 M		17.1 M		
Mercury	<0.14 mg/kg	TM181			<0.14 M		<0.14 M		
Nickel	<0.2 mg/kg	TM181			15.1 M		32.3 M		
Selenium	<1 mg/kg	TM181			<1 #		1.36 #		
Vanadium	<0.2 mg/kg	TM181			30.8 #		52.8 #		
Zinc	<1.9 mg/kg	TM181			6120 M		52.9 M		
Polyaromatic hydrocarbons, Total	<10 mg/kg	TM213		<10		<10	<10		
Soluble Sulphate 2:1 extract as SO4 BRE	<0.003 g/l	TM243			0.0816 M		0.0182 M		

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

GRO by GC-FID (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	TP 1
			Depth (m)	1.10 - 1.10
			Sample Type	Soil/Solid
			Date Sampled	25/08/2011
			Date Received	31/08/2011
			SDG Ref	110831-47
			Lab Sample No.(s)	4200339
			AGS Reference	
GRO Surrogate % recovery**	%	TM089		75 §
GRO >C5-C12	<44 µg/kg	TM089		<44 §
Methyl tertiary butyl ether (MTBE)	<5 µg/kg	TM089		<5 § #
Benzene	<10 µg/kg	TM089		<10 § M
Toluene	<2 µg/kg	TM089		<2 § M
Ethylbenzene	<3 µg/kg	TM089		<3 § M
m,p-Xylene	<6 µg/kg	TM089		<6 § M
o-Xylene	<3 µg/kg	TM089		<3 § M
sum of detected mpo xylene by GC	<9 µg/kg	TM089		<9 §
sum of detected BTEX by GC	<24 µg/kg	TM089		<24 §
Aliphatics >C5-C6	<10 µg/kg	TM089		<10 §
Aliphatics >C6-C8	<10 µg/kg	TM089		<10 §
Aliphatics >C8-C10	<10 µg/kg	TM089		<10 §
Aliphatics >C10-C12	<10 µg/kg	TM089		<10 §
Aromatics >EC5-EC7	<10 µg/kg	TM089		<10 §
Aromatics >EC7-EC8	<10 µg/kg	TM089		<10 §
Aromatics >EC8-EC10	<10 µg/kg	TM089		<10 §
Aromatics >EC10-EC12	<10 µg/kg	TM089		<10 §

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

OC, OP Pesticides and Triazine Herb

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Customer Sample R			TP 18
Depth (m)			0.50 - 0.50
Sample Type			Soil/Solid
Date Sampled			26/08/2011
Date Received			31/08/2011
SDG Ref			110831-47
Lab Sample No.(s)			4200336
AGS Reference			
Component	**LOD/Units**	**Method**	
Mevinphos	<50 µg/kg	TM073	<50
Dichlorvos	<50 µg/kg	TM073	<50
Hexachlorobenzene	<50 µg/kg	TM073	<50
Tecnazene	<50 µg/kg	TM073	<50
alpha-Hexachlorocyclohexane (HCH / Lindane)	<50 µg/kg	TM073	<50
Trifluralin	<50 µg/kg	TM073	<50
Diazinon	<50 µg/kg	TM073	<50
Quintozene (PCNB)	<50 µg/kg	TM073	<50
Etrimphos	<50 µg/kg	TM073	<50
Triallate	<50 µg/kg	TM073	<50
gamma-Hexachlorocyclohexane (HCH / Lindane)	<50 µg/kg	TM073	<50
Heptachlor	<50 µg/kg	TM073	<50
Propetamphos	<50 µg/kg	TM073	<50
Dimethoate	<50 µg/kg	TM073	<50
Chlorpyriphos methyl	<50 µg/kg	TM073	<50
Chlorothalonil	<50 µg/kg	TM073	<50
Aldrin	<50 µg/kg	TM073	<50
beta-Hexachlorocyclohexane (HCH / Lindane)	<50 µg/kg	TM073	<50
Pirimiphos-methyl	<50 µg/kg	TM073	<50
Telodrin	<50 µg/kg	TM073	<50
Chlorpyriphos	<50 µg/kg	TM073	<50
Isodrin	<50 µg/kg	TM073	<50
Methyl parathion	<50 µg/kg	TM073	<50
Malathion	<50 µg/kg	TM073	<50
Fenthion	<50 µg/kg	TM073	<50
Fenitrothion	<50 µg/kg	TM073	<50
Triadimefon	<50 µg/kg	TM073	<50
Heptachlor epoxide	<50 µg/kg	TM073	<50
Parathion	<50 µg/kg	TM073	<50
Pendimethalin	<50 µg/kg	TM073	<50
Chlorfenvinphos	<50 µg/kg	TM073	<50
o,p-DDE	<50 µg/kg	TM073	<50
Trans-chlordane	<50 µg/kg	TM073	<50
Endosulphan I	<50 µg/kg	TM073	<50
p,p-DDE	<50 µg/kg	TM073	<50

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

OC, OP Pesticides and Triazine Herb

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Customer Sample R			TP 18
Depth (m)			0.50 - 0.50
Sample Type			Soil/Solid
Date Sampled			26/08/2011
Date Received			31/08/2011
SDG Ref			110831-47
Lab Sample No.(s)			4200336
AGS Reference			
Component	**LOD/Units**	**Method**	
cis-Chlordane	<50 µg/kg	TM073	<50
o,p-TDE (DDD)	<50 µg/kg	TM073	<50
Dieldrin	<50 µg/kg	TM073	<50
o,p-DDT	<50 µg/kg	TM073	<50
Endrin	<50 µg/kg	TM073	<50
Ethion	<50 µg/kg	TM073	<50
p,p-TDE (DDD)	<50 µg/kg	TM073	<50
p,p-DDT	<50 µg/kg	TM073	<50
Endosulphan II	<50 µg/kg	TM073	<50
o,p-Methoxychlor	<50 µg/kg	TM073	<50
Carbophenothion	<50 µg/kg	TM073	<50
p,p-Methoxychlor	<50 µg/kg	TM073	<50
Triazophos	<50 µg/kg	TM073	<50
Permethrin I	<50 µg/kg	TM073	<50
Endosulphan sulphate	<50 µg/kg	TM073	<50
Permethrin II	<50 µg/kg	TM073	<50
Phosalone	<50 µg/kg	TM073	<50
Azinphos-ethyl	<50 µg/kg	TM073	<50
Azinphos-methyl	<50 µg/kg	TM073	<50

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

PAH by GCMS

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	TP 1	TP 2	TP 3	WS 3	WS 4	WS 6
			Depth (m)	2.20 - 2.20	2.00 - 2.00	1.10 - 1.10	0.10 - 0.40	0.10 - 0.30	0.10 - 0.50
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	25/08/2011	26/08/2011	25/08/2011	30/08/2011	30/08/2011	30/08/2011
			Date Received	31/08/2011	31/08/2011	31/08/2011	31/08/2011	31/08/2011	31/08/2011
			SDG Ref	110831-47	110831-47	110831-47	110831-47	110831-47	110831-47
			Lab Sample No.(s)	4200341	4200346	4200304	4200318	4200312	4200321
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		65.4	92.3	87.8	92.9	96.4	99.7
Acenaphthene-d10 % recovery**	%	TM218		56.7	85.8	86.3	89.3	94.3	96.9
Phenanthrene-d10 % recovery**	%	TM218		52.4	79.2	85	88.8	93.5	95.1
Chrysene-d12 % recovery**	%	TM218		46.6	80.6	88.1	87.1	91.2	97.5
Perylene-d12 % recovery**	%	TM218		43.4	85.6	93.3	85.1	91.7	95.7
Naphthalene	<9 µg/kg	TM218		<9 M	75.3 M	18.8 M	227 M	27.3 M	27.5 M
Acenaphthylene	<12 µg/kg	TM218		<12 M	124 M	20.5 M	513 M	31.3 M	16.7 M
Acenaphthene	<8 µg/kg	TM218		<8 M	34.7 M	<8 M	1800 M	<8 M	<8 M
Fluorene	<10 µg/kg	TM218		<10 M	57.2 M	18.2 M	1250 M	<10 M	<10 M
Phenanthrene	<15 µg/kg	TM218		26.3 M	609 M	117 M	3460 M	78.2 M	105 M
Anthracene	<16 µg/kg	TM218		<16 M	182 M	36.1 M	1520 M	63.8 M	30.4 M
Fluoranthene	<17 µg/kg	TM218		26.9 M	1410 M	210 M	11300 M	165 M	289 M
Pyrene	<15 µg/kg	TM218		22.2 M	1330 M	192 M	11100 M	155 M	266 M
Benz(a)anthracene	<14 µg/kg	TM218		<14 M	754 M	139 M	6160 M	117 M	156 M
Chrysene	<10 µg/kg	TM218		<10 M	913 M	137 M	5840 M	106 M	169 M
Benzo(b)fluoranthene	<15 µg/kg	TM218		<15 M	1500 M	170 M	9750 M	206 M	289 M
Benzo(k)fluoranthene	<14 µg/kg	TM218		<14 M	421 M	87.4 M	3390 M	56.1 M	100 M
Benzo(a)pyrene	<15 µg/kg	TM218		<15 M	1090 M	131 M	8310 M	112 M	201 M
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218		<18 M	807 M	97 M	4330 M	105 M	135 M
Dibenzo(a,h)anthracene	<23 µg/kg	TM218		<23 M	214 M	58.3 M	1380 M	31.6 M	41.2 M
Benzo(g,h,i)perylene	<24 µg/kg	TM218		<24 M	980 M	105 M	5910 M	175 M	179 M
PAH, Total Detected USEPA 16	<118 µg/kg	TM218		<118	10500	1540	76200	1430	2000

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Semi Volatile Organic Compounds

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	WS 3	WS 6				
			Depth (m)	0.10 - 0.40	0.10 - 0.50				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	30/08/2011	30/08/2011				
			Date Received	31/08/2011	31/08/2011				
			SDG Ref	110831-47	110831-47				
			Lab Sample No.(s)	4200318	4200321				
			AGS Reference						
Phenol	<100 ug/kg	TM157		<200	<100				
Pentachlorophenol	<100 ug/kg	TM157		<200	<100				
n-Nitroso-n-dipropylamine	<100 ug/kg	TM157		<200	<100				
Nitrobenzene	<100 ug/kg	TM157		<200	<100				
Isophorone	<100 ug/kg	TM157		<200	<100				
Hexachloroethane	<100 ug/kg	TM157		<200	<100				
Hexachlorocyclopentadiene	<100 ug/kg	TM157		<200	<100				
Hexachlorobutadiene	<100 ug/kg	TM157		<200	<100				
Hexachlorobenzene	<100 ug/kg	TM157		<200	<100				
n-Dioctyl phthalate	<100 ug/kg	TM157		<200	<100				
Dimethyl phthalate	<100 ug/kg	TM157		<200	<100				
Diethyl phthalate	<100 ug/kg	TM157		<200	<100				
n-Dibutyl phthalate	<100 ug/kg	TM157		<200	<100				
Dibenzofuran	<100 ug/kg	TM157		1130	<100				
Carbazole	<100 ug/kg	TM157		509	<100				
Butylbenzyl phthalate	<100 ug/kg	TM157		<200	<100				
bis(2-Ethylhexyl) phthalate	<100 ug/kg	TM157		391	<100				
bis(2-Chloroethoxy)methane	<100 ug/kg	TM157		<200	<100				
bis(2-Chloroethyl)ether	<100 ug/kg	TM157		<200	<100				
Azobenzene	<100 ug/kg	TM157		<200	<100				
4-Nitrophenol	<100 ug/kg	TM157		<200	<100				
4-Nitroaniline	<100 ug/kg	TM157		<200	<100				
4-Methylphenol	<100 ug/kg	TM157		<200	<100				
4-Chlorophenylphenylether	<100 ug/kg	TM157		<200	<100				
4-Chloroaniline	<100 ug/kg	TM157		<200	<100				
4-Chloro-3-methylphenol	<100 ug/kg	TM157		<200	<100				
4-Bromophenylphenylether	<100 ug/kg	TM157		<200	<100				
3-Nitroaniline	<100 ug/kg	TM157		<200	<100				
2-Nitrophenol	<100 ug/kg	TM157		<200	<100				
2-Nitroaniline	<100 ug/kg	TM157		<200	<100				
2-Methylphenol	<100 ug/kg	TM157		<200	<100				
1,2,4-Trichlorobenzene	<100 ug/kg	TM157		<200	<100				
2-Chlorophenol	<100 ug/kg	TM157		<200	<100				
2,6-Dinitrotoluene	<100 ug/kg	TM157		<200	<100				
2,4-Dinitrotoluene	<100 ug/kg	TM157		<200	<100				

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	WS 3	WS 6				
			Depth (m)	0.10 - 0.40	0.10 - 0.50				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	30/08/2011	30/08/2011				
			Date Received	31/08/2011	31/08/2011				
			SDG Ref	110831-47	110831-47				
			Lab Sample No.(s)	4200318	4200321				
			AGS Reference						
2,4-Dimethylphenol	<100 µg/kg	TM157		<200	<100				
2,4-Dichlorophenol	<100 µg/kg	TM157		<200	<100				
2,4,6-Trichlorophenol	<100 µg/kg	TM157		<200	<100				
2,4,5-Trichlorophenol	<100 µg/kg	TM157		<200	<100				
1,4-Dichlorobenzene	<100 µg/kg	TM157		<200	<100				
1,3-Dichlorobenzene	<100 µg/kg	TM157		<200	<100				
1,2-Dichlorobenzene	<100 µg/kg	TM157		<200	<100				
2-Chloronaphthalene	<100 µg/kg	TM157		<200	<100				
2-Methylnaphthalene	<100 µg/kg	TM157		<200	<100				
Benzo(a)anthracene	<100 µg/kg	TM157		7040	<100				
Chrysene	<100 µg/kg	TM157		7180	<100				
Naphthalene	<100 µg/kg	TM157		<200	<100				

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

TPH CWG (S)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	WS 3	WS 4	WS 6			
			Depth (m)	0.10 - 0.40	0.10 - 0.30	0.10 - 0.50			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	30/08/2011	30/08/2011	30/08/2011			
			Date Received	31/08/2011	31/08/2011	31/08/2011			
			SDG Ref	110831-47	110831-47	110831-47			
			Lab Sample No.(s)	4200318	4200312	4200321			
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		38	58	88			
GRO >C5-C12	<44 µg/kg	TM089		95.5	<44	<44			
Methyl tertiary butyl ether (MTBE)	<5 µg/kg	TM089		<5 #	<5 #	<5 #			
Benzene	<10 µg/kg	TM089		<10 M	<10 M	<10 M			
Toluene	<2 µg/kg	TM089		<2 M	<2 M	<2 M			
Ethylbenzene	<3 µg/kg	TM089		<3 M	<3 M	<3 M			
m,p-Xylene	<6 µg/kg	TM089		<6 M	<6 M	<6 M			
o-Xylene	<3 µg/kg	TM089		<3 M	<3 M	<3 M			
sum of detected mpo xylene by GC	<9 µg/kg	TM089		<9	<9	<9			
sum of detected BTEX by GC	<24 µg/kg	TM089		<24	<24	<24			
Aliphatics >C5-C6	<10 µg/kg	TM089		25.5	<10	<10			
Aliphatics >C6-C8	<10 µg/kg	TM089		30	<10	<10			
Aliphatics >C8-C10	<10 µg/kg	TM089		<10	<10	<10			
Aliphatics >C10-C12	<10 µg/kg	TM089		13.3	<10	<10			
Aliphatics >C12-C16	<100 µg/kg	TM173		12400	2120	1580			
Aliphatics >C16-C21	<100 µg/kg	TM173		35800	1240	5760			
Aliphatics >C21-C35	<100 µg/kg	TM173		303000	11300	192000			
Aliphatics >C35-C44	<100 µg/kg	TM173		260000	1360	31900			
Total Aliphatics >C12-C44	<100 µg/kg	TM173		611000	16000	232000			
Aromatics >EC5-EC7	<10 µg/kg	TM089		<10	<10	<10			
Aromatics >EC7-EC8	<10 µg/kg	TM089		<10	<10	<10			
Aromatics >EC8-EC10	<10 µg/kg	TM089		<10	<10	<10			
Aromatics >EC10-EC12	<10 µg/kg	TM089		<10	<10	<10			
Aromatics >EC12-EC16	<100 µg/kg	TM173		28100	8750	2990			
Aromatics >EC16-EC21	<100 µg/kg	TM173		128000	8210	7110			
Aromatics >EC21-EC35	<100 µg/kg	TM173		733000	38000	53800			
Aromatics >EC35-EC44	<100 µg/kg	TM173		734000	17000	20200			
Aromatics >EC40-EC44	<100 µg/kg	TM173		350000	8280	7720			
Total Aromatics >EC12-EC44	<100 µg/kg	TM173		1620000	71900	84100			
Total Aliphatics & Aromatics >C5-C44	<100 µg/kg	TM173		2230000	88000	316000			
Total Aliphatics >C5-35	<100 µg/kg	TM173		351000	14700	200000			
Total Aromatics >C5-35	<100 µg/kg	TM173		889000	54900	63900			
Total Aliphatics & Aromatics >C5-35	<100 µg/kg	TM173		1240000	69600	264000			

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	WS 3	WS 6				
			Depth (m)	0.10 - 0.40	0.10 - 0.50				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	30/08/2011	30/08/2011				
			Date Received	31/08/2011	31/08/2011				
			SDG Ref	110831-47	110831-47				
			Lab Sample No.(s)	4200318	4200321				
			AGS Reference						
Dibromofluoromethane**	%	TM116		98.2	99.9				
Toluene-d8**	%	TM116		92.8	100				
4-Bromofluorobenzene**	%	TM116		150	129				
Dichlorodifluoromethane	<4 µg/kg	TM116		<8 M	<4 M				
Chloromethane	<7 µg/kg	TM116		<14 #	<7 #				
Vinyl Chloride	<10 µg/kg	TM116		<20 #	<10 #				
Bromomethane	<13 µg/kg	TM116		<26 M	<13 M				
Chloroethane	<14 µg/kg	TM116		<28 M	<14 M				
Trichlorofluorormethane	<6 µg/kg	TM116		<12 M	<6 M				
1.1-Dichloroethene	<10 µg/kg	TM116		<20 #	<10 #				
Carbon Disulphide	<7 µg/kg	TM116		53.6 M	<7 M				
Dichloromethane	<10 µg/kg	TM116		<20 #	<10 #				
Methyl Tertiary Butyl Ether	<11 µg/kg	TM116		<22 M	<11 M				
trans-1-2-Dichloroethene	<11 µg/kg	TM116		<22 M	<11 M				
1.1-Dichloroethane	<8 µg/kg	TM116		<16 M	<8 M				
cis-1-2-Dichloroethene	<5 µg/kg	TM116		<10 M	<5 M				
2.2-Dichloropropane	<12 µg/kg	TM116		<24 M	<12 M				
Bromochloromethane	<14 µg/kg	TM116		<28 M	<14 M				
Chloroform	<8 µg/kg	TM116		<16 M	<8 M				
1.1.1-Trichloroethane	<7 µg/kg	TM116		<14 M	<7 M				
1.1-Dichloropropene	<11 µg/kg	TM116		<22 M	<11 M				
Carbontetrachloride	<14 µg/kg	TM116		<28 M	<14 M				
1.2-Dichloroethane	<5 µg/kg	TM116		<10 M	<5 M				
Benzene	<9 µg/kg	TM116		<18 M	<9 M				
Trichloroethene	<9 µg/kg	TM116		<18 M	<9 M				
1.2-Dichloropropane	<12 µg/kg	TM116		<24 M	<12 M				
Dibromomethane	<9 µg/kg	TM116		<18 M	<9 M				
Bromodichloromethane	<7 µg/kg	TM116		<14 M	<7 M				
cis-1-3-Dichloropropene	<14 µg/kg	TM116		<28 M	<14 M				
Toluene	<5 µg/kg	TM116		<10 M	7.37 M				
trans-1-3-Dichloropropene	<14 µg/kg	TM116		<28	<14				
1.1.2-Trichloroethane	<10 µg/kg	TM116		<20 M	<10 M				
1.3-Dichloropropane	<7 µg/kg	TM116		<14 #	<7 #				
Tetrachloroethene	<5 µg/kg	TM116		<10 M	<5 M				
Dibromochloromethane	<13 µg/kg	TM116		<26 M	<13 M				

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
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*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	WS 3	WS 6				
			Depth (m)	0.10 - 0.40	0.10 - 0.50				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	30/08/2011	30/08/2011				
			Date Received	31/08/2011	31/08/2011				
			SDG Ref	110831-47	110831-47				
			Lab Sample No.(s)	4200318	4200321				
			AGS Reference						
1.2-Dibromoethane	<12 µg/kg	TM116		<24 M	<12 M				
Chlorobenzene	<5 µg/kg	TM116		<10 M	<5 M				
1.1.1.2-Tetrachloroethane	<10 µg/kg	TM116		<20 M	<10 M				
Ethylbenzene	<4 µg/kg	TM116		<8 M	<4 M				
p/m-Xylene	<14 µg/kg	TM116		<28 #	<14 #				
o-Xylene	<10 µg/kg	TM116		<20 M	<10 M				
Styrene	<10 µg/kg	TM116		<20 M	<10 M				
Bromoform	<10 µg/kg	TM116		<20 M	<10 M				
Isopropylbenzene	<5 µg/kg	TM116		<10 M	<5 M				
1.1.2.2-Tetrachloroethane	<10 µg/kg	TM116		<20 #	<10 #				
1.2.3-Trichloropropane	<17 µg/kg	TM116		<34 M	<17 M				
Bromobenzene	<10 µg/kg	TM116		<20 M	<10 M				
Propylbenzene	<11 µg/kg	TM116		<22 M	<11 M				
2-Chlorotoluene	<9 µg/kg	TM116		<18 M	<9 M				
1.3.5-Trimethylbenzene	<8 µg/kg	TM116		<16 #	<8 #				
4-Chlorotoluene	<12 µg/kg	TM116		<24 M	<12 M				
tert-Butylbenzene	<12 µg/kg	TM116		<24 #	<12 #				
1.2.4-Trimethylbenzene	<9 µg/kg	TM116		<18 #	<9 #				
sec-Butylbenzene	<10 µg/kg	TM116		<20 M	<10 M				
4-Isopropyltoluene	<11 µg/kg	TM116		<22 M	<11 M				
1.3-Dichlorobenzene	<6 µg/kg	TM116		<12 M	<6 M				
1.4-Dichlorobenzene	<5 µg/kg	TM116		<10 M	<5 M				
n-Butylbenzene	<10 µg/kg	TM116		<20 M	<10 M				
1.2-Dichlorobenzene	<12 µg/kg	TM116		<24 M	<12 M				
1.2-Dibromo-3-chloropropane	<14 µg/kg	TM116		<28 M	<14 M				
Tert-amyl methyl ether	<15 µg/kg	TM116		<30	<15				
1.2.4-Trichlorobenzene	<6 µg/kg	TM116		<12 #	<6 #				
Hexachlorobutadiene	<12 µg/kg	TM116		<24	<12				
Naphthalene	<13 µg/kg	TM116		<26 M	<13 M				
1.2.3-Trichlorobenzene	<6 µg/kg	TM116		<12 M	<6 M				

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Extractable Petroleum Hydrocarbons (EPH) By GC-FID

EPH (DRO) (C10-C40)

Sample No	Customer Sample Ref.	Depth	Matrix (mg/kg)	EPH	Interpretation
4234529	WS 1	2.50 - 3.00	SOLID	78.4	PAHS/Humic Acids
4234627	TP 4	1.00 - 1.00	SOLID	<35.0	No Identification Possible
4234722	WS 2	1.50 - 2.00	SOLID	240	Carboxylic Acids
4235469	TP 18	0.50 - 0.50	SOLID	44.2	PAHS/Humic Acids
4235584	TP 4	0.50 - 0.50	SOLID	145	PAHS/Humic Acids
4235621	TP 1	2.20 - 2.20	SOLID	138	PAHS/Humic Acids
4235653	TP 2	1.00 - 1.00	SOLID	207	PAHS/Humic Acids
4236908	WS 3	0.70 - 1.00	SOLID	42.8	No Identification Possible
4236936	WS 6	0.80 - 1.00	SOLID	420	PAHS
4236950	TP 3	2.00 - 2.00	SOLID	241	PAHS
4237355	WS 4	0.70 - 1.00	SOLID	<35.0	No Identification Possible
4237369	WS 1	0.50 - 1.00	SOLID	59.6	No Identification Possible
4237583	WS 11	0.20 - 0.50	SOLID	55.9	PAHS
4241036	TP 1	0.50 - 0.50	SOLID	110	PAHS/Humic Acids
4241056	TP 2	3.00 - 3.00	SOLID	152	PAHS/Humic Acids
4241083	BH 1	0.30 - 0.80	SOLID	<35.0	No Identification Possible
4241126	BH 4	0.15 - 0.60	SOLID	42.7	No Identification Possible
4248402	TP 2	2.00 - 2.00	SOLID	511	PAHS/Humic Acids
4248428	TP 3	1.10 - 1.10	SOLID	238	PAHS/Humic Acids

Extractable Petroleum Hydrocarbons (formally Diesel Range Organics) :- Any compound extractable in n-hexane within the carbon range C10-C40, includes Aliphatic (Min Oil), Aromatic (PAHs) and naturally occurring compounds.

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Asbestos Identification

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	TP 1 NS Z 1.10 - 1.10 SOLID 25/08/2011 00:00:00 110831-47 4,200,339 TM048	07/09/11	Tomasz Pawlikowski	Loose fibres in soil.	Not Detected (#)	Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	TP 2 NS Z 2.00 - 2.00 SOLID 26/08/2011 00:00:00 110831-47 4,200,346 TM048	07/09/11	Tomasz Pawlikowski	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	TP 2 NS Z 2.00 - 2.80 SOLID 26/08/2011 00:00:00 110831-47 4,200,347 TM048	07/09/11	Tomasz Pawlikowski	A largie piece of tile typical of asbestos cement.	Not Detected (#)	Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	TP 3 NS Z 1.10 - 1.10 SOLID 25/08/2011 00:00:00 110831-47 4,200,304 TM048	07/09/11	Tomasz Pawlikowski	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

CEN 10:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Woodcroft Farm, Waterlooville
Mass Sample taken (kg)	0.117	**Moisture Content Ratio (%)**	30.0
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	76.9
Particle Size <4mm	>95%		

Case				
SDG	110831-47			
Lab Sample Number(s)	4200305			
Sampled Date	25-Aug-2011			
Customer Sample Ref.	TP 3			
Depth (m)	2.00 - 2.00			

Solid Waste Analysis	**Result**			
Total Organic Carbon (%)	1.27	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	<10.0	-	-	-
pH (pH Units)	7.63	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**C_2 Conc^n in 10:1 eluate (mg/l)**		**A_2 10:1 conc^n leached (mg/kg)**		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Arsenic	0.00307	<0.00012	0.0307	<0.0012	-	-	-
Barium	-	-	-	-	-	-	-
Cadmium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Chromium	0.00331	<0.00022	0.0331	<0.0022	-	-	-
Copper	0.00211	<0.00085	0.0211	<0.0085	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	0.00283	<0.00015	0.0283	<0.0015	-	-	-
Lead	0.00069	<0.00002	0.0069	<0.0002	-	-	-
Antimony	-	-	-	-	-	-	-
Selenium	0.00115	<0.00039	0.0115	<0.0039	-	-	-
Zinc	0.00242	<0.00041	0.0242	<0.0041	-	-	-
Chloride	-	-	-	-	-	-	-
Fluoride	-	-	-	-	-	-	-
Sulphate (soluble)	90.3	<2	903	<20	-	-	-
Total Dissolved Solids	-	-	-	-	-	-	-
Total Monohydric Phenols (W)	-	-	-	-	-	-	-
Dissolved Organic Carbon	-	-	-	-	-	-	-

Leach Test Information

Date Prepared	05-Sep-2011
pH (pH Units)	7.90
Conductivity (µS/cm)	360.00
Temperature (°C)	20.00
Volume Leachant (Litres)	0.873
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

CEN 10:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Woodcroft Farm, Waterlooville
Mass Sample taken (kg)	0.117	**Moisture Content Ratio (%)**	30.0
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	76.9
Particle Size <4mm	>95%		

Case	
SDG	110831-47
Lab Sample Number(s)	4200305
Sampled Date	25-Aug-2011
Customer Sample Ref.	TP 3
Depth (m)	2.00 - 2.00

Solid Waste Analysis	**Result**			
Total Organic Carbon (%)	1.27	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	<10.0	-	-	-
pH (pH Units)	7.63	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**C_2 Conc^n in 10:1 eluate (mg/l)**		**A_2 10:1 conc^n leached (mg/kg)**		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
pH	8	<0.001	80	<0.01	-	-	-
Beryllium	<0.00007	<0.00007	<0.0007	<0.0007	-	-	-
Vanadium	0.00193	<0.00024	0.0193	<0.0024	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Acenaphthene by GCMS	<0.000015	<0.000015	<0.00015	<0.00015	-	-	-
Acenaphthylene by GCMS	<0.000011	<0.000011	<0.00011	<0.00011	-	-	-
Fluoranthene by GCMS	0.0000318	<0.000017	0.000318	<0.00017	-	-	-
Anthracene by GCMS	0.0000199	<0.000015	0.000199	<0.00015	-	-	-
Phenanthrene by GCMS	<0.000022	<0.000022	<0.00022	<0.00022	-	-	-
Fluorene by GCMS	<0.000014	<0.000014	<0.00014	<0.00014	-	-	-
Chrysene by GCMS	<0.000013	<0.000013	<0.00013	<0.00013	-	-	-
Pyrene by GCMS	0.0000428	<0.000015	0.000428	<0.00015	-	-	-
Benz(a)anthracene by GCMS	<0.000017	<0.000017	<0.00017	<0.00017	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000023	<0.000023	<0.00023	<0.00023	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000027	<0.000027	<0.00027	<0.00027	-	-	-
Benzo(a)pyrene by GCMS	<0.000009	<0.000009	<0.00009	<0.00009	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000016	<0.000016	<0.00016	<0.00016	-	-	-
Benzo(ghi)perylene by GCMS	<0.000016	<0.000016	<0.00016	<0.00016	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000014	<0.000014	<0.00014	<0.00014	-	-	-
PAH 16 EPA Total by GCMS	<0.000247	<0.000247	<0.00247	<0.00247	-	-	-

Leach Test Information

Date Prepared	05-Sep-2011
pH (pH Units)	7.90
Conductivity (µS/cm)	360.00
Temperature (°C)	20.00
Volume Leachant (Litres)	0.873
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

CEN 10:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Woodcroft Farm, Waterlooville
Mass Sample taken (kg)		**Moisture Content Ratio (%)**	
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	
Particle Size <4mm	>95%		

Case				
SDG	110831-47			
Lab Sample Number(s)	4200339			
Sampled Date	25-Aug-2011			
Customer Sample Ref.	TP 1			
Depth (m)	1.10 - 1.10			

Solid Waste Analysis	**Result**			
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	<24.0	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Arsenic	-	-	-	-	-	-	-
Barium	-	-	-	-	-	-	-
Cadmium	-	-	-	-	-	-	-
Chromium	-	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-
Mercury Dissolved (CVAF)	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-
Antimony	-	-	-	-	-	-	-
Selenium	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-
Chloride	-	-	-	-	-	-	-
Fluoride	-	-	-	-	-	-	-
Sulphate (soluble)	-	-	-	-	-	-	-
Total Dissolved Solids	-	-	-	-	-	-	-
Total Monohydric Phenols (W)	-	-	-	-	-	-	-
Dissolved Organic Carbon	-	-	-	-	-	-	-

Leach Test Information

Date Prepared	06-Sep-2011
pH (pH Units)	
Conductivity (µS/cm)	
Temperature (°C)	
Volume Leachant (Litres)	
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

CEN 10:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Woodcroft Farm, Waterlooville
Mass Sample taken (kg)	0.115	**Moisture Content Ratio (%)**	27.8
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	78.2
Particle Size <4mm	>95%		

Case	
SDG	110831-47
Lab Sample Number(s)	4200346
Sampled Date	26-Aug-2011
Customer Sample Ref.	TP 2
Depth (m)	2.00 - 2.00

Solid Waste Analysis	**Result**			
Total Organic Carbon (%)	3.46	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	7.73	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**C_2 Conc^n in 10:1 eluate (mg/l)**		**A_2 10:1 conc^n leached (mg/kg)**		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Arsenic	0.000595	<0.00012	0.00595	<0.0012	-	-	-
Barium	-	-	-	-	-	-	-
Cadmium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Chromium	0.00228	<0.00022	0.0228	<0.0022	-	-	-
Copper	0.00166	<0.00085	0.0166	<0.0085	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	0.000631	<0.00015	0.00631	<0.0015	-	-	-
Lead	0.000134	<0.00002	0.00134	<0.0002	-	-	-
Antimony	-	-	-	-	-	-	-
Selenium	0.00108	<0.00039	0.0108	<0.0039	-	-	-
Zinc	0.000595	<0.00041	0.00595	<0.0041	-	-	-
Chloride	-	-	-	-	-	-	-
Fluoride	-	-	-	-	-	-	-
Sulphate (soluble)	3.6	<2	36	<20	-	-	-
Total Dissolved Solids	-	-	-	-	-	-	-
Total Monohydric Phenols (W)	-	-	-	-	-	-	-
Dissolved Organic Carbon	-	-	-	-	-	-	-

Leach Test Information

Date Prepared	06-Sep-2011
pH (pH Units)	8.21
Conductivity (µS/cm)	124.00
Temperature (°C)	19.90
Volume Leachant (Litres)	0.875
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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19/09/2011 14:33:25

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

CEN 10:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Woodcroft Farm, Waterlooville
Mass Sample taken (kg)	0.115	**Moisture Content Ratio (%)**	27.8
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	78.2
Particle Size <4mm	>95%		

Case				
SDG	110831-47			
Lab Sample Number(s)	4200346			
Sampled Date	26-Aug-2011			
Customer Sample Ref.	TP 2			
Depth (m)	2.00 - 2.00			

Solid Waste Analysis	**Result**			
Total Organic Carbon (%)	3.46	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	7.73	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
pH	8	<0.001	80	<0.01	-	-	-
Beryllium	<0.00007	<0.00007	<0.0007	<0.0007	-	-	-
Vanadium	0.00114	<0.00024	0.0114	<0.0024	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.000156	<0.0001	0.00156	<0.001	-	-	-
Acenaphthene by GCMS	0.0000187	<0.000015	0.000187	<0.00015	-	-	-
Acenaphthylene by GCMS	<0.000011	<0.000011	<0.00011	<0.00011	-	-	-
Fluoranthene by GCMS	<0.000017	<0.000017	<0.00017	<0.00017	-	-	-
Anthracene by GCMS	<0.000015	<0.000015	<0.00015	<0.00015	-	-	-
Phenanthrene by GCMS	0.0000248	<0.000022	0.000248	<0.00022	-	-	-
Fluorene by GCMS	<0.000014	<0.000014	<0.00014	<0.00014	-	-	-
Chrysene by GCMS	<0.000013	<0.000013	<0.00013	<0.00013	-	-	-
Pyrene by GCMS	<0.000015	<0.000015	<0.00015	<0.00015	-	-	-
Benz(a)anthracene by GCMS	<0.000017	<0.000017	<0.00017	<0.00017	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000023	<0.000023	<0.00023	<0.00023	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000027	<0.000027	<0.00027	<0.00027	-	-	-
Benzo(a)pyrene by GCMS	<0.000009	<0.000009	<0.00009	<0.00009	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000016	<0.000016	<0.00016	<0.00016	-	-	-
Benzo(ghi)perylene by GCMS	<0.000016	<0.000016	<0.00016	<0.00016	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000014	<0.000014	<0.00014	<0.00014	-	-	-
PAH 16 EPA Total by GCMS	<0.000247	<0.000247	<0.00247	<0.00247	-	-	-

Leach Test Information

Date Prepared	06-Sep-2011
pH (pH Units)	8.21
Conductivity (µS/cm)	124.00
Temperature (°C)	19.90
Volume Leachant (Litres)	0.875
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates

19/09/2011 14:33:25

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Notification of Deviating Samples

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
4234529	WS 1	2.50 - 3.00	SOLID	EPH by FID	EPH Range >C10 - C40	Sample holding time exceeded
4234529	WS 1	2.50 - 3.00	SOLID	EPH by FID	EPH Surrogate % recovery**	Sample holding time exceeded
4234529	WS 1	2.50 - 3.00	SOLID	EPH by FID	Interpretation	Sample holding time exceeded
4234627	TP 4	1.00 - 1.00	SOLID	EPH by FID	EPH Range >C10 - C40	Sample holding time exceeded
4234627	TP 4	1.00 - 1.00	SOLID	EPH by FID	EPH Surrogate % recovery**	Sample holding time exceeded
4234627	TP 4	1.00 - 1.00	SOLID	EPH by FID	Interpretation	Sample holding time exceeded
4234722	WS 2	1.50 - 2.00	SOLID	EPH by FID	EPH Range >C10 - C40	Sample holding time exceeded
4234722	WS 2	1.50 - 2.00	SOLID	EPH by FID	EPH Surrogate % recovery**	Sample holding time exceeded
4234722	WS 2	1.50 - 2.00	SOLID	EPH by FID	Interpretation	Sample holding time exceeded
4235469	TP 18	0.50 - 0.50	SOLID	EPH by FID	EPH Range >C10 - C40	Sample holding time exceeded
4235469	TP 18	0.50 - 0.50	SOLID	EPH by FID	EPH Surrogate % recovery**	Sample holding time exceeded
4235469	TP 18	0.50 - 0.50	SOLID	EPH by FID	Interpretation	Sample holding time exceeded
4235584	TP 4	0.50 - 0.50	SOLID	EPH by FID	EPH Range >C10 - C40	Sample holding time exceeded
4235584	TP 4	0.50 - 0.50	SOLID	EPH by FID	EPH Surrogate % recovery**	Sample holding time exceeded
4235584	TP 4	0.50 - 0.50	SOLID	EPH by FID	Interpretation	Sample holding time exceeded
4235621	TP 1	2.20 - 2.20	SOLID	EPH by FID	EPH Range >C10 - C40	Sample holding time exceeded
4235621	TP 1	2.20 - 2.20	SOLID	EPH by FID	EPH Surrogate % recovery**	Sample holding time exceeded
4235621	TP 1	2.20 - 2.20	SOLID	EPH by FID	Interpretation	Sample holding time exceeded
4235653	TP 2	1.00 - 1.00	SOLID	EPH by FID	EPH Range >C10 - C40	Sample holding time exceeded
4235653	TP 2	1.00 - 1.00	SOLID	EPH by FID	EPH Surrogate % recovery**	Sample holding time exceeded
4235653	TP 2	1.00 - 1.00	SOLID	EPH by FID	Interpretation	Sample holding time exceeded
4236908	WS 3	0.70 - 1.00	SOLID	EPH by FID	EPH Range >C10 - C40	Sample holding time exceeded
4236908	WS 3	0.70 - 1.00	SOLID	EPH by FID	EPH Surrogate % recovery**	Sample holding time exceeded
4236908	WS 3	0.70 - 1.00	SOLID	EPH by FID	Interpretation	Sample holding time exceeded
4236936	WS 6	0.80 - 1.00	SOLID	EPH by FID	EPH Range >C10 - C40	Sample holding time exceeded
4236936	WS 6	0.80 - 1.00	SOLID	EPH by FID	EPH Surrogate % recovery**	Sample holding time exceeded
4236936	WS 6	0.80 - 1.00	SOLID	EPH by FID	Interpretation	Sample holding time exceeded
4236950	TP 3	2.00 - 2.00	SOLID	EPH by FID	EPH Range >C10 - C40	Sample holding time exceeded
4236950	TP 3	2.00 - 2.00	SOLID	EPH by FID	EPH Surrogate % recovery**	Sample holding time exceeded
4236950	TP 3	2.00 - 2.00	SOLID	EPH by FID	Interpretation	Sample holding time exceeded
4237355	WS 4	0.70 - 1.00	SOLID	EPH by FID	EPH Range >C10 - C40	Sample holding time exceeded
4237355	WS 4	0.70 - 1.00	SOLID	EPH by FID	EPH Surrogate % recovery**	Sample holding time exceeded
4237355	WS 4	0.70 - 1.00	SOLID	EPH by FID	Interpretation	Sample holding time exceeded
4237369	WS 1	0.50 - 1.00	SOLID	EPH by FID	EPH Range >C10 - C40	Sample holding time exceeded
4237369	WS 1	0.50 - 1.00	SOLID	EPH by FID	EPH Surrogate % recovery**	Sample holding time exceeded
4237369	WS 1	0.50 - 1.00	SOLID	EPH by FID	Interpretation	Sample holding time exceeded
4241036	TP 1	0.50 - 0.50	SOLID	EPH by FID	EPH Range >C10 - C40	Sample holding time exceeded
4241036	TP 1	0.50 - 0.50	SOLID	EPH by FID	EPH Surrogate % recovery**	Sample holding time exceeded
4241036	TP 1	0.50 - 0.50	SOLID	EPH by FID	Interpretation	Sample holding time exceeded
4241056	TP 2	3.00 - 3.00	SOLID	EPH by FID	EPH Range >C10 - C40	Sample holding time exceeded
4241056	TP 2	3.00 - 3.00	SOLID	EPH by FID	EPH Surrogate % recovery**	Sample holding time exceeded
4241056	TP 2	3.00 - 3.00	SOLID	EPH by FID	Interpretation	Sample holding time exceeded
4241083	BH 1	0.30 - 0.80	SOLID	EPH by FID	EPH Range >C10 - C40	Sample holding time exceeded
4241083	BH 1	0.30 - 0.80	SOLID	EPH by FID	EPH Surrogate % recovery**	Sample holding time exceeded
4241083	BH 1	0.30 - 0.80	SOLID	EPH by FID	Interpretation	Sample holding time exceeded
4241126	BH 4	0.15 - 0.60	SOLID	EPH by FID	EPH Range >C10 - C40	Sample holding time exceeded
4241126	BH 4	0.15 - 0.60	SOLID	EPH by FID	EPH Surrogate % recovery**	Sample holding time exceeded
4241126	BH 4	0.15 - 0.60	SOLID	EPH by FID	Interpretation	Sample holding time exceeded
4248402	TP 2	2.00 - 2.00	SOLID	EPH by FID	EPH Range >C10 - C40	Sample holding time exceeded
4248402	TP 2	2.00 - 2.00	SOLID	EPH by FID	EPH Surrogate % recovery**	Sample holding time exceeded
4248402	TP 2	2.00 - 2.00	SOLID	EPH by FID	Interpretation	Sample holding time exceeded
4248428	TP 3	1.10 - 1.10	SOLID	EPH by FID	EPH Range >C10 - C40	Sample holding time exceeded
4248428	TP 3	1.10 - 1.10	SOLID	EPH by FID	EPH Surrogate % recovery**	Sample holding time exceeded
4248428	TP 3	1.10 - 1.10	SOLID	EPH by FID	Interpretation	Sample holding time exceeded
4249726	TP 2	2.00 - 2.00	SOLID	pH	pH	Sample holding time exceeded
4200399	TP 1	1.10 - 1.10	SOLID	GRO by GC-FID (S)	Aliphatics >C10-C12	Volatile container not received
4200399	TP 1	1.10 - 1.10	SOLID	GRO by GC-FID (S)	Aliphatics >C5-C6	Volatile container not received
4200399	TP 1	1.10 - 1.10	SOLID	GRO by GC-FID (S)	Aliphatics >C6-C8	Volatile container not received
4200399	TP 1	1.10 - 1.10	SOLID	GRO by GC-FID (S)	Aliphatics >C8-C10	Volatile container not received

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
4200399	TP 1	1.10 - 1.10	SOLID	GRO by GC-FID (S)	Aromatics >EC10-EC12	Volatile container not received
4200399	TP 1	1.10 - 1.10	SOLID	GRO by GC-FID (S)	Aromatics >EC5-EC7	Volatile container not received
4200399	TP 1	1.10 - 1.10	SOLID	GRO by GC-FID (S)	Aromatics >EC7-EC8	Volatile container not received
4200399	TP 1	1.10 - 1.10	SOLID	GRO by GC-FID (S)	Aromatics >EC8-EC10	Volatile container not received
4200399	TP 1	1.10 - 1.10	SOLID	GRO by GC-FID (S)	Benzene	Volatile container not received
4200399	TP 1	1.10 - 1.10	SOLID	GRO by GC-FID (S)	Ethylbenzene	Volatile container not received
4200399	TP 1	1.10 - 1.10	SOLID	GRO by GC-FID (S)	GRO >C5-C12	Volatile container not received
4200399	TP 1	1.10 - 1.10	SOLID	GRO by GC-FID (S)	GRO Surrogate % recovery**	Volatile container not received
4200399	TP 1	1.10 - 1.10	SOLID	GRO by GC-FID (S)	m,p-Xylene	Volatile container not received
4200399	TP 1	1.10 - 1.10	SOLID	GRO by GC-FID (S)	Methyl tertiary butyl ether (MTBE)	Volatile container not received
4200399	TP 1	1.10 - 1.10	SOLID	GRO by GC-FID (S)	o-Xylene	Volatile container not received
4200399	TP 1	1.10 - 1.10	SOLID	GRO by GC-FID (S)	sum of detected BTEX by GC	Volatile container not received
4200399	TP 1	1.10 - 1.10	SOLID	GRO by GC-FID (S)	sum of detected mpo xylene by GC	Volatile container not received
4200399	TP 1	1.10 - 1.10	SOLID	GRO by GC-FID (S)	Toluene	Volatile container not received

Note : Test results may be compromised

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Table of Results - Appendix

REPORT KEY

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10-7

NDP	No Determination Possible	**#**	ISO 17025 Accredited	*	Subcontracted Test	**M**	MCERTS Accredited
NFD	No Fibres Detected	**PFD**	Possible Fibres Detected	»	Result previously reported (Incremental reports only)	**EC**	Equivalent Carbon (Aromatics C8-C35)

Note: Method detection limits are not always achievable due to various circumstances beyond our control

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
PM001		Preparation of Samples for Metals Analysis		
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
PM114		Leaching Procedure for CEN Two Stage BatchTest 2:1/8:1 Cumulative		
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step		
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material		
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM073	MEWAM BOOK 60 1980,95 1985, HMSO / Modified: US EPA Method 8081A & 8141A	Determination of organochlorine and organophosphorous pesticides by GCMS		
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)		
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS		
TM132	In - house Method	ELTRA CS800 Operators Guide		
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM157	HP 6890 Gas Chromatograph (GC) system and HP 5973 Mass Selective Detector (MSD).	Determination of SVOC in Soils by GC-MS extracted by sonication in DCM/Acetone		
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM213	In-house Method	Rapid Determination of PAHs by GC-FID		
TM218	Microwave extraction – EPA method 3546	Microwave extraction - EPA method 3546		
TM243		Mixed Anions In Soils By Kone		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Test Completion Dates

Lab Sample No(s)	4200333	4200335	4200337	4200339	4200341	4200344	4200346	4200347	4200348	4200304
Customer Sample Ref.	BH 1	BH 4	TP 1	TP 1	TP 1	TP 2	TP 2	TP 2	TP 2	TP 3
AGS Ref.										
Depth	0.30 - 0.80	0.15 - 0.60	0.50 - 0.50	1.10 - 1.10	2.20 - 2.20	1.00 - 1.00	2.00 - 2.00	2.00 - 2.80	3.00 - 3.00	1.10 - 1.10
Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Anions by Kone (soil)	07-Sep-2011						08-Sep-2011			
Anions by Kone (w)							08-Sep-2011			
Asbestos Identification (Soil)				07-Sep-2011			07-Sep-2011	07-Sep-2011		07-Sep-2011
CEN 10:1 Leachate (1 Stage)							06-Sep-2011			
CEN Readings							08-Sep-2011			
Dissolved Metals by ICP-MS							08-Sep-2011			
EPH by FID	08-Sep-2011	08-Sep-2011	08-Sep-2011		08-Sep-2011	08-Sep-2011	08-Sep-2011		08-Sep-2011	08-Sep-2011
GRO by GC-FID (S)				19-Sep-2011						
Mercury Dissolved							08-Sep-2011			
Metals by iCap-OES (Soil)	07-Sep-2011	07-Sep-2011	07-Sep-2011		08-Sep-2011	07-Sep-2011	09-Sep-2011		07-Sep-2011	08-Sep-2011
PAH by GCMS					09-Sep-2011		08-Sep-2011			08-Sep-2011
PAH Spec MS - Aqueous (W)							08-Sep-2011			
PAH Value of soil	07-Sep-2011	07-Sep-2011				07-Sep-2011				
pH	07-Sep-2011						08-Sep-2011			
pH Value							08-Sep-2011			
Sample description	05-Sep-2011	05-Sep-2011	05-Sep-2011	13-Sep-2011	05-Sep-2011	05-Sep-2011	08-Sep-2011		05-Sep-2011	08-Sep-2011
Total Organic Carbon	07-Sep-2011						08-Sep-2011			

Lab Sample No(s)	4200305	4200308	4200309	4200336	4200325	4200328	4200330	4200318	4200319	4200312
Customer Sample Ref.	TP 3	TP 4	TP 4	TP 18	WS 1	WS 1	WS 2	WS 3	WS 3	WS 4
AGS Ref.										
Depth	2.00 - 2.00	0.50 - 0.50	1.00 - 1.00	0.50 - 0.50	0.50 - 1.00	2.50 - 3.00	1.50 - 2.00	0.10 - 0.40	0.70 - 1.00	0.10 - 0.30
Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Anions by Kone (soil)	08-Sep-2011			07-Sep-2011	08-Sep-2011	07-Sep-2011	07-Sep-2011	08-Sep-2011		08-Sep-2011
Anions by Kone (w)	08-Sep-2011									
CEN 10:1 Leachate (1 Stage)	05-Sep-2011									
CEN Readings	08-Sep-2011									
Dissolved Metals by ICP-MS	08-Sep-2011									
EPH by FID	08-Sep-2011	08-Sep-2011	08-Sep-2011	08-Sep-2011	08-Sep-2011	08-Sep-2011	08-Sep-2011		08-Sep-2011	
EPH CWG (Aliphatic) GC (S)								08-Sep-2011		08-Sep-2011
EPH CWG (Aromatic) GC (S)								08-Sep-2011		08-Sep-2011
GRO by GC-FID (S)								09-Sep-2011		09-Sep-2011
Mercury Dissolved	08-Sep-2011									
Metals by iCap-OES (Soil)	08-Sep-2011	08-Sep-2011	08-Sep-2011	08-Sep-2011	07-Sep-2011	08-Sep-2011	08-Sep-2011	08-Sep-2011		07-Sep-2011
OC, OP Pesticides and Triazine Herb				09-Sep-2011						
PAH by GCMS								07-Sep-2011		07-Sep-2011
PAH Spec MS - Aqueous (W)	08-Sep-2011									
PAH Value of soil	07-Sep-2011	07-Sep-2011	07-Sep-2011	07-Sep-2011	07-Sep-2011	07-Sep-2011	07-Sep-2011		07-Sep-2011	
pH	07-Sep-2011			07-Sep-2011	07-Sep-2011	07-Sep-2011	07-Sep-2011	07-Sep-2011		07-Sep-2011
pH Value	08-Sep-2011									
Sample description	05-Sep-2011	05-Sep-2011	05-Sep-2011	05-Sep-2011	05-Sep-2011	05-Sep-2011	05-Sep-2011	05-Sep-2011	05-Sep-2011	05-Sep-2011
Semi Volatile Organic Compounds								07-Sep-2011		
Total Organic Carbon	07-Sep-2011			07-Sep-2011	07-Sep-2011	07-Sep-2011	07-Sep-2011	07-Sep-2011		07-Sep-2011
TPH CWG GC (S)								09-Sep-2011		09-Sep-2011
VOC MS (S)								12-Sep-2011		

Lab Sample No(s)	4200313	4200321	4200322	4200317
Customer Sample Ref.	WS 4	WS 6	WS 6	WS 11
AGS Ref.				
Depth	0.70 - 1.00	0.10 - 0.50	0.80 - 1.00	0.20 - 0.50
Type	SOLID	SOLID	SOLID	SOLID
Anions by Kone (soil)		08-Sep-2011		08-Sep-2011
EPH by FID	08-Sep-2011		08-Sep-2011	08-Sep-2011
EPH CWG (Aliphatic) GC (S)		07-Sep-2011		
EPH CWG (Aromatic) GC (S)		07-Sep-2011		
GRO by GC-FID (S)		09-Sep-2011		
Metals by iCap-OES (Soil)		07-Sep-2011		08-Sep-2011
PAH by GCMS		08-Sep-2011		
PAH Value of soil	07-Sep-2011		07-Sep-2011	07-Sep-2011
pH		07-Sep-2011		07-Sep-2011
Sample description	05-Sep-2011	05-Sep-2011	05-Sep-2011	05-Sep-2011
Semi Volatile Organic Compounds		08-Sep-2011		
Total Organic Carbon		07-Sep-2011		07-Sep-2011
TPH CWG GC (S)		09-Sep-2011		
VOC MS (S)		08-Sep-2011		

CERTIFICATE OF ANALYSIS

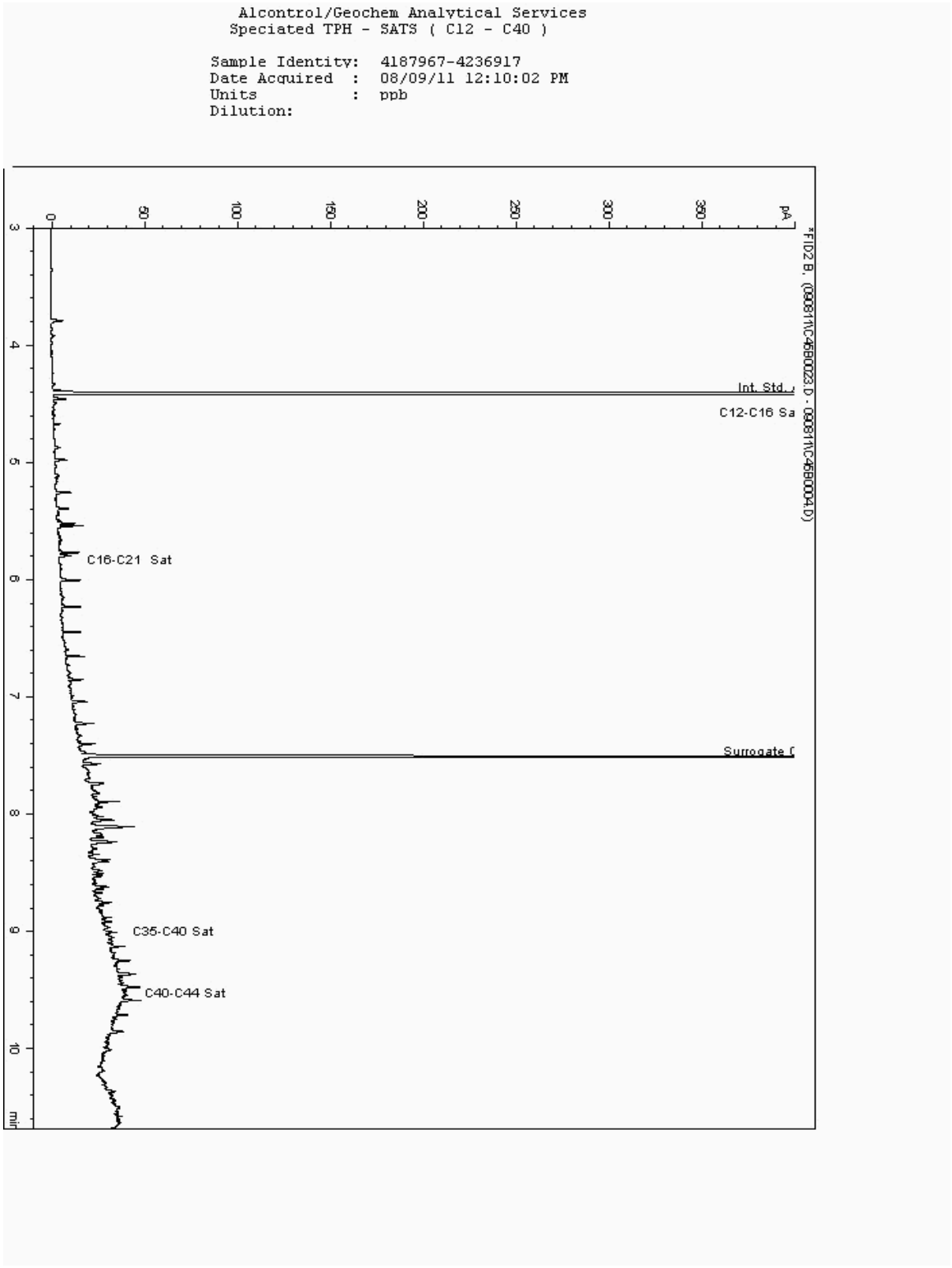
SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: EPH CWG (Aliphatic) GC (S)

Sample No : 4236917
Sample ID : WS 3

Depth : 0.10 - 0.40



CERTIFICATE OF ANALYSIS

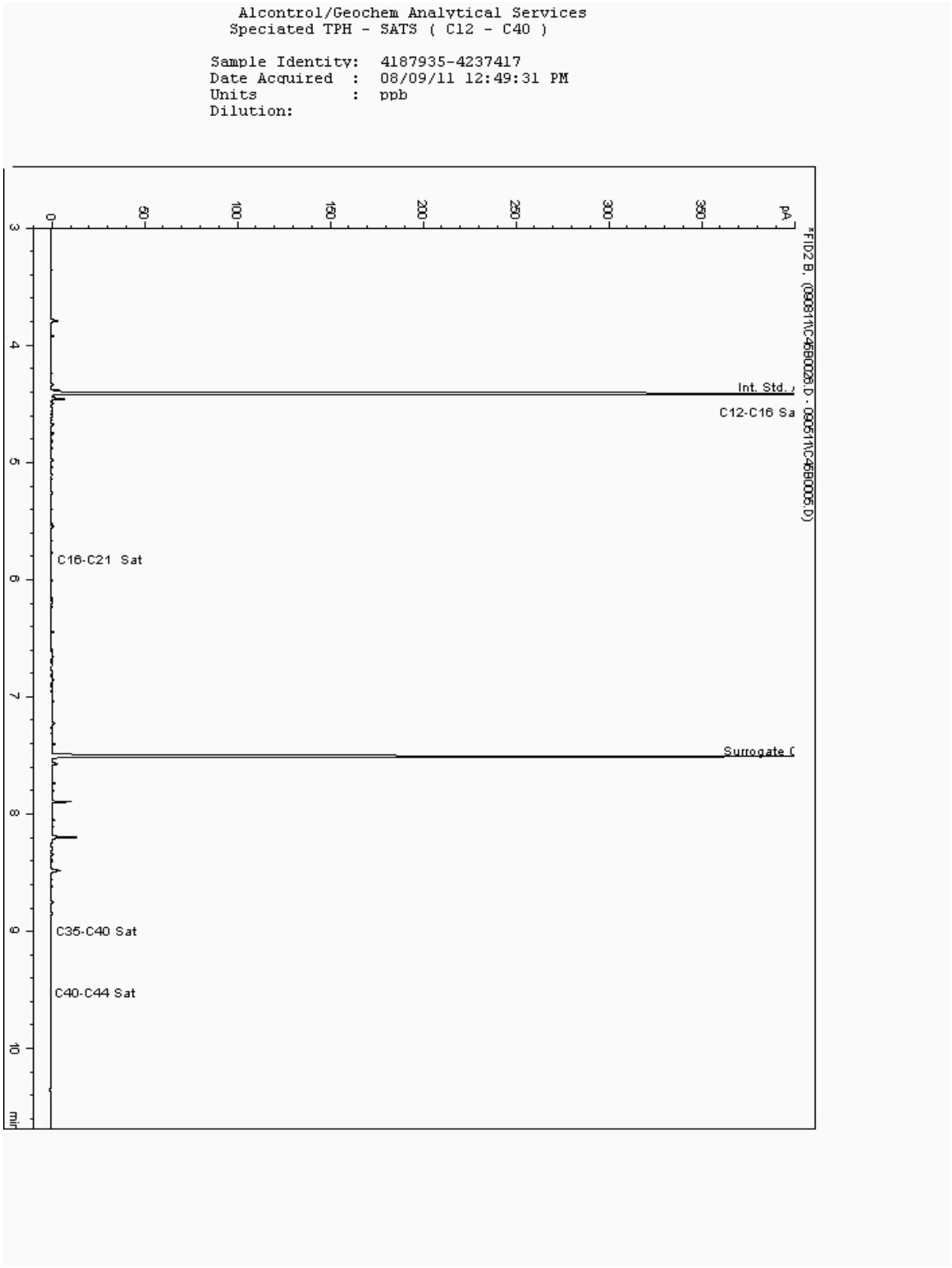
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Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: EPH CWG (Aliphatic) GC (S)

Sample No : 4237417
Sample ID : WS 4

Depth : 0.10 - 0.30



CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

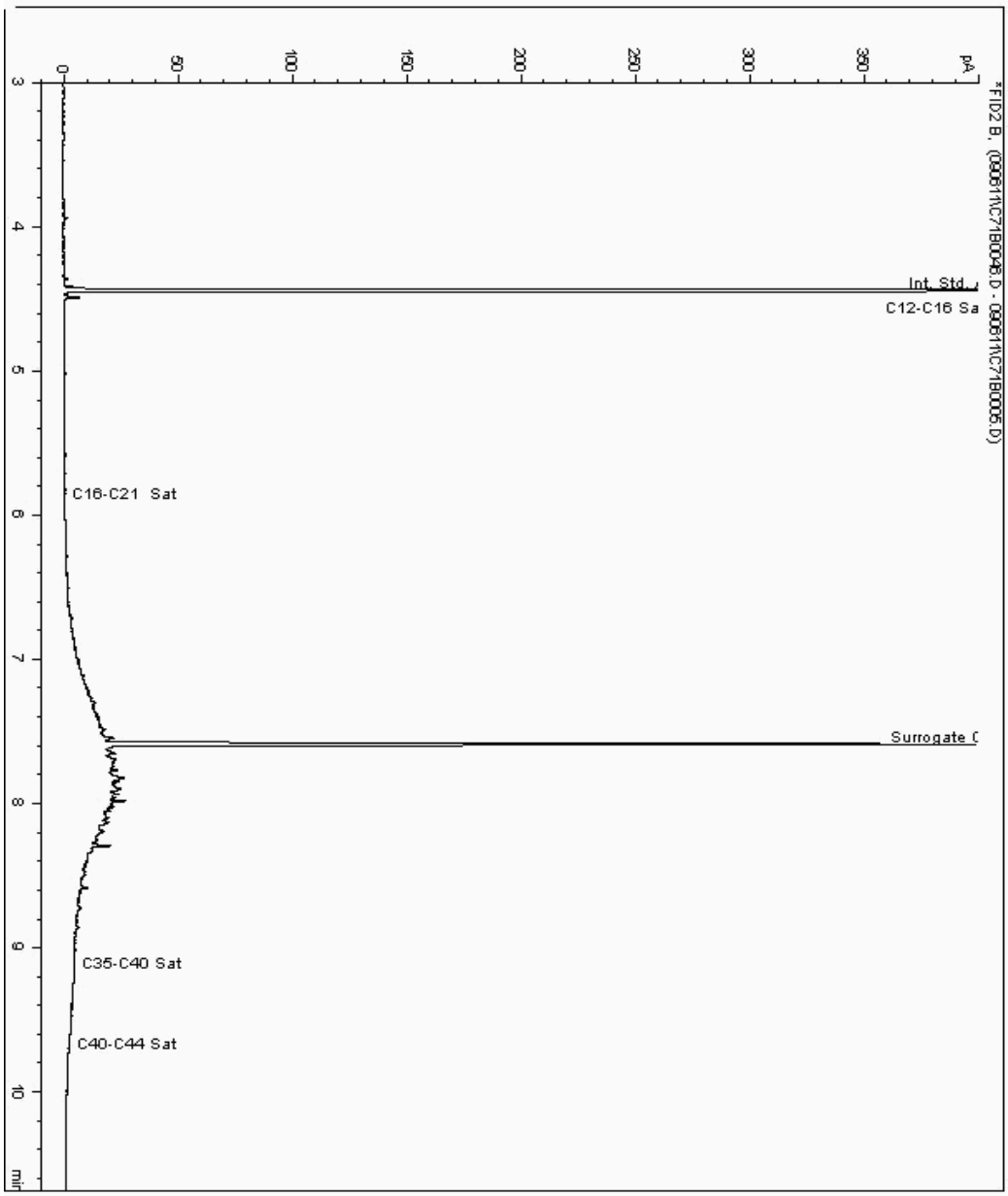
Analysis: EPH CWG (Aliphatic) GC (S)

Sample No : 4238224
Sample ID : WS 6

Depth : 0.10 - 0.50

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 4187997-4238224
Date Acquired : 07/09/2011 01:22:06 PM
Units : ppb
Dilution:



CERTIFICATE OF ANALYSIS

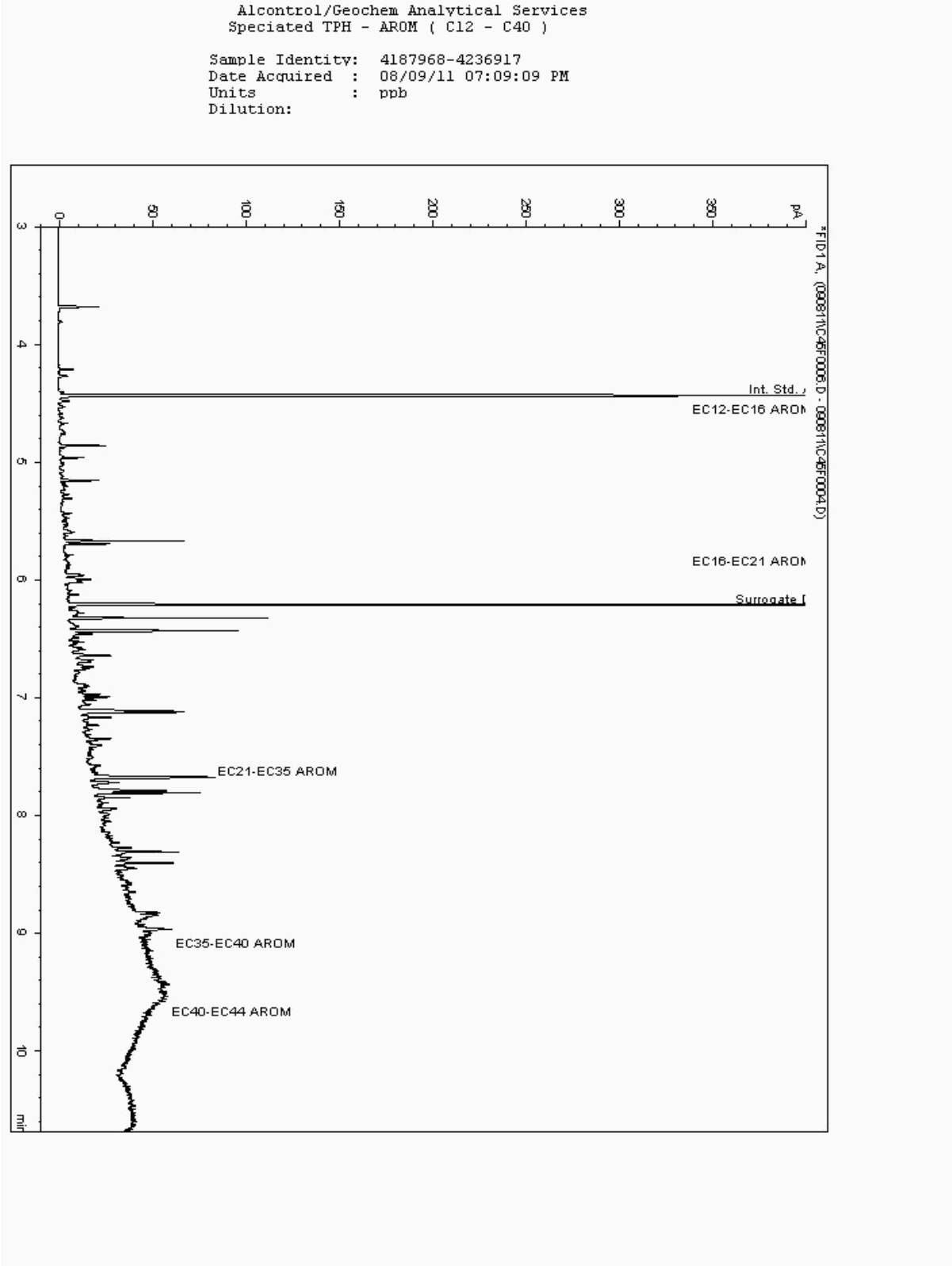
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Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: EPH CWG (Aromatic) GC (S)

Sample No : 4236917
Sample ID : WS 3

Depth : 0.10 - 0.40



CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

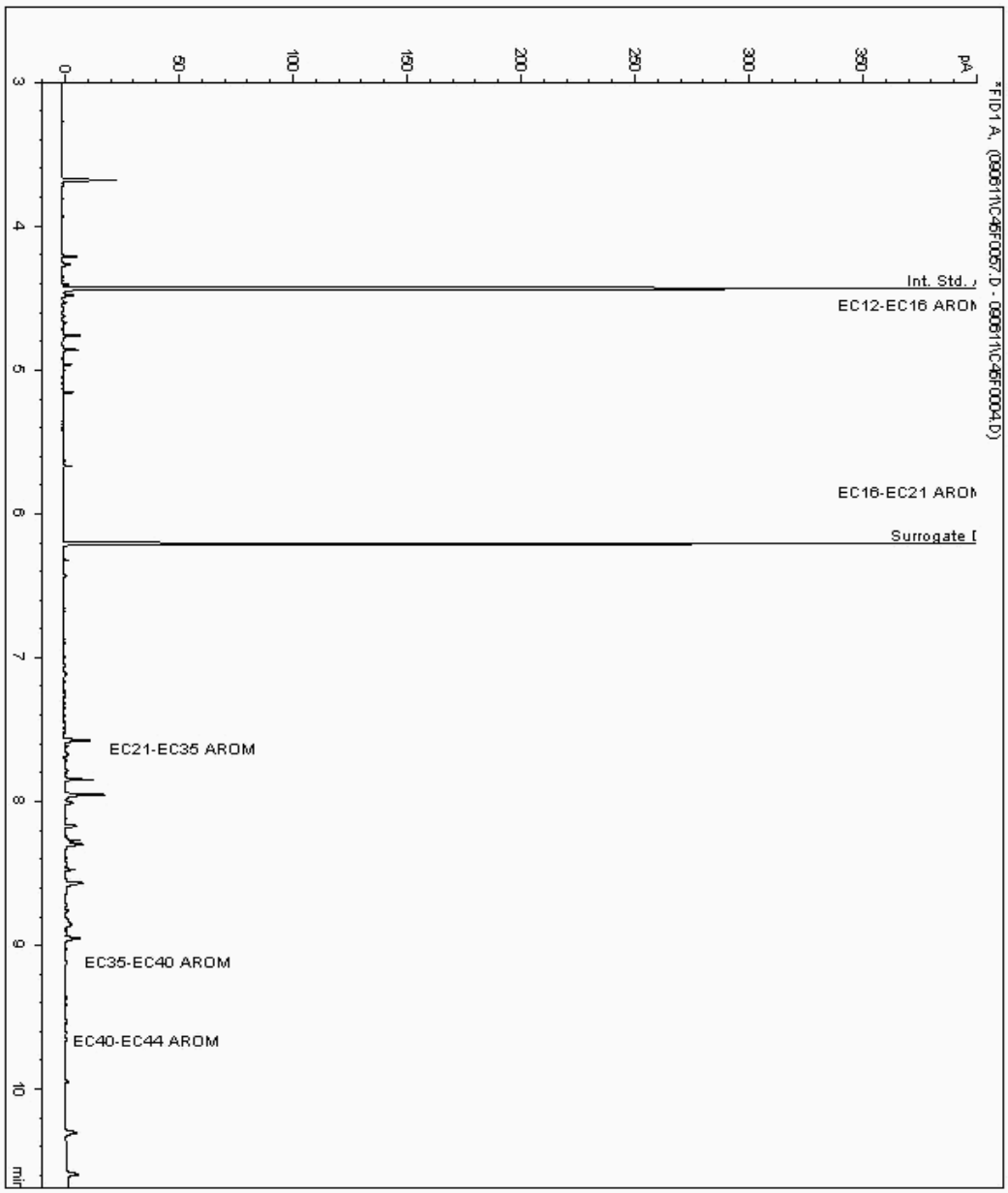
Analysis: EPH CWG (Aromatic) GC (S)

Sample No : 4237417
Sample ID : WS 4

Depth : 0.10 - 0.30

Alcontrol/Geochem Analytical Services
Speciated TPH - AROM (C12 - C40)

Sample Identity: 4187936-4237417
Date Acquired : 07/09/11 03:39:14 PM
Units : ppb
Dilution:



CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

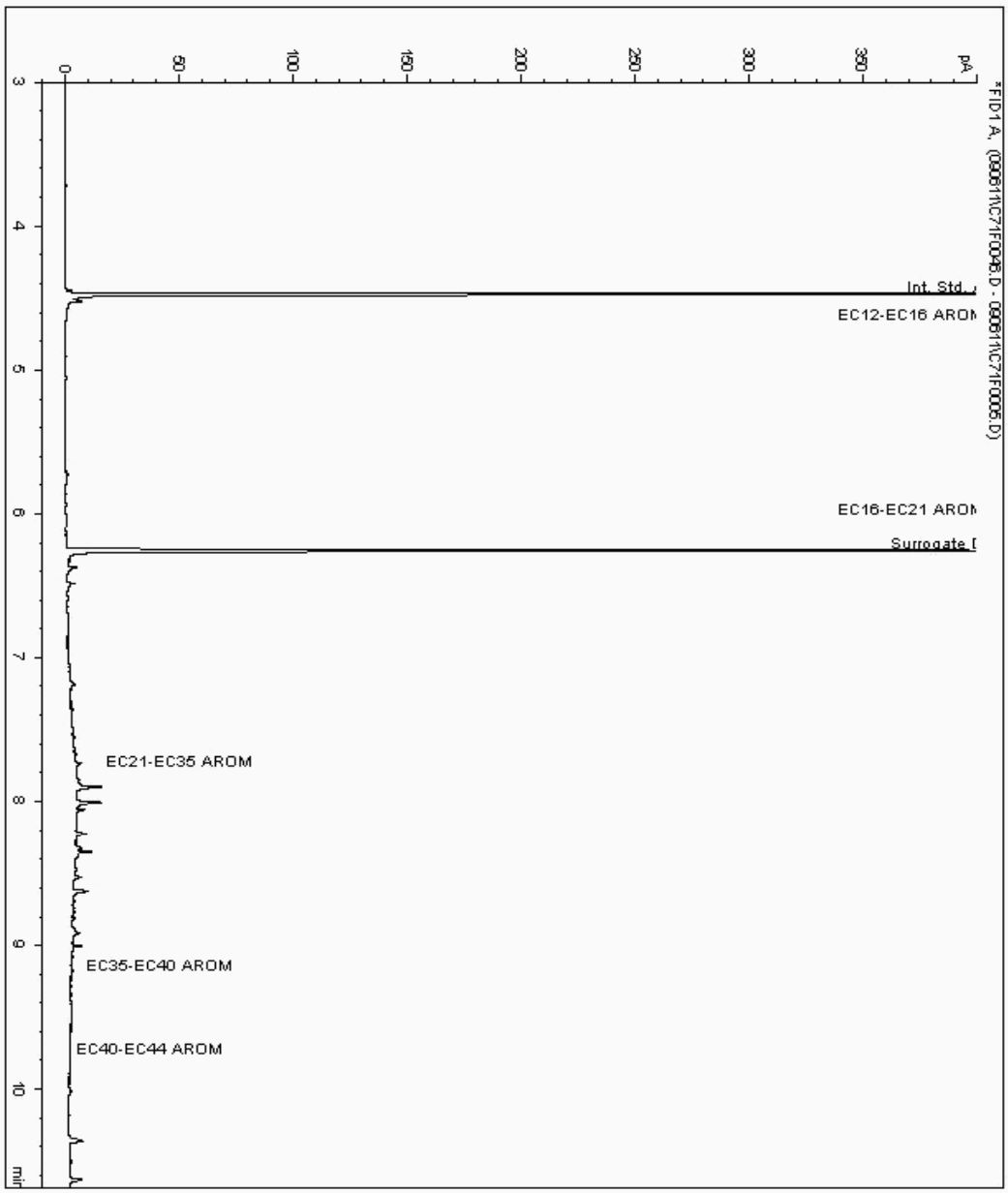
Analysis: EPH CWG (Aromatic) GC (S)

Sample No : 4238224
Sample ID : WS 6

Depth : 0.10 - 0.50

Alcontrol/Geochem Analytical Services
Speciated TPH - AROM (C12 - C40)

Sample Identity: 4187998-4238224
Date Acquired : 07/09/2011 01:22:06 PM
Units : ppb
Dilution:



CERTIFICATE OF ANALYSIS

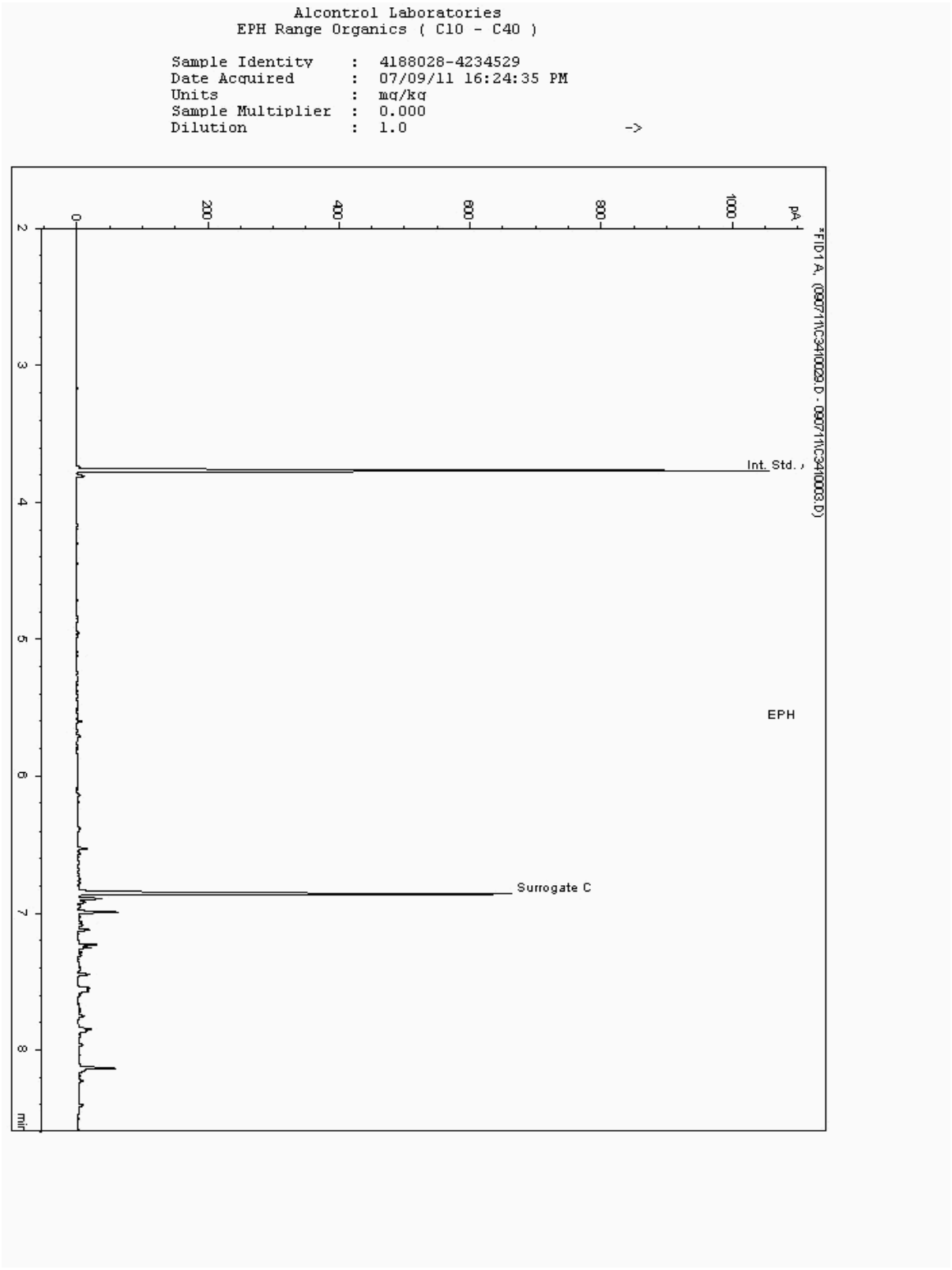
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Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: EPH by FID

Sample No : 4234529
Sample ID : WS 1

Depth : 2.50 - 3.00



CERTIFICATE OF ANALYSIS

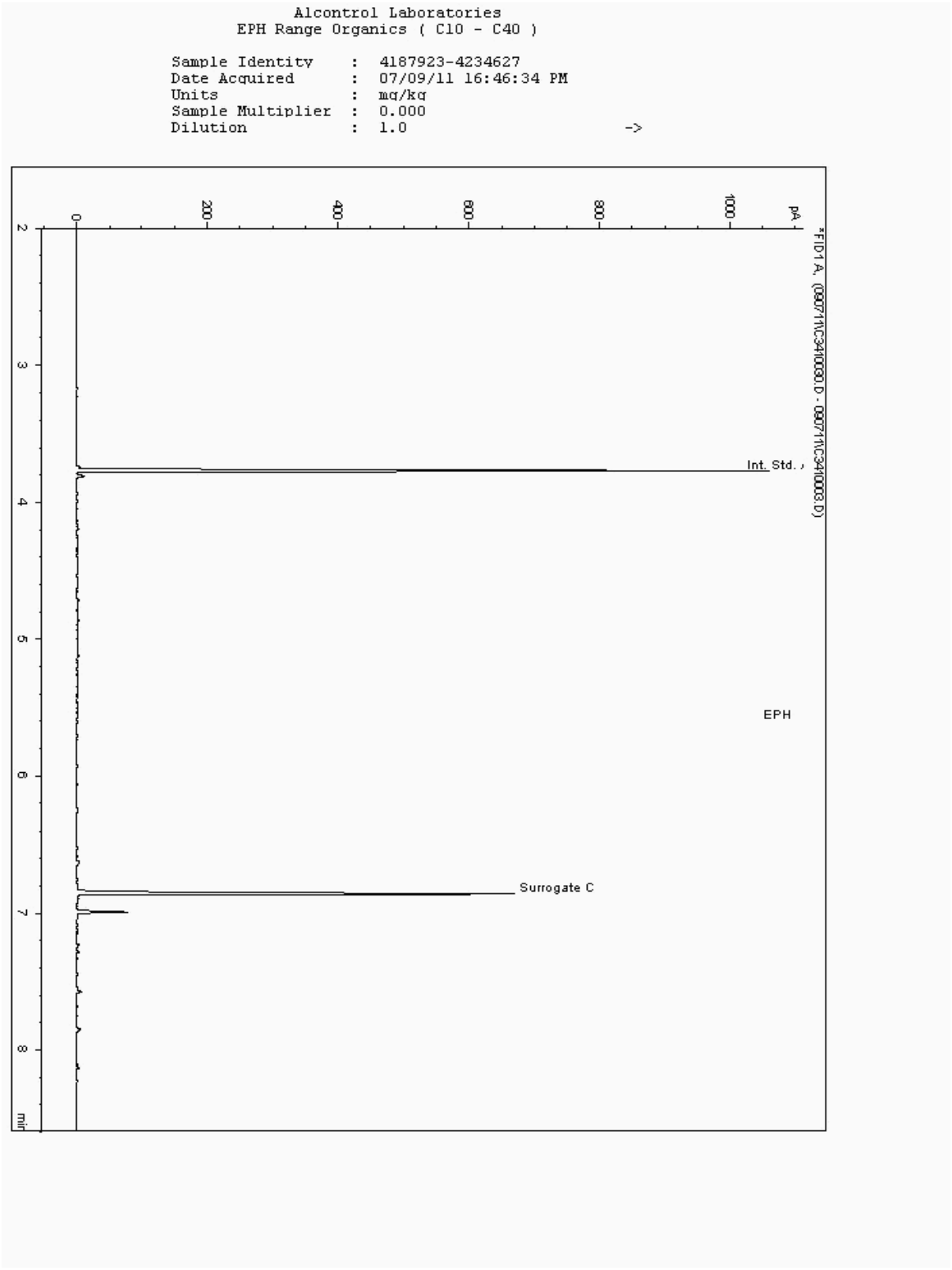
SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: EPH by FID

Sample No : 4234627
Sample ID : TP 4

Depth : 1.00 - 1.00



CERTIFICATE OF ANALYSIS

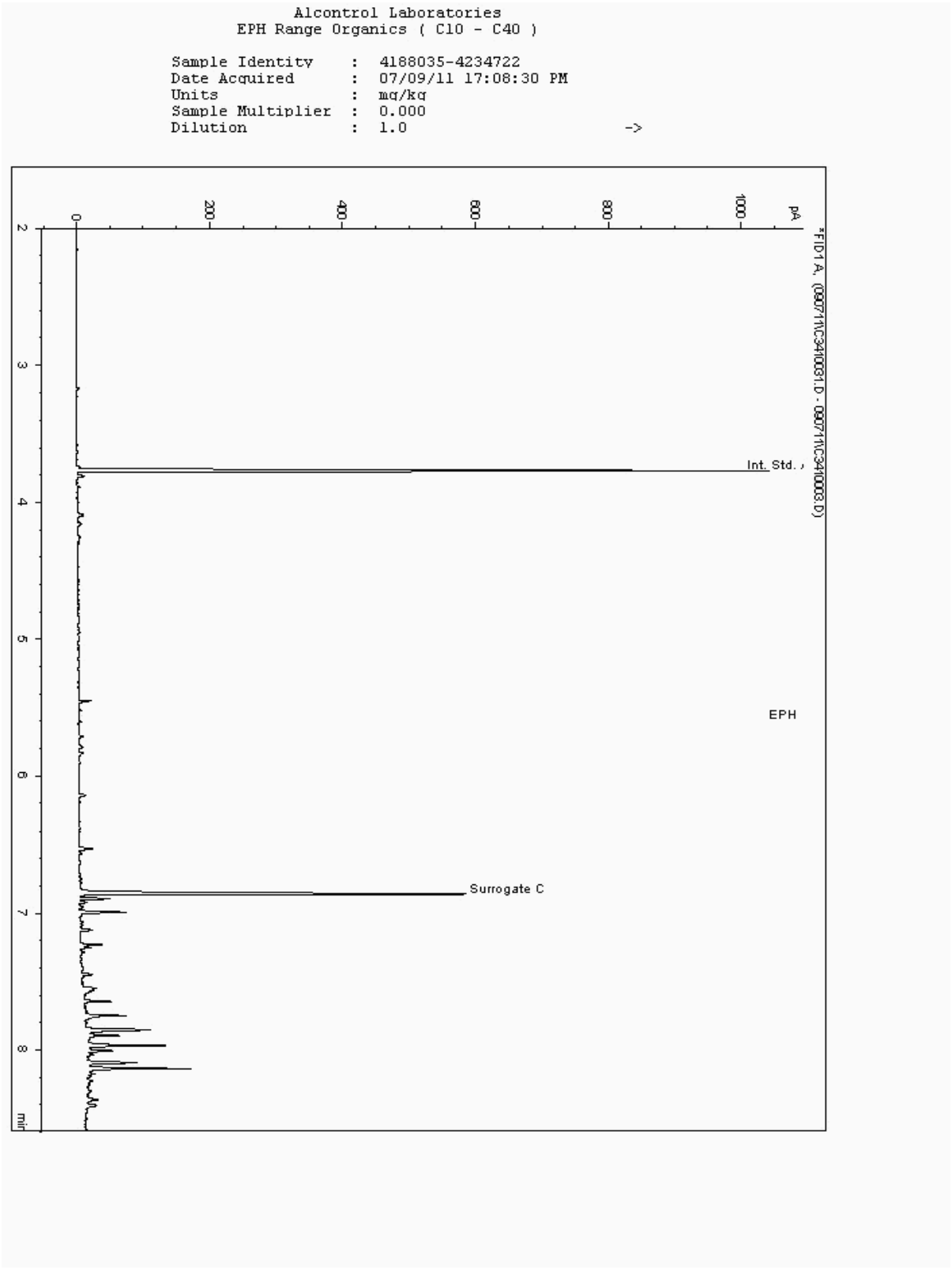
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Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: EPH by FID

Sample No : 4234722
Sample ID : WS 2

Depth : 1.50 - 2.00



CERTIFICATE OF ANALYSIS

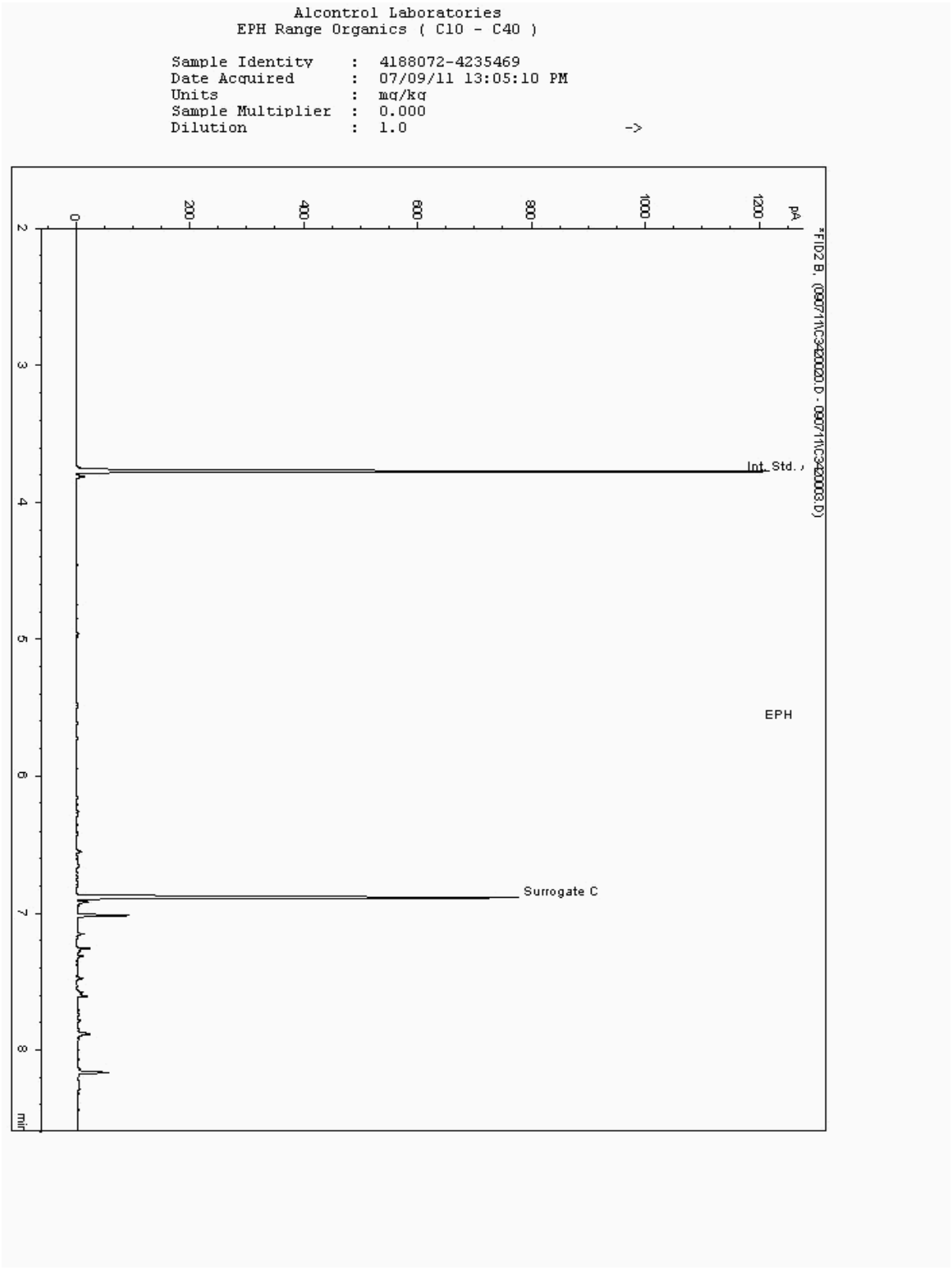
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Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: EPH by FID

Sample No : 4235469
Sample ID : TP 18

Depth : 0.50 - 0.50



CERTIFICATE OF ANALYSIS

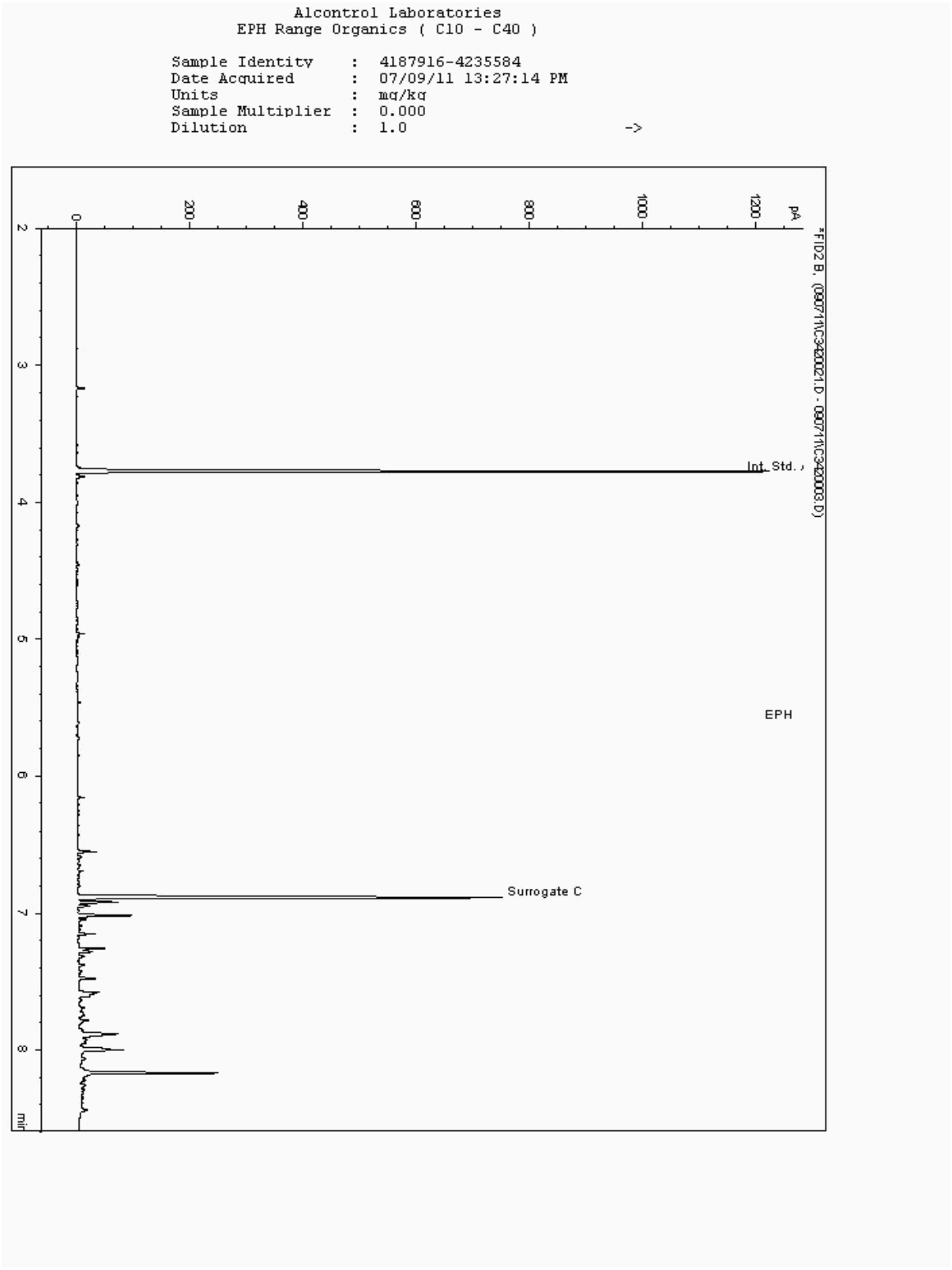
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Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: EPH by FID

Sample No : 4235584
Sample ID : TP 4

Depth : 0.50 - 0.50



CERTIFICATE OF ANALYSIS

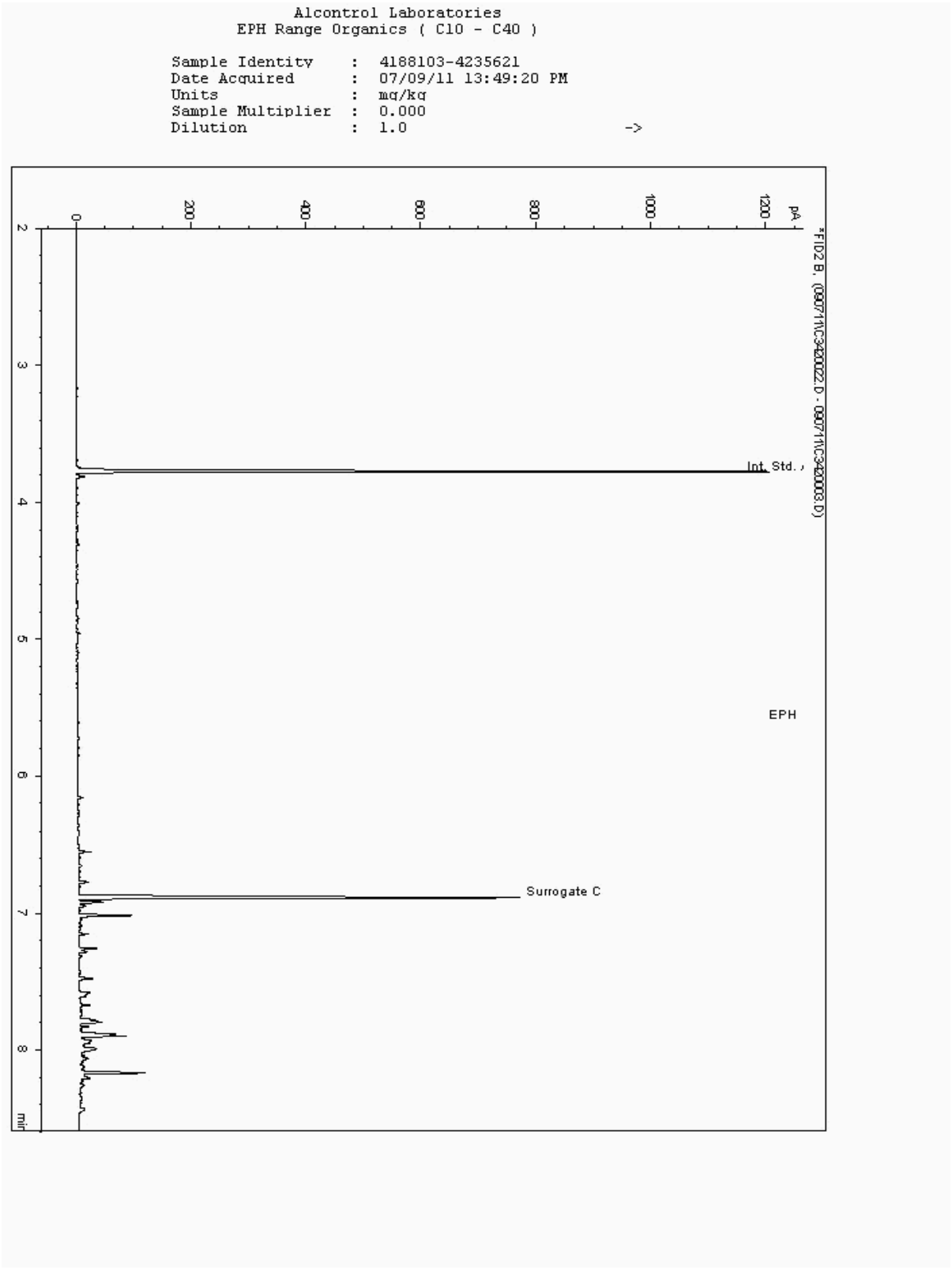
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Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: EPH by FID

Sample No : 4235621
Sample ID : TP 1

Depth : 2.20 - 2.20



CERTIFICATE OF ANALYSIS

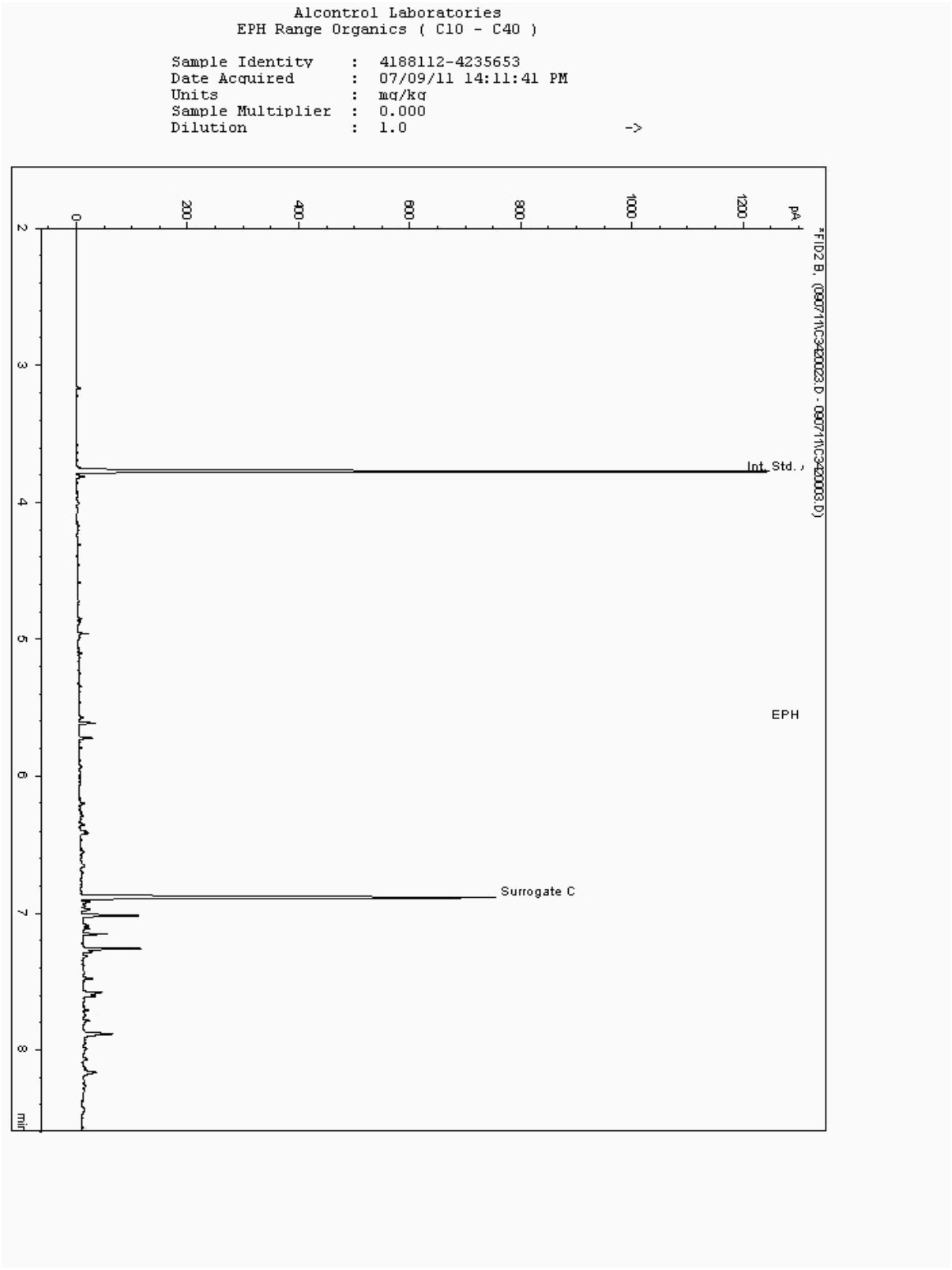
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Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: EPH by FID

Sample No : 4235653
Sample ID : TP 2

Depth : 1.00 - 1.00



CERTIFICATE OF ANALYSIS

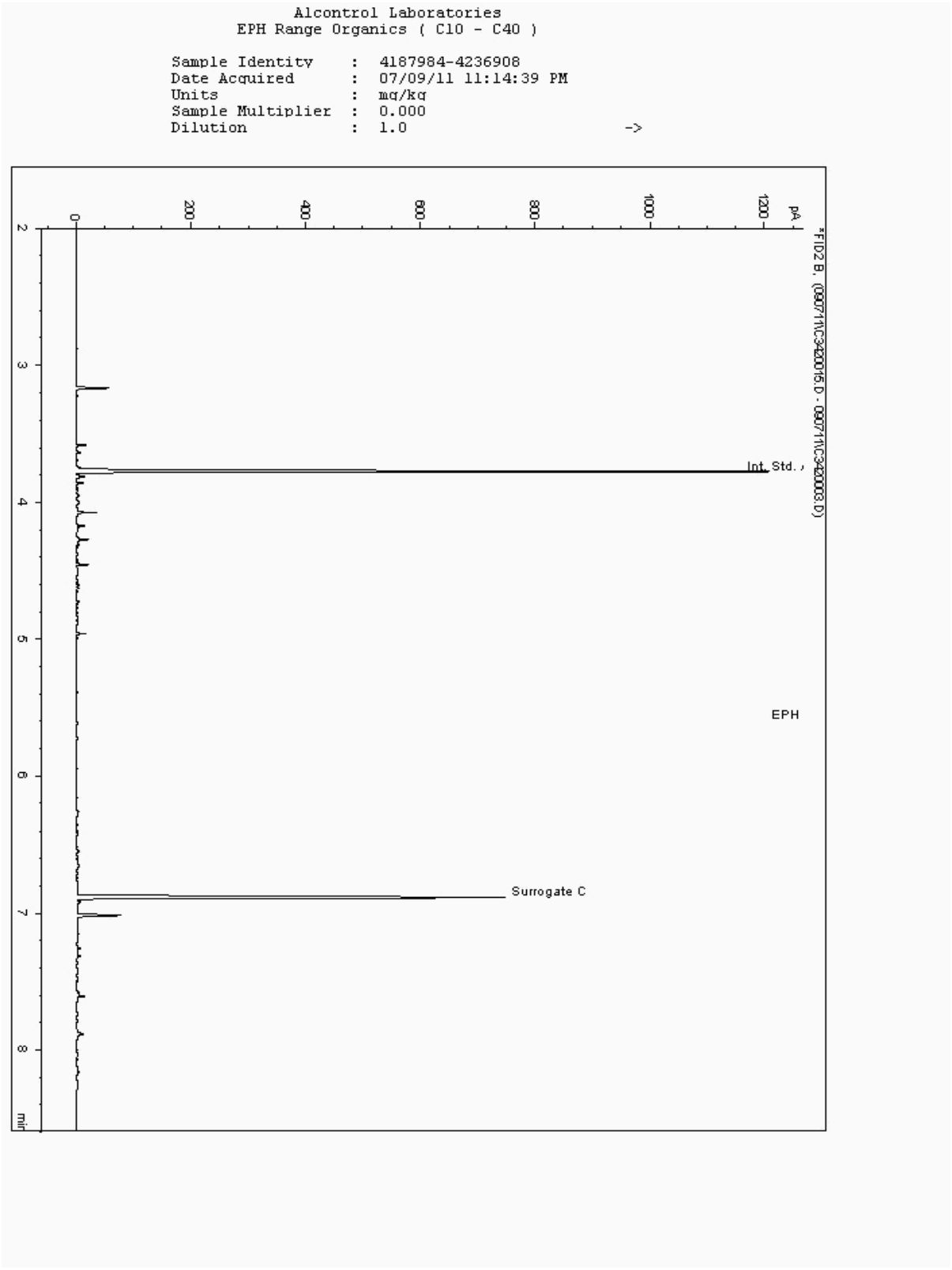
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Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: EPH by FID

Sample No : 4236908
Sample ID : WS 3

Depth : 0.70 - 1.00



CERTIFICATE OF ANALYSIS

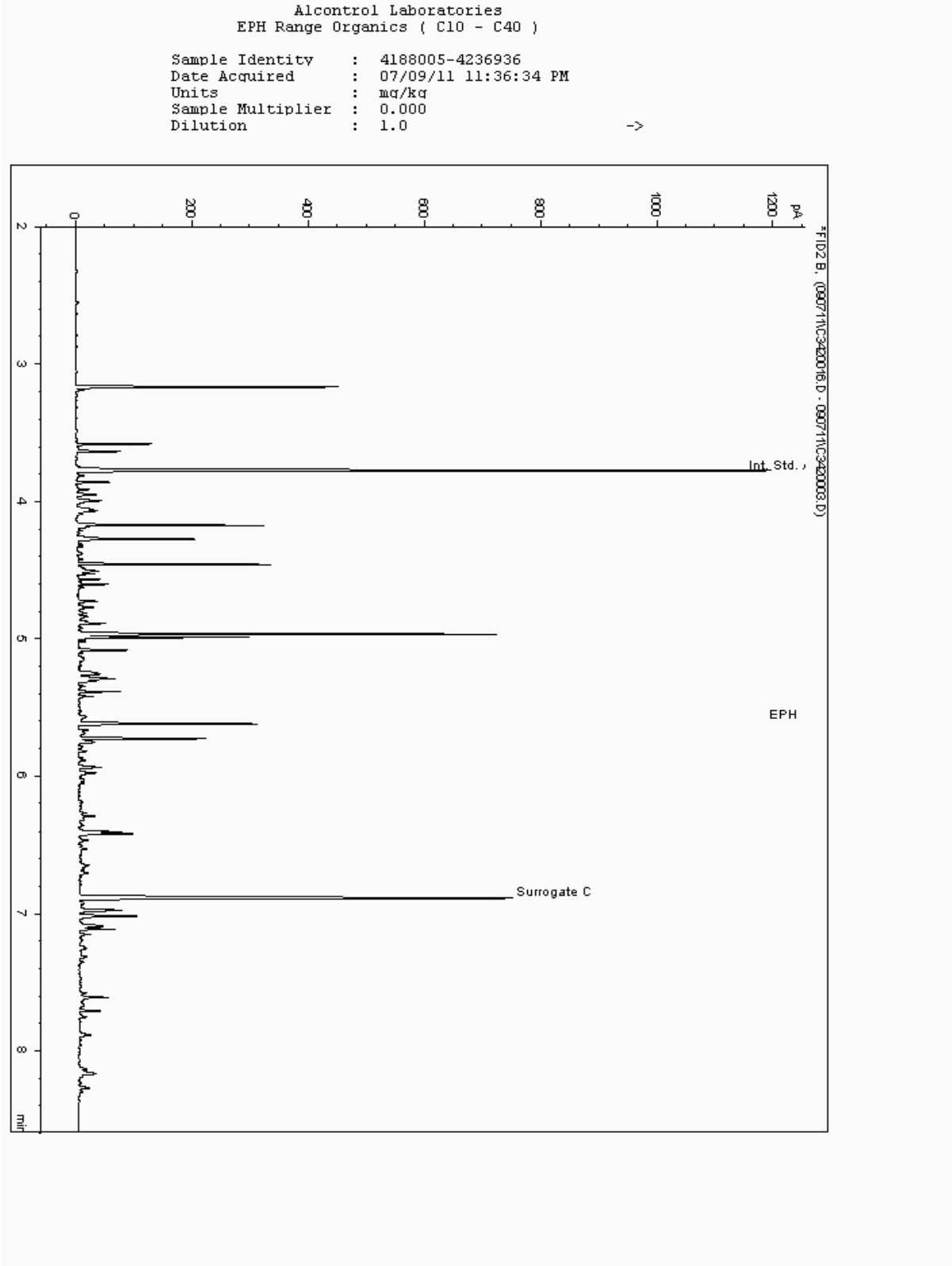
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Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: EPH by FID

Sample No : 4236936
Sample ID : WS 6

Depth : 0.80 - 1.00



CERTIFICATE OF ANALYSIS

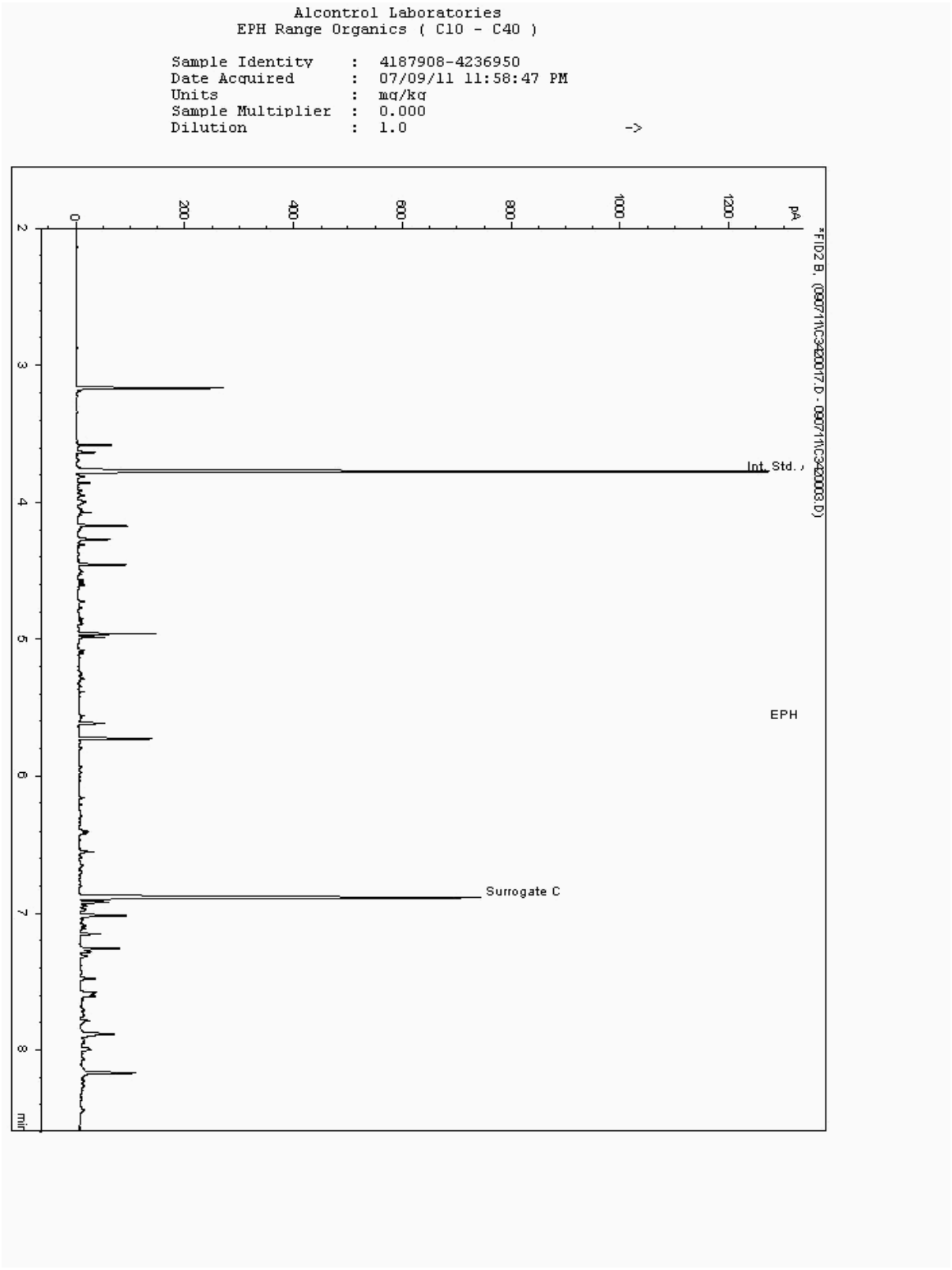
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Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: EPH by FID

Sample No : 4236950
Sample ID : TP 3

Depth : 2.00 - 2.00



CERTIFICATE OF ANALYSIS

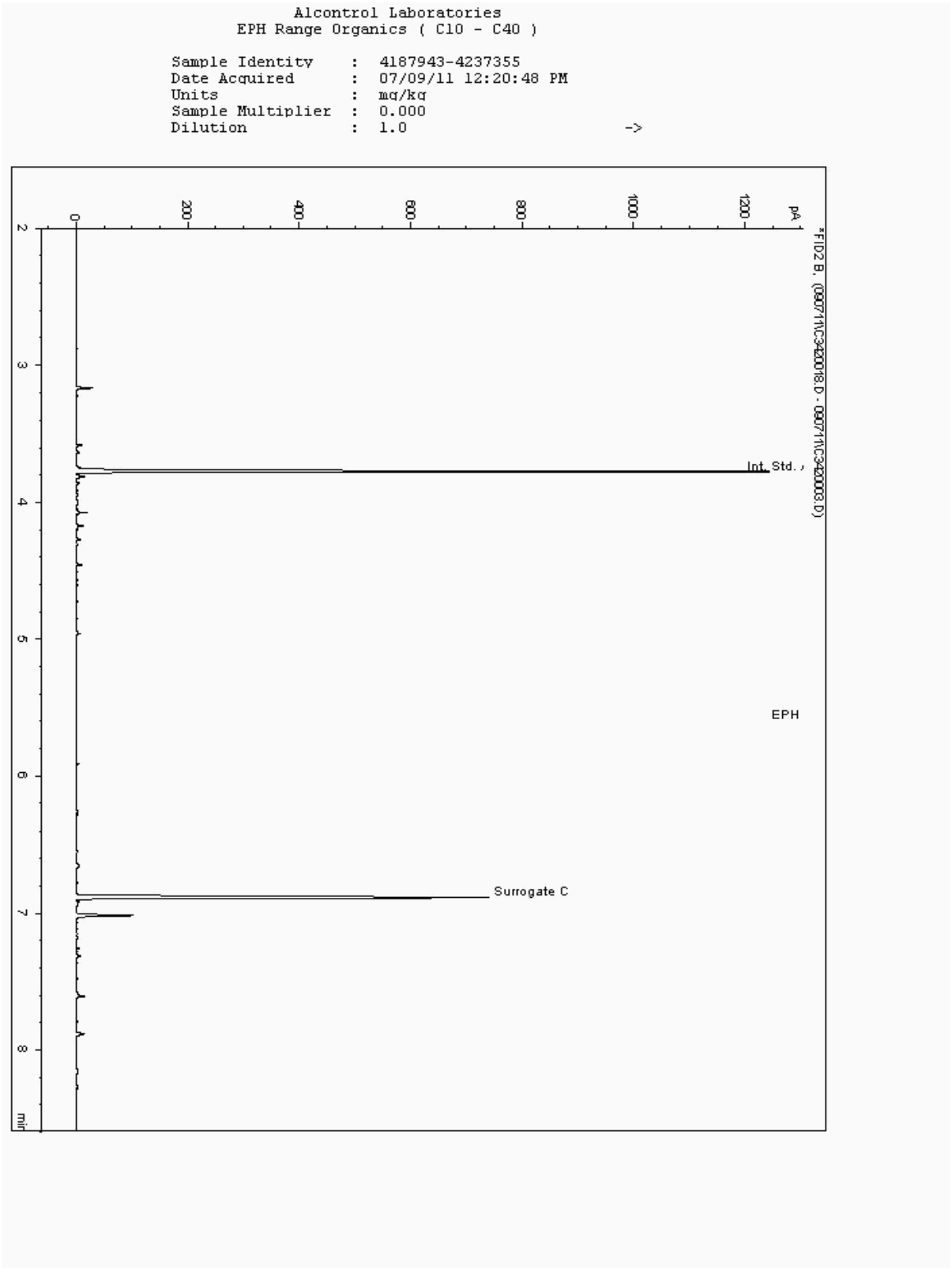
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Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: EPH by FID

Sample No : 4237355
Sample ID : WS 4

Depth : 0.70 - 1.00



CERTIFICATE OF ANALYSIS

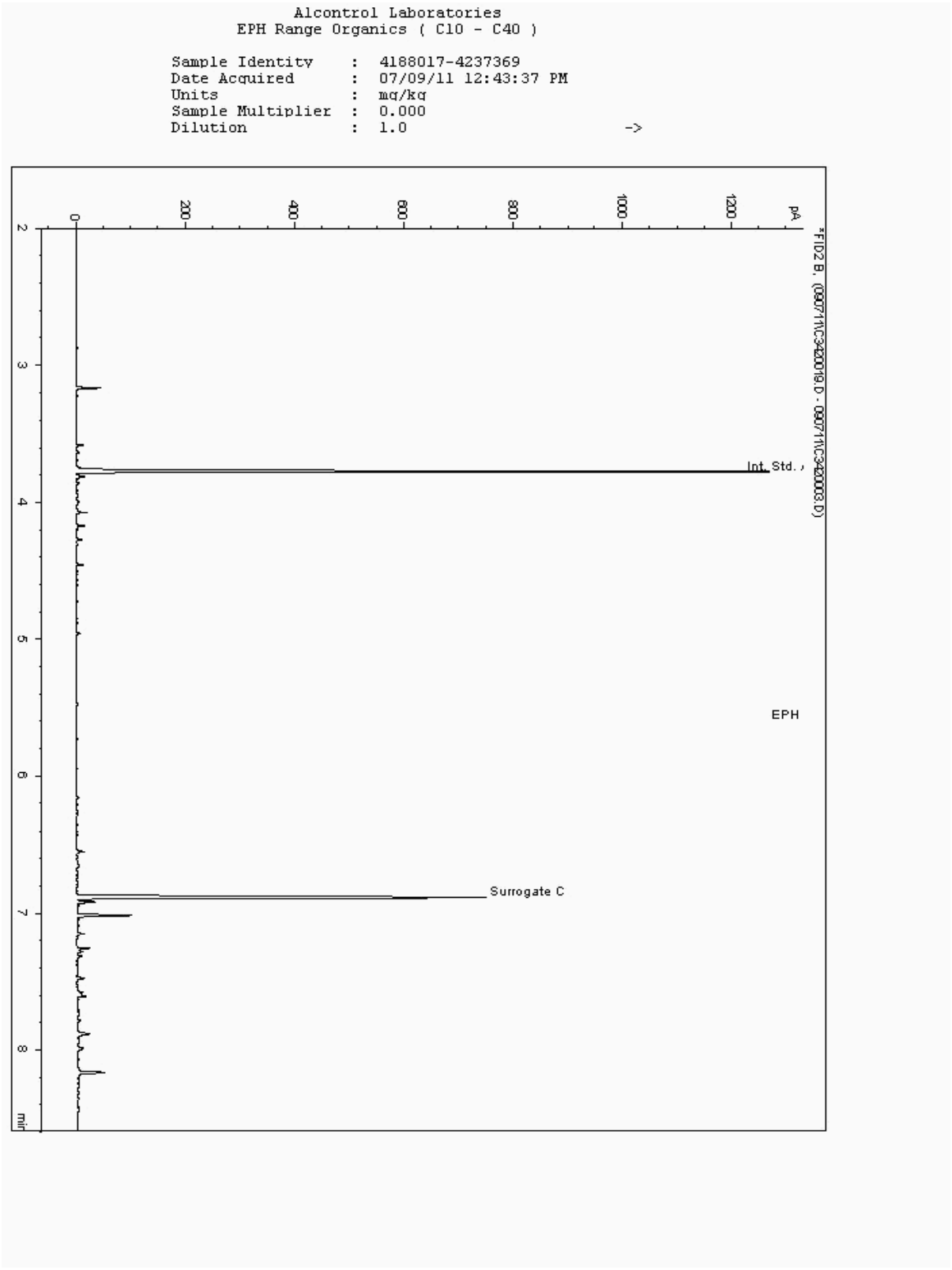
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Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: EPH by FID

Sample No : 4237369
Sample ID : WS 1

Depth : 0.50 - 1.00



CERTIFICATE OF ANALYSIS

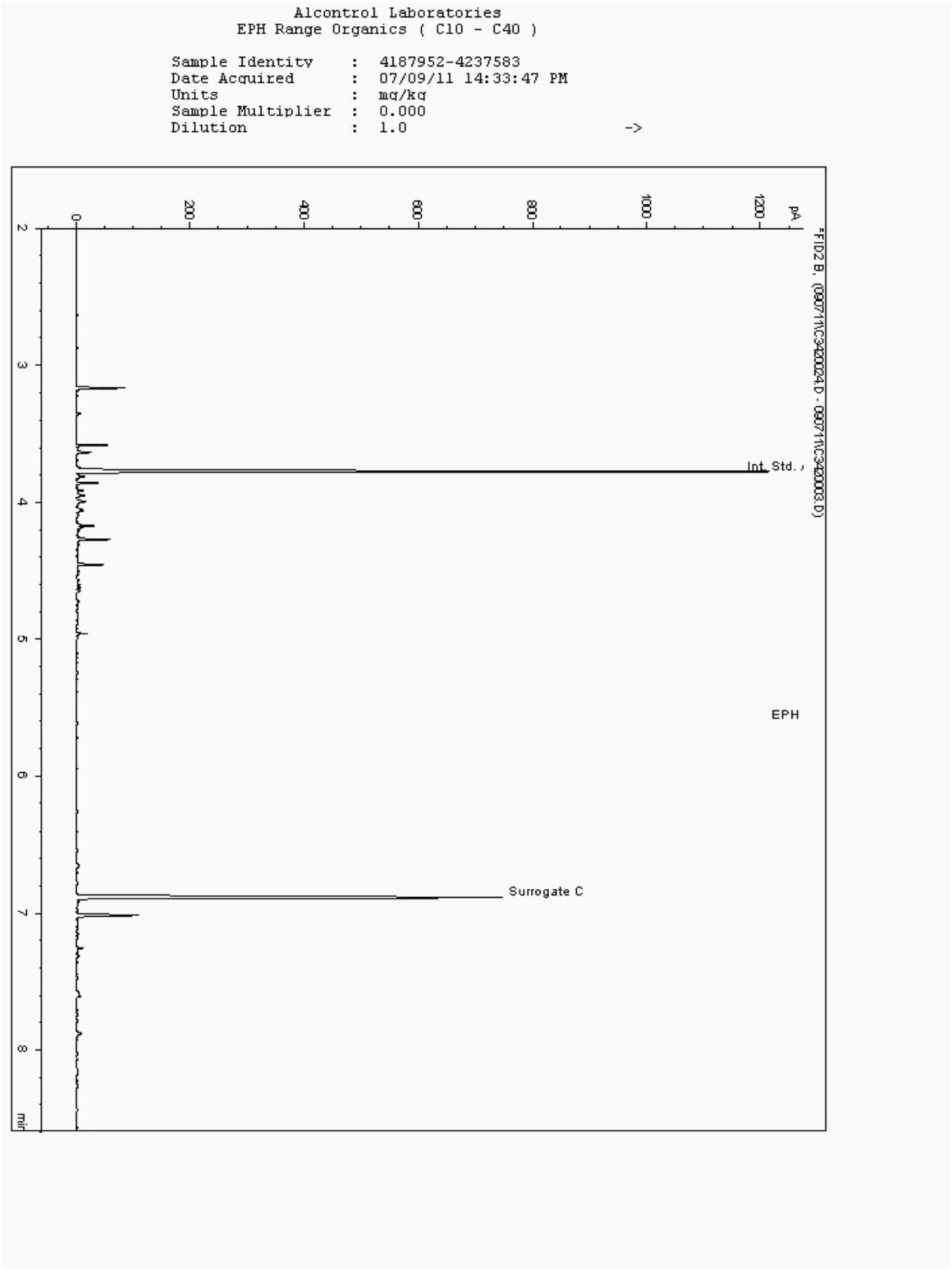
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Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: EPH by FID

Sample No : 4237583
Sample ID : WS 11

Depth : 0.20 - 0.50



CERTIFICATE OF ANALYSIS

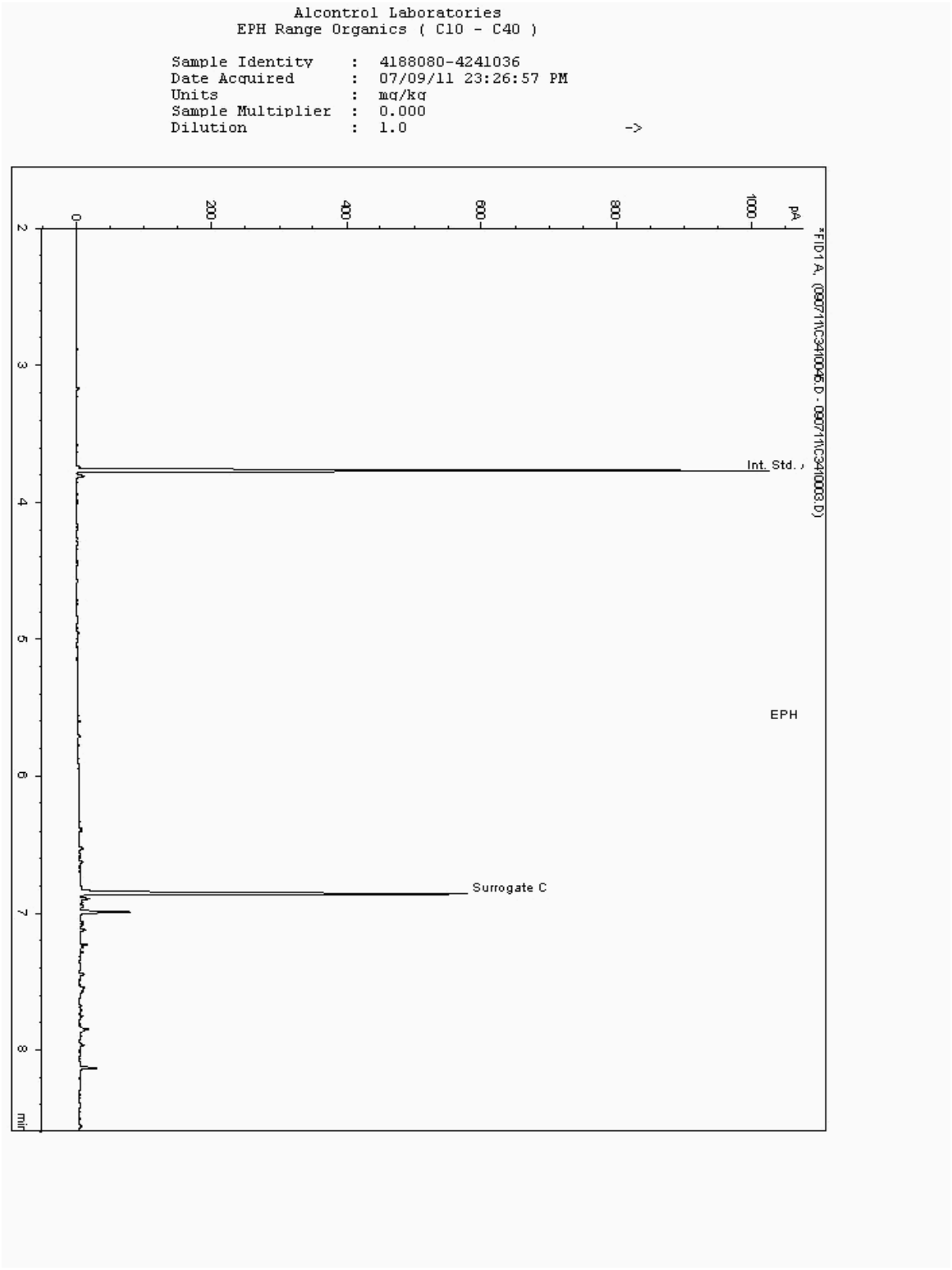
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Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: EPH by FID

Sample No : 4241036
Sample ID : TP 1

Depth : 0.50 - 0.50



CERTIFICATE OF ANALYSIS

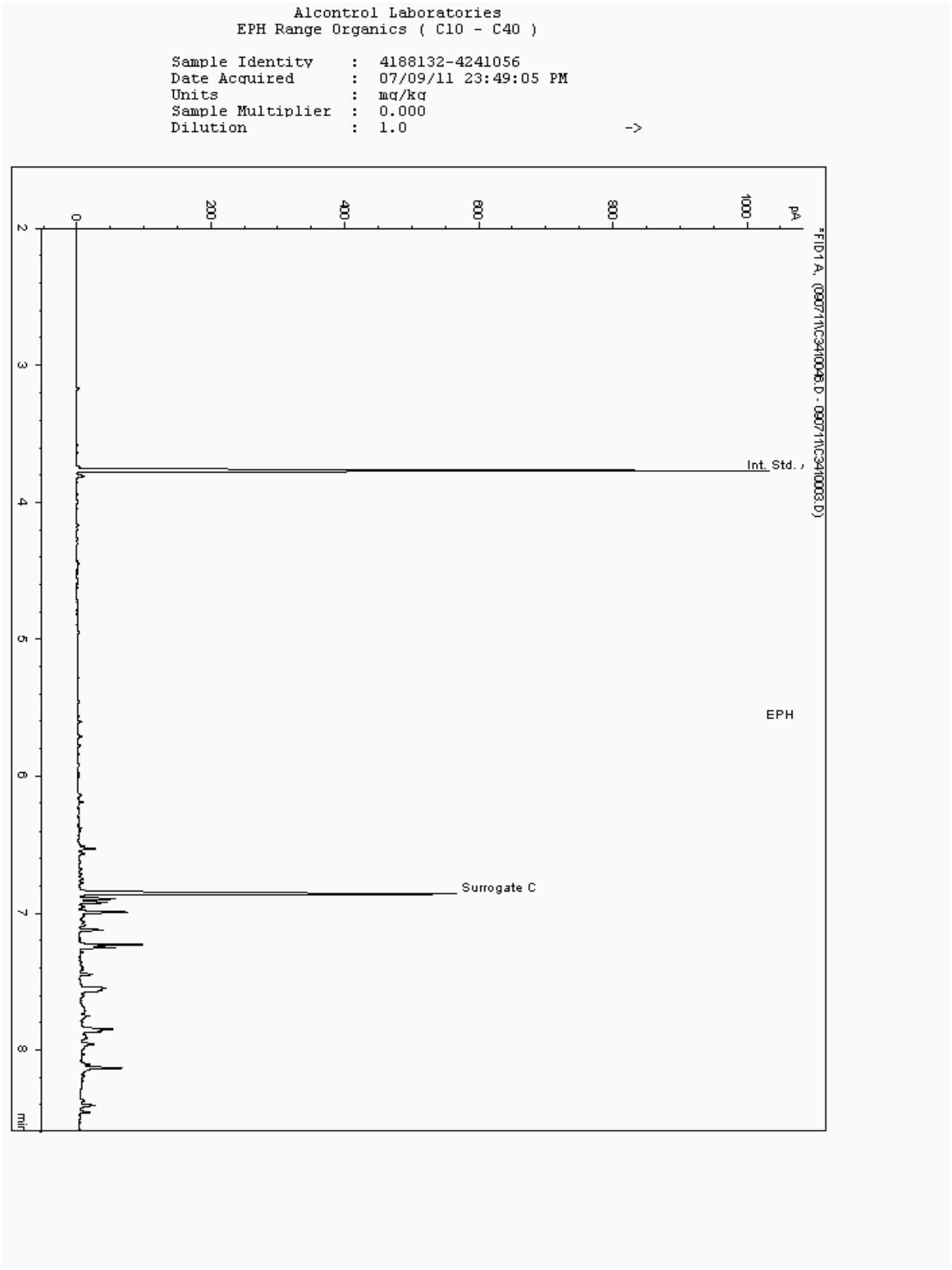
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Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: EPH by FID

Sample No : 4241056
Sample ID : TP 2

Depth : 3.00 - 3.00



CERTIFICATE OF ANALYSIS

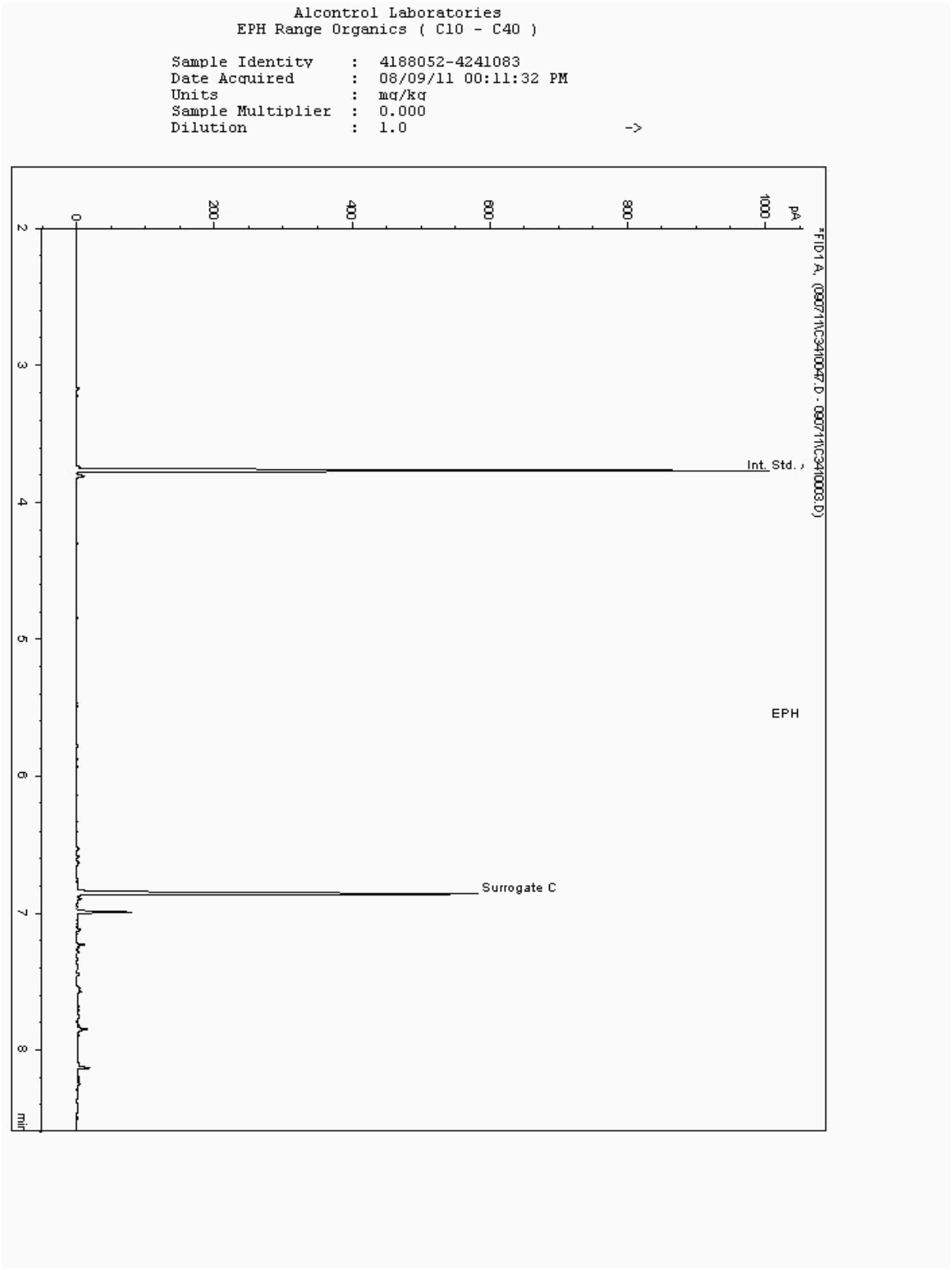
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Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: EPH by FID

Sample No : 4241083
Sample ID : BH 1

Depth : 0.30 - 0.80



CERTIFICATE OF ANALYSIS

SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

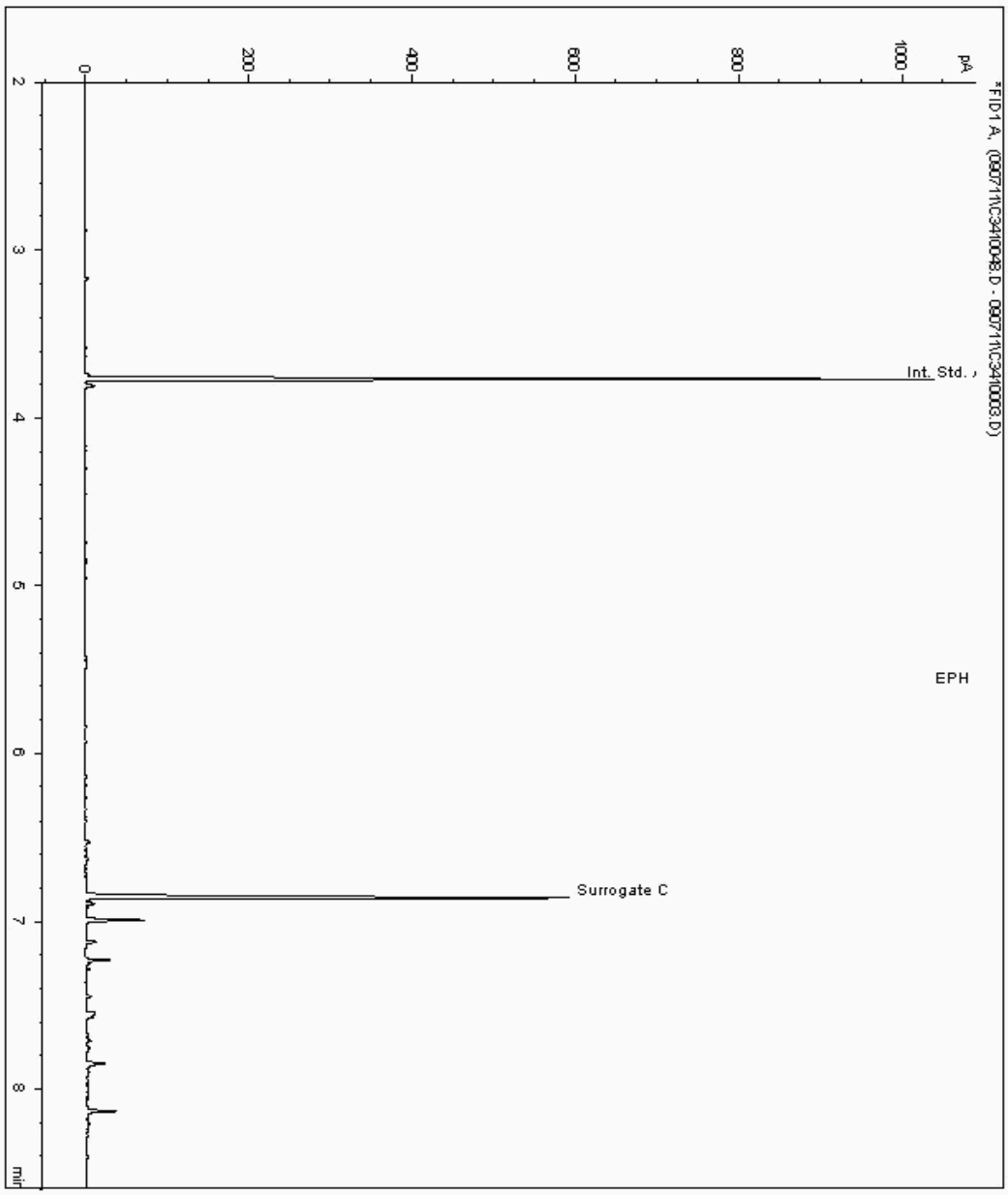
Analysis: EPH by FID

Sample No : 4241126
Sample ID : BH 4

Depth : 0.15 - 0.60

Alcontrol Laboratories
EPH Range Organics (C10 - C40)

Sample Identity : 4188060-4241126
Date Acquired : 08/09/11 00:33:49 PM
Units : mg/kg
Sample Multiplier : 0.000
Dilution : 1.0 ->



CERTIFICATE OF ANALYSIS

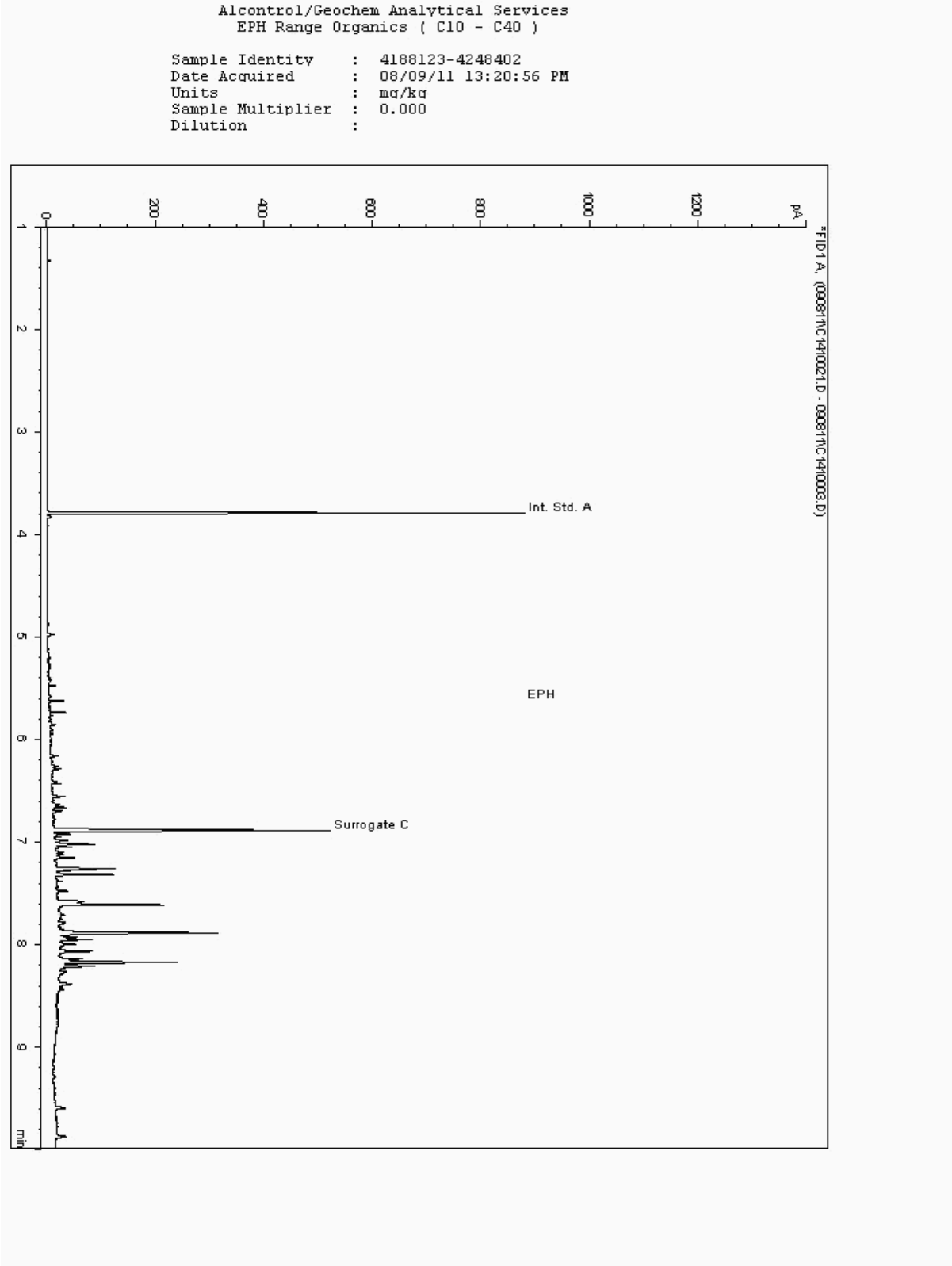
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Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: EPH by FID

Sample No : 4248402
Sample ID : TP 2

Depth : 2.00 - 2.00



CERTIFICATE OF ANALYSIS

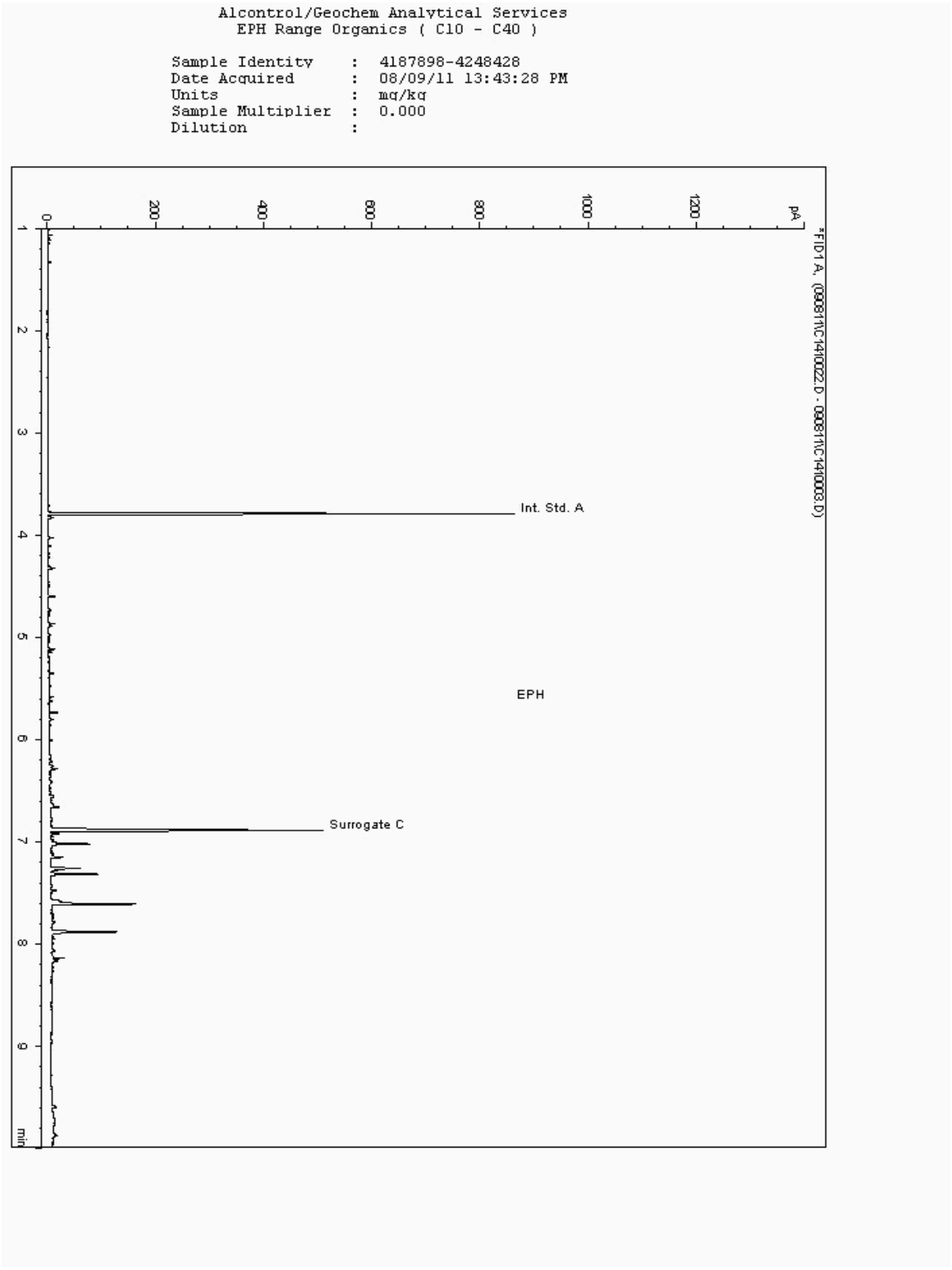
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Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: EPH by FID

Sample No : 4248428
Sample ID : TP 3

Depth : 1.10 - 1.10



CERTIFICATE OF ANALYSIS

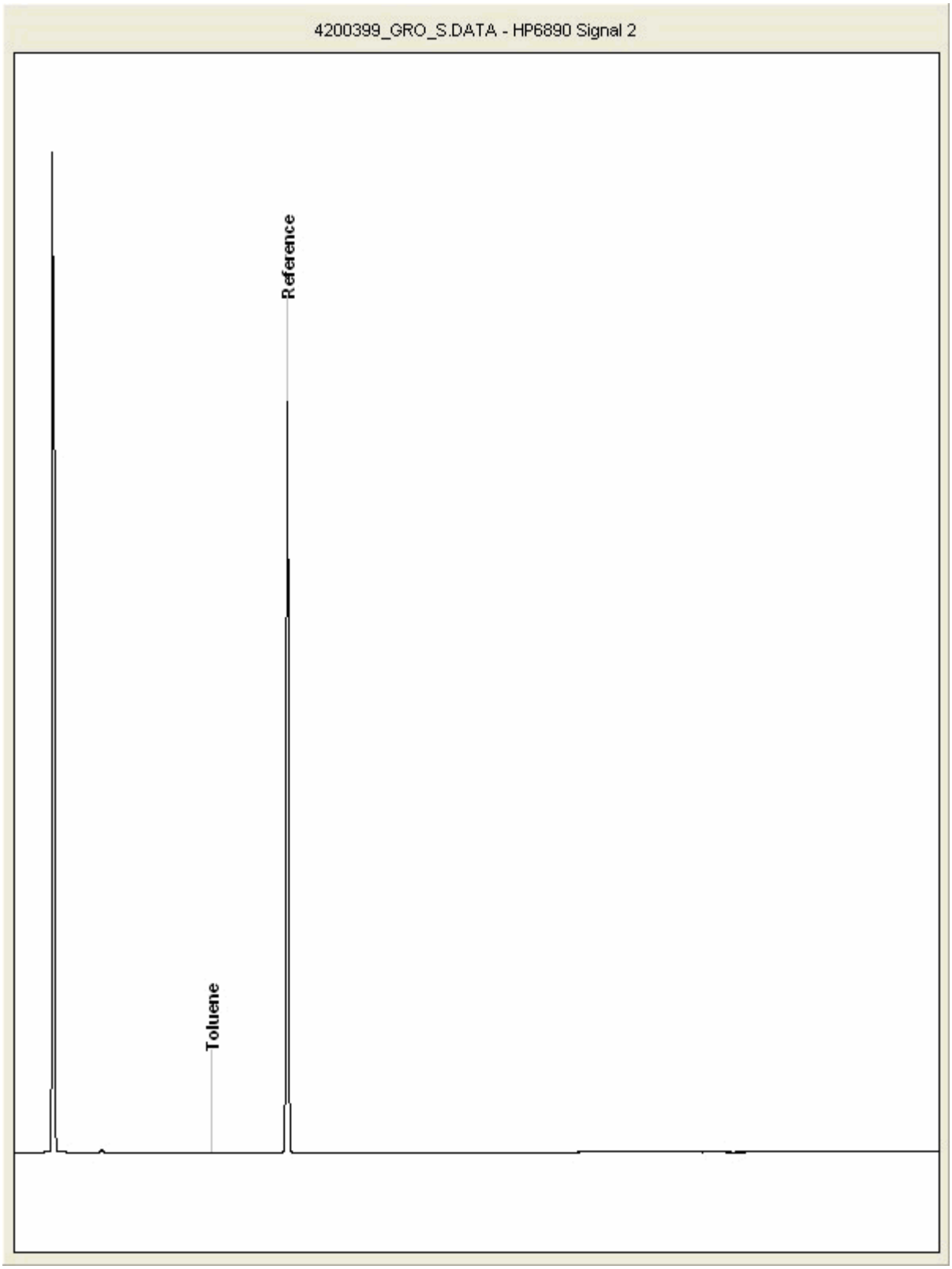
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Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 4200399
Sample ID : TP 1

Depth : 1.10 - 1.10



CERTIFICATE OF ANALYSIS

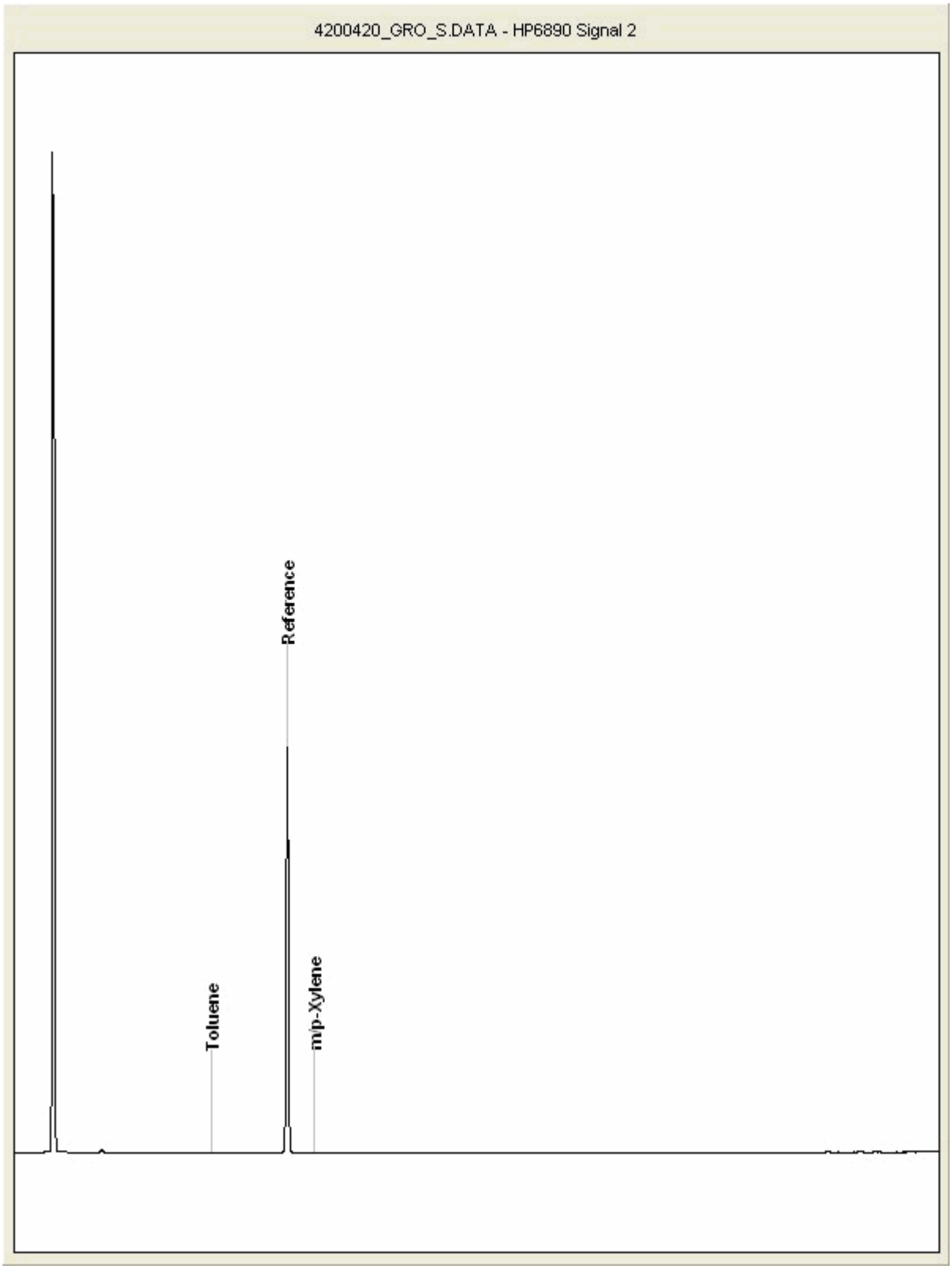
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Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 4200420
Sample ID : WS 4

Depth : 0.10 - 0.30



CERTIFICATE OF ANALYSIS

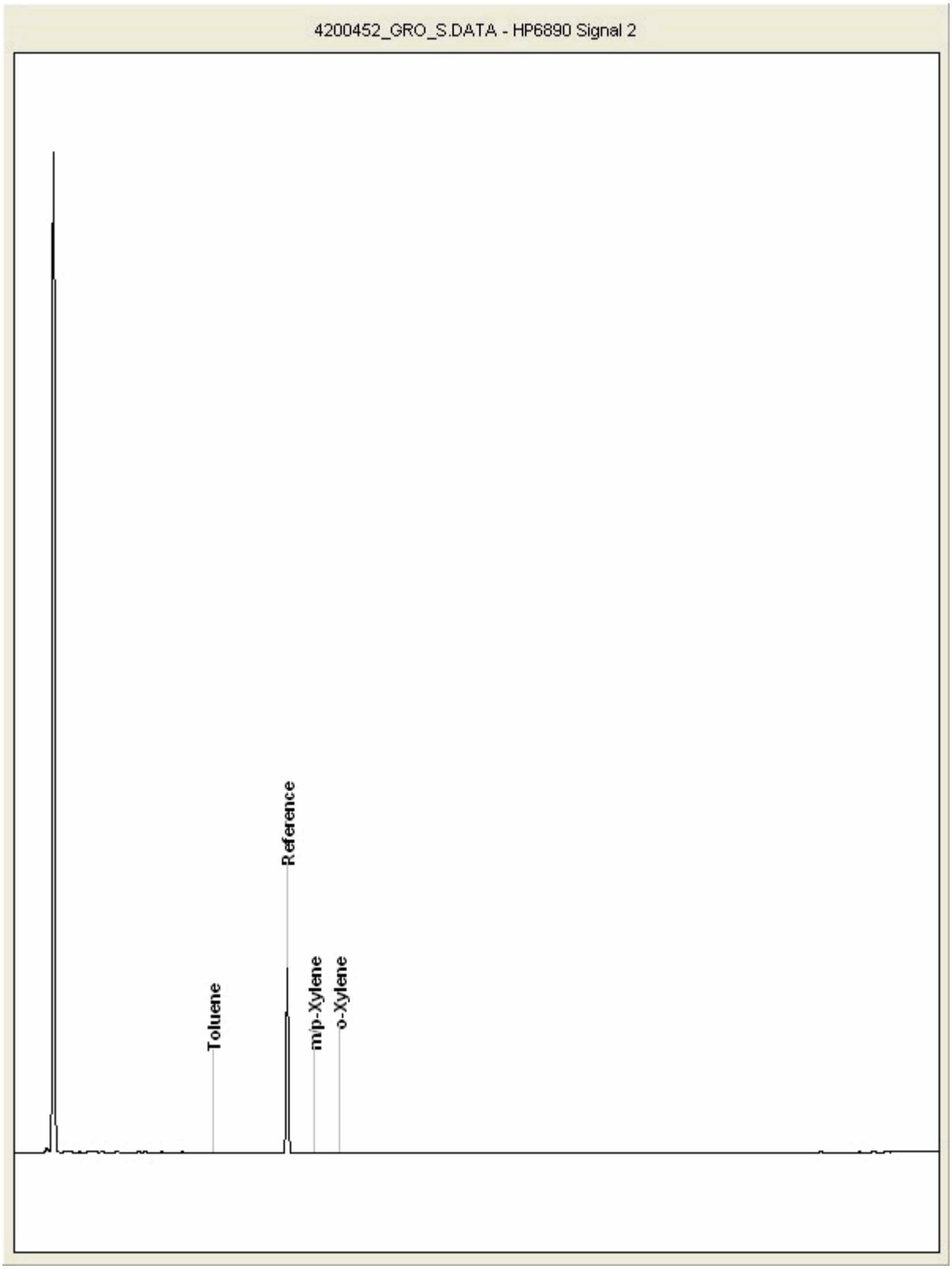
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Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 4200452
Sample ID : WS 3

Depth : 0.10 - 0.40



CERTIFICATE OF ANALYSIS

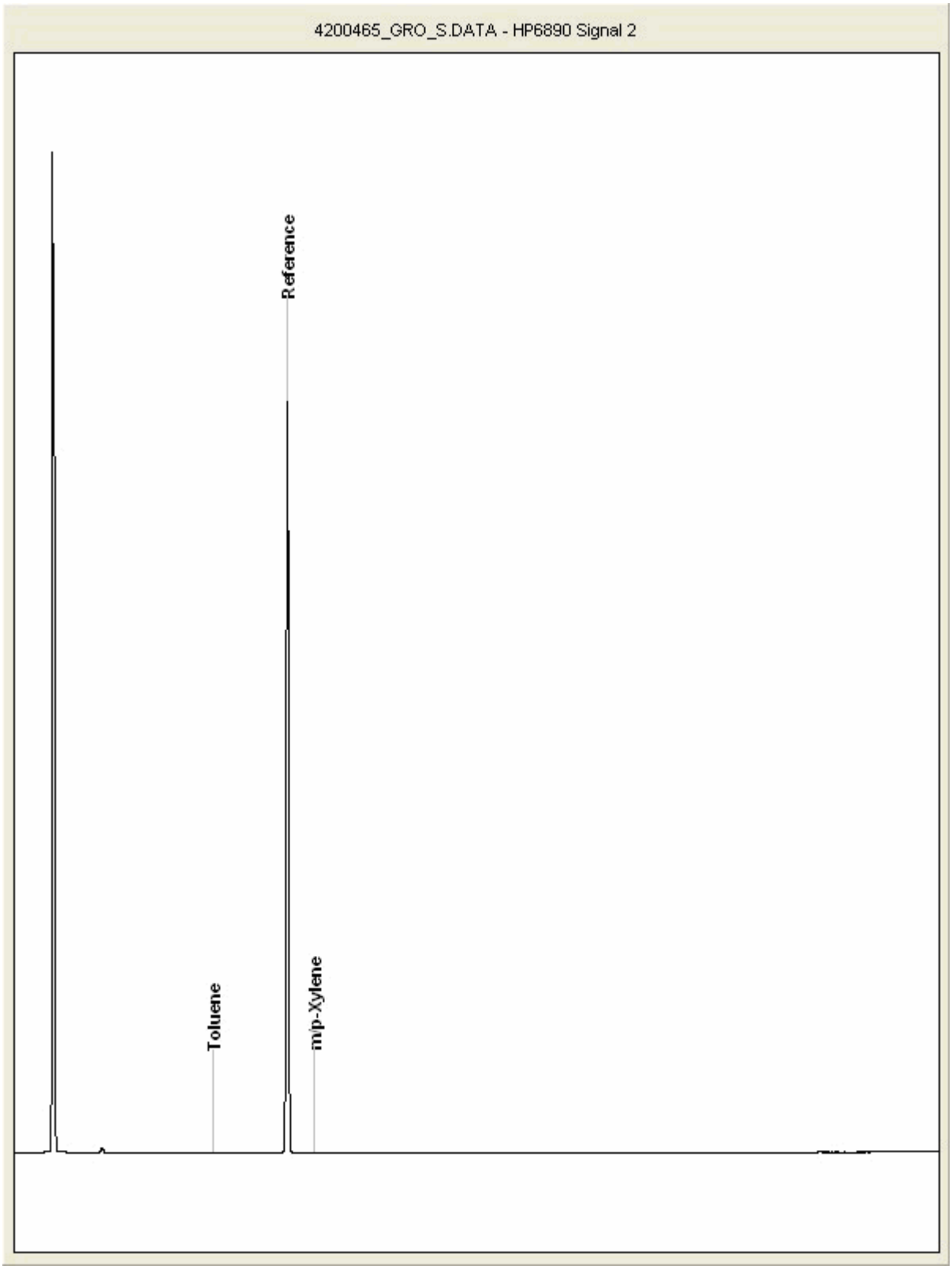
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Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 4200465
Sample ID : WS 6

Depth : 0.10 - 0.50



SDG:	110831-47	**Location:**	Woodcroft Farm, Waterlooville	**Order Number:**	PBA007983
Job:	H_PBRETT_REA-49	**Customer:**	Peter Brett Associates	**Report Number:**	150822
Client Reference:	21834/030	**Attention:**	Arie Zamler	**Superseded Report:**	149065

Appendix

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.

7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample -similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors
employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials -whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute themajor part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 -C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
SOLVENT EXTRACTABLE MATTER	D&C	DCM	SOXTHERM	GRAVIMETRIC
CYCLOHEXANE EXT. MATTER	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
ELEMENTAL SULPHUR	D&C	DCM	SOXTHERM	HPLC
PHENOLS BY GCMS	WET	DCM	SOXTHERM	GC-MS
HERBICIDES	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
PESTICIDES	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (MIN OIL)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (CLEANED UP)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG BY GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB TOT / PCB CON	D&C	HEXANE:ACETONE	END OVER END	GC-MS
POLYAROMATIC HYDROCARBONS (MS)	WET	HEXANE:ACETONE	MICROWAVE TM218.	GC-MS
C8-C40 (C8-C40) EZ FLASH	WET	HEXANE:ACETONE	SHAKER	GC-EZ
POLYAROMATIC HYDROCARBONS RAPID GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
SEMI VOLATILE ORGANIC COMPOUNDS	WET	DCM:ACETONE	SONICATE	GC-MS

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH-MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC-MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC-MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC-MS
SVOC	DCM	LIQUID/LIQUID SHAKE	GC-MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM	LIQUID/LIQUID SHAKE	GC-MS
TRIAZINE HERBS	DCM	LIQUID/LIQUID SHAKE	GC-MS
PHENOLS-MS	DCM	SOLID PHASE EXTRACTION	GC-MS
TPH by INFRARED (IR)	TCE	LIQUID/LIQUID SHAKE	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID SHAKE	HPLC
GLYCOLS	NONE	DIRECT INJECTION	GC-MS

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials or those identified as potentially asbestos containing during sample description which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -
Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

POST FIELDWORK MONITORING RECORD (PBA 1)

Job Title	Woodcroft Farm, Waterlooville
Job No	21834/030
Date	08/09/2011
Operator	Arie Zamler

CALIBRATION			
	Limits (%)	Cal Gas *Start/ End*	Air *Start/ End*
CH4 (5%)	4.5 - 5.5	4.7/4.7	0.0/0.0
CO2 (5%)	4.5 - 5.5	6.1/6.1	0.0/0.0
02 (6%)	5.0 - 7.0	5.5/5.5	21.2/21.1

Instrument (type/serial no) and date of last manufacturers service	

Atmospheric Pressure	Time	- 48 hrs	- 24 hrs	0	+ 24 hrs	+ 48 hrs	Comment
	mbar	unknown	1006	1004	1010	1002	

Ground conditions	Firm and dry

Weather	Overcast and mild

Borehole identification and construction BH1

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	-1.7	1005	0.0	1.8	12.1	0.0	0.0	DRY	5.18
1 to 2	-0.9		0.0	1.9	11.7	0.0	0.0		
2 to 3	-1.1		0.0	2.0	11.4	0.0	0.0		

Borehole identification and construction BH2

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.2/0.0	1004	0.0	0.7	18.3	0.0	0.0	DRY	7.03
1 to 2			0.0	1.1	17.6	0.0	0.0		
2 to 3			0.0	1.4	16.7	0.0	0.0		

Borehole identification and construction BH3

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.2/0.0	1004	0.0	0.7	16.8	0.0	0.0	6.49	7.02
1 to 2			0.0	0.7	16.5	0.0	0.0		
2 to 3			0.0	1.4	13.6	0.0	0.0		

Borehole identification and construction BH4

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.6/0.2	1004	0.0	1.7	15.9	0.0	0.0	DRY	6.92
1 to 2			0.0	1.9	15.2	0.0	0.0		
2 to 3			0.0	2.0	14.7	0.0	0.0		

Borehole identification and construction WS1

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1004	0.0	3.3	10.8	0.0	0.0	DRY	3.12
1 to 2			0.0	4.1	8.0	0.0	0.0		
2 to 3			0.0	6.0	7.6	0.0	0.0		

Typed By: Arie Zamler Date 08/09/2011 Checked By: Date

Borehole identification and construction			WS2						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.2/0.0	1004	27.5	15.0	0.0	>>>	0.0	DRY	4.20
1 to 2			26.0	15.0	0.0	>>>	0.0		
2 to 3			25.0	15.0	0.0	>>>	0.0		

Borehole identification and construction			WS3						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1004	0.0	5.2	5.5	0.0	0.0	DRY	4.08
1 to 2			0.0	6.0	6.2	0.0	0.0		
2 to 3			0.0	6.1	6.4	0.0	0.0		

Borehole identification and construction			WS4						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.1/0.0	1004	0.0	1.4	17.3	0.0	0.0	DRY	3.13
1 to 2			0.0	2.0	17.2	0.0	0.0		
2 to 3			0.0	2.6	17.2	0.0	0.0		

Borehole identification and construction			WS5						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.3/0.0	1004	0.0	3.1	15.9	0.0	0.0	DRY	4.08
1 to 2			0.0	3.3	15.9	0.0	0.0		
2 to 3			0.0	3.2	15.9	0.0	0.0		

Borehole identification and construction			WS6						
Comment/Condition	Not accesable								
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1									
1 to 2									
2 to 3									

Borehole identification and construction			WS11						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1004	0.0	3.6	14.8	0.0	0.0	DRY	2.74
1 to 2			0.0	3.8	14.7	0.0	0.0		
2 to 3			0.0	3.8	14.7	0.0	0.0		

Typed By:	Arie Zamler	Date	08/09/2011	Checked By:		Date	

POST FIELDWORK MONITORING RECORD (PBA 1)

Job Title	Woodcroft Farm, Waterlooville
Job No	21834/030
Date	14/09/2011
Operator	Arie Zamler

CALIBRATION			
	Limits (%)	Cal Gas *Start/ End*	Air *Start/ End*
CH4 (5%)	4.5 - 5.5	4.5/4.6	0.0/0.0
CO2 (5%)	4.5 - 5.5	5.4/5.8	0.0/0.0
02 (6%)	5.0 - 7.0	5.7/5.5	21.3/21.1

Instrument (type/serial no) and date of last manufacturers service	

Atmospheric Pressure	Time	- 48 hrs	- 24 hrs	0	+ 24 hrs	+ 48 hrs	Comment
	mbar	unknown	1013	1020	1021	1017	Rising pressure

Ground conditions	Firm and dry

Weather	Sunny and mild

Borehole identification and construction BH01

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0/0.1	1015	0.0	2.3	12.0	0.0	0.0	DRY	5.18
1 to 2			0.0	2.6	11.1	0.0	0.0		
2 to 3			0.0	2.6	10.7	0.0	0.0		

Borehole identification and construction BH02

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.3/0.0	1013.0	0.0	1.8	15.0	0.0	0.0	DRY	7.03
1 to 2			0.0	1.9	14.8	0.0	0.0		
2 to 3			0.0	1.9	14.5	0.0	0.0		

Borehole identification and construction BH03

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.1/0.0	1013	0.0	1.7	11.2	0.0	0.0	DRY	7.02
1 to 2			0.0	1.7	11.2	0.0	0.0		
2 to 3			0.0	1.7	11.2	0.0	0.0		

Borehole identification and construction BH04

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1015	0.3/0.2	0.0	21.0	6.0	0.0	DRY	6.92
1 to 2			1.0	0.0	21.0	20.0	0.0		
2 to 3			2.0	0.0	21.0	40.0	0.0		

Borehole identification and construction WS01

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0/0.1	1014	0.8/0.7	2.0	13.8	14.0	0.0	DRY	3.13
1 to 2			0.8/0.6	3.0	12.1	13.0	0.0		
2 to 3			0.8/0.7	5.6	6.6	10.0	0.0		

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Borehole identification and construction			WS02						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.3/0.0	1014	42.5/40.0	17.0/16.0	0.0	>>>	0.0	DRY	4.20
1 to 2			38.0/36.5	16.0	0.0	>>>	0.0		
2 to 3			31.0	13.0	0.0	>>>	0.0		

Borehole identification and construction			WS04						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0/0.1	1013	0.0	1.3	17.8	0.0	0.0	DRY	3.12
1 to 2			0.0	1.9	17.6	0.0	0.0		
2 to 3			0.0	2.1	17.6	0.0	0.0		

Borehole identification and construction			WS05						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0/0.2	1013	0.0	3.3	15.5	0.0	0.0	DRY	4.1
1 to 2			0.0	3.5	15.4	0.0	0.0		
2 to 3			0.0	3.5	15.3	0.0	0.0		

Borehole identification and construction			WS11						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.3/0.0	1013	0.0	4.1	13.8	0.0	0.0	DRY	2.7
1 to 2			0.0	4.3	13.8	0.0	0.0		
2 to 3			0.0	4.3	13.9	0.0	0.0		

Borehole identification and construction			Water well						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	-	-	-	-	-	-	-	30.13	-
1 to 2									
2 to 3									

Borehole identification and construction									
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1									
1 to 2									
2 to 3									

Typed By:	Arie Zamler	14/09/2011 Date	Checked By:	Date

POST FIELDWORK MONITORING RECORD (PBA 1)

Job Title	Woodcroft Farm, Waterlooville
Job No	21834/030
Date	22/09/2011
Operator	Arie Zamler

CALIBRATION			
	Limits (%)	Cal Gas *Start/ End*	Air *Start/ End*
CH4 (5%)	4.5 - 5.5	4.5/4.5	0.0/0.0
CO2 (5%)	4.5 - 5.5	5.8/5.7	0.0/0.0
02 (6%)	5.0 - 7.0	5.6/5.7	21.3/21.1

Instrument (type/serial no) and date of last manufacturers service	

Atmospheric Pressure	Time	- 48 hrs	- 24 hrs	0	+ 24 hrs	+ 48 hrs	Comment
	mbar	1019	1017	1021	1018	1014	

Ground conditions	Wet after heavy rain in the previoues day

Weather	Overcast and mild

Borehole identification and construction BH01

Comment/Condition Cover partially filled wih water, water removed.

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	-0.6	1017	0.0	3.8	7.1	0.0	0.0	DRY	5.20
1 to 2			0.0	3.5	7.0	0.0	0.0		
2 to 3			0.0	3.8	6.9	0.0	0.0		

Borehole identification and construction BH02

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1015	0.0	2.4	13.9	0.0	0.0	DRY	7.12
1 to 2			0.0	2.5	13.7	0.0	0.0		
2 to 3				2.5	13.7	0.0	0.0		

Borehole identification and construction BH03

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.2/0.0	1004	0.0	0.7	16.8	0.0	0.0	4.50	7.02
1 to 2			0.0	0.9	16.5	0.0	0.0		
2 to 3			0.0	1.4	13.6	0.0	0.0		

Borehole identification and construction BH04

Comment/Condition Some water in the cover

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1017	0.0	3.6	6.4	0.0	0.0	DRY	6.92
1 to 2			0.0	3.5	6.4	0.0	0.0		
2 to 3			0.0	3.4	6.4	0.0	0.0		

Borehole identification and construction WS01

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1017	0.0	12.0	0.8	0.0	0.0	DRY	3.12
1 to 2			0.0	12.0	0.8	0.0	0.0		
2 to 3			0.0	12.0	0.8	0.0	0.0		

Typed By: Arie Zamler Date 22/09/2011 Checked By: Date

Borehole identification and construction	WS02								
Comment/Condition	Cover partially full with water.								
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1017	36.5	17.0	0.0	>>>	0.0	DRY	4.20
1 to 2			34.5	17.0	0.0	>>>	0.0		
2 to 3			33.0	17.0	0.0	>>>	0.0		

Borehole identification and construction	WS03								
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1016	0.0	4.5	17.3	0.0	0.0	DRY	4.08
1 to 2			0.0	4.2	17.0	0.0	0.0		
2 to 3			0.0	4.3	17.0	0.0	0.0		

Borehole identification and construction	WS04								
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1016	0.0	0.8	17.9	0.0	0.0	DRY	3.12
1 to 2			0.0	1.9	17.3	0.0	0.0		
2 to 3			0.0	2.5	17.1	0.0	0.0		

Borehole identification and construction	WS05								
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1015/1016	0.0	2.0	17.5	0.0	0.0	DRY	4.12
1 to 2			0.0	2.7	17.0	0.0	0.0		
2 to 3			0.0	2.7	16.8	0.0	0.0		

Borehole identification and construction	WS11								
Comment/Condition	Cover filled with water water is removed.								
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.1/0.0	1017	0.0	2.9	14.4	0.0	0.0	DRY	2.73
1 to 2			0.0	3.4	14.1	0.0	0.0		
2 to 3			0.0	3.7	13.8	0.0	0.0		

Borehole identification and construction									
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1									
1 to 2									
2 to 3									

Typed By: Arie Zamler Date 22/09/2011 Checked By: Date

POST FIELDWORK MONITORING RECORD (PBA 1)

Job Title	Woodcroft Farm, Waterlooville
Job No	21834/030
Date	28/09/2011
Operator	Arie Zamler

CALIBRATION			
	Limits (%)	Cal Gas *Start/ End*	Air *Start/ End*
CH4 (5%)	4.5 - 5.5		
CO2 (5%)	4.5 - 5.5		
02 (6%)	5.0 - 7.0		

Instrument (type/serial no) and date of last manufacturers service	

Atmospheric Pressure	Time	- 48 hrs	- 24 hrs	0	+ 24 hrs	+ 48 hrs	Comment
	mbar	1026	1029	1025	1022	1022	Falling pressure

Ground conditions	Firm and dry

Weather	Sunny and warm

Borehole identification and construction BH01

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1021	0.0	4.6	8.2	0.0	0.0	DRY	5.18
1 to 2			0.0	4.6	8.0	0.0	0.0		
2 to 3			0.0	4.7	8.1	0.0	0.0		

Borehole identification and construction BH02

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.1/0.0	1021.0	0.0	2.7	14.5	0.0	0.0	DRY	7.03
1 to 2			0.0	2.6	14.4	0.0	0.0		
2 to 3			0.0	2.7	14.5	0.0	0.0		

Borehole identification and construction BH03

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1019	0.0	1.8	8.8	0.0	0.0	4.05	7.02
1 to 2			0.0	1.8	8.7	0.0	0.0		
2 to 3			0.0	1.7	8.7	0.0	0.0		

Borehole identification and construction BH4

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1021	0.0	3.5	8.8	0.0	0.0	DRY	6.92
1 to 2				3.5	8.7	0.0	0.0		
2 to 3				3.6	8.6	0.0	0.0		

Borehole identification and construction WS01

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1021	0.0	15.0	0.8	0.0	0.0	DRY	3.12
1 to 2			0.0	15.0	0.7	0.0	0.0		
2 to 3			0.0	15.0	0.8	0.0	0.0		

Typed By: Arie Zamler Date 29/09/2011 Checked By: Date

Borehole identification and construction			WS02						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	1.3/0.3	1021	35.5	19.0	0.0	>>>	1.2/1.1	DRY	4.20
1 to 2			34.5	16.0	0.0	>>>	1.1		
2 to 3			32.5	16.0	0.0	>>>	1.1		

Borehole identification and construction			WS03						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.5/0.0	1020	0.0	7.5	5.0	0.0	0.0	DRY	4.08
1 to 2				8.1	5.5	0.0	0.0		
2 to 3				8.2	5.7	0.0	0.0		

Borehole identification and construction			WS04						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1021	0.0	0.8	17.8	0.0	0.0	DRY	3.14
1 to 2				1.6	17.0	0.0	0.0		
2 to 3				2.0	17.0	0.0	0.0		

Borehole identification and construction			WS05						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1021	0.0	2.3	17.3	0.0	0.0	DRY	4.09
1 to 2			0.0	2.5	17.2	0.0	0.0		
2 to 3			0.0	2.4	17.2	0.0	0.0		

Borehole identification and construction			WS06						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1021	0.0	5.2	12.0	0.0	0.0	DRY	2.5
1 to 2				6.0	10.0	0.0	0.0		
2 to 3				5.5	10.0	0.0	0.0		

Borehole identification and construction			WS11						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.2/0.1	1021	0.0	5.4	12.6	0.0	0.0	DRY	2.74
1 to 2			0.0	5.4	12.7	0.0	0.0		
2 to 3			0.0	5.3	12.7	0.0	0.0		

Typed By:	Arie Zamler	Date	Checked By:	Date

1 Introduction

A Tier 2 Risk Assessment is a quantitative assessment using published generic criteria to "screen" the site-specific contamination testing data and identify potential hazards to specific receptors.

The aim of this document is to present an explanation for the selection of the assessment criteria routinely used by PBA when undertaking a Tier 2 risk assessment. This document is divided into general introductory text and sections on soils, waters and soil gases.

This document should be read in conjunction with another entitled "PBA methodology for ground condition assessment" which summarises the legislative regime and our approach to ground contamination and risk assessment.

2 General Notes

Any deviation from the routine criteria and/or selection of criteria for parameters not covered in this document will be described in the report text. The report will also comment on the appropriateness of the routine criteria for project objectives or ground conditions.

Any PBA interpretation of contamination test results is based on a scientific and engineering appraisal. The perceptions of, for example, banks, insurers, lay people etc are not taken into account.

Any summary tables included in this Appendix are produced for ease of reference to the criteria, they do not in any way replace the documents of origin (which are fully referenced) and which should be read to ensure appropriate use and interpretation of the data.

3 Tier 2 Criteria for Assessing Soils

3.1 Potential Harm to Human Health

The criteria routinely used by PBA as Tier 2 soil screening values for the protection of human health are the Governmental Soil Guidance Values (SGVs) and various non-Governmental Generic Assessment Criteria (GAC) and the criteria routinely adopted are presented in Table 1.

DEFRA has yet to produce a comprehensive list of assessment criteria that on its own, would be sufficient to enable the assessment of the potential risks posed by soil contaminants (to human health). A number of industry-driven initiatives have developed to generate contaminated land assessment criteria. This has led to the publication of a series of non-statutory non-Governmental contaminated land assessment criteria. It should be noted that the published DEFRA guidance is also non-statutory.

Both the Governmental and non Governmental sets of criteria have been generated using the Contaminated Land Exposure Assessment model (CLEA) and supporting technical guidance (EA, 2009a, 2009b, 2009c).

PBA has reviewed these publications and where we consider that the non-Governmental criteria are authoritative and robust, and therefore we will refer to such criteria until such time that DEFRA derive and publish Governmental SGVs to replace the non Governmental GACs.

In is important to note that because the GACs are not published by the UK Government, they may be subject to challenge by a regulatory body or their representative. If use of the GACs is challenged, it may be necessary to carry out modelling to generate site-specific assessment criteria.

Soil Guideline Values (SGVs) - Governmental

The first series of SGVs were generated using a probabilistic version of the CLEA model. However, on 22 July 2008 DEFRA announced the withdrawal of these SGVs.

Revised SGVs have been calculated using the revised fully deterministic version of the CLEA model. The standard land use scenarios are residential with plant uptake, allotments and industrial/commercial.

Generic Assessment Criteria (GAC) - Non Governmental

SGVs generated for organic compounds are dependent on the amount of organic matter present in the soil (a lower SGV is generated for soils with lower organic matter contents since organic matter acts to immobilise organic contaminants). The SGVs for BTEX compounds and phenol assume that the 'host' soil has 6% organic matter.

UK soils often have organic matter concentrations below 6% and that it may therefore not be conservative to use the published SGVs for BTEX compounds when assessing the potential risks from these chemicals. The on-line Contaminated Land Strategies Digest (CLSD) formed a consortium of ten practitioners (including representatives from local authorities), to prepare generic assessment criteria for a number of contaminants at more conservative organic matter contents of 1% and 3% for the same end uses. The consortium also reproduced the SGVs using the EA's latest CLEA model and latest CLEA guidance and PBA independently verified the results published using CLEA v1.06. These criteria will be used by PBA where appropriate.

In addition the CLSD consortium derived GAC for selected substances for an additional end use, that being residential without plant uptake (CLSD, 2009).

In July 2009, GAC for 82 substances were published by the Chartered Institute of Environmental Health (CIEH) (LQM and CIEH,

2009) using the then current version of the CLEA software v1.04. These GAC replace those generated in 2006 using the original version of the model CLEA UK *beta*.

In January 2010, GAC for 35 substances were published by the Environmental Industries Commission (EIC), Association of Geotechnical and Geoenvironmental Specialists (AGS) and Contaminated Land: Applications in Real Environments (CL:AIRE), (CL:AIRE, 2010) using the then current version of the CLEA software v1.05. These substances are more rarely found to be contaminants of concern during contaminated land investigations and hence are not routinely tested for. The CL:AIRE GAC are not reproduced in Table 1 but may be referred to as required during the investigation of specific sites.

Note on Appropriate Use of SGV/GAC The SGVs and GACs generated using the CLEA model are based on numerous and complex assumptions. The appropriateness of these assumptions in a site-specific context requires confirmation on a project by project basis.

In general, SGVs/GACs have been developed using highly conservative assumptions and therefore exceedance does not necessarily indicate that a site is statutorily contaminated and/or unsuitable for use (CLAN2-05) and that whilst SGV/GAC provide an aid to decision-making, they do not replace the need for sound professional judgement in risk assessment (EA, 2006b).

Note on Mercury and Arsenic Assessment The analytical testing routinely undertaken by PBA determines total concentration, however, the toxicity of Mercury and Arsenic differ depending on the form.

If there a source of Mercury or Arsenic is identified or the total concentration exceeds the relevant worst case speciated criteria it will be desirable/necessary to undertake additional speciated testing.

3.2 Potential Harm to the Built Environment

PBA use the following primary guidance to assess the significance of soil chemistry with respect to its potential to harm the built environment.

i) Site Preparation and Resistance to Contaminants and Moisture. Approved Document C (BRE 2004);

ii) Concrete in aggressive ground SD1 (BRE 2005); and

iii) Technical guidance on the assessment of soil chemistry with respect to its potential to corrode plastic service pipes has been published by the Water Regulations Advisory Scheme (WRAS, 2002).

3.3 Potential to Harm Ecosystems, Animals, Crops etc

The criteria routinely used by PBA as Tier 2 screening values to assess the potential of soil chemistry to harm ecosystems are taken from the following guidance and summarised in are given in Table 2.

i) Ecological Risk Assessment (ERA) Science Report Series SC070009, published by the Environment Agency, Bristol (EA, 2008);

ii) The Restoration and Aftercare of Metalliferous Mining Sites for Pasture and Grazing (ICRCL 70/90, 1990); and

iii) Code of Practice for Agricultural Use of Sewage Sludge (DOE, 1993).

4 Tier 2 Screening Values for Assessing Controlled Waters

4.1 Potential Harm to Human Health

The criteria routinely used by PBA as Tier 2 water screening values are taken from the Water Supply (Water Quality) Regulations 2000 (DETR (2000a) and are given in Table 3.

It should be noted that some of the prescribed concentrations listed in the Water Supply Regulations have been set for reasons other than their potential to cause harm to human health. The concentrations of iron and manganese are controlled because they may taint potable water with an undesirable taste, odour or colour or may potentially deposit precipitates in water supply pipes.

4.2 Potential to Harm Controlled Waters

Controlled Waters are rivers, estuaries, coastal waters, lakes and groundwaters, but not perched waters.

The criteria routinely used by PBA as Tier 2 screening values are taken from the directions to the Environment Agency in regard to the implementation of the Water Framework Directive (EA 2009d) and are given in Tables 3, 4 and 5.

Table 3 presents the criteria for assessing the chemistry of groundwater bodies and Tables 4 and 5 present the criteria for assessing the chemistry of surface water bodies.

The results from any eluted liquids will be compared to appropriate assessment criteria depending on the receptor of concern.

5 Tier 2 Screening Guidance for Assessing Soil Gases

Guidance on the assessment of risks specifically for sites located adjacent to Landfill Sites has been published by the Environment Agency (EA, 2004d). A tiered approach to assessing risk is advocated by the guidance. This allows the level

of detail in a risk assessment to be proportionate to the nature and complexity of the risk.

The Tier 1 Risk Screening methodology advocated by the Environment Agency (EA) guidance document (EA, 2004) should:

i) Identify complete source-pathway-receptor linkages;

ii) Screen out insignificant risks;

iii) Prioritise the risks and receptors; and

iv) Provide an initial assessment of the potential impacts at a receptor.

A Tier 2 assessment comprises the quantitative analysis of risk following the collection and analysis of soil gas monitoring data.

Guidance on suitable methodologies for the collection of gas monitoring data is provided in CIRIA Report C665 (CIRIA, 2007).

Guidance Available PBA use the following primary guidance to assess the significance of soil gas chemistry with respect to its potential to harm human health.

i) Assessing risks posed by hazardous gases to buildings C665 (CIRIA 2007);

ii) Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present. (NHBC 2007);

iii) Code of practice for the characterization and remediation from ground gas is affected developments (BSI, 2007); and

iv) Waste Management Paper No. 27 (DoE, 1991).

Waste Management Paper No. 27 (DoE, 1991) defines what constitutes a "significant quantity" of gas. WMP27 advises that a site producing (i) Methane concentrations in excess of 1% by volume and with a flow rate of greater than 15 litres per hour; or (ii) Carbon dioxide in excess of 1.5% by volume in air and with a flow rate of greater than 22 litres per hour would be considered as a significant source of soil gas.

Guidance on quantifying the risks from hazardous soil gases to properties and their occupiers is provided in CIRIA, 2007 (commercial developments), NHBC, 2007 (low rise residential developments) and British Standard BS 8485:2007. These documents provide guidance on gas monitoring methods and strategy, the assessment of risk posed by soil gases and mitigating the risks posed by soil gases during site development.

PBA use gas concentrations and borehole flow data in order to obtain the gas screening value (GSV) for methane and carbon dioxide at the site. The GSV can be used to establish the characteristic situation of the site as detailed in CIRIA C665 and in order to make recommendations for gas protection measures for buildings if required.

Radon In addition to the guidance listed above, PBA use the following primary guidance to assess the significance of the radon content of soil gas.

i) Radon: guidance on protective measures for new dwellings. Report BR211 (BRE, 1999); and

ii) Radon Atlas of England, R290 (NRPB, 1996).

6 References

BRE (2004) Site preparation and resistance to contaminants and moisture. Approved Document C, The Building Regulations 2000. Building Research Establishment, Garston, Herts.

BRE (2005) Concrete in aggressive ground. Special Digest 1, Building Research Establishment, Garston, Herts.

BRE (1999). Radon: guidance on protective measures for new dwellings. Report BR211, Building Research Establishment, Garston, Herts.

BSI (2007) BS 8485:2007 Code of practice for the characterization and remediation from ground gas is affected developments. British Standards Institute, London.

CIRIA (2007) Assessing risks posed by hazardous gases to buildings. C665, Construction Industry Research and Information Association, London.

CL:AIRE (2010). Soil Generic Assessment Criteria for Human Health Risk Assessment. Published in January 2010 by Contaminated Land: Applications in Real Environments, London. ISBN 978-1-905046-20-1.

CLAN2-05 Contaminated land advice note 02 from September 2005. Department for the Environment, Food and Rural Affairs, London.

CLSD (2009) Contaminated-Land-Strategies Digest - 30 Apr 2009 to 1 May 2009 - Special issue (#2009-89). Posting titled: "JISCmail GACs for SGV substances: April 2009 and subsequent postings".

DETR (2000a) The Water Supply (Water Quality) Regulations, 2000. Statutory Instrument 2000 No 3184, Department of the Environment, Transport and the Regions, London.

DoE (1991) Landfill Gas, Waste Management Paper No. 27. Department of the Environment, London.

DoE (1993) Code of Practice for Agricultural Use of Sewage Sludge. Department of the Environment, London.

EA (2004) Guidance on Assessment of Risks from Landfill Sites. Environment Agency, Bristol.

EA (2006b) CLEA update No. 4. Environment Agency, Bristol.

EA (2008) Ecological Risk Assessment (ERA). Science Report Series SC070009, Environment Agency, Bristol.

EA (2009a) Using Soil Guideline Values. Science Report SC050021/SGV Introduction. Environment Agency, Bristol.

EA (2009b) Updated Technical Background to the CLEA model. Science Report SC050021/SR3 Introduction. Environment Agency, Bristol.

EA (2009c) Human health toxicological assessment of contaminants in soil. Science Report SC050021/SR2. Environment Agency, Bristol.

EA (2009d) River Basin Typology, Standards and Groundwater threshold values (Water Framework Directive) England and Wales) Direction 2009.

ICRCL (1990) The Restoration and Aftercare of Metalliferous Mining Sites for Pasture and Grazing 70/90. Interdepartmental Committee on the Redevelopment of Contaminated Land, London.

LQM & CIEH (2006) Generic Assessment Criteria for Human Health Risk Assessment. Land Quality Management Limited and the Chartered Institute of Environmental Health, London.

LQM & CIEH (2009) The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment (2nd Edition). Land Quality Press, Nottingham. ISBN 0-9547474-7-X.

NRPB (1996) Radon Atlas of England. R290, National Radiological Protection Board, Didcot, Oxfordshire.

NHBC (2007) Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present. National House Building Council.

WRAS (2002) The selection of materials for water supply pipes to be laid in contaminated land. Water Regulations Advisory Scheme.

Table 1: Tier 2 Screening Criteria for the Assessment of Potential Contaminant Concentrations in Soil – Protection of Human Health

Determinand	Allotments	Residential with plant uptake	Residential without plant uptake	Commercial/ Industrial
Metals/Metalloids				
Arsenic (Inorganic)	43[a]	32[a]	35[f]	640[a]
Beryllium	55[c]	51[c]	-	420[c]
Boron	45[c]	291[c]	-	192,000[c]
Cadmium	1.8[a]	10[a]	117[f]	230[a]
Chromium (trivalent)	34,600[c]	3000[c]	-	30,400[c]
Chromium (hexavalent)	2.1[c]	4.3[c]	-	35[c]
Copper	524[c]	2330[c]	-	71,700[c]
Lead	-	450[b]	450[b]	750[b]
Mercury (elemental)	1[a]	26[a]	-	26[a]
Mercury (inorganic)	80[a]	170[a]	235[f]	3600[a]
Methyl Mercury	8[a]	11[a]	-	410[a]
Nickel	230[a]	130[a]	130[f]	1800[a]
Selenium	120[a]	350[a]	595[f]	13000[a]
Vanadium	18[c]	75[c]	-	3160[c]
Zinc	618[c]	3750[c]	-	665,000[c]
BTEX Compounds (1%, 3% and 6% SOM)[d]				
Benzene	0.02[f] / 0.04[f] / 0.07[a]	0.08[f] / 0.18[f] / 0.33[a]	0.27[f] / 0.56[f] / 1.0[f]	28[f] / 57[f] / 95[a]
Toluene	22[f] / 60[f] / 120[a]	120[f] / 320[f] / 610[a]	600[f] / 1500[f] / 2700[f]	870[f]/ 2200[f] / 4400[a]
Ethylbenzene	16[f] / 45[f] / 90[a]	65[f] / 180[f] / 350[a]	165[f] / 450[f] / 840[f]	520[f] / 1400[f] / 2800[a]
Xylenes #	28[f] / 80[f] / 160[a]	42[f] / 120[f] / 230[a]	53[f] / 145[f] / 285[f]	475[f] / 1300[f] / 2600[a]
Polycyclic Aromatic Hydrocarbons (1%, 2.5% and 6% SOM)[d]				
Acenaphthene	34[c] / 85[c] / 200[c]	210[c] / 480[c] / 1000[c]	-	85000[c] / 98000[c] / 100000[c]
Acenaphthylene	28[c] / 69[c] / 160[c]	170[c] / 400[c] / 850[c]	-	84000[c] / 97000[c] / 100000[c]
Anthracene	380[c] / 950[c] / 2200[c]	2300[c] / 4900[c] / 9200[c]	-	530000[c] / 540000[c] / 540000[c]
Benzo(a)anthracene	2.5[c] / 5.5[c] / 10[c]	3.1[c] / 4.7[c] / 5.9[c]	-	90[c] / 95[c] / 97[c]
Benzo(a)pyrene	0.60[c] / 1.2[c] / 2.1[c]	0.83[c] / 0.94[c] / 1.0[c]	-	14[c] / 14[c] / 14[c]
benzo(b)fluoranthene	3.5[c] / 7.4[c] / 13[c]	5.6[c] / 6.5[c] / 7.0[c]	-	100[c] / 100[c] / 100[c]
benzo(g,h,i)perylene	70[c] / 120[c] / 160[c]	44[c] / 46[c] / 47[c]	-	650[c] / 660[c] / 660[c]
benzo(k)fluoranthene	6.8[c] / 14[c] / 23[c]	8.5[c] / 9.6[c] / 10[c]	-	140[c] / 140[c] / 140[c]
Chrysene	2.6[c] / 5.8[c] / 12[c]	6.0[c] / 8.0[c] / 9.3[c]	-	140[c] / 140[c] / 140[c]
Dibenzo(a,h)anthracene	0.76[c] / 1.5[c] / 2.3[c]	0.76[c] / 0.86[c] / 0.90[c]	-	13[c] / 13[c] / 13[c]
Fluoranthene	52[c] / 130[c] / 290[c]	260[c] / 460[c] / 670[c]	-	23000[c] / 23000[c] / 23000[c]
Fluorene	27[c] / 67[c] / 160[c]	160[c] / 380[c] / 780[c]	-	64000[c] / 69000[c] / 71000[c]
Indeno(1,2,3-cd)pyrene	1.8[c] / 3.8[c] / 7.1[c]	3.2[c] / 3.9[c] / 4.2[c]	-	60[c] / 61[c] / 61[c]
Naphthalene	4.1[c] / 9.9[c] / 23[c]	1.5[c] / 3.7[c] / 8.7[c]	-	200[c] / 480[c] / 1100[c]
Phenanthrene	16[c] / 38[c] / 90[c]	92[c] / 200[c] / 380[c]	-	22000[c] / 22000[c] / 23000[c]
Pyrene	110[c] / 270[c] / 620[c]	560[c] / 1000[c] / 1600[c]	-	54000[c] / 54000[c] / 54000[c]
Aliphatic/Aromatic Hydrocarbons (1%, 2.5% and 6% SOM)[d]				
TPH Aliphatic >C5-6	740[c] / 1700[c] / 3900[c]	30[c] / 55[c] / 110[c]	-	3400[c] / 6200[c] / 13000[c]
TPH Aliphatic >C6-8	2300[c] / 5600[c] / 13000[c]	73[c] / 160[c] / 370[c]	-	8300[c] / 18000[c] / 42000[c]
TPH Aliphatic >C8-10	320[c] / 770[c] / 1700[c]	19[c] / 46[c] / 110[c]	-	2100[c] / 5100[c] / 12000[c]
TPH Aliphatic >C10-12	2200[c] / 4400[c] / 7300[c]	93[c] / 230[c] / 540[c]	-	10000[c] / 24000[c] / 49000[c]
TPH Aliphatic >C12-16	11000[c] / 13000[c] / 13000[c]	740[c] / 1700[c] / 3000[c]	-	61000[c] / 83000[c] / 91000[c]

Determinand	Allotments	Residential with plant uptake	Residential without plant uptake	Commercial/ Industrial
TPH Aliphatic >C16-35	260000[c] / 270000[c] / 270000[c]	45000[c] / 64000[c] / 76000[c]	-	1600000[c] / 1800000[c] / 1800000[c]
TPH Aliphatic >C35-44	260000[c] / 270000[c] / 270000[c]	45000[c] / 64000[c] / 76000[c]	-	1600000[c] / 1800000[c] / 1800000[c]
TPH Aromatic >C5-7 (benzene)	13[c] / 27[c] / 57[c]	65[c] / 130[c] / 280[c]	-	28000[c] / 49000[c] / 90000[c]
TPH Aromatic >C7-8 (toluene)	22[c] / 51[c] / 120[c]	120[c] / 270[c] / 611[c]	-	59000[c] / 110000[c] / 190000[c]
TPH Aromatic >C8-10	8.6[c] / 21[c] / 51[c]	27[c] / 65[c] / 151[c]	-	3700[c] / 8600[c] / 18000[c]
TPH Aromatic >C10-12	13[c] / 31[c] / 74[c]	69[c] / 160[c] / 346[c]	-	17000[c] / 29000[c] / 34500[c]
TPH Aromatic >C12-16	23[c] / 57[c] / 130[c]	140[c] / 310[c] / 593[c]	-	36000[c] / 37000 /[c] 37800[c]
TPH Aromatic >C16-21	46[c] / 110[c] / 260[c]	250[c] / 480[c] / 770[c]	-	28000[c] / 28000[c] / 28000[c]
TPH Aromatic >C21-35	370[c] / 820[c] / 1600[c]	890[c] / 1100[c] / 1230[c]	-	28000[c] / 28000[c] / 28000[c]
TPH Aromatic >C35-44	370[c] / 820[c] / 1600[c]	890[c] / 1100[c] / 1230[c]	-	28000[c] / 28000[c] / 28000[c]
TPH Aliphatic + Aromatic >C44-70	1200[c] / 2100[c] / 3000[c]	1200[c] / 1300[c] / 1300[c]	-	28000[c] / 28000[c] / 28000[c]
Chlorinated Hydrocarbons (1%, 2.5% and 6% SOM) [d]				
1,2-dichloroethane	0.0046[c] / 0.0083[c] / 0.016[c]	0.0054[c] / 0.0080[c] / 0.014[c]	-	0.71[c] / 1.0[c] / 1.8[c]
1,1,1 Trichloroethane (TCA)	48[c] / 110[c] / 240[c]	6.2[c] / 13[c] / 28[c]	-	700[c] / 1400[c] / 3100[c]
1,1,1,2 Tetrachloroethane	0.79[c] / 1.9[c] / 4.4[c]	0.90[c] / 2.1[c] / 4.8[c]	-	120[c] / 260[c] / 590[c]
1,1,2,2 Tetrachloroethane	0.41[c] / 0.89[c] / 2.0[c]	1.4[c] / 2.9[c] / 6.3[c]	-	290[c] / 580[c] / 1200[c]
Tetrachloroethene (PCE)	1.6[c] / 3.7[c] / 8.7[c]	0.94[c] / 2.1[c] / 4.8[c]	-	130[c] / 290 / 660[c]
Tetrachloromethane	0.16[c] / 0.37[c] / 0.85[c]	0.018[c] / 0.039[c] / 0.089[c]	-	3.0[c] / 6.6 / 15[c]
Trichloroethene (TCE)	0.43[c] / 0.95[c] / 2.2[c]	0.11[c] / 0.22[c] / 0.49[c]	-	12[c] / 25[c] / 55[c]
Trichloromethane/Chloroform	0.36[c] / 0.70[c] / 1.5[c]	0.75[c] / 1.3[c] / 2.7[c]	-	110[c] / 190[c] / 370[c]
Vinyl Chloride/Chloroethene	0.00055[c] / 0.0010[c] / 0.0018[c]	0.00047[c] / 0.00064[c] / 0.00099[c]	-	0.063[c] / 0.081[c] / 0.12[c]
Pesticides and Other Organic Compounds (1%, 2.5% and 6% SOM) [d]				
Aldrin	1.3[c] / 2.6[c] / 4.0[c]	1.7[c] / 2.0[c] / 2.1[c]	-	54[c] / 54[c] / 54[c]
Atrazine	0.037[c] / 0.085[c] / 0.2[c]	0.24[c] / 0.56[c] / 1.3[c]	-	870[c] / 880[c] / 880[c]
Dichlorvos	0.044[c] / 0.091[c] / 0.20[c]	0.29[c] / 0.6[c] / 1.3[c]	-	842[c] / 872[c] / 893[c]
Dieldrin	0.13[c] / 0.32[c] / 0.73[c]	0.69[c] / 1.4[c] / 2.2[c]	-	90[c] / 91[c] / 92[c]
Endosulfan	0.47[c] / 1.2[c] / 2.7[c]	2.9[c] / 7.0[c] / 16[c]	-	2310[c] / 2990[c] / 3390[c]
Carbon Disulphide	4.8[c] / 10[c] / 23[c]	0.10[c] / 0.20[c] / 0.44[c]	-	12[c] / 23[c] / 50[c]
Chlorobenzene	5.9[c] / 14[c] / 32[c]	0.33[c] / 0.73[c] / 1.7[c]	-	59[c] / 130[c] / 310[c]
Hexachloro-1,3-butadiene	0.25[c] / 0.61[c] / 1.4[c]	0.21[c] / 0.51[c] / 1.2[c]	-	32[c] / 69[c] / 120[c]
Hexachlorobenzene	0.18[c] / 0.42[c] / 0.92[c]	0.59[c] / 1.0[c] / 1.4[c]	-	48[c] / 53[c] / 55[c]
Pentachlorobenzene	1.2[c] / 3.1[c] / 7.1[c]	5.2[c] / 10[c] / 17[c]	-	650[c] / 770[c] / 830[c]
Pentachlorophenol	0.084[c] / 0.21[c] / 0.49[c]	0.55[c] / 1.3[c] / 2.96[c]	-	1200[c] / 1300[c] / 1400[c]
Phenol (1, 3, 6% SOM)	66[f] / 158[f] / 280[a]	184[f] / 316[f] / 420[a]	310[f] / 441[f] / 519[f]	3200[a]
Dioxins, Furans and dioxin-like PCBs	8[a]	8[a]		240[a]

Notes

Units mg/kg

\# most conservative of the three isomers selected for each scenario

a Soil Guideline Value (2009) with SOM of 6%

b Soil Guideline Value (2002)

c Generic Assessment Criteria (LQM & CIEH 2009)

d Where three values are presented, SGV/GAC for soils with SOM of 1%, 2.5% and 6% or 1%, 3% and 6% are given as detailed in the table. SOM denotes Soil Organic Matter.

f Generic Assessment Criteria generated using CLEA v 1.04 by an independent contaminated land working group and independently verified by PBA (CLSD, 2009)

Table 2 Tier 2 Screening Criteria for the Assessment of Potential Contaminant Concentrations in Soil – Protection of Ecological Systems

Parameter	ICRCL 70/90 [a]			Proposed SSVs [b]	Code of Practice for Agricultural Use of Sewage Sludge [c]
	Threshold [d]	Maximum			
		Livestock	Crop Growth		
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Benzo(a)pyrene				0.15	
Arsenic	50	500	1000		50
Cadmium	3	30	50	1.15	3
Chromium				21.1	400
Copper	250	500	250	88.4	80/ 100/ 135/ 200 [e]
Fluoride	500	1000			500
Lead	300	1000		167.9	300
Mercury				0.06	1
Molybdenum					4
Nickel				25.1	50/ 60/ 75/ 110 [e]
Pentachlorobenzene				0.029	
Pentachlorophenol				0.6	
Selenium					3
Tetrachloroethene				0.01	
Toluene				0.3	
Zinc	1000	3000	1000	90.1	200/ 200/ 200/ 300 [e]

Notes

a. Interdepartmental Committee on the Redevelopment of Contaminated Land (ICRCL) 70/90 Restoration and Aftercare of Metalliferous Mining Sites for Pasture and Grazing 1st edition 1990.

b. Proposed Soil Screening Values (SSVs) – Consultation, Environment Agency 2008. Threshold which if exceeded prompts further assessment.

c. Maximum permissible concentration of potentially toxic elements from the Code of Practice for Agricultural Use of Sewage Sludge. Second Edition. DOE 1993.

d. Concentrations are for contamination derived from mine spoil. In other situations the speciation may be more available. Factors include total concentration, speciation, particle size, pH, species of plant, type of animal/grazing habit.

e. Where four values are presented, concentrations are for soils with pH values 5.0-5.5/ 5.5-6.0/ 6.0-7.0/ >7.0

Table 3: Tier 2 Criteria for Screening Selected Contaminants in Groundwater

Parameter	Protection of Human Health	Protection of Controlled Waters			
	Water Supply (Water Quality) Regulations 2000	Test 2 Minimum	Test 2 Maximum	Test 4	Test 5
Metal/Semi Metal:					
Antimony (µg/l)	5				
Arsenic (µg/l)	10	51.6	199	7.5	
Boron (µg/l)	1000			750	
Cadmium (µg/l)	5	0.2	1.1	3.75	
Chromium (µg/l)	50	5	27.6	37.5	
Copper (µg/l)	2000	10.1	57.8	1500	
Iron (µg/l)	200				
Lead (µg/l)	25 (10 from 25/12/13)	7.3	39.8	18.8	
Manganese (µg/l)	50				
Mercury (µg/l)	1			0.75	
Nickel (µg/l)	20	20.2	116	15	
Selenium (µg/l)	10				
Zinc (µg/l)	-	75.8	414	3750	
Other:					
Ammonium NH4 (mg/l)	0.5				
Ammonia NH3 (mg/l)	-	0.3	1.73	0.29	0.29
Chloride (mg/l)	250			188	187.5
Cyanide (mg/l)	50				
Electrical Conductivity (µS/cm)	2500			1880	
pH (pH units)	6.5 to 10				
Nitrate (mg/l)	50			42	42
Sulphate (mg/l)	250			188	188
Organics:					
Anthracene		0.1	0.55		
Benzene (µg/l)	1	10.1	55.2	0.75	0.75
Benzo(a)pyrene (µg/l)	0.01			0.075	
Chloroform (µg/l)	100 a	2.53	13.8	75	75
1.2-Dichloroethane (µg/l)	3			2.25	2.25
Fluoranthene		0.1	0.6		
Naphthalene (µg/l)	-	2.4	13.2		
Phenol Total (mg/l)	0.5	15.2	82.8		
PAHs (µg/l)	0.1 b				
Toluene (µg/l)	-	50.5	276		
Trichloroethene TCE (µg/l)	10 c	10.1	55.2	7.5	7.5
Tetrachloroethene PCE (µg/l)	10 c	10.1	57.8	7.5	7.5
Vinyl Chloride (µg/l)	0.5				
Xylene (µg/l)	-	30.3	166		

Notes

TV Threshold Values for each groundwater body are given in the River Basin Management Plans

Test 2 Groundwater Impacts on Surface Water

Test 4 Groundwater Drinking Water Protected Areas – designed to be equivalent to a 95% standard

Test 5 General Quality of Groundwater Body – designed to be equivalent to a 95% standard

a. Sum for Trihalomethanes – chloroform, bromoform, dibromochloromethane, bromodichloromethane

b. Concentration for sum of benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene, indeno(1,2,3-cd)pyrene

c. Sum of TCE and PCE

Table 4: Surface Waters - Specific Pollutants – Standards for Ecological Status

Pollutant	Rivers and Freshwater Lakes	Transitional and Coastal Waters
2,4-Dichlorophenoxyacetic acid (2,4-D)	0.3 (1.3)*	0.3 (1.3)*
2,4-Dichlorophenol	20	20
Ammonia (Un-ionised) as Nitrogen	Not applicable	21
Arsenic #	50	25
Chlorine (total available)	2 (5)*	(10)*
Chromium VI	3.4	0.6 (32)*
Chromium III	4.7	(32)*
Copper – standard is hardness dependant for freshwater	1 (CaCO3 <50mg/l) 6 (CaCO3 50-<100mg/l) 10 (CaCO3 100-<250mg/l) 28 (CaCO3 >250mg/l)	5
Cyanide	1 (5)*	1 (5)*
Cypermethrin as ng/l	0.1 (0.4)*	0.1 (0.4)*
Diazinon	0.01 (0.02)*	0.01 (0.1)*
Dimethoate	0.48 (4)*	0.48 (4)*
Iron as mg/l	1	1
Linuron	0.5 (0.9)*	0.5 (0.9)*
Mecoprop	18 (187)*	18 (187)*
Permethrin	(0.01)	(0.01)
Phenol	7.7 (46)*	7.7 (46)*
Toluene	50 (380)*	40 (370)*
Zinc – standard is hardness dependant for freshwater	8 (CaCO3 <50mg/l) 50 (CaCO3 50-<100mg/l) 75 (CaCO3 100-<250mg/l) 125 (CaCO3 >250mg/l)	40

i. All units ug/l unless otherwise stated.
ii. The standard is the annual mean standard over a period of 12 consecutive months unless otherwise stated.
iii. ( ) indicates that this is the 95-percentile standard where the standard is failed if the measured concentration is above the standard for 5% or more of the time.
iv. * indicates that the standard is not to be used for the purpose of classifying the ecological status or potential of bodies of surface water.
v. # indicates that the standard is the dissolved fraction obtained by filtration through a 0.45um filter.

Reproduced from Part 4 of The River Basin Districts Typology, Standards and Groundwater threshold values (Water Framework Directive) (England and Wales) Direction 2009.

Table 5: Surface Waters - Priority Substances – Standards for Chemical Status

Pollutant	***Annual Average***		***Maximum Allowable Concentration***	
	Inland	***Other***	***Inland***	***Other***
Alachlor	0.3	0.3	0.7	0.7
Anthracene	0.1	0.1	0.4	0.4
Atrazine	0.6	0.6	2.0	2.0
Benzene	10	8	50	50
Brominated diphenylether	0.0005	0.0002	NA	NA

Pollutant	***Annual Average***		***Maximum Allowable Concentration***	
	Inland	***Other***	***Inland***	***Other***
Cadmium (and its compounds) # – hardness dependant – refer to Notes for definitions of C1 to C5	<0.08 C1 0.08 C2 0.09 C3 0.15 C4 0.25 C5	0.2	<0.45 C1 0.45 C2 0.6 C3 0.9 C4 1.5 C5	<0.45 C1 0.45 C2 0.6 C3 0.9 C4 1.5 C5
Carbon tetrachloride	12	12	NA	NA
C10-13 Chloroalkanes	0.4	0.4	1.4	1.4
Chlorfenvinphos	0.1	0.1	0.3	0.3
Chlorpyrifos	0.03	0.03	0.1	0.1
Aldrin, Dieldin, Endrin, Isodrin (Sum)	0.01	0.005	NA	NA
DDT Total	0.025	0.25	NA	NA
Para-para-DDT	0.01	0.01	NA	NA
1,2-Dichloroethane	10	10	NA	NA
Dichloromethane	20	20	NA	NA
Di(2-ethylhexyl)-phthalate (DEHP)	1.3	1.3	NA	NA
Diuron	0.2	0.2	1.8	1.8
Endosulfan	0.005	0.005	0.01	0.01
Fluoranthene	0.1	0.1	1	1
Hexachlorobenzene	0.01	0.01	0.05	0.05
Hexachlorobutadiene	0.1	0.1	0.6	0.6
Hexachlorocyclohexane	0.02	0.002	0.04	0.02
Isoproturon	0.3	0.3	1	1
Lead (and its compounds) #	7.2	7.2	NA	NA
Mercury (and its compounds) #	0.05	0.05	0.07	0.07
Naphthalene	2.4	1.2	NA	NA
Nickel (and its compounds) #	20	20	NA	NA
Nonylphenol	0.3	0.3	2	2
Octylphenol	0.1	0.01	NA	NA
Pentachlorobenzene	0.007	0.0007	NA	NA
Pentachlorophenol	0.4	0.4	1	1
Benzo(a)pyrene	0.05	0.05	0.1	0.1
Benzo(b)fluoranthene + Benzo(k)fluoranthene	0.03	0.03	NA	NA
Benzo(ghi)perylene + Indeno(1,2,3-cd)pyrene	0.002	0.002	NA	NA
Simazine	1	1	4	4
Tetrachloroethylene	10	10	NA	NA
Trichloroethylene	10	10	NA	NA
Tributyl tin compounds	0.0002	0.0002	0.0015	0.0015
Trichlorobenzenes	0.4	0.4	NA	NA
Trichloromethane	2.5	2.5	NA	NA
Tifluralin	0.03	0.03	NA	NA

i. The EQS are expressed as total concentrations in the whole water sample except for #.
ii. # indicates that the EQS is dissolved concentration obtained by filtration through 0.45um filter.
iii. Inland = surface waters encompassing rivers and lakes and related artificial or heavily modified water bodies.
iv. Hardness Classifications C1 <40 mg CaCO3/l, C2 40 to <50 mg CaCO3/l, C3 50 to <100 mg CaCO3/l, C4 100 to <200 mg CaCO3/l, C5 200 mg CaCO3/l.

Reproduced from Part 5 of The River Basin Districts Typology, Standards and Groundwater threshold values (Water Framework Directive) (England and Wales) Direction 2009.

1 Introduction

This document defines the approach adopted by PBA in relation to the assessment of potentially contaminated land. The aim is for the approach to (i) be systematic and objective, (ii) provide for the assessment of uncertainty and (iii) provide a rational, consistent, transparent framework.

When preparing our methodology we have made reference to various technical guidance documents including the Model Procedures for the Management of Contamination (CLR 11) (EA 2003), Contaminated Land investigation, assessment and remediation (ICE 2007), Guidance for the Safe Development of Housing on Land Affected by Contamination (R&D Publication 66) (EA/NHBC/CIEH 2008) and Contaminated land risk assessment: A guide to good practice (C552) (CIRIA 2001).

2 Part 2A, Planning & Building Control

UK legislation aims to help address the problem of historic contamination of land and the risks it can pose to people's health and the environment. The legislation allows for required remediation and voluntary remediation through the planning system.

2.1 Part 2 A

The Environment Act 1995 introduced Part IIA into the Environmental Protection Act 1990. Part IIA, its accompanying regulations and Statutory Guidance contained in DETR Circular 02/2000 came into force in England in April 2000.

Part IIA defines contaminated land as "*land which appears to the Local Authority in whose area it is situated to be in such a condition that, by reason of substances in, on or under the land that significant harm is being caused, or there is a significant possibility that such harm could be caused, or pollution of controlled waters is being, or likely to be, caused*".

Harm is defined as "*harm to the health of living organisms or other interference with the ecological systems of which they form part, and in the case of man, includes harm to his property*".

The legislation was extended in August 2006 to include radiological hazards (now referred to as Part 2A). For the purposes of Part 2A land is contaminated if it poses a significant possibility of significant harm (SPOSH). Statuary guidance is given in Defra Circular 01/2006. Non statutory guidance on the legal definition of contaminated land is given in Defra 2008 and para 18 states "*the law takes a risk-based approach because it is the only way in which it can, at least in principle, target land where there is SPOSH, whilst avoiding the disproportionate effects of catching land where there is no SPOSH. It also helps focus remediation on reducing risks, rather than the removal of contaminants from soil irrespective of risk (which would in some cases be unsustainable and unnecessary).*

2.2 Planning

The Local Planning Authority (LPA) is responsible under various Planning Acts for the control of development, and in doing so, it has a duty to take account of all material considerations, including contamination. "Planning Policy Statement 23 Planning & Pollution Control (ODPM 2004): and Annex 2: Development on Land Affected by Contamination" expands on the policy considerations the Government expects Local Planning Authorities (LPA) to have in regard to land affected by contamination when preparing policies for development plans and in taking decisions on applications. This PPS applies in England only.

For planning purposes, PPS23 states that the assessment of risks arising from contamination and remediation requirements should be considered on the basis of the current environmental setting, the current land use, and the circumstances of its proposed new use. In most other respects, however, the underlying approach to identifying and dealing with risk, and the overall policy objective of safeguarding human health and the environment, are similar to that outlined in Part 2A.

A wider range of contamination and receptors is relevant to planning because of its wider spatial perspective, but the degree of harm or pollution relevant to planning and the approach to remediation are essentially the same: i.e. unacceptable risk in planning terms includes the risks addressed by Part 2A. The developer is required to ensure that land, after development, is not capable of being determined as contaminated land under Part IIA of the EPA 1990 and that all unacceptable risks have been addressed.

The principal planning objective is to ensure that any unacceptable risks to human health, buildings and other property and the natural and historical environment from the contaminated condition of the land are identified so that appropriate action can be considered and taken to address those risks. In order to grant a planning permission the Local Planning Authority (LPA) has to be satisfied that there is sufficient information about the

condition of the land, its impacts and the availability of viable remedial options.

It should be noted that PPS23 states because of the widespread potential occurrence of contamination, the possibility should always be considered, regardless of past land use, when development is proposed involving or introducing a particularly sensitive use (housing, schools, hospitals, play areas).

2.3 Building Control

The building control department of the local authority (along with the private sector approved inspectors) are responsible for the operation and enforcement of the Building Regulations 2000 to protect the health, safety and welfare of people in and around buildings.

Building Control Regulations Approved Document C specifically requires the protection of buildings and associated land from the effects of contamination, to be applied (non-exclusively) in all changes of use from commercial or industrial premises, to residential property.

3 Approach

PPS 23 refers to CLR 11 which recommends a phased or tiered approach to risk assessment with the three tiers being:-

- Tier 1 - preliminary – a qualitative assessment forming part of a Phase 1 report,
- Tier 2 - generic - a quantitative assessment using published criteria to screen site specific ground condition data forming part of a Phase 2 report
- Tier 3 - detailed – a quantitative assessment involving the generation of site specific assessment criteria

Each tier of risk assessment comprises the following four stages:-

1. Hazard Identification – identifying potential contaminant sources on and off site;
2. Hazard Assessment – assessing the potential for unacceptable risks by identifying what pathways and receptors could be present, and what pollutant linkages could result (forming the Conceptual Site Model (CSM));
3. Risk Estimation – estimating the magnitude and probability of the possible consequences (what degree of harm might result to a defined receptor and how likely); and
4. Risk Evaluation – evaluating whether the risk needs to be, and can be, managed.

A PBA Phase 1 report normally comprises a desk study, walkover and Tier 1 risk assessment (the project specific offer defines the actual scope of work). At Tier 1 the PBA approach to risk estimation involves identifying the magnitude of the potential consequence (taking into account both the potential severity of the hazard and the sensitivity of the receptor) and the magnitude of the likelihood i.e. the probability (taking into account the presence of the hazard and the receptor and the integrity of the pathway). This approach is promoted in current guidance such as R&D 66 (NHBC 2008).

The PBA approach is that if a pollution linkage is identified then it represents a potential risk which requires further consideration and either (1) remediation / direct risk management or (2) further tiers of assessment.

A PBA preliminary Phase 2 report comprises an intrusive investigation to collect site specific information, a Tier 2 quantitative generic risk assessment and a refinement of the CSM using the site specific data. Depending on the findings further investigation and/or progression to Tier 3 risk assessment and the generation of site specific assessment criteria may be required.

The PBA methodology provides an estimate of the level of risk, it does not identify a risk level at which the risk is considered "significant" and/or "unacceptable" as this is dependant on the view of the individual / stakeholder. For example; to a risk adverse stakeholder even a risk level of "very low" may be considered unacceptable and as such this stakeholder may require risk management options to be implemented.

4 Identification of Pollutant Linkages and Conceptual Site Model (CSM)

For all Tiers the underlying principle to ground condition assessment is the identification of *pollutant linkages* in order to evaluate whether the presence of a source of contamination could potentially lead to harmful consequences. A pollutant linkage consists of the following three elements:-

- A source/hazard – a substance or situation which has the potential to cause harm or pollution;
- A pathway – a means by which the hazard moves along / generates exposure; and
- A receptor/target – an entity which is vulnerable to the potential adverse effects of the hazard.

The *Conceptual Site Model* identifies the types and locations of potential contaminant sources/hazards and potential receptors and potential migration/transportation pathway(s). The

CSM is refined as the assessment progresses through the Tiers.

4.1 Hazard Identification

A hazard is a substance or situation that has the potential to cause harm. Hazards may be chemical, biological or physical (e.g. explosive gases).

At Tier 1 the potential for hazards to be present is determined from consideration of the previous or ongoing activities on or near to the site in accordance with the criteria presented in the **Table 1**.

Based on the land use information Potential Contaminants of Concern (PCOC) are identified. The PCOC direct the scope of the analytical testing selected for subsequent Tiers and the collection of site specific data.

At Tier 2 the site specific data is screened using published assessment criteria (refer to PBA document entitled Rationale for the Selection of Tier 2 Assessment Criteria). In general, published criteria have been developed using highly conservative assumptions and therefore if the criterion is not exceeded then the PCOC is eliminated as a potential Hazard. It should be noted that exceedance does not necessarily indicate that a site is contaminated and/or unsuitable for use only that the PCOC is retained as a potential Hazard. Published criteria are generated using models based on numerous and complex assumptions. The appropriateness of these assumptions in a site-specific context requires confirmation on a project by project basis.

4.2 Receptor and Pathway Identification

For all Tiers the potential receptors (for both on site and adjoining land) that will be considered are:

- Human Health – including current and future occupiers, construction and future maintenance workers, and neighbouring properties/third parties;
- Ecological systems; *[1]
- Controlled waters *[2] – including surface water and groundwater;
- Property, Animal or Crop (existing or proposed) - including buildings, service lines and pipes, crops, livestock, pets, woodland; and
- Archaeological sites and ancient monuments.

*[1] Internationally or nationally designated sites (as defined in the statutory guidance (Draft Circular on Contaminated Land, DETR, 2000)) "in the local area" will be identified as potential ecological receptors. A search radius of 1, 2 or 5km will be utilised depending on the site specific circumstances (see also pathway identification). The Environment Agency has published an ecological risk assessment framework (EA 2008) which promotes (as opposed to statutorily enforces) consideration of additional receptors to include locally protected sites and protected or notable species. These additional potential receptors will only be considered if a Phase 1 habitat survey, undertaken in accordance with guidance (JNCC 1993), is commissioned and the data provided to PBA. It should be noted that without such a survey the Tier 1 risk assessment may conclude that the identification of potential ecological receptors is inconclusive (see Specification).

*[2] the definition of "pollution of controlled water" has been amended by the introduction of Section 86 of the Water Act 2003. For the purposes of Part 2A groundwater does not include waters above the saturated zone and our assessment does not therefore address perched water other than where development causes a pathway to develop.

If a receptor is taken forward for further assessment it will be classified in terms of its sensitivity, the criteria for which are presented in **Table 2**. Table 2 has been generated using descriptions of environmental receptor importance/value given in various guidance documents including R&D 66 (NHBC 2008) and Transport Analysis Guidance (based on DETR 2000). Human health and buildings classifications have been generated by PBA using the attribute description for each class.

The exposure pathway and modes of transport that will be considered are presented in **Table 3**.

4.3 Note regarding Ecological Systems

The Environment Agency (EA) has developed an ecological risk assessment framework which aims to provide a structured approach for assessing the risks to ecology from chemical contaminants in soils (EA 2008). In circumstances where contaminants in water represent a potential risk to aquatic ecosystems then risk assessors will need to consider this separately.

The framework consists of a three tiered process:-

- Tier 1 is a screening step where the site soils chemical data is compared to a soil screening value (SSV)
- Tier 2 uses various tools (including surveys and biological testing) to gather evidence for any harm to the ecological receptors
- Tier 3 seeks to attribute the harm to the chemical contamination

Tier 1 is preceded by a desk study to collate information about the site and the nature of the contamination to assess whether pollutant linkages are feasible. The framework presents ten steps for ecological desk studies and development of a conceptual site model as follows.

1 Establish Regulatory Context
2 Collate and Assess Documentary Information
3 Summarise Documentary Information
4 Identify Potential Contaminants of Concern

5 Identify Likely Fate Transport of Contaminants
6 Identify Potential Receptors of Concern
7 Identify Potential Pathways of Concern
8 Create a Conceptual Site Model
9 Identify Assessment and Measurement Endpoints
10 Identify Gaps and Uncertainties

The information in a standard PBA Phase 1 report covers Steps 1 to 4 inclusive. Step 5 considers fate and transport of contaminants and it should be noted that our standard report adopts a simplified approach considering only transport mechanisms. A simplified approach has also been adopted in respect of Steps 6 and 7 (receptors (a detailed review of the ecological attributes has not been undertaken) and pathways (a food chain assessment has not been undertaken). Step 9 is outside the scope of our standard Phase 1 report.

The Tier 1 prepared by PBA as part of a Phase 1 report will assess the viability of the mode of transport given the site specific circumstances not specific pathways. As with receptor identification it should be noted that without a habitat survey the Tier 1 risk assessment may conclude that the risk to potential ecological receptors is inconclusive (see PBA Specification for Phase 1 Assessment of Potentially Contaminated Land).

5 Risk Estimation

Risk estimation classifies what degree of harm might result to a receptor (defined as consequence) and how likely it is that such harm might arise (probability).

At Tier 1 the consequence classification is generated by multiplying the hazard classification score and the receptor sensitivity score. This approach follows that presented in the republished R&D 66 (NHBC 2008).

The criteria for classifying probability are set out in **Table 4** and have been taken directly from CIRIA C552 (Table 6.4). Probability considers the integrity of the exposure pathway.

The consequence classifications detailed in **Table 5** have been adapted from Table 6.3 presented in C552 and R&D 66 (Annex 4 Table A4.3).

The Tier 1 risk classification is estimated for each pollutant linkage using the matrix given in **Table 6** which is taken directly from C552 (Table 6.5).

Subsequent Tiers refine the CSM through retention or elimination of potential hazards and pollutant linkages.

6 Risk Evaluation

In order to put the Tier 1 risk classification into context the likely actions are described in Table 7 which is taken directly from C552 (Table 6.6).

Subsequent Tiers identify potential risk management options through remediation and/or mitigation measures.

7 References

CIRIA 2001: Contaminated land risk assessment – a guide to good practice C552.

CIRIA 2008: Assessing risks posed by hazardous ground gases to buildings C655

DETR 2000 Methodology for Multi Modal Studies. Volume 2 Section 4 The Environmental Objective.

Defra Circular 02/2000

Defra Circular 01/2006

EA 2004: The Model Procedures for the Management of Land Contamination CRL 11 published by the Environment Agency (EA).

EA/NHBC/CIEH 2008: R&D Publication 66 Guidance for the safe development of housing on land affected by contamination.

EA 2008 Ecological Risk Assessment Science Report Series SC070009 published by the Environment Agency (EA).

ICE 2007: Contaminated Land investigation, assessment and remediation prepared by the Institute of Civil Engineers (ICE)

JNCC 1993 Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit prepared by the Joint Nature Conservancy Council (JNCC)

ODPM 2004: Planning Policy Statement 23 (PPS 23):Planning and Pollution Control.

ODPM 2004 Building Regulations 2000 Approved Document C Site preparation and resistance to contaminants and moisture

Table 1: Criteria for Classifying Hazards / Potential for Generating Contamination

Classification/Score	Potential for generating contamination/gas based on land use
Very Low 1	Land Use: greenfield Contamination: None. Gas generation potential : Inert Made Ground
Low 2	Land Use: residential, retail or office use, recent small scale industrial. Contamination: None or locally slightly elevated concentrations. Gas generation potential : Alluvium or dock silt
Moderate 3	Land Use: railways, collieries, scrap yards, light industry, engineering works. Contamination: Locally elevated concentrations. Gas generation potential : Pre 1960's landfill
High 4	Land Use: gas works, chemical works, heavy industry, non-hazardous landfills. Contamination: Possible widespread elevated concentrations. Gas generation potential : Shallow mine workings
Very High 5	Land Use: hazardous waste landfills. Contamination: Likely widespread elevated concentrations. Gas generation potential : Domestic landfill post 1960

Table 2: Criteria for Classifying Receptor Sensitivity/Value

Classification/Score	Definition
Very Low 1	Receptor of limited importance Groundwater: Non aquifer Surface water: GQA Grade F Ecology: No local designation Buildings: Replaceable Human health: Unoccupied/limited access
Low 2	Receptor of local or county importance with potential for replacement Groundwater: Secondary aquifer Surface water: GQA Grade D/E Ecology: local habitat resources Buildings: Local value Human health: Industrial
Moderate 3	Receptor of local or county importance with potential for replacement Groundwater: Principal aquifer Surface water: GQA Grade B/C Ecology: County wildlife sites, Areas of Outstanding Natural Beauty (AONB) Buildings: Area of Historic Character Human health: Commercial
High 4	Receptor of county or regional importance with limited potential for replacement Groundwater: Source Protection Zone 2 Surface water: GQA Grade A Ecology: SSSI, National or Marine Nature Reserve (NNR or MNR) Buildings: Conservation Area Human health: Open spaces and uses where children are present
Very High 5	Receptor of national or international importance Groundwater: Source Protection Zone 1 Surface water: GQA Grade A Ecology: Special Areas of Conservation (SAC and candidates), Special Protection Areas (SPA and potentials) or wetlands of international importance (RAMSAR) Buildings: World Heritage site Human health: Residential

Table 3: Exposure Pathway and Modes of Transport

Receptor	Pathway	Mode of transport
Human health	Ingestion	Fruit or vegetable leaf or roots
		Contaminated water
		Soil/dust indoors
		Soil/dust outdoors
	Inhalation	Particles (dust / soil) – outdoor
		Particles (dust / soil) - indoor
		Vapours – outdoor - migration via natural or anthropogenic pathways
		Vapours - indoor - migration via natural or anthropogenic pathways
	Dermal absorption	Direct contact with soil
		Direct contact with waters (swimming / showering)
		Irradiation
Groundwater	Leaching	Gravity / permeation
	Migration	Natural – groundwater as pathway Anthropogenic (e.g. boreholes, culverts, pipelines etc.)
Surface Water	Direct	Runoff or discharges from pipes
	Indirect	Recharge from groundwater
	Indirect	Deposition of wind blown dust
Buildings	Direct contact	Sulphate attack on concrete, hydrocarbon corrosion of plastics
	Gas ingress	Migration via natural or anthropogenic paths
Ecological systems	See Notes	Runoff/discharge to surface water body
	See Notes	Windblown dust
	See Notes	Groundwater migration
	See Notes	At point of contaminant source
Animal and crop	Direct	Wind blown or flood deposited particles / dust / sediments
	Indirect	Plants via root up take or irrigation. Animals through watering
	Inhalation	By livestock / fish - gas / vapour / particulates / dust
	Ingestion	Consumption of vegetation / water / soil by animals

Table 4: Classification of Probability

Classification	Definition
High likelihood	There is a pollution linkage and an event either appears very likely in the short-term and almost inevitable over the long-term, or there is already evidence at the receptor of harm / pollution.
Likely	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short-term and likely over the long-term.
Low likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter-term.
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long-term.

Table 6: Classification of Risk (Combination of Consequence and Probability)

	Consequence			
Probability	***Severe***	***Medium***	***Mild***	***Minor***
High likelihood	Very high	High	Moderate	Low
Likely	High	Moderate	Moderate/low	Low
Low likelihood	Moderate	Moderate/low	Low	Very low
Unlikely	Moderate/low	Low	Very low	Very low

Table 5: Classification of Consequence (score = magnitude of hazard and sensitivity of receptor)

Classification / Score	Examples
Severe **20-25**	Human health effect - exposure likely to result in "significant harm". Significant harm to humans is defined in circular 01/2006 as death, disease, serious injury, genetic mutation, birth defects or impairment of reproductive function. Controlled water effect - short-term risk of pollution (note: Water Resources Act contains no scope for considering significance of pollution) of sensitive water resource. Equivalent to EA Category 1 incident (persistent and/or extensive effects on water quality leading to closure of potable abstraction point or loss of amenity, agriculture or commercial value. Major fish kill. Ecological effect - short-term exposure likely to result in a substantial adverse effect. Catastrophic damage to crops, buildings or property
Medium **10-16**	Human health effect - exposure could result in "significant harm". Significant harm to humans is defined in circular 01/2006 as death, disease, serious injury, genetic mutation, birth defects or impairment of reproductive function. Controlled water effect - equivalent to EA Category 2 incident requiring notification of abstractor Ecological effect - short-term exposure may result in a substantial adverse effect. Damage to crops, buildings or property
Mild **6-9**	Human health effect - exposure may result in "significant harm". Significant harm to humans is defined in circular 01/2006 as death, disease, serious injury, genetic mutation, birth defects or impairment of reproductive function. Controlled water effect - equivalent to EA Category 3 incident (short lived and/or minimal effects on water quality). Ecological effect - unlikely to result in a substantial adverse effect. Minor damage to crops, buildings or property. Damage to building rendering it unsafe to occupy (for example foundation damage resulting in instability).
Minor **1-5**	No measurable effect on humans. Protective equipment is not required during site works. Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems. Repairable effects to crops, buildings or property. The loss of plants in a landscaping scheme. Discolouration of concrete.

Table 7: Description of Risks and Likely Action Required

Risk Classification	Description
Very high risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation is likely to be required in the short term.
High risk	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short-term and are likely over the longer-term.
Moderate risk	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer-term.
Low risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very low risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

29th September 2017

Our ref: GE16662/FG02/170929

Geo-Environmental

Lance Else
Linden Homes South
1A Guildford Business Park
Guildford
Surrey
GU2 8XG

Dear Lance,

RE: Woodcroft Farm, Lovedean, PO8 9QA

Further to our recent investigation works at the above site, we write to provide the soil contamination and ground gas risk assessment for the above site.

Geo-Environmental Services Limited was instructed by Linden Homes South, to undertake an investigation of the geo-environmental factors pertaining to Woodcroft Farm, Lovedean, PO8 9QA herein referred to as 'the site'. The site's location is presented in Figure 1 and Figure 2.

The proposed development is understood to comprise a residential redevelopment with private gardens, areas of soft landscaping, public open space and associated development infrastructure.

Site Description

At the time of the intrusive investigation, August 2017, the site predominantly comprised open fields utilised for the grazing of horses. The farm complex area, shown in Figure 3, comprised a farm house located in the south east of the complex area, with private gardens to the front and rear of the property. To the north and west of the farm house were a number of stable blocks that at the time of the site investigation works were occupied by a number of horses. The stable blocks were constructed on hard standing, generally concrete, and comprised a mixture of wooden stables and stables constructed within breeze block barns. These barns were noted to have corrugated roofs that have the potential to contain asbestos.

In the central area and west of the farm complex area was an area utilised for parking, and the storage of scrap type items. This included engines, vehicles (in varying states of repair), a skip of metal, and other assorted metal items. There was also evidence of recent burning activities being undertaken within this area, piles of ash and blackened patches were noted. A manure heap was also located with the central northern part of this area.

Photographs were taken during the site investigation works and are presented in Appendix A.

Geology

British Geological Survey geological mapping indicated the geology of the site to comprise clay, silt, sand, and gravel Head Deposits overlying the Lambeth Group. Given that the farm complex portion of the site comprises areas of hardstanding cover there is the potential that Made Ground may be present beneath some areas of the site.

BS5930:2015 defines **Made Ground** as anthropogenic ground in which the material has been placed without engineering control and/or manufactured by man in some way, such as through crushing or washing, or arising from an industrial process. Great variations in material type, thickness and degree of compaction invariably occur and there can be deleterious or harmful matter, as well as potentially methanogenic organic material. In addition, on sites which have undergone several phases of historic development it is not uncommon for asbestos to be present within Made Ground soils.

Head Deposits are drifts produced by solifluction, the downslope movement of debris outwash during the periglacial period, and characteristically comprise poorly sorted sand, gravel and chalk of local derivation often with an appreciable clay and silt content.

The **Lambeth Group** comprises a mixture of stiff to hard red, blue/grey and brown mottled clays with basal beds of sand and gravel which vary greatly both laterally and vertically. Locally, these sediments are cemented with calcium carbonate, iron oxides and silica to form materials with relatively high strength.

Hydrogeology

With reference to Envirocheck data the superficial deposits (Head Deposits) were classified as a Secondary 'A' Aquifer. The bedrock geology was shown to be located on the boundary of two classifications, Principal Aquifer and Secondary 'A' Aquifer.

Principals Aquifers are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

Secondary 'A' Aquifers comprise permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

According to information provided from the Environment Agency the site was indicated to be located within a Source Protection Zone, Inner Zone (Zone 1), with regard to the protection of groundwater for potable supply.

Asbestos

During the intrusive investigation works it was noted that there was the potential for the stable buildings and barns to contain asbestos therefore, in line with current best practice, asbestos and ACM should be assumed to be present until proven otherwise, this includes the consideration of the potential for asbestos to be present within the shallow soils on the site, e.g. within and beneath concrete slabs and also with Made Ground soils.

Potential Contamination

The site's previous and current uses include use as a farm, scrapyard and part of the site as a landfill (inert).

These types of uses are covered by the National House Building Council (NHBC), Environment Agency (EA) and Chartered Institute of Environmental Health (CIEH) publication 'Guidance for the Safe Development of Housing on Land Affected by Contamination' (2008), which provides a summary of industrial profiles (1995 - 1996) published by the former Department of the Environment (DoE) (now part of the Department for Environment, Food and Rural Affairs [DEFRA]).

Potential contaminants associated with the site's use include heavy metals such as lead, chromium, zinc and copper, organic pollutants such as poly-aromatic hydrocarbons (PAH), Organic solvents, herbicides, insecticides and inorganic compounds, acids/alkalis, and PCBs.

It is possible that a thickness of Made Ground may be present beneath the farm yard complex area. Made Ground or shallow soils may contain contaminants of concern, including metals, non-metal, in organic pollutants, organic pollutants (including PAH/TPH) and asbestos. Previous investigation and testing by others has identified exceedances of PAH compounds, metals and asbestos within the Made Ground soils in the farm yard complex area of the site.

Ground Gas Assessment and Vapour Summary

Environment Agency records shows the south western portion of the site as being a historic licensed inert landfill. This along with the possible presence of Made Ground represent possible sources of ground gases/vapours.

Ground gas monitoring and a ground gas risk assessment was undertaken previously by a third party (PBA). Further comment of the results of this assessment are provided within the environmental considerations section of this letter report.

Preliminary Risk Assessment

A Preliminary Risk Assessment ('PRA') and Conceptual Site Model ('CSM') have been prepared in accordance with CLR11 based on information obtained as part of the desk study. Possible risks associated with potential sources of contamination and sensitive receptors identified have been qualitatively assessed following a source-pathway-receptor ('Pollutant Linkage') approach in accordance with current UK protocols.

A risk of harm may only exist where a plausible pollutant linkage is present, and where the quantity or concentration of a contaminant is sufficient so as to pose harm. Under the statutory definition, "Contamination" may only strictly exist where contaminants pose a risk of harm to a receptor. The risk classification has been assessed in accordance with CIRIA C552 (Rudland et al., 2001). A summary of how the risks are derived and their definitions are presented in Tables 1 and 2.

		Consequence			
		Severe	**Medium**	**Mild**	**Minor**
Probability	**High Likelihood**	Very high risk	High risk	Moderate risk	Moderate/low risk
	Likely	High risk	Moderate risk	Moderate/low risk	Low risk
	Low Likelihood	Moderate risk	Moderate/low risk	Low risk	Very low risk
	Unlikely	Moderate/low risk	Low risk	Very low risk	Very low risk

Table 1 Risk Ratings Matrix

Risk Rating	Definitions
Very high risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not already undertaken) and remediation are likely to be required.
High risk	Harm is likely to arise to a designated receptor from an identified hazard Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not already undertaken) is required and remediation works may be necessary in the short term and are likely over the longer term.
Moderate risk	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild.
Moderate to low risk	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is unlikely that any such harm would be severe, or if any harm were to occur it is probable that the harm would be relatively mild.
Low risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very low risk	There is low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

Table 2 Risk Rating Definitions

Summary of Plausible Sources

Possible sources of contamination identified are summarised in Table 3.

Source	Description	Contaminants
Made Ground and shallow natural soils	The general quality of Made Ground and shallow soils could be impacted by the presence of contamination in view of the site's previous development and former uses. However, this would appear to relate to specific areas or zones of the site with the remainder of the site appearing to have been of greenfield use.	Possible elevated concentrations of metals, metalloids, organic compounds to include TPH and PAH, inorganic compounds such as sulphate and asbestos.
On-site land uses	The site in the part has been used as a farm, a scrap yard and an historic inert landfill. There is also the potential that former activities may have included the storage of fuel/oils on the site which may have resulted in a potential impact to soils	Possible elevated concentrations of metals, metalloids, possible elevated organic pollutants such as TPH and PAH compounds, sulphate and asbestos.

Source	Description	Contaminants
	and groundwater (likely to be a significant depth) beneath the site.	
Asbestos Containing Materials within the fabric of buildings and possibly in shallow soils	There is a likelihood the former and current buildings on site could have been constructed using asbestos containing materials. Consequently, the potential presence of asbestos in the near surface soils cannot be discounted.	Asbestos
Ground gases/vapours	In view of part of the site having possibly been an historic inert landfill coupled with the possible presence of Made Ground, the potential for shallow soils to be impacted locally with hydrocarbons, there is the potential for ground gases and vapours to be present.	Possible presence of ground gases such as methane and carbon dioxide together with depleted oxygen, trace gases and elevated Volatile Organic Compounds.

Table 3 Possible Sources of Contamination

Summary of Plausible Pathways

The plausible pathways are summarised in Table 4. These pathways are based on the proposed end use, including communal gardens and soft landscaping.

Pathway	Description
Direct Contact	Ingestion of soil particles, inhalation of soil derived dust (including tracked back dust), dermal contact. Bioaccumulation within home grown vegetation.
Inhalation	Inhalation of soil dust both inside and outside of buildings.
	Inhalation of ground gas/vapours within buildings.
Vertical & Lateral Migration	Contaminant movement both vertically through leaching/gravity and horizontally along preferential pathways, e.g. services trenches, more permeable bedded strata or with groundwater.
Shallow Groundwater	Shallow groundwater or perched water may be present within the Made Ground or underlying sands and gravels which could result in the vertical and lateral migration of contaminants.
Chemical Attack	Attack of buried plastics and concrete by aggressive ground conditions.

Table 4 Possible Contamination Pathways

Summary of Plausible Receptors

Potential receptors associated with the site and its development are summarised in Table 5.

Receptor	Description	Comments
End Users	Residents/occupants of the proposed development.	The proposed development comprises residential housing with private garden areas, soft landscaping, access roads, car parking and associated development infrastructure.
Soft Landscaping	Possible areas of planting including possible lawns, shrubs, trees, etc.	Private gardens and areas of soft landscaping are proposed.

Receptor	Description	Comments
Built Environment	Buried concrete for foundations and plastics for potable water supply pipes may be laid in contact with contaminated soils.	Aggressive ground conditions may be present beneath the site.
Adjacent Land Users	Sensitive land uses identified within the immediate vicinity.	Adjacent land uses to the south were primarily residential with gardens, with a school also located to the south of the site.
Groundwater	Controlled waters contained within the aquifer(s) beneath the site.	The site overlies a Principal Aquifer and is located within a Source Protection Zone.
Surface Water	Controlled Waters within lakes, rivers, and ponds, etc., or coastal waters.	No surface water was identified on site.

Table 5 Possible Receptors of Contamination

Site workers involved in the preparation and construction of the development have not been considered further in this assessment as the Principal Contractor is duty bound under the current CDM Regulations to undertake their own risk assessments with respect to their employees.

Whilst the above sources and receptors have been identified, Table 6 summarises the identified plausible pollution linkages and a qualitative assessment of the risks.

Potential Source/Media	Potential Receptors	Potential Pathways	Probability	Consequence	Risk and Justification
Contaminants within Made Ground (If present) & Shallow Natural Ground	End users	Direct contact and inhalation of soil derived dust	Likely	Medium	**Moderate** End users could come into contact with soils via direct contact as the development will include private gardens and areas of soft landscaping. Made Ground/ Infilled ground is likely to be present in distinct and localised areas of the site. The risk in other areas of the site, i.e. open fields, is likely to be lower due to an absence of Made Ground and plausible contamination sources.
	Soft Landscaping	Root Uptake	Likely	Mild	**Moderate to Low** The proposed development is likely to include private gardens and areas of soft landscaping.
	Adjacent land users	Direct contact	Likely	Minor	**Low** Adjacent site users are unlikely to come into contact with soils within areas of proposed soft landscaping.
	Water supply pipes	Direct contact	Likely	Mild	**Moderate to Low** Water supply pipes could come into contact with impacted soils depending upon depth of installation and extent of soil impact. The consequence is likely to be mild.
	Buildings and infrastructure	Direct contact	Likely	Minor	**Low** Foundations and utilities will be placed within potentially aggressive soils (e.g. sulphate). However the consequence is anticipated to be minor.
	Groundwater	Vertical migration	Likely	Mild	**Moderate to Low** Shallow groundwater (<5m bgl) is unlikely to be present and records reviewed as part of the assessment indicate that groundwater could be in excess of 25m bgl. The strata beneath the site are classified as a Secondary A Aquifer over a Principal Aquifer. Fluctuations in groundwater levels are likely and but given the anticipated depth, it is unlikely to result in migration of mobile contaminants. Given that site wide Made Ground or soil based impact is unlikely, the risk of harm to groundwater from Made Ground could be limited.

Potential Source/Media	Potential Receptors	Potential Pathways	Probability	Consequence	Risk and Justification
On-site land uses	End users	Direct contact and inhalation of soil derived dust	Likely	Medium	**Moderate** End users could come into contact with soils via direct contact as the development will include private gardens and areas of soft landscaping. Potential contaminative uses however are generally only present in distinct and localised areas of the site, thus remote from these areas, the risk is likely to be lower.
	Soft landscaping	Root Uptake	Likely	Mild	**Moderate to Low** The proposed development is likely to include private gardens and areas of soft landscaping.
	Adjacent land users	Direct contact	Low	Minor	**Very Low** Adjacent site users are unlikely to come into contact with soils within areas of proposed soft landscaping.
	Water supply pipes	Direct contact	Likely	Mild	**Moderate to Low** Water supply pipes could come into contact with impacted soils depending upon depth of installation and extent of soil impact. The consequence is likely to be mild.
	Buildings and infrastructure	Direct contact	Low	Minor	**Very Low** Foundations and utilities will be placed within potentially aggressive soils (e.g. sulphate). However the consequence is anticipated to be minor.
	Groundwater	Vertical migration	Likely	Mild	**Moderate to Low** Shallow groundwater (<5m bgl) is unlikely to be present and records reviewed as part of the assessment indicate that groundwater could be in excess of 25m bgl. The strata beneath the site are classified as a Secondary A Aquifer over a Principal Aquifer. Fluctuations in groundwater levels are likely and but given the anticipated depth, it is unlikely to result in migration of mobile contaminants. Given that site wide Made Ground or soil based impact is unlikely, the risk of harm to groundwater from Made Ground could be limited.
Ground Gases and Vapours	End users	Inhalation	Low	Medium	**Moderate to Low** Ingress of hazardous ground gas into buildings could occur locally and could result in significant harm where ground gases are identified on site. The third party ground gas assessment indicated that ground gas risks were associated with specific areas of the site only. Incorporation of gas and/or vapour

Potential Source/Media	Potential Receptors	Potential Pathways	Probability	Consequence	Risk and Justification
					protection measures could mitigate the risk of harm and thus the consequence would be low.
	Adjacent land users	Inhalation	Unlikely	Medium	**Low** It is considered to be unlikely and a low probability that adjacent land users will come into contact with ground gases and vapours originating on site. Should ground gases and vapours be identified on-site service routes should be constructed in line with best practice to prevent the creation of preferential pathways off site. In addition, if gross contamination is identified that could represent a source of gas/vapour which could impact adjacent land users then remedial action would be required to reduce, remove or otherwise mitigate the source or break the exposure pathway(s).
	Buildings and infrastructure	Gas accumulation and potential explosion of flammable gases	Unlikely	Minor	**Very Low** Foundations and utilities will be constructed in/through Made Ground soils (if present). However the consequence is anticipated to be minor.

Table 6 Plausible Pollutant Linkages & Qualitative Risk Assessment

Preliminary Risk Assessment Summary

The potential pollutant linkages established within this preliminary risk assessment are not considered to prevent development on the subject site, but could require investigation and assessment to support further characterisation, calibration of the CSM and where/if necessary determine a remedial strategy to reduce, remove or otherwise control any risk within the site to key receptors.

Investigation Strategy

The positioning of exploratory holes was determined on site to provide general coverage and to target specific areas. Table 7 sets out the investigation strategy adopted.

Area of Concern	Investigation	Positions
General ground conditions	Exploratory holes located across the site, coupled with sampling and laboratory analysis.	All
Potential contamination of near surface soils	Exploratory holes located to provide coverage of the site, coupled with sampling and laboratory analysis.	All
Farmyard complex area, including scrapyard area	Exploratory holes located to provide targeted coverage of areas identified as being potentially contaminated, coupled with sampling and laboratory analysis.	TP213-TP216, TP220, TP223-TP226 and TP239

Table 7 Summary of Investigation Strategy

Soil samples were collected and placed into amber jars and cool boxes on site for transit to the office, where they were stored under chilled conditions (<4°C) prior to final transportation in cool boxes to the laboratory by their in-house courier. Both the geotechnical and contamination testing were undertaken by UKAS accredited laboratories. Contamination testing of soil samples was also undertaken in accordance with accredited MCERTs protocols. Samples were stored in temperature controlled conditions from sampling until receipt at the laboratory from which time sample preparation and storage was determined by testing requirements and in line with laboratory's protocols.

Encountered Conditions

A factual record of the conditions encountered during the physical investigation of the site is presented in the following sections.

For further details of the ground conditions, reference should be made to the exploratory hole logs and in situ testing presented in Appendix B, and geochemical testing results in Appendix C.

The physical ground investigation works were undertaken from on the 21st- 23rd August 2017 and on 5th September 2017.

Unless stated otherwise, all depths are reported as metres below ground level (m bgl).

The ground conditions encountered comprised a mantle of Topsoil and/or Made Ground overlying, clay, gravelly clay and sandy clay, with bands of flint cobbles and bands of sandy clay in certain locations. Chalk was encountered within boreholes BH301 and BH303 at depths of 12.9m bgl and 1.9m bgl respectively.

Made Ground was encountered within all the trial pits located within the farmyard complex area and was also encountered in TP211, TP213 and TP214. The Made Ground was found to comprise bricks, brick fragments, chalk of cobble and gravel size, ashy deposits, plastic, wood, possible asbestos (tiles and sheets), concrete, tarmac, and

charcoal. Made Ground was encountered to a maximum depth of 2.3m bgl, although TP225 was terminated within the Made Ground at 0.6m bgl so the full depth of Made Ground in this location was not established. Due to the use of the farm buildings as stables, and horses being present at the time of the investigation, it was not possible to investigate beneath these existing farm/stable buildings. It is thought likely that Made Ground will be present beneath these buildings given it has been encountered in all areas of the farm complex investigated to date.

The Topsoil and/or Made Ground was underlain by firm to stiff clay and sandy clay of the Lambeth Group in the majority of locations. In some isolated locations mainly in the north of the site the Topsoil and/or Made Ground was underlain by gravelly clay, very sandy clay and clayey sand of the Lambeth Group. The clay and sand of the Lambeth Group were encountered to depths of up to 25m bgl. BH301 and BH303 found Chalk to underlie the Lambeth Group, the chalk was encountered at 12.9m bgl and 1.9m bgl respectively.

For more detailed descriptions at specific locations, reference should be made to the exploratory hole logs presented in Appendix B.

Groundwater

Groundwater was not encountered within any of the investigation locations and is anticipated to be present at depths in excess of 25m bgl. However BH303 (proposed pumping station location) was installed with a standpipe for further monitoring. A monitoring visit was undertaken on 5th September 2017 and the well was found to be dry.

It should also be noted that changes in groundwater levels do occur for a number of reasons including seasonal effects and variations in drainage. Such fluctuations may only be recorded by the measurement of the groundwater level within a series of standpipes or piezometers installed within appropriate response zones.

Chemical Analysis

In order to assess the general chemical quality of the strata encountered, samples of soils recovered from the exploratory holes were submitted for analysis for a range of potential contaminants selected on the basis of the findings of the desk study and supported by CLR publication CLR8 and Environment Agency R&D66 publication.

The testing rationale included sampling and analysis to provide a general coverage of the subject site. Testing was undertaken for a broad range of commonly occurring contaminants including metals, metalloids, inorganic compounds, phenols, speciated TPH, PAH and asbestos as identified.

Environmental Considerations

A Generic Quantitative Risk Assessment (GQRA) incorporating the results of the desk study and ground investigation was undertaken. A number of plausible pollutant linkages were initially identified and the investigation did not encounter conditions that warranted a revision of the preliminary Conceptual Site Model.

Soil Contamination vs End User

The presence of a possible contaminant does not necessarily imply that a site or area is contaminated or that there is any unacceptable risk to human health. A Preliminary Quantitative Risk Assessment has been undertaken in order to evaluate any unacceptable risks posed to human health with respect to the proposed redevelopment. It should be noted that this assessment is protective of the chronic long-term effects of contaminants, which is also likely to be protective of any possible immediate acute effects.

A quantitative risk assessment has been undertaken by comparing the results of the laboratory chemical testing of shallow soils against Site Specific Assessment Criteria (SSAC) generated using the Contaminated Land Exposure Assessment (CLEA) model v1.071 published by the Environment Agency, or against the Category 4 Screening Levels (C4SLs) published by DEFRA. Although the C4SLs were released for Part 2A use, the associated policy companion document for the C4SLs indicated that they may also be used for planning. Although the C4SLs represent a marginally higher risk level than the SSACs (low risk rather than minimal risk) it is considered that the risk levels remain very low. Therefore, the final C4SLs are considered to be suitable to assess soils under the planning regime.

The exploratory holes were located to provide general coverage of the site as well as to target specific areas of concern, as identified by the preliminary risk assessment, in line with the proposed development. Samples were selected to target the areas of Made Ground identified and underlying natural ground and to provide coverage of the site. Analysis was undertaken on soil samples collected from these exploratory holes.

In the first instance the results of the sample analysis were compared to the Tier 1 screening criteria where available. Table 8 shows the exceedances identified on site above the respective generic guideline values for a proposed residential land use with plant uptake.

Determinant	Tier 1 Criteria mg/kg	Depth m bgl	Concentration mg/kg	Geology
Arsenic	S4UL- 37 SSAC – 38.03	TP229 at 0.6	38.2	Topsoil
Beryllium	S4UL – 1.7 SSAC – 1.72	TP229 at 0.6	1.8	Topsoil
Benzo(a)pyrene	S4UL -2.2 (1% SOM) SSAC – 3.93	TP215 at 0.3	3.1	Made Ground
Dibenzo(a,h)anthracene	S4UL -0.24 (1% SOM) SSAC – 0.39	TP213 at 1.0 TP215 at 0.3 TP222 at 0.4 TP225 at 0.25 TP226 at 0.1 TP239 at 0.2	0.5 0.6 0.3 0.3 0.3 0.3	Made Ground Made Ground Lambeth Group Made Ground Topsoil Made Ground

Table 8 Summary of contaminant exceedance above respective threshold for residential end use

The results were assessed further in order to clarify the initial screening assessment, through the development of Site Specific Assessment Criteria (SSAC).

The assumptions made as part of the CLEA V1.071 calculations for a residential end use with plant uptake (SSAC) are presented in Table 9. Copies of the CLEA calculations are enclosed in Appendix C. The calculated SSAC for contaminants where Tier 1 screening criteria are exceeded have also been included in Table 8.

	Assumptions			Comments
Land Use	Residential with plant uptake			Commensurate with proposed development.
Receptor	Female (res C4SL)			A conservative assumption using the most sensitive possible receptor.
Receptor Age	Age Groups 1-6			Critical receptor age from birth to age 6.
Building	Small terraced house			A conservative assumption for the proposed development.
Soil Type	Sandy silty loam	pH 7.4	SOM 0.86%	Based on site specific conditions.
Exposure Pathways	Oral	Direct soil and dust ingestion		Default setting for land use.
	Dermal	indoor and outdoor		Default setting for land use.
	Inhalation	outdoor dust & vapour		Default setting for land use.
Occupancy	days/year	hours/day (indoors)	hour/day (outdoors)	Default settings for the critical receptor.
	365	23	1	

Table 9 Assumptions for SSAC Calculation (CLEA v1.071 Software)

The tier 1 exceedances where screened against the Site Specific Assessment Criteria (SSAC) calculated for the site. A number of those initially identified as exceedances were found to be below the calculated SSAC. The following initial exceedances were found to be below the SSAC:

- Benzo(a)pyrene, TP215 at 0.3m, identified 3.1mg/kg compared to a SSAC of 3.93mg/kg
- Dibenzo(a,h)anthracene, TP222 at 0.4m, TP225 at 0.25m, TP226 at 0.1m and TP239 at 0.2m, all identified 0.3mg/kg compared to a SSAC of 0.39mg/kg

The calculated SSAC were based on a residential exposure scenario without plant uptake so as to provide a conservative assessment and cover a worst case scenario. It is therefore considered that the initial exceedances found to be below the calculated SSAC do not require further assessment nor is further remedial action warranted with respect to these substances and/or locations.

Previous investigations by third parties identified elevated concentrations of PAH, Lead and Zinc at locations within the farmyard complex area.

In addition, all samples were submitted for asbestos screening and where asbestos was identified quantification testing was carried out. The locations where asbestos was identified are summarised in Table 10.

Location and Depth (m bgl)	Type	Free Fibres (%)	Total (%)
TP213 at 1.0	Chrysotile and Crocidolite	<0.001	2.66
TP225 at 0.25	Chrysotile	<0.001	3.54
TP239 at 0.5	Chrysotile	<0.001	25.0

Table 10 Summary of locations of asbestos identified

The asbestos identified within TP239 was in the form of asbestos tiling. The tiles discovered where relatively intact within the ground. Given the age of the buildings present on site there is the potential for asbestos to be present within the building fabric, and as such an appropriate asbestos survey would be recommended prior to any demolition works.

In addition previous investigations undertaken by third parties also identified the presence of asbestos within soils in the farmyard complex area. Figures 7 shows a wider overview of the entire site due for development, it shows the locations of all the identified contaminant exceedances along with the development layout proposals.

Figure 8 shows the areas intended for development by Linden Homes along with the recommended remedial requirements for these areas.

Based on the above assessment it is considered that remedial action would be warranted to protect end users of a residential development, within isolated areas due to be developed by Linden Homes on this site in relation to the asbestos, PAH, Lead and Zinc identified within the shallow soils (Made Ground). The following recommendations made refer solely to the areas due for development by Linden Homes, as shown in Figure 8. It is presumed that the other areas of the site, outside of Linden's site boundary, where contamination has been identified will be remediated by others.

It is understood that ground levels could not readily be raised due to implications on development restrictions and thus localised excavation and removal of Made Ground soils would be recommended. At this stage, an average depth of 0.5m is considered likely. The reduced dig could be backfilled with site won subsoil and Topsoil (the latter to a minimum thickness of 150mm excluding any turf).

It is recommended that a reduced dig is undertaken within the farmyard complex area, as shown in Figure 8, to remove asbestos found to be present within the Made Ground. Due to the restriction in access to some areas of the farmyard complex during the initial investigation works, it is also recommend that following demolition of the buildings on site, further intrusive investigations are carried out to identify and delineate the location of asbestos within the Made Ground within this area. This would enable areas impacted by asbestos to be more accurately identified, for removal and disposal purposes.

Where areas of identified Made Ground are proposed to be located beneath building footprints or hard standing, it is considered that the plausible pollutant linkage is removed and thus risk of harm to end users from exposure to the contaminants is removed, as roads, buildings and permanent hard cover would sever the pollutant linkage and thus it may be possible for the impacted shallow soils to remain in these areas.

It is recommended that any remediation works are undertaken in accordance with a remedial strategy and specific methodology which includes on-site observation, audit sampling/analysis and validation reporting by the Geo-Environmental Consultant.

With regards to areas amenity/communal soft landscaping, it is recommended that Topsoil is placed to provide a suitable growing medium for proposed planting at a minimum thickness of 150mm. Where it is required to import topsoil on to the development then, prior to importation, the chemical, physical and nutritional suitability should be verified. Importation of topsoil or subsoil from unverified or unsuitable sources would require their removal from site and replacement with suitable materials. As a matter of good practice, it is recommended that the location, approximate extent and thickness of any imported topsoil are recorded and presented in the Validation/Verification Report to be prepared by the Environmental Consultant. Any such importation of Topsoil may require a Material management Plan and Declaration in accordance with the Definition of Waste Code of Practice (DoWCoP).

Soil Contamination vs Adjacent Land Users

Surrounding land uses were identified to comprise residential properties. On the basis of the testing undertaken to date, it is considered that no significant risks to adjacent land users exist.

Notwithstanding the above, it is recommended that exposed soils are kept damp to avoid the release of soil particles to the air during development.

Soil Contamination vs Soft Landscaping

British Standard BS3882:2015 *Specification for topsoil and requirements for use* provides assessment criteria for a number of potentially phytotoxic contaminants in terms of new planting.

The results of the chemical analysis for determinants known to pose a potential phytotoxic risk to plant growth are summarised in Table 11, together with the respective adopted Generic Assessment Criteria (GAC) for plant growth. The compliance criteria set out in BS3882:2015 are pH dependent and thus the GAC used relate to the pH range measured on samples recovered from the site.

Determinant	Phytotoxicity GAC (mg/kg)			GAC Exceedances
	pH <6.0	pH 6.0-7.0	pH >7.0	
Zinc	200	200	300	No
Copper	100	135	200	No
Nickel	60	75	110	No

Table 11 Summary of Plant Phytotoxicity Assessment

The phytotoxicity assessment did not identify any exceedances and thus no specific remedial measures are considered to be warranted in relation to plants.

Soil Contamination vs Built Environment

Recommendations with respect to pH and sulphate in relation to buried concrete are made in Section 5.5.

The current guidance on the selection of materials for water supply pipes to be laid in contaminated land is contained in UK Water Industry Research's (UKWIR) report reference 10/WM/03/21 (re-issued 2010). However, the guidance is not mandatory and there has been concerns raised by various industry technical associations regarding the document and the methodologies proposed.

As such, the utility company should be consulted in order to confirm their specific requirements in this respect, at this time subject to further confirmation it is considered that specific protection measures are unlikely to be required for potable water supply. As a matter of good practice and to maximise the protection to maintenance workers, it is recommended that clean, granular backfill is used in service runs and that marker tapes are used for all buried services.

Soil Contamination vs Groundwater

The investigation did not identify any mobile contamination and thus in the absence of a pollutant linkage, no further action is warranted.

Groundwater Contamination vs Human Health

End users would not come in to contact with groundwater and thus in the absence of a plausible pollutant linkage between groundwater and end-users, no specific protection measures are considered likely to be required in this respect

Groundwater Contamination vs Soft Landscaping

Groundwater is considered to present at depth within the Thanet Sand Formation beneath the site and as such was considered to be outside of the root zone of influence for the soft landscaping on the site. Notwithstanding

this, the vegetation on and around the site showed no evidence of stress. As such, it is considered that no specific action is warranted with respect to soft landscaping.

Ground Gas Assessment

Ground gas monitoring was undertaken by a third party in 2016, as part of a wider investigation of the site. A copy of this report has been provided to GESL, however it is understood that permission has not been granted by the authors to allow any reliance to be placed upon it. Gas monitoring was also undertaken as part of an investigation carried out by a third party, Peter Brett Associates (PBA), in 2010. A summary of which has been provided to GESL.

The PBA report identifies the former historic landfill as a potential source of ground gas, and comments that following discussions with the landowner and the Local Authority Contaminated Land Officer, the waste is believed to be inert waste. However the report also points out that the definition of inert has changed over time, and records are relatively inaccurate and historically, inspection regimes were less formal and onerous than required for present day filling schemes. As such, it is likely that detailed investigation could be required in to development on the landfill area of the site.

Although no gas monitoring data was provided in the PBA summary, the 2016 report makes reference to this monitoring data, where gas monitoring reported concentrations of methane up to 42.5% v/v and concentrations of carbon dioxide of up to 17.0%v/v along with flow rates of 0.3l/hr.

Using this data Gas Screening Values (GSVs) were calculated resulting in a GSV for methane of 0.1275l/hr and a GSV for carbon dioxide of 0.051l/hr. Based on the GSV for methane this would classify the area of the landfill as 'Red' under the NHBC Traffic Light scheme. Figure 9 shows the extent of the former landfill area in relation to the proposed site layout. The landfill is situated outside of the area due to be developed for residential dwellings by Linden Homes.

The 2016 report encountered lower flow rates and significantly lower volumes of methane and carbon dioxide and argued that, based on flow rates encountered during the gas monitoring undertaken in 2016 a classification of Amber 2 for the former landfill area was more appropriate.

Further ground gas monitoring and assessment were beyond the scope of the investigation works carried out Geo-Environmental, therefore the following is based upon the conclusions drawn by the PBA report, and the fact that the area of residential development due to be carried out by Linden Homes is situated outside of the former landfill area.

It is recommended that gas protection measures are installed within properties constructed in the area of the former landfill and adjacent land, as shown on Figure 9, in line within Amber 2, as set out by the NHBC. Protection measures for an Amber 2 classification would comprise the following:

- Suspended ground floor slabs;
- Passively ventilated sub-floor void via air bricks (minimum 150mm clear void height across the footprint) with sufficient ventilation to allow at least one complete volume change in any given 24hr period. Air bricks will need to be positioned above external ground level in the outer skin such that they have a clear and uninterrupted flow of air across them. This has a direct bearing of construction and external levels where level thresholds are required;
- Cross ventilation through sleeper walls to prevent the formation of low flow zones within the sub-floor void;
- Minimum penetration of the slab by services and sealing of all penetrations and joints using 'top hats' or bespoke/site formed top hat seals;

- Installation of a gas resistant membrane laid across the floor with all joints and service penetrations sealed to form a single integral membrane. For Amber 2 conditions, joints are required to be welded. All joints should comprise a minimum 150mm overlap. It is recommended that membrane installation is undertaken by a suitability competent (e.g. NVQ qualified) installer;
- Use of an appropriate gas resistant DPC across the cavity with lap on the inner skin wall to facilitate joining to the floor membrane.
- Inspection and verification of installed measures.

Waste Disposal

Waste Acceptance Criteria (WAC) testing was undertaken on samples of the shallow soils on the site from TP223 at 0.5m bgl, TP225 at 0.3m bgl and TP233 at 0.4m bgl, from across the site and details are provided below:

- TP223 at 0.5m bgl (Lambeth) soils classified soils classified as 'Inert Waste' with the exception of dissolved organic carbon which was noted to be above the level for inert but below the Hazardous waste in a non-hazardous landfill threshold;
- TP225 at 0.3m bgl (Made Ground) soils classified as 'Inert Waste';
- TP233 at 0.4m bgl (Lambeth) soils classified as 'Inert Waste'

Based on the WAC testing undertaken from representative samples of the shallow soils across the site it is considered the Made Ground and natural soils beneath the site would be considered as inert waste for the purpose of disposal.

However the presence of asbestos was identified within the Made Ground in the farmyard complex area. Quantification of this asbestos was undertaken and based on these results Made Ground within the farmyard complex would have an initial classification of Hazardous for waste disposal purposes. It is therefore recommended that further investigation is carried out within the farm complex area in order to appropriately classify materials for disposal.

We trust we have interpreted your request correctly and provided sufficient information for your current requirements. If you have any questions or queries in relation the information provided at this stage please let us know.

Yours sincerely
For and on Behalf of Geo-Environmental



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Enc Figures 1-9
Appendix A – Site Photographs
Appendix B – Preliminary Exploratory Hole Logs and in-situ testing
Appendix C - Geochemical Testing Results and Statistical Assessment Criteria

FIGURES





Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Site Location Plan
Client:	Liden Homes South			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16662	**Revision:**	0		
Drawn:	GR	**Date:**	31/07/2017		
Figure:	1	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Site Boundary Plan (Linden Homes)
Client:	Liden Homes South			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16662	**Revision:**	0		
Drawn:	FG	**Date:**	29/09/2017		
Figure:	2	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Location of Farmyard Complex
Client:	Liden Homes South			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16662	**Revision:**	0		
Drawn:	FG	**Date:**	29/09/2017		
Figure:	3	**Scale:**	Not To Scale		



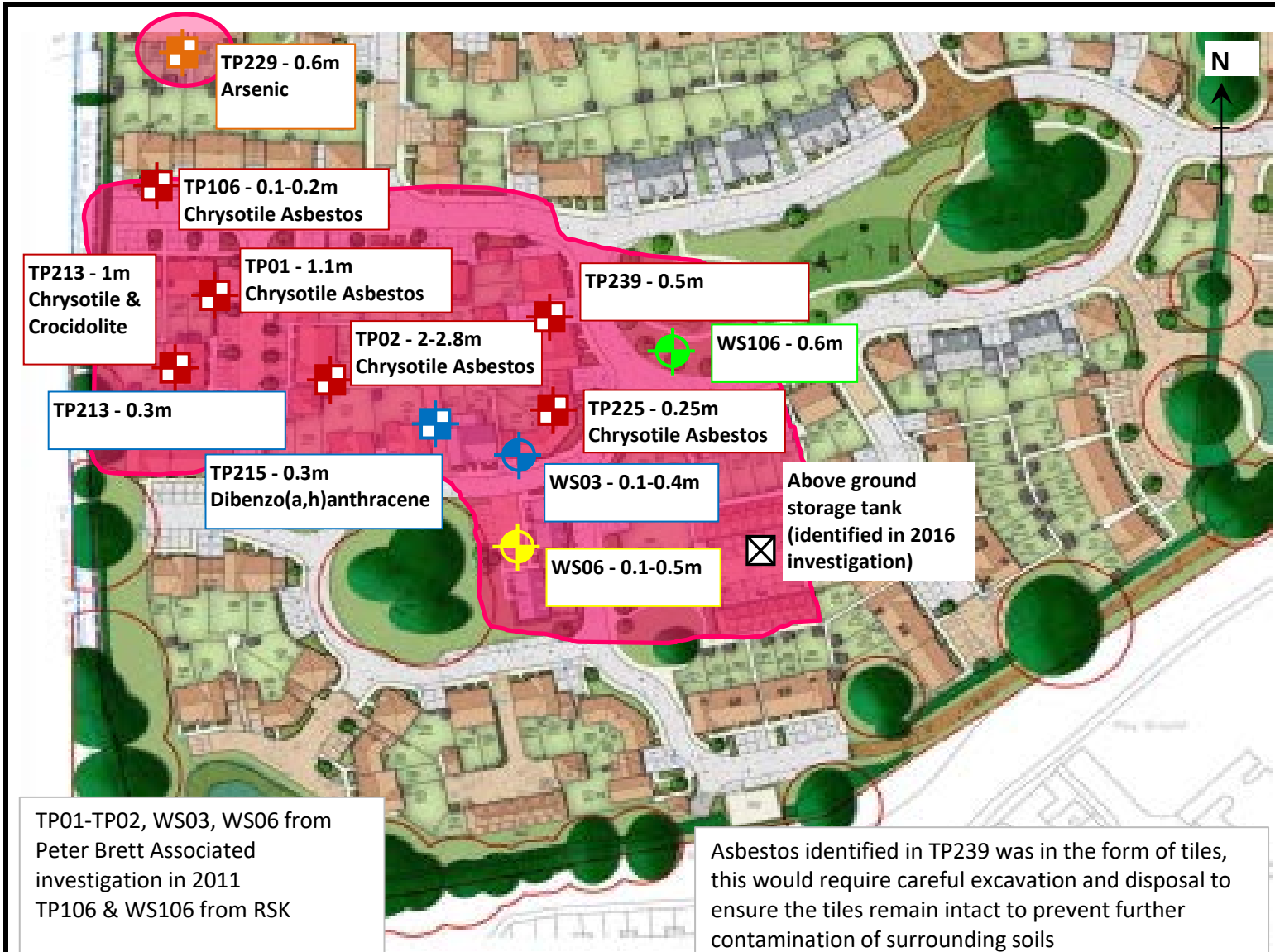
Project:	Woodcroft Farm, Lovedean, PO8 9			**Title**	Trial Pit and Borehole Location Plan (main site)
Client:	Liden Homes South			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environment
Ref No:	GE16662	**Rev:**	0		
Drawn:	GR/FG	**Date:**	17/08/2017		
Figure:	4	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Trial Pit and Borehole Location Plan (off main site)
Client:	Liden Homes South			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16662	**Revision:**	0		
Drawn:	FG	**Date:**	17/08/2017		
Figure:	5	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Window Sampling Locations
Client:	Liden Homes South			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16662	**Revision:**	0		
Drawn:	FG	**Date:**	05/09/2017		
Figure:	6	**Scale:**	Not To Scale		



Majority of contamination identified in the farmyard complex and scrapyard area Several isolated hotspots also identified by recent GESL

Possible remedial requirement to remove all Made Ground within the farmyard complex (up to c.2.8m depth) Likely remedial requirement to remove all asbestos impacted soils within prosed gardens/ areas of soft landscaping

Asbestos identified in GESL investigation quantified, indicating a classification of Hazardous Waste

Buildings on site have the potential to contain asbestos,

Further investigation works would be recommended following vacation of the site, to delineate asbestos contaminated areas and appropriately classify asbestos containing soils for disposal.

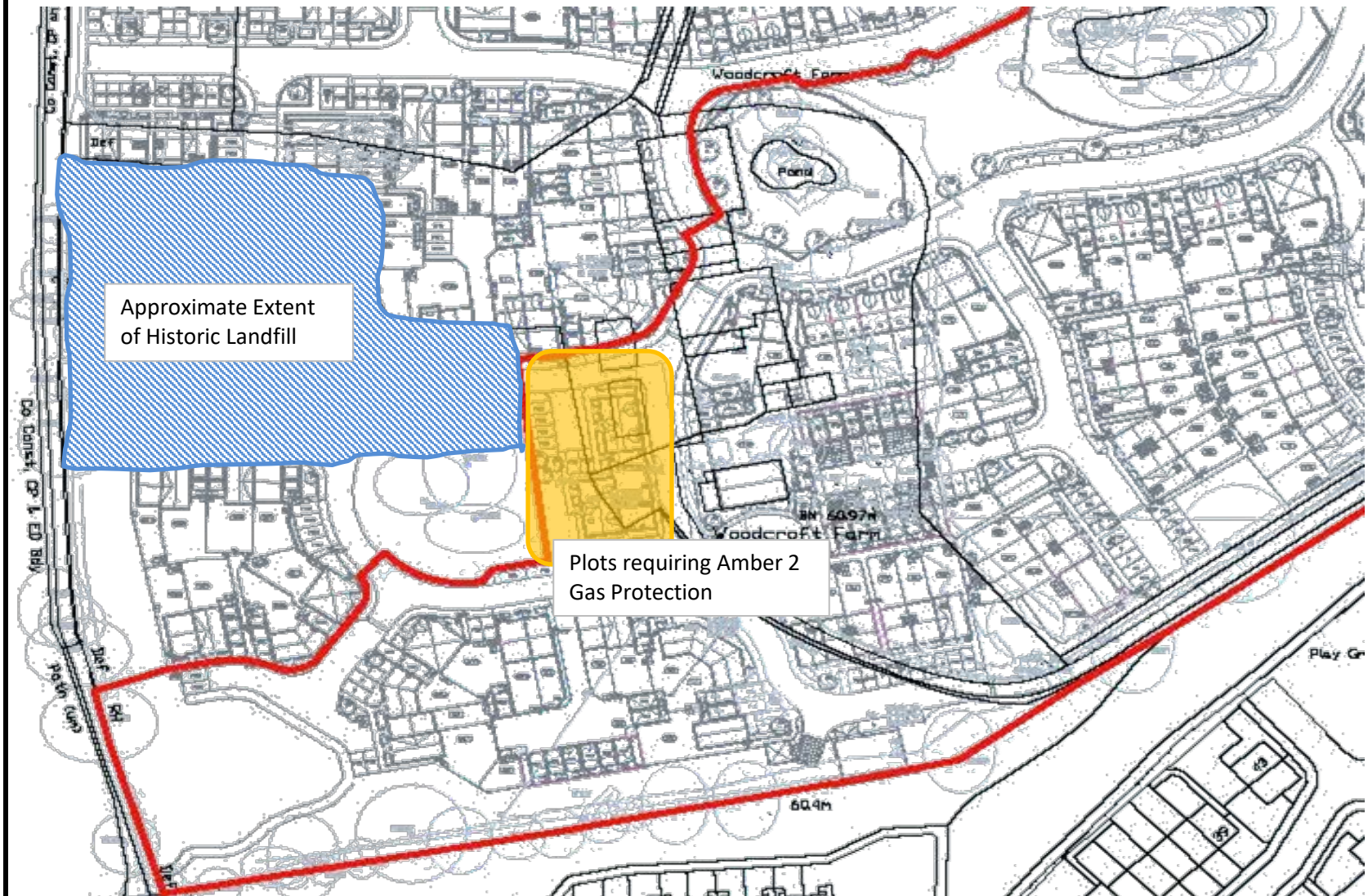
TP01-TP02, WS03, WS06 from Peter Brett Associated investigation in 2011
TP106 & WS106 from RSK

Asbestos identified in TP239 was in the form of tiles, this would require careful excavation and disposal to ensure the tiles remain intact to prevent further contamination of surrounding soils

Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Identified Soil Contaminant Exceedances (Wider Site)
Client:	Liden Homes South			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16662	**Revision:**	2		
Drawn:	FG	**Date:**	29/09/2017		
Figure:	7	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Soil Contamination and Remediation Area Summary Plan
Client:	Liden Homes South			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16662	**Revision:**	0		
Drawn:	FG	**Date:**	29/09/2017		
Figure:	8	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Historic Landfill Location and Plots requiring Gas Protection Measures
Client:	Liden Homes South			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16662	**Revision:**	0		
Drawn:	FG	**Date:**	29/09/2017		
Figure:	9	**Scale:**	Not To Scale		

APPENDIX A

Site Photographs

Site Photos – 18/08/2017



Plate 1 View north west from the access road across the western field



Plate 2 View north of the farmyard complex area currently being used as a scrapyard



Plate 3 View south of the farmyard complex being used for vehicle storage



Plate 4 View south west of the farmyard complex area being used as vehicle storage



Plate 5 Farmyard complex area showing evidence of recent burning activity



Plate 6 View west of the farmyard complex area



Plate 7 View of the skips stored in the farmyard complex containing engines and assorted metals



Plate 8 View east across the farm complex area



Plate 9 View west across the area of former landfill



Plate 10 Manure heap within the farm complex



Plate 11 View north of the field to the north of the farmhouse



Plate 12 View north west of the north western field



Plate 13 View of the current access track that runs from north to south through the site

Site Photos – 05/09/2017



Plate 14 View of the skip that contained engines and assorted metals, evidence of recent burning



Plate 15 View north of farmyard complex



Plate 16 View of farmyard complex showing evidence of recent burning activites



Plate 17 View north west of farmyard complex



Plate 18 View south west of farmyard complex



Plate 19 View west of farmyard complex



Plate 20 View south of farmyard complex



Plate 21 View south of farmyard complex



Plate 22 View south of farmyard complex



Plate 23 View west of farmyard complex



Plate 24 View north of farmyard complex

Geo-Environmental

APPENDIX B

Exploratory Hole Logs

and In-situ Testing



Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **BH301** Sheet 1 of 3

Project Name:	Woodcroft	Project No. GE16662	Co-ords: 468385E - 112188N	Hole Type CP
Location:	Woodcroft Farm, Lovedean,		Level:	Scale 1:50
Client:	Linden Homes South		Dates: 22/08/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.15			Grass over Topsoil TOPSOIL
		0.50 - 1.00	B					Firm grey/brown silty CLAY LAMBETH GROUP
		1.00	S	N=6 (2,/1,1,2,2)				
		1.45	D					
		1.50 - 2.00	B					
					1.80			Stiff reddy brown mottled CLAY LAMBETH GROUP
		2.00	S	N=8 (3,/2,2,2,2)				
		2.45	D					
		2.50 - 3.00	B					
		3.00	S	N=13 (4,/3,3,4,3)				
		3.45	D					
		4.00	S	N=14 (4,/3,3,4,4)				
		4.45	D		4.40			Stiff to hard reddy brown mottled CLAY LAMBETH GROUP
		5.00	S	N=18 (5,/4,5,4,5)				
		5.45	D					
		6.00	D					
		6.50	S	N=22 (6,/5,6,5,6)				
		6.95	D					
		7.50	D					
					7.60			Stiff to hard grey/brown silty CLAY LAMBETH GROUP
		8.00	S	N=26 (7,/6,7,6,7)				
		8.45	D					
		9.00	D					
		9.50	S	N=30 (8,/7,7,8,8)				
		9.95	D					
								Continued on Next Sheet

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **BH301** Sheet 2 of 3

Project Name:	Woodcroft	Project No. GE16662	Co-ords: 468385E - 112188N	Hole Type CP
Location:	Woodcroft Farm, Lovedean,		Level:	Scale 1:50
Client:	Linden Homes South		Dates: 22/08/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					10.20			Stiff to hard yellowy brown silty CLAY LAMBETH GROUP	
		10.50	D						
		11.00	S	N=31 (9,/7,8,8,8)					11
		11.45	D						
		12.00	D		11.90			Stiff to hard brown gravelly CLAY LAMBETH GROUP	12
		12.50 - 12.95 12.50	B C	N=38 (10,/8,9,11,10)					
					12.90			Hard off white rock, CHALK CHALK	13
		13.50	D						
		14.00	S	120 (40,/120 for 225mm)					14
		14.45	D						
		15.00	D						15
		15.50	S	0 (50,/0 for 0mm)					
		15.95	D						16
		16.50	D						
		17.00	S	0 (50,/0 for 0mm)					17
		17.45	D						
		18.00	D						18
		18.50	S	0 (50,/0 for 0mm)					
		18.95	D						19
		19.50	D						
		20.00	S	0 (50,/0 for 0mm)					20
								Continued on Next Sheet	

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

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Borehole Log

Borehole No.
BH301
Sheet 3 of 3

Project Name:	Woodcroft	Project No. GE16662	Co-ords: 468385E - 112188N	Hole Type CP
Location:	Woodcroft Farm, Lovedean,		Level:	Scale 1:50
Client:	Linden Homes South		Dates: 22/08/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		20.45	D					
		21.00	D					
		21.50	S	0 (50,/0 for 0mm)				
		21.95	D					
		22.50	D					
		23.00	S	0 (50,/0 for 0mm)				
		23.45	D					
		24.00	D					
		24.50	S	0 (50,/0 for 0mm)				
		24.95	D		25.00			End of Borehole at 25.00m

21 22 23 24 25 26 27 28 29 30

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks
Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **BH302** Sheet 1 of 3

Project Name:	Woodcroft	Project No. GE16662	Co-ords: 468212E - 111942N	Hole Type CP
Location:	Woodcroft Farm, Lovedean,		Level:	Scale 1:50
Client:	Linden Homes South		Dates: 21/08/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.15			Grass over Topsoil TOPSOIL	
		0.50 - 1.00	B					Firm brown silty CLAY LAMBETH GROUP	
		1.00	S	N=8 (2,/2,2,2,2)					1
		1.45	D						
		1.50 - 2.00	B						
		2.00	S	N=9 (3,/2,2,2,3)					2
		2.45	D		2.50				
		2.50 - 3.00	B					Stiff grey/brown silty CLAY LAMBETH GROUP	
		3.00	S	N=10 (3,/2,3,2,3)					3
		3.45	D		3.30			Stiff brown silty CLAY with traces of gravel LAMBETH GROUP	
		4.00	S	N=11 (4,/3,3,2,3)					4
		4.45	D						
		5.00	S	N=13 (4,/3,3,3,4)					5
		5.45	D						
		6.00	D						6
		6.50	S	N=15 (4,/3,4,4,4)					
		6.95	D						7
		7.50	D						
		8.00	S	N=16 (4,/3,4,5,4)					8
		8.45	D		8.50			Firm to stiff brown silty, sandy CLAY LAMBETH GROUP	
		9.00	D						9
		9.50	S	N=16 (5,/4,4,4,4)					
		9.95	D		9.70			Brown silty SAND with bands of clay LAMBETH GROUP	10
								Continued on Next Sheet	

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **BH302** Sheet 2 of 3

Project Name:	Woodcroft	Project No. GE16662	Co-ords: 468212E - 111942N	Hole Type CP
Location:	Woodcroft Farm, Lovedean,		Level:	Scale 1:50
Client:	Linden Homes South		Dates: 21/08/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		10.50	D						
		11.00	S	N=18 (6,/4,4,5,5)					11
		11.45	D						
		12.00	D						12
		12.50	S	N=19 (6,/5,5,4,5)					
		12.95	D						13
		13.50	D						
		14.00	S	N=15 (5,/4,3,4,4)					14
		14.45	D						
		15.00	D						15
		15.50	S	N=8 (3,/2,1,3,2)					
		15.95	D						16
		16.50	D						
		17.00	S	N=13 (4,/3,3,4,3)					17
		17.45	D						
		18.00	D						18
		18.50	S	N=16 (5,/4,4,4,4)					
		18.95	D						19
		19.50	D						
		20.00	S	N=19 (6,/4,5,5,5)					20
								Continued on Next Sheet	

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

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Borehole Log

Borehole No.
BH302
Sheet 3 of 3

Project Name:	Woodcroft	Project No. GE16662	Co-ords: 468212E - 111942N	Hole Type CP
Location:	Woodcroft Farm, Lovedean,		Level:	Scale 1:50
Client:	Linden Homes South		Dates: 21/08/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		20.45	D					
		21.00	D					
		21.50	S	N=22 (7,/5,6,5,6)				
		21.95	D					
		22.50	D					
		23.00	S	N=27 (8,/6,7,7,7)				
		23.45	D					
		24.00	D					
		24.50	S	N=30 (9,/7,8,7,8)				
		24.95	D		25.00			End of Borehole at 25.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks
Groundwater not encountered

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **BH303** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords: 467988E - 111975N	Hole Type CP
Location:	Woodcroft Farm, Lovedean,		Level:	Scale 1:50
Client:	Linden Homes South		Dates: 23/08/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20			Topsoil TOPSOIL
		0.50 - 1.00	B					Stiff brown silty CLAY LAMBETH GROUP
		1.00	S	N=11 (3,/2,3,3,3)				
		1.45	D		1.50			
		1.50 - 2.00	B					Stiff brown sandy CLAY with flints LAMBETH GROUP
		2.00	S	N=22 (8,/5,6,5,6)	1.90			Firm to stiff white CHALK with flints CHALK
		2.45	D					
		2.50 - 3.00	B					
		3.00	S	N=16 (9,/4,3,4,5)				
		3.45	D					
		4.00	S	N=11 (4,/2,3,3,3)				
		4.45	D					
		5.00	S	N=15 (5,/4,3,4,4)				
		5.45	D					
		6.00	D					
		6.50	S	N=21 (9,/7,5,4,5)				
		6.95	D					
		7.50	D					
		8.00	S	N=22 (12,/8,5,4,5)				
		8.45	D					
		9.00	D					
		9.50	S	N=26 (15,/9,7,5,5)				
		9.95	D		10.00			End of Borehole at 10.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

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Trial Pit Log

TrialPit No
TP201
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468508.00 - 111984.00 Level:	Date 23/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 2.70	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.15			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.50	D		0.40			Soft orange and grey mottled slightly sandy CLAY with occasional flint cobbles and abundant rootlets. Sand is medium LAMBETH GROUP
	0.50	ES		0.60			Firm orange and grey mottled slightly sandy CLAY with frequent flint cobbles and abundant rootles. Sand is medium LAMBETH GROUP
	1.00	D					Firm orange and grey mottled CLAY with frequent rootlets and red banding of sandy clay, sand is medium LAMBETH GROUP
	2.00	D		2.20			Firm orange and grey mottled slightly sandy CLAY with frequent rootlets and red banding of sandy clay, sand is medium LAMBETH GROUP
	2.70	D		2.70			End of Pit at 2.70m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Trial Pit Log**	TrialPit No TP202 Sheet 1 of 1
Project Name: Woodcroft		Project No. GE16662	Co-ords: 468473.00 - 112031.00 Level:	Date 23/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 2.00	1.20 0.60	Scale 1:25
Client: Linden Homes South				Logged FG

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10	ES		0.15			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.40			Firm grey and orange mottled CLAY with frequent flint cobbles, flint gravel and rootlets LAMBETH GROUP
	0.50 0.50	D ES					Firm grey and orange mottled CLAY with frequent rootlets LAMBETH GROUP
	1.00	D					
				1.30			Stiff grey and orange mottled CLAY with frequent rootlets with bands of red sandy clay, sand is medium LAMBETH GROUP
	1.90	D					
	2.00	D		2.00			End of Pit at 2.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP203
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468456.00 - 112068.00 Level:	Date 23/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.90	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES					Grass over, Light brown sandy, gravelly CLAY, with frequent roots (1-3mm) and rootlets TOPSOIL
				0.40			
	0.50	D					Firm grey and orange mottled slightly sandy CLAY with frequent flint cobbles and roots (2-4mm). Sand is fine LAMBETH GROUP
	0.50	ES		0.60			Firm grey and orange mottled slightly sandy CLAY with frequent roots (2-4mm), with red banding of sandy clay. Sand is medium LAMBETH GROUP
				1.40			Stiff grey and orange mottled slightly sandy CLAY with frequent roots (2-5mm), with red banding of sandy clay. Sand is medium LAMBETH GROUP
				1.80			
	1.90	D		1.90			Stiff grey and orange mottled slightly sandy CLAY with frequent rootlets, with red banding of sandy clay. Sand is medium LAMBETH GROUP End of Pit at 1.90m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP204
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468401.00 - 112148.00 Level:	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 2.80	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.20			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.50 0.50	D ES		0.80			Soft grey and orange mottled gravelly CLAY with flint cobbles LAMBETH GROUP
	1.00	D		1.00			Firm grey and orange mottled sandy CLAY LAMBETH GROUP
				1.70			Firm grey and orange mottled CLAY LAMBETH GROUP
				1.80			Firm grey and orange mottled CLAY with flint cobbles LAMBETH GROUP
				2.50			Firm grey and orange mottled CLAY LAMBETH GROUP
				2.80			Firm grey and orange mottled CLAY with red bands of sandy CLAY LAMBETH GROUP
							End of Pit at 2.80m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP205
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468335.00 - 112129.00 Level:	Date 23/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.70 — 1.20 × 0.60	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.25			Grass over, Light brown sandy, gravelly CLAY, with frequent roots (2-4mm) and rootlets TOPSOIL
	0.50 0.50 0.50	B D ES					Firm orange and grey mottled slightly sandy CLAY with frequent roots (2-4mm) and rootlets. Sand is medium (large roots (7-10mm) at 0.4m) LAMBETH GROUP
	1.00	D		1.20			
				1.40			Firm orange and grey mottled slightly sandy CLAY with frequent rootlets. Sand is medium LAMBETH GROUP
	1.70	D		1.70			Firm orange and grey mottled slightly sandy CLAY with red bandings of sandy clay and frequent rootlets. Sand is medium LAMBETH GROUP End of Pit at 1.70m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP206
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468329.00 - 112033.00 Level:	Date 23/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.80	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.25			Grass over, Light brown sandy, gravelly CLAY, with frequent flint gravels and rootlets TOPSOIL
	0.50	B		0.30			Stiff orange and grey mottled sandy, gravelly CLAY with abundant roots (4-7mm). Sand is medium (Large roots (50mm) at 0.3m) LAMBETH GROUP
	0.50	D					
	0.50	ES		0.60			Firm orange and grey mottled very sandy CLAY with frequent roots (2-6mm). Sand is medium LAMBETH GROUP
	1.00	D					Stiff orange and grey mottled slightly sandy CLAY with roots (2-4mm). Sand is medium LAMBETH GROUP
				1.20			Stiff orange and grey mottled slightly sandy CLAY with red bandings of sandy clay and roots (2-4mm). Sand is medium LAMBETH GROUP
	1.80	D		1.80			End of Pit at 1.80m

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP207
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468244.00 - 112050.00 Level:	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 2.00 (0.60 × 2.00)	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets and occasional flint gravel TOPSOIL
	0.30	ES					Firm orange and grey mottled CLAY with occasional sandy red banding and rootlets (charcoal fragments at 1m and decaying roots) LAMBETH GROUP
	0.50	B					
	0.80	D					
				1.20			Firm red and grey mottled slightly sandy CLAY (charcoal fragments at 1.4m) LAMBETH GROUP
				1.60			Firm red and grey mottled sandy CLAY LAMBETH GROUP
	2.00	D		2.00			End of Pit at 2.00m

1 2 3 4 5

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP208
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468227.00 - 112031.00 Level:	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 2.00 × 0.60 Depth 2.00	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.15			Grass over, Dark brown clayey sand with abundant tree roots (2-5mm) and rootlets (large tree root (50mm) at 0.15m) TOPSOIL
	0.50	D					Firm orange brown sandy CLAY. Sand is fine to medium (large tree root (20mm) at 0.9m) LAMBETH GROUP
	1.00	D		1.10			Stiff orange slightly sandy CLAY with abundant roots (between 2mm and 8mm). Sand is medium LAMBETH GROUP
	1.50	D		1.50			Stiff grey and orange mottled slightly sandy CLAY with occasional roots between 2mm and 6mm (no roots from 1.7m) LAMBETH GROUP
	2.00	D		2.00			End of Pit at 2.00m

1 2 3 4 5

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No: TP209
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468200.00 - 112025.00 Level:	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 2.00 — 0.60 × 2.00	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.30			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets and occasional flint gravel TOPSOIL
	0.50	D		0.80			Firm orange brown slightly gravelly CLAY with occasional cobbles of flint. Gravel is medium sub-angular of flint (roots (10mm) at 0.5m) LAMBETH GROUP
				1.50			Firm orange brown slightly sandy CLAY with frequent cobbles of flint. Sand is medium LAMBETH GROUP
	2.00	D		2.00			Firm orange and grey mottled slightly sandy CLAY. Sand is fine to medium LAMBETH GROUP
							End of Pit at 2.00m

1 2 3 4 5

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP210
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468151.00 - 112030.00 Level:	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.40	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.15			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.50	B					Firm grey and orange mottled slightly sandy CLAY with rootlets. Sand is medium LAMBETH GROUP
	1.00	D		0.90			Firm grey and orange mottled slightly sandy CLAY. Sand is medium (charcoal fragments at 1.35m) LAMBETH GROUP
				1.40			End of Pit at 1.40m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP211
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468148.00 - 112098.00 Level:	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.30 — 1.20 × 0.60	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.10			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.30			Brown sandy clay with flint cobbles, chalk fragments and occasional brick fragments MADE GROUND
	0.50	D					Firm brown slightly sandy CLAY with occasional rootlets. Sand is medium LAMBETH GROUP
				0.80			Firm red brown sandy CLAY. Sand is medium LAMBETH GROUP
	1.00	D					
				1.30			End of Pit at 1.30m

1 2 3 4 5

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Project Name: Woodcroft		Project No. GE16662	Co-ords: 468050.00 - 112055.00 Level:	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.40	1.20 × 0.60	Scale 1:25
Client: Linden Homes South				Logged FG

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	ES		0.15			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.35			Soft orange brown very sandy CLAY with occasional sub-angular flint gravel. Sand is medium LAMBETH GROUP
	0.50 0.50	B D					Firm orange brown CLAY with frequent flint cobbles and chalk fragments LAMBETH GROUP
	0.80	D					
	1.10	D		1.10			Structureless CHALK composed of: medium to coarse sub-angular white GRAVEL. Fragments are weak CHALK
				1.40			End of Pit at 1.40m

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468023.00 - 112009.00 Level:	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 2.20	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.20			Brown sandy clay with brick fragments and chalk gravel MADE GROUND
	0.50 0.50	B D					Stiff light brown gravelly CLAY MADE GROUND
				0.80			Brown sandy clay with brick, concrete fragments, possible asbestos tiles, and decaying roots MADE GROUND
	1.00	ES					
				1.70			Soft light grey CLAY (decaying root (3mm) at 2m) LAMBETH GROUP
	2.00	D					
				2.20			End of Pit at 2.20m

1 2 3 4 5

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP214
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468056.00 - 112002.00 Level:	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 2.00	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.20			Brown clay with bricks and chalk cobbles MADE GROUND
	0.50	B					Firm light brown and grey mottled CLAY, with frequent flint gravel (decaying root (4mm) at 0.5m) MADE GROUND
	0.50	D					
	0.90	ES		0.90			Dark brown clay with ashy deposits, plastic, brick fragments, chalk gravel, and wood MADE GROUND
				1.90			Firm light brown and grey mottled CLAY LAMBETH GROUP
	2.00	D		2.00			End of Pit at 2.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP215
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468082.00 - 111995.00 Level:	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 2.90	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30	ES					Ashy deposits overlying brown gravelly clay with bricks, concrete, flint cobbles, tarmac and chalk fragments MADE GROUND
				1.00			Soft orange brown sandy re-worked CLAY MADE GROUND
				1.70			Structureless CHALK composed of: medium to coarse sub-angular white sandy GRAVEL, sand is medium and fragments are weak CHALK
				2.30			Structureless CHALK composed of: medium to coarse sub-angular white sandy GRAVEL, fragments are weak CHALK
	2.90 2.90	D D		2.90			End of Pit at 2.90m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP216
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468060.00 - 111982.00 Level:	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.00	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.20			Brown sandy clay with charcoal and brick fragments MADE GROUND
	0.50 0.50 0.60	B D ES					Firm light brown and grey mottled gravelly CLAY. Gravel is medium, sub angular of flint LAMBETH GROUP
	1.00	D		1.00			End of Pit at 1.00m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP217
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468063.00 - 111949.00 Level:	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.00 — 1.20 × 0.60	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.05			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.20	ES					Firm light brown and grey mottled CLAY, with frequent rootlets LAMBETH GROUP
	0.50	D					
	1.00	D		1.00			End of Pit at 1.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP218
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468068.00 - 111932.00 Level:	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 0.90 — 1.20 × 0.60	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.15	ES		0.15			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.50 0.50	B D					Firm light brown and grey mottled CLAY LAMBETH GROUP
	1.00	D		0.90			End of Pit at 0.90m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

Geo-Environmental Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Trial Pit Log**		TrialPit No TP219 Sheet 1 of 1
Project Name: Woodcroft	Project No. GE16662	Co-ords: 468127.00 - 111929.00 Level:	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.00	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.20			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets and chalk fragments TOPSOIL
	0.50	D					Firm light brown and grey mottled CLAY LAMBETH GROUP
	1.00 1.00	D ES		1.00			End of Pit at 1.00m

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP220
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468116.00 - 111958.00 Level:	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 2.00	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES					Grass over, dark brown gravelly clay with chalk and brick fragments MADE GROUND
				0.60			Soft brown and grey mottled CLAY LAMBETH GROUP
				0.80			Firm brown and grey mottled CLAY, with red sandy banding at 1.5m LAMBETH GROUP
	1.00	D					
	1.00	ES					
				2.00			End of Pit at 2.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP221
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468161.00 - 111926.00 Level:	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.20 — 1.20 × 0.60	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.30			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.50 0.50	D ES		0.70			Soft orange brown slightly sandy CLAY with occasional chalk fragments and roots (1-3mm) LAMBETH GROUP
	1.00	D		1.20			Firm orange and grey mottled slightly sandy CLAY with roots (1-3mm) and rootlets LAMBETH GROUP
							End of Pit at 1.20m

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Project Name:	Woodcroft	Project No. GE16662	Co-ords: 468221.00 - 111986.00 Level:	Date 21/08/2017
Location:	Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.50	Scale 1:25
Client:	Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.25			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.40	ES		0.50			Firm orange brown slightly sandy CLAY with occasional flint gravels and roots (1-2mm). Sandy is medium LAMBETH GROUP
	1.00	D		1.00			Firm orange brown slightly sandy CLAY with occasional flint gravels. Sandy is medium LAMBETH GROUP
				1.50			Stiff orange brown slightly sandy, slightly gravelly CLAY. Sand is medium, gravel is medium, sub-angular of flint LAMBETH GROUP
							End of Pit at 1.50m

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP223
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468126.00 - 111996.00 Level:	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.10	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.05			Concrete MADE GROUND
				0.25			Brown gravelly clay with concrete and brick fragments MADE GROUND
	0.40	ES					Soft grey and orange mottled slightly sandy CLAY LAMBETH GROUP
	0.50	D					
	0.50	ES					
	1.00	D					
				1.10			End of Pit at 1.10m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP224
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468077.00 - 112011.00 Level:	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 2.20	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES					Ashy deposits overlying brown gravelly clay with bricks, flint cobbles, chalk fragments and tarmac MADE GROUND
				0.70			Soft blue grey re-worked CLAY with bricks MADE GROUND
				1.60			Firm grey brown CLAY (Large flint cobble at 1.8m) LAMBETH GROUP
	2.20 2.20	D D		2.20			End of Pit at 2.20m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP225
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468112.00 - 111991.00 Level:	Date 23/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 0.60	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15			Chippings over tarmac MADE GROUND
	0.25 0.30	ES ES		0.60			Brown gravelly clay with tarmac, brick fragments, chalk fragments, flint gravel, ash and charcoal (concrete encountered at 0.6m) MADE GROUND
							End of Pit at 0.60m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks Concrete encounted at 0.6m, pit terminated

Stability

AGS

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Trial Pit Log

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TP226
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468103.00 - 112028.00 Level:	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.10	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.20			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.40	D					Firm orange brown slightly sandy CLAY. Sand is medium LAMBETH GROUP
				0.80			Firm orange brown slightly sandy CLAY with frequent cobbles of flint and occasional charcoal fragments. Sand is medium LAMBETH GROUP
				1.10			End of Pit at 1.10m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP227
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468105.00 - 112061.00 Level:	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.00	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.25			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.40	D		0.70			Firm orange brown slightly sandy, slightly gravelly CLAY. Sand is medium and gravel is fine to medium, sub-angular of flint LAMBETH GROUP
				0.90			Firm orange brown CLAY LAMBETH GROUP
				1.00			Structureless CHALK composed of: medium to coarse sub-angular white GRAVEL. Fragments are weak CHALK End of Pit at 1.00m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP228
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468169.00 - 112048.00 Level:	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.70 — 1.20 × 0.60	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.15	ES		0.25			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.50	D					Soft brown orange sandy CLAY with occasional flint gravel and rootlets. Sand is medium LAMBETH GROUP
	1.20	D		1.10			Yellow fine medium SAND LAMBETH GROUP
				1.70			End of Pit at 1.70m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP229
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468030.00 - 112090.00 Level:	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.80 — 0.60 × 1.20	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.60 0.60	D ES		0.60			Grass over, Orange brown sandy CLAY with frequent rootlets TOPSOIL
				0.80			Firm orange brown very sandy CLAY with occasional flint cobbles. Sand is medium LAMBETH GROUP
	1.00	D					Firm orange brown CLAY with occasional flint cobbles LAMBETH GROUP
				1.40			
	1.50	D					Firm grey slightly sandy CLAY with frequent cobbles of flint. Sand is medium LAMBETH GROUP
				1.80			End of Pit at 1.80m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP230
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468086.00 - 112103.00 Level:	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.20 — 1.20 × 0.60	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.30	ES					Soft orange brown very sandy CLAY. Sand is medium LAMBETH GROUP
	0.50	D					
				0.70			Firm grey and orange mottled CLAY with frequent flint cobbles LAMBETH GROUP
	1.10	D					
				1.20			End of Pit at 1.20m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP231
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468130.00 - 112119.00 Level:	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.20 — 1.20 × 0.60	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.40	ES		0.60			Soft orange brown very gravelly sandy CLAY. Gravel is medium, sub-angular of flint and sand is medium LAMBETH GROUP
	0.80	D		1.20			Firm orange brown slightly sandy CLAY with occasional rootlets. Sand is medium LAMBETH GROUP
							End of Pit at 1.20m

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP232
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468210.00 - 112065.00 Level:	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.30	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.30			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.80	D		0.70			Firm orange and grey mottled slightly sandy CLAY. Sand is fine to medium LAMBETH GROUP
				1.30			Firm orange and grey mottled sandy CLAY. Sand is fine to medium LAMBETH GROUP End of Pit at 1.30m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468228.00 - 112111.00 Level:	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.10	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Grass over, Brown sandy, gravelly CLAY with frequent roots and rootlets TOPSOIL
	0.40 0.40	ES ES		0.30			Firm orange brown gravelly CLAY. Gravel is medium to coarse sub-angular of flint LAMBETH GROUP
	0.80	D		0.65			Stiff grey and orange mottled CLAY with occasional red bands of sandy CLAY LAMBETH GROUP
				1.10			End of Pit at 1.10m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP234
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468242.00 - 112136.00 Level:	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.00	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20			Grass over, Brown sandy, gravelly CLAY with frequent roots and rootlets TOPSOIL
	0.30	ES					Firm brown very gravelly CLAY. Gravel is medium to coarse sub-angular of flint LAMBETH GROUP
				0.45			Stiff orange and grey mottled CLAY (Large tree root (70mm) at 0.7m and tree root (4mm) at 1m) LAMBETH GROUP
	1.00	D		1.00			End of Pit at 1.00m

1 2 3 4 5

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP235
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468165.00 - 112133.00 Level:	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 2.20	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.25			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.50 0.50	D ES					Orange brown clayey medium SAND with occasional flint gravel LAMBETH GROUP
	1.00	D					
				1.80			Grey and orange fine to medium SAND LAMBETH GROUP
				2.20			End of Pit at 2.20m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP236
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468115.00 - 112146.00 Level:	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.70	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.30	ES		0.40			Soft orange brown slightly gravelly sandy CLAY. Sand is medium and gravel is medium, sub-angular of flint LAMBETH GROUP
	1.00	D		1.00			Orange slightly clayey medium SAND LAMBETH GROUP
				1.70			End of Pit at 1.70m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP237
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468036.00 - 112164.00 Level:	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.00	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15			Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.40	ES					Soft orange brown very sandy CLAY. Sand is medium LAMBETH GROUP
	0.50	D					
				0.85			Firm orange brown CLAY LAMBETH GROUP
	1.00	D		1.00			End of Pit at 1.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP238
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468045.00 - 112137.00 Level:	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.00	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.25			Grass over, Orange brown sandy CLAY with frequent rootlets TOPSOIL
	0.50	D					Stiff orange brown CLAY with occasional cobbles of sub angular flint LAMBETH GROUP
	0.80	ES					
	1.00	D		1.00			End of Pit at 1.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP239
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468112.00 - 112015.00 Level:	Date 23/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.40	Scale 1:25
Client: Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES					Grass over brown sandy gravelly clay with brick, chalk fragments, concrete, and flint gravel MADE GROUND
	0.50	ES		0.50			
				0.60			Brown sandy clay with tiles of possible asbestos, chalk fragments, concrete and brick MADE GROUND
							Soft brown very sandy CLAY. Sand is medium LAMBETH GROUP
				1.40			Soft brown very sandy CLAY. Sand is medium LAMBETH GROUP
	1.50	ES					End of Pit at 1.40m
	1.80	D		1.80			

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Borehole Log

Borehole No. **WS201**

Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords: 468236E - 111994N
Location:	Woodcroft Farm, Lovedean,		Level:
Client:	Linden Homes South		Dates: 05/09/2017

Hole Type: WLS
Scale: 1:25
Logged By: FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.25	D		0.20			Grass over, brown sandy clay with flint gravel and frequent rootlets TOPSOIL
		0.25	PP	1.3kg/cm2				Firm orange and grey mottled slightly sandy CLAY. Sand is medium LAMBETH GROUP
		0.50	D					
		0.50	PP	0.7kg/cm2				
		0.75	D		0.80			
		0.75	PP	0.7kg/cm2				Firm orange and grey mottled slightly sandy CLAY with occasional bands of red sandy clay. Sand is medium LAMBETH GROUP
		1.00	D		1.10			
		1.00	PP	0.9kg/cm2				Stiff orange and grey mottled sandy CLAY. Sand is medium LAMBETH GROUP
		1.25	D					
		1.25	PP	1.3kg/cm2				
		1.50	D					
		1.50	PP	1.3kg/cm2				
		1.75	D					
		1.75	PP	1.7kg/cm2				
		2.00	D		2.00			
		2.00	PP	1.2kg/cm2				Firm orange very sandy CLAY. Sand is fine LAMBETH GROUP
		2.25	D		2.30			
		2.25	PP	0.5kg/cm2				Yellow greyish clayey fine SAND LAMBETH GROUP
		2.50	D					
		2.75	D					
		3.00	D		3.00			End of Borehole at 3.00m

1 2 3 4 5

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **WS202** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords: 468174E - 111973N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level:	Scale 1:25
Client:	Linden Homes South		Dates: 05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
					0.30			
		0.50 0.50	D PP	1.6kg/cm2				Stiff orange, red and grey mottled slightly sandy CLAY with occasional rootlets. Sand is medium LAMBETH GROUP
		0.75 0.75	D PP	1.7kg/cm2				
		1.00 1.00	D PP	1.8kg/cm2				*.....Occasional roots (1-3mm)*
					1.10			Stiff orange and grey mottled sandy CLAY with occasional roots (2mm) and occasional red banding of sandy clay. LAMBETH GROUP
		1.25 1.25	D PP	2.0kg/cm2				*.....Occasional roots (2mm)*
		1.50 1.50	D PP	1.8kg/cm2				
		1.75 1.75	D PP	1.7kg/cm2				*.....Large root (5mm)*
		2.00 2.00	D PP	1.6kg/cm2				
		2.25 2.25	D PP	1.5kg/cm2				
					2.40			Firm orange and grey mottled very sandy CLAY with occasional roots (2-4mm) and rootlets. Sand is medium LAMBETH GROUP
		2.50 2.50	D PP	0.7kg/cm2				*.....Occasional roots (2-4mm)*
		2.75 2.75	D PP	0.5kg/cm2	2.80			Yellow/ Orange fine SAND LAMBETH GROUP
		3.00	D		3.00			End of Borehole at 3.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS203** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords: 468173E - 111996N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level:	Scale 1:25
Client:	Linden Homes South		Dates: 05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.15			Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
		0.25 0.25	D PP	1.6kg/cm2				Firm orange brown gravelly CLAY with occasional flint cobbles. Gravel is medium sub angular to sub rounded of flint LAMBETH GROUP
		0.50 0.50	D PP	0.9kg/cm2				
		0.75 0.75	D PP	1.1kg/cm2	0.70			Firm orange, red and grey mottled slightly sandy CLAY. Sand is fine LAMBETH GROUP
		1.00 1.00	D PP	0.5kg/cm2	1.10			Firm orange and grey mottled sandy CLAY. Sand is fine LAMBETH GROUP
		1.25 1.25	D PP	1.0kg/cm2				
		1.50 1.50	D PP	0.8kg/cm2				
		1.75 1.75	D PP	1.3kg/cm2	1.90			Firm orange and grey mottled very sandy CLAY. Sand is fine LAMBETH GROUP
		2.00 2.00	D PP	1.5kg/cm2				
		2.25 2.25	D PP	0.9kg/cm2	2.30			Yellow/ Orange fine SAND LAMBETH GROUP
		2.50	D					
		2.75	D					
		3.00	D		3.00			End of Borehole at 3.00m

1 2 3 4 5

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **WS204** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords: 468179E - 112013N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level:	Scale 1:25
Client:	Linden Homes South		Dates: 05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30			Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
		0.50 0.50	D PP	0.9kg/cm2				Stiff orange/ brown slightly sandy CLAY with frequent rootlets. Sand is fine LAMBETH GROUP
		0.75 0.75	D PP	1.0kg/cm2				
		1.00 1.00	D PP	1.2kg/cm2	1.10			
		1.25 1.25	D PP	1.4kg/cm2				Stiff orange/ brown slightly sandy CLAY with rare rootlets. Sand is fine LAMBETH GROUP
		1.50 1.50	D PP	1.5kg/cm2				
		1.75 1.75	D PP	1.3kg/cm2				
		2.00 2.00	D PP	1.0kg/cm2				
		2.25 2.25	D PP	1.1kg/cm2	2.30			Firm orange and grey mottled sandy CLAY. Sand is fine LAMBETH GROUP
		2.50 2.50	D PP	0.9kg/cm2				
		2.75 2.75	D PP	0.7kg/cm2				
		3.00 3.00	D PP	0.8kg/cm2	3.00			End of Borehole at 3.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **WS205** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords: 468150E - 112033N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level:	Scale 1:25
Client:	Linden Homes South		Dates: 05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.25			Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
		0.50	D					Brown clayey fine SAND LAMBETH GROUP
		0.75	D					
					0.90			
		1.00	D					Orange fine SAND LAMBETH GROUP
		1.25	D					
		1.50	D					
					1.70			
		1.75	D					Orange clayey fine SAND LAMBETH GROUP
		2.00	D		2.00			Stiff grey slightly sandy CLAY. Sand is fine LAMBETH GROUP
		2.00	PP	1.1kg/cm2				
		2.25	D					
		2.25	PP	1.2kg/cm2				
		2.50	D					
		2.50	PP	1.0kg/cm2				
					2.60			Soft brown slightly sandy CLAY. Sand is fine LAMBETH GROUP
		2.75	D					
		2.75	PP	0.4kg/cm2	2.80			Structureless CHALK composed of: medium to coarse sub-angular white sandy GRAVEL, sand is medium and fragments are weak CHALK
		3.00	D		3.00			End of Borehole at 3.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **WS206** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords: 468081E - 111960N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level:	Scale 1:25
Client:	Linden Homes South		Dates: 05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
					0.35			
		0.50 0.50	D PP	1.2kg/cm2				Firm brown orange slightly sandy gravelly CLAY with frequent rootlets. Sand is fine, gravel is medium sub angular to sub rounded of flint. LAMBETH GROUP
		0.75 0.75	D PP	1.6kg/cm2				
		1.00 1.00	D PP	1.5kg/cm2				
		1.25 1.25	D PP	1.1kg/cm2				
		1.50 1.50	D PP	0.8kg/cm2				
		1.75 1.75	D PP	1.3kg/cm2				
					1.90			
		2.00 2.00	D PP	1.8kg/cm2				Firm brown very gravelly CLAY. Gravel is medium sub angular to sub rounded of flint. LAMBETH GROUP
		2.25 2.25	D PP	1.7kg/cm2				
		2.50 2.50	D PP	1.5kg/cm2				
		2.75 2.75	D PP	1.6kg/cm2				
		3.00 3.00	D PP	1.5kg/cm2	3.00			End of Borehole at 3.00m

1 2 3 4 5

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **WS207** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords: 468075E - 111938N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level:	Scale 1:25
Client:	Linden Homes South		Dates: 05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.15			Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
		0.25 0.25	D PP	1.0kg/cm2				Firm orange and grey mottled CLAY with frequent rootlets and occasional flint gravel LAMBETH GROUP
		0.50 0.50	D PP	1.0kg/cm2				
		0.75 0.75	D PP	0.7kg/cm2				
		1.00 1.00	D PP	0.6kg/cm2				
								.....Decaying root (6mm)
		1.25 1.25	D PP	0.9kg/cm2	1.20			Stiff orange and grey mottled slightly sandy CLAY with occasional rootlets. Sand is fine LAMBETH GROUP
		1.50 1.50	D PP	1.5kg/cm2	1.40			*.....Occasional roots (2mm)* Stiff orange and grey mottled slightly sandy CLAY with occasional rootlets and red banding of sandy clay. Sand is fine LAMBETH GROUP
		1.75 1.75	D PP	1.5kg/cm2				*.....Occasional roots (2mm)*
		2.00 2.00	D PP	1.5kg/cm2				
		2.25 2.25	D PP	1.7kg/cm2	2.20			Stiff orange and grey mottled slightly sandy CLAY with frequent rootlets. Sand is fine LAMBETH GROUP
		2.50 2.50	D PP	1.5kg/cm2				
		2.75 2.75	D PP	1.7kg/cm2	2.80			Stiff grey CLAY with chalk fragments LAMBETH GROUP
		3.00 3.00	D PP	1.8kg/cm2	3.00			End of Borehole at 3.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

Geo-Environmental

APPENDIX C

Geochemical Laboratory Results

and Statistical Assessment Criteria



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2683

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	17-13705
Issue:	1
Date of Issue:	31/08/2017
Contact:	Fiona Goode
Customer Details:	GESL Unit 7 Danworth Farm Hurstpierpoint West SussexBN6 9GL
Quotation No:	Q14-00021
Order No:	2253
Customer Reference:	GE16662
Date Received:	24/08/2017
Date Approved:	31/08/2017
Details:	Woodcroft
Approved by:	

John Wilson, Operations Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

Sample Summary

Report No.: 17-13705

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
109920	TP201 0.10	23/08/2017	24/08/2017		
109921	TP201 0.50	23/08/2017	24/08/2017		
109922	TP202 0.10	23/08/2017	24/08/2017	Silty loam	
109923	TP202 0.50	23/08/2017	24/08/2017		
109924	TP203 0.10	23/08/2017	24/08/2017		
109925	TP203 0.50	23/08/2017	24/08/2017	Silty clayey loam	
109926	TP204 0.10	22/08/2017	24/08/2017		
109927	TP204 0.50	22/08/2017	24/08/2017	Silty clayey loam	
109928	TP205 0.10	23/08/2017	24/08/2017		
109929	TP205 0.50	23/08/2017	24/08/2017	Clayey loam	
109930	TP206 0.10	23/08/2017	24/08/2017	Silty loam	
109931	TP206 0.50	23/08/2017	24/08/2017		
109932	TP207 0.30	21/08/2017	24/08/2017	Silty clayey loam	
109933	TP208 0.10	21/08/2017	24/08/2017		
109934	TP209 0.10	21/08/2017	24/08/2017		
109935	TP210 0.10	21/08/2017	24/08/2017		
109936	TP211 0.10	22/08/2017	24/08/2017		
109937	TP212 0.20	21/08/2017	24/08/2017		
109938	TP213 1.00	21/08/2017	24/08/2017	Silty loam	
109939	TP214 0.90	21/08/2017	24/08/2017	Silty loam	
109940	TP215 0.30	22/08/2017	24/08/2017	Sandy silty loam	
109941	TP215 2.90	23/08/2017	24/08/2017	Chalk	
109942	TP216 0.60	21/08/2017	24/08/2017		
109943	TP217 0.20	21/08/2017	24/08/2017	Silty clayey loam	
109944	TP218 0.15	21/08/2017	24/08/2017		
109945	TP219 1.00	21/08/2017	24/08/2017		
109946	TP220 0.20	22/08/2017	24/08/2017	Sandy silty loam	
109947	TP220 1.00	22/08/2017	24/08/2017	Silty clayey loam	
109948	TP221 0.10	22/08/2017	24/08/2017	Silty loam	
109949	TP221 0.50	22/08/2017	24/08/2017		
109950	TP222 0.40	21/08/2017	24/08/2017	Silty clayey loam	
109951	TP223 0.40	22/08/2017	24/08/2017	Clayey loam	
109952	TP223 0.50	22/08/2017	24/08/2017	Clayey loam	
109953	TP224 0.20	22/08/2017	24/08/2017	Sandy silty loam + Chalk	
109954	TP224 2.20	22/08/2017	24/08/2017	Silty loam	
109955	TP225 0.25	23/08/2017	24/08/2017	Sandy silty loam	
109956	TP225 0.30	23/08/2017	24/08/2017	Sandy loam	
109957	TP226 0.10	21/08/2017	24/08/2017	Silty loam	c
109958	TP227 0.10	21/08/2017	24/08/2017		
109959	TP228 0.15	22/08/2017	24/08/2017	Silty loam	
109960	TP229 0.60	21/08/2017	24/08/2017	Loamy sand	
109961	TP230 0.30	21/08/2017	24/08/2017		
109962	TP231 0.40	21/08/2017	24/08/2017	Sandy silty loam	
109963	TP232 0.10	21/08/2017	24/08/2017	Silty loam	
109964	TP233 0.40	21/08/2017	24/08/2017	Silty clayey loam	
109965	TP234 0.30	21/08/2017	24/08/2017	Silty loam	
109966	TP235 0.50	22/08/2017	24/08/2017	Loamy sand	
109967	TP236 0.30	21/08/2017	24/08/2017	Loamy sand	
109968	TP237 0.40	21/08/2017	24/08/2017	Silty loam	
109969	TP238 0.80	21/08/2017	24/08/2017		
109970	TP239 0.20	23/08/2017	24/08/2017	Sandy loam	
109971	TP239 0.50	23/08/2017	24/08/2017		
109972	TP239 1.50	23/08/2017	24/08/2017	Loamy sand	
109973	TP224 0.30	22/08/2017	24/08/2017		

Results Summary

Report No.: 17-13705

	ELAB Reference	109922	109925	109927	109929	109930	109932
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP202	TP203	TP204	TP205	TP206	TP207
	Sample Depth (m)	0.10	0.50	0.50	0.50	0.10	0.30
	Sampling Date	23/08/2017	23/08/2017	22/08/2017	23/08/2017	23/08/2017	21/08/2017
Determinand	**Codes** / **Units** / **LOD**						
Metals							
Arsenic	M / mg/kg / 1	9.5	11.1	9.9	12.1	4.5	11.8
Barium	U / mg/kg / 10	34.6	48.8	45.9	17.2	16.7	30.1
Beryllium	U / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cadmium	M / mg/kg / 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	M / mg/kg / 5	34.7	60.8	53.7	30.9	12.4	38.0
Copper	M / mg/kg / 5	20.3	29.5	23.9	14.6	8.0	20.3
Lead	M / mg/kg / 5	21.0	24.3	18.8	27.0	11.5	15.3
Mercury	M / mg/kg / 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M / mg/kg / 5	18.3	21.5	22.0	8.9	5.4	9.2
Selenium	M / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium	M / mg/kg / 5	33.5	86.7	77.1	69.9	23.4	54.1
Zinc	M / mg/kg / 5	41.1	52.1	58.4	28.8	17.6	27.1
Anions							
Water Soluble Chloride	M / mg/kg / 40	48	54	45	53	< 40	70
Water Soluble Sulphate	M / g/l / 0.02	0.06	0.05	0.04	0.04	0.03	0.05
Inorganics							
Elemental Sulphur	N / mg/kg / 20	< 20	< 20	< 20	< 20	< 20	< 20
Hexavalent Chromium	N / mg/kg / 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N / mg/kg / 2	< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M / mg/kg / 1	1.1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U / % / 0.02	0.07	0.11	0.04	0.07	0.04	0.05
Water Soluble Boron	N / mg/kg / 0.5	0.8	0.5	< 0.5	0.8	< 0.5	< 0.5
Miscellaneous							
Acid Neutralisation Capacity	N / mol/kg / 0.1	n/t	n/t	n/t	n/t	n/t	n/t
Loss On Ignition (450°C)	M / % / 0.01	n/t	n/t	n/t	n/t	n/t	n/t
pH	M / pH units / 0.1	7.7	7.4	7.5	5.7	5.7	7.6
Total Organic Carbon	N / % / 0.01	0.50	0.54	0.23	0.19	0.36	0.19
Phenols							
Total Phenols	N / mg/kg / 6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons							
Naphthalene	M / mg/kg / 0.1	0.9	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	M / mg/kg / 0.1	0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1
Benzo(a)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo (b) fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo (a) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno (1,2,3-cd) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total PAH(16)	M / mg/kg / 0.4	1.1	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Total PAH (Including Coronene)	N / mg/kg / 2	n/t	n/t	n/t	n/t	n/t	n/t

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Results Summary

Report No.: 17-13705

	ELAB Reference	109922	109925	109927	109929	109930	109932
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP202	TP203	TP204	TP205	TP206	TP207
	Sample Depth (m)	0.10	0.50	0.50	0.50	0.10	0.30
	Sampling Date	23/08/2017	23/08/2017	22/08/2017	23/08/2017	23/08/2017	21/08/2017
Determinand	**Codes** / **Units** / **LOD**						
BTEX							
Benzene	M / ug/kg / 10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M / ug/kg / 10	35.9	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M / ug/kg / 10	40.3	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M / ug/kg / 10	312	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Total BTEX	M / mg/kg / 0.01	n/t	n/t	n/t	n/t	n/t	n/t
TPH CWG							
>C5-C6 Aliphatic	N / mg/kg / 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N / mg/kg / 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N / mg/kg / 1	1.8	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N / mg/kg / 1	3.3	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N / mg/kg / 1	2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N / mg/kg / 1	1.8	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N / mg/kg / 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N / mg/kg / 0.01	0.04	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N / mg/kg / 1	9.0	< 1.0	3.2	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N / mg/kg / 1	14.4	< 1.0	5.3	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N / mg/kg / 1	3.2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aromatic	N / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N / mg/kg / 1	35.5	< 1.0	8.5	< 1.0	< 1.0	< 1.0
Total Petroleum Hydrocarbons							
Mineral Oil	U / mg/kg / 5	n/t	n/t	n/t	n/t	n/t	n/t
PCB (ICES 7 congeners)							
PCB (Total of 7 Congeners)	M / mg/kg / 0.03	n/t	n/t	n/t	n/t	n/t	n/t

Results Summary

Report No.: 17-13705

			ELAB Reference	109938	109939	109940	109941	109943	109946
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP213	TP214	TP215	TP215	TP217	TP220
			Sample Depth (m)	1.00	0.90	0.30	2.90	0.20	0.20
			Sampling Date	21/08/2017	21/08/2017	22/08/2017	23/08/2017	21/08/2017	22/08/2017
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	9.0	13.8	10.4	^ 4.7	32.6	25.7
Barium	U	mg/kg	10	61.4	72.5	162	11.5	86.2	373
Beryllium	U	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	2.5	3.0
Cadmium	M	mg/kg	0.5	0.5	< 0.5	0.8	^ 0.6	< 0.5	1.1
Chromium	M	mg/kg	5	18.4	36.4	26.0	^ 8.6	63.2	36.9
Copper	M	mg/kg	5	14.7	20.4	22.0	^ 6.9	37.4	93.0
Lead	M	mg/kg	5	62.6	56.0	44.4	^ < 5.0	24.3	170
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	^ < 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	16.7	19.4	18.0	^ 11.8	19.1	56.2
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0	^ < 1.0	< 1.0	< 1.0
Vanadium	M	mg/kg	5	27.7	59.1	32.2	^ 7.8	117	133
Zinc	M	mg/kg	5	72.7	101	121	^ 15.9	30.3	335
Anions									
Water Soluble Chloride	M	mg/kg	40	< 40	50	55	^ < 40	53	< 40
Water Soluble Sulphate	M	g/l	0.02	0.03	0.30	0.16	^ 0.04	0.05	0.03
Inorganics									
Elemental Sulphur	N	mg/kg	20	< 20	1050	< 20	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	8	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	^ < 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.07	0.13	0.11	0.04	0.06	0.08
Water Soluble Boron	N	mg/kg	0.5	0.6	1.7	0.6	< 0.5	< 0.5	1.0
Miscellaneous									
Acid Neutralisation Capacity	N	mol/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Loss On Ignition (450°C)	M	%	0.01	n/t	n/t	n/t	n/t	n/t	n/t
pH	M	pH units	0.1	8.4	8.0	10.0	^ 8.8	8.2	8.2
Total Organic Carbon	N	%	0.01	0.49	0.92	0.47	0.02	0.32	4.9
Phenols									
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	^ < 0.1	< 0.1	0.2
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	^ < 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	0.3	^ < 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	0.3	^ < 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	0.4	0.2	2.4	^ < 0.1	< 0.1	0.3
Anthracene	M	mg/kg	0.1	0.1	< 0.1	0.9	^ < 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	1.3	0.6	5.9	^ < 0.1	< 0.1	0.7
Pyrene	M	mg/kg	0.1	1.3	0.6	5.1	^ 0.1	< 0.1	0.8
Benzo(a)anthracene	M	mg/kg	0.1	0.8	0.3	2.9	^ < 0.1	< 0.1	0.4
Chrysene	M	mg/kg	0.1	0.8	0.4	3.0	^ < 0.1	< 0.1	0.5
Benzo (b) fluoranthene	M	mg/kg	0.1	1.1	< 0.1	3.0	^ < 0.1	< 0.1	0.6
Benzo(k)fluoranthene	M	mg/kg	0.1	1.0	< 0.1	2.9	^ < 0.1	< 0.1	0.6
Benzo (a) pyrene	M	mg/kg	0.1	1.0	0.4	3.1	^ 0.2	< 0.1	0.5
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	0.9	0.2	2.2	^ < 0.1	< 0.1	0.4
Dibenzo(a,h)anthracene	M	mg/kg	0.1	0.5	0.2	0.6	^ < 0.1	< 0.1	0.2
Benzo[g,h,i]perylene	M	mg/kg	0.1	0.9	0.3	2.1	^ < 0.1	< 0.1	0.5
Total PAH(16)	M	mg/kg	0.4	10.4	3.2	34.6	^ < 0.4	< 0.4	5.8
Total PAH (Including Coronene)	N	mg/kg	2	n/t	n/t	n/t	n/t	n/t	n/t

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Results Summary

Report No.: 17-13705

			ELAB Reference	109938	109939	109940	109941	109943	109946
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP213	TP214	TP215	TP215	TP217	TP220
			Sample Depth (m)	1.00	0.90	0.30	2.90	0.20	0.20
			Sampling Date	21/08/2017	21/08/2017	22/08/2017	23/08/2017	21/08/2017	22/08/2017
Determinand	**Codes**	**Units**	**LOD**						
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0
Total BTEX	M	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	2.9	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	14.4	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	2.1	< 1.0	18.8	9.2	< 1.0	3.3
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	3.5	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	6.9	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	7.1	< 1.0	28.2	10.9	< 1.0	7.2
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	14.6	< 1.0	< 1.0	1.8
Total (>C5-C40) Ali/Aro	N	mg/kg	1	9.3	< 1.0	65.1	44.4	< 1.0	12.3
Total Petroleum Hydrocarbons									
Mineral Oil	U	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
PCB (ICES 7 congeners)									
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t	n/t	n/t	n/t	n/t

Results Summary

Report No.: 17-13705

	ELAB Reference	109947	109948	109950	109951	109952	109953
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP220	TP221	TP222	TP223	TP223	TP224
	Sample Depth (m)	1.00	0.10	0.40	0.40	0.50	0.20
	Sampling Date	22/08/2017	22/08/2017	21/08/2017	22/08/2017	22/08/2017	22/08/2017
Determinand	**Codes** / **Units** / **LOD**						
Metals							
Arsenic	M / mg/kg / 1	11.0	8.6	12.1	9.5	n/t	^ 7.8
Barium	U / mg/kg / 10	99.6	42.6	45.7	30.9	n/t	65.4
Beryllium	U / mg/kg / 1	1.2	< 1.0	< 1.0	1.0	n/t	< 1.0
Cadmium	M / mg/kg / 0.5	< 0.5	< 0.5	< 0.5	< 0.5	n/t	^ 0.5
Chromium	M / mg/kg / 5	39.5	24.2	42.3	33.0	n/t	^ 19.5
Copper	M / mg/kg / 5	21.6	26.3	20.6	19.7	n/t	^ 16.4
Lead	M / mg/kg / 5	20.1	26.5	16.9	18.1	n/t	^ 37.9
Mercury	M / mg/kg / 0.5	< 0.5	< 0.5	< 0.5	< 0.5	n/t	^ < 0.5
Nickel	M / mg/kg / 5	20.6	15.2	17.4	20.4	n/t	^ 16.4
Selenium	M / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	^ < 1.0
Vanadium	M / mg/kg / 5	74.6	37.3	62.6	41.2	n/t	^ 27.3
Zinc	M / mg/kg / 5	39.7	53.8	43.6	41.0	n/t	^ 51.1
Anions							
Water Soluble Chloride	M / mg/kg / 40	48	41	49	92	n/t	^ 167
Water Soluble Sulphate	M / g/l / 0.02	0.08	0.04	0.04	0.06	n/t	^ 0.09
Inorganics							
Elemental Sulphur	N / mg/kg / 20	< 20	< 20	< 20	< 20	n/t	< 20
Hexavalent Chromium	N / mg/kg / 0.8	< 0.8	< 0.8	< 0.8	< 0.8	n/t	< 0.8
Total Sulphide	N / mg/kg / 2	4	< 2	< 2	< 2	n/t	< 2
Total Cyanide	M / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	^ < 1.0
Acid Soluble Sulphate (SO4)	U / % / 0.02	0.07	0.06	0.05	0.06	n/t	0.07
Water Soluble Boron	N / mg/kg / 0.5	< 0.5	0.5	< 0.5	0.5	n/t	< 0.5
Miscellaneous							
Acid Neutralisation Capacity	N / mol/kg / 0.1	n/t	n/t	n/t	n/t	< 0.1	n/t
Loss On Ignition (450°C)	M / % / 0.01	n/t	n/t	n/t	n/t	2.82	n/t
pH	M / pH units / 0.1	7.3	7.7	7.5	8.3	7.7	^ 8.3
Total Organic Carbon	N / % / 0.01	0.29	0.69	0.19	0.15	0.18	0.10
Phenols							
Total Phenols	N / mg/kg / 6	< 6	< 6	< 6	< 6	n/t	< 6
Polyaromatic hydrocarbons							
Naphthalene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ < 0.1
Acenaphthylene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ < 0.1
Acenaphthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ < 0.1
Fluorene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ < 0.1
Phenanthrene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ 0.5
Anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ 0.1
Fluoranthene	M / mg/kg / 0.1	< 0.1	0.1	< 0.1	< 0.1	n/t	^ 1.0
Pyrene	M / mg/kg / 0.1	< 0.1	0.1	< 0.1	< 0.1	n/t	^ 0.9
Benzo(a)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ 0.6
Chrysene	M / mg/kg / 0.1	< 0.1	0.1	< 0.1	< 0.1	n/t	^ 0.7
Benzo (b) fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ 0.6
Benzo(k)fluoranthene	M / mg/kg / 0.1	< 0.1	0.1	< 0.1	< 0.1	n/t	^ 0.6
Benzo (a) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	0.2	< 0.1	n/t	^ 0.6
Indeno (1,2,3-cd) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	0.2	< 0.1	n/t	^ 0.6
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	0.3	< 0.1	n/t	^ 0.2
Benzo[g,h,i]perylene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ 0.5
Total PAH(16)	M / mg/kg / 0.4	< 0.4	< 0.4	0.9	< 0.4	n/t	^ 7.0
Total PAH (Including Coronene)	N / mg/kg / 2	n/t	n/t	n/t	n/t	< 2	n/t

Results Summary

Report No.: 17-13705

			ELAB Reference	109947	109948	109950	109951	109952	109953
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP220	TP221	TP222	TP223	TP223	TP224
			Sample Depth (m)	1.00	0.10	0.40	0.40	0.50	0.20
			Sampling Date	22/08/2017	22/08/2017	21/08/2017	22/08/2017	22/08/2017	22/08/2017
Determinand	**Codes**	**Units**	**LOD**						
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	n/t	^ < 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	n/t	^ < 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	n/t	^ < 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	n/t	^ < 10.0
Total BTEX	M	mg/kg	0.01	n/t	n/t	n/t	n/t	< 0.01	n/t
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	n/t	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	n/t	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	11.3
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	5.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	n/t	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	n/t	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	1.5
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	41.2
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	28.5
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	87.5
Total Petroleum Hydrocarbons									
Mineral Oil	U	mg/kg	5	n/t	n/t	n/t	n/t	< 5	n/t
PCB (ICES 7 congeners)									
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t	n/t	n/t	< 0.03	n/t

Results Summary

Report No.: 17-13705

	ELAB Reference	109954	109955	109956	109957	109959	109960
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP224	TP225	TP225	TP226	TP228	TP229
	Sample Depth (m)	2.20	0.25	0.30	0.10	0.15	0.60
	Sampling Date	22/08/2017	23/08/2017	23/08/2017	21/08/2017	22/08/2017	21/08/2017
Determinand	**Codes** / **Units** / **LOD**						
Metals							
Arsenic	M / mg/kg / 1	6.6	13.2	n/t	11.5	10.4	38.2
Barium	U / mg/kg / 10	63.4	124	n/t	46.0	40.0	51.2
Beryllium	U / mg/kg / 1	1.1	< 1.0	n/t	< 1.0	< 1.0	1.8
Cadmium	M / mg/kg / 0.5	< 0.5	0.5	n/t	< 0.5	< 0.5	< 0.5
Chromium	M / mg/kg / 5	28.9	52.8	n/t	21.7	19.5	37.3
Copper	M / mg/kg / 5	18.4	59.3	n/t	16.1	12.2	23.7
Lead	M / mg/kg / 5	18.5	82.9	n/t	25.9	23.7	18.9
Mercury	M / mg/kg / 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5	< 0.5
Nickel	M / mg/kg / 5	30.5	43.4	n/t	24.5	19.1	52.0
Selenium	M / mg/kg / 1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	1.1
Vanadium	M / mg/kg / 5	41.5	32.9	n/t	33.8	33.8	61.2
Zinc	M / mg/kg / 5	64.4	230	n/t	64.7	50.3	98.9
Anions							
Water Soluble Chloride	M / mg/kg / 40	56	140	n/t	65	< 40	< 40
Water Soluble Sulphate	M / g/l / 0.02	0.04	0.35	n/t	0.11	0.04	0.03
Inorganics							
Elemental Sulphur	N / mg/kg / 20	< 20	< 20	n/t	< 20	< 20	< 20
Hexavalent Chromium	N / mg/kg / 0.8	< 0.8	< 0.8	n/t	< 0.8	< 0.8	< 0.8
Total Sulphide	N / mg/kg / 2	< 2	< 2	n/t	< 2	< 2	< 2
Total Cyanide	M / mg/kg / 1	1.0	1.1	n/t	2.4	1.1	< 1.0
Acid Soluble Sulphate (SO4)	U / % / 0.02	0.05	0.77	n/t	0.12	0.07	0.05
Water Soluble Boron	N / mg/kg / 0.5	< 0.5	0.7	n/t	0.6	0.7	< 0.5
Miscellaneous							
Acid Neutralisation Capacity	N / mol/kg / 0.1	n/t	n/t	0.2	n/t	n/t	n/t
Loss On Ignition (450°C)	M / % / 0.01	n/t	n/t	2.63	n/t	n/t	n/t
pH	M / pH units / 0.1	7.7	11.1	11.4	9.2	7.4	7.2
Total Organic Carbon	N / % / 0.01	0.33	0.41	0.40	1.1	0.69	0.10
Phenols							
Total Phenols	N / mg/kg / 6	< 6	< 6	n/t	c < 6	< 6	< 6
Polyaromatic hydrocarbons							
Naphthalene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	c < 0.1	< 0.1	< 0.1
Acenaphthylene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	c < 0.1	< 0.1	< 0.1
Acenaphthene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	c < 0.1	< 0.1	< 0.1
Fluorene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	c < 0.1	< 0.1	< 0.1
Phenanthrene	M / mg/kg / 0.1	< 0.1	0.4	n/t	c < 0.1	< 0.1	< 0.1
Anthracene	M / mg/kg / 0.1	< 0.1	0.1	n/t	c < 0.1	< 0.1	< 0.1
Fluoranthene	M / mg/kg / 0.1	0.2	1.2	n/t	c 0.3	< 0.1	< 0.1
Pyrene	M / mg/kg / 0.1	< 0.1	1.1	n/t	c 0.3	0.1	< 0.1
Benzo(a)anthracene	M / mg/kg / 0.1	< 0.1	0.8	n/t	c 0.2	< 0.1	< 0.1
Chrysene	M / mg/kg / 0.1	< 0.1	0.9	n/t	c 0.2	< 0.1	< 0.1
Benzo (b) fluoranthene	M / mg/kg / 0.1	< 0.1	0.9	n/t	c 0.3	< 0.1	< 0.1
Benzo(k)fluoranthene	M / mg/kg / 0.1	< 0.1	1.0	n/t	c 0.5	< 0.1	< 0.1
Benzo (a) pyrene	M / mg/kg / 0.1	< 0.1	1.0	n/t	c 0.3	< 0.1	< 0.1
Indeno (1,2,3-cd) pyrene	M / mg/kg / 0.1	< 0.1	0.8	n/t	c 0.3	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	< 0.1	0.3	n/t	c 0.3	< 0.1	< 0.1
Benzo[g,h,i]perylene	M / mg/kg / 0.1	< 0.1	0.8	n/t	c 0.2	< 0.1	< 0.1
Total PAH(16)	M / mg/kg / 0.4	< 0.4	9.4	n/t	c 3.0	< 0.4	< 0.4
Total PAH (Including Coronene)	N / mg/kg / 2	n/t	n/t	25	n/t	n/t	n/t

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Results Summary

Report No.: 17-13705

			ELAB Reference	109954	109955	109956	109957	109959	109960
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP224	TP225	TP225	TP226	TP228	TP229
			Sample Depth (m)	2.20	0.25	0.30	0.10	0.15	0.60
			Sampling Date	22/08/2017	23/08/2017	23/08/2017	21/08/2017	22/08/2017	21/08/2017
Determinand	**Codes**	**Units**	**LOD**						
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	n/t	c < 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	n/t	c < 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	n/t	c < 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	n/t	c < 10.0	< 10.0	< 10.0
Total BTEX	M	mg/kg	0.01	n/t	n/t	< 0.01	n/t	n/t	n/t
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	c < 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	c < 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	6.4	n/t	c < 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	c < 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	c < 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	12.3	n/t	c 3.4	< 1.0	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	4.2	n/t	c 1.4	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	22.9	n/t	c 4.9	< 1.0	< 1.0
Total Petroleum Hydrocarbons									
Mineral Oil	U	mg/kg	5	n/t	n/t	11	n/t	n/t	n/t
PCB (ICES 7 congeners)									
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t	< 0.03	n/t	n/t	n/t

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Results Summary

Report No.: 17-13705

	ELAB Reference	109962	109963	109964	109965	109966	109967
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP231	TP232	TP233	TP234	TP235	TP236
	Sample Depth (m)	0.40	0.10	0.40	0.30	0.50	0.30
	Sampling Date	21/08/2017	21/08/2017	21/08/2017	21/08/2017	22/08/2017	21/08/2017
Determinand	**Codes** / **Units** / **LOD**						
Metals							
Arsenic	M / mg/kg / 1	33.1	5.6	n/t	6.9	14.7	30.4
Barium	U / mg/kg / 10	31.8	27.5	n/t	30.8	18.9	38.8
Beryllium	U / mg/kg / 1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	1.5
Cadmium	M / mg/kg / 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5	< 0.5
Chromium	M / mg/kg / 5	31.6	17.6	n/t	21.3	13.2	41.5
Copper	M / mg/kg / 5	17.8	12.8	n/t	12.5	8.9	22.0
Lead	M / mg/kg / 5	14.6	17.3	n/t	26.3	12.9	19.6
Mercury	M / mg/kg / 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5	< 0.5
Nickel	M / mg/kg / 5	18.9	14.3	n/t	8.2	7.2	30.2
Selenium	M / mg/kg / 1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
Vanadium	M / mg/kg / 5	63.1	26.9	n/t	33.7	27.5	84.2
Zinc	M / mg/kg / 5	38.5	38.3	n/t	37.5	25.8	71.7
Anions							
Water Soluble Chloride	M / mg/kg / 40	42	< 40	n/t	41	44	< 40
Water Soluble Sulphate	M / g/l / 0.02	0.03	0.03	n/t	0.03	0.03	< 0.02
Inorganics							
Elemental Sulphur	N / mg/kg / 20	< 20	< 20	n/t	< 20	< 20	< 20
Hexavalent Chromium	N / mg/kg / 0.8	< 0.8	< 0.8	n/t	< 0.8	< 0.8	< 0.8
Total Sulphide	N / mg/kg / 2	< 2	< 2	n/t	< 2	< 2	< 2
Total Cyanide	M / mg/kg / 1	1.1	1.3	n/t	1.6	1.8	< 1.0
Acid Soluble Sulphate (SO4)	U / % / 0.02	0.06	0.08	n/t	0.07	0.05	0.07
Water Soluble Boron	N / mg/kg / 0.5	< 0.5	0.6	n/t	1.0	< 0.5	< 0.5
Miscellaneous							
Acid Neutralisation Capacity	N / mol/kg / 0.1	n/t	n/t	< 0.1	n/t	n/t	n/t
Loss On Ignition (450°C)	M / % / 0.01	n/t	n/t	1.81	n/t	n/t	n/t
pH	M / pH units / 0.1	6.2	6.6	6.7	6.2	5.9	5.3
Total Organic Carbon	N / % / 0.01	0.30	1.4	0.15	1.4	0.14	0.10
Phenols							
Total Phenols	N / mg/kg / 6	< 6	< 6	n/t	< 6	< 6	< 6
Polyaromatic hydrocarbons							
Naphthalene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Acenaphthylene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Acenaphthene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Fluorene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Phenanthrene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Pyrene	M / mg/kg / 0.1	0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Chrysene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Benzo (b) fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Benzo (a) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Indeno (1,2,3-cd) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	0.3	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	0.2	< 0.1	< 0.1
Total PAH(16)	M / mg/kg / 0.4	< 0.4	< 0.4	n/t	0.7	< 0.4	< 0.4
Total PAH (Including Coronene)	N / mg/kg / 2	n/t	n/t	< 2	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 17-13705

			ELAB Reference	109962	109963	109964	109965	109966	109967
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP231	TP232	TP233	TP234	TP235	TP236
			Sample Depth (m)	0.40	0.10	0.40	0.30	0.50	0.30
			Sampling Date	21/08/2017	21/08/2017	21/08/2017	21/08/2017	22/08/2017	21/08/2017
Determinand	**Codes**	**Units**	**LOD**						
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	n/t	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	n/t	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	n/t	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	n/t	< 10.0	< 10.0	< 10.0
Total BTEX	M	mg/kg	0.01	n/t	n/t	< 0.01	n/t	n/t	n/t
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
Total Petroleum Hydrocarbons									
Mineral Oil	U	mg/kg	5	n/t	n/t	< 5	n/t	n/t	n/t
PCB (ICES 7 congeners)									
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t	< 0.03	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 17-13705

			ELAB Reference	109968	109970	109972
			Customer Reference			
			Sample ID			
			Sample Type	SOIL	SOIL	SOIL
			Sample Location	TP237	TP239	TP239
			Sample Depth (m)	0.40	0.20	1.50
			Sampling Date	21/08/2017	23/08/2017	23/08/2017
Determinand	**Codes**	**Units**	**LOD**			
Metals						
Arsenic	M	mg/kg	1	14.1	4.5	17.5
Barium	U	mg/kg	10	81.7	33.9	42.2
Beryllium	U	mg/kg	1	1.4	< 1.0	1.3
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	40.8	17.4	32.7
Copper	M	mg/kg	5	21.1	13.1	15.9
Lead	M	mg/kg	5	16.2	13.4	20.1
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	28.8	11.3	21.3
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0
Vanadium	M	mg/kg	5	58.3	18.4	90.2
Zinc	M	mg/kg	5	62.9	31.0	43.6
Anions						
Water Soluble Chloride	M	mg/kg	40	54	126	107
Water Soluble Sulphate	M	g/l	0.02	0.03	0.10	0.04
Inorganics						
Elemental Sulphur	N	mg/kg	20	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.04	0.04	0.10
Water Soluble Boron	N	mg/kg	0.5	< 0.5	0.5	< 0.5
Miscellaneous						
Acid Neutralisation Capacity	N	mol/kg	0.1	n/t	n/t	n/t
Loss On Ignition (450°C)	M	%	0.01	n/t	n/t	n/t
pH	M	pH units	0.1	6.6	8.8	7.9
Total Organic Carbon	N	%	0.01	0.16	0.21	0.09
Phenols						
Total Phenols	N	mg/kg	6	< 6	< 6	< 6
Polyaromatic hydrocarbons						
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	< 0.1	0.5	< 0.1
Pyrene	M	mg/kg	0.1	< 0.1	0.6	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	0.5	< 0.1
Chrysene	M	mg/kg	0.1	< 0.1	0.5	< 0.1
Benzo (b) fluoranthene	M	mg/kg	0.1	< 0.1	0.5	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	0.7	< 0.1
Benzo (a) pyrene	M	mg/kg	0.1	< 0.1	0.5	< 0.1
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	0.6	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	0.3	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	0.4	< 0.1
Total PAH(16)	M	mg/kg	0.4	< 0.4	5.2	< 0.4
Total PAH (Including Coronene)	N	mg/kg	2	n/t	n/t	n/t

Results Summary

Report No.: 17-13705

			ELAB Reference	109968	109970	109972
			Customer Reference			
			Sample ID			
			Sample Type	SOIL	SOIL	SOIL
			Sample Location	TP237	TP239	TP239
			Sample Depth (m)	0.40	0.20	1.50
			Sampling Date	21/08/2017	23/08/2017	23/08/2017
Determinand	**Codes**	**Units**	**LOD**			
BTEX						
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Total BTEX	M	mg/kg	0.01	n/t	n/t	n/t
TPH CWG						
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	4.6	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	4.6	< 1.0
Total Petroleum Hydrocarbons						
Mineral Oil	U	mg/kg	5	n/t	n/t	n/t
PCB (ICES 7 congeners)						
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t	n/t

Results Summary

Report No.: 17-13705

WAC Analysis								
Elab Ref:	109964					**Landfill Waste Acceptance Criteria Limits**		
Sample Date:	21/08/2017					**Inert Waste Landfill**	**Stable Non-reactive Hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:	TP233							
Depth (m)	0.4							
Site:	Woodcroft							
Determinand		**Code**	**Units**					
Total Organic Carbon		N	%		0.15	3	5	6
Loss on Ignition		M	%		1.8	--	--	10
Total BTEX		M	mg/kg		< 0.01	6	--	--
Total PCBs (7 congeners)		M	mg/kg		< 0.03	1	--	--
TPH Total WAC		M	mg/kg		< 5	500	--	--
Total (of 17) PAHs		N	mg/kg		< 2	100	--	--
pH		M			6.7	--	>6	--
Acid Neutralisation Capacity		N	mol/kg		< 0.1	--	To evaluate	To evaluate
Eluate Analysis			**10:1**		**10:1**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
			mg/l		**mg/kg**			
Arsenic		N	< 0.005		< 0.05	0.5	2	25
Barium		N	< 0.005		< 0.05	20	100	300
Cadmium		N	< 0.001		< 0.01	0.04	1	5
Chromium		N	< 0.005		< 0.05	0.5	10	70
Copper		N	< 0.005		< 0.05	2	50	100
Mercury		N	< 0.005		< 0.01	0.01	0.2	2
Molybdenum		N	< 0.005		< 0.05	0.5	10	30
Nickel		N	< 0.001		< 0.05	0.4	10	40
Lead		N	< 0.001		< 0.05	0.5	10	50
Antimony		N	< 0.005		< 0.05	0.06	0.7	5
Selenium		N	< 0.005		< 0.05	0.1	0.5	7
Zinc		N	< 0.005		< 0.05	4	50	200
Chloride		N	< 5		< 50	800	15000	25000
Fluoride		N	< 5		< 10	10	150	500
Sulphate		N	5		45.70	1000	20000	50000
Total Dissolved Solids		N	< 10		< 100	4000	60000	100000
Phenol Index		N	< 0.01		< 0.10	1	-	-
Dissolved Organic Carbon		N	9.780		98.00	500	800	1000
Leach Test Information								
pH		N	5.7					
Conductivity (uS/cm)		N	28					
Dry mass of test portion (g)			100.000					
Dry Matter (%)			83					
Moisture (%)			21					
Eluent Volume (ml)			952					

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ELAB cannot be held responsible for any discrepencies with current legislation

Results Summary

Report No.: 17-13705

WAC Analysis								
Elab Ref:	109956					**Landfill Waste Acceptance Criteria Limits**		
Sample Date:	23/08/2017					**Inert Waste Landfill**	**Stable Non-reactive Hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:	TP225							
Depth (m)	0.3							
Site:	Woodcroft							
Determinand		**Code**	**Units**					
Total Organic Carbon		N	%		0.40	3	5	6
Loss on Ignition		M	%		2.6	--	--	10
Total BTEX		M	mg/kg		< 0.01	6	--	--
Total PCBs (7 congeners)		M	mg/kg		< 0.03	1	--	--
TPH Total WAC		M	mg/kg		11	500	--	--
Total (of 17) PAHs		N	mg/kg		25.0	100	--	--
pH		M			11.4	--	>6	--
Acid Neutralisation Capacity		N	mol/kg		0.2	--	To evaluate	To evaluate
Eluate Analysis			**10:1**		**10:1**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
			mg/l		**mg/kg**			
Arsenic		N	0.009		0.09	0.5	2	25
Barium		N	0.010		0.10	20	100	300
Cadmium		N	< 0.001		< 0.01	0.04	1	5
Chromium		N	< 0.005		< 0.05	0.5	10	70
Copper		N	0.016		0.16	2	50	100
Mercury		N	< 0.005		< 0.01	0.01	0.2	2
Molybdenum		N	< 0.005		< 0.05	0.5	10	30
Nickel		N	0.003		< 0.05	0.4	10	40
Lead		N	0.007		0.07	0.5	10	50
Antimony		N	< 0.005		< 0.05	0.06	0.7	5
Selenium		N	< 0.005		< 0.05	0.1	0.5	7
Zinc		N	0.016		0.16	4	50	200
Chloride		N	7		67.00	800	15000	25000
Fluoride		N	< 5		< 10	10	150	500
Sulphate		N	12		120.00	1000	20000	50000
Total Dissolved Solids		N	< 10		< 100	4000	60000	100000
Phenol Index		N	< 0.01		< 0.10	1	-	-
Dissolved Organic Carbon		N	12.300		123.00	500	800	1000
Leach Test Information								
pH		N	8.3					
Conductivity (uS/cm)		N	154					
Dry mass of test portion (g)			100.000					
Dry Matter (%)			81					
Moisture (%)			24					
Eluent Volume (ml)			953					

Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Results Summary

Report No.: 17-13705

WAC Analysis								
Elab Ref:	109952					**Landfill Waste Acceptance Criteria Limits**		
Sample Date:	22/08/2017					**Inert Waste Landfill**	**Stable Non-reactive Hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:	TP223							
Depth (m)	0.5							
Site:	Woodcroft							
Determinand		**Code**	**Units**					
Total Organic Carbon		N	%		0.18	3	5	6
Loss on Ignition		M	%		2.8	--	--	10
Total BTEX		M	mg/kg		< 0.01	6	--	--
Total PCBs (7 congeners)		M	mg/kg		< 0.03	1	--	--
TPH Total WAC		M	mg/kg		< 5	500	--	--
Total (of 17) PAHs		N	mg/kg		< 2	100	--	--
pH		M			7.7	--	>6	--
Acid Neutralisation Capacity		N	mol/kg		< 0.1	--	To evaluate	To evaluate
Eluate Analysis			**10:1**		**10:1**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
			mg/l		**mg/kg**			
Arsenic		N	< 0.005		< 0.05	0.5	2	25
Barium		N	< 0.005		< 0.05	20	100	300
Cadmium		N	< 0.001		< 0.01	0.04	1	5
Chromium		N	< 0.005		< 0.05	0.5	10	70
Copper		N	0.011		0.11	2	50	100
Mercury		N	< 0.005		< 0.01	0.01	0.2	2
Molybdenum		N	< 0.005		< 0.05	0.5	10	30
Nickel		N	0.003		< 0.05	0.4	10	40
Lead		N	< 0.001		< 0.05	0.5	10	50
Antimony		N	< 0.005		< 0.05	0.06	0.7	5
Selenium		N	< 0.005		< 0.05	0.1	0.5	7
Zinc		N	< 0.005		< 0.05	4	50	200
Chloride		N	6		65.00	800	15000	25000
Fluoride		N	< 5		< 10	10	150	500
Sulphate		N	6		58.00	1000	20000	50000
Total Dissolved Solids		N	< 10		< 100	4000	60000	100000
Phenol Index		N	< 0.01		< 0.10	1	-	-
Dissolved Organic Carbon		N	54.400		544.00	**500**	800	1000
Leach Test Information								
pH		N	7.7					
Conductivity (uS/cm)		N	117					
Dry mass of test portion (g)			100.000					
Dry Matter (%)			79					
Moisture (%)			27					
Eluent Volume (ml)			931					

Results are expressed on a dry weight basis, after correction for moisture content where applicable
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2683

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Results Summary

Report No.: 17-13705

Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #)
in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
109922	0.10	TP202	Brown sandy soil, stones, organics	No asbestos detected	n/t	n/t	n/t	n/t
109925	0.50	TP203	Brown sandy soil, stones, organics	No asbestos detected	n/t	n/t	n/t	n/t
109927	0.50	TP204	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
109929	0.50	TP205	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
109930	0.10	TP206	Brown sandy soil, stones, organics	No asbestos detected	n/t	n/t	n/t	n/t
109932	0.30	TP207	Clay, stones	No asbestos detected	n/t	n/t	n/t	n/t
109938	1.00	TP213	Brown sandy soil, stones, concrete, brick, clinker	Chrysotile Crocidolite (asbestos cement)	2.66	Asbestos cement (2.663%)	< 0.001	2.66
109939	0.90	TP214	Brown sandy soil, stones, brick, clinker, wood	No asbestos detected	n/t	n/t	n/t	n/t
109940	0.30	TP215	Brown sandy soil, stones, concrete, brick, clinker	No asbestos detected	n/t	n/t	n/t	n/t
109941	2.90	TP215	Chalk, stones	No asbestos detected	n/t	n/t	n/t	n/t
109943	0.20	TP217	Clay, stones	No asbestos detected	n/t	n/t	n/t	n/t
109946	0.20	TP220	Brown sandy soil, stones, chalk, brick, clinker	No asbestos detected	n/t	n/t	n/t	n/t
109947	1.00	TP220	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
109948	0.10	TP221	Brown sandy soil, stones, chalk, organics	No asbestos detected	n/t	n/t	n/t	n/t
109950	0.40	TP222	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109951	0.40	TP223	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109953	0.20	TP224	Brown soil,Stones,Brick	No asbestos detected	n/t	n/t	n/t	n/t
109954	2.20	TP224	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
109955	0.25	TP225	Brown sandy soil,Stones,Brick	Chrysotile (Cement Fragment)	3.54	Cement Fragment (3.543)	< 0.001	3.54
109957	0.10	TP226	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
109959	0.15	TP228	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109960	0.60	TP229	Brown sandy soil	No asbestos detected	n/t	n/t	n/t	n/t
109962	0.40	TP231	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109963	0.10	TP232	Brown soil,stones	No asbestos detected	n/t	n/t	n/t	n/t
109965	0.30	TP234	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109966	0.50	TP235	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
109967	0.30	TP236	Brown sandy soil,stones	No asbestos detected	n/t	n/t	n/t	n/t
109968	0.40	TP237	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109970	0.20	TP239	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109971	0.50	TP239	Cement fragment	Chrysotile	25.0	Cement Fragment (25)	< 0.001	25.0
109972	1.50	TP239	Sand	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 17-13705

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Sulphide	N	As submitted sample	25/08/2017	109	Colorimetry
Hexavalent chromium	N	As submitted sample	25/08/2017	110	Colorimetry
Acid Soluble Sulphate	U	Air dried sample	29/08/2017	115	Ion Chromatography
Aqua regia extractable metals	M	Air dried sample	25/08/2017	118	ICPMS
Phenols in solids	N	As submitted sample	25/08/2017	121	HPLC
Elemental Sulphur	N	Air dried sample	25/08/2017	122	HPLC
PAH (GC-FID)	M	As submitted sample	29/08/2017	133	GC-FID
Water soluble anions	M	Air dried sample	25/08/2017	172	Ion Chromatography
Water soluble boron	N	Air dried sample	25/08/2017	202	Colorimetry
Total cyanide	M	As submitted sample	25/08/2017	204	Colorimetry
Aliphatic hydrocarbons in soil	N	As submitted sample	29/08/2017	214	GC-FID
Aliphatic/Aromatic hydrocarbons in soil	N	As submitted sample	29/08/2017	214	GC-FID
Aromatic hydrocarbons in soil	N	As submitted sample	29/08/2017	214	GC-FID
Low range Aliphatic hydrocarbons soil	N	As submitted sample	25/08/2017	214	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	25/08/2017	214	GC-MS
Asbestos identification	U	As submitted sample	25/08/2017	260	Microscopy
Leachate					
Arsenic*	N		30/08/2017	101	ICPMS
Cadmium*	N		30/08/2017	101	ICPMS
Chromium*	N		30/08/2017	101	ICPMS
Lead*	N		30/08/2017	101	ICPMS
Nickel*	N		30/08/2017	101	ICPMS
Copper*	N		30/08/2017	101	ICPMS
Zinc*	N		30/08/2017	101	ICPMS
Mercury*	N		30/08/2017	101	ICPMS
Selenium*	N		30/08/2017	101	ICPMS
Antimony	N		30/08/2017	101	ICPMS
Barium*	N		30/08/2017	101	ICPMS
Molybdenum*	N		30/08/2017	101	ICPMS
pH Value*	N		30/08/2017	113	Electrometric
Electrical Conductivity*	N		30/08/2017	136	Probe
Dissolved Organic Carbon	N		30/08/2017	102	TOC analyser
Chloride*	N		30/08/2017	131	Ion Chromatography
Fluoride*	N		30/08/2017	131	Ion Chromatography
Sulphate*	N		30/08/2017	131	Ion Chromatography
Total Dissolved Solids	N		30/08/2017	144	Gravimetric
Phenol index	N		30/08/2017	121	HPLC
WAC Solids analysis	N				
pH Value**	M	Air dried sample	29/08/2017	113	Electrometric
Total Organic Carbon	N	Air dried sample	29/08/2017	210	IR
Loss on Ignition**	M	Air dried sample	30/08/2017	129	Gravimetric
Acid Neutralization Capacity to pH 7	N	Air dried sample	29/08/2017	NEN 737	Electrometric
Total BTEX**	M	As submitted sample	25/08/2017	181	GCMS
Mineral Oil**	U	As submitted sample	29/08/2017	117	GCFID
Total PCBs (7 congeners)	M	Air dried sample	25/08/2017	120	GCMS
Total PAH (17)**	N	As submitted sample	29/08/2017	133	GCFID

Tests marked N are not UKAS accredited

Report Information

Report No.: 17-13705

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis (dried at < 30°C)
Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage

CLEA Software Version 1.071

Report generated	28-Sep-17
Report title	Woodcroft Farm, Lovedean
Created by	FG at GESL

RESULTS

Environment Agency

		Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?		Top Two applied?	Apply Top 2 Approach to Produce Group					
		oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal		Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
1	Arsenic	3.80E+01	1.21E+02	NR	1.00	0.31	NR	NR	No	No	Yes	No	No	No	No	No	No
2	Beryllium	1.29E+02	1.72E+00	NR	0.01	1.00	NR	NR	Yes	Yes	Yes	No	No	No	No	No	No
3	Benzo(a)pyrene	3.93E+00	1.57E+01	NR	1.00	0.25	NR	7.83E-01 (vap)	No	No	Yes	No	No	No	No	No	No
4	Dibenz(ah)anthracene	3.93E-01	1.40E+00	NR	1.00	0.28	NR	3.38E-03 (vap)	No	No	Yes	No	No	No	No	No	No
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Environment Agency

	Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?		Top Two applied?	Apply Top 2 Approach to Produce Group					
	oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal		Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
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Environment Agency

		Soil Distribution				Media Concentrations													
		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
		%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
1	Arsenic	99.9	0.1	0.0	100.0	3.80E+01	NR	1.90E+01	1.62E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.64E-02	1.52E-02	8.75E-03	1.26E-02	7.61E-03	4.18E-02
2	Beryllium	100.0	0.0	0.0	100.0	1.72E+00	NR	8.62E-01	7.34E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.21E-02	2.07E-03	2.07E-03	2.07E-03	2.07E-03	2.07E-03
3	Benzo(a)pyrene	100.0	0.0	0.0	100.0	3.93E+00	1.08E-05	1.96E+00	1.67E-09	0.00E+00	1.42E-08	3.33E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4	Dibenz(ah)anthracene	100.0	0.0	0.0	100.0	3.93E-01	2.28E-06	1.96E-01	1.67E-10	0.00E+00	2.83E-09	2.68E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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Environment Agency

	Soil Distribution				Media Concentrations													
	Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
	%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
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Environment Agency

		Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
		Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
1	Arsenic	2.82E-04	1.42E-05	3.77E-06	6.29E-07	0.00E+00	0.00E+00	0.00E+00	94.03	4.72	1.26	0.00	0.00	0.00	0.00	0.00
2	Beryllium	1.28E-05	2.67E-06	0.00E+00	2.85E-08	0.00E+00	8.44E-04	9.09E-08	0.00	0.00	0.00	50.00	0.00	0.00	0.00	50.00
3	Benzo(a)pyrene	2.91E-05	1.84E-07	1.69E-06	6.49E-08	1.02E-08	6.19E-06	3.64E-07	93.96	0.59	5.45	0.00	0.00	0.00	0.00	0.00
4	Dibenz(ah)anthracene	2.91E-06	1.84E-08	1.69E-07	6.49E-09	1.92E-09	2.25E-06	2.00E-06	93.96	0.59	5.45	0.00	0.00	0.00	0.00	0.00
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Environment Agency

	Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
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Environment Agency

		Oral Health Criteria Value (µg kg^{-1} BW day^{-1})		Inhalation Health Criteria Value (µg kg^{-1} BW day^{-1})		Oral Mean Daily Intake (µg day^{-1})	Inhalation Mean Daily Intake (µg day^{-1})	Air-water partition coefficient (K_{aw}) (cm^3 cm^{-3})	Coefficient of Diffusion in Air (m^2 s^{-1})	Coefficient of Diffusion in Water (m^2 s^{-1})	log K_{oc} (cm^3 g^{-1})	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor (g g^{-1} DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
1	Arsenic	ID	0.3	ID	0.002	NR	NR	NR	NR	NR	NR	NR	0.03	0.5	1	1	1
2	Beryllium	TDI	2	TDI	0.000057	15	0.0015	NR	NR	NR	NR	NR	0	0.5	1	1	1
3	Benzo(a)pyrene	ID	0.031	ID	0.0003	0.11	0.006	1.76E-06	4.38E-06	3.67E-10	5.11	6.18	0.13	0.5	1	1	1
4	Dibenz(ah)anthracene	ID	0.0031	ID	0.00003	0.04	0.033	5.40E-06	4.08E-06	3.40E-10	5.27	6.38	0.13	0.5	1	1	1
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Environment Agency

	Oral Health Criteria Value (µg kg^{-1} BW day^{-1})		Inhalation Health Criteria Value (µg kg^{-1} BW day^{-1})		Oral Mean Daily Intake (µg day^{-1})	Inhalation Mean Daily Intake (µg day^{-1})	Air-water partition coefficient (K_{aw}) (cm^3 cm^{-3})	Coefficient of Diffusion in Air (m^2 s^{-1})	Coefficient of Diffusion in Water (m^2 s^{-1})	log K_{oc} (cm^3 g^{-1})	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor (g g^{-1} DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
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Environment Agency

		Soil-to-water partition coefficient ($cm^3\ g^{-1}$)	Vapour pressure (Pa)	Water solubility ($mg\ L^{-1}$)	Soil-to-plant concentration factor for green vegetables ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for root vegetables ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for tuber vegetables ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for herbaceous fruit ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for shrub fruit ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for tree fruit ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)
1	Arsenic	5.00E+02	NR	1.25E+06	0.00043 fw	0.0004 fw	0.00023 fw	0.00033 fw	0.0002 fw	0.0011 fw
2	Beryllium	1.70E+03	NR	1.66E+06	0.007 fw	0.0012 fw	0.0012 fw	0.0012 fw	0.0012 fw	0.0012 fw
3	Benzo(a)pyrene	6.43E+02	2.00E-08	3.80E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4	Dibenz(ah)anthracene	9.29E+02	1.66E-10	6.00E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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Environment Agency

	Soil-to-water partition coefficient ($cm^3\ g^{-1}$)	Vapour pressure (Pa)	Water solubility ($mg\ L^{-1}$)	Soil-to-plant concentration factor for green vegetables ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for root vegetables ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for tuber vegetables ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for herbaceous fruit ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for shrub fruit ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for tree fruit ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)
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Geo-Environmental

GEOTECHNICAL INTERPRETATIVE REPORT

for the site at

PHASE 2 AREA, WOODCROFT FARM,

LOVEDEAN, HAMPSHIRE PO8 9QA

on behalf of

GRAINGER PLC



Report:	**GEOTECHNICAL INTERPRETATIVE REPORT**
Site:	**PHASE 2 AREA, WOODCROFT FARM, LOVEDEAN, HAMPSHIRE PO8 9QA**
Client:	**GRAINGER PLC**
Date:	**3rd AUGUST 2018**
Reference:	**GE16942-GIR-AUG18**
Version:	**1.1**
Prepared by:	
	GAVIN ROBERTS CGeol, BEng(Hons), MSc, FGS **TECHNICAL DIRECTOR**
Reviewed by:	
	SHAUN ARMITAGE BSc (Hons), FGS **SENIOR CONSULTING ENGINEER**

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Environmental Consultants | Geotechnical Engineers | Site Investigations

AMENDMENT RECORD

Revision ref.	Date	Reasons for amendment	Author's initials
1.0	02/07/2018	First issue	GR
1.1	03/08/2018	Inclusion of aerial survey findings	GR

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APPENDICES

APPENDIX A Exploratory Hole Logs and In-situ Test Results

1.0 INTRODUCTION

1.1 General

Geo-Environmental Services Limited (Geo-Environmental) was instructed by Grainger plc to undertake an investigation of the geotechnical factors pertaining to land within the Phase 2 development area at Woodcroft Farm, Lovedean (see Figure 1). The area to be investigated included a series of surface depressions, including four sinkholes as identified by previous third party investigation. The ground between the previously identified sinkholes undulated and included several other smaller surface depressions.

1.2 Form of Development

The proposed development is understood to comprise the development of 288 residential units, associated car parking, open space and landscaping. The portion of the site assessed within this report includes c. 60 houses and flats.

The development layout incorporates retention of the four main sinkholes, i.e. Sinkholes 1 to 4 as referred to in the PBA reports, but includes development on the land between these features, i.e. on land where further solution features are suspected to be present and where there was limited information on variation in composition and condition of shallow strata, or clarification of the depth to the Chalk beneath the site.

1.3 Objectives

The investigation was undertaken to target the land around Sinkholes 1-4 where development is proposed with an aim of clarifying the ground conditions in terms of composition, condition and variation across the development area and from this to identify potential foundation options.

1.4 Standards

Where practicable, the ground investigation and subsequent geotechnical and environmental assessments were undertaken in accordance with the following documents and guidance:

- EN ISO 14688 – Geotechnical investigation and testing
- BS5930: 2015 - Code of Practice for Site Investigations, BSI 2015
- BS1377: 1990 - Soils for Civil Engineering Purposes, BSI1990
- EN 1990: Eurocode – Basis of Structural Design
- BS EN 1997-1. Eurocode 7: Geotechnical Design – General Rules 1997-1:2004, BSI
- British Standards Institute - Eurocode 7 – Geotechnical Design - Parts 1 & 2 (BS EN1997-1:2004 & BS EN1997-2:2007).
- National Annex to BS EN 1997-1. UK National Annex to Eurocode 7: Geotechnical Design – General Rules 1997-1:2004, BSI.
- CIRIA C574 – Engineering in Chalk (2002);
- The nature, formation and engineering significance of sinkholes related to dissolution of chalk in SE Hampshire, England. P W McDowell, J Coulton, C N Edmonds and A J Poulsom. Quarterly Journal of Engineering Geology and Hydrogeology, Volume 41, Part 3, August 2008, pp 279-290.
- A Hole lot of Trouble. Farrant, A. and Cooper, A. Geoscientist. July 2014.
- NHBC Standards Chapter 4.2 Building Near Trees.

1.5 Conditions

The data collected from the investigations have been used to provide an interpretation of the geotechnical conditions pertaining to the site. The recommendations and opinions expressed in this report are based on the data obtained. Geo-Environmental takes no responsibility for conditions that either have not been revealed in the available records, or that occurs between or under points of physical investigation. Whilst every effort has been made to interpret the conditions, such information is only indicative and liability cannot be accepted for its accuracy.

Information contained in this report is intended for the use of the Client and Geo-Environmental can take no responsibility for the use of this information by any party for uses other than that described in this report. Geo-Environmental makes no warranty or representation whatsoever express or implied with respect to the use of this information by any third party.

2.0 SITE SETTING

2.1 Site Description

The site comprised an irregularly shaped parcel of land located at NGR 468150, 112100 which extended to c. 2.6ha and was situated in the north-western portion of the wider Woodcroft Farm development site. Four distinct depressions were present within the investigation area and these correlated with Sinkholes 1 – 4 as identified in previous phases of investigation.

The investigation area comprised fallow grassed fields which had formerly been used for horse grazing, but which had been vacated such that the grass had grown to an uncropped height. Numerous mature deciduous trees including oaks were located around the site's perimeter.

Sinkhole 1 was located in the north-western portion of the investigation area and comprised a surface depression in and around which several mature and immature trees were present. Sinkhole 2 was located in the north-eastern portion of the investigation area and formed part of the grassed field. Sinkhole 3 was located in the south-eastern portion of the investigation area and several mature trees were located within and around the edge of the depression. Sinkhole 4 was located in the central southern portion of the investigation area and had been cleared of vegetation. During previous site visits, Sinkhole 4 appears to have been used as a pond associated with the former farmyard located to the south of the investigation area.

In addition to Sinkholes 1-4, the ground around and between Sinkholes 2,3 and 4 was observed to undulate and include several changes in slope profile and orientation. Two shallow, small scale depressions were located between Sinkholes 2 and 3 and appeared to be located along a break in slope with ground levels falling towards the west. A shallow elongated surface depression trending east-north-east to west-south-west was located to the west of Sinkhole 2. Ground levels rose to the south of this elongated depression to form an undulating dome extending towards Sinkhole 4 and with an undulating slope profile falling towards the west.

A hardcore surfaced track extended through the site from the southern to the northern boundaries. Sinkholes 2, 3 and 4 were located to the east of this track and Sinkhole 1 was located to the west of the track.

The ground surface around Sinkhole 1 was more uniform and comprised a very gentle slope falling towards the south-south-west.

The investigation area was accessed from Woodcroft Lane and the former farmyard located to the immediate south.

The site was bounded to the north by a line of trees with fields beyond; to the east by a field which formed part of the wider development area; to the south by the former farmyard and farmhouse and continuation of the fields, with an existing housing development to the south; and a line of trees with a field to the west.

The land beyond the western boundary comprised a shallow valley plunging at a relatively shallow gradient towards the south-west (approx.). Several depressions were observed on the northern flank of the valley. In addition, the land to the north of the site was observed to include several other depressions and areas of undulating ground.

2.2 Geomorphology

With regards to the description of geomorphological features and sub-surface cavities, the following terms are used and comply with general UK and international terminology. As can be seen there is a degree of cross over between the various terms:

- Doline – commonly a circular or oval shaped depression at ground level caused by dissolution of sub-surface strata, e.g. Chalk.
- Sinkhole – a depression at ground level caused due to the subsidence or collapse of surface strata into sub-surface cavities.
- Solution Feature – a cavity, or infilled former cavity extending into underlying strata, e.g. Chalk. The infill is derived from overlying strata but there may be no evidence of the feature at ground level.
- Solution Pipe – a solution feature which is typically cylindrical in section.
- Crown Hole – typically a circular feature where a sub-surface void has migrated to ground level. Foundered strata are present within the crown hole often a shallow depth below ground level.
- Swallow Hole – a sink hole into which surface water flows.
- Denehole – man made shaft or cavity extending into the Chalk. Deneholes date from the Neolithic period (Stone Age) to recent past. CIRIA C574 describes deneholes as typically formed of a vertical shaft approximately 1m in diameter. The cavities were created often to recover chalk for use as lime although occasionally also as a source of flint or for storage. Deneholes were excavated using hand tools and were typically unsupported and unlined. The shafts were often backfilled with mined spoil and/or overburden placed on top of vegetation (trees, branches or bushes) dropped into the shaft. Decomposition of the organic material and settlement of the soil backfill can result in unstable ground and the regression of the void back to ground level.
- Ice wedge – a conical depression in the upper portion of a stratum created by localised freezing of the ground which resulted in degradation of the frozen soil/ground and subsequent infilling with overlying soils. These can be very similar in appearance to solution features but may be more uniform in section.
- Suffusion and dropout sinkholes form in superficial deposits overlying the soluble rock, typically limestone. Suffusion sinkholes occur where sediment is gradually washed down into fissures in underlying limestone which have been enlarged by 'solution' activity, causing gradual subsidence. Dropout failures form similarly, but in more cohesive soils which are able to bridge voids until they become unsupportable, resulting in sudden failure and collapse. Where the Chalk is covered by a thin cover of clay or sand, acidic drainage can gradually dissolve out the Chalk beneath, creating dissolution pipes up to 10m deep. Normally they gradually become infilled with sediment as they form, so rarely contain voids and are generally stable where surface conditions remain constant although changes in loading, compaction and drainage can reduce this stability.

As noted in Section 2.1, four oval to circular depressions had previously been identified and referenced as Sinkholes 1 to 4. In addition, the ground surface around Sinkholes 2,3 and 4 was observed to undulate and incorporate additional smaller scale depressions between Sinkholes 2 and 3, an elongated depression to the west of Sinkhole 2 and undulating ground between Sinkholes 2 and 4.

The land to the north included undulating ground and several depressions and the land to the west comprised a south-west trending valley with several depressions observed on the northern flank. As such, the features located within the site appeared to be associated with a more extensive zone of undulating ground and geomorphological features.

In addition, with reference to McDowell *et al* (2008) the position of the depressions on the side of a shallow post Ice Age valley and the general orientation of these depressions appeared to correlate well with solution features elsewhere within the Lovedean, Clanfield and Horndean area.

2.3 Geology

British Geological Survey mapping indicated the subject site to be underlain by Head Deposits, Lambeth Group and Tarrant Chalk Member. The area indicated to be underlain by Head Deposits appeared to correlate with the general orientation of the valley to the west of the site and to extend through the site towards the north-east.

Head Deposits are drifts produced by solifluction, the downslope movement of debris outwash during the periglacial period, and characteristically vary from silt and clay to poorly sorted sands gravels and chalk of local derivation.

The **Lambeth Group** is a sedimentary complex characterised by red, orange, yellow and grey mottled clay and sandy clay with a basal bed (the Bottom Bed) composed of clayey glauconitic sand. A bed of green-coated flints is also commonly present.

Tarrant Chalk is a soft white friable microporous limestone composed of coccolith biomicrites with a varying proportion of larger shell fragments. Flint occurs as nodular courses, tabular beds and linings to fractures.

At various levels clay sized material occurs as marl seams and partings. Close to the surface the upper few metres are invariably discoloured brown, due to leaching from the overlying strata. The interface with any overlying stratum is invariably extremely irregular as a result of localised weathering and general dissolution of the chalk. Weathering by frost action may extend to a depth of several metres.

Occasional solution features, such as pipes, swallow holes and solution cavities, usually in-filled with drift deposits, are found in the chalk, sometimes manifesting themselves at the surface as shallow circular depressions. Solution features may be reactivated by the concentrated ingress of water from leaking drains or soakaways. Reactivation may lead to surface collapse.

With reference to McDowell *et al* (2008), the occurrence of solution features in the general Lovedean and Horndean area (encompassing/bordering the subject site) is significantly higher than elsewhere within south-east Hampshire, with approximately 55 features per km^2, the average being 15 per km^2. The solution features reported by McDowell *et al* are predominantly associated with a shallow cover of drift deposits and palaeo-valley features. The majority of these features have been identified from shallow depressions (dolines) at ground level rather than collapse at ground level and the formation of sinkholes. The document reports that given the frequency of solution features in this area surprisingly few collapses at ground level have been recorded. Whilst the primary focus of McDowell *et al's* study was approximately 2km to the east of the subject site, the ground conditions on the subject site and located close to the head of a paleo-valley form a similar ground model for the occurrence of solution features within the Chalk, this being further supported by the geomorphological evidence as described in Section 2.2 above.

2.4 Hydrology

No surface water features were located on or in close proximity to the subject site.

2.5 Hydrogeology

With reference to Environment Agency records and the Groundwater Vulnerability Map No 52 entitled South Hampshire, the site is indicated to overlie a Secondary Aquifer (undifferentiated); a Secondary 'A' Aquifer; over a Principal Aquifer (inferred to be the Head Deposits, Lambeth Group and Chalk respectively).

The 'Secondary (undifferentiated)' Aquifer classification has been assigned in cases where the stratum in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the strata.

Secondary 'A' Aquifers are defined as fractured or potentially fractured rocks which do not normally have a high primary permeability. Although these formations will seldom produce large quantities of water for abstraction they are important both for local supplies and in supplying base flow to rivers.

Principal Aquifers are layers of rock or drift deposits that have high intergranular and/or fracture permeability,

meaning that they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.

The soil cover across the site varies from low to intermediate vulnerability classification. Intermediate leaching potential soils have some ability to attenuate diffuse source pollutants and in which non-absorbed diffuse source pollutants and liquid discharges have the potential to move rapidly to underlying strata or to shallow groundwater.

The site is located within the Inner zone of a Source Protection Zone (SPZ I) which is associated with a potable water abstraction located 1.1km to the north of the site.

With reference to previous phases of assessment, groundwater is anticipated to be present at depth, possibly in excess of 25m below site ground level.

2.6 Previous Geotechnical Investigation

The site as a whole, has been the subject to Phase I Ground Condition Report, ref 21834, dated 2010 prepared by Peter Brett Associates (PBA), which included a desk study and preliminary risk assessment for the overall Woodcroft Farm site; a Factual Report, ref RML 4750, dated October 2011 prepared by Risk Management Limited, which included ground investigation and laboratory test results; and a Geoenvironmental and Geotechnical Ground Investigation Report, ref 21834-030-R02, dated July 2013 prepared by PBA, which presented an interpretative assessment of the overall Woodcroft Farm site. These previous phases of assessment included targeting of the known sinkholes but there was limited assessment and intrusive investigation of the undulating land around the known sinkholes. Third party information is assumed to be factually correct and Geo-Environmental accepts no liability for errors or omissions within third party documents.

The investigations reported by PBA included trial pitting, window sampling and dynamic probing within Sinkholes 1, 2 and 3 and window sampling close to the northern fringe of Sinkhole 4. The PBA reports should be referred to for further detail.

In addition, Geo-Environmental has undertaken intrusive investigations on the wider site, some of which included the construction of exploratory holes within the portion of the site being considered within this report. The previous phases of ground investigation undertaken by Geo-Environmental were in 2017 (report refs. GE16662-FG02-170929 and GE16662-GR04-170929) and 2018 (report refs. GE16943-RSVP-FY-JUL18, GE16943-RSVP-CP-JUL18 and GE16943-RSVP-HA-JUL18).

Where relevant to this assessment, the findings of previous investigations undertaken by Geo-Environmental have been incorporated into this assessment.

2.7 Scope of Supplementary Investigation

The scope of the supplementary investigation incorporated the following elements to clarify the variations in ground conditions and inform the supplementary assessment of the sinkhole area.

- Undertake an aerial LiDAR and photogrammetry survey to capture data to develop a digital terrain model (DTM).
- The construction of machine dug trial pits and trenches across the investigation area and to target key features.
- Construction of 6No. cable percussion boreholes to a provisional depth of 15m bgl together with in-situ testing and sampling at regular intervals.
- Construction of 15No. dynamic sampler boreholes to depths of up to 8m bgl, depending on drilling conditions, using a self-propelled track mounted rig.

3.0 MORPHOLOGY, GROUND CONDITIONS & MATERIAL PROPERTIES

A factual record of the conditions encountered during the physical investigation of the subject site is presented in the following sections. Exploratory hole locations are shown in Figure 3.

For further details of the ground conditions encountered, reference should be made to Figures 5 to 14 and the exploratory hole logs presented in Appendix A.

Cable percussion boreholes BH601 to BH606 were positioned to provide information to depth where development is proposed in proximity to Sinkholes 1-4 and other surface features as well as providing general coverage. Window sampler boreholes WS501 to WS515 were positioned along three survey lines crossing between the main sinkholes to clarify the ground conditions through the area of undulating and hummocky ground and target areas of proposed development. Trial pits and trenches TP701 to TP711 were located to provide further information on the ground conditions around specific sinkholes and also to target areas of hummocky/undulating ground surface, e.g. TP703 and TP704 targeted smaller scale surface depressions between Sinkholes 2 and 3, and TP711 targeted an elongated depression to the west of Sinkhole 2.

Unless stated otherwise, all depths are reported as metres below ground level (m bgl).

3.1 Morphology

The aerial survey incorporated photogrammetry and LiDAR surveys to develop a Digital Terrain Model (DTM) of the site in its current condition, as shown in Figures 16 and 17. The DTM showed the ground levels to vary across the site and correlate with observed conditions, i.e. with a shallow and relatively broad valley feature crossing through the site from the northern boundary to the western boundary and extending into a more extensive dry valley feature located to the west and calling towards the west and south-west. Whilst the valley feature within the site was relatively broad, i.e. extend across much of the site, the extension upgradient across the northern boundary was much narrower and appeared to tie-in with ground level undulations and depressions observed on the land to the north.

The DTM supports the hypothesis stated in previous phases of assessment that the site was located close to the head of a palaeo-valley, now a dry valley and also showed the correlation of the sinkhole features in the wider valley context, i.e. with sinkholes located around the periphery of the valley. Several other sinkhole features were identified in similar context where the valley extended off-site to the north and also along the northern flank of the valley extending to the west of the site.

The DTM was developed further by incorporating information from all phases of ground investigation undertaken across the site to develop a ground model for the site and thereby assist in determining foundation solutions across this portion of the site.

3.2 Soils

The ground conditions encountered were consistent with those anticipated based on published geological mapping and previous phases of intrusive investigation. However, it was difficult to differentiate between Head Deposits and weathered Lambeth Group in several exploratory holes and Head Deposits were observed to vary in composition, with depth and laterally within individual trial pits and trenches, as indicated in Figures 5-7. Reference has been made to published geological mapping to assist in assigning soils to specific strata. In addition, strata encountered in some exploratory holes appeared to include frost shattered gravel and these were considered likely to comprise Head Deposits derived from highly weathered Lambeth Group.

Whilst a summary of the ground conditions encountered in exploratory holes on the subject site is presented in Table 3.1, reference should be made to the individual exploratory hole logs for further details.

Top (m bgl)	Base (m bgl)	Description
0	0.2 – 0.3	TOPSOIL: Brown silty sandy clay with roots
0.2 – 0.3	1.9 – 4.6	HEAD DEPOSITS: Stiff orange-brown, light grey and reddish brown mottled sandy CLAY with varying proportions of gravel and cobble of flint and chalk; stiff orange-brown and light grey CLAY; light grey and off-white clayey sandy GRAVEL and cobble of flint; grey silty chalk GRAVEL.
0.4 – 1.8	3.2 – 15+	LAMBETH GROUP: Stiff grey and orange-brown CLAY; medium dense brown SAND; stiff to very stiff grey CLAY
1.7 – 15+	15+	TARRANT CHALK: Structureless CHALK composed of light brown and off-white silty size matrix and gravel size clasts of very weak to weak chalk. CIRIA Grade Dc; Structureless CHALK composed of angular to blocky clasts of weak to moderately weak chalk with a silt matrix. Some brown discolouration on clast faces. CIRIA Grade Dc/C. Structureless CHALK composed of off-white silt matrix with off-white and white very weak to moderately weak chalk clasts. CIRIA Grade Dm/Dc; Off-white and white moderately weak CHALK. CIRIA Grade C/B

Table 3.1 Summary of Ground Conditions

As noted above, the ground conditions were observed to vary over relatively short distances, i.e. within the extent of some of the trial pits/trenches excavated. In addition, the depth to the Chalk was observed to vary significantly such that whilst Chalk was encountered at relatively shallow depth in some of the exploratory holes, it was not encountered in others. Soils of the Lambeth Group were encountered to the full depth of investigation, i.e. 15m bgl, in boreholes BH302 (part of the 2017 investigation) and BH603. In addition, as indicated in Figures 5-7, the depth to the Chalk was observed to vary over short distances within individual trenches where overlying strata were observed to penetrate deeper into the Chalk locally. These were considered to comprise localised dissolution features, or suffusion features. In all occurrences, the strata overlying the Chalk were observed to be in contact with the Chalk and no voids were encountered within these superficial strata. In several exploratory holes, the clay strata directly overlying the Chalk were observed to be discoloured from grey and brown mottled to brown or dark brown at the contact surface with the Chalk and flint gravel appeared to have been frost shattered.

Sections through the site are presented as Figures 9-15 and demonstrate the variation in superficial strata and depth to Chalk as well as the variation in ground surface level.

Figures 16-17 show the 3D DTM developed from the aerial survey and these clearly identify Sinkholes 1 to 4 and the valley feature described in Section 3.1. Figures 18 and 19 show the variation in depth to Chalk across this portion of the site and the chalk level 3D model, respectively. Figure 19 shows that there are sudden changes in the level of the upper surface of the Chalk around Sinkholes 1, 2 and 3, but no clear evidence around Sinkhole 4 despite thee DTM indicating the presence of Sinkhole 4 and corroborating pervious phases of investigation. It is possible that the variation in level of the Chalk is less pronounced around Sinkhole 4. Figure 19 also indicates the presence of a sharp change (lowering) in level to the upper surface of the Chalk along the northern boundary between Sinkholes 1 and 2, as postulated in a previous third party report, and appears to extend off-site to the north. The boundary of this additional feature may differ from that predicted in the model as there was no ground investigation information on the land to the north (outside of the site), but the portion of the feature within the site was modelled based on a combination of the DTM and ground investigation information.

No soils were recovered from 1.5-2.5m bgl in WS515, but there was no indication of encountering a void during the drilling process, e.g. a sudden drop in the drill string, and it was considered that the lack of recovery was associated with driving a gravel to cobble sized flint through the soil mass and that this was finally broken through at 2.5m bgl

Whilst no loose or voided zones were encountered at any of the exploratory hole locations, the presence of voids or weaker strata cannot be discounted elsewhere particularly associated with any sinkholes. It is noted that the proposed development is based on retention of Sinkholes 1 to 4 as landscape features with development around their periphery and beyond.

3.3 Groundwater

Groundwater was not encountered within any of the exploratory holes during the intrusive investigation. Whilst no monitoring wells were installed as part of this phase of investigation, monitoring of wells elsewhere on the site has not encountered groundwater. With reference to previous phases of assessment, groundwater is anticipated to be present at depth within the Chalk, possibly c. 25m bgl or deeper.

It should be noted that changes in groundwater levels do occur for a number of reasons including seasonal effects and variations in drainage. Such fluctuations may only be recorded by the measurement of the groundwater level within a standpipe or piezometer installed within appropriate response zones.

Changes in groundwater level can have a direct effect on the stability of excavations and slopes, and the presence of water (groundwater, perched water or run-off) in granular or interbedded strata can result in rapid loss of stability.

3.4 Obstructions

Several of the window sampler boreholes were terminated shallower than their target depth of 8m bgl due to refusal, i.e. no penetration, and was considered likely to be associated with the presence of gravel and cobble sized flint.

In addition, buried services crossed the southern portion of the site and whilst the site was no longer in use at the time of the investigation, the services had not been cut off.

3.5 Geotechnical Testing

Geotechnical laboratory testing was not undertaken as part of the scope of investigation. However, in-situ testing was undertaken and comprised Standard Penetration Tests (SPTs) in the cable percussion boreholes, BH601-BH606. These showed a general trend of increasing SPT 'N' value with depth as indicated on Figure 4.

4.0 GEOTECHNICAL ASSESSMENT

Subsequent to the intrusive investigation of the site and receipt of the laboratory results, the following geotechnical assessment has been made.

4.1 Ground Model

As described previously, the ground surface in the area around Sinkholes 1 to 4 was variable. The ground surface to the east of Sinkholes 2 to 3 was generally level, with a break in slope running approximately north to south just to the east of Sinkholes 2 and 3. Two localised and shallow surface depressions were located within this break in slope. The ground surface to the west of this line was observed to undulate and an elongated depression was located to the west of Sinkhole 2.

Whilst Sinkholes 1 to 4 comprised localised and relatively well defined surface features, as noted previously, surface depressions were also observed on the land immediately to the north of the site and along the northern flank (south facing slope) of a shallow valley which extended to the west of the site and the site appeared to be located towards the head of the valley feature. As such, the features observed within the site were considered to form a part of a larger complex of sinkholes/features associated with the shallow valley.

Intrusive investigation of this portion of the site revealed variable and relatively complex ground conditions. The variations included interbedded sand and clay within both the Head Deposits and Lambeth Group, with some sand layers within the Head Deposits appearing to form lenses and infilled channel features cutting into underlying clay and gravelly clay soils. The depth to the junction with the underlying Chalk was also highly variable, with localised deeper penetration of Head Deposits as suffusion features in some trial pit/trench sections. A plunging junction between the chalk and overlying Head Deposits was encountered in trial pit TP708, the junction being at c. 70-80° towards the west-south-west. This was considered likely to be associated with an infilled solution feature/suffusion feature on the eastern fringe of Sinkhole 1.

Figures 20 to 22 show the variation in existing ground level, level of the upper surface of the Chalk and depth to Chalk respectively. These demonstrate that there is variation in depth to the Chalk and that the key sinkhole features as identified in previous phases of assessment are outside of the main development areas, i.e. form part of the development soft landscaping, based on the current development layout. Figures 21 and 22 indicate that there is variation in level of, and depth to, the Chalk within the development areas but the variations are generally much less marked than around Sinkholes 1 to 4. However, as discussed in Section 3.2, an additional sub-surface feature was identified along the site's northern boundary whereby the depth to the Chalk was more variable and could be indicative of an additional sinkhole (with no surface expression) or erosion surface (such as valley scour) in the top of the Chalk. With reference to Figures 21 and 22, this sub-surface feature was located beneath proposed plots 177 to 181, albeit with the most significant variation being located in the road and soft landscaped area to the north and north-west of Plot 181.

Based on the findings of the intrusive investigation it is anticipated that substantial variation in ground conditions is likely to be encountered within foundation trenches and should be accounted for in foundation design and construction.

4.2 Foundations

The intrusive investigation has confirmed the presence of highly variable strata in terms of both composition and depth across this portion of the site. The three key strata comprise sand, clay and Chalk. Sand and clay were attributed to both Head Deposits and Lambeth Group, with the strata differentiated in part based on geological mapping and observation of Head Deposits cutting into and through underlying strata as lenses, channels and the like.

On the basis of the ground conditions encountered, it is considered that conventional foundations could be used for the proposed development, with strip foundations extending through any Made Ground, disturbed, reworked, desiccated ground or root zones and terminating within the soils of the Head Deposits, Lambeth Group or Chalk.

Previous phases of investigation have shown the more cohesive soils to vary from low to high volume change potential as defined in NHBC Standards. The sand and Chalk would be considered non-shrinkable. Given the high degree of variability in ground conditions over short distances, it is not considered feasible to zone the site and thus foundation design should account for the presence of clay soils of high volume change potential and thus a minimum founding depth of 1m bgl is recommended.

It should be noted that near surface soils (<1m bgl) were visually assessed to be desiccated and this should be accounted for in foundation design. In addition, the junction between the Head Deposits and/or Lambeth Group and the underlying Chalk was found to be highly variable and solution features (infilled with gravelly clay) were encountered within several pits as summarised above. Localised deepening to terminate on a single soil type is not considered feasible and thus, it is thus recommended that reinforcement is incorporated within all foundations. Such reinforcement typically comprises an upper and lower layer of steel mesh laid within the foundation during construction. The specification of the mesh, construction requirements and placement positions within the foundation should be confirmed by the structural engineer responsible for designing foundations on this site. Given that that sink holes and solution pipes have been identified at various locations across the site, it is recommended that the inclusion of reinforcement in foundations is maintained throughout the development of this portion of the Woodcroft Farm site.

On the basis of ground conditions encountered, a net allowable bearing capacity of 100kPa is recommended for the soils of the Head Deposits. This could be increased to 125kPa for the high strength soils of the Lambeth Group and to 150kPa for the structureless Chalk and 200kPa for the weathered, blocky Chalk. However, where it is likely that foundations will span Head Deposits, the lower bearing capacity of 100kPa is recommended in order to minimise the potential for localised overstressing of the founding strata and possible resultant differential settlement.

In the event that superficial strata are removed from a building footprint, e.g. following a reduced dig exercise, and that foundations will terminate entirely within weathered Chalk, it may be possible to increase the net allowable bearing capacity to 150-200kPa, subject to confirmation from a Geotechnical Engineer at the time of construction.

Given the potential for foundations to be constructed within the zone of influence of trees in some portions of the site, it is possible that foundation bases would require to be stepped and as such, it is recommended that steps do not exceed 0.225m in height at any point and are at least 1.0m (lateral distance) away from any corner or node point on the foundations. Where this cannot be accommodated, the foundation should be formed at the greater depth.

Initial modelling using the NHBC Foundation Depth Calculator indicates that deepened foundations could be required in proximity to trees. This is dependent on the species, condition, water demand of the tree(s) and their distance from the proposed foundation.

Where foundations extend to depths in excess of 1.5m bgl, heave precaution measures should be included to the face of foundations in accordance with NHBC Standards Chapter 4.2.

It is recommended that foundation excavations be concreted or blinded as soon after excavation as possible. Where concreting could take place the following day it is recommended that excavations are not taken to full depth overnight and that the final 0.5m of cover is only removed immediately prior to concreting.

It is unknown whether the former farm house originally drew water from a well thus an allowance for treatment

and possibly infilling of voids such as a former well would be prudent. In addition, the use of reinforcement in foundations would serve to minimise any deflection if foundations were to span any such backfill feature.

4.3 Floor Slabs

It is recommended that suspended ground floor slabs should be utilised across the site due to the presence of shrinkable soils at shallow depth.

4.4 Excavations

Shallow excavations on level ground should remain stable in the short term assuming an absence of water ingress, although may require battering to a safe angle if open in the medium to long term. It is anticipated that all excavations would become unstable where water ingress occurs without measures to control water and support excavation faces. In addition, excavations across the slope should be kept to as short a distance as possible to avoid stability issues and associated collapse.

Ground works should be designed in such a manner to avoid man entry into excavations.

4.5 Soakaways

The intrusive investigation has identified the presence of sinkholes and suffusion/solution features extending into the Chalk with high variability in overlying soils. This area of the site is considered high risk in terms of solution feature activation and thus a minimum offset of 10m is recommended between any soakaway and structure (i.e. in line with NHBC guidance). However, if soakaways could be constructed at depths beneath the solution features, i.e. discharging in to blocky chalk, then there is no risk of water discharging through the solution feature, or infill and thus collapse risk is markedly reduced. However, the use of deeper soakaways would be subject to the agreement of the Environment Agency given the site's location in SPZ I for a potable water abstraction.

Given the positional constraints associated with a 10m offset rule for soakaways, it may be necessary to consider disposal of storm water via alternative means to conventional soakaways in individual or groups of gardens. One possible option would be to construct fewer, larger soakaways to act as collector and attenuation tanks and discharge either at depth in to blocky Chalk or to be located in set aside areas 10m away from any structures, such as possible communal open space.

4.6 Abnormal Conditions

In the event that abnormal, or unexpected ground conditions are encountered during construction, the advice of a Geotechnical Engineer should be sought.

FIGURES



Project:	Woodcroft Farm, Lovedean, Hampshire			**Title**	Site Location Plan
Client:	Grainger plc			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16942	**Revision:**	1.0		
Drawn:	Grainger plc	**Date:**	28/06/2018		
Figure:	1	**Scale:**	Not To Scale		

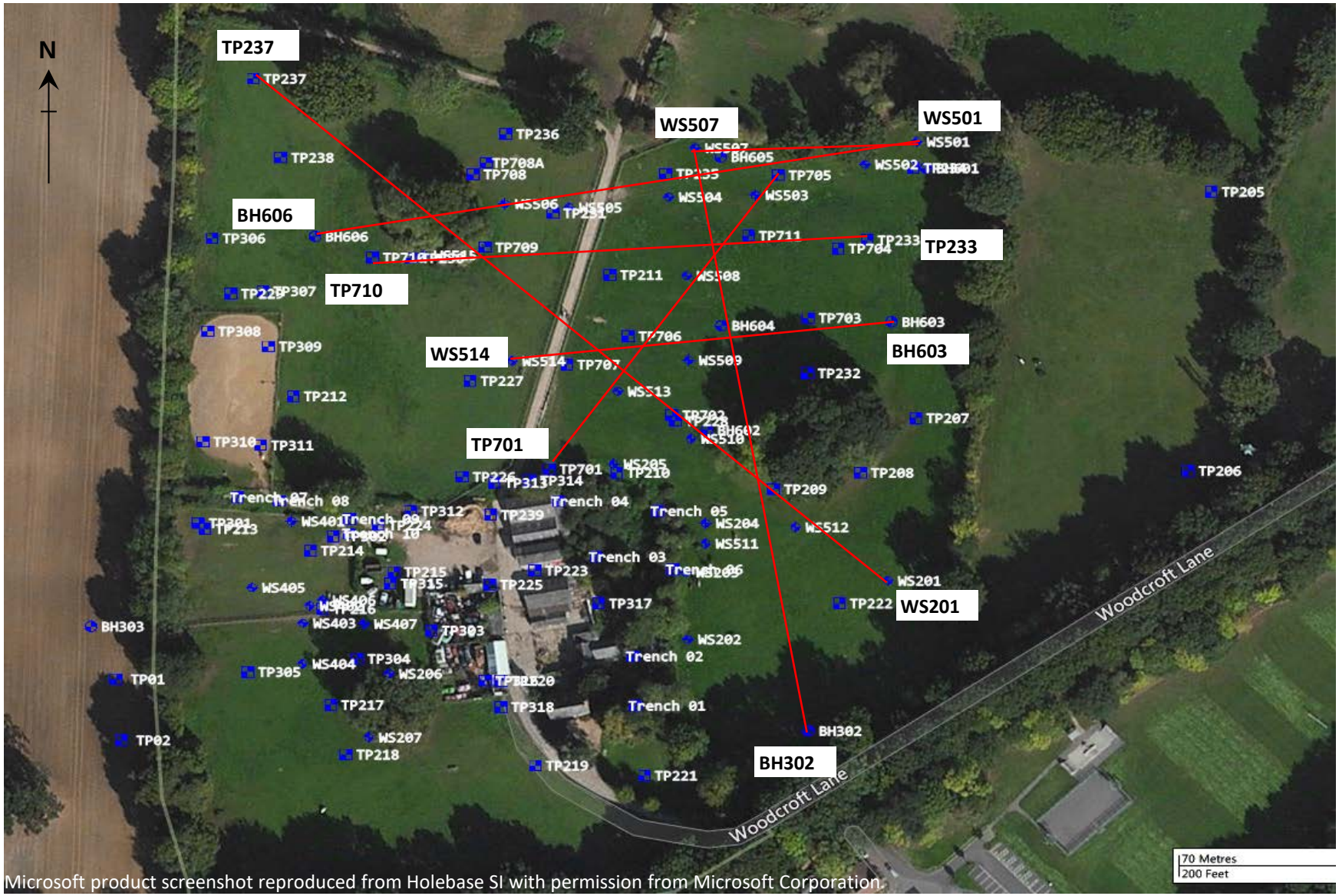


Project:	Woodcroft Farm, Lovedean, Hampshire			**Title**	Proposed Scheme Layout
Client:	Grainger plc			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16942	**Revision:**	1.0		
Drawn:	GR	**Date:**	28/06/2018		
Figure:	2	**Scale:**	Not To Scale		



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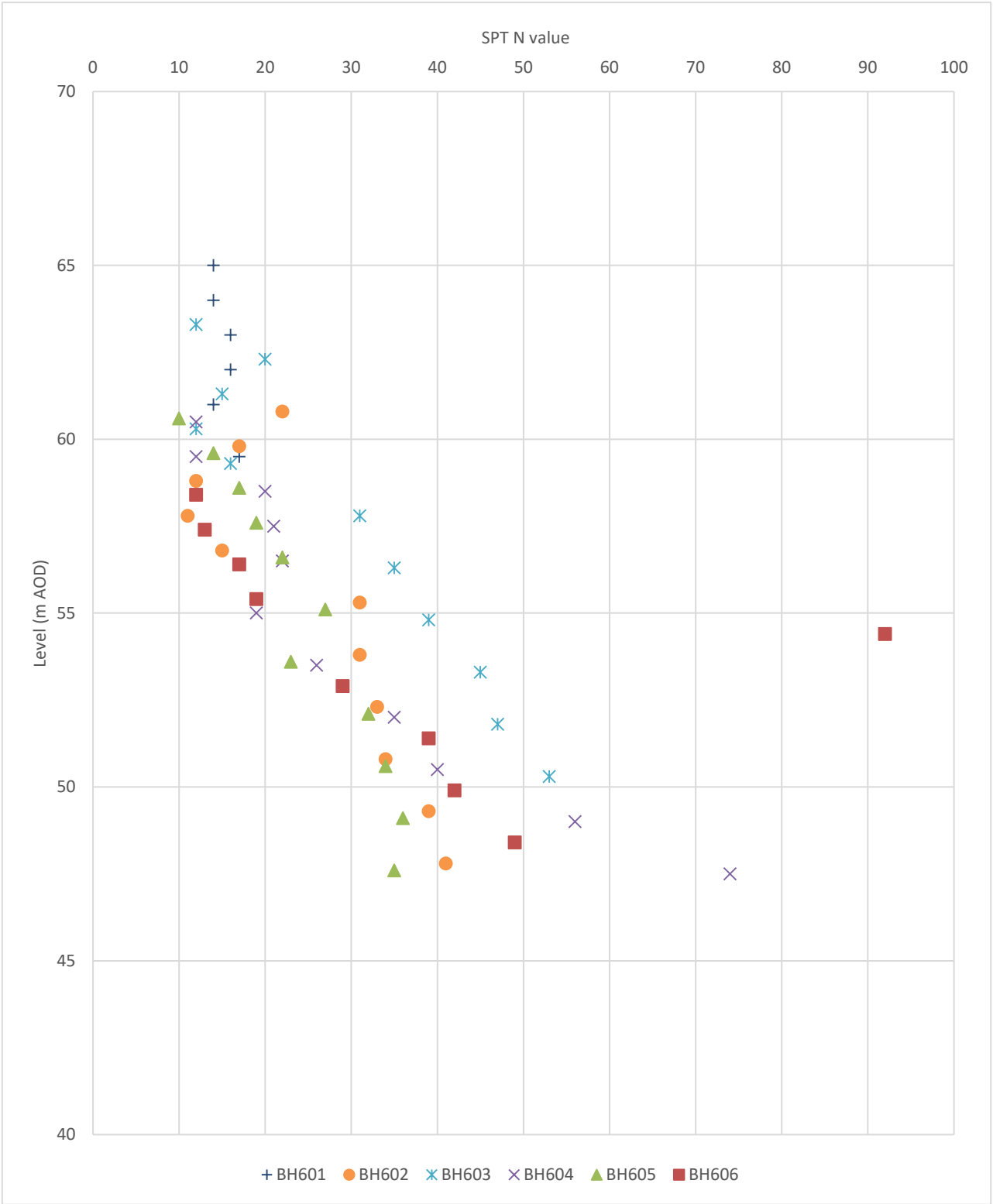
Project:	Woodcroft Farm, Lovedean, Hampshire			**Title**	Exploratory Hole Location Plan
Client:	Grainger plc			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16942	**Revision:**	1.1		
Drawn:	GR	**Date:**	02/08/2018		
Figure:	3	**Scale:**	Not To Scale		



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Project:	Woodcroft Farm, Lovedean, Hampshire			**Title**	Lines of section plan
Client:	Grainger plc			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16942	**Revision:**	1.0		
Drawn:	GR	**Date:**	02/08/2018		
Figure:	4	**Scale:**	Not To Scale		

Geo-Environmental Services Limited www.gesl.net +44 (0)1273 832 972	FIGURE 5 SPT N Value vs Level
Project ID: **GE16942**	Project Title: **Woodcroft - Phase 3 Supplementry GI**
Client: **Grainger PLC**	Location: **Woodcroft Farm, Lovedean**

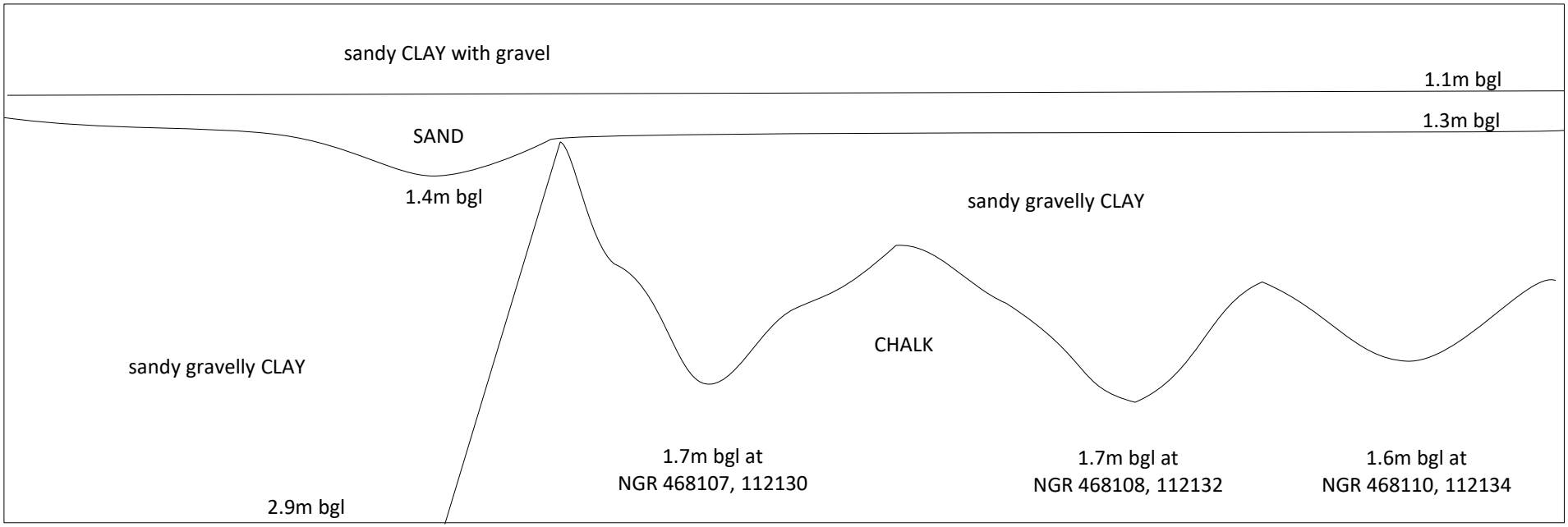


Date Reported: **28/06/2018**

Data Status:

Trench start NGR 468105, 112132

Trench end NGR 468111, 112135



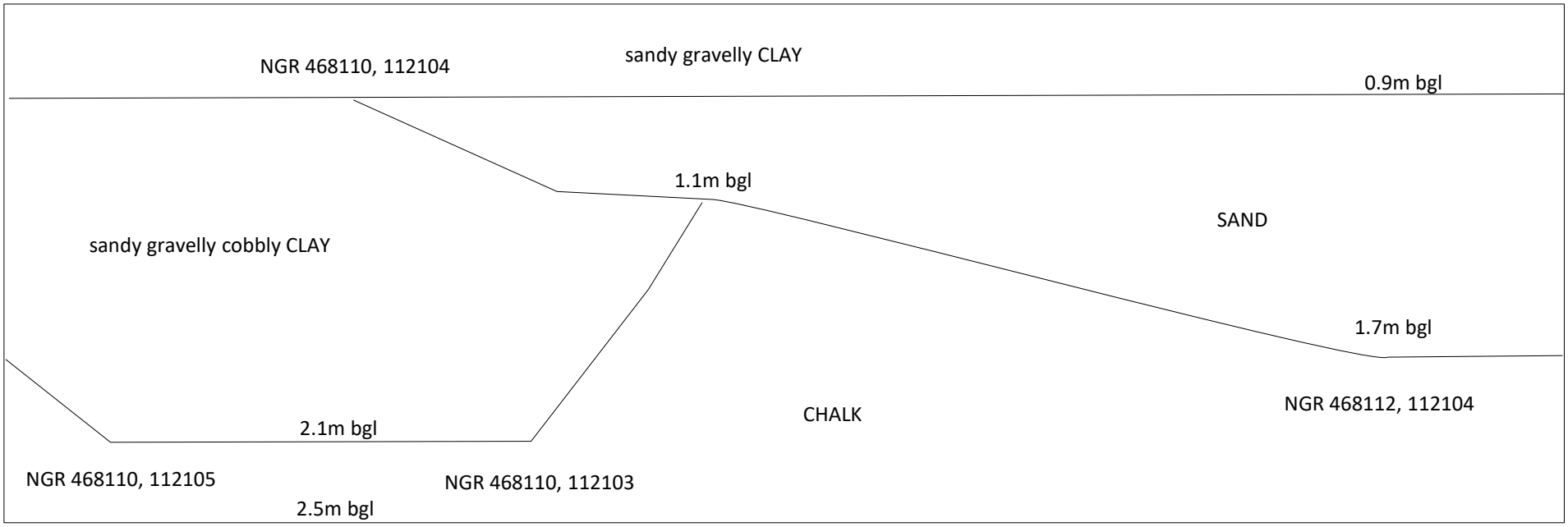
Chalk interface with sandy gravelly CLAY plunging WSW at c.70-80° at NGR468109, 112136

Refer to TP708 and TP708A logs for detailed descrptions of strata

Project:	Woodcroft Farm, Lovedean			**Title**	TP708-708A Section sketch
Client:	Grainger plc			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE19642	**Revision:**	1.1		
Drawn:	GR	**Date:**	02/08/2018		
Figure:	6	**Scale:**	Not To Scale		

Trench start NGR 468109, 112107

Trench end NGR 468113, 112104

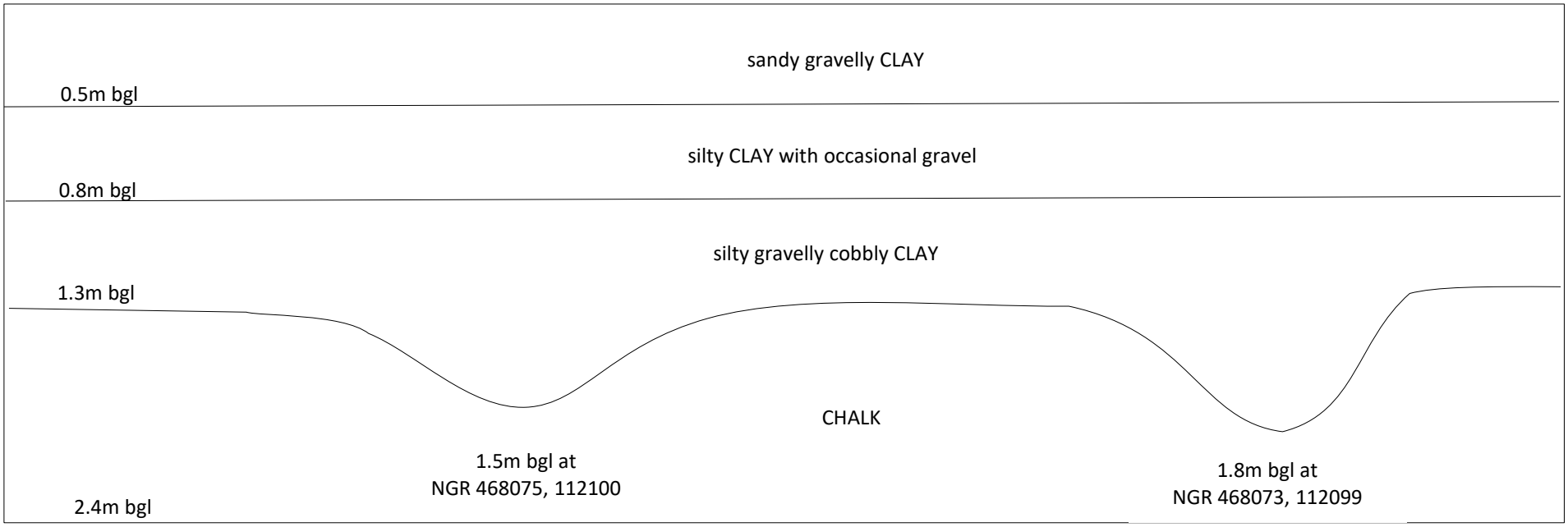


Refer to TP709 log for detailed descrptions of strata

Project:	Woodcroft Farm, Lovedean			**Title**	TP709 Section sketch
Client:	Grainger plc			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE19642	**Revision:**	1.1		
Drawn:	GR	**Date:**	02/08/2018		
Figure:	7	**Scale:**	Not To Scale		

Trench start NGR 468074, 112103

Trench end NGR 468072, 112099



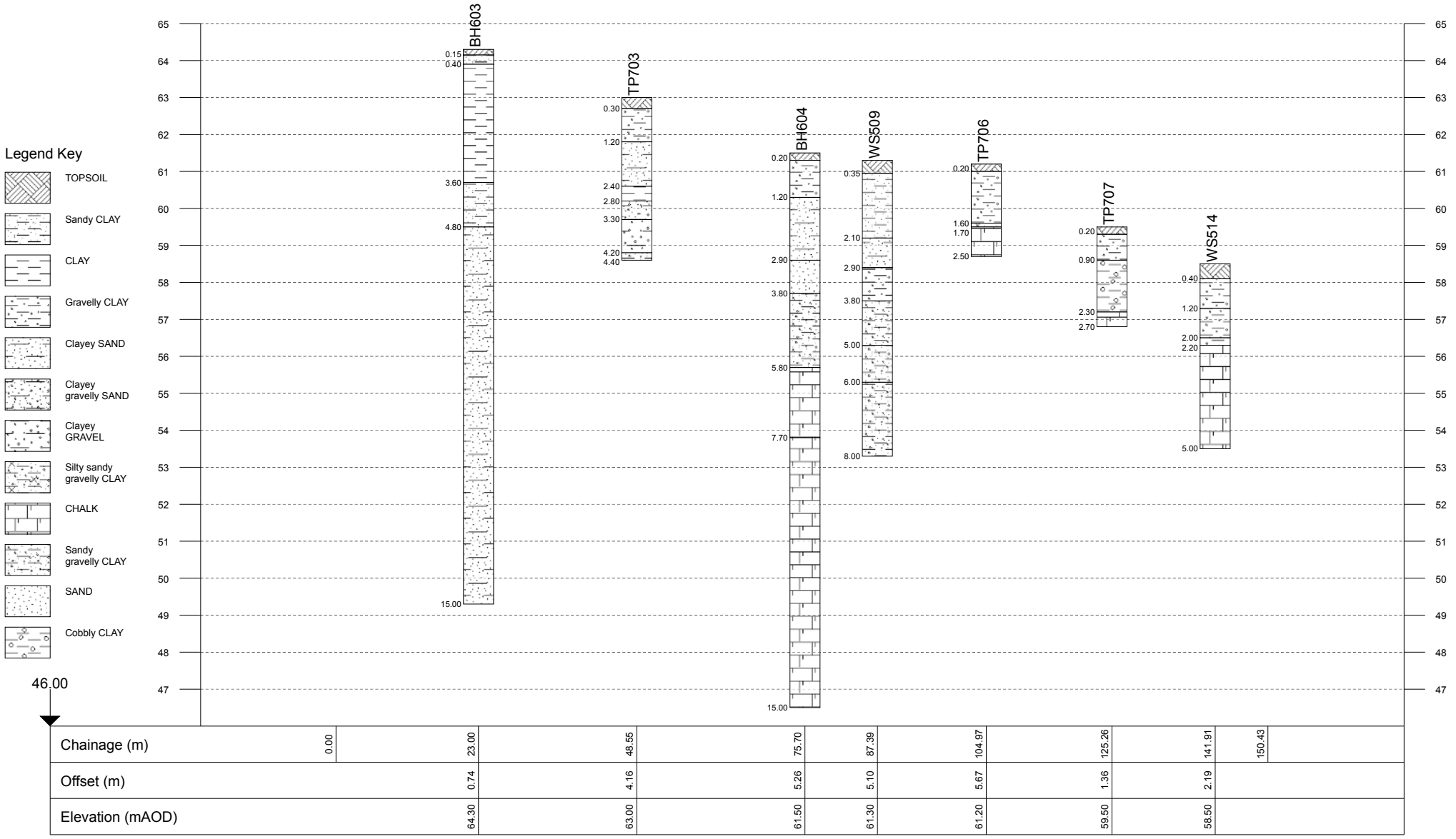
Refer to TP710 log for detailed descrptions of strata

Project:	Woodcroft Farm, Lovedean			**Title**	TP710 Section sketch
Client:	Grainger plc			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE19642	**Revision:**	1.1		
Drawn:	GR	**Date:**	02/08/2018		
Figure:	8	**Scale:**	Not To Scale		

Project Id: GE16942	Title: BH603 to WS514
Project Title: Woodcroft - Phase 3 Supplementry GI	Vertical Scale: 1:146
Location: Woodcroft Farm, Lovedean	Horizontal Scale: 1:872
Client: Grainger PLC	Engineer: GR

Figure 9 Section BH603 to WS514

Geo-Environmental

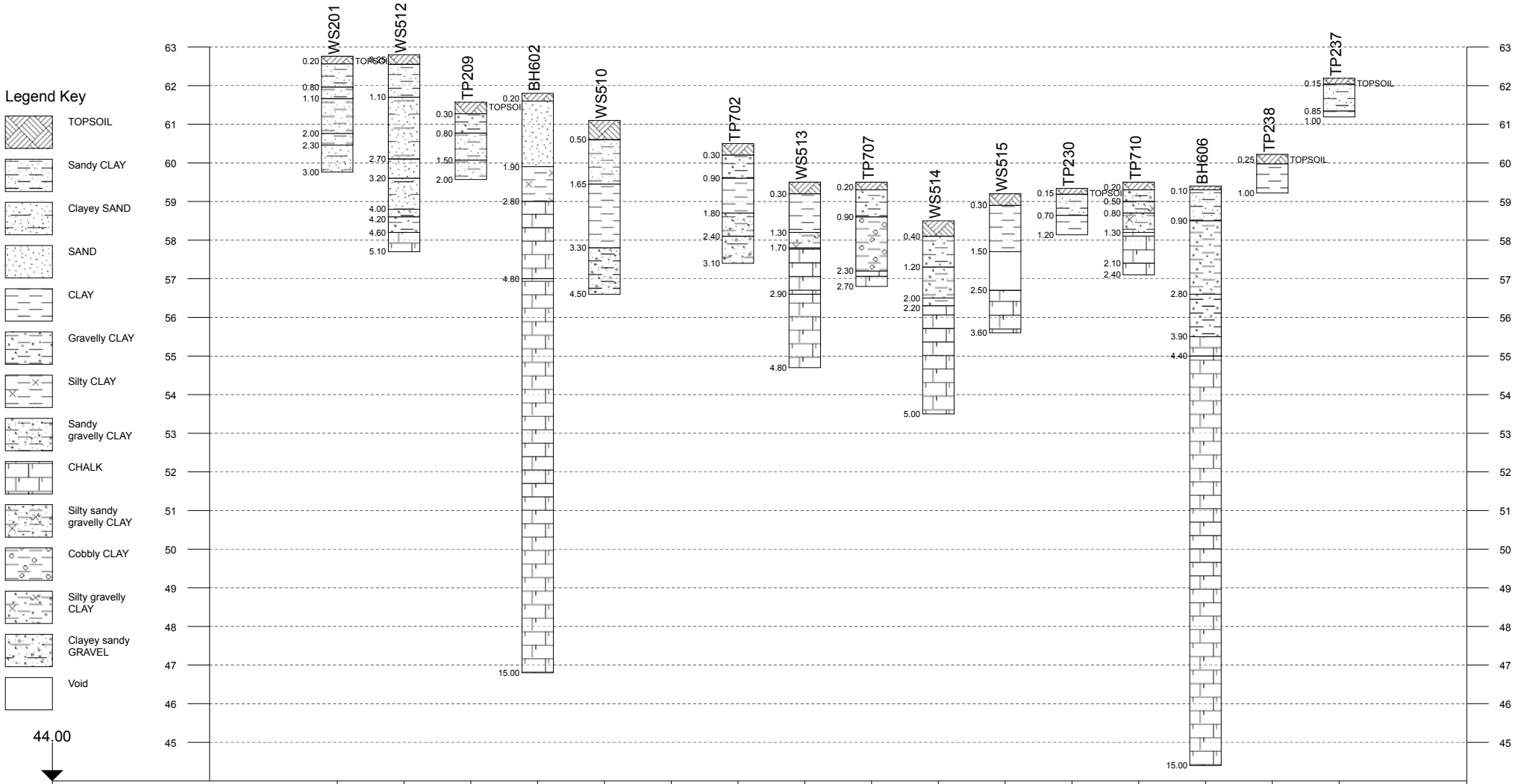


Project Id: GE16942
Project Title: Woodcroft - Phase 3 Supplementry GI
Location: Woodcroft Farm, Lovedean
Client: Grainger PLC

Title: WS201 to TP237
Vertical Scale: 1:146
Horizontal Scale: Not to scale
Engineer: GR

Figure 10 Section WS201 to TP237

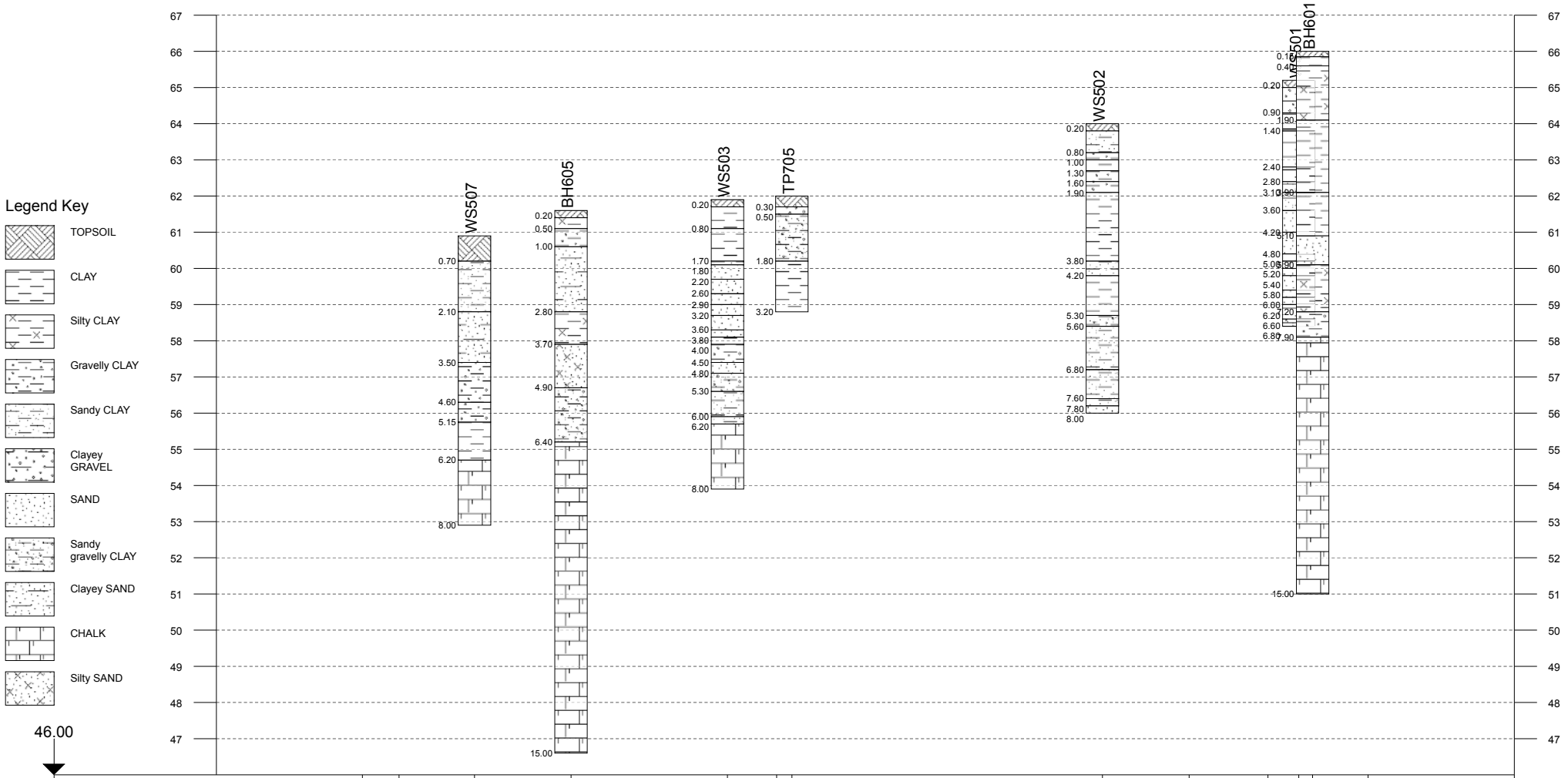
Geo-Environmental



Chainage (m)	13.86	47.99	61.12	90.08	91.92	99.62	101.68	120.85	139.12	154.59	197.57	200.27	210.09	230.34	260.99	289.45
Offset (m)	4.41	4.54	1.23	2.74	2.79	1.49	0.62	1.52	0.28	5.68	7.71	4.60	2.30	0.42	0.73	0.23
Elevation (mAOD)	62.76	62.80	61.57	61.80	61.10	60.35	60.50	59.50	59.50	58.50	59.20	59.34	59.50	59.40	60.22	62.19

Project Id: GE16942	Title: WS501 to WS507	Figure 11 Section WS501 to WS507
Project Title: Woodcroft - Phase 3 Supplementry GI	Vertical Scale: 1:161	
Location: Woodcroft Farm, Lovedean	Horizontal Scale: 1:512	
Client: Grainger PLC	Engineer: GR	

Geo-Environmental

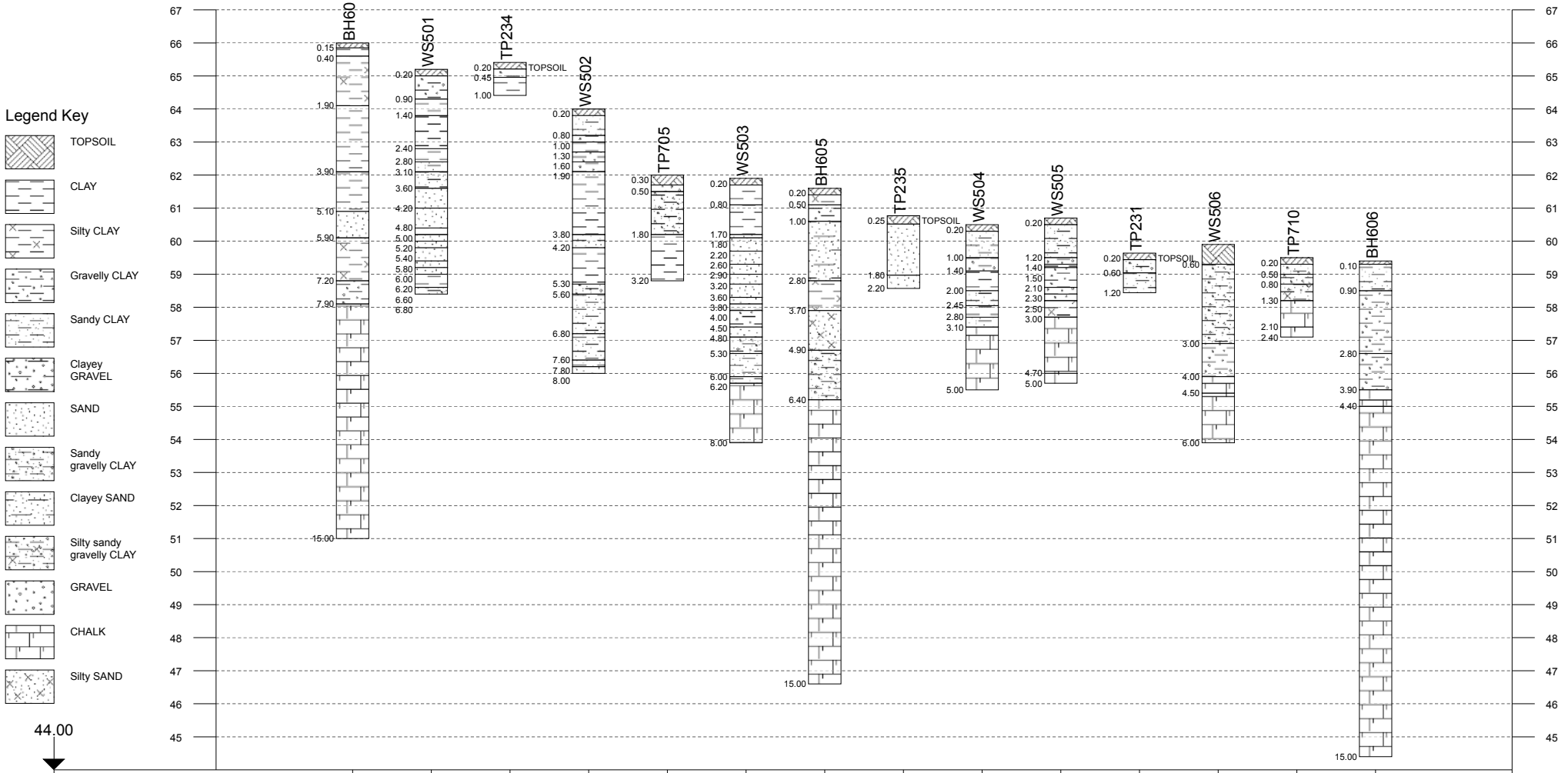


Project Id: GE16942
Project Title: Woodcroft - Phase 3 Supplementry GI
Location: Woodcroft Farm, Lovedean
Client: Grainger PLC

Title: WS501 to BH606
Vertical Scale: 1:176
Horizontal Scale: Not to scale
Engineer: GR

Figure 12 Section WS501 to BH606

Geo-Environmental



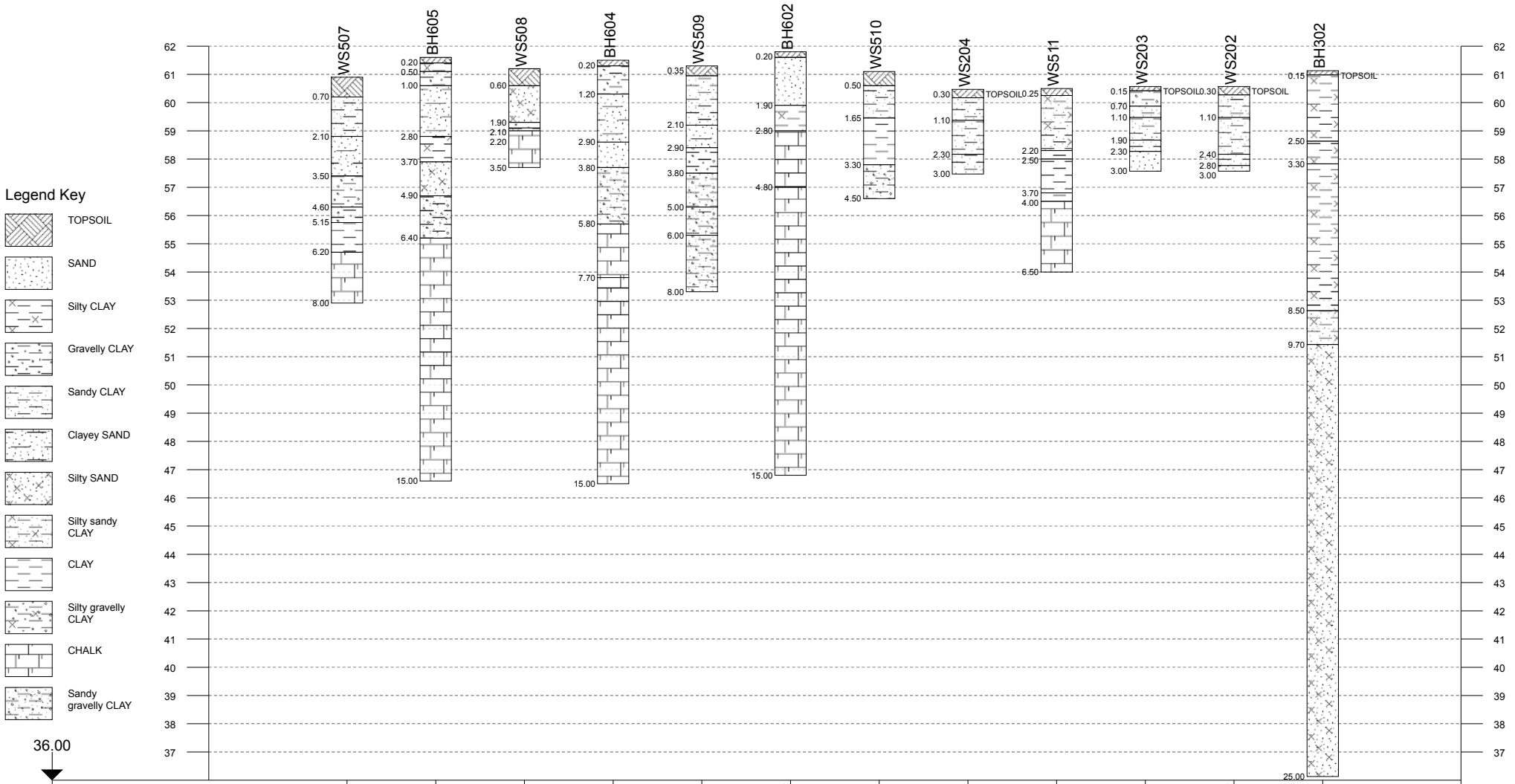
Chainage (m)	13.39	14.80	17.33	31.94	59.22	67.32	75.92	93.70	94.09	125.32	130.59	144.85	188.50	205.03
Offset (m)	5.41	3.97	4.73	1.17	0.47	6.17	8.53	5.53	2.52	1.14	2.25	3.28	8.40	1.58
Elevation (mAOD)	66.00	65.20	65.41	64.00	62.00	61.90	61.60	60.77	60.50	60.70	59.64	59.90	59.50	59.40

Project Id: GE16942
Project Title: Woodcroft - Phase 3 Supplementry GI
Location: Woodcroft Farm, Lovedean
Client: Grainger PLC

Title: WS507 to BH302
Vertical Scale: 1:199
Horizontal Scale: Not to scale
Engineer: GR

Figure 13 Section WS507 to BH302

Geo-Environmental

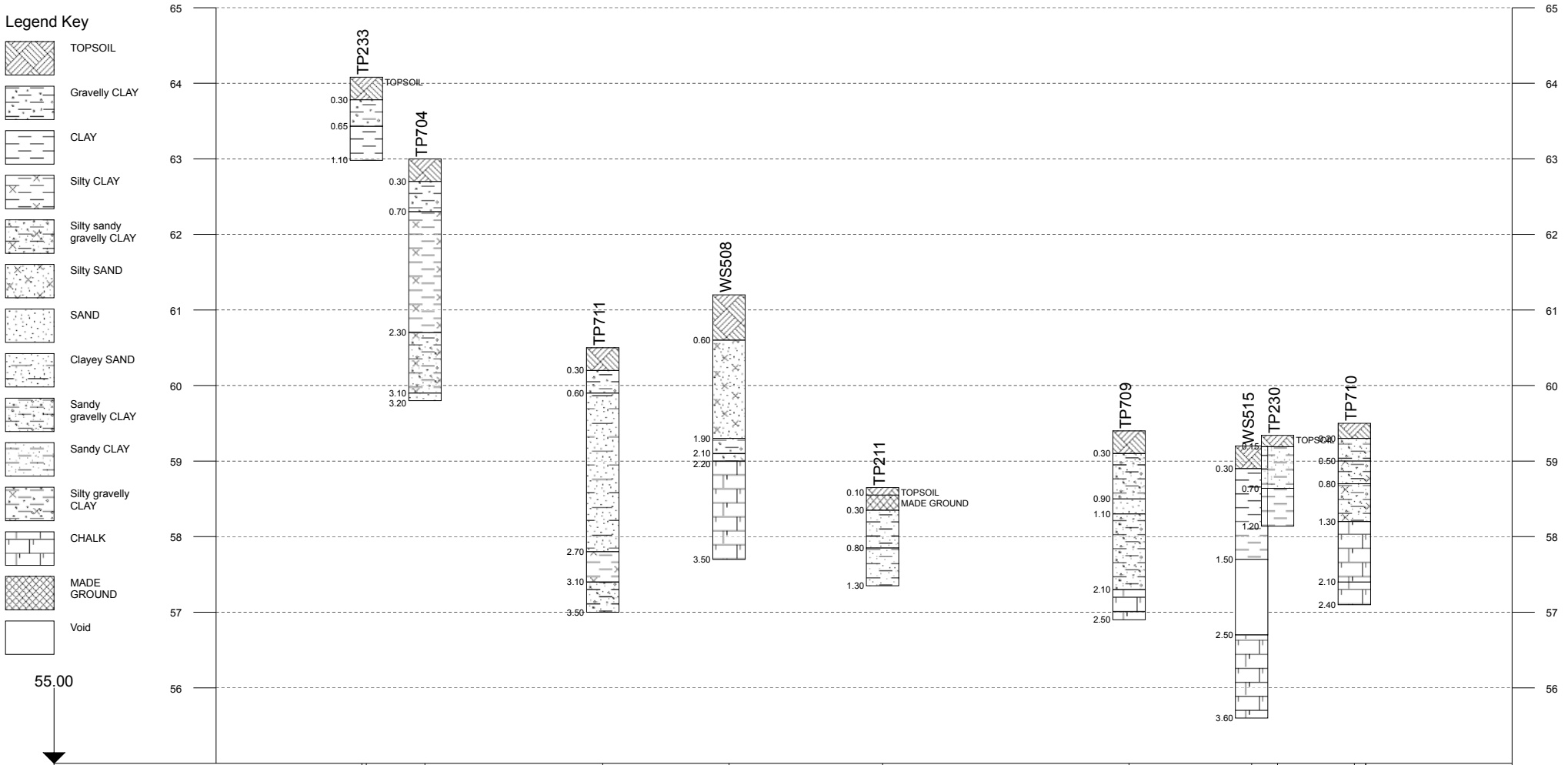


Chainage (m)	12.77	14.96	57.42	75.53	85.80	110.45	112.62	142.70	149.70	161.12	183.45	233.22
Offset (m)	7.82	0.44	2.60	8.85	2.92	0.78	6.19	1.97	1.90	6.23	0.62	0.24
Elevation (mAOD)	60.90	61.60	61.20	61.50	61.30	61.80	61.10	60.47	60.50	60.57	60.57	61.13

Project Id: GE16942	Title: TP233 to TP710
Project Title: Woodcroft - Phase 3 Supplementry GI	Vertical Scale: 1:77
Location: Woodcroft Farm, Lovedean	Horizontal Scale: 1:908
Client: Grainger PLC	Engineer: GR

Figure 14 Section TP233 to TP710

Geo-Environmental

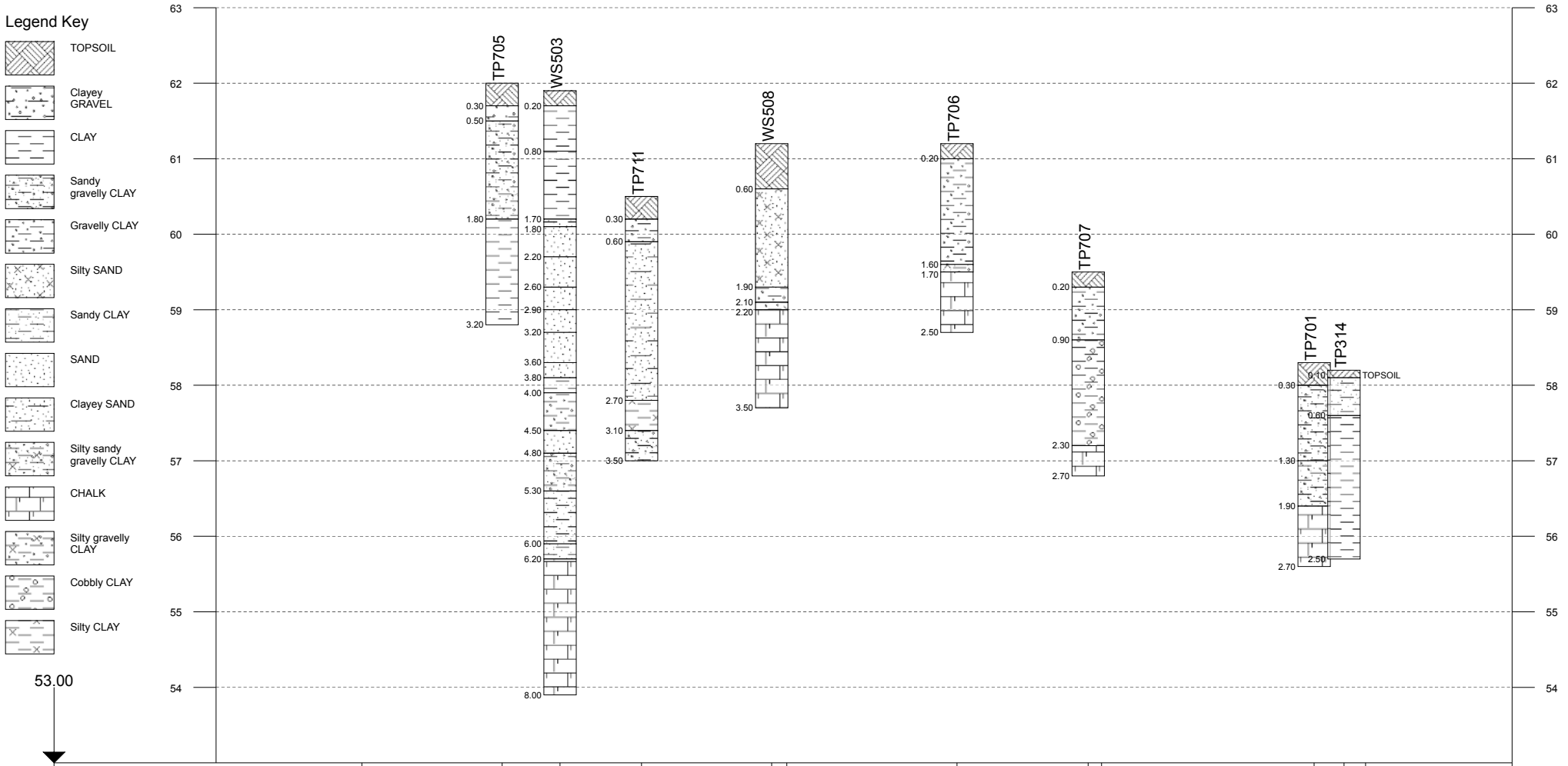


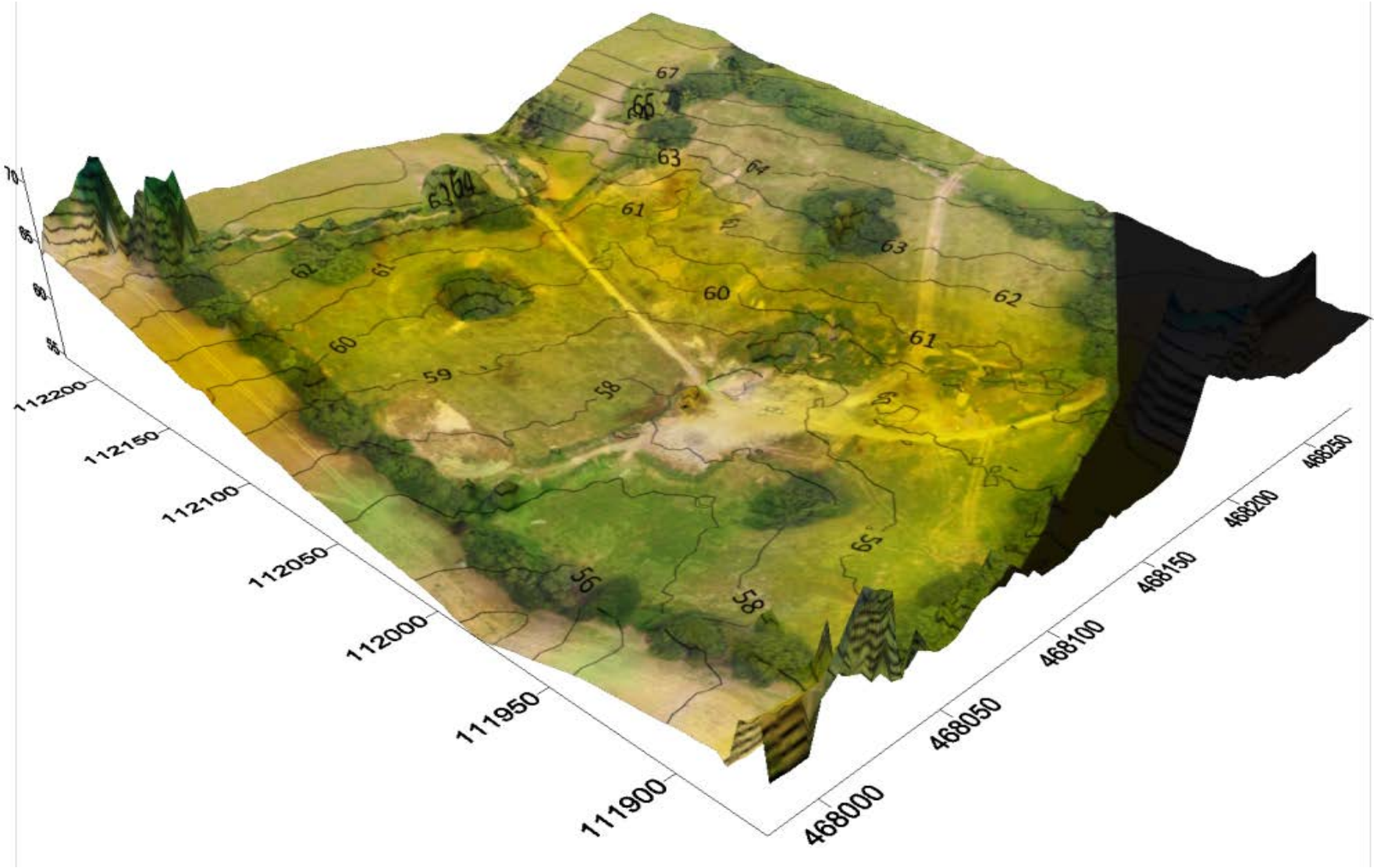
Project Id: GE16942
Project Title: Woodcroft - Phase 3 Supplementry GI
Location: Woodcroft Farm, Lovedean
Client: Grainger PLC

Title: TP705 to TP701
Vertical Scale: 1:77
Horizontal Scale: 1:950
Engineer: GR

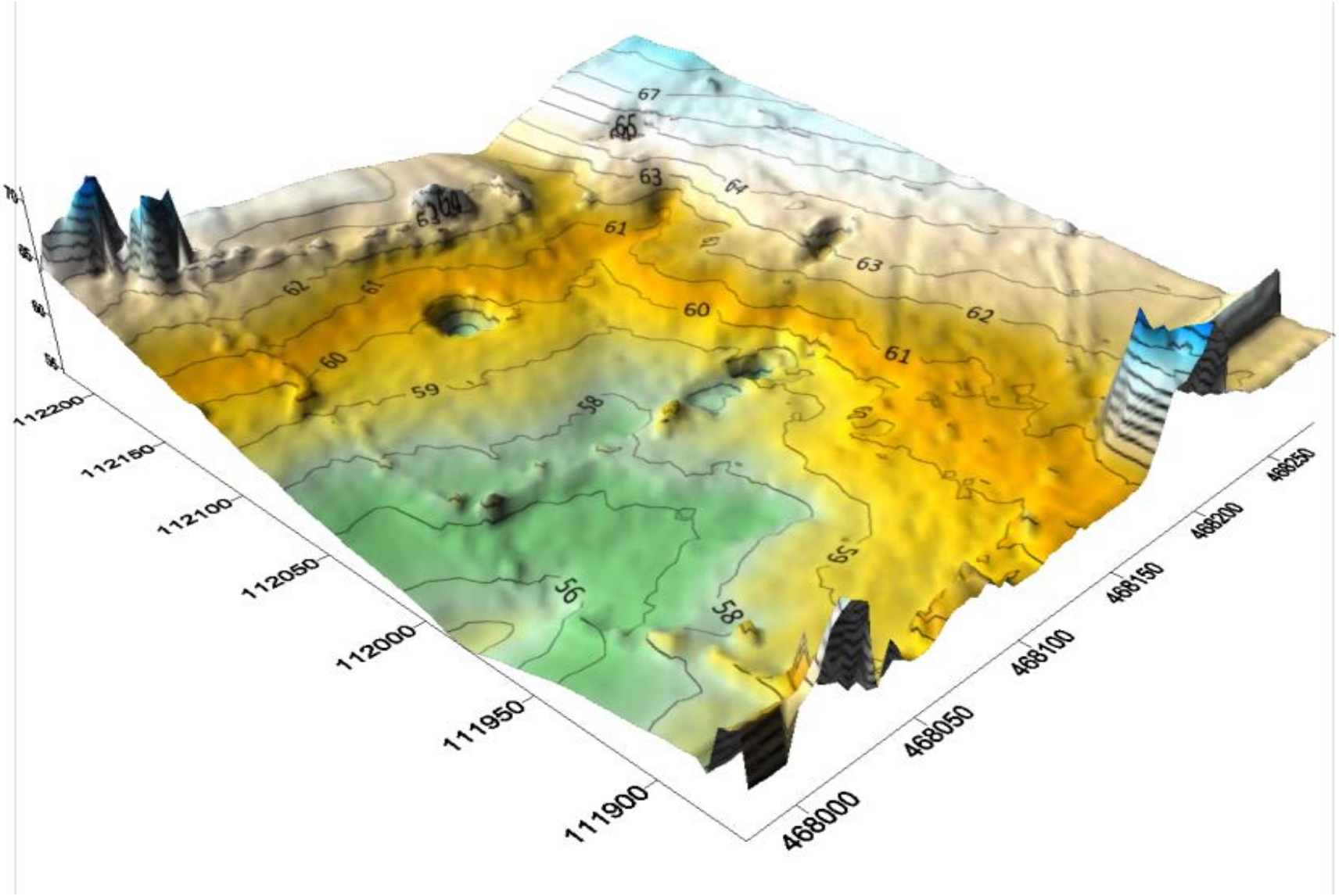
Figure 15 Section TP705 to TP701

Geo-Environmental

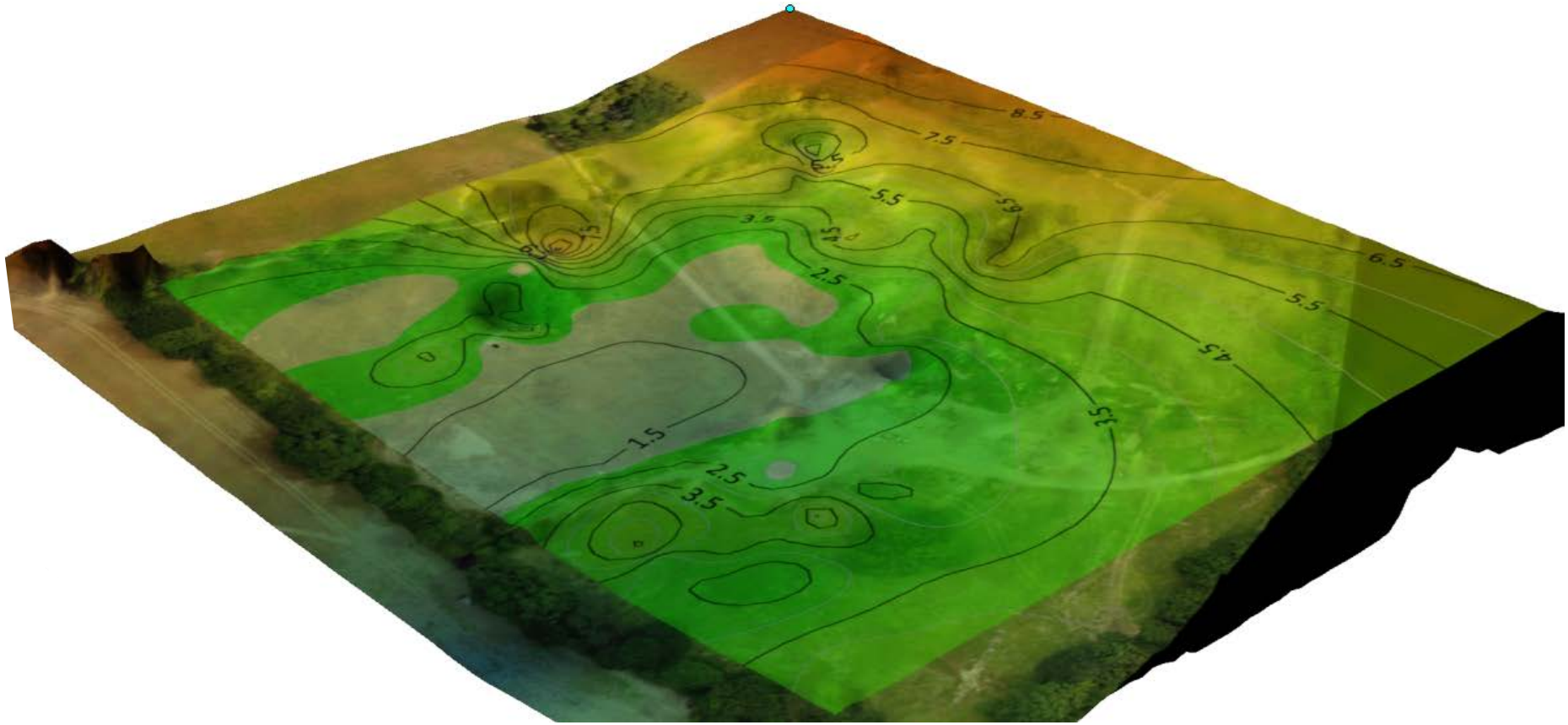




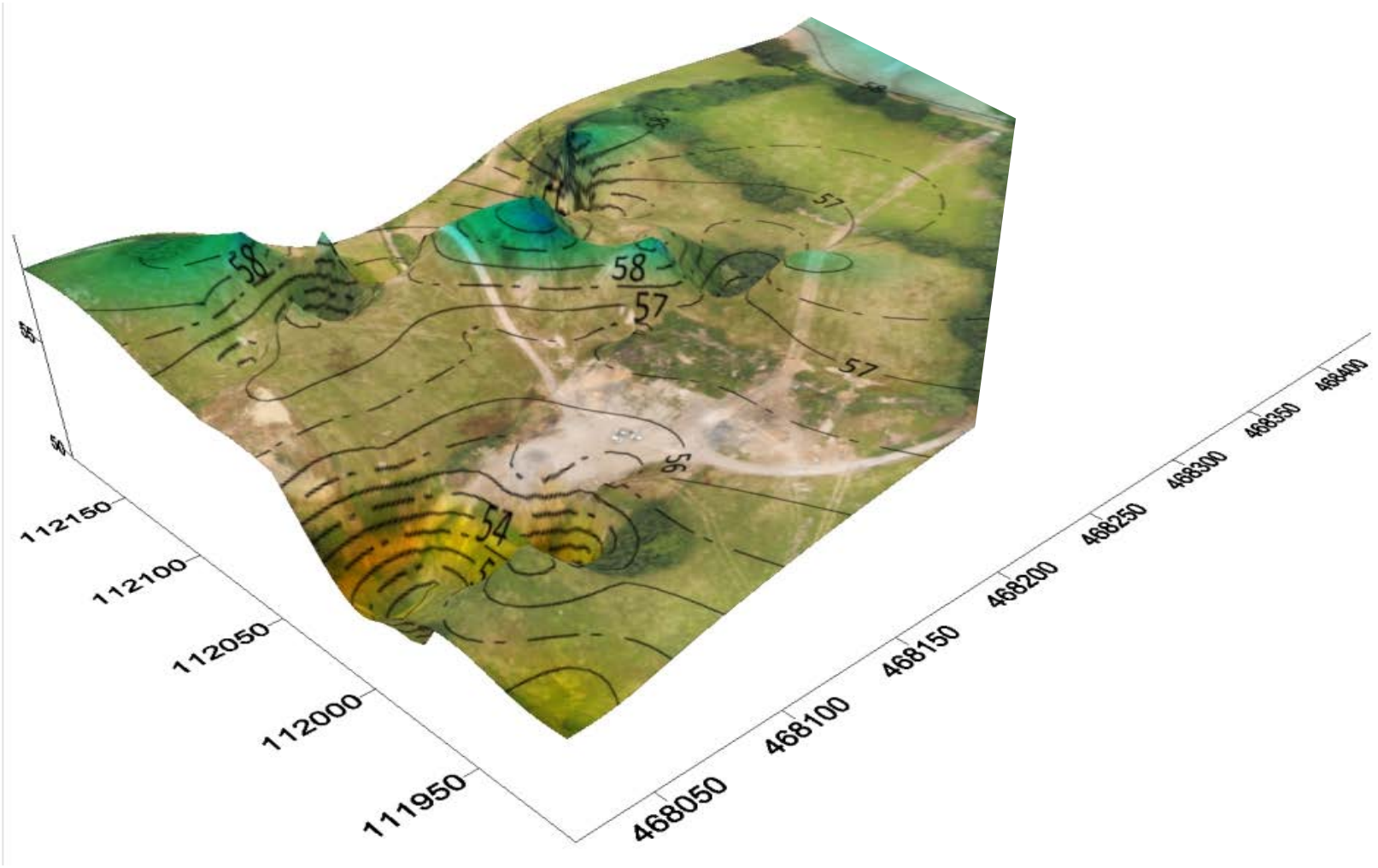
Project:	Woodcroft Farm, Lovedean, Hampshire			**Title**	3D Ground surface model
Client:	Grainger plc			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16942	**Revision:**	1.0		
Drawn:	GR	**Date:**	02/08/2018		
Figure:	16	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, Hampshire			**Title**	3D ground surface contour model
Client:	Grainger plc			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16942	**Revision:**	1.0		
Drawn:	GR	**Date:**	02/08/2018		
Figure:	17	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, Hampshire			**Title**	Aerial photograph with depth to chalk overlay
Client:	Grainger plc			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16942	**Revision:**	1.0		
Drawn:	GR	**Date:**	02/08/2018		
Figure:	18	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, Hampshire			**Title**	Chalk level 3D model on aerial overlay
Client:	Grainger plc			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16942	**Revision:**	1.0		
Drawn:	GR	**Date:**	02/08/2018		
Figure:	19	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, Hampshire			**Title**	Pre-development ground level contours on development layout
Client:	Grainger plc			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16942	**Revision:**	1.0		
Drawn:	GR	**Date:**	02/08/2018		
Figure:	20	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, Hampshire			**Title**	Chalk level contours on development layout
Client:	Grainger plc			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16942	**Revision:**	1.0		
Drawn:	GR	**Date:**	02/08/2018		
Figure:	21	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, Hampshire			**Title**	Depth to chalk on development layout
Client:	Grainger plc			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16942	**Revision:**	1.0		
Drawn:	GR	**Date:**	02/08/2018		
Figure:	22	**Scale:**	Not To Scale		

Geo-Environmental

APPENDIX A

Exploratory Hole Logs



Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **BH601** Sheet 1 of 2

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468246E - 112136N	Hole Type CP
Location:	Woodcroft Farm, Lovedean		Level: 66.00	Scale 1:50
Client:	Grainger PLC		Dates: 28/06/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.15	65.85		Grass over brown silty clay with roots	
					0.40	65.60		Friable brown CLAY (visually assessed to be desiccated)	
		0.50 - 1.00	B					Stiff brown orange-brown and greyish brown mottled silty CLAY	
		1.00	S	N=14 (5,/4,3,4,3)					1
		1.45	D						
		1.50 - 2.00	B						
		2.00	S	N=14 (4,/3,3,4,4)	1.90	64.10		Stiff brown and grey mottled silty CLAY	2
		2.45	D						
		2.50 - 3.00	B						
		3.00	S	N=16 (4,/3,4,5,4)					3
		3.45	D						
		4.00	S	N=16 (5,/4,4,4,4)	3.90	62.10		Stiff light grey and purple mottled CLAY	4
		4.45	D						
		5.00	S	N=14 (4,/3,4,3,4)					5
		5.45	D		5.10	60.90		Medium dense brown medium to coarse SAND	
		6.00	D		5.90	60.10		Stiff grey silty CLAY	6
		6.50	S	N=17 (5,/4,4,4,5)					
		6.95	D						7
		7.50	D		7.20	58.80		Stiff to very stiff grey gravelly to very gravelly CLAY. Gravel is fine to medium angular to subrounded flint.	
		8.00	S	0 (50 for 75mm/0 for 0mm)	7.90	58.10		Off-white and white CHALK composed of silt size matrix with weak to moderately weak clasts becoming blocky chalk with depth. CIRIA Grade Dm/Dc becoming Grade C/B at depth	8
		8.45	D						
		9.00	D						9
		9.50	S	0 (50 for 50mm/0 for 0mm)					
		9.95	D						10
								Continued on Next Sheet	

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to
				0.00	1.00
				7.90	10.00
				10.00	15.00

Remarks

Groundwater not encountered.

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **BH601** Sheet 2 of 2

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords:	468246E - 112136N	Hole Type CP
Location:	Woodcroft Farm, Lovedean		Level:	66.00	Scale 1:50
Client:	Grainger PLC		Dates:	28/06/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.50	D					
		11.00	S	0 (50 for 65mm/0 for 0mm)				
		11.45	D					
		12.00	D					
		12.50	S	0 (50 for 75mm/0 for 0mm)				
		12.95	D					
		13.50	D					
		14.00	S	0 (50 for 25mm/0 for 0mm)				
		14.45	D					
		15.00	D		15.00	51.00		End of Borehole at 15.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to
				0.00	1.00
				7.90	10.00
				10.00	15.00

Remarks

Groundwater not encountered.

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **BH602** Sheet 1 of 2

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468179E - 112045N	Hole Type CP
Location:	Woodcroft Farm, Lovedean		Level: 61.80	Scale 1:50
Client:	Grainger PLC		Dates: 27/06/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	61.60		Grass over brown silty clay with roots
		0.50 - 1.00	B					Medium dense brown fine and medium SAND
		1.00	S	N=22 (7,/5,6,5,6)				
		1.45	D					
		1.50 - 2.00	B					
		2.00	S	N=17 (5,/4,4,4,5)	1.90	59.90		Stiff grey silty CLAY
		2.45	D					
		2.50 - 3.00	B					
		3.00	S	N=12 (5,/3,3,2,4)	2.80	59.00		Structureless CHALK composed of off-white silt matrix with off-white and white very weak to moderately weak chalk clasts. CIRIA Grade Dm/Dc
		3.45	D					
		4.00	S	N=11 (3,/2,3,3,3)				
		4.45	D					
		5.00	S	N=15 (4,/3,3,4,5)	4.80	57.00		Off-white and white moderately weak CHALK. CIRIA Grade C/B
		5.45	D					
		6.00	D					
		6.50	S	N=31 (7,/6,7,8,10)				
		6.95	D					
		7.50	D					
		8.00	S	N=31 (9,/7,7,8,9)				
		8.45	D					
		9.00	D					
		9.50	S	N=33 (8,/7,8,9,9)				
		9.95	D					

Continued on Next Sheet

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to
				0.00	1.00

Remarks

Groundwater not encountered.

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **BH602** Sheet 2 of 2

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords:	468179E - 112045N	Hole Type CP
Location:	Woodcroft Farm, Lovedean		Level:	61.80	Scale 1:50
Client:	Grainger PLC		Dates:	27/06/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.50	D					
		11.00	S	N=34 (9,/7,8,9,10)				
		11.45	D					
		12.00	D					
		12.50	S	N=39 (11,/9,10,11,9)				
		12.95	D					
		13.50	D					
		14.00	S	N=41 (12,/9,10,11,11)				
		14.45	D					
		15.00	D		15.00	46.80		End of Borehole at 15.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to
				0.00	1.00

Remarks

Groundwater not encountered.

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **BH603** Sheet 1 of 2

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468236E - 112083N	Hole Type CP
Location:	Woodcroft Farm, Lovedean		Level: 64.30	Scale 1:50
Client:	Grainger PLC		Dates: 27/06/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.15	64.15		Grass over brown silty clay with roots
					0.40	63.90		Friable brown sandy CLAY (visually assessed to be desiccated)
		0.50 - 1.00	B					Stiff reddish brown light grey and brown mottled CLAY
		1.00	S	N=12 (3,/2,3,3,4)				
		1.45	D					
		1.50 - 2.00	B					
		2.00	S	N=20 (5,/4,5,6,5)				
		2.45	D					
		2.50 - 3.00	B					
		3.00	S	N=15 (4,/3,4,4,4)				
		3.45	D					
					3.60	60.70		Stiff brown sandy CLAY
		4.00	S	N=12 (3,/2,3,3,4)				
		4.45	D					
					4.80	59.50		Medium dense becoming dense brown fine to medium SAND with bands of stiff grey and brown clay
		5.00	S	N=16 (4,/3,4,4,5)				
		5.45	D					
		6.00	D					
		6.50	S	N=31 (9,/7,7,8,9)				
		6.95	D					
		7.50	D					
		8.00	S	N=35 (11,/8,9,9,9)				
		8.45	D					
		9.00	D					
		9.50	S	N=39 (10,/7,9,11,12)				
		9.95	D					

Continued on Next Sheet

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to
				0.00	1.00

Remarks

Groundwater not encountered.

AGS

Geo-Environmental
Unit 7, Danworth Farm
Hurstpierpoint
BN6 9GL
www.gesl.net

Borehole Log

Borehole No.
BH603
Sheet 2 of 2

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468236E - 112083N	Hole Type CP
Location:	Woodcroft Farm, Lovedean		Level: 64.30	Scale 1:50
Client:	Grainger PLC		Dates: 27/06/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.50	D					
		11.00	S	N=45 (11,/9,11,12,13)				
		11.45	D					
		12.00	D					
		12.50	S	N=47 (12,/10,11,12,14)				
		12.95	D					
		13.50	D					
		14.00	S	N=53 (13,/11,12,14,16)				
		14.45	D					
		15.00	D		15.00	49.30		End of Borehole at 15.00m

11 12 13 14 15 16 17 18 19 20

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to
				0.00	1.00

Remarks
Groundwater not encountered.

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **BH604** Sheet 1 of 2

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468183E - 112081N	Hole Type CP
Location:	Woodcroft Farm, Lovedean		Level: 61.50	Scale 1:50
Client:	Grainger PLC		Dates: 26/06/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	61.30		Grass over brown silty clay with roots
		0.50 - 1.00	B					Stiff brown CLAY with fine to coarse flint gravel
		1.00	S	N=12 (3,/2,3,4,3)				
					1.20	60.30		Medium dense orange-brown clayey SAND
		1.45	D					
		1.50 - 2.00	B					
		2.00	S	N=12 (3,/2,3,4,3)				
		2.45	D					
		2.50 - 3.00	B					
					2.90	58.60		Medium dense orange-brown fine to coarse SAND
		3.00	S	N=20 (5,/4,5,6,5)				
		3.45	D					
					3.80	57.70		Stiff orange-brown sandy CLAY with fine to coarse gravel of angular to subangular flint.
		4.00	S	N=21 (6,/5,5,5,6)				
		4.45	D					
		5.00	S	N=22 (7,/5,6,5,6)				
		5.45	D					
					5.80	55.70		Structureless CHALK composed of off-white silt matrix with off-white and white very weak to moderately weak chalk clasts. CIRIA Grade Dm/Dc
		6.00	D					
		6.50	S	N=19 (5,/4,5,4,6)				
		6.95	D					
		7.50	D					
					7.70	53.80		Off-white and white moderately weak CHALK. CIRIA Grade C/B
		8.00	S	N=26 (8,/5,6,7,8)				
		8.45	D					
		9.00	D					
		9.50	S	N=35 (9,/7,9,10,9)				
		9.95	D					
								Continued on Next Sheet

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to
				0.00	1.00

Remarks

Groundwater not encountered.

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **BH604** Sheet 2 of 2

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords:	468183E - 112081N	Hole Type CP
Location:	Woodcroft Farm, Lovedean		Level:	61.50	Scale 1:50
Client:	Grainger PLC		Dates:	26/06/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.50	D					
		11.00	S	N=40 (11,/8,9,11,12)				
		11.45	D					
		12.00	D					
		12.50	S	N=56 (12,/11,13,15,17)				
		12.95	D					
		13.50	D					
		14.00	S	N=74 (20,/18,15,19,22)				
		14.45	D					
		15.00	D		15.00	46.50		End of Borehole at 15.00m

11 12 13 14 15 16 17 18 19 20

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to
				0.00	1.00

Remarks

Groundwater not encountered.

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **BH605** Sheet 1 of 2

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468182E - 112139N	Hole Type CP
Location:	Woodcroft Farm, Lovedean		Level: 61.60	Scale 1:50
Client:	Grainger PLC		Dates: 25/06/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	61.40		Grass over brown silty clay with roots
		0.50 - 1.00	B		0.50	61.10		Friable brown CLAY (visually assessed to be desiccated)
		1.00	S	N=10 (3,/2,3,2,3)	1.00	60.60		Stiff orange-brown sandy CLAY
		1.45	D					Loose to medium dense orange-brown SAND with bands of brown and grey clay
		1.50 - 2.00	B					
		2.00	S	N=14 (4,/3,4,3,4)				
		2.45	D					
		2.50 - 3.00	B					
					2.80	58.80		Stiff grey and brown mottled silty CLAY
		3.00	S	N=17 (4,/3,4,4,6)				
		3.45	D					
					3.70	57.90		Medium dense light greyish and light brown silty SAND
		4.00	S	N=19 (5,/4,4,5,6)				
		4.45	D					
					4.90	56.70		Stiff brown sandy CLAY with fine to coarse gravel of flint and chalk
		5.00	S	N=22 (7,/5,6,5,6)				
		5.45	D					
		6.00	D					
					6.40	55.20		Off-white and white CHALK composed of silt size matrix with weak to moderately weak clasts becoming blocky chalk with depth. CIRIA Grade Dm/Dc becoming Grade C/B at depth
		6.50	S	N=27 (9,/7,6,7,7)				
		6.95	D					
		7.50	D					
		8.00	S	N=23 (6,/5,7,6,5)				
		8.45	D					
		9.00	D					
		9.50	S	N=32 (9,/7,8,8,9)				
		9.95	D					

Continued on Next Sheet

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to
				0.00	1.00

Remarks

Groundwater not encountered.

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **BH605** Sheet 2 of 2

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords:	468182E - 112139N	Hole Type CP
Location:	Woodcroft Farm, Lovedean		Level:	61.60	Scale 1:50
Client:	Grainger PLC		Dates:	25/06/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.50	D					
		11.00	S	N=34 (10,/8,8,9,9)				
		11.45	D					
		12.00	D					
		12.50	S	N=36 (9,/8,9,10,9)				
		12.95	D					
		13.50	D					
		14.00	S	N=35 (10,/9,8,9,9)				
		14.45	D					
		15.00	D		15.00	46.60		End of Borehole at 15.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to
				0.00	1.00

Remarks

Groundwater not encountered.

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **BH606** Sheet 1 of 2

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468056E - 112110N	Hole Type CP
Location:	Woodcroft Farm, Lovedean		Level: 59.40	Scale 1:50
Client:	Grainger PLC		Dates: 27/03/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	59.30		Grass over brown silty clay with roots Stiff brown sandy CLAY (Visually assessed to be desiccated)
		0.50 - 1.00	B					
		1.00	S	N=12 (4,/3,2,4,3)	0.90	58.50		Stiff brown gravelly CLAY. Gravel is medium to coarse flint
		1.45	D					
		1.50 - 2.00	B					
		2.00	S	N=13 (5,/3,3,3,4)				
		2.45	D					
		2.50 - 3.00	B					
		3.00	S	N=17 (3,/4,4,5,4)	2.80	56.60		Firm to stiff light grey and off-white silty CLAY with much fine to medium gravel of very weak chalk.
		3.45	D					
		4.00	S	N=19 (7,/4,5,5,5)	3.90	55.50		Structureless CHALK composed of off-white silt matrix with off-white and white very weak to moderately weak chalk clasts. CIRIA Grade Dm/Dc
		4.45	D		4.40	55.00		Off-white and white moderately weak CHALK. CIRIA Grade C/B
		5.00	S	N=92 (38,/20,22,24,26)				
		5.45	D					
		6.00	D					
		6.50	S	N=29 (9,/6,7,8,8)				
		6.95	D					
		7.50	D					
		8.00	S	N=39 (10,/8,9,10,12)				
		8.45	D					
		9.00	D					
		9.50	S	N=42 (12,/9,11,11,11)				
		9.95	D					

Continued on Next Sheet

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to
				0.00	1.00
				12.50	13.00
				13.20	15.00

Remarks

Groundwater not encountered.

AGS

Geo-Environmental
Unit 7, Danworth Farm
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Borehole Log

Borehole No. **BH606**
Sheet 2 of 2

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468056E - 112110N	Hole Type CP
Location:	Woodcroft Farm, Lovedean		Level: 59.40	Scale 1:50
Client:	Grainger PLC		Dates: 27/03/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.50	D					
		11.00	S	N=49 (11,/9,12,13,15)				
		11.45	D					
		12.00	D					
		12.50	S	0 (50 for 75mm/0 for 0mm)				
		12.95	D					
		13.50	D					
		14.00	S	0 (50 for 40mm/0 for 0mm)				
		14.45	D					
		15.00	D		15.00	44.40		End of Borehole at 15.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to
				0.00	1.00
				12.50	13.00
				13.20	15.00

Remarks
Groundwater not encountered.

AGS

Geo-Environmental
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Trial Pit Log

TrialPit No: TP701
Sheet 1 of 1

Project Name: Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468130.00 - 112031.00 Level: 58.30	Date 25/06/2018
Location: Woodcroft Farm, Lovedean		Dimensions (m): Depth 2.70	Scale 1:25
Client: Grainger PLC			Logged

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	58.00		Grass over brown silty sandy clay with roots
				1.30	57.00		Stiff orange-brown and light grey mottled sandy CLAY with occasional iron staining and occasional to some fine to coarse gravel of flint and chalk from 0.9m bgl and becoming brown and grey mottled from 1.1m bgl
				1.90	56.40		Stiff brown orange-brown red dark brown and grey mottled sandy CLAY with fine to coarse flint gravel occasional flint cobble and occasional fine to coarse gravel of weak chalk
				2.70	55.60		Structureless CHALK composed of light brown and off-white silty sandy gravel and occasional cobble sized weak to moderately strong chalk clasts and occasional flint cobble. CIRIA Grade Dc
							End of Pit at 2.70m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks: No variation in depth to chalk. Pit stable and dry.

Stability

AGS

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Trial Pit Log

TrialPit No
TP702
Sheet 1 of 1

Project Name: Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468168.00 - 112050.00 Level: 60.50	Date 25/06/2018
Location: Woodcroft Farm, Lovedean		Dimensions (m): Depth 3.10	Scale 1:25
Client: Grainger PLC			Logged

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	60.20		Grass over brown silty sandy clay with roots
				0.90	59.60		Stiff orange-brown slightly sandy CLAY. Visually assessed to be desiccated
				1.80	58.70		Stiff orange-brown and light grey CLAY
				2.40	58.10		Dark grey light grey and orange-brown sandy CLAY with abundant fine angular to subangular flint gravel and rare flint cobble. Orange brown colour dominant in western half of the trench and grey colour dominant in eastern half of the trench.
				3.10	57.40		Dark grey light grey and off-white clayey sandy GRAVEL and cobble of flint with some moderately weak to moderately strong gravel and cobble sized chalk. Chalk gravel from 2.4m bgl at eastern end of pit and from 2.6m bgl through the remainder of the pit.
							End of Pit at 3.10m

1 2 3 4 5

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks: Pit stable and dry. Unable to penetrate gravel and cobble in base of pit. Untracebale plastic water pipe at 0.6m broken and repaired with stop-end fitting.

Stability

AGS

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Trial Pit Log

TrialPit No: TP703
Sheet 1 of 1

Project Name: Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468210.00 - 112084.00 Level: 63.00	Date 25/06/2018
Location: Woodcroft Farm, Lovedean		Dimensions (m): Depth 4.40	Scale 1:25
Client: Grainger PLC			Logged

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	62.70		Grass over brown silty sandy clay with roots
				1.20	61.80		Stiff light brown and orange-brown mottled slightly sandy silty CLAY wit pockets of slightly clayey sand
				2.40	60.60		Orange-brown light grey and yellow-brown mottled slightly clayey medium to coarse SAND
				2.80	60.20		Stiff light grey and brown mottled CLAY. Closely fissured with occasional subangular medium flint gravel. Dark grey and dark brown discolouration on some clay fissure block faces. Occasional localised red mottling.
				3.30	59.70		Grey clayey SAND with fine angular to very angular flint gravel (frost shattered?)
				4.20	58.80		Grey silty GRAVEL of chalk with some moderately weak to moderately strong chalk of cobble size.
				4.40	58.60		Stiff dark grey and orange-brown sandy CLAY with some fine to medium angular flint gravel End of Pit at 4.40m

1 2 3 4 5

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks: Pit stable and dry. Excavated into side of a doline/depression feature. GL falls by c. 1.5m from west to east.

Stability

AGS

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Trial Pit Log

TrialPit No: TP704
Sheet 1 of 1

Project Name: Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468219.00 - 112108.00 Level: 63.00	Date 25/06/2018
Location: Woodcroft Farm, Lovedean		Dimensions (m): Depth 3.20	Scale 1:25
Client: Grainger PLC			Logged

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	62.70		Grass over brown silty sandy clay with roots
				0.70	62.30		Stiff orange-brown slightly sandy silty CLAY. Visually assessed to be desiccated
				2.30	60.70		Very stiff orange-brown silty CLAY becoming slightly sandy silty CLAY. Light grey and orange-brown mottled from 1.7m bgl.
				3.10	59.90		Stiff to very stiff orange-brown light grey yellow-brown and red mottled closely fissured silty CLAY with rare fine to coarse flint gravel.
				3.20	59.80		Yellow and orange-brown medium to coarse SAND.
							End of Pit at 3.20m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks: Pit stable and dry. Chalk not encountered.

Stability

AGS

Geo-Environmental
Unit 7, Danworth Farm
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Trial Pit Log

TrialPit No
TP705
Sheet 1 of 1

Project Name: Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468200.00 - 112133.00 Level: 62.00	Date 25/06/2018
Location: Woodcroft Farm, Lovedean		Dimensions (m): Depth 1.80	Scale 1:25
Client: Grainger PLC			Logged

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Grass over brown silty sandy clay with roots
				0.30	61.70		Brown slightly sandy clayey fine to coarse GRAVEL of subangular to subrounded flint
				0.50	61.50		Stiff orange-brown slightly sandy CLAY with occasional fine to coarse gravel of flint. Root 10mm diameter at 0.9m bgl at NGR 468198, 112132
				1.80	60.20		Stiff grey and orange-brown mottled CLAY End of Pit at 1.80m
				3.20	58.80		

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks Pit stable and dry. Chalk not encountered.

Stability

AGS

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Trial Pit Log

TrialPit No
TP706
Sheet 1 of 1

Project Name: Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468154.00 - 112077.00 Level: 61.20	Date 25/06/2018
Location: Woodcroft Farm, Lovedean		Dimensions (m): Depth 2.50	Scale 1:25
Client: Grainger PLC			Logged

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	61.00		Grass over brown silty sandy clay with roots
							Stiff orange-brown sandy CLAY with rare coarse flint gravel at depth. Visually assessed to be desiccated and friable texture to 0.9m bgl. Lenses of orange-brown medium to coarse sand from 1.2m bgl to depth at NGR 468154, 112079.
				1.60	59.60		Stiff to very stiff light grey sandy CLAY with fine and medium gravel of flint and chalk. Clay present from 1.8m bgl at NGR 468154, 112084
				1.70	59.50		Structureless CHALK composed of light brown and off-white silt size matrix with gravel to cobble sized clasts of very weak to moderately strong chalk and occasional gravel and cobble sized flint. Chalk initially encountered at 1.7m bgl at NGR 468156, 112080 and at 2.3m bgl at NGR 468154, 112084
				2.50	58.70		End of Pit at 2.50m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks Varible depths of strata along the trench. Pit stable and dry.

Stability

AGS

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Trial Pit Log

TrialPit No
TP707
Sheet 1 of 1

Project Name: Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468135.00 - 112067.00 Level: 59.50	Date 25/06/2018
Location: Woodcroft Farm, Lovedean		Dimensions (m): Depth 2.70	Scale 1:25
Client: Grainger PLC			Logged

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	59.30		Grass over brown silty sandy clay with roots
				0.90	58.60		Stiff orange-brown sandy to very sandy CLAY becoming sandy very gravelly clay from 0.6m bgl at eastern end of pit and extending to 1.4m bgl at NGR 468137, 112068. Clay visually assessed to be desiccated and friable to c. 0.5m bgl.
				2.30	57.20		Stiff light grey and yellow-brown CLAY with some medium to coarse gravel and cobble of weak to moderately strong chalk and flint.
				2.70	56.80		Structureless CHALK composed of light brown and off-white slightly clayey silty gravel and cobble sized weak to moderately strong chalk clasts with occasional flint cobble [from NGR 468135, 112067 to 468136, 112066]. CIRIA Grade Dc. Chalk present as gravel in clay/silt chalk matrix from 1.1m bgl at NGR 468139, 112065 becoming CIRIA Grade Dc from 1.9m bgl. End of Pit at 2.70m

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Water Strikes
Depth Strike | Rose to (mbgl)

Remarks Varible depth to and composition of Chalk. Pit stable and dry.

Stability

AGS

Geo-Environmental
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Trial Pit Log

TrialPit No: TP708
Sheet 1 of 1

Project Name: Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468105.00 - 112132.00 Level: 60.20	Date 26/06/2018
Location: Woodcroft Farm, Lovedean		Dimensions (m): Depth 2.90	Scale 1:25
Client: Grainger PLC			Logged

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Grass over brown silty sandy clay with roots
				0.30	59.90		Orange-brown sandy CLAY/clayey SAND. Friable texture and visually assessed to be desiccated.
				0.60	59.60		Stiff orange-brown sandy to very sandy CLAY with some fine and medium subangular to subrounded flint gravel. Becoming very gravelly from 0.9m bgl.
				1.10	59.10		Orange-brown SAND
				1.20	59.00		Stiff brownish grey slightly sandy to sandy CLAY with some medium to coarse gravel and cobble sized flint occasional gravel and cobble sized chalk. Becoming more gravelly from 2.3m bgl and gravel becoming angular to very angular (frost shattered?) and occasional ironstone nodules. Plunging interface with chalk at north end of trench and remainder of trench logged as TP708A
				2.90	57.30		End of Pit at 2.90m

1 2 3 4 5

Water Strikes: Depth Strike	Rose to (mbgl)

Remarks: Pit stable and dry.

Stability

AGS

Geo-Environmental
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BN6 9GL
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Trial Pit Log

TrialPit No
TP708A
Sheet 1 of 1

Project Name: Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468109.00 - 112136.00 Level: 60.20	Date 26/06/2018
Location: Woodcroft Farm, Lovedean		Dimensions (m): Depth 2.80	Scale 1:25
Client: Grainger PLC			Logged

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	59.90		Grass over brown silty sandy clay with roots
				0.60	59.60		Orange-brown sandy CLAY/clayey SAND. Friable texture and visually assessed to be desiccated.
				1.10	59.10		Stiff orange-brown sandy to very sandy CLAY with some fine and medium subangular to subrounded flint gravel. Becoming very gravelly from 0.9m bgl.
				1.30	58.90		Orange-brown SAND
				2.80	57.40		Structureless CHALK composed of light brown and off-white silty size matrix and gravel size clasts of very weak to weak chalk. CIRIA Grade Dc. Junction between chalk and overlying stratum is irregular with deepest superficial intrusion to 1.7m bgl at NGR 468107, 112130, 1.7m bgl at NGR 468108, 121132 and 1.6m bgl at NGR 468110, 121134. Chalk interface at western end of trench formed a plunging profile inclined at c. 70-80° towards WSW End of Pit at 2.80m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks Trench follows on directlkly from TP708. Section split where plunging chalk junction encountered.

Stability

AGS

Geo-Environmental Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Trial Pit Log**		TrialPit No TP709 Sheet 1 of 1
Project Name: Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468109.00 - 112107.00 Level: 59.40	Date 26/06/2018
Location: Woodcroft Farm, Lovedean		Dimensions (m): Depth 2.50	Scale 1:25
Client: Grainger PLC			Logged

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Grass over brown silty sandy clay with roots
				0.30	59.10		Brown and orange-brown sandy gravelly CLAY. Gravel is fine to coarse subangular to rounded flint.
				0.90	58.50		Orange-brown and brown SAND. Junction between the sand and underlying gravelly clay is variable along the trench - 1.1m bgl from NGR 468109, 112107 to 468110, 112104 increasing to 1.7m bgl by NGR 468112, 112104.
				1.10	58.30		Stiff light grey and brown mottled sandy CLAY with fine to coarse gravel and cobble of flint. Some frost shattered angular to very angular flint and ironstone nodules/ staining at depth. Clay within c. 10mm of chalk is a dark brown colour.
				2.10	57.30		Structureless CHALK composed of off-white light brown and yellow sandy silt size matrix with gravel and cobble sized clasts of weak to moderately strong chalk and occasional gravel and cobble sized flint. Chalk encountered around NGR 468110, 112105 to 468110, 112103 at 1.1m bgl and to NGR 468110, 121104 at 2.5m bgl
				2.50	56.90		End of Pit at 2.50m

1 2 3 4 5

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks Pit stable and dry.

Stability

AGS

Geo-Environmental
Unit 7, Danworth Farm
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Trial Pit Log

TrialPit No
TP710
Sheet 1 of 1

Project Name: Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468074.00 - 112103.00 Level: 59.50	Date 26/06/2018
Location: Woodcroft Farm, Lovedean		Dimensions (m): Depth 2.40	Scale 1:25
Client: Grainger PLC			Logged

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	59.30		Grass over brown silty sandy clay with roots
				0.50	59.00		Orange-brown sandy CLAY with occasional medium and coarse flint gravel. Friable texture and visually assessed as desiccated.
				0.80	58.70		Stiff orange-brown and brown mottled silty CLAY with occasional medium to coarse subrounded to subangular flint gravel and occasional flint cobble.
				1.30	58.20		Stiff light grey light brown and orange-brown mottled silty CLAY with medium to coarse flint gravel and occasional cobble sized flint and chalk gravel from 1.1m bgl. Brown to dark brown colour within c. 10mm of junction with underlying chalk. Junction with underlying chalk is irregular and extends as localised suffusion features to 1.5m bgl at NGR 468075, 112100 and 1.8m bgl at NGR 468073, 112099.
				2.10	57.40		Structureless CHALK composed of brown off-white and light brown silty gravel of chalk with occasional cobble sized chalk. Clasts are weathered irregular in shape and very weak to moderately strong. Occasional gravel and cobble sized flint. CIRIA Grade Dc.
				2.40	57.10		Structureless CHALK composed of angular to blocky clasts of weak to moderately weak chalk with a silt matrix. Some brown discolouration on clast faces. CIRIA Grade Dc possibly becoming Dc/C. Very hard digging (8tonne excavator and toothed bucket) from 2.2m bgl.
							End of Pit at 2.40m

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks Pit dry. Some overdig in chalk.

Stability

AGS

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Trial Pit Log

TrialPit No: TP711
Sheet 1 of 1

Project Name: Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468191.00 - 112112.00 Level: 60.50	Date 25/06/2018
Location: Woodcroft Farm, Lovedean		Dimensions (m): Depth 3.50	Scale 1:25
Client: Grainger PLC			Logged

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Grass over brown silty sandy clay with roots
				0.30	60.20		Stiff orange-brown slightly sandy silty CLAY. Visually assessed to be desiccated
				0.60	59.90		Orange-brown slightly clayey SAND with occasional impersistent clay partings. Becoming orange-brown and yellow-brown from 1.8m bgl.
				2.70	57.80		Very stiff light grey and orange-brown silty to very silty CLAY becoming dark grey from 3.0m bgl.
				3.10	57.40		Stiff light grey silty sandy CLAY with much subrounded to rounded flint gravel lenses of clayey fine to medium angular to very angular (frost shattered?) flint gravel and lenses of stiff to very stiff dark grey clay.
				3.50	57.00		End of Pit at 3.50m

1 2 3 4 5

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks: Pit dry and stable. Chalk not encountered.

Stability

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **WS501** Sheet 1 of 2
Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468243E - 112145N Hole Type WLS
Location:	Woodcroft Farm, Lovedean		Level: 65.20 Scale 1:25
Client:	Grainger PLC		Dates: 13/06/2018 Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	65.00		Grass over brown slightly sandy gravelly CLAY with frequent rootlets
		0.50	PP	1.2kg/cm2				Firm orange and grey mottled desiccated gravelly CLAY. Gravel is medium to coarse sub angular to sub rounded of flint
		1.00	PP	1.7kg/cm2	0.90	64.30		Firm to stiff orange and grey mottled slightly desiccated CLAY with occasional flint gravel
		1.50	PP	1.9kg/cm2	1.40	63.80		Firm to stiff orange and grey mottled slightly desiccated CLAY
		2.00	PP	2.0kg/cm2				
		2.50	PP	2.1kg/cm2	2.40	62.80		Firm to stiff orange and grey mottled CLAY with occasional flint gravel
		3.00	PP	2.1kg/cm2	2.80	62.40		Firm to stiff orange and grey slightly sandy CLAY. Sand is fine
		3.40	PP	1.6kg/cm2	3.10	62.10		Firm orange/brown and occasionally grey sandy CLAY. Sand is fine
					3.60	61.60		Orange and grey slightly clayey fine to medium SAND
					4.20	61.00		Orange, yellow and grey fine to medium SAND
		4.90	PP	1.7kg/cm2	4.80	60.40		Firm orange and grey mottled CLAY
					5.00	60.20		Continued on Next Sheet

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Refused at 6.8m bgl

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **WS501** Sheet 2 of 2

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords:	468243E - 112145N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean		Level:	65.20	Scale 1:25
Client:	Grainger PLC		Dates:	13/06/2018	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Yellow and grey medium SAND
					5.20	60.00		
								Orange and grey fine to medium SAND
					5.40	59.80		
								Orange and grey fine to medium SAND with rare flint gravel
					5.80	59.40		
								Orange and grey fine SAND with rare flint gravel
					6.00	59.20		
								Orange and yellow medium SAND
					6.20	59.00		
		6.30	PP	1.5kg/cm2				Firm orange and grey CLAY with occasional flint gravel
					6.60	58.60		
		6.70	PP	1.4kg/cm2				Firm dark brown and dark grey slightly sandy gravelly CLAY with occasional chalk gravel. Sand is fine gravel is red medium sub angular of flint
					6.80	58.40		End of Borehole at 6.80m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Refused at 6.8m bgl

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS502** Sheet 1 of 2

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468227E - 112137N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean		Level: 64.00	Scale 1:25
Client:	Grainger PLC		Dates: 13/06/2018	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.20	63.80		Grass over dark brown silty CLAY with frequent rootlets and occasional flint gravel	
								Firm brown slightly sandy CLAY with occasional flint gravel	
					0.80	63.20			
		0.90	PP	1.6kg/cm2				Firm orange, grey and black slightly gravelly CLAY. Gravel is medium sub angular of flint	
					1.00	63.00		Firm orange and grey desiccated CLAY with occasional flint gravels	1
		1.10	PP	1.8kg/cm2				*Black flecking*	
					1.30	62.70		Firm orange and grey gravelly CLAY. Gravel is coarse sub angular of flint	
		1.50	PP	1.5kg/cm2					
					1.60	62.40		Firm orange and grey slightly gravelly CLAY. Gravel is coarse sub angular of flint	
					1.90	62.10		Firm to stiff orange and grey mottled CLAY with occasional flint gravel	
		2.00	PP	2.0kg/cm2					2
		2.50	PP	1.9kg/cm2					
		3.00	PP	1.6kg/cm2					3
		3.50	PP	1.6kg/cm2					
					3.80	60.20		Firm orange and grey slightly sandy CLAY. Sand is fine	
		4.00	PP	1.5kg/cm2					4
					4.20	59.80		Firm orange and grey mottled CLAY with occasional flint gravel	
		4.50	PP	1.5kg/cm2					
								Continued on Next Sheet	5

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to	

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **WS502** Sheet 2 of 2
Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468227E - 112137N Hole Type WLS
Location:	Woodcroft Farm, Lovedean		Level: 64.00 Scale 1:25
Client:	Grainger PLC		Dates: 13/06/2018 Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.30	PP	1.1kg/cm2	5.30	58.70		Soft orange/brown slightly sandy slightly gravelly CLAY. Sand is fine and gravel is medium sub angular of flint
					5.60	58.40		Soft orange/brown slightly sandy CLAY. Sand is fine
					6.80	57.20		Soft orange/brown sandy CLAY. Sand is fine
					7.60	56.40		Soft orange/brown very sandy CLAY. Sand is fine
					7.80	56.20		Grey and orange medium SAND
					8.00	56.00		End of Borehole at 8.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to	

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **WS503** Sheet 1 of 2

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468193E - 112126N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean		Level: 61.90	Scale 1:25
Client:	Grainger PLC		Dates: 13/06/2018	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	61.70		Grass over dark brown slightly silty gravelly CLAY with frequent rootlets
		0.50	PP	2.0kg/cm2				Firm orange/brown desiccated CLAY with frequent flint cobbles
					0.80	61.10		Firm orange and grey mottled slightly desiccated CLAY with frequent roots
		1.00	PP	2.3kg/cm2				
		1.50	PP	2.3kg/cm2				
					1.70	60.20		Soft orange very sandy CLAY. Sand is fine
					1.80	60.10		Orange fine SAND
					2.20	59.70		*Orange and grey laminated sandy CLAY with occasional flint gravel*
								Yellow and orange medium SAND
					2.60	59.30		Yellow and orange medium SAND with frequent red medium sub angular flint gravel
					2.90	59.00		Yellow and orange medium SAND
								Band of dark red medium sub angular flint gravel
					3.20	58.70		Yellow fine to medium SAND
					3.60	58.30		Orange and yellow fine to medium SAND
								Large flint cobble
					3.80	58.10		Firm to stiff orange and grey mottled CLAY with occasional red flint gravel
		3.90	PP	2.7kg/cm2				
					4.00	57.90		Firm orange gravelly CLAY. Gravel is medium sub angular of flint
								Large flint cobble
					4.50	57.40		Orange fine to medium SAND with occasional red flint gravel
					4.80	57.10		Firm orange/brown sandy gravelly CLAY. Sand is medium and gravel is fine to medium sub angular of
								Continued on Next Sheet

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **WS503** Sheet 2 of 2
Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468193E - 112126N Hole Type WLS
Location:	Woodcroft Farm, Lovedean		Level: 61.90 Scale 1:25
Client:	Grainger PLC		Dates: 13/06/2018 Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								flint *Large flint cobble*
					5.30	56.60		Soft light brown sandy CLAY with occasional chalk and flint gravel
					6.00	55.90		Firm light brown sandy CLAY with frequent chalk gravel
					6.20	55.70		Recovered as, Structureless CHALK composed of white sub angular to sub rounded coarse moderately weathered weak chalk in a comminuted matrix
					8.00	53.90		End of Borehole at 8.00m

6 7 8 9 10

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to	

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **WS504** Sheet 1 of 1
Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468166E - 112125N Hole Type WLS
Location:	Woodcroft Farm, Lovedean		Level: 60.50 Scale 1:25
Client:	Grainger PLC		Dates: 13/06/2018 Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	60.30		Grass over dark brown slightly silty gravelly CLAY with frequent rootlets
		0.80	PP	1.2kg/cm2				Soft orange/brown sandy CLAY with frequent flint gravel. Sand is medium
					1.00	59.50		Firm red and orange very gravelly CLAY. Gravel is medium sub angular of flint
		1.20	PP	1.5kg/cm2				
					1.40	59.10		Firm orange and grey mottled CLAY with occasional flint gravel
		1.50	PP	2.0kg/cm2				
					2.00	58.50		Firm orange/brown sandy CLAY. Sand is medium
		2.10	PP	1.2kg/cm2				*Band of red flint gravel*
					2.45	58.05		*Large flint cobble*
		2.50	PP	1.9kg/cm2				Firm green/grey CLAY with occasional chalk gravel
					2.80	57.70		Firm brown sandy CLAY with frequent chalk gravel. Sand is medium
								Large flint cobble
					3.10	57.40		Recovered as, Structureless CHALK composed of white sub angular to sub rounded coarse moderately weathered weak chalk in a comminuted matrix with little brown CLAY
					5.00	55.50		End of Borehole at 5.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to	

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS505** Sheet 1 of 1

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468135E - 112121N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean		Level: 60.70	Scale 1:25
Client:	Grainger PLC		Dates: 13/06/2018	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Grass over dark brown slightly silty gravelly CLAY with frequent rootlets
					0.20	60.50		Soft orange/brown very sandy CLAY with frequent flint gravel
					1.20	59.50		Firm orange and grey mottled desiccated gravelly CLAY. Gravel is medium to coarse sub angular to sub rounded of flint
					1.40	59.30		Firm orange and grey mottled desiccated gravelly CLAY. Gravel is medium to coarse sub angular to sub rounded of chalk
					1.50	59.20		Firm white and brown very gravelly CLAY. Gravel is medium to coarse sub angular of chalk
								Large chalk cobble
								Large chalk cobble
					2.10	58.60		Firm grey/green very gravelly CLAY. Gravel is coarse angular of flint
					2.30	58.40		Off white fine to medium angular to sub angular chalk GRAVEL
					2.50	58.20		Firm grey/green slightly silty CLAY with occasional flint gravel
								Large flint cobble
					3.00	57.70		Recovered as, Structureless CHALK composed of white very weak highly weathered chalk in a comminuted matrix
								Large flint cobble
					4.70	56.00		Recovered as, Structureless CHALK composed of white sub angular to sub rounded coarse moderately weathered weak chalk in a comminuted matrix
								Large flint cobble
					5.00	55.70		End of Borehole at 5.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS506** Sheet 1 of 2

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468115E - 112122N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean		Level: 59.90	Scale 1:25
Client:	Grainger PLC		Dates: 14/06/2018	Logged By WH

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Grass over brown slightly sandy CLAY with frequent rootlets and gravel. Gravel is fine to coarse sub-angular flint
					0.60	59.30		Orangeish brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium sub-angular to rounded flint
		2.00	PP	2.5kg/cm2				*Becomes gravelly. Gravel is fine to coarse flint with occasional fine to medium chalk*
		3.00	PP	2.7kg/cm2	3.00	56.90		Firm light brown with orange mottled gravelly CLAY. Gravel is fine to coarse sub-angular flint *Becomes slightly gravelly sandy clay with frequent black flecks* *Becomes brown and orange mottled slightly gravelly CLAY*
		4.00	PP	1.2kg/cm2	4.00	55.90		Recovered as, Structureless CHALK composed of white slightly clayey gravelly SILT. Gravel is fine to medium sub-rounded to sub-angular moderatley weathered weak chalk within a comminuted chalk and orange clay matrix. With frequent fine to coarse sub-angular flint
		4.50	PP	1.8kg/cm2	4.50	55.40		*Gravel mostly flint* Recovered as, Structureless CHALK composed of white slightly gravelly SILT with occasional orange clay infill. Gravel is fine to medium sub-rounded to sub-angular moderatley weathered weak chalk within a comminuted matrix
								Continued on Next Sheet

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Refused at 6.0m bgl.

AGS

Geo-Environmental
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Borehole Log

Borehole No.
WS506
Sheet 2 of 2

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468115E - 112122N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean		Level: 59.90	Scale 1:25
Client:	Grainger PLC		Dates: 14/06/2018	Logged By WH

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		6.00	PP	1.6kg/cm2	6.00	53.90		End of Borehole at 6.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks
Refused at 6.0m bgl.

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log		Borehole No. **WS507** Sheet 1 of 2
Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468174E - 112142N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean		Level: 60.90	Scale 1:25
Client:	Grainger PLC		Dates: 14/06/2018	Logged By WH

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
								Brown slightly sandy CLAY with frequent rootlets and occasional gravel. Gravel is fine to coarse sub-angular flint	
					0.70	60.20			
								Soft reddish brown very sandy CLAY with occasional fine to coarse sub-angular flint gravel	
		1.00	PP	1.5kg/cm2					1
		1.50	PP	1.0kg/cm2					
		2.00	PP	7.0kg/cm2					2
					2.10	58.80		Reddish brown very clayey coarse SAND with occasional fine to medium sub-angular flint gravel	
									3
					3.50	57.40		Firm brown and grey mottled slightly gravelly CLAY with frequent black flecks. Gravel is fine sub-angular red flint	
		4.00	PP	1.6kg/cm2					4
		4.50	PP	1.5kg/cm2					
					4.60	56.30		Firm to stiff brownish grey slightly gravelly CLAY. Gravel is fine to medium angular weak white chalk	
		5.00	PP	2.0kg/cm2					5
								Continued on Next Sheet	

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **WS507** Sheet 2 of 2

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468174E - 112142N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean		Level: 60.90	Scale 1:25
Client:	Grainger PLC		Dates: 14/06/2018	Logged By WH

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					5.15	55.75		*Gravel becomes predominantly flint*
								Firm dark orangeish brown CLAY with abundant black flecks and frequent gravel. Gravel is fine to coarse sub-angular flint
		5.50	PP	1.7kg/cm2				
		6.00	PP	1.5kg/cm2				
					6.20	54.70		Recovered as, Structureless CHALK composed of white slightly gravelly SILT of comminuted chalk. Gravel is fine to medium sub-angular flint. Rare brown clay inclusions
					8.00	52.90		End of Borehole at 8.00m

6 7 8 9 10

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **WS508** Sheet 1 of 1
Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468172E - 112098N Hole Type WLS
Location:	Woodcroft Farm, Lovedean		Level: 61.20 Scale 1:25
Client:	Grainger PLC		Dates: 14/06/2018 Logged By WH

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Turf over brown sandy CLAY with occasional rootlets and gravel. Gravel is fine to medium sub-angular flint
					0.60	60.60		Dark orangeish brown slightly clayey medium to coarse SAND with occasional gravel. Gravel is fine to medium sub-angular flint
					1.90	59.30		Stiff greyish brown gravelly CLAY with abundant black flecks. Gravel is fine to medium sub-angular red flint
					2.10	59.10		Stiff light grey slightly gravelly silty CLAY with frequent black flecks. Gravel is fine to medium sub-rounded to sub-angular weak chalk
					2.20	59.00		Recovered as, Structureless CHALK composed of white and cream mottled gravelly clayey SILT. Gravel is fine to coarse with occasional cobbles sub-rounded to sub-angular moderatley weathered weak to medium strong chalk with occasional fine to medium flint within a comminuted matrix with orange clay infill
								Orangeish brown clay matrix supporting chalk gravel
					3.50	57.70		End of Borehole at 3.50m

1 2 3 4 5

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Refused at 3.5m bgl.

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **WS509** Sheet 1 of 2

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468173E - 112069N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean		Level: 61.30	Scale 1:25
Client:	Grainger PLC		Dates: 14/06/2018	Logged By WH

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Grass over brown sandy CLAY with abundant rootlets and occasional gravel. Gravel is fine flint
					0.35	60.95		Orangeish brown sandy CLAY with occasional gravel. Gravel is fine to medium sub-angular flint
								5cm sand lense
								5cm sand lense
					2.10	59.20		Orangeish brown slightly clayey coarse SAND
		3.00	PP	5.0kg/cm2	2.90	58.40		Very stiff dessicated slightly sandy CLAY
		3.50	PP	5.0kg/cm2				
		4.00	PP	5.0kg/cm2	3.80	57.50		Very stiff brownish grey with dark orange mottling slightly sandy gravelly CLAY. Gravel is fine to coarse angular flint with frequent fine to medium sub-rounded to sub-angular weak chalk
		5.00	PP	5.0kg/cm2	5.00	56.30		Continued on Next Sheet

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Geo-Environmental
Unit 7, Danworth Farm
Hurstpierpoint
BN6 9GL
www.gesl.net

Borehole Log

Borehole No.
WS509
Sheet 2 of 2

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468173E - 112069N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean		Level: 61.30	Scale 1:25
Client:	Grainger PLC		Dates: 14/06/2018	Logged By WH

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Very stiff orange with grey mottling slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular flint with occasional fine weak chalk
					6.00	55.30		Orangeish brown slightly gravelly sandy CLAY. Gravel is fine to medium angular flint. Occasional grey and orange mottled clay inclusions. Sand is medium to coarse
					8.00	53.30		End of Borehole at 8.00m

6 7 8 9 10

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS510** Sheet 1 of 1

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468174E - 112042N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean		Level: 61.10	Scale 1:25
Client:	Grainger PLC		Dates: 14/06/2018	Logged By WH

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Grass over brown slightly sandy CLAY with frequent rootlets and gravel. Gravel is fine to coarse sub-angular flint
					0.50	60.60		Orangeish brown very sandy CLAY with occasional fine gravel. Gravel is fine to medium sub-angular flint
								Pale yellow clayey SAND with frequent orange sandy clay lenses
					1.65	59.45		Firm becoming stiff orange and grey mottled CLAY with rare fine sub-angular flint gravel
		2.00	PP	1.2kg/cm2				*Pale yellow clayey SAND with occasional grey clay lenses*
								Additional red mottling
		2.50	PP	2.7kg/cm2				
					3.30	57.80		Whiteish grey and orangeish brown mottled slightly sandy gravelly CLAY. Gravel is fine to coarse sub-angular grey and red flint as well as abundant weathered weak fine gravel and comminuted chalk
					4.50	56.60		End of Borehole at 4.50m

1 2 3 4 5

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Refused at 4.5m bgl.

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **WS511** Sheet 1 of 2

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468179E - 112006N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean		Level: 60.50	Scale 1:25
Client:	Grainger PLC		Dates: 15/06/2018	Logged By WH

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.25	60.25		Grass over brown slightly sandy CLAY with abundant rootlets and occasional gravel. Gravel is fine to medium sub-angular flint
								Firm brown slightly sandy silty CLAY with occasional gravel. Gravel is fine to medium sub-angular flint
		1.00	PP	2.4kg/cm2				
								Becomes sandy
		1.50	PP	2.6kg/cm2				
		2.00	PP	2.6kg/cm2				
					2.20	58.30		Very stiff orange with grey mottling desiccated CLAY
		2.30	PP	4.5kg/cm2				
					2.50	58.00		Very stiff grey and orange mottled desiccated CLAY
								Layer of black staining
		3.00	PP	3.7kg/cm2				
		3.50	PP	4.5kg/cm2				
								Slightly sandy
					3.70	56.80		Very stiff dark orange and dark grey mottled desiccated CLAY with occasional dark orange sand lenses
		4.00	PP	3.3kg/cm2	4.00	56.50		Recovered as, Structureless CHALK composed of white slightly gravelly SILT with frequent orange clay infill. Gravel is fine to medium sub-rounded to sub-angular moderatley weatherd weak chalk with rare fine flint within a comminuted matrix
								Continued on Next Sheet

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Refused at 6.5m bgl.

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Geo-Environmental
Unit 7, Danworth Farm
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BN6 9GL
www.gesl.net

Borehole Log

Borehole No.
WS511
Sheet 2 of 2

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468179E - 112006N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean		Level: 60.50	Scale 1:25
Client:	Grainger PLC		Dates: 15/06/2018	Logged By WH

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								No clay infill
					6.50	54.00		End of Borehole at 6.50m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks
Refused at 6.5m bgl.

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **WS512** Sheet 1 of 2

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468207E - 112012N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean		Level: 62.80	Scale 1:25
Client:	Grainger PLC		Dates: 15/06/2018	Logged By WH

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Grass over brown slightly gravelly slightly sandy CLAY with abundant rootlets. Gravel is fine to medium sub-angular flint
					0.25	62.55		Grey and orangeish brown mottled sandy CLAY with frequent soft brown clay inclusions
					1.10	61.70		Orange very clayey SAND
								Orange and grey mottled very sandy CLAY
					2.70	60.10		Yellowish brown medium to coarse SAND
					3.20	59.60		Dark orange slightly clayey coarse SAND
					4.00	58.80		Very soft light brown slightly gravelly sandy CLAY. Gravel is fine rounded flint. Sand is coarse
					4.20	58.60		Stiff orange and grey mottled becoming grey slightly gravelly CLAY with frequent black flecks. Gravel is fine to medium sub-angular flint
		4.50	PP	3.0kg/cm2				
					4.60	58.20		Recovered as, Structureless CHALK composed of a white and grey mottled slightly sandy slightly gravelly SILT. Gravel is fine to medium sub-angular moderatley weathered weak chalk within a comminuted matrix with frequent flint and occasional orange clay
								Continued on Next Sheet

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Refused at 5.0m bgl.

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log		Borehole No. **WS512** Sheet 2 of 2
Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468207E - 112012N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean		Level: 62.80	Scale 1:25
Client:	Grainger PLC		Dates: 15/06/2018	Logged By WH

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					5.10	57.70		inclusions End of Borehole at 5.10m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Refused at 5.0m bgl.

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS513** Sheet 1 of 1

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468151E - 112058N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean		Level: 59.50	Scale 1:25
Client:	Grainger PLC		Dates: 14/06/2018	Logged By WH

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	59.20		Grass over brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is fine to coarse sub-angular flint
		1.00	PP	1.2kg/cm2				Grey and orangeish brown mottled desiccated CLAY with rare gravel. Gravel is fine to medium sub-angular flint
		1.50	PP	4.0kg/cm2	1.30	58.20		Very stiff white and brown mottled slightly gravelly silty CLAY. Gravel is fine to medium angular grey and red flint with occasional chalk
					1.70	57.80		Recovered as, Structureless CHALK composed of light grey slightly gravelly SILT with frequent orange clay lenses. Gravel is fine to medium sub-rounded to sub-angular moderatley weatherd weak chalk and flints
		2.50	PP	4.5kg/cm2				
		3.00	PP	4.5kg/cm2	2.90	56.60		Recovered as, Structureless CHALK composed of white slightly gravelly SILT structureless CHALK with occasional orange staining. Gravel is fine to medium sub-angular to rounded flint and moderatley weathered weak chalk
								10cm band of orange slightly clayey
					4.80	54.70		End of Borehole at 4.80m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Refused at 4.8m bgl.

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Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS514** Sheet 1 of 1

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords: 468118E - 112068N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean		Level: 58.50	Scale 1:25
Client:	Grainger PLC		Dates: 14/06/2018	Logged By WH

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.40	58.10		Grass over brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is fine to coarse sub-angular flint
		1.10	PP	1.2kg/cm2				Brown and orangeish brown mottled desiccated slightly gravelly CLAY. Gravel is fine to coarse sub-angular flint with rare chalk
					1.20	57.30		Soft light brown and light orangeish brown mottled desiccated slightly gravelly CLAY. Gravel is fine to coarse sub-angular white chalk
		1.50	PP	1.2kg/cm2				*Fine to coarse sub-angular flint gravel*
					2.00	56.50		Firm reddish brown slightly gravelly CLAY with occasional black flecking. Gravel is fine to coarse sub-angular flint
		2.10	PP	2.0kg/cm2	2.20	56.30		Recovered as, Structureless CHALK composed of white slightly clayey GRAVEL within a comminuted matrix. Gravel is fine to coarse sub-rounded to sub-angular moderatley weathered weak chalk with occasional black specks. Occasional fine to medium flint gravel. Frequent reddish brown clay infill becoming rarer with depth
								Reddish brown clay no longer present
					5.00	53.50		End of Borehole at 5.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Refused at 5.0m bgl.

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Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS515** Sheet 1 of 1

Project Name:	Woodcroft - Phase 3 Supplementry GI	Project No. GE16942	Co-ords:	468090E - 112104N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean		Level:	59.20	Scale 1:25
Client:	Grainger PLC		Dates:	15/06/2018	Logged By WH

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Grass over brown slightly sandy SILT with frequent rootlets and gravel. Gravel is fine to coarse sub-angular flint
					0.30	58.90		Stiff orange CLAY with frequent black flecks and occasional gravel. Gravel is fine to coarse sub-angular flint with rare cobbles
					1.50	57.70		NO RECOVERY
					2.50	56.70		Recovered as, Structureless CHALK composed of soft white slightly gravelly SILT. Gravel is fine to medium sub-angular to sub-rounded moderatley weathered weak chalk and fine to coarse flint within a comminuted chalk matrix
		3.00	PP	1.2kg/cm2				
		3.50	PP	1.5kg/cm2				
					3.60	55.60		End of Borehole at 3.60m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Refused at 3.6m bgl.

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epg

The Environmental Protection Group Ltd







Detailed quantitative gas risk assessment

Woodcroft Farm

Waterlooville

October 2018

The Environmental Protection Group
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Reference	EPG/8938/2018/DQGRA/V1	Version	1.0	Issue Date	October 2018

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Appendix A: Gas monitoring results

Appendix B: Surface emissions survey

Appendix C: Diffusive flow modelling

SUMMARY

It is proposed to develop a site known as Woodcroft Farm for residential use. Historic records in the form of maps, regulatory records and verbal communication have identified that in the far western area of the site an historic chalk pit was infilled with construction and demolition waste in the 1970s.

Several phases of site investigation have been undertaken between 2011 and the current day in order to define the lateral and vertical extent of filling in this area, and to determine whether the infilled pit represents a risk to the proposed development in the form of soil gases.

Gas monitoring results from 2011, 2016 and 2018 in the main identify that the site should be considered a Green NHBC classification. The exception is a single standpipe located in the centre of the infilled pit, which during monitoring in 2011 recorded elevated concentrations of methane and carbon dioxide combined with low flow rates.

A review of ground conditions, in particular total organic carbon content and records of organic components, indicates that the infilled pit does not represent a source of continued bulk gas generation. Further consideration of the gas regime concludes that the source of gas recorded during monitoring is residual gases sorbed to soil particles or stored in soil pore spaces, with migration occurring by diffusive flow mechanisms only.

A surface emissions survey identified no concentrations of methane at the surface in excess of background concentrations. Modelling of diffusive migration identified that the maximum concentration of gas recorded during all monitoring does not represent an unacceptable risk to the proposed development.

Based on all the lines of evidence presented within the report, it is considered in relation to the proposed development, that the site should be considered a Green NHBC classification, and that no gas protection measures are required.

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1. INTRODUCTION

1.1 Purpose

Planning permission has been granted for a residential development on a site in Lovedean, Waterlooville (planning permission reference APP/13/00804). The planning permission includes a pre-commencement condition relating to contamination as follows:

Condition 11: Prior to the commencement of construction within any specified phase or defined area the development approved by this planning permission (as may be agreed in writing by the Local Planning Authority), a scheme to deal with the risks associated with contamination of the site shall be submitted to and approved in writing by the Local Planning Authority. That scheme shall include all of the following elements unless specifically excluded in writing by the Local Planning Authority.

i) A scheme of further investigation based on the previously submitted geoenvironmental and geotechnical report. The scope of the investigation shall be sufficient to:

- *Confirm the preliminary assessment of the nature and extent of contamination at the site;*
- *Inform an appropriate assessment of the risks to all receptors that may be affected, including controlled waters; and*
- *Enable the appropriate design of remediation and/or risk mitigation measures (if required).*

ii) The results of the further investigation and risk assessment (i) and if appropriate, a method statement based on these results giving full details of the remediation and/or risk mitigation measures required, and how they are to be undertaken.

As implied by the wording of the condition, a previous investigation across the site had identified contamination to be present in some areas of the site. Geo-Environmental Services Limited (the Client) has been retained by the developer to fulfil parts (i) and (ii) of the condition, and to this end the Environmental Protection Group Limited (EPG) has been appointed by the Client to produce a detailed quantitative gas risk assessment in relation to the proposed development, to be submitted pursuant to discharge of parts (i) and (ii) of condition 11, in relation to gas only.

With regard to the assessment of the gas regime, this report has been prepared in general accordance with the following documents:

- BS8576:2013: *Guidance on investigations for ground gas – permanent gases and volatile organic compounds (VOCs)* (2013);

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- BS8485:2015: *Code of practice for the design of protective measures for methane and carbon dioxide ground gas for new buildings* (2015);
- *Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present*. NHBC (Edition 4, March 2007);
- CIRIA Report C665: *Assessing risks posed by hazardous ground gases to buildings* (2007);
- *The Local Authority guide to ground gas*: Chartered Institute of Environmental Health (2008); and
- CIRIA Report C682: *Investigating, assessing and managing risks from inhalation of volatile organic compounds at land affected by contamination* (2009).

1.2 The site

The site is located in Lovedean, approximately one mile to the north of Waterlooville. The location of the site is shown in Figure 1, with the area covered by the planning permission bounded in black.

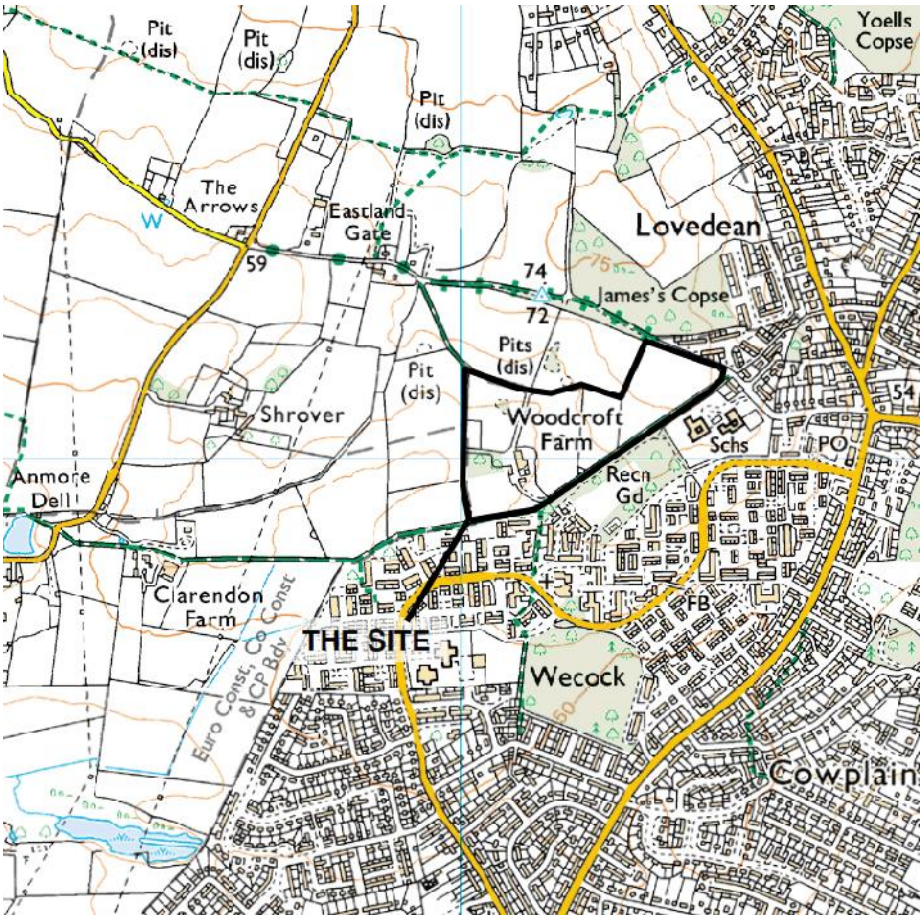


Figure 1: Site location

The site is an irregular shape, extending to approximately 10.6 hectares, and is roughly centered around National Grid Reference 468250 112090. The proposed development layout is illustrated in Figure 2.



Figure 2: Proposed development layout

As can be seen in Figure 2, the proposed development has been divided into phases. These have been identified as Phase 1 (white hatched red line running north to south), Phase 2A (blue), Phase 2B (purple) and Phase 3 (green). The potential risk to the development from gases as identified by previous reporting is limited to the western area of the site, and as such this report relates to Phase 3 and the western part of Phase 2B only, as indicated in Figure 3.

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Figure 3: Area covered by report

1.3 Information sources

This report has been informed via the following sources of information:

- *Factual report on a site investigation at Woodcroft Farm, Waterlooville*. Risk Management Limited (RML), October 2011. Reference RML4750;
- *Geoenvironmental and geotechnical ground investigation report*. Peter Brett Associates (PBA), July 2013. Reference 21834/030-R02/rev01;

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- *Geoenvironmental and geotechnical site assessment*. RSK Environment Limited (RSK), October 2016. Reference 28722-R01(00);
- *Letter report*. Geo-Environmental Services Limited (GESL), September 2017. Reference GE16662/FG02/170929;
- *Remediation strategy and verification plan for the land at chalk pit and landfill area (CP), Woodcroft Farm*. Geo-Environmental Services Limited (GESL), June 2018. Reference GE16943-RSVP-CP-JUN18;
- *Remediation strategy and verification plan for the land at Farmyard (FY), Woodcroft Farm*. Geo-Environmental Services Limited (GESL), June 2018. Reference GE16943-RSVP-FY-JUN18;
- *Remediation strategy and verification plan for the land at Horse Arena (HA), Woodcroft Farm*. Geo-Environmental Services Limited (GESL), June 2018. Reference GE-16943-RSVP-HA-JUN18;
- Gas monitoring records. GESL, 2018;
- Surface emissions survey. Enitial Limited, September 2018;
- Historic maps obtained from Envirocheck;
- British Geological Survey 1:50000 Series England and Wales sheet 316: Fareham solid and drift geology (BGS 1998); and
- Review of available web-based data resources, notably the Environment Agency's '*What's in your backyard?'* service, and the British Geological Survey's Geology of Britain viewer.

It is known that a desk study report was produced in 2010 by Peter Brett Associates, however only a summary has been available for review.

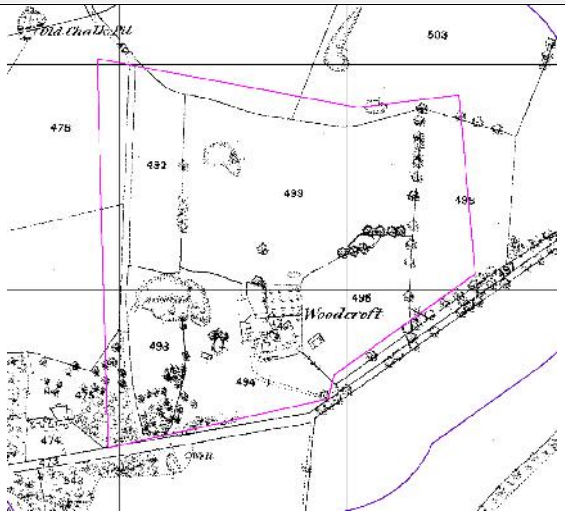
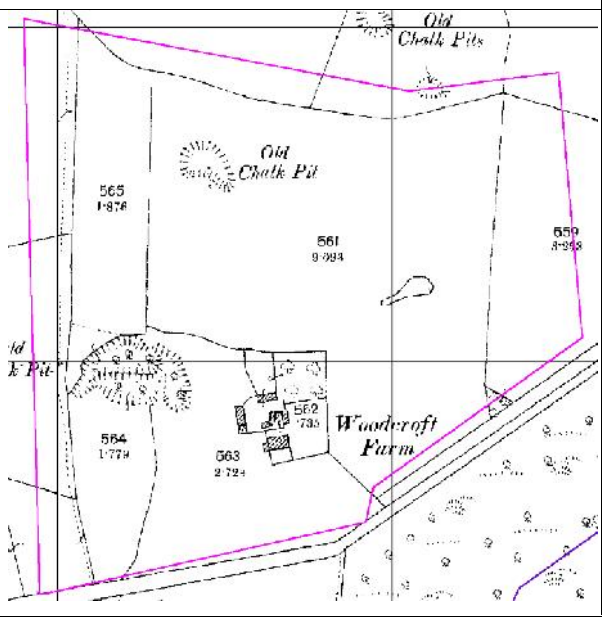
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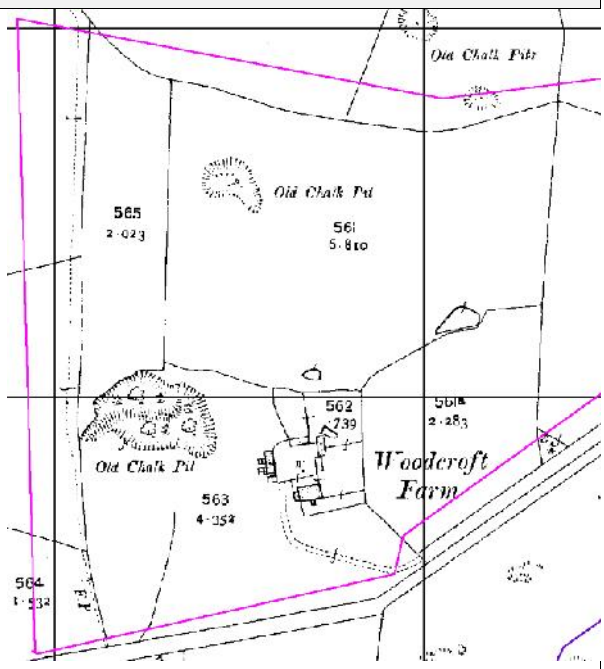
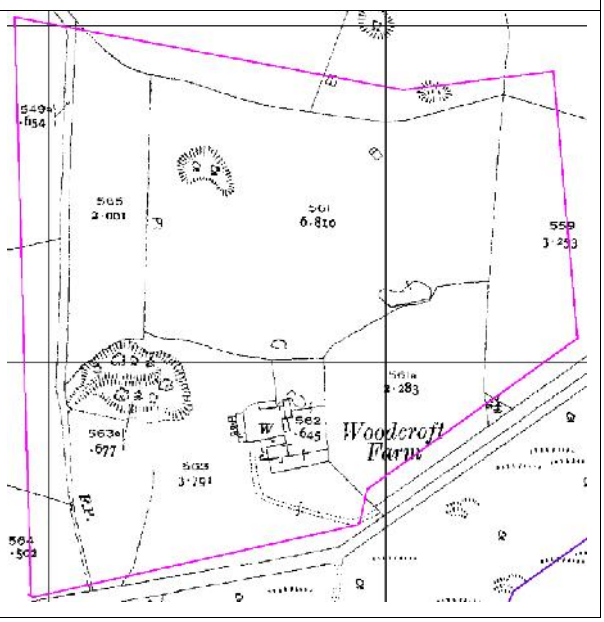
2. BACKGROUND INFORMATION

Background information from several sources has been referred to in order to gain an understanding of the site conditions. Extracts are presented below, and items relevant to a gas appraisal noted. It should be noted that the boundary polygon on the map extracts is not a wholly accurate representation of the site boundary.

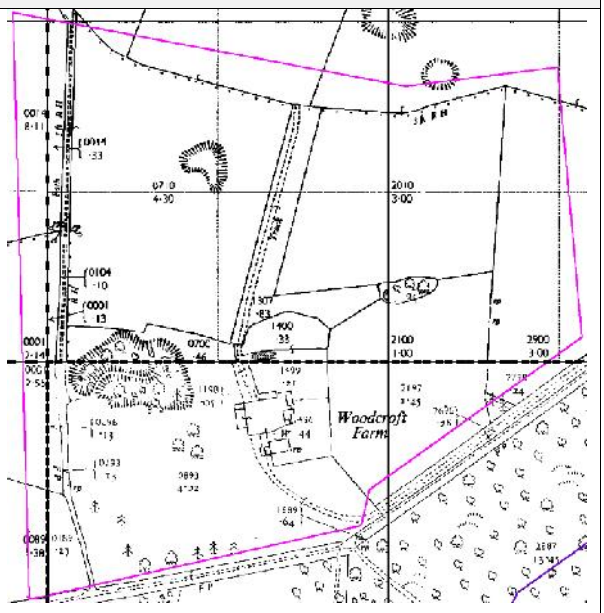
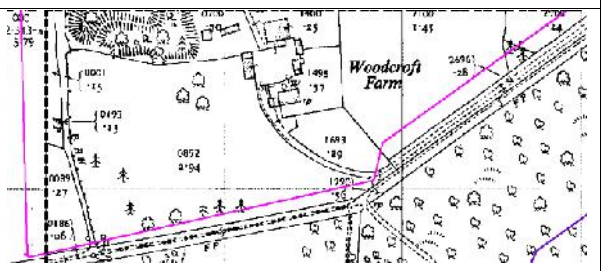
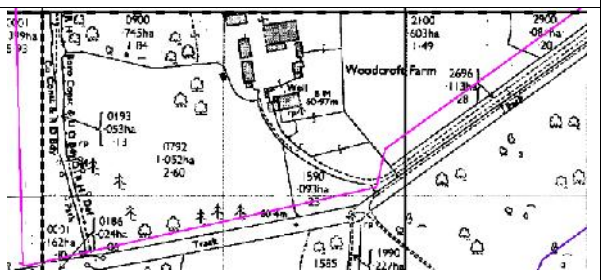
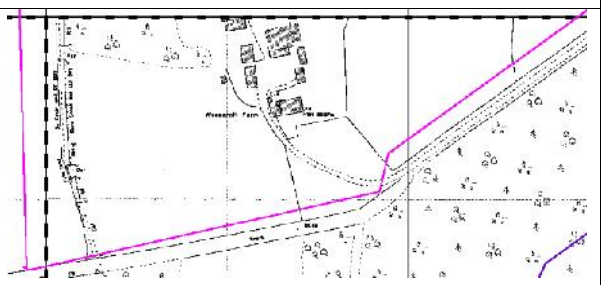
2.1 Historic maps

Table 1: Extracts from historic maps with commentary

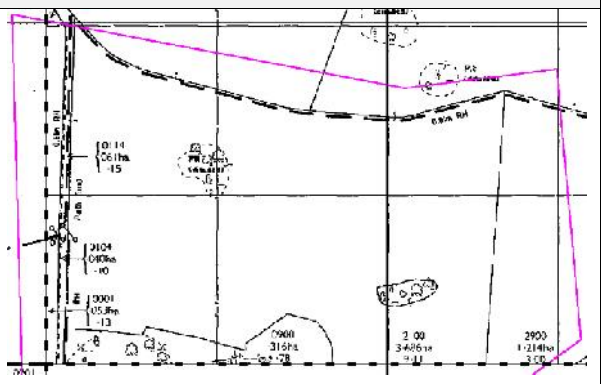
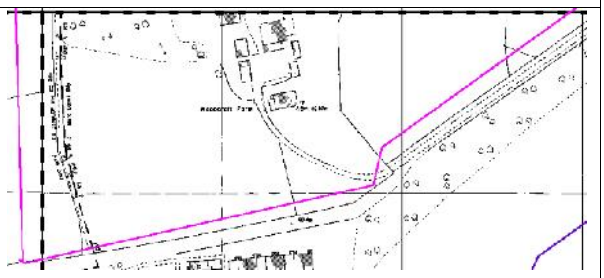
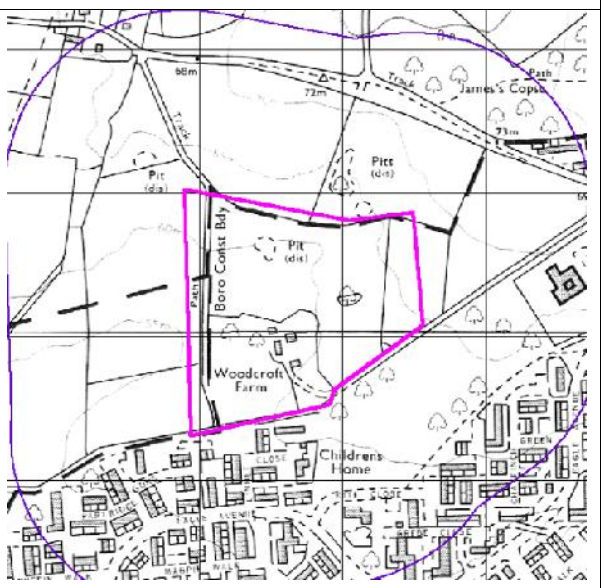
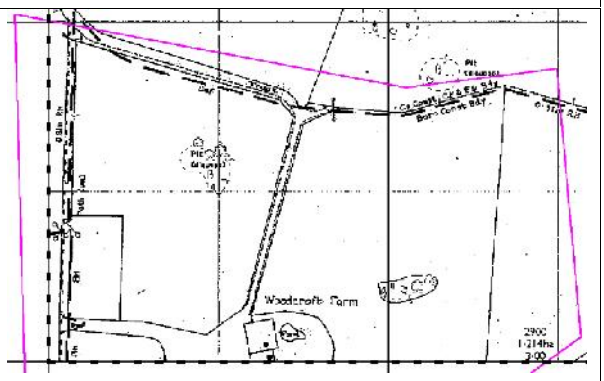
Commentary	Extracts from historic maps Ordnance Survey Licence 0100056695
c.1868 *Woodcroft Farm* is present in its current day location. The main part of the site comprises agricultural land, with the exception of three pits (far west, far north and a small feature immediately north of the farm garden) and two ponds (one to the west of the farm, and one to the north east).	
c.1897 The pond to the west of the farm and the small pit immediately to the north are no longer shown. The larger pit in the north is identified as *Old Chalk Pit*. A well (denoted *W*) is shown immediately north of the main farm building.	

Commentary	Extracts from historic maps Ordnance Survey Licence 0100056695
c.1909 Both of the larger pits are identified as *Old Chalk Pit*. An additional pond is shown to the north of the farm garden, and a possible pond within the garden. The extent of the pits is not very large and the size of the slope markers in the map also indicate that it was not very deep.	
c.1932 No significant changes.	

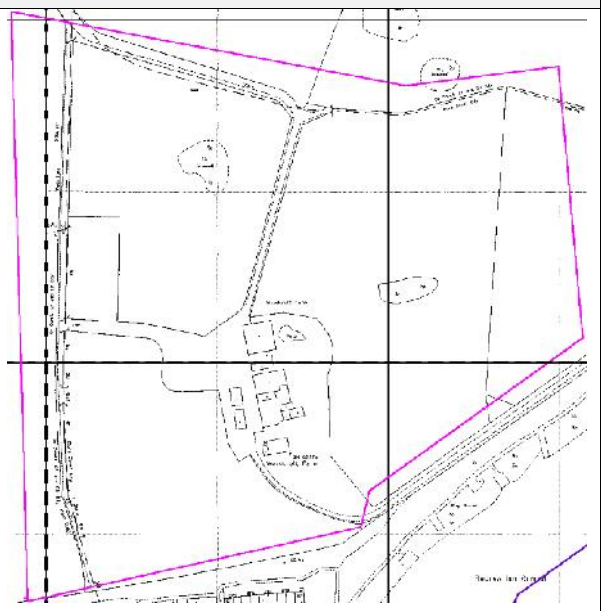
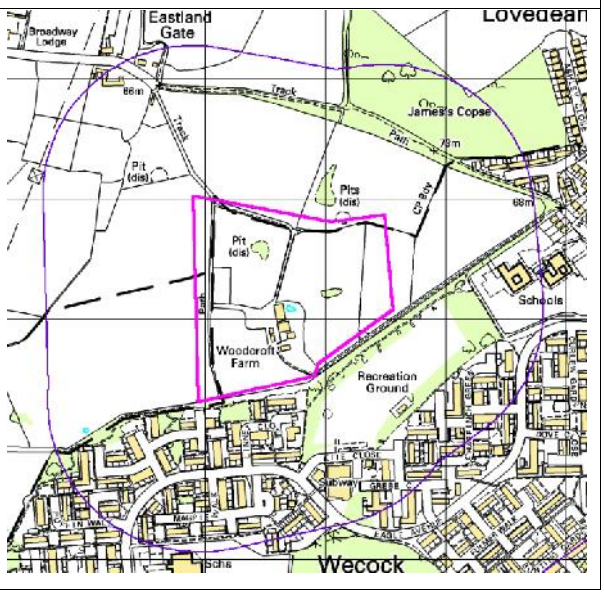
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Commentary	Extracts from historic maps Ordnance Survey Licence 0100056695
c.1965 The two smaller ponds are no longer shown. The farmyard complex has become more extensive.	
c.1959 The northern part of the map is not available for this edition. No significant changes.	
c.1970 The northern part of the map is not available for this edition. The larger chalk pit is no longer clearly marked; however, it is not clear if this is due to infilling.	
c.1973 The northern part of the map is not available for this edition. The boundary for the larger chalk pit feature (once again not clearly marked) has changed. The well is no longer indicated.	

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Commentary	Extracts from historic maps Ordnance Survey Licence 0100056695
c.1975 The southern part of the map is not available for this edition. The pond and the northern chalk pit are still present. The northern extent of the larger chalk pit is not clearly marked.	
c.1976 The northern part of the map is not available for this edition. The southern extent of the larger chalk pit is not clearly marked.	
c.1980 No indication of the presence of the larger chalk pit is shown, suggesting that infilling was complete by this time. The date of infilling is unclear, as none of the previous maps denote *refuse tip*, *works* or *spoil heaps* in the vicinity.	
c.1990 No significant changes.	

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Commentary	Extracts from historic maps Ordnance Survey Licence 0100056695
c.1993 No significant changes.	
c. 2000 No significant changes.	

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Commentary	Extracts from historic maps Ordnance Survey Licence 0100056695
Extract from Environment Agency 'What's in your backyard' web tool No dates of infilling are given. Waste type is identified as *Industrial*, defined as *waste from a factory or industrial process, excluding waste from mines, quarries and agricultural wastes.*	

It can be seen from the historic maps that the site has remained in predominantly open agricultural use since the earliest edition map of 1868, with the location of the main farmhouse remaining unchanged throughout. Several features indicative of excavations (pits and ponds) are denoted. The largest feature, a chalk pit located adjacent to the western boundary, was infilled some time prior to 1980, although the actual date of infilling cannot be determined from the maps. The larger pond in the east of the site and the chalk pit in the north remain unfilled, and as such are will not be considered further as potential sources of soil gas. The evidence suggests that the chalk pit was of limited extent and depth.

The landfill boundary presented by the Environment Agency is significantly larger than would be suggested solely by the infilling of the largest chalk pit. A level of conservatism is required at this stage in the risk assessment, and as such the potential larger extent of landfilling cannot be discounted.

2.2 Additional information from earlier reports

The summary of the PBA desk study report (2010) identifies three potential sources of contamination as follows:

- *Historical landfill site within the southwest of the site*
- *Compound containing scrap cars and car parts located adjacent to the west of the farmyard*
- *Disused fuel tank located 20m to the west of the farmhouse*

Additional comment relating to the landfill is contained as follows:

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'Although a historical recorded EA landfill site is located within the site boundary, it is reported by the landowner that this was infilled with 'uncontaminated' inert waste, which is backed up by information provided by the CLO (contaminated land officer). *With this in mind it is considered that it may possibly not represent a likely source of significant contamination. However, it is noted that the records pertaining to this type of landfill are often inaccurate and the regulatory and inspection regime at the time was much less formal. Also, the definition of inert waste has changes since that time and so the nature of this landfill will need to be proven by future intrusive investigations to assess the potential related development constraints.'*

The 2013 PBA site investigation report contains the following text:

'Available information indicates that from around the 1870s the site and the immediate surrounding area were predominantly undeveloped consisting mainly of agricultural farmland and woodlands. The (larger) site comprises six fields and several farm buildings (including a well) named as Woodcroft Farm, which are located within the southwestern part of the site. Four chalk pits and a possible pond are marked on the historical maps within the western part of the site, one of the pits is later labelled as a pond. By the 1970s the chalk pit labelled in Field 2 had been backfilled. According to the Environment Agency records the pit was filled with 'deposited waste including industrial waste' (LIG 2010). Anecdotal information from the farm tenant, Mrs Jenny Manson indicates that the pit was backfilled with inert and construction demolition materials. The farm tenant also stated that the area of the infilled pit continued to settle over the years.'

The car-breaking compound and above ground fuel tank cannot be discounted as potential secondary sources of soil gas as a result of the breakdown of hydrocarbon contamination at this stage.

2.3 Natural geology

The 1:50000 scale geological map of the area identifies bedrock comprising the Lambeth Group across the site, overlying the Upper Chalk. No superficial deposits are identified across the majority of the site however a spur of Head Deposits extends across the centre of the western site boundary and encroaches onto the site.

The Lambeth Group is described as vertically and laterally variable sequences mainly of clay, some silty or sandy, with some sands and gravels. The Head Deposits are described as comprising poorly sorted gravel, sand and clay. None of the strata identified represent a potential source of bulk permanent gases that could pose a risk to the development. However, all the soils are sedimentary materials that will contain small volumes of organic material that may represent a minor source of carbon dioxide that can cause elevated concentrations in monitoring wells.

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2.4 Groundwater

The overall dip of the Lambeth Group and Chalk is to the south. It is considered likely that the main body of groundwater will be at depth within the Chalk, while the sandy elements of the Lambeth Group and Head Deposits may contain groundwater perched upon the less- or non-permeable clay elements. The prevalent direction of flow of any perched waters will be locally dependant on the extent and dip of the underlying clay surface.

2.5 Walkover descriptions

The following walkover descriptions are presented within reference documents listed above:

SI report, PBA July 2013:

At the time of the investigation the site comprised predominantly a farmyard and 6 fields used as agricultural pastureland for the grazing of horses. Woodcroft Farm farmyard is located within the central western part of the site. The farm comprised 9 sheds, the majority of which were used as stables and for hay and tack storage. Woodcroft Farm farmhouse is located immediately to the south of the farmyard, with gardens extending 15m to the north of the house and 20m to the west. A water well was located about 2m to the north of the house. A small (≈1000 litre) disused fuel storage tank (observed to be empty) was located approximately 20m to the west of the house. A number of outbuildings are located around the house and are seemingly used as garages/storage. The stables and outbuildings were observed to be of stone blockwork or metal cladding construction with either metal or possible asbestos cement sheet roofs. A yard used for dismantling and repair of cars and other vehicles is located immediately adjacent to a second yard used to store racing cars located about 20m northwest of the farmyard.

SI report, RSK November 2016:

The site comprised a series of five fields surrounding Woodcroft Farm. The fields were generally used for grazing horses. A sand riding arena was present in the west. Field 1/2 was undulating, likely due to historic landfill activities. Field 3 generally sloped down to the south. The fields were generally level within fields 4-6, sloping down gently from northeast to southwest.

A pond was noted to the rear of the farm buildings. Ground depressions were noted in the areas identified on historic maps as 'old chalk pits'.

Letter report, GESL September 2017:

At the time of the intrusive investigation, August 2017, the site predominantly comprised open fields utilised for the grazing of horses. The farm complex area comprised a farm house located in the south

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east of the complex area, with private gardens to the front and rear of the property. To the north and west of the farm house were a number of stable blocks that at the time of the investigation works were occupied by a number of horses. The stable blocks were constructed on hard standing, generally concrete, and comprised a mixture of wooden stables and stables constructed within breeze block barns. These barns were noted to have corrugated roofs that have the potential to contain asbestos.

In the central area and west of the farm complex area was an area utilised for parking, and the storage of scrap type items. This included engines, vehicles (in varying states of repair), a skip of metal, and other assorted items. There was also evidence of recent burning activities being undertaken within this area, piles of ash and blackened patches were noted. A manure heap was also located within the central northern part of this area.

2.6 Discussion

Historic maps and recent walkover records presented above have identified a potential source of soil gas in the form of an infilled chalk pit. Secondary and less viable sources have also been identified in the form of a vehicle repair/breaking yard, and a (small) above ground fuel tank. The location of these features is depicted in Figure 4 below.

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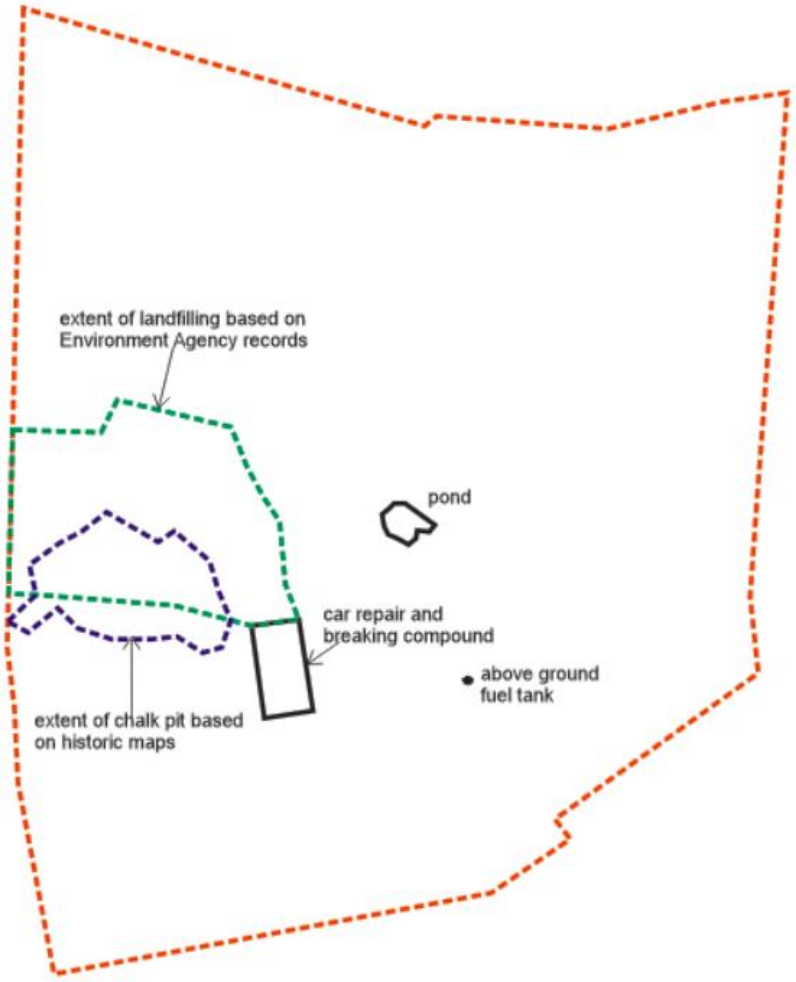


Figure 4: Approximate location of relevant features

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3. GROUND CONDITIONS

Several phases of site investigation have been undertaken across the area of the site covered by this report. This section summarises the ground conditions as presented in the following source documents:

- *Factual report on a site investigation at Woodcroft Farm, Waterlooville*. RML, October 2011;
- *Geoenvironmental and geotechnical ground investigation report*. PBA, July 2013;
- *Geoenvironmental and geotechnical site assessment*. RSK, October 2016;
- *Remediation strategy and verification plan for the land at chalk pit and landfill area (CP), Woodcroft Farm*. GESL, June 2018;
- *Remediation strategy and verification plan for the land at farmyard (FY), Woodcroft Farm*. GESL, June 2018; and
- *Remediation strategy and verification plan for the land at horse arena (HA), Woodcroft Farm*. GESL, June 2018.

As discussed in section 2 above, a single viable potential source of gas has been identified, in the form of an infilled chalk pit in the western area of the site, with secondary less viable sources in the form of a car breaking compound and above ground fuel tank also identified. The extent of the pit as indicated on historic maps is not necessarily representative of its true lateral extent, and as such a significant number of exploratory holes have been excavated in an attempt to determine both the lateral extent and depth of infilling and the nature of the fill material.

3.1 Summary of ground conditions

The approximate locations of exploratory holes located within the area of interest are indicated in Figure 5 below, together with those outside the area of interest which included the installation of monitoring standpipes. The ground conditions as described in the logs are summarised within Table 2.

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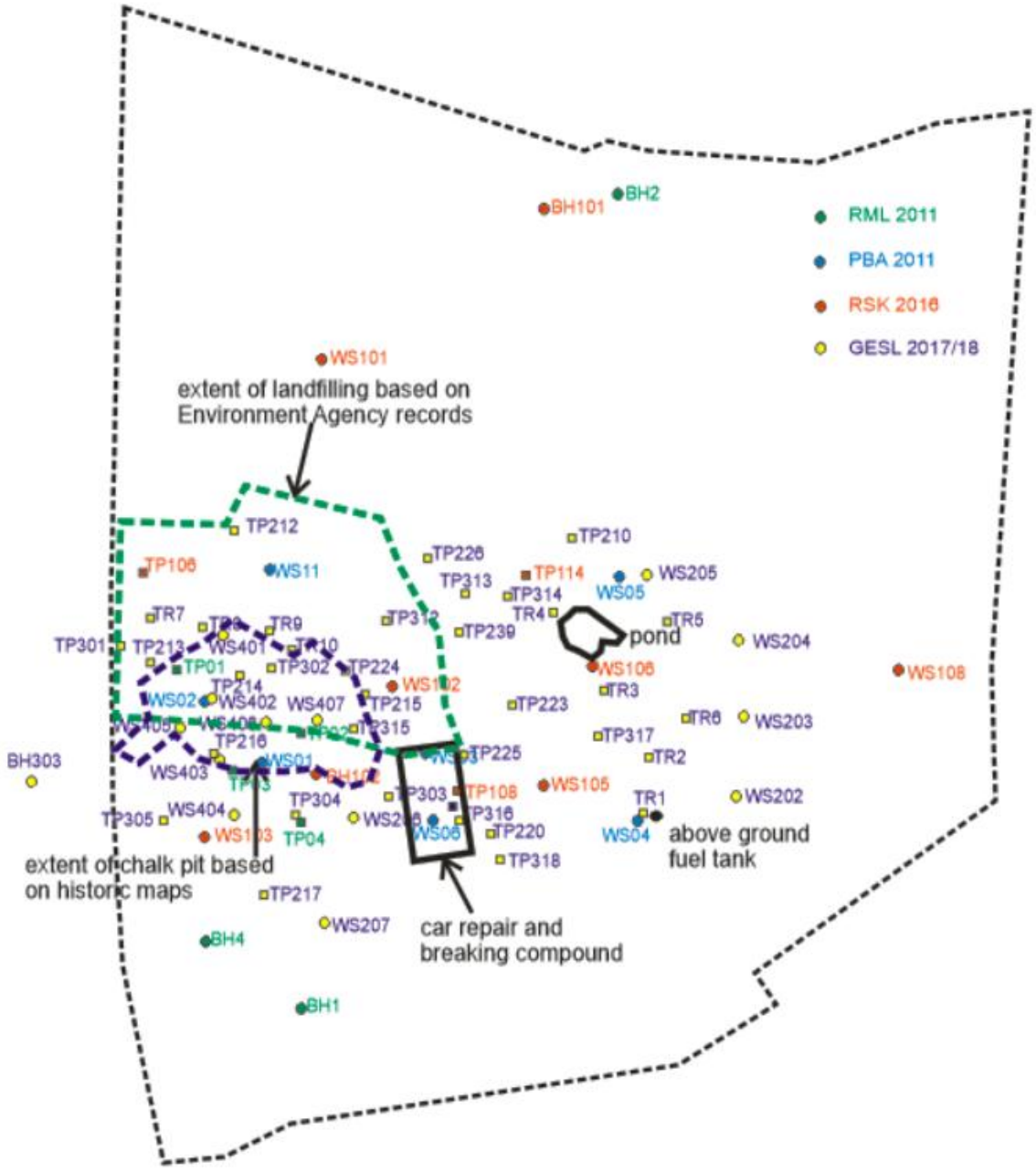


Figure 5: Approximate location of exploratory holes

Table 2: Summary of ground conditions

Reference	Ground Conditions
TP01 RML 2011	GL-0.15: grass over topsoil 0.15-1.1: MG brown clay with bricks, brick fragments, crushed concrete and gravel 1.1-2.5: MG grey/orange-brown clay with bricks, brick fragments, concrete, gravel, timber, plastic and polyurethane sheeting with organic odour 2.5-2.6 (end): MG brown/black clay with much discolouration and brick fragments Groundwater seepage at 2.2m
TP02 RML 2011	GL-0.15: grass over topsoil 0.15-2.8: MG brown clay with flint, bricks, brick fragments, crushed concrete, timber, tiles, metal, glass and plastic 2.8-3.5: MG blue-grey/red-brown clay matrix containing some organic matter with organic odour 3.5-3.6 (end): Chalk No groundwater encountered
TP03 RML 2011	GL-0.1: grass over topsoil 0.1-1.1: MG brown clay with gravel and brick fragments 1.1-2.7: MG brown/grey clay with black discolouration, flint gravel, bricks, brick fragments, concrete, timber and organic odour 2.7-3.4 (end): brown/orange-brown Clay with flint gravel, occasional partings of sand (Head Deposits) No groundwater encountered
TP04 RML 2011	GL-0.1: grass over topsoil 0.1-0.6: MG brown clay with occasional flint gravel, brick fragments, roots and chalk fragments 0.6-2.0 (end): grey/orange-brown sandy Clay/Clay with flint gravel (Head Deposits) No groundwater encountered
BH01 RML 2011	GL-0.3: grass over topsoil 0.3-2.2: orange-brown/grey Clay, occasional pockets of silt (Head Deposits) 2.2-4.2: grey/red-brown Clay, occasional pockets of silt (Lambeth Group) 4.2-5.0 (end): Chalk No groundwater encountered Standpipe installed, response zone 1.0m to 5.0m
BH02 RML 2011	GL-0.15: grass over topsoil 0.15-2.2: brown/orange-brown sandy Clay with frequent gravel of flint, pockets of sand (Head Deposits) 2.2-15.0 (end): Chalk (sand between 3.15m and 4.3m in solution feature) No groundwater encountered Standpipe installed, response zone 1.0m to 7.0m
BH04 RML 2011	GL-0.15: grass over topsoil 0.15-0.6: brown sandy Clay 0.6-4.2: brown/orange-brown sandy Clay with flint gravel (Head Deposits) 4.2-7.35 (end): Chalk No groundwater encountered Standpipe installed, response zone 1.0m to 7.0m
WS01 PBA 2011	GL-0.05: topsoil 0.05-1.1: MG brown sandy gravelly clay, gravel is flint, chalk and brick 1.1-3.0: MG brown/grey sandy gravelly clay, gravel is flint, chalk, brick. Organic odour. Grey staining between 2.2m and 3.0m 3.0-4.0 (end): Chalk No groundwater encountered Standpipe installed, response zone 1.0m to 3.0m
WS02 PBA 2011	GL-0.05: topsoil 0.05-0.8: MG brown sandy gravelly clay, gravel is flint, chalk, brick and rare charcoal 0.8-1.2: MG brown/grey sandy gravel of brick and concrete 1.2-5.2: MG brown/grey slightly gravelly sandy clay with pockets of organic material. Gravel is brick, concrete, chalk. Organic odour 5.2-5.8: gravelly sandy Clay, gravel is chalk (possible MG) 5.8-6.0 (end): Chalk No groundwater encountered Standpipe installed, response zone 1.0m to 4.0m

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Reference	Ground Conditions
WS03 PBA 2011	GL-0.1: MG brown clayey gravel of flint and brick 0.1-0.4: MG black clayey gravelly sand, gravel is flint, clinker and brick. Slight hydrocarbon odour 0.4-0.5: MG white with grey staining gravel of chalk 0.5-1.7: brown slightly gravelly Clay, gravel is flint (Head Deposits) 1.7-3.3: brown/grey Clay (possible Lambeth Group) 3.3-4.0 (end): Chalk No groundwater encountered Standpipe installed, response zone 1.0m to 4.0m
WS04 PBA 2011	GL-0.05: topsoil 0.05-0.3: MG brown slightly gravelly sandy clay, gravel is chalk and brick 0.3-1.7: gravelly sandy Clay (Head Deposits) 1.7-3.0 (end): red/blue Clay (Lambeth Group) No groundwater encountered Standpipe installed, response zone 1.0m to 3.0m
WS05 PBA 2011	GL-0.2: topsoil 0.2-3.8: brown orange clayey Sand over sandy gravelly Clay (Head Deposits) 3.8-4.0 (end): Chalk No groundwater encountered Standpipe installed, response zone 1.0m to 4.0m
WS06 PBA 2011	GL-0.6: MG brown sandy gravelly clay, gravel is flint, brick and concrete 0.6-2.4: grey/red-brown Clay over grey/orange gravelly Clay (Lambeth Group) 2.4-2.6 (end): Chalk No groundwater encountered Standpipe installed, response zone 1.6m to 2.6m
WS11 PBA 2011	GL-0.2: topsoil 0.2-1.5: slightly sandy gravelly Clay (Head Deposits) 1.5-4.0 (end): Chalk No groundwater encountered Standpipe installed, response zone 1.0m to 2.5m
WS101 RSK 2016	GL-0.3: topsoil 0.3-3.45 (end): orange/brown becoming grey/orange sandy gravelly Clay No groundwater encountered Standpipe installed, response zone 1.0m to 3.0m
WS102 RSK 2016	GL-0.1: MG grey sandy gravel of flint and concrete 0.1-0.25: MG brown sandy gravelly clay, gravel is flint 0.25-0.5: MG brown/white reworked chalk, occasional black staining 0.5-0.8: MG grey sandy gravel of concrete, wood and flint 0.8-1.0: grey brown sandy gravelly Clay (possibly reworked) 1.0-3.45 (end): orange grey brown slightly sandy Clay No groundwater encountered Standpipe installed, response zone 1.0m to 3.0m
WS103 RSK 2016	GL-0.2: topsoil 0.2-0.65: orange grey sandy gravelly clay, gravel is flint (reworked) 0.65-2.9: orange grey sandy Clay 2.9-3.45 (end): brown silty gravelly Clay (weathered Chalk) No groundwater encountered Standpipe installed, response zone 1.0m to 3.0m
WS105 RSK 2016	GL-0.1: concrete 0.1-0.3: gravelly silty Clay, gravel is chalk (reworked) 0.3-3.45 (end): orange-grey-brown sandy Clay No groundwater encountered
WS106 RSK 2016	GL-0.4: MG brown sandy gravelly clay, gravel is brick and flint 0.4-0.65: MG brown sand gravelly clay, gravel is charcoal, brick and sandstone 0.65-1.5: grey-brown sandy gravelly Clay, gravel is flint 1.5-3.45 (end): orange-brown Sand No groundwater encountered
WS108 RSK 2016	GL-0.2: topsoil 0.2-1.0: orange brown grey sandy Clay 1.0-3.45 (end): orange brown grey red silty Clay (Lambeth Group) No groundwater encountered Standpipe installed, response zone 1.0m to 3.0m

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Reference	Ground Conditions
BH101 RSK 2016	GL-0.2: topsoil 0.2-0.8: brown silty Clay 0.8-2.8: Sand becoming slightly silty slightly gravelly Sand 2.8-6.2: Chalk 6.2-11.0: brown sandy gravelly Clay 11.0-20.0 (end): Chalk No groundwater encountered Standpipe installed, response zone 5.0m to 20.0m
BH102 RSK 2016	GL-0.1: topsoil 0.1-2.0: MG brown-grey/orange-brown-red sandy silty clay 2.0-2.7: MG orange-brown-grey-red clay, rare rootlets, weak organic odour 2.7-4.0: MG brown-grey/orange-brown gravelly clay, gravel is flint, layer of gravel-sized wood remains, frequent rootlets 4.0-5.0: yellow-white sandy gravelly Clay, gravel is chalk and flint, rare roots, occasional pockets of clay weak organic odour (possible MG) 5.0-5.8: grey-brown/orange-brown sandy gravelly Clay, gravel is flint and chalk (possible MG) 5.8-20.0 (end): Chalk No groundwater encountered Standpipe installed, response zone 1.0m to 5.0m
TP106 RSK 2016	GL-0.1: MG yellow grey sand 0.1-0.3: grey/black Clay (possible MG) 0.3-0.8 (end): orange-brown silty gravelly Clay No groundwater encountered
TP108 RSK 2016	GL-0.45: MG brown gravelly clay with abundant fragments of brick, tarmac, slate, occasional wood, rare metal 0.45-0.9: grey-yellow-brown Clay 0.9-2.0 (end): grey-brown Clay, occasional yellow-brown ands of sand (Lambeth Group) No groundwater encountered
TP114 RSK 2016	GL-0.25: grass over topsoil 0.25-1.2: orange-brown sandy gravelly Clay, gravel is flint 1.2-2.0: grey Clay 2.0-2.8 (end): Chalk No groundwater encountered
BH303 GESL 2017	GL-0.2: topsoil 0.2-1.9: brown silty Clay (Lambeth Group) 1.9-10.0 (end): Chalk No groundwater encountered
TP210 GESL 2017	GL-0.15: grass over topsoil 0.15-1.4 (end): grey-orange sandy Clay with rootlets to 0.9m, charcoal fragments at 1.35m No groundwater encountered
TP212 GESL 2017	GL-0.15: grass over topsoil 0.15-0.35: orange-brown very sandy Clay 0.35-1.1: orange-brown Clay 1.1-1.4 (end): Chalk No groundwater encountered
TP213 GESL 2017	GL-0.1: grass over topsoil 0.1-0.2: MG brown sandy clay with brick fragments and chalk gravel 0.2-0.8: MG brown gravelly clay 0.8-1.7: MG brown sandy clay with brick, concrete, possible asbestos tiles and decaying roots 1.7-2.2 (end): grey Clay, decaying root at 2m No groundwater encountered
TP214 GESL 2017	GL-0.1: grass over topsoil 0.1-0.2: MG brown clay with bricks and chalk 0.2-0.9: MG brown-grey clay with frequent flint gravel, decaying root at 0.5m 0.9-1.9: MG brown clay with ashy deposits, plastic, brick fragments, chalk gravel and wood 1.9-2.0 (end): brown-grey Clay No groundwater encountered
TP215 GESL 2017	GL-1.0: MG ashy deposits over brown gravelly clay with bricks, concrete, flint, tarmac and chalk 1.0-1.7: orange-brown sandy re-worked clay 1.7-2.9 (end): Chalk No groundwater encountered

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Reference	Ground Conditions
TP216 GESL 2017	GL-0.1: topsoil 0.1-0.2: MG brown sandy clay with charcoal and brick fragments 0.2-1.0 (end): brown-grey gravelly Clay (Lambeth Group) No groundwater encountered
TP217 GESL 2017	GL-0.05: grass over topsoil 0.05-1.0 (end): brown-grey Clay with frequent rootlets (Lambeth Group) No groundwater encountered
TP220 GESL 2017	GL-0.6: MG grass over brown gravelly clay with chalk and brick fragments 0.6-2.0 (end): brown-grey Clay with red sandy banding (Lambeth Group) No groundwater encountered
TP223 GESL 2017	GL-0.05: concrete 0.05-0.25: MG brown gravelly clay with concrete and brick fragments 0.25-1.1 (end): grey-orange slightly sandy Clay (Lambeth Group) No groundwater encountered
TP224 GESL 2017	GL-0.7: MG ashy deposits over brown gravelly clay with bricks, flint, chalk and tarmac 0.7-1.6: MG blue-grey re-worked clay with bricks 1.6-2.2 (end): grey-brown Clay (Lambeth Group) No groundwater encountered
TP225 GESL 2017	GL-0.15: chippings over tarmac 0.15-0.6 (end): MG brown gravelly clay with tarmac, brick, chalk, flint, ash and charcoal. Ended on concrete No groundwater encountered
TP226 GESL 2017	GL-0.2: grass over topsoil 0.2-1.1 (end): orange-brown slightly sandy Clay (Lambeth Group) No groundwater encountered
TP239 GESL 2017	GL-0.5: MG grass over brown sandy gravelly clay with brick, chalk, concrete and flint 0.5-0.6: MG brown sandy clay with tiles of possible asbestos, chalk, concrete and brick 0.6-1.8 (end): brown very sandy Clay No groundwater encountered
WS202 GESL 2017	GL-0.3: MG grass over topsoil 0.3-2.8: red-orange-grey sandy Clay with occasional roots and occasional red banding of sandy clay 2.8-3.0 (end): yellow-orange Sand No groundwater encountered
WS203 GESL 2017	GL-0.15: grass over topsoil 0.15-0.7: orange-brown gravelly Clay 0.7-2.3: orange-grey sandy Clay 2.3-3.0 (end): yellow-orange Sand No groundwater encountered
WS204 GESL 2017	GL-0.3: grass over topsoil 0.3-2.3: orange-brown sandy Clay 2.3-3.0 (end): orange-grey sandy Clay No groundwater encountered
WS205 GESL 2017	GL-0.25: grass over topsoil 0.25-0.9: brown clayey Sand 0.9-1.7: orange Sand 1.7-2.0: orange clayey Sand 2.0-2.6: grey sandy Clay 2.6-2.8: brown sandy Clay 2.8-3.0 (end): Chalk No groundwater encountered
WS206 GESL 2017	GL-0.35: grass over topsoil 0.35-1.9: brown-orange sandy gravelly Clay 1.9-3.0 (end): brown very gravelly Clay No groundwater encountered
WS207 GESL 2017	GL-0.15: grass over topsoil 0.15-2.8: orange-grey Clay with varying sand content 2.8-3.0 (end): grey Clay with Chalk fragments No groundwater encountered

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Reference	Ground Conditions
TP301 GESL 2018	GL-0.2: grass over topsoil 0.2-0.45: MG brown sandy gravelly clay with brick (5%), wood (4%), glass (0.5%), and slate (0.5%) 0.45-0.9: MG brown sandy clay with flint (10%), brick (5%) and wood (5%) 0.9-1.3: MG brown clay with brick (5%), wood (5%), rope, flint, large concrete slab 1.3-2.7 (end): MG grey and black clay with wood (15%), brick (15%), plastic (10%), chalk gravel No groundwater encountered
TP302 GESL 2018	GL-0.25: MG grass over clayey sandy gravel of tarmac, chalk fragments, brick (3%), wood (2%) 0.25-0.4: MG brown-grey with black/dark grey staining clay with brick (5%), wood (5%) 0.4-1.2: MG grey clay with wood (10%), brick (5%), plastic (3%), cement (2%), chipboard 1.2-2.8 (end): MG brown occasional black staining gravelly sandy clay with wood (10%), brick (5%), charcoal (3%) and plastic (2%) No groundwater encountered
TP303 GESL 2018	GL-0.1: grass over topsoil 0.1-0.35: MG brown slightly sandy clay with flint (5%), brick (3%), concrete (1%), glass (0.5%), wood (0.5%), possible asbestos 0.35-0.8: MG brown clay with chalk gravel (8%), brick (2%) 0.8-1.2: brown-grey Clay 1.2-1.4: brown-grey sandy gravelly Clay, gravel is flint 1.4-1.8: brown very gravelly Clay, gravel is Chalk 1.8-2.4 (end): Chalk No groundwater encountered
TP304 GESL 2018	GL-0.1: grass over topsoil 0.1-0.6: MG grey-brown frequent black staining sandy clay with chalk gravel (15%), brick (5%), wood (3%), plastic (1.5%), glass and charcoal (0.5%) 0.6-1.0: MG brown-grey occasional black staining clay with chalk gravel and brick 1.0-1.2: brown gravelly Clay, gravel is flint 1.2-2.4 (end): brown-grey sandy Clay No groundwater encountered
TP305 GESL 2018	GL-0.2: grass over topsoil 0.2-0.9: MG brown-grey sandy clay with occasional flint, single large piece of metal 0.9-1.2 (end): MG grey occasional black staining sandy clay with wood (10%) Rapid water ingress at 1.1m
TP313 GESL 2018	GL-0.1: grass over topsoil 0.1-0.3: MG white/brown clayey chalk gravel with flint 0.3-0.6: brown very clayey gravel of Flint 0.6-1.5: orange/brown/grey Clay with occasional bands of orange Sand 1.5-1.6: orange Sand 1.6-1.8: orange/brown sandy Clay 1.8-2.5 (end): orange/brown Sand with bands of grey Clay No groundwater encountered
TP314 GESL 2018	GL-0.1: grass over topsoil 0.1-0.6: orange/brown sandy Clay 0.6-2.5 (end): orange/brown/grey Clay with occasional bands of orange Sand, band of Chalk at 1.8m No groundwater encountered
TP315 GESL 2018	GL-0.5: MG chippings over brown/grey clayey gravel of flint and chalk with brick (5%), concrete (3%) and tarmac (2%) 0.5-2.2: MG brown/grey clay with brick (5%), concrete (3%), tree roots, flint and lead pipe (3%) 2.2-2.4 (end): brown/grey Clay with occasional bands of orange Sand No groundwater encountered
TR01 (trench) GESL 2018	GL-0.1: topsoil 0.1-1.0 (end): grey/orange sandy Clay No groundwater encountered
TR02 (trench) GESL 2018	GL-0.2: MG brown sandy silty clay with slate, brick, gravel and wood 0.2-0.7 (end): orange/brown sandy Clay No groundwater encountered
TR03 (trench) GESL 2018	GL-0.5: MG brown sandy silty clay with wood, gravel, brick, pipe and concrete 0.5-1.0 (end): grey sandy Clay No groundwater encountered
TR04 (trench) GESL 2018	GL-0.5 (end): orange/brown sandy Clay No groundwater encountered

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Reference	Ground Conditions
TR05 (trench) GESL 2018	GL-0.15: topsoil 0.15-0.75 (end): brown very sandy Clay No groundwater encountered
TR06 (trench) GESL 2018	GL-0.15: topsoil 0.15-0.7 (end): brown sandy Clay No groundwater encountered
TR07 (trench) GESL 2018	GL-0.5: MG grass over brown clayey sandy gravel of flint cobbles, tarmac (5%), wood (3%), charcoal and glass (2%) 0.5-1.1 (end): orange-brown slightly gravelly Clay No groundwater encountered
TR08 (trench) GESL 2018	GL-0.7: MG brown/white clayey sandy chalk and flint gravel with brick (3%) tile (2%) and concrete (2%) 0.7-1.15: orange/brown gravelly Clay, gravel is flint No groundwater encountered
TR09 (trench) GESL 2018	GL-0.7: MG brown/white clayey sandy gravel of chalk and flint with brick (5%) and tarmac (5%) 0.7-1.1 (end): orange/brown sandy Clay No groundwater encountered
TR10 (trench) GESL 2018	GL-0.5: MG brown clayey sandy gravel of flint and chalk with brick (4%), concrete (4%), tree roots and clay pipe (2%) 0.5-1.2 (end): MG grey clay with brick (3%), plastic (2%), wood/roots (2%) and chalk/flint/tile (3%) No groundwater encountered
WS401 GESL 2018	GL-0.1: grass over topsoil 0.1-0.9: MG brown clay with gravel of flint and brick 0.9-2.0: MG grey clay with flint gravel, ash, wood and brick 2.0-3.7: MG grey clay with chalk and flint gravel, red brick at 3.6m 3.7-4.8: MG brown clay with chalk gravel and rare brick fragments 4.8-5.0 (end): Chalk No groundwater encountered Standpipe installed, response zone 1.0m to 5.0m
WS402 GESL 2018	GL-0.1: grass over topsoil 0.1-0.9: MG brown/grey silty clay 0.9-1.4: MG brown/grey clay with gravel of brick and slate 1.4-2.8: MG grey clay with pockets of sandy gravel, concrete, ash, charcoal, roots, wood fragments 2.8-3.7: MG brown/grey clay with concrete fragments 3.7-4.5: MG grey to black fibrous material possibly decomposed paper and wood fragments with brick 4.5-5.0 (end): MG white/grey/black chalk with ashy or possibly fine organic matter in matrix No groundwater encountered Standpipe installed, response zone 1.0m to 5.0m
WS403 GESL 2018	GL-0.1: grass over topsoil 0.1-1.1: MG brown clay with flint and rare brick 1.1-1.7: MG grey clay with clinker, ash, brick and occasional wood fragments 1.7-3.9: MG brown/grey clay with occasional gravel of flint, chalk and occasional ash and brick 3.9-5.0 (end): Chalk No groundwater encountered Standpipe installed, response zone 1.0m to 5.0m
WS404 GESL 2018	GL-0.1: grass over topsoil 0.1-0.6: MG grey silty gravelly clay, gravel is flint and brick 0.6-1.9: grey/orange/brown silty Clay 1.9-2.8 (end): Chalk No groundwater encountered Standpipe installed, response zone 1.0m to 2.5m
WS405 GESL 2018	GL-0.2: grass over topsoil 0.2-1.0: MG brown/grey clay with occasional roots, flint gravel, decomposed plant remains and wood 1.0-2.5: MG grey clay with gravel of flint, brick and concrete 2.5-3.0 (end): Chalk No groundwater encountered Standpipe installed, response zone 1.0m to 2.5m

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Reference	Ground Conditions
WS406 GESL 2018	GL-0.1: grass over topsoil 0.1-3.1: MG brown/grey silty clay with pockets of sandy gravel of concrete, brick, ash and rare wood 3.1-3.7: MG grey/black clay with decomposed wood and plant fragments with brick 3.7-5.0 (end): Chalk No groundwater encountered Standpipe installed, response zone 1.0m to 5.0m
WS407 GESL 2018	GL-0.1: grass over topsoil 0.1-1.0: MG brown clay with much gravel of flint and brick 1.0-4.0: MG grey silty sand with much ash, charcoal and brick and occasional glass 4.0-5.0 (end): Chalk No groundwater encountered Standpipe installed, response zone 1.0m to 4.0m
RML is Risk Management Limited PBA is Peter Brett Associates RSK is RSK Environment Limited GESL is Geo-Environmental Services Limited MG is made ground All measurements are m below ground level	

From the soil descriptions it can be seen that much of the larger site area comprises topsoil over natural soils. Made ground is limited to the area around and west of the farmyard complex, which is in line with the background information presented in section 2 above. Descriptions of made ground vary from re-worked natural clays to material indicative of aged landfill waste. However, the majority of the material is soil, concrete, brick, etc that will not generate landfill gas.

Figure 6 has been created using contouring software, and cannot be considered definitive, however it does serve to illustrate the approximate distribution of made ground across the western part of the site. Only data from exploratory holes that proved the base of made ground has been used. Areas between and outside of the data points are created by interpolation using the Kriging method, a geostatistical gridding method that produces maps from irregularly spaced data by attempting to express trends.

Although not definitive, the contour map indicates that the extent of major infilling is limited to the area defined as the chalk pit on historic maps, with a lesser thickness extending outwards a short distance to the north and south, but more extensively to the east towards and within the farmyard complex. This demonstrates that the area defined by the Environment Agency records extending to the north is inaccurate.

There is some variation in the nature of made ground recorded. The majority of inclusions noted comprise inert material in the form of brick, tiles, slate, glass, concrete, metal and flint. Complex organic inclusions in the form of clinker, wood and charcoal were recorded to a lesser extent in some locations. Simple organic inclusions in the form of organic matter was recorded in TP02, WS02, and WS402 within the infilled pit. No descriptions were indicative of bagged domestic waste, and the material encountered generally supports the owner's statement that the pit was infilled with construction and demolition waste.

An organic odour was noted in some exploratory holes located within the infilled pit, and a hydrocarbon odour was recorded in WS03 located within the vehicle breaking and repair compound.

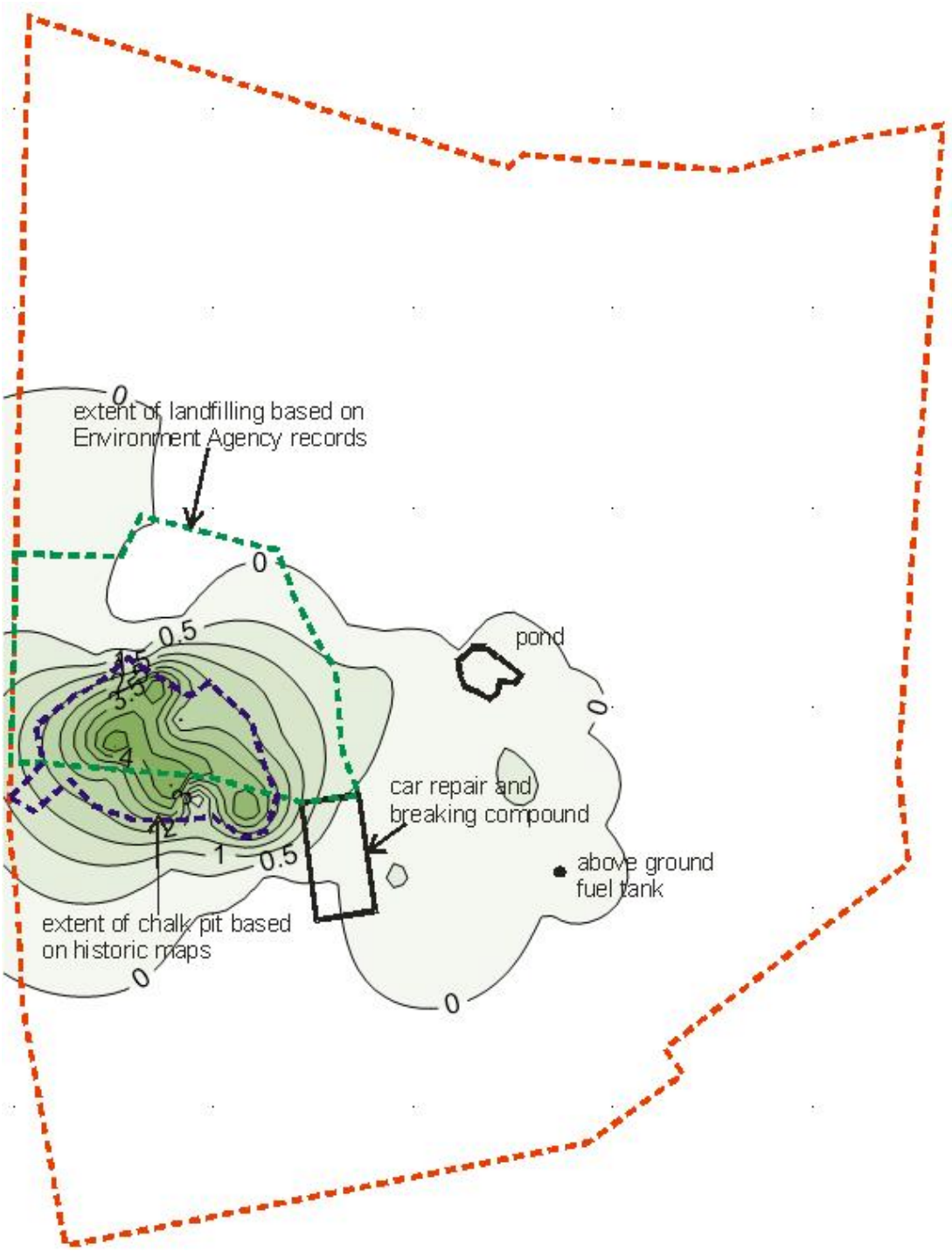


Figure 6: Contours illustrative of the distribution of thickness of made ground

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3.2 Total organic carbon

The definition of inert waste in the Landfill Directive[1] is:

'waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health.'

The Environment Agency[2] (EA) has developed waste acceptance criteria (WAC) with which to identify soils in terms of waste category. In relation to the potential for gas generation, the key criteria included within the WAC is total organic carbon (TOC). In order for material to be designated as inert, it must demonstrate TOC of <3%. TOC gives a crude and conservative estimate of the amount of biodegradable material in soil or waste. It includes both readily available carbon that degrades relatively quickly, and non-readily available carbon that will breakdown and degrade very slowly.

During the phases of site investigation between 2011 and 2018 analytical results for soils within and in the direct vicinity of the infilled chalk pit include seventy results for either TOC or soil organic matter (SOM), which can be converted to TOC by dividing by a factor of 1.72. The results identified concentrations of between 0.05% and 3.8%, with an average of 0.99%. As defined above, in the main this represents inert material that '*does not undergo any significant physical, chemical or biological transformations'.* Those samples that exceeded 3% were taken from WS406 at 3.1m (3.8%), WS102 at 0.4m (3.47%) and TP02 at 2.0m (3.47%), coinciding with the following soil descriptions:

WS406: 3.1m to 3.7m dark grey to black clay with decomposed wood and plant fragments with red brick

WS102: 0.25m to 0.5m brown to off white reworked chalk composed of gravelly silt. Gravel is flint and chalk. Occasional black staining

TP02: 0.15m to 2.8m brown clay with flint gravel, brick, concrete, timber, tiles, metal, glass and plastic

It should also be noted that the guidance relates to the placement of fresh waste. The material within the infilled chalk pit has been in place for >40 years, and as such the residual total organic content will be comprised of complex non-readily available carbon.

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[1] *Council Directive 1999/31/EC*. European Union, 1999.

[2] *Waste acceptance at landfills – guidance on waste acceptance procedures and criteria.* Environment Agency, 2010.

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CLAIRE RB17[3] and BS8485:2015[4] use TOC results to classify a site in terms of anticipated gas risk. For recently placed material a TOC of less than 1% indicates Characteristic Situation 1, less than 1.5% indicates Characteristic Situation 2 and less than 4% indicates Characteristic Situation 3. The average concentration recorded within the made ground on this site is less than 1% therefore the overall results indicate that the material is inert, and the site is CS1 if based solely on the total organic carbon.

A summary of the anthropogenic and organic inclusions observed within the fill material and underlying natural soils as recorded in exploratory hole logs is presented in Table 3.

Table 3: Summary of fill composition

Hole ID	Evidence of anthropogenic material	Evidence of organic material
TP01-RML	Brick, concrete, wood, plastic	Organic odour recorded in MG between 1.25m and 2.5m
TP02-RML	Brick, concrete, wood, tiles, metal, glass, plastic, organic matter	'Some' organic matter with organic odour recorded in MG between 2.8m and 3.5m
TP03-RML	Brick, concrete, wood	Organic odour recorded in MG between 1.1m and 2.7m
WS01-PBA	Brick	Organic odour in MG between 1.1m and 3.0m
WS02-PBA	Brick, rare charcoal, concrete	Pockets of organic matter and organic odour recorded in MG between 1.2m and 5.2m
WS03-PBA	Brick, clinker	Black clayey gravelly sand, slight hydrocarbon odour recorded in MG between 0.1m and 0.4m
WS04-PBA	Brick	N/A
WS05-PBA	N/A	N/A
WS06-PBA	Brick, concrete	N/A
WS102-RSK	Concrete, wood	N/A
WS105-RSK	N/A	N/A
WS106-RSK	Brick, charcoal	N/A
BH102-RSK	N/A	Weak organic odour and rare rootlets recorded in MG between 2.0m and 2.7m, frequent rootlets and layer of wood remains recorded in MG between 2.7m and 4.0m, Occasional pockets of brown/grey clay with roots and rootlets and weak organic odour recorded in possible MG between 4.0m and 5.0m
TP108-RSK	Brick, tarmac, slate, occasional wood, rare metal, plastic pipe	N/A
TP213-GESL	Brick, tiles, concrete	Decaying roots recorded in MG between 0.8m and 1.7m
TP214-GESL	Brick, ash, plastic, wood	N/A
TP215-GESL	Brick, concrete, tarmac	N/A
TP216-GESL	Brick, charcoal	N/A
TP220-GESL	Brick	N/A
TP224-GESL	Brick, tarmac, ash	N/A
TP225-GESL	Tarmac, brick, ash, charcoal, concrete	N/A
TP239-GESL	Brick, concrete	N/A
TP301-GESL	Brick, tile, slate, wood, glass, concrete, plastic	Wood/decaying roots recorded in MG between 0.45m and 0.9m, large decaying tree root recorded in MG at 1.4m

[3] *A pragmatic approach to ground gas risk assessment*. CL:AIRE Research Bulletin RB 17, 2012

[4] *BS8485:2015 Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new building.* British Standards Institution, 2015

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Hole ID	Evidence of anthropogenic material	Evidence of organic material
TP302-GESL	Tarmac, brick, tile, charcoal, wood, plastic, cement	Decaying roots recorded in MG between 0.25m and 0.4m
TP303-GESL	Brick, glass, concrete, wood	N/A
TP304-GESL	Brick, wood, plastic, glass, charcoal	N/A
TP315-GESL	Tarmac, brick, concrete, lead pipe	Some tree roots recorded in MG between 0.5m and 2.2m
TR7-GESL	Tarmac, wood, charcoal, glass	N/A
TR8-GESL	Brick, tile, concrete	N/A
TR9-GESL	Brick, tarmac	N/A
TR10-GESL	Brick, plastic, wood, concrete, clay pipe	Tree roots recorded in MG between GL and 0.5m, roots recorded in MG between 0.5m and 1.2m
WS401-GESL	Brick, ash, wood	N/A
WS402-GESL	Brick, slate, concrete, ash, charcoal, dead roots and wood fragments	Fibrous material possibly decomposed paper and wood fragments recorded in MG between 3.7m and 4.5m, chalk with ashy or possibly fine organic matter in matrix recorded in MG between 4.5m and 5.0m
WS403-GESL	Brick, clinker, ash, occasional wood fragments	N/A
WS404-GESL	Brick	N/A
WS405-GESL	Brick, concrete, wood	Decomposed plant remains recorded in MG between 0.2m and 1.0m
WS406-GESL	Concrete, brick, ash, wood, roofing felt	N/A
WS407-GESL	Brick, ash, charcoal, glass	N/A

With the exception of ash, decomposed paper, decomposed plant remains, rare wood, charcoal and clinker, all the recorded material is representative of inert waste that will not undergo any significant physical, chemical or biological transformations. The biodegradable elements of wood, charcoal and clinker comprise complex organic materials that are slow to biodegrade, and do not represent a potential source of bulk gas generation. The biological and chemical degradation of ash, together with the daughter products, is very much source specific, however it is rarely present in sufficient volume and containing sufficient non-combusted material to represent a potential source of bulk gas generation. The paper and plant remains were reportedly decomposed, indicating that the biodegradation process is in the main complete.

In summary, up to 5.2m of aged (>40 years) predominantly inert waste (as demonstrated by site investigation soil descriptions/analytical results) are present within the infilled chalk pit and extending some distance into the farmyard complex to the east. No evidence of simple easily degradable material has been recorded, which is supported by the total organic carbon analytical results.

3.3 Organic contaminants in soils

Secondary potential sources of gas in the form of hydrocarbon contamination from an above ground fuel storage tank and the use of part of the farmyard complex for the repair and breaking of vehicles have been identified. A significant amount of site investigation has been undertaken within the relevant areas, including comprehensive chemical analysis of soils. Minor exceedances of some polyaromatic hydrocarbons have been identified, when compared to acceptable concentrations for the proposed residential end use of the site. No evidence of bulk hydrocarbon contamination was

identified, and it is no considered that these findings indicate that hydrocarbon contamination represents a viable source of bulk gas generation on this site.

3.4 Natural soils

Natural soils with a high carbonate content, such as Chalk, or sedimentary rocks with small volumes of organic material, can represent a low production source of carbon dioxide, which does not represent a risk to development. Soils such as London Clay which were laid down in a shallow sea environment contain small volumes of non-labile organic carbon, shell fragments, calcareous nodules (claystone) and pyrites. Other soils that can also contain small amounts of organic material include Glacial Till and River Terrace Gravels. Labile organic carbon is the portion of soil organic carbon that can be readily decomposed by soil organisms. When boreholes are drilled into the soils it allows oxygen to be introduced and various chemical and biological process can take place locally immediately around the well that cause high concentrations of carbon dioxide (or methane) in the wells. The rate of gas generation and the volume produced is extremely small and high concentrations in a monitoring well do not indicate a risk to buildings.

Microbial respiration takes place wherever organic matter, oxygen and soil moisture are present together. It does so as follows:

$$CH_2O + O_2 \rightarrow CO_2 + H_2O \qquad (1)$$

This means that as oxygen is consumed and the oxygen concentration reduces, the carbon dioxide concentration increases in the same proportion. This produces carbon dioxide with a relationship between oxygen and carbon dioxide concentration that has a slope of -1 (Figure 7). If oxygen and other electron acceptors such as nitrate and sulphate are depleted then methane can be produced under highly reducing conditions around the outside of the well. This can be oxidised when oxygen is introduced via the well as follows:

$$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O \qquad (2)$$

During methane oxidation the slope on the graph in Figure 7 is -2.

The carbon dioxide and oxygen results shown in Figure 7 are all from sites where the wells were installed into natural soils in the UK, with no other nearby sources of gas that could contribute to the gas being recorded.

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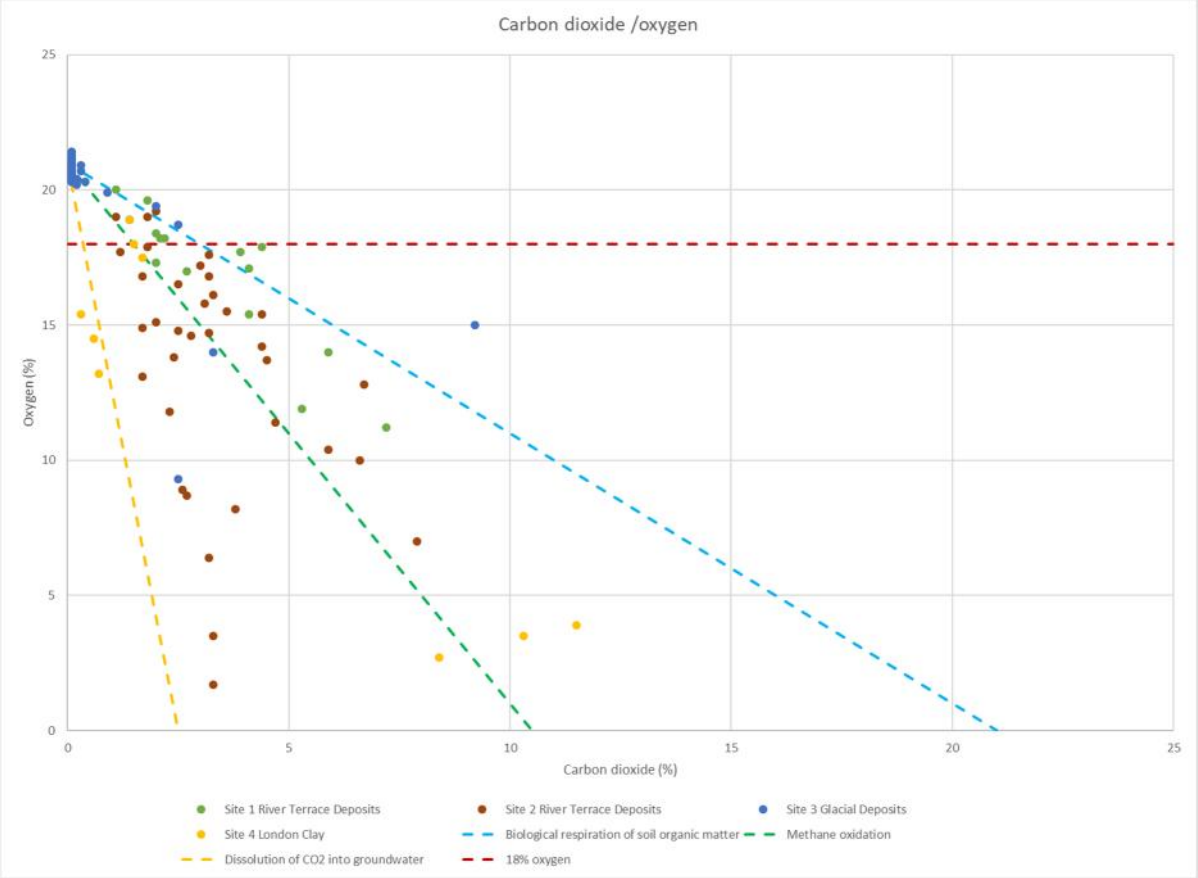


Figure 7: Carbon dioxide:oxygen relationship in natural soils

All the results are consistent with carbon dioxide being produced mainly via biological respiration with some contribution from oxidation of methane that was produced either under anaerobic conditions or under reducing conditions. There is also evidence that some of the carbon dioxide that is being produced is either reacting with carbonate in the soil or being dissolved into groundwater which acts as a sink.

The relationship between microbial respiration and methane oxidization becomes ambiguous above 18% v/v oxygen and other ratios such as nitrogen:oxygen may need to be compared to help with the assessment of the source of the carbon dioxide.

Whichever the method of gas generation, all are very slow processes with a turnover of many thousands of years. Thus, surface emissions of carbon dioxide from such sources are negligible. It can cause high gas concentrations in monitoring wells that are not representative of the risk to buildings, even those including basements. Such conditions are widespread throughout the UK with no known incidents of carbon dioxide emissions into buildings from this natural process.

4. SUMMARY OF GAS MONITORING 2011 TO 2018

Gas monitoring was undertaken on four occasions in 2011, three occasions in 2016 and seven occasions in 2018. The approximate location of all monitored standpipes is depicted in Figure 8, with the contour representative of where fill reduced to 0.5m thickness as presented in Figure 6 above indicated by the green line. The gas monitoring results are summarised in Table 4 below, and presented in full in Appendix A.

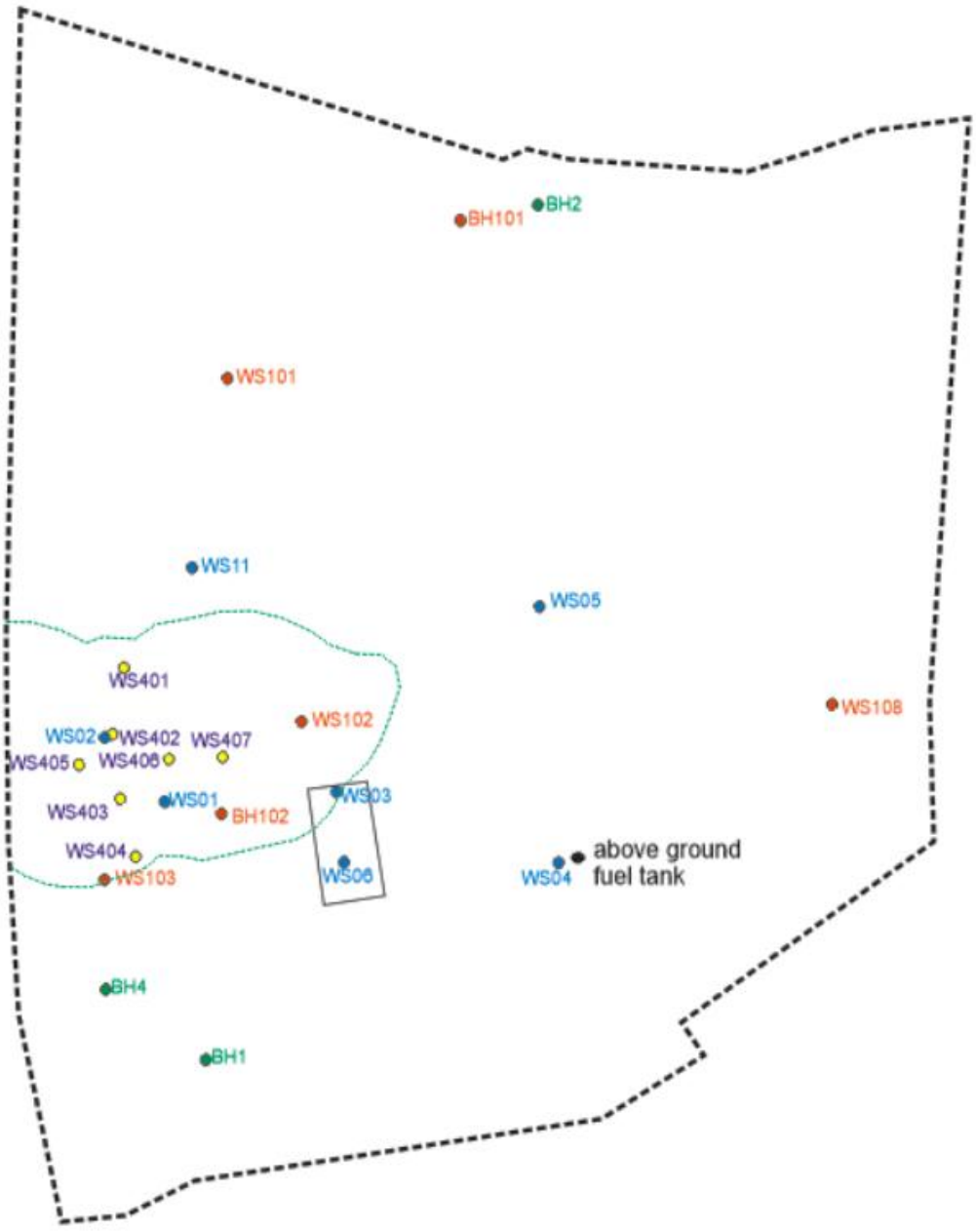


Figure 8: Location of monitored standpipes

Table 4: Summary of gas monitoring data 2011 to 2018

ID	CH_4 (%v/v)	CO_2 (%v/v)	O_2 (%v/v)	Flow (l/hr)	At pressure (mBar)	Comments
BH1	0.0 0.0 0.0 0.0	2.0 2.6 3.8 4.7	11.4 10.7 6.9 8.0	-0.9 **0.1** -0.6 0.0	1005 1015 1017 1021	In far south of site, no MG recorded. Response zone 1.0m to 5.0m in natural Clay over Chalk. Standpipe dry on all monitoring events
BH2	0.0 0.0 0.0 0.0	1.4 1.9 2.5 2.7	16.7 14.5 13.7 14.5	**0.2** **0.3** 0.0 **0.1**	1004 1013 1015 1021	In far north of site, no MG recorded. Response zone 1.0m to 7.0m in natural Clay over Chalk. Standpipe dry on all monitoring events
BH4	0.0 **2.0** 0.0 0.0	2.0 0.0 3.6 3.6	14.7 21.0 6.4 8.6	0.6 0.0 0.0 0.0	1004 1015 1017 1021	In far south of site, no MG recorded. Response zone 1.0m to 7.0m in natural Clay over Chalk. Standpipe dry on all monitoring events
WS01	0.0 **0.8** 0.0 0.0	**6.0** **5.6** **12.0** **15.0**	7.6 6.6 0.8 0.8	0.0 **0.1** 0.0 0.0	1004 1014 1017 1021	Within infilled pit, 3.0m of MG recorded, clay with flint, chalk and brick. Response zone 1.0m to 3.0m in MG. Standpipe dry on all monitoring events
WS02	**27.5** **42.5** **36.5** **35.5**	**15.0** **17.0** **17.0** **19.0**	0.0 0.0 0.0 0.0	**0.2** **0.3** 0.0 **1.3**	1004 1014 1017 1021	Within infilled pit, 5.2m of MG recorded, clay with flint, chalk, brick, concrete, charcoal, pockets of organic material, organic odour. Response zone 1.0m to 4.0m in MG. Standpipe dry on all monitoring events
WS03	0.0 0.0 0.0	**6.1** 4.5 **8.2**	6.4 17.0 5.7	0.0 0.0 **0.5**	1004 1016 1020	At eastern boundary of infilled pit, 0.5m of MG recorded, clay with flint, clinker and brick, slight hydrocarbon odour. Response zone 1.0m to 4.0m in natural Clay over Chalk. Standpipe dry on all monitoring events
WS04	0.0 0.0 0.0 0.0	2.6 2.1 2.5 2.0	17.2 17.6 17.1 17.0	**0.1** **0.1** 0.0 0.0	1004 1013 1016 1021	In south east of site adjacent to fuel tank, 0.3m of MG recorded, clay with chalk and brick. Response zone 1.0m to 3.0m in natural Clay. Standpipe dry on all monitoring events
WS05	0.0 0.0 0.0 0.0	3.3 3.5 2.7 2.5	15.9 15.3 16.8 17.2	**0.3** **0.2** 0.0 0.0	1004 1013 1016 1021	East of farmyard complex, no MG recorded. Response zone 1.0m to 4.0m in natural Sand over Clay over Chalk. Standpipe dry on all monitoring events
WS06	0.0	**6.0**	10.0	0.0	1021	In scrapyard complex outside of extent of infilled pit (from kriging), 0.6m of MG recorded, clay with flint, brick and concrete. Response zone 1.6m to 2.6m in natural Clay over Chalk. Standpipe dry on all monitoring events
WS11	0.0 0.0 0.0 0.0	3.8 4.3 3.7 **5.4**	14.7 13.8 13.8 12.6	0.0 **0.3** **0.1** **0.2**	1004 1013 1017 1021	North of infilled pit, no MG recorded. Response zone 1.0m to 2.5m in natural Clay over Chalk. Standpipe dry on all monitoring events
BH101	0.0 0.0 0.0	3.8 3.8 3.7	14.6 14.4 16.2	**0.2** 0.0 0.0	1015 (rising) 1012 (steady) 1014 (steady)	In far north of site, no MG recorded. Response zone 5.0m to 20.0m in natural soils. Standpipe dry or at 20m on all monitoring events
BH102	0.0 0.0 0.0	1.3 0.5 0.3	20.1 21.3 21.4	0.0 0.0 0.0	1015 (rising) 1012 (steady) 1014 (steady)	Within infilled pit, 4.0m of MG recorded, clay with flint, wood, rootlets, weak organic odour. Response zone 1.0m to 5.0m in MG/natural soils. Standpipe dry on all monitoring events
WS101	0.0 0.0 0.0	3.4 3.5 2.9	18.3 19.1 19.8	**0.2** 0.0 0.0	1015 (rising) 1012 (steady) 1014 (steady)	North of infilled pit, no MG recorded. Response zone 1.0m to 3.0m in natural soils. Standpipe dry on all monitoring events
WS102	0.0 0.0 0.0	**8.5** **9.9** **6.0**	5.2 3.5 3.0	0.0 0.0 0.0	1015 (rising) 1012 (steady) 1014 (steady)	Within infilled pit, 0.8m of MG recorded, clay/chalk/gravel of flint, concrete, wood, occasional black staining. Response zone 1.0m to 3.0m in natural soils. Standpipe dry on all monitoring events
WS103	0.0 0.0 0.0	**8.4** **7.2** **7.0**	11.3 12.5 14.7	0.0 0.0 0.0	1015 (rising) 1012 (steady) 1014 (steady)	On southern boundary of infilled pit, 0.65m of MG recorded, clay with flint gravel (reworked) Response zone 1.0m to 3.0m in natural soils Standpipe dry on all monitoring events
WS108	0.0 0.0 0.0	2.2 3.4 2.1	18.8 17.0 20.4	0.0 0.0 0.0	1015 (rising) 1012 (steady) 1014 (steady)	In far east of site, no MG recorded. Response zone is 1.0m to 3.0m in natural soils Standpipe dry on all monitoring events.

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ID	CH_4 (%v/v)	CO_2 (%v/v)	O_2 (%v/v)	Flow (l/hr)	At pressure (mBar)	Comments
WS401	0.0 0.0 0.0 0.0 0.0 0.0 0.0	4.5 **6.9** **7.3** **5.0** **9.0** **6.1** **6.0**	13.9 11.0 10.2 15.4 7.5 14.4 13.7	0.0 0.0 0.0 0.0 0.0 0.0 0.0	1004 1005 1012 1017 1009 1010 1009	Within infilled pit, 4.8m of MG recorded, clay with flint, ash, wood, brick and chalk. Response zone 1.0m to 5.0m in MG. Standpipe dry on all monitoring events
WS402	0.0 0.0 0.0 0.0 0.0 0.0 0.0	2.0 4.7 **7.0** 3.3 **7.3** **5.5** **5.4**	16.8 10.7 9.8 18.0 10.3 14 12.1	0.0 0.0 0.0 0.0 0.0 0.0 0.0	1004 1005 1012 1017 1009 1010 1009	Within infilled pit, depth of MG not proven at 5.0m, clay with brick, slate, concrete, ash, charcoal, roots, wood, decomposed paper, chalk. Response zone 1.0m to 5.0m in MG. Standpipe dry on all monitoring events
WS403	0.0 0.0 0.0 0.0 0.0 0.0	4.2 **5.2** 3.7 3.4 4.0 4.7	13.2 15.7 18.1 17.8 15.8 13.9	0.0 0.0 0.0 0.0 0.0 0.0	1004 1012 1017 1009 1010 1009	Within infilled pit, 3.9m of MG recorded, clay with flint, brick, clinker, ash, wood and chalk. Response zone 1.0m to 5.0m in MG over chalk. Standpipe dry on all monitoring events
WS404	0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.1 0.3 0.7 1.4 1.6 2.3 2.2	20.0 19.5 18.2 19.4 18.9 18.2 18.6	0.0 0.0 0.0 0.0 0.0 0.0 0.0	1004 1005 1012 1017 1009 1010 1009	Towards the southern edge of the infilled pit, 0.6m MG recorded, clay, flint and brick Response zone 1.0m to 2.5m in natural soils. Standpipe dry on all monitoring events
WS405	0.0 0.0 0.0 0.0 0.0 0.0 0.0	**6.4** **11.5** 3.6 3.1 3.9 3.9 4.7	8.2 1.7 14.9 18.0 14.9 15.4 13.4	0.0 0.0 0.0 0.0 0.0 0.0 0.0	1004 1005 1012 1017 1009 1010 1009	Within infilled pit, 2.5m of MG recorded, clay with flint, plant remains, wood, brick and concrete. Response zone 1.0m to 2.5m in MG. Standpipe dry on all monitoring events
WS406	0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.7 0.1 2.0 2.2 2.7 2.9 3.3	18.2 20.3 18.0 19.1 18.2 16.8 16.1	0.0 0.0 0.0 0.0 0.0 0.0 0.0	1004 1005 1012 1017 1009 1010 1009	Within infilled pit, 3.7m of MG recorded, clay with concrete, brick, ash, wood and plant fragments. Response zone 1.0m to 5.0m in MG over chalk. Standpipe dry on all monitoring events
WS407	0.0 0.0 0.0 0.0 0.0 0.0 0.0	3.4 **10.1** **9.1** 4.6 4.7 1.9 4.7	13.4 10.3 13.9 17.4 16.8 14.7 13.9	0.0 0.0 0.0 0.0 0.0 0.0 0.0	1004 1005 1012 1017 1009 1010 1009	Within infilled pit, 4.0m of MG recorded, clay and sand with flint, brick, ash, charcoal and glass. Response zone 1.0m to 4.0m in MG. Standpipe dry on all monitoring events
Values represent maximum recorded concentration and flow rate MG is made ground						

It can be seen that carbon dioxide was recorded in all standpipes, with marginally elevated concentrations in WS01, WS02, WS03, WS06, WS11, WS102, WS103, WS401, WS402, WS403, WS405 and WS407. All of these standpipes are located within the infilled pit with the exception of WS06 (within the scrapyard compound) and WS11 (north of the infilled pit). Figure 9 below presents the distribution of carbon dioxide in relation to oxygen.

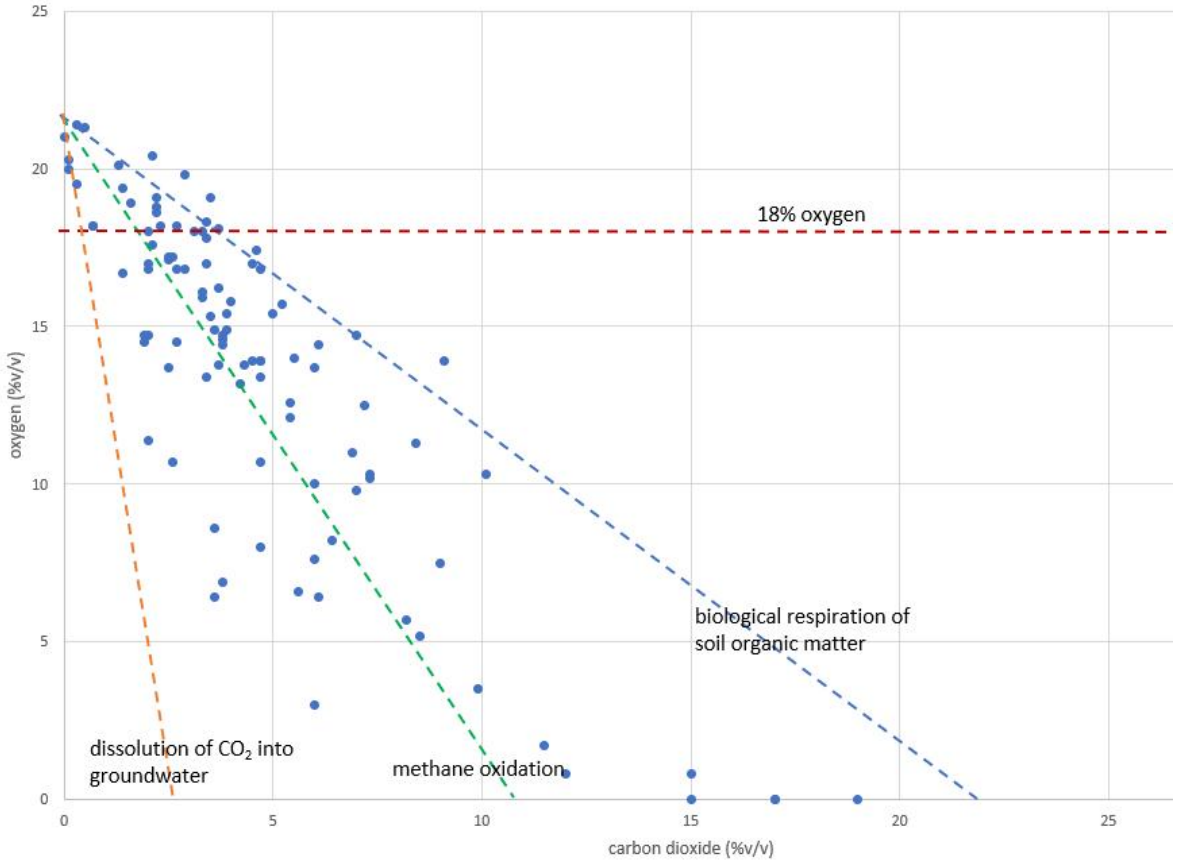


Figure 9: The relationship between oxygen and carbon dioxide

It can be seen that as in Figure 7 above, the carbon dioxide is from low risk sources, and no external source such as landfill gas generation is present.

Elevated concentrations of methane were consistently recorded within WS02 within the centre of the infilled pit, with a maximum concentration of 42.5%. WS02 was also the installation where the highest concentrations of carbon dioxide were recorded, with a maximum of 19%. Low concentrations of methane were recorded on a single occasion in BH4 (2%, located in the south of the site some distance from the infilled pit and farm complex) and WS01 (0.8%, located within the infilled pit).

No positive flow was recorded on the majority of occasions within the majority of installations. The maximum recorded flow rate was 1.3l/hr in WS02, located in the centre of the infilled pit.

The lack of notable flow indicates that the source of the methane within WS02 is residual gas stored within soils within the central area of the infilled pit, and that the bulk gas generation phase of the infill material is complete. This is supported by the lack of methane or positive flow recorded in other standpipes located within the pit. All the results indicate gas is migrating by diffusive flow only from a

‘reservoir’ within the deeper central area of the infilled pit. The migration would be along a diffusive continuum, with equilibrium being maintained at the outer boundary of the fill.

No groundwater was recorded on any monitoring event, with the exception of at the base of BH101 at a depth of 20m.

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5. PRELIMINARY QUALITATIVE GAS RISK ASSESSMENT

Current UK guidance in the form of BS8485:2015[5] identifies the first steps of the risk assessment process for methane and carbon dioxide as follows:

Step 1: Define conceptual site model

Step 2: Develop risk model and qualitative assessment

Step 3: Pollutant linkage identified?

The risk model develops the conceptual model to identify potential sources of gas, receptors that could be affected, and possible pathways by which the gas could reach the receptors and cause harm.

5.1 Sources

The information presented above has identified a potential source of gas within the site boundary in the form of an infilled chalk pit in the western part of the site. Exploratory hole records have identified significant thicknesses of made ground in this area, with the greatest thickness confined to the area identified as a chalk pit on historic map, although a lesser thickness extends outwards from this feature, predominantly to the east. Due to the age of the infill in the chalk pit (>40 years), biodegradation of all material that is easily and quickly biodegradable (simple carbon forms) will be complete at this time. The remainder (more complex carbon forms) represents a gas generation source that will continue to biodegrade slowly over a long period but does not represent a source of bulk gas generation.

It is normal for areas of aged landfill such as this to represent a 'reservoir' of gases stored within less permeable materials, which acts as a continued source of gas which will migrate outwards and to the surface by diffusive mechanism along a continuum that equates to atmospheric concentrations at the ground surface and reaches a soil equilibrium at a distance from the source. Over time, various changes will occur, with the central core of the reservoir reducing in size as oxygen infiltrates, concentrations gradually reducing, and methane being oxidised to carbon dioxide.

[5] *Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*. British Standards, BS8485:2015.

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5.2 Pathways

Gas primarily migrates via either pressure driven (advective) flow or via diffusive flow. In general, the predominant mechanism for migration of gases from aged landfill waste such as that encountered on this site is diffusive, with no driving pressure. This is supported by the consistently negligible flow rates recorded during gas monitoring between 2011 and 2018.

As such, gas present within the made ground identified across the western part of the site will diffuse through the soils forming a continuum between the source and ground level, with only minor concentrations of gas reaching ground level, and no perceivable flow. The majority of gas will remain trapped in the soil pores or sorbed to soil particles.

5.3 Receptors

Receptors at risk from gas ingress primarily include:

- Construction workers;
- Occupants of the new buildings; and
- The new buildings' infrastructure.

5.4 Ground model

A simplistic ground model of the site as identified by intrusive investigation is presented in Figure 10 below, and an interpretation of the gas regime within the infilled pit is presented as Figure 11.

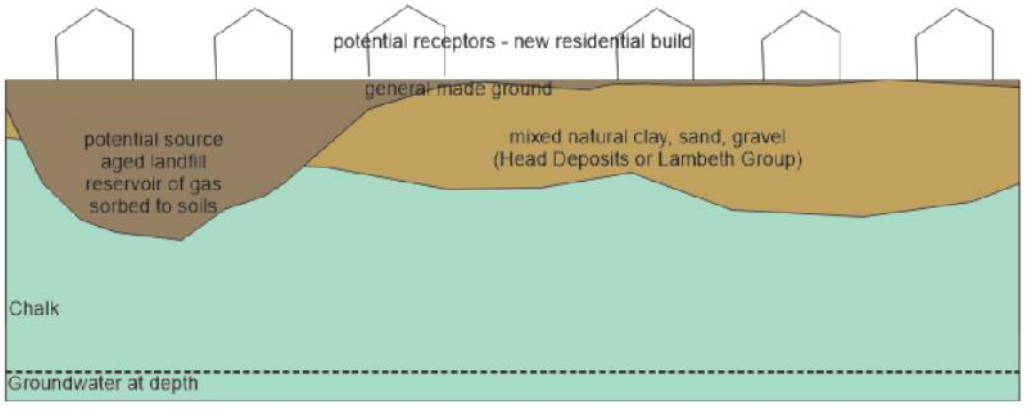


Figure 10: Simplistic ground model of western area of site

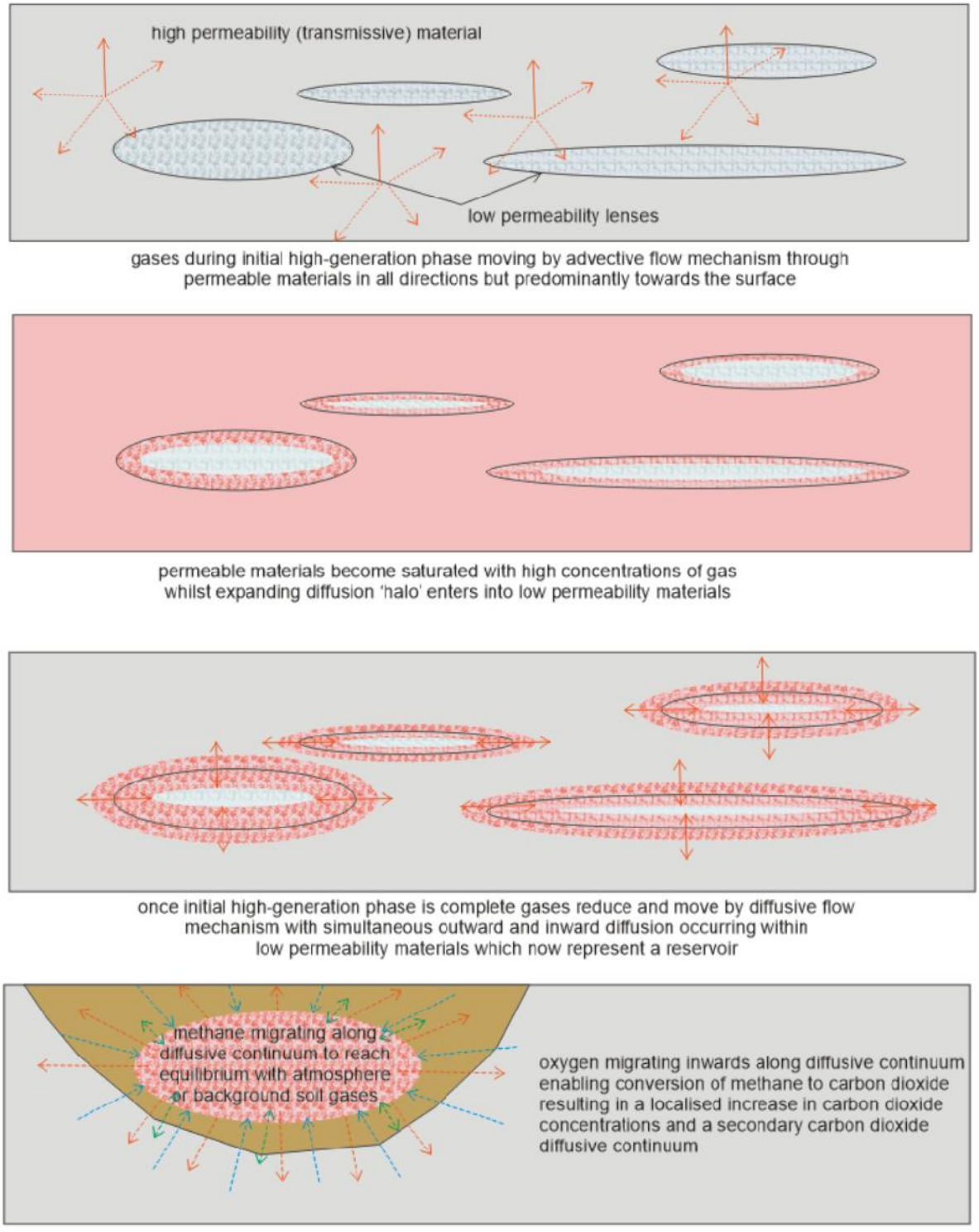


Figure 11: Low permeability soils acting as a reservoir after advective flow has ended

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In summary, a single historic source of gas has been identified as predominantly inert landfill within an infilled chalk pit, with made ground extending out beyond the perimeter of the infilled pit. Due to the age and low organic content of the fill material, it is likely to have a very low ongoing gas generation potential from residual complex carbon forms. The underlying Chalk formation and chalk gravel within the made ground represents a continuous source of low levels of carbon dioxide which should be considered as background and does not pose a risk.

Lower permeability material within the deeper centre of the pit represents an anaerobic reservoir for carbon dioxide and methane. These gases will migrate in all directions along a diffusive continuum (concentration gradient) until equilibrium is reached either with atmospheric concentrations at the surface, or with air within soil pores. A secondary diffusive continuum of oxygen will migrate into the centre, introducing oxygen into the anaerobic environment with resulting conversion of methane into carbon dioxide. This will result in a localised area of higher concentrations of carbon dioxide combined with negligible methane. Negligible flow rates support the lack of advective flow.

Based on the lines of evidence presented above, it is considered that risks to the proposed development from gas are low.

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6. SITE CHARACTERISATION

Appropriate values must be selected on which to base the quantitative risk assessment. The next step in the risk assessment process is to characterise the site and define gas screening value/s.

6.1 Gas screening value

CIRIA Report C665[6] and BS8485: 2015 detail the use of the system proposed by Wilson and Card to aid interpretation of gas monitoring results in terms of actual risk. The method uses both concentration and flow rates to define a characteristic situation for the site.

BS8485 uses the concept of the borehole hazardous gas flow rate. This is obtained by multiplying the gas concentration by the flow rate of all gases from a well. It is calculated for each monitoring event in each well. Where flow is not detected the limit of detection of the instrument is used in the calculations.

The individual values of hazardous gas flow rate obtained from several monitoring locations over a number of visits are considered collectively to establish a Gas Screening Value (GSV) for the site as a whole (or more than one if it is considered that zoning is appropriate). This requires consideration of the results in relation to the conceptual site model.

Using the GSV(s) the site is characterised as one of six characteristic situations with situation CS1 being the lowest risk and situation CS6 being the highest. In addition, there is a requirement to consider an increase from CS1 to CS2 if methane concentrations exceed 1% v/v or carbon dioxide concentrations exceed 5% v/v. It is not mandatory in either BS8485 or the NHBC guidance to automatically increase the classification of a site because of elevated gas concentrations.

In order to depict the worst-case scenario on this site a slightly amended approach has been adopted. The highest flow and concentrations recorded during spot monitoring are summarised in Table 5 below, together with the corresponding HGFR derived from these worst-case values (rather than calculating the HGFR for each set of results).

[6] C*665 Assessing risks posed by hazardous ground gases to buildings*. Construction Industry Research and Information Association, (2007);

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Table 5: Hazardous gas flow rates from worst-case results

Hole ID	Flow[3] (l/hr)	CH_4[4] (%v/v)	CO_2[4] (%v/v)	HGFR[1] CH_4	HGFR CO_2	CS[2]
BH1	0.1	0.1	4.7	0.0001	0.0047	CS1
BH2	0.3	0.1	2.7	0.0003	0.0081	CS1
BH4	0.6	2.0	3.6	0.012	0.0216	CS1
WS01	0.1	0.8	15.0	0.0008	0.015	CS1
WS02	**1.3**	**42.5**	**19**	**0.5525**	**0.247**	**CS2**
WS03	0.5	0.1	8.2	0.0005	0.041	CS1
WS04	0.1	0.1	2.6	0.0001	0.0026	CS1
WS05	0.3	0.1	3.5	0.0003	0.0105	CS1
WS06	0.1	0.1	6.0	0.0001	0.006	CS1
WS11	0.3	0.1	5.4	0.0003	0.0162	CS1
BH101	0.2	0.1	3.8	0.0002	0.0076	CS1
BH102	0.1	0.1	1.3	0.0001	0.0013	CS1
WS101	0.2	0.1	3.5	0.0002	0.007	CS1
WS102	0.1	0.1	9.9	0.0001	0.0099	CS1
WS103	0.1	0.1	8.4	0.0001	0.0084	CS1
WS108	0.1	0.1	3.4	0.0001	0.0034	CS1
WS401	0.1	0.1	7.3	0.0001	0.0073	CS1
WS402	0.1	0.1	7.3	0.0001	0.0073	CS1
WS403	0.1	0.1	5.2	0.0001	0.0052	CS1
WS404	0.1	0.1	2.3	0.0001	0.0023	CS1
WS405	0.1	0.1	11.5	0.0001	0.0115	CS1
WS406	0.1	0.1	3.3	0.0001	0.0033	CS1
WS407	0.1	0.1	10.1	0.0001	0.0101	CS1

1. HGFR is hazardous gas flow rate as defined in BS8485:2015
2. CS is characteristic situation as defined in BS8485:2015, based solely on the assumption that the HGFR represents the Gas Screening Value (GSV)
3. All recorded negative and zero flows have been substituted with 0.1l/hr for calculation of HGFR
4. All concentrations recorded as 0% have been substituted with 0.1% for calculation of HGFR

It can be seen that even when considering the worst-case concentrations and flow rates, all but one of the standpipes present gas conditions representative of characteristic situation 1 (i.e. requiring no gas protection measures). The exception is WS02, which presents gas conditions representative of CS2.

In this instance, based on HGFRs only, the guidance identifies that the hazard potential is very low to low, however the following factors are relevant on this site:

- The landfill materials on the site are over 40 years old;
- The source of gas is from gas held in soil pore spaces;
- No advective flow has been identified;
- In some instances, the concentrations of methane are above 30%; and
- The development is to include housing.

Given the sensitivity of the proposed development, further consideration is required to aid professional judgement.

6.2 WS02

As the sole standpipe to demonstrate gassing conditions in excess of a hazardous gas flow rate indicative of characteristic situation 1, the location, ground conditions and construction of WS02 should be considered in comparison to other standpipes in the direct vicinity. Figure 12 illustrates the approximate location of WS02 together with other standpipes within the infilled pit, with the recorded thickness of made ground in each location.

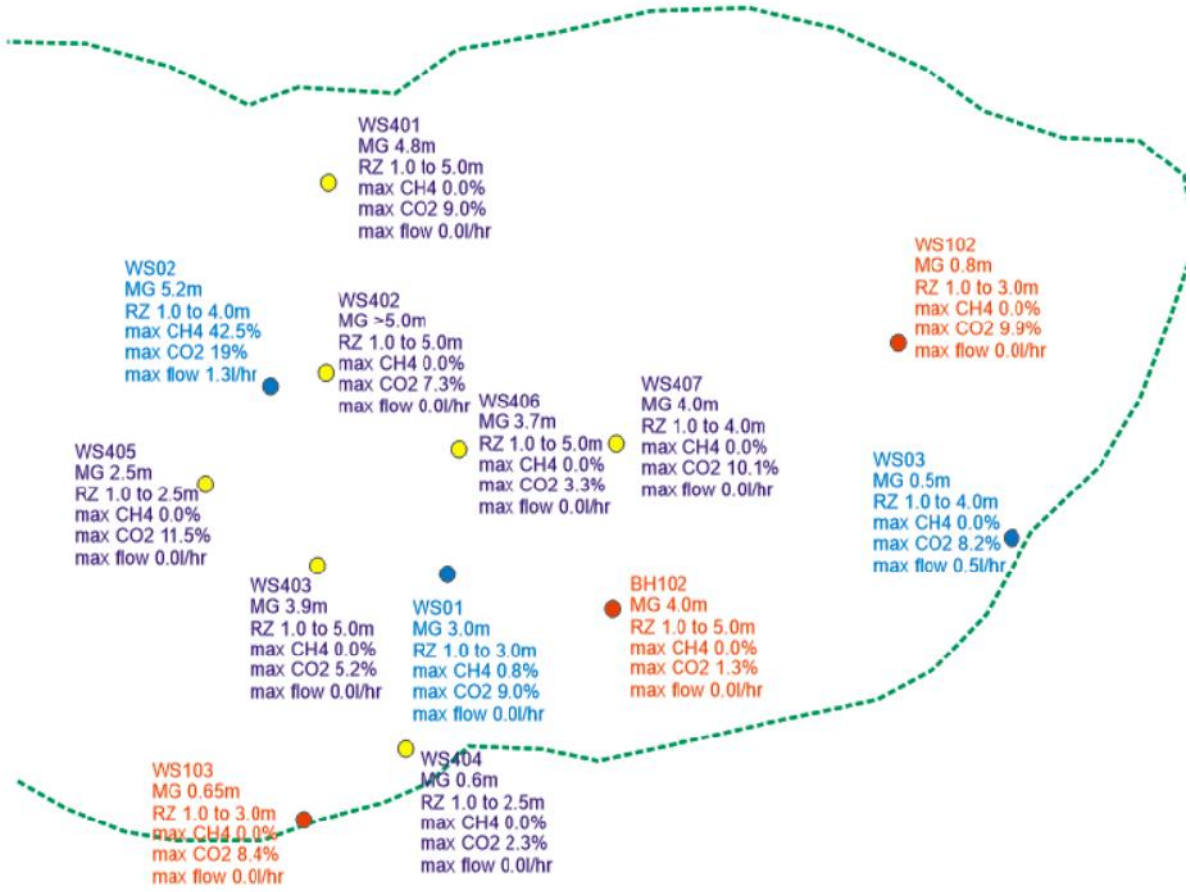


Figure 12: Location and details of WS02 in comparison to other standpipes

It can be seen that WS02 is not outstanding either in the thickness of made ground penetrated, or the depth of the response zone, however it is located in the centre of the mass of fill material and as such will be at the furthest point from any lateral ingress of fresh air, and at the centre of the concentration gradients presented in Figure 8 above (CH_4, CO_2 and O_2).

It is notable that WS02 is the only standpipe within the deeper area of fill where flow was recorded above the level of detection of 0.1l/hr. The recorded flows within WS02 were consecutively 0.2l/hr, 0.3l/hr, 0.0l/hr and 1.3l/hr, which supports the conclusion that no advective flow is occurring – even the slightest pressure driven flow would result in consistently positive flow. The variable flow between 0.0l/hr and 1.3l/hr is suggestive of a 'chimney' effect linked to granular material in contact with the response zone of the standpipe. A consideration of the recorded ground conditions identifies that a layer of granular material described as sandy gravel of brick and concrete was encountered between 0.8m and 1.2m, which would support this conclusion.

This granular layer would also result in the consistently high concentrations of gas within WS02. Diffusive flow through granular material occurs much more rapidly than in cohesive material, as the majority of pores in cohesive material are discrete (not interconnected), thus restricting movement along a concentration gradient. When diffusion into a well headspace occurs via permeable material, the headspace rapidly reaches equilibrium with the adjacent interconnected soil pore spaces. When diffusion into a well headspace occurs through impermeable material, it can take weeks to reach equilibrium, and each time the well is opened and dipped it's vented to air so the process must start again.

6.3 Carbon dioxide vs methane

It is notable that within WS02 in the centre of the mass of fill elevated concentrations of methane are combined with elevated concentrations of carbon dioxide, where as further out from the centre methane concentrations reduce to 0.0% (0.8% in WS01 on one occasion) whilst carbon dioxide concentrations remain elevated, although to a lesser extent.

It is known that the bulk gas generation phase of landfill the carbon dioxide:methane ratio is approximately 4:6. The measured concentrations have been combined with the prevalent gases in the atmosphere (oxygen and nitrogen) to make 100% and presented in a ternary plot to identify gases in the approximate range of landfill gas ratio (Figure 13).

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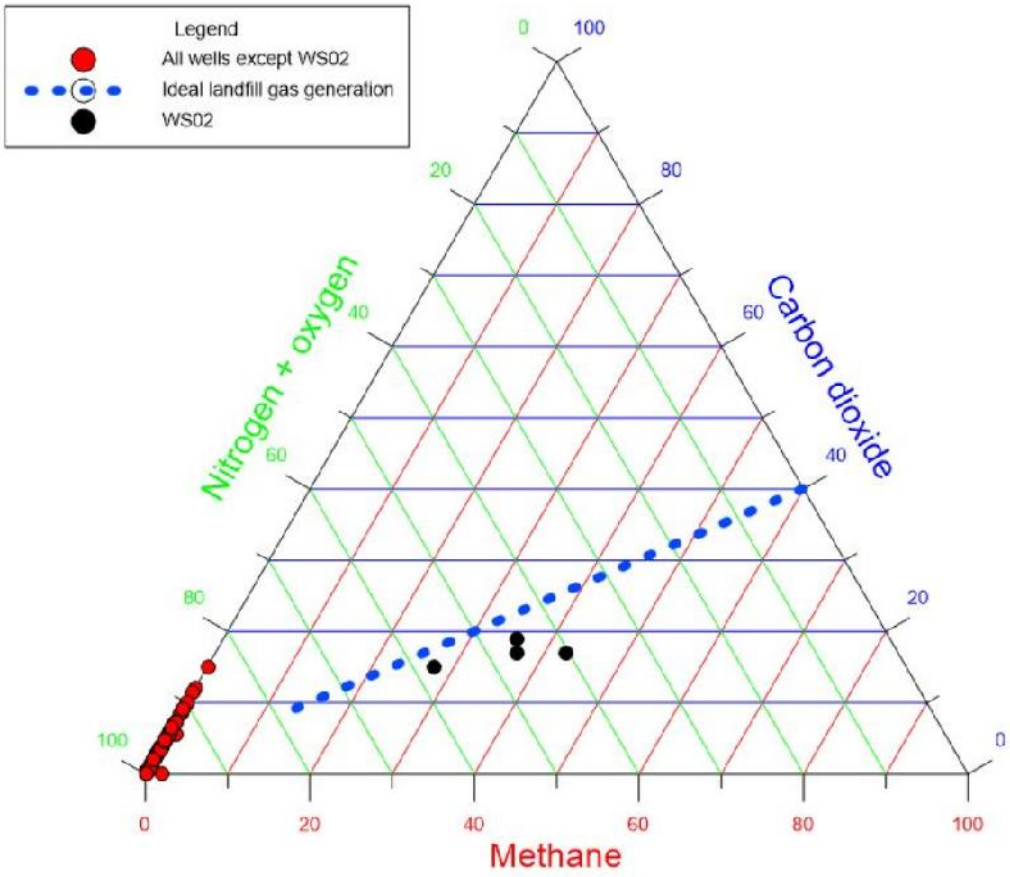


Figure 13: Ternary plot illustrating monitoring results in the context of landfill CO_2:CH_4 ratio

It can be seen that although significantly diluted, the concentrations recorded in WS02 are in the correct ratio to be representative of fresh landfill gas. This supports the conclusion that the centre of the fill is acting as a reservoir for gas generated in the phase of bulk gas generation shortly after the pit was infilled, and that aerobic conditions have not yet returned to this area. It is what is known as an anaerobic hotspot within the fill. The dilution also supports the hypothesis about the migration of gas by diffusion via the permeable layer into the well headspace until equilibrium is reached – the fresh air within the well headspace will create its own diffusive concentration gradient outwards from the response zone, with a resultant dilution of concentrations at equilibrium. It is feasible that within the pore spaces of the cohesive soils concentrations of carbon dioxide and methane are significantly higher than those recorded during monitoring, however these elevated concentrations will never reach the ground surface.

The ternary plot identifies that with the exception of WS02, no monitoring results are within the zone of fresh landfill gas ratios. The results for WS02 show diluted gas that is not in the phase of active gas generation.

6.4 Carbon dioxide

It is notable that even though concentrations of methane elsewhere throughout the infilled pit are recorded as 0.0%, elevated concentrations of carbon dioxide have been recorded in some standpipes. The main source is most likely biological respiration as explained previously. However, this may also be a result of the confluence of diffusive continuums as presented in schematic form in Figure 11 above. The following processes will be occurring in combination:

- Methane and carbon dioxide migrate out from the anaerobic centre of the mass, in all directions along a diffusion gradient;
- Oxygen migrates in towards the centre of the mass, from all directions along a diffusion gradient;
- As oxygen enters previously aerobic areas, it reacts with methane to produce hydrogen (or H_2O) and carbon dioxide, resulting in a reduction in methane and oxygen concentrations and an increase in carbon dioxide concentrations.

The migration occurs very slowly along tortuous paths, which is why many years after the active gas generation phase has ended high concentrations of gas are still present within the soils. Much of the gas will also be sorbed to soil particles or trapped in pore spaces until such time as something ruptures the soil skeleton (for example the excavation of a borehole and the introduction of a standpipe). Once this occurs, a new diffusive continuum will generate incorporating the fresh air (oxygen) introduced by the process. Unless permeable soils are present, the reaching of an equilibrium within the headspace will take place very slowly. In the absence of permeable soils, this will take place so slowly that any methane reaching the headspace will be converted to carbon dioxide by the available oxygen. Hence the elevated carbon dioxide and the coincidental reduction in oxygen concentrations recorded in a number of standpipes.

6.5 Discussion

The site characterisation identified that hazardous gas flow rates based on worse-case monitoring results all indicate that the site is a characteristic situation 1, with the exception of those recorded in WS02. A detailed consideration of the gas regime within the infilled chalk pit has concluded that the elevated methane and carbon dioxide recorded in WS02, combined with the negligible flow rates, are indicative of a reservoir of gas in the centre of the pit, sorbed to soil surfaces or trapped in pore spaces. The extent of the reservoir will continue to decrease with time as oxygen migrates inwards. In the short term, the influx of oxygen will result in a reduction in methane and oxygen and an increase in carbon dioxide concentrations. There is no evidence of advective flow, which is supported by the age and nature of the fill, including the total organic carbon content.

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This interpretation of the gas regime indicates that no gas will be released at the soil surface. To explore another line of evidence to support this hypothesis, a surface emissions survey has been undertaken. The results are presented below in Section 7.

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7. SURFACE EMISSIONS SURVEY

It is considered that the elevated concentrations of gas recorded in a single standpipe in 2100 are representative of high concentrations of gas stored in soil pores in the centre of the infilled chalk pit. As oxygen migrates inwards, the anaerobic conditions conducive to the continued presence of methane will continue to decrease laterally, resulting in a minor rise in carbon dioxide concentrations in the short-term. No advective flow has been identified, and the recorded concentrations do not translate into equivalent surface emissions.

In order to demonstrate this, a surface emissions survey has been undertaken across the area of the infilled pit. The surface of the site was surveyed on the 21st September 2018, using a TDL500 Laser methane detector connected to a Getac PDA to log surface methane concentrations and GPS locations at three second intervals. It was undertaken on a 5m transect/grid spacing. The results are presented below as a contour plot (Figure 14) and at a larger scale showing the grid points in Appendix B.



Figure 14: Surface emissions survey results

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Background levels of methane in the UK vary dependent on location but are widely reported as being 1.7ppm to 1.8ppm. The survey comprised a total of 835 monitoring points, of which 87% were ≤1.8ppm. Of the remaining 13% of readings, the average was 2.0ppm and all can be considered as negligible levels. No concentrations were recorded above 2.2ppm (0.00022%).

The results indicate that there are no significant surface emissions across the infilled pit.

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8. DETAILED QUANTITATIVE RISK ASSESSMENT

The ground model schematic for the site, as defined by EPG's preliminary gas risk assessment, is graphically presented in Figure 15.

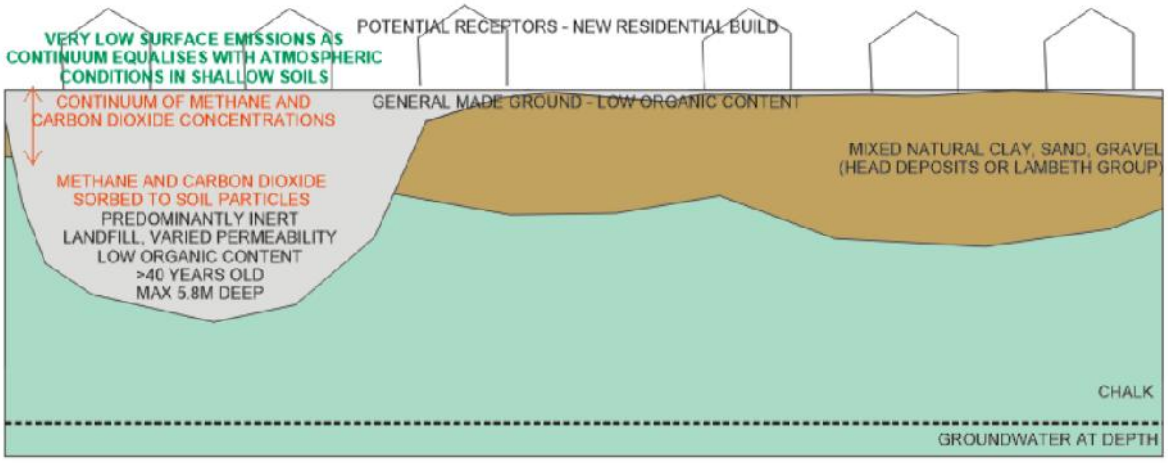


Figure 15: Ground model for Woodcroft Farm

Characteristic situation is defined within BS8485:2015 not only by the calculated HGFR but by additional factors in terms of maximum concentrations and hazard potential – for clarification an extract of the appropriate table from BS8485:2015 is reproduced in Figure 16 below:

Table 2 CS by site characteristic GSV

CS	Hazard potential	Site characteristic GSV [A] L/h	Additional factors
CS1	Very low	<0.07	Typically <1% methane concentration and <5% carbon dioxide concentration (otherwise consider an increase to CS2)
CS2	Low	0.07 to <0.7	Typical measured flow rate <70 L/h (otherwise consider an increase to CS3)
CS3	Moderate	0.7 to <3.5	–
CS4	Moderate to high	3.5 to <15	–
CS5	High	15 to <70	–
CS6	Very high	>70	–

[A] The figures used in this column are empirical.

NOTE The CS is equivalent to the characteristic GSV in CIRIA C665 [6].

Figure 16: Extract from table 2, BS8485:2015

The HGFRs are considered along with the other information and a representative value of GSV is chosen for the site. In this instance, based on the 'look up' table, the guidance identifies that the hazard potential is very low to low. However, all current UK guidance recommends professional judgement be applied in determining the actual risk and appropriate mitigation requirements.

When considered in accordance with NHBC guidance[7], much greater emphasis is placed on concentrations of gas recorded. The maximum calculated HGFR (referred to as GSVs in the NHBC guidance) presented in Table 5 would place the site in the Amber 1/ category, however all the others would be in the green category. The recorded gas concentrations indicate that **consideration** should be given as to whether the site should be characterized as Red. For clarification, an extract of the appropriate table from the NHBC guidance is reproduced in Figure 17 below:

Traffic Light Classification	Methane [1]		Carbon Dioxide [1]	
	Typical Maximum Concentration [3] (%v/v)	Gas Screening Value [2,4] (l/hr)	Typical Maximum Concentration [3] (%v/v)	Gas Screening Value [2,4] (l/hr)
Green	1	0.16	5	0.78
Amber 1	5	0.63	10	1.56
Amber 2	20	1.56	30	3.10
Red				

Figure 17: Extract from Table 14.1, NHBC guidance

It can be seen that the maximum recorded methane concentration of 42.5% would place the site in the Red category in accordance with NHBC guidance. However as discussed above the maximum concentration was only present in a single standpipe located in the centre of the infilled pit and is not representative of surface gas emissions, as supported by the results of the surface emission survey.

BS8485:2015 advises that a detailed quantitative assessment of gas emissions should be carried out in appropriate situations, such as where the approach undertaken above suggests an over-conservative assessment of risk. All the lines of evidence presented in the preceding sections indicate that the prevalent migration mechanism of gases across the site is diffusive flow. As such, in order to

[7] *Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present*. NHBC, 2007

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provide additional decision-making information, modelling of predicted gas flow into the buildings through the floor slab via diffusive flow has been undertaken.

8.1 Assessment of risk - diffusion

Modelling of gas flowing into the proposed development by diffusion has been completed using the method of analysis as described by Wilson[8]. This uses the equations for diffusive flow of gas through the ground and dilution of gas inside a building. The rate of gas flow by diffusion is given by:

$$E = \frac{A_B\left(C_{source} - C_{g0}\right)D^{eff}}{L}$$

Where:

A_B = cross sectional area of gas migration pathway

C_{g0} = gas concentration at top of soil

C_{source} = gas concentration in soil

D^{eff} = effective diffusion coefficient of soil (or annulus around pile)

E = rate of mass transfer by diffusion

L = length of migration pathway (depth to source in soil)

The equilibrium methane concentration inside the building (in units of mass per volume) is given by:

$$Q_{building}C_{building} = Q_{entry}$$

Where:

$C_{building}$ = equilibrium concentration of vapour in building under steady state conditions

$Q_{building}$ = flow rate of fresh air into building

Q_{entry} = rate of vapour migration into building

[8] Land Contamination and Reclamation, 16 (3) *Modular approach to analysing vapour migration into buildings in the UK*. 2008

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In this equation $Q_{building}$ has units of volume/time and Q_{entry} has units of mass/time.

The parameters for a residential building have been used as defined in CLEA briefing notes 2 and 3[9/10]. The parameters used are summarised in Table 6.

Table 6: Summary of parameters for analysis (CLEA default for residential)

Parameter	Value	Comment
Length of building, L	2m	Based on small room within the building as worst case
Width of building, W	2m	
Occupied space height, h	2.4m	Assumed ceiling height from SR3[11]
Internal ventilation air change rate, V	0.5 h^{-1}	Used to calculate $Q_{building}$
Depth to source of gas, L	0.5m	Assume gas is present within shallow infill soils, although in reality gas within shallow soils will be diluted by atmospheric ingress.
Air filled porosity of soil, θ_v	0.15	Assume soil through which gas migrates is a Loam. Used to calculated effective diffusion coefficient for soil
Water filled porosity of soil, θ_w	0.36	
Methane concentration in landfill, C_{source}	42.5%v/v	Maximum value recorded
Ambient temperature in the ground, T	10 ^oC	

The results of the analysis using worse case assumptions (42.5% methane) indicate an equilibrium concentration of methane of 0.028% inside the building. This also ignores the retardation provided by the floor slab construction (it assumes the floors are bare soil) and ignores the effect of any ventilated underfloor void. Therefore, even if gas concentrations in the ground increase to 100%, or the building ventilation reduces to a tenth of the assumed value, the risk from gas migration remains negligible. The results of the modelling are presented in Appendix C.

[9] *CLEA briefing note 2: update on estimating vapour intrusion into buildings*. Environment Agency, 2004, version 1.1

[10] *CLEA briefing note 3: update of supporting values and assumptions describing UK building stock*. Environment Agency, 2004, version 1.1

[11] *Updated technical background to the CLEA model. Science report: SC050021/SR3*. Environment Agency, 2009.

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9. CONCLUSIONS AND RECOMMENDATIONS

In summary, the site currently has a negligible gas generation potential. Importantly there is no evidence of material that could cause surface emissions of gas out of the ground in large volumes. There are localised elevated concentrations of methane in the centre of the infilled chalk pit, and carbon dioxide radiating out from the centre, but there is no evidence of advective flow.

All the lines of evidence explored above, including a surface emissions survey, indicate that there is no risk of elevated concentrations of gas reaching the soil surface. To support this, using the highest recorded concentration of methane within diffusion modelling shows that there is negligible risk of gas emissions into the proposed buildings.

In conclusion, it is considered that the site should be designated as NHBC Green, requiring no gas protection measures.

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Appendix A

Gas monitoring results

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POST FIELDWORK MONITORING RECORD (PBA 1)

Job Title	Woodcroft Farm, Waterlooville
Job No	21834/030
Date	08/09/2011
Operator	Arie Zamler

CALIBRATION			
	Limits (%)	Cal Gas *Start/ End*	Air *Start/ End*
CH4 (5%)	4.5 - 5.5	4.7/4.7	0.0/0.0
CO2 (5%)	4.5 - 5.5	6.1/6.1	0.0/0.0
02 (6%)	5.0 - 7.0	5.5/5.5	21.2/21.1

Instrument (type/serial no) and date of last manufacturers service	

Atmospheric Pressure	Time	- 48 hrs	- 24 hrs	0	+ 24 hrs	+ 48 hrs	Comment
	mbar	unknown	1006	1004	1010	1002	

Ground conditions	Firm and dry

Weather	Overcast and mild

Borehole identification and construction BH1

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	-1.7	1005	0.0	1.8	12.1	0.0	0.0	DRY	5.18
1 to 2	-0.9		0.0	1.9	11.7	0.0	0.0		
2 to 3	-1.1		0.0	2.0	11.4	0.0	0.0		

Borehole identification and construction BH2

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.2/0.0	1004	0.0	0.7	18.3	0.0	0.0	DRY	7.03
1 to 2			0.0	1.1	17.6	0.0	0.0		
2 to 3			0.0	1.4	16.7	0.0	0.0		

Borehole identification and construction BH3

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.2/0.0	1004	0.0	0.7	16.8	0.0	0.0	6.49	7.02
1 to 2			0.0	0.7	16.5	0.0	0.0		
2 to 3			0.0	1.4	13.6	0.0	0.0		

Borehole identification and construction BH4

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.6/0.2	1004	0.0	1.7	15.9	0.0	0.0	DRY	6.92
1 to 2			0.0	1.9	15.2	0.0	0.0		
2 to 3			0.0	2.0	14.7	0.0	0.0		

Borehole identification and construction WS1

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1004	0.0	3.3	10.8	0.0	0.0	DRY	3.12
1 to 2			0.0	4.1	8.0	0.0	0.0		
2 to 3			0.0	6.0	7.6	0.0	0.0		

Typed By: Arie Zamler Date 08/09/2011 Checked By: Date

Borehole identification and construction			WS2						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.2/0.0	1004	27.5	15.0	0.0	>>>	0.0	DRY	4.20
1 to 2			26.0	15.0	0.0	>>>	0.0		
2 to 3			25.0	15.0	0.0	>>>	0.0		

Borehole identification and construction			WS3						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1004	0.0	5.2	5.5	0.0	0.0	DRY	4.08
1 to 2			0.0	6.0	6.2	0.0	0.0		
2 to 3			0.0	6.1	6.4	0.0	0.0		

Borehole identification and construction			WS4						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.1/0.0	1004	0.0	1.4	17.3	0.0	0.0	DRY	3.13
1 to 2			0.0	2.0	17.2	0.0	0.0		
2 to 3			0.0	2.6	17.2	0.0	0.0		

Borehole identification and construction			WS5						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.3/0.0	1004	0.0	3.1	15.9	0.0	0.0	DRY	4.08
1 to 2			0.0	3.3	15.9	0.0	0.0		
2 to 3			0.0	3.2	15.9	0.0	0.0		

Borehole identification and construction			WS6						
Comment/Condition	Not accesable								
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1									
1 to 2									
2 to 3									

Borehole identification and construction			WS11						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1004	0.0	3.6	14.8	0.0	0.0	DRY	2.74
1 to 2			0.0	3.8	14.7	0.0	0.0		
2 to 3			0.0	3.8	14.7	0.0	0.0		

Typed By:	Arie Zamler	Date	08/09/2011	Checked By:		Date	

POST FIELDWORK MONITORING RECORD (PBA 1)

Job Title	Woodcroft Farm, Waterlooville
Job No	21834/030
Date	14/09/2011
Operator	Arie Zamler

CALIBRATION			
	Limits (%)	Cal Gas *Start/ End*	Air *Start/ End*
CH4 (5%)	4.5 - 5.5	4.5/4.6	0.0/0.0
CO2 (5%)	4.5 - 5.5	5.4/5.8	0.0/0.0
02 (6%)	5.0 - 7.0	5.7/5.5	21.3/21.1

Instrument (type/serial no) and date of last manufacturers service	

Atmospheric Pressure	Time	- 48 hrs	- 24 hrs	0	+ 24 hrs	+ 48 hrs	Comment
	mbar	unknown	1013	1020	1021	1017	Rising pressure

Ground conditions	Firm and dry

Weather	Sunny and mild

Borehole identification and construction BH01

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0/0.1	1015	0.0	2.3	12.0	0.0	0.0	DRY	5.18
1 to 2			0.0	2.6	11.1	0.0	0.0		
2 to 3			0.0	2.6	10.7	0.0	0.0		

Borehole identification and construction BH02

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.3/0.0	1013.0	0.0	1.8	15.0	0.0	0.0	DRY	7.03
1 to 2			0.0	1.9	14.8	0.0	0.0		
2 to 3			0.0	1.9	14.5	0.0	0.0		

Borehole identification and construction BH03

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.1/0.0	1013	0.0	1.7	11.2	0.0	0.0	DRY	7.02
1 to 2			0.0	1.7	11.2	0.0	0.0		
2 to 3			0.0	1.7	11.2	0.0	0.0		

Borehole identification and construction BH04

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1015	0.3/0.2	0.0	21.0	6.0	0.0	DRY	6.92
1 to 2			1.0	0.0	21.0	20.0	0.0		
2 to 3			2.0	0.0	21.0	40.0	0.0		

Borehole identification and construction WS01

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0/0.1	1014	0.8/0.7	2.0	13.8	14.0	0.0	DRY	3.13
1 to 2			0.8/0.6	3.0	12.1	13.0	0.0		
2 to 3			0.8/0.7	5.6	6.6	10.0	0.0		

Typed By: Arie Zamler Date Checked By: Date

Borehole identification and construction			WS02						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.3/0.0	1014	42.5/40.0	17.0/16.0	0.0	>>>	0.0	DRY	4.20
1 to 2			38.0/36.5	16.0	0.0	>>>	0.0		
2 to 3			31.0	13.0	0.0	>>>	0.0		

Borehole identification and construction			WS04						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0/0.1	1013	0.0	1.3	17.8	0.0	0.0	DRY	3.12
1 to 2			0.0	1.9	17.6	0.0	0.0		
2 to 3			0.0	2.1	17.6	0.0	0.0		

Borehole identification and construction			WS05						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0/0.2	1013	0.0	3.3	15.5	0.0	0.0	DRY	4.1
1 to 2			0.0	3.5	15.4	0.0	0.0		
2 to 3			0.0	3.5	15.3	0.0	0.0		

Borehole identification and construction			WS11						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.3/0.0	1013	0.0	4.1	13.8	0.0	0.0	DRY	2.7
1 to 2			0.0	4.3	13.8	0.0	0.0		
2 to 3			0.0	4.3	13.9	0.0	0.0		

Borehole identification and construction			Water well						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	-	-	-	-	-	-	-	30.13	-
1 to 2									
2 to 3									

Borehole identification and construction									
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1									
1 to 2									
2 to 3									

Typed By:	Arie Zamler	14/09/2011 Date	Checked By:	Date

POST FIELDWORK MONITORING RECORD (PBA 1)

Job Title	Woodcroft Farm, Waterlooville
Job No	21834/030
Date	22/09/2011
Operator	Arie Zamler

CALIBRATION			
	Limits (%)	Cal Gas *Start/ End*	Air *Start/ End*
CH4 (5%)	4.5 - 5.5	4.5/4.5	0.0/0.0
CO2 (5%)	4.5 - 5.5	5.8/5.7	0.0/0.0
02 (6%)	5.0 - 7.0	5.6/5.7	21.3/21.1

Instrument (type/serial no) and date of last manufacturers service	

Atmospheric Pressure	Time	- 48 hrs	- 24 hrs	0	+ 24 hrs	+ 48 hrs	Comment
	mbar	1019	1017	1021	1018	1014	

Ground conditions	Wet after heavy rain in the previoues day

Weather	Overcast and mild

Borehole identification and construction BH01

Comment/Condition Cover partially filled wih water, water removed.

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	-0.6	1017	0.0	3.8	7.1	0.0	0.0	DRY	5.20
1 to 2			0.0	3.5	7.0	0.0	0.0		
2 to 3			0.0	3.8	6.9	0.0	0.0		

Borehole identification and construction BH02

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1015	0.0	2.4	13.9	0.0	0.0	DRY	7.12
1 to 2			0.0	2.5	13.7	0.0	0.0		
2 to 3				2.5	13.7	0.0	0.0		

Borehole identification and construction BH03

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.2/0.0	1004	0.0	0.7	16.8	0.0	0.0	4.50	7.02
1 to 2			0.0	0.9	16.5	0.0	0.0		
2 to 3			0.0	1.4	13.6	0.0	0.0		

Borehole identification and construction BH04

Comment/Condition Some water in the cover

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1017	0.0	3.6	6.4	0.0	0.0	DRY	6.92
1 to 2			0.0	3.5	6.4	0.0	0.0		
2 to 3			0.0	3.4	6.4	0.0	0.0		

Borehole identification and construction WS01

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1017	0.0	12.0	0.8	0.0	0.0	DRY	3.12
1 to 2			0.0	12.0	0.8	0.0	0.0		
2 to 3			0.0	12.0	0.8	0.0	0.0		

Typed By: Arie Zamler Date 22/09/2011 Checked By: Date

Borehole identification and construction	WS02								
Comment/Condition	Cover partially full with water.								
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1017	36.5	17.0	0.0	>>>	0.0	DRY	4.20
1 to 2			34.5	17.0	0.0	>>>	0.0		
2 to 3			33.0	17.0	0.0	>>>	0.0		

Borehole identification and construction	WS03								
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1016	0.0	4.5	17.3	0.0	0.0	DRY	4.08
1 to 2			0.0	4.2	17.0	0.0	0.0		
2 to 3			0.0	4.3	17.0	0.0	0.0		

Borehole identification and construction	WS04								
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1016	0.0	0.8	17.9	0.0	0.0	DRY	3.12
1 to 2			0.0	1.9	17.3	0.0	0.0		
2 to 3			0.0	2.5	17.1	0.0	0.0		

Borehole identification and construction	WS05								
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1015/1016	0.0	2.0	17.5	0.0	0.0	DRY	4.12
1 to 2			0.0	2.7	17.0	0.0	0.0		
2 to 3			0.0	2.7	16.8	0.0	0.0		

Borehole identification and construction	WS11								
Comment/Condition	Cover filled with water water is removed.								
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.1/0.0	1017	0.0	2.9	14.4	0.0	0.0	DRY	2.73
1 to 2			0.0	3.4	14.1	0.0	0.0		
2 to 3			0.0	3.7	13.8	0.0	0.0		

Borehole identification and construction									
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1									
1 to 2									
2 to 3									

Typed By: Arie Zamler Date 22/09/2011 Checked By: Date

POST FIELDWORK MONITORING RECORD (PBA 1)

Job Title	Woodcroft Farm, Waterlooville
Job No	21834/030
Date	28/09/2011
Operator	Arie Zamler

CALIBRATION			
	Limits (%)	Cal Gas *Start/ End*	Air *Start/ End*
CH4 (5%)	4.5 - 5.5		
CO2 (5%)	4.5 - 5.5		
02 (6%)	5.0 - 7.0		

Instrument (type/serial no) and date of last manufacturers service	

Atmospheric Pressure	Time	- 48 hrs	- 24 hrs	0	+ 24 hrs	+ 48 hrs	Comment
	mbar	1026	1029	1025	1022	1022	Falling pressure

Ground conditions	Firm and dry

Weather	Sunny and warm

Borehole identification and construction BH01

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1021	0.0	4.6	8.2	0.0	0.0	DRY	5.18
1 to 2			0.0	4.6	8.0	0.0	0.0		
2 to 3			0.0	4.7	8.1	0.0	0.0		

Borehole identification and construction BH02

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.1/0.0	1021.0	0.0	2.7	14.5	0.0	0.0	DRY	7.03
1 to 2			0.0	2.6	14.4	0.0	0.0		
2 to 3			0.0	2.7	14.5	0.0	0.0		

Borehole identification and construction BH03

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1019	0.0	1.8	8.8	0.0	0.0	4.05	7.02
1 to 2			0.0	1.8	8.7	0.0	0.0		
2 to 3			0.0	1.7	8.7	0.0	0.0		

Borehole identification and construction BH4

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1021	0.0	3.5	8.8	0.0	0.0	DRY	6.92
1 to 2				3.5	8.7	0.0	0.0		
2 to 3				3.6	8.6	0.0	0.0		

Borehole identification and construction WS01

Comment/Condition

Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1021	0.0	15.0	0.8	0.0	0.0	DRY	3.12
1 to 2			0.0	15.0	0.7	0.0	0.0		
2 to 3			0.0	15.0	0.8	0.0	0.0		

Typed By: Arie Zamler Date 29/09/2011 Checked By: Date

Borehole identification and construction			WS02						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	1.3/0.3	1021	35.5	19.0	0.0	>>>	1.2/1.1	DRY	4.20
1 to 2			34.5	16.0	0.0	>>>	1.1		
2 to 3			32.5	16.0	0.0	>>>	1.1		

Borehole identification and construction			WS03						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.5/0.0	1020	0.0	7.5	5.0	0.0	0.0	DRY	4.08
1 to 2				8.1	5.5	0.0	0.0		
2 to 3				8.2	5.7	0.0	0.0		

Borehole identification and construction			WS04						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1021	0.0	0.8	17.8	0.0	0.0	DRY	3.14
1 to 2				1.6	17.0	0.0	0.0		
2 to 3				2.0	17.0	0.0	0.0		

Borehole identification and construction			WS05						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1021	0.0	2.3	17.3	0.0	0.0	DRY	4.09
1 to 2			0.0	2.5	17.2	0.0	0.0		
2 to 3			0.0	2.4	17.2	0.0	0.0		

Borehole identification and construction			WS06						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.0	1021	0.0	5.2	12.0	0.0	0.0	DRY	2.5
1 to 2				6.0	10.0	0.0	0.0		
2 to 3				5.5	10.0	0.0	0.0		

Borehole identification and construction			WS11						
Comment/Condition									
Start time with pump time (minutes)	Flow (l/hr) Peak/Steady	Pressure (mb) Peak/Steady	CH4 (%v/v) Peak/Steady	CO2 (%v/v) Peak/Steady	O2 (%v/v) Peak/Steady	CH4 (%LEL) Peak/Steady	H2S (ppm) Peak/Steady	Groundwater Level Level (mBGL)	Depth to base (mBGL)
0 to 1	0.2/0.1	1021	0.0	5.4	12.6	0.0	0.0	DRY	2.74
1 to 2			0.0	5.4	12.7	0.0	0.0		
2 to 3			0.0	5.3	12.7	0.0	0.0		

Typed By:	Arie Zamler	Date	Checked By:	Date

IN-SITU GAS MONITORING RESULTS

[Pressures]	Previous	During	Start	End	Equipment Used & Remarks
Round 1	-	-	1013	1015	Ground: Damp + Wind: None + Air Temp: 15DegC
Round 2	-	-	1012	1012	GA2000 + Weather: Sunny + Ground: Damp + Wind: Medium + Air Temp: 14DegC
Round 3	-	-	1014	1014	GA2000 + Weather: Sunny with showers + Ground: Damp + Wind: Light + Air Temp: 15DegC

Exploratory Position ID	Monitoring Round	Measured Installation Depth (mbgl)	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
BH2	1	7.00	19/09/2016 09:55:00	-	-	-	DRY	-	-	-	-	-	-	-	
BH101	1	20.05	19/09/2016 10:04:00	1015	1015	$0.1_{(I)}$	DRY	0.1	0.0	20.8	0.0	0.6	0.0	0.0	
BH101	1	---	15 secs	1015	1015	$0.2_{(SS)}$	-	3.6	0.0	17.6	0.0	-	1.0	0.0	
BH101	1	---	30 secs	1015	1015	-	-	3.6	0.0	15.0	0.0	-	1.0	0.0	
BH101	1	---	60 secs	1015	1015	-	-	3.7	0.0	14.8	0.0	-	1.0	0.0	
BH101	1	---	90 secs	1015	1015	-	-	3.8	0.0	14.7	0.0	-	1.0	0.0	
BH101	1	---	120 secs	1015	1015	-	-	3.8	0.0	14.6	0.0	-	1.0	0.0	
BH101	1	---	180 secs	1015	1015	-	-	3.8	0.0	14.6	0.0	-	1.0	0.0	
BH101	1	---	240 secs	1015	1015	-	-	3.8	0.0	14.5	0.0	-	1.0	0.0	
BH101	1	---	300 secs	1015	1015	-	-	3.8	0.0	14.4	0.0	-	1.0	0.0	
BH101	2	20.00	18/10/2016 12:17:00	-	1012	$0.0_{(I)}$	20.00	0.0	0.0	21.4	0.0	-	-	-	
BH101	2	---	15 secs	-	1012	$0.0_{(SS)}$	-	2.9	0.0	18.5	0.0	-	-	-	
BH101	2	---	30 secs	-	1012	-	-	3.0	0.0	16.9	0.0	-	-	-	
BH101	2	---	60 secs	-	1012	-	-	3.0	0.0	16.7	0.0	-	-	-	
BH101	2	---	90 secs	-	1012	-	-	3.1	0.0	16.7	0.0	-	-	-	
BH101	2	---	120 secs	-	1012	-	-	3.1	0.0	16.6	0.0	-	-	-	
BH101	2	---	180 secs	-	1012	-	-	3.1	0.0	16.5	0.0	-	-	-	

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

RSK Environment Ltd
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Compiled By	Date	Checked By	Date	Contract Ref:
R. Speight	26/10/16			28722

Contract: **Woodcroft Farm**

AGS

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Monitoring Round	Installation Depth (mbgl)	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
BH101	3	20.00	25/10/2016 14:31:00	-	1014	$0.0_{(I)}$	20.00	0.1	0.0	21.4	0.0	-	-	-	
BH101	3	---	15 secs	-	-	$0.0_{(SS)}$	-	3.5	0.0	17.0	0.0	-	-	-	
BH101	3	---	30 secs	-	-	-	-	3.5	0.0	16.5	0.0	-	-	-	
BH101	3	---	60 secs	-	-	-	-	3.6	0.0	16.4	0.0	-	-	-	
BH101	3	---	90 secs	-	-	-	-	3.6	0.0	16.3	0.0	-	-	-	
BH101	3	---	120 secs	-	-	-	-	3.7	0.0	16.2	0.0	-	-	-	
BH101	3	---	180 secs	-	-	-	-	3.7	0.0	16.2	0.0	-	-	-	
BH102	1	5.20	19/09/2016 10:51:00	1015	1015	$0.0_{(I)}$	DRY	0.2	0.0	20.7	0.0	0.1	0.0	0.0	
BH102	1	---	15 secs	1015	1015	$0.0_{(SS)}$	-	0.4	0.0	20.7	0.0	-	1.0	0.0	
BH102	1	---	30 secs	1015	1015	-	-	0.4	0.0	20.6	0.0	-	4.0	0.0	
BH102	1	---	60 secs	1015	1015	-	-	0.4	0.0	20.6	0.0	-	3.0	0.0	
BH102	1	---	90 secs	1015	1015	-	-	0.5	0.0	20.6	0.0	-	3.0	0.0	
BH102	1	---	120 secs	1015	1015	-	-	0.5	0.0	20.5	0.0	-	2.0	0.0	
BH102	1	---	180 secs	1015	1015	-	-	0.6	0.0	20.5	0.0	-	2.0	0.0	
BH102	1	---	240 secs	1015	1015	-	-	0.8	0.0	20.4	0.0	-	1.0	0.0	
BH102	1	---	300 secs	1015	1015	-	-	1.0	0.0	20.3	0.0	-	1.0	0.0	
BH102	1	---	360 secs	1015	1015	-	-	1.2	0.0	20.2	0.0	-	1.0	0.0	
BH102	1	---	420 secs	1015	1015	-	-	1.3	0.0	20.1	0.0	-	1.0	0.0	
BH102	2	5.21	18/10/2016 11:49:00	-	1012	$0.0_{(I)}$	DRY	0.0	0.0	21.7	0.0	-	-	-	
BH102	2	---	3 secs	-	1012	-	-	0.4	0.0	21.4	0.0	-	-	-	
BH102	2	---	15 secs	-	1012	$0.0_{(SS)}$	-	0.3	0.0	21.6	0.0	-	-	-	
BH102	2	---	60 secs	-	1012	-	-	0.4	0.0	21.4	0.0	-	-	-	
BH102	2	---	90 secs	-	1012	-	-	0.5	0.0	21.4	0.0	-	-	-	
BH102	2	---	120 secs	-	1012	-	-	0.5	0.0	21.3	0.0	-	-	-	

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18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Compiled By	Date	Checked By	Date	Contract Ref:
R. Speight	26/10/16			28722

Contract: **Woodcroft Farm**

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Monitoring Round	Installation Depth (mbgl)	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
BH102	2	---	180 secs	-	1012	-	-	0.5	0.0	21.3	0.0	-	-	-	
BH102	3	5.21	25/10/2016 14:07:00	-	1014	$0.0_{(I)}$	DRY	0.0	0.0	21.3	0.0	-	-	-	
BH102	3	---	15 secs	-	-	$0.0_{(SS)}$	-	0.3	0.0	21.4	0.0	-	-	-	
BH102	3	---	30 secs	-	-	-	-	0.3	0.0	21.4	0.0	-	-	-	
BH102	3	---	60 secs	-	-	-	-	0.3	0.0	21.4	0.0	-	-	-	
BH102	3	---	90 secs	-	-	-	-	0.3	0.0	21.4	0.0	-	-	-	
BH102	3	---	120 secs	-	-	-	-	0.3	0.0	21.4	0.0	-	-	-	
BH103	1	10.13	19/09/2016 11:17:00	1014	1014	$0.0_{(I)}$	DRY	0.1	0.0	20.9	0.0	0.4	0.0	0.0	
BH103	1	---	15 secs	1014	1014	$0.1_{(SS)}$	-	0.1	0.0	20.8	0.0	-	0.0	0.0	
BH103	1	---	30 secs	1014	1014	-	-	0.1	0.0	20.8	0.0	-	0.0	0.0	
BH103	1	---	60 secs	1014	1014	-	-	0.1	0.0	20.8	0.0	-	0.0	0.0	
BH103	1	---	90 secs	1014	1014	-	-	0.1	0.0	20.8	0.0	-	0.0	0.0	
BH103	1	---	120 secs	1014	1014	-	-	0.1	0.0	20.8	0.0	-	0.0	0.0	
BH103	1	---	180 secs	1014	1014	-	-	0.1	0.0	20.8	0.0	-	0.0	0.0	
BH103	1	---	240 secs	1014	1014	-	-	0.1	0.0	20.7	0.0	-	0.0	0.0	
BH103	1	---	300 secs	1014	1014	-	-	0.1	0.0	20.7	0.0	-	0.0	0.0	
BH103	2	10.08	18/10/2016 12:51:00	-	1012	$0.0_{(I)}$	DRY	0.1	0.0	21.1	0.0	-	-	-	
BH103	2	---	15 secs	-	1012	$0.0_{(SS)}$	-	0.5	0.0	20.9	0.0	-	-	-	
BH103	2	---	30 secs	-	1012	-	-	0.6	0.0	20.4	0.0	-	-	-	
BH103	2	---	60 secs	-	1012	-	-	0.6	0.0	20.4	0.0	-	-	-	
BH103	2	---	90 secs	-	1012	-	-	0.6	0.0	20.4	0.0	-	-	-	
BH103	2	---	120 secs	-	1012	-	-	0.6	0.0	20.4	0.0	-	-	-	
BH103	3	10.08	25/10/2016 14:58:00	-	1014	$0.0_{(I)}$	DRY	0.1	0.0	21.3	0.0	-	-	-	
BH103	3	---	15 secs	-	-	$0.0_{(SS)}$	-	1.2	0.0	20.6	0.0	-	-	-	

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

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HP3 9RT

Compiled By	Date	Checked By	Date	Contract Ref:
R. Speight	26/10/16			28722

Contract: **Woodcroft Farm**

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Monitoring Round	Installation Depth (mbgl)	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
BH103	3	---	30 secs	-	-	-	-	1.2	0.0	20.4	0.0	-	-	-	
BH103	3	---	60 secs	-	-	-	-	1.2	0.0	20.3	0.0	-	-	-	
BH103	3	---	90 secs	-	-	-	-	1.3	0.0	20.3	0.0	-	-	-	
BH103	3	---	120 secs	-	-	-	-	1.3	0.0	20.3	0.0	-	-	-	
BH103	3	---	180 secs	-	-	-	-	1.3	0.0	20.3	0.0	-	-	-	
WS101	1	2.83	19/09/2016 10:20:00	1015	1015	0.1$_{(I)}$	DRY	0.1	0.0	20.9	0.0	0.2	0.0	0.0	
WS101	1	---	15 secs	1015	1015	0.2$_{(SS)}$	-	2.4	0.0	19.9	0.0	-	1.0	0.0	
WS101	1	---	30 secs	1015	1015	-	-	2.8	0.0	18.7	0.0	-	0.0	0.0	
WS101	1	---	60 secs	1015	1015	-	-	3.0	0.0	18.5	0.0	-	0.0	0.0	
WS101	1	---	90 secs	1015	1015	-	-	3.0	0.0	18.5	0.0	-	0.0	0.0	
WS101	1	---	120 secs	1015	1015	-	-	3.0	0.0	18.5	0.0	-	0.0	0.0	
WS101	1	---	180 secs	1015	1015	-	-	3.2	0.0	18.4	0.0	-	0.0	0.0	
WS101	1	---	240 secs	1015	1015	-	-	3.3	0.0	18.4	0.0	-	0.0	0.0	
WS101	1	---	300 secs	1015	1015	-	-	3.4	0.0	18.3	0.0	-	0.0	0.0	
WS101	2	---	18/10/2016 12:09:00	-	1012	0.0$_{(I)}$	-	0.0	0.0	21.1	0.0	-	-	-	
WS101	2	2.74	15 secs	-	1012	0.0$_{(SS)}$	DRY	2.8	0.0	19.8	0.0	-	-	-	
WS101	2	---	30 secs	-	1012	-	-	2.9	0.0	19.4	0.0	-	-	-	
WS101	2	---	60 secs	-	1012	-	-	2.9	0.0	19.4	0.0	-	-	-	
WS101	2	---	90 secs	-	1012	-	-	3.0	0.0	19.3	0.0	-	-	-	
WS101	2	---	120 secs	-	1012	-	-	3.1	0.0	19.2	0.0	-	-	-	
WS101	2	---	180 secs	-	1012	-	-	3.5	0.0	19.1	0.0	-	-	-	
WS101	3	2.74	25/10/2016 14:23:00	-	1014	0.0$_{(I)}$	DRY	0.0	0.0	21.5	0.0	-	-	-	
WS101	3	---	15 secs	-	-	0.0$_{(SS)}$	-	2.2	0.0	20.3	0.0	-	-	-	
WS101	3	---	30 secs	-	-	-	-	2.5	0.0	20.1	0.0	-	-	-	

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

RSK Environment Ltd
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Compiled By	Date	Checked By	Date	Contract Ref:
R. Speight	26/10/16			28722

Contract: **Woodcroft Farm**

AGS

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Monitoring Round	Installation Depth (mbgl)	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
WS101	3	---	60 secs	-	-	-	-	2.5	0.0	20.1	0.0	-	-	-	
WS101	3	---	90 secs	-	-	-	-	2.5	0.0	20.0	0.0	-	-	-	
WS101	3	---	120 secs	-	-	-	-	2.6	0.0	20.0	0.0	-	-	-	
WS101	3	---	180 secs	-	-	-	-	2.9	0.0	19.8	0.0	-	-	-	
WS102	1	3.05	19/09/2016 12:02:00	1015	1015	$0.0_{(I)}$	DRY	0.1	0.0	20.8	0.0	0.3	0.0	0.0	
WS102	1	---	15 secs	1015	1015	$0.0_{(SS)}$	-	0.1	0.0	20.8	0.0	-	3.0	0.0	
WS102	1	---	30 secs	1015	1015	-	-	0.1	0.0	20.7	0.0	-	3.0	0.0	
WS102	1	---	60 secs	1015	1015	-	-	0.2	0.0	20.2	0.0	-	2.0	0.0	
WS102	1	---	90 secs	1015	1015	-	-	1.0	0.0	18.4	0.0	-	1.0	0.0	
WS102	1	---	120 secs	1015	1015	-	-	2.8	0.0	14.4	0.0	-	0.0	0.0	
WS102	1	---	180 secs	1015	1015	-	-	6.4	0.0	7.6	0.0	-	0.0	0.0	
WS102	1	---	240 secs	1015	1015	-	-	7.6	0.0	6.3	0.0	-	0.0	0.0	
WS102	1	---	300 secs	1015	1015	-	-	8.0	0.0	5.8	0.0	-	0.0	0.0	
WS102	1	---	360 secs	1015	1015	-	-	8.2	0.0	5.5	0.0	-	0.0	0.0	
WS102	1	---	420 secs	1015	1015	-	-	8.4	0.0	5.3	0.0	-	0.0	0.0	
WS102	1	---	480 secs	1015	1015	-	-	8.5	0.0	5.2	0.0	-	0.0	0.0	
WS102	2	2.94	18/10/2016 11:57:00	-	1012	$-0.1_{(I)}$	DRY	0.1	0.0	21.7	0.0	-	-	-	
WS102	2	---	15 secs	-	1012	$0.0_{(SS)}$	-	7.1	0.0	6.3	0.0	-	-	-	
WS102	2	---	30 secs	-	1012	-	-	7.3	0.0	3.8	0.0	-	-	-	
WS102	2	---	60 secs	-	1012	-	-	7.4	0.0	3.4	0.0	-	-	-	
WS102	2	---	90 secs	-	1012	-	-	7.5	0.0	3.3	0.0	-	-	-	
WS102	2	---	120 secs	-	1012	-	-	7.5	0.0	3.4	0.0	-	-	-	
WS102	2	---	180 secs	-	1012	-	-	8.4	0.0	3.5	0.0	-	-	-	
WS102	2	---	240 secs	-	1012	-	-	9.5	0.0	3.6	0.0	-	-	-	

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RSK Environment Ltd
18 Frogmore Road
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Hertfordshire
HP3 9RT

Compiled By	Date	Checked By	Date	Contract Ref:
R. Speight	26/10/16			28722

Contract: **Woodcroft Farm**

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Monitoring Round	Installation Depth (mbgl)	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
WS102	2	---	300 secs	-	1012	-	-	9.9	0.0	3.6	0.0	-	-	-	
WS102	2	---	330 secs	-	1012	-	-	9.9	0.0	3.5	0.0	-	-	-	
WS102	3	3.03	25/10/2016 14:14:00	-	1014	$0.0_{(I)}$	DRY	0.1	0.0	21.8	0.0	-	-	-	
WS102	3	---	15 secs	-	-	$0.0_{(SS)}$	-	5.7	0.0	8.5	0.0	-	-	-	
WS102	3	---	30 secs	-	-	-	-	6.0	0.0	3.5	0.0	-	-	-	
WS102	3	---	60 secs	-	-	-	-	6.0	0.0	3.1	0.0	-	-	-	
WS102	3	---	90 secs	-	-	-	-	5.8	0.0	3.0	0.0	-	-	-	
WS102	3	---	120 secs	-	-	-	-	5.6	0.0	2.9	0.0	-	-	-	
WS102	3	---	180 secs	-	-	-	-	6.0	0.0	3.0	0.0	-	-	-	
WS103	1	2.81	19/09/2016 10:40:00	1015	1015	$0.0_{(I)}$	DRY	0.2	0.0	20.8	0.0	-	0.0	0.0	
WS103	1	---	15 secs	1015	1015	$0.0_{(SS)}$	-	8.0	0.0	14.8	0.0	-	3.0	0.0	
WS103	1	---	30 secs	1015	1015	-	-	8.5	0.0	10.7	0.0	-	1.0	0.0	
WS103	1	---	60 secs	1015	1015	-	-	8.7	0.0	10.4	0.0	-	0.0	0.0	
WS103	1	---	90 secs	1015	1015	-	-	8.6	0.0	10.7	0.0	-	0.0	0.0	
WS103	1	---	120 secs	1015	1015	-	-	8.5	0.0	11.1	0.0	-	0.0	0.0	
WS103	1	---	180 secs	1015	1015	-	-	8.4	0.0	11.3	0.0	-	0.0	0.0	
WS103	1	---	240 secs	1015	1015	-	-	8.4	0.0	11.3	0.0	-	0.0	0.0	
WS103	1	---	300 secs	1015	1015	-	-	8.4	0.0	11.3	0.0	-	0.0	0.0	
WS103	2	2.75	18/10/2016 11:41:00	-	1012	$0.0_{(I)}$	DRY	0.0	0.0	21.5	0.0	-	-	-	
WS103	2	---	15 secs	-	1012	$0.0_{(SS)}$	-	0.8	0.0	14.4	0.0	-	-	-	
WS103	2	---	30 secs	-	1012	-	-	7.1	0.0	12.8	0.0	-	-	-	
WS103	2	---	60 secs	-	1012	-	-	7.1	0.0	12.6	0.0	-	-	-	
WS103	2	---	90 secs	-	1012	-	-	7.1	0.0	12.4	0.0	-	-	-	
WS103	2	---	120 secs	-	1012	-	-	7.1	0.0	12.4	0.0	-	-	-	

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Hertfordshire
HP3 9RT

Compiled By	Date	Checked By	Date	Contract Ref:
R. Speight	26/10/16			28722

Contract: **Woodcroft Farm**

AGS

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Monitoring Round	Installation Depth (mbgl)	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
WS103	2	---	180 secs	-	1012	-	-	7.2	0.0	12.5	0.0	-	-	-	
WS103	3	2.75	25/10/2016 14:00:00	-	1014	$0.0_{(I)}$	DRY	0.0	0.0	20.9	0.0	-	-	-	
WS103	3	---	15 secs	-	-	$0.0_{(SS)}$	-	6.8	0.0	15.2	0.0	-	-	-	
WS103	3	---	30 secs	-	-	-	-	7.0	0.0	14.7	0.0	-	-	-	
WS103	3	---	60 secs	-	-	-	-	7.0	0.0	14.7	0.0	-	-	-	
WS103	3	---	90 secs	-	-	-	-	7.0	0.0	14.7	0.0	-	-	-	
WS103	3	---	120 secs	-	-	-	-	7.0	0.0	14.7	0.0	-	-	-	
WS108	1	2.89	19/09/2016 09:29:00	1013	1013	$0.0_{(I)}$	DRY	0.2	0.0	20.9	0.0	0.2	0.0	0.0	
WS108	1	---	15 secs	1013	1013	$0.0_{(SS)}$	-	2.2	0.0	19.7	0.0	-	2.0	0.0	
WS108	1	---	30 secs	1013	1013	-	-	2.2	0.0	18.8	0.0	-	0.0	0.0	
WS108	1	---	60 secs	1013	1013	-	-	2.2	0.0	18.8	0.0	-	0.0	0.0	
WS108	1	---	90 secs	1013	1013	-	-	2.2	0.0	18.9	0.0	-	0.0	0.0	
WS108	1	---	120 secs	1013	1013	-	-	2.0	0.0	19.2	0.0	-	0.0	0.0	
WS108	1	---	180 secs	1013	1013	-	-	1.8	0.0	19.5	0.0	-	0.0	0.0	
WS108	1	---	240 secs	1013	1013	-	-	1.6	0.0	19.6	0.0	-	0.0	0.0	
WS108	1	---	300 secs	1013	1013	-	-	1.6	0.0	19.6	0.0	-	0.0	0.0	
WS108	2	2.92	18/10/2016 12:31:00	-	1012	$0.0_{(I)}$	DRY	0.0	0.0	20.8	0.0	-	-	-	
WS108	2	---	15 secs	-	1012	$0.0_{(SS)}$	-	3.1	0.0	18.5	0.0	-	-	-	
WS108	2	---	30 secs	-	1012	-	-	3.4	0.0	17.0	0.0	-	-	-	
WS108	2	---	60 secs	-	1012	-	-	3.4	0.0	17.1	0.0	-	-	-	
WS108	2	---	90 secs	-	1012	-	-	3.2	0.0	17.4	0.0	-	-	-	
WS108	2	---	120 secs	-	1012	-	-	2.9	0.0	18.0	0.0	-	-	-	
WS108	2	---	180 secs	-	1012	-	-	2.5	0.0	18.5	0.0	-	-	-	
WS108	3	2.94	25/10/2016 14:41:00	-	1014	$0.0_{(I)}$	DRY	0.1	0.0	20.8	0.0	-	-	-	

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RSK Environment Ltd
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Compiled By	Date	Checked By	Date	Contract Ref:
R. Speight	**26/10/16**			**28722**

Contract: **Woodcroft Farm**

GINT_LIBRARY_V8_06.GLB : E - GAS MON - REDUCED - 9A - A4L : 28722 WOODCROFT FARM.GPJ : 26/10/16 11:30 : RS2 :

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Monitoring Round	Installation Depth (mbgl)	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
WS108	3	---	15 secs	-	-	$0.0_{(SS)}$	-	2.0	0.0	20.7	0.0	-	-	-	
WS108	3	---	30 secs	-	-	-	-	2.1	0.0	20.4	0.0	-	-	-	
WS108	3	---	60 secs	-	-	-	-	2.0	0.0	20.4	0.0	-	-	-	
WS108	3	---	90 secs	-	-	-	-	2.0	0.0	20.4	0.0	-	-	-	
WS108	3	---	120 secs	-	-	-	-	1.9	0.0	20.4	0.0	-	-	-	
WS108	3	---	180 secs	-	-	-	-	1.9	0.0	20.4	0.0	-	-	-	
WS112	1	2.84	19/09/2016 09:10:00	1013	1013	$0.1_{(I)}$	DRY	0.1	0.0	20.9	0.0	0.5	0.0	0.0	
WS112	1	---	15 secs	1013	1013	$0.2_{(SS)}$	-	2.4	0.0	20.1	0.0	-	3.0	0.0	
WS112	1	---	30 secs	1013	1013	-	-	2.4	0.0	19.3	0.0	-	0.0	0.0	
WS112	1	---	60 secs	1013	1013	-	-	2.5	0.0	19.2	0.0	-	0.0	0.0	
WS112	1	---	90 secs	1013	1013	-	-	2.6	0.0	19.1	0.0	-	0.0	0.0	
WS112	1	---	120 secs	1013	1013	-	-	2.6	0.0	19.1	0.0	-	0.0	0.0	
WS112	1	---	180 secs	1013	1013	-	-	2.3	0.0	19.2	0.0	-	0.0	0.0	
WS112	1	---	240 secs	1013	1013	-	-	1.8	0.0	19.6	0.0	-	0.0	0.0	
WS112	1	---	300 secs	1013	1013	-	-	1.4	0.0	20.0	0.0	-	0.0	0.0	
WS112	1	---	360 secs	1013	1013	-	-	1.2	0.0	20.1	0.0	-	0.0	0.0	
WS112	1	---	420 secs	1013	1013	-	-	1.1	0.0	20.3	0.0	-	0.0	0.0	
WS112	1	---	480 secs	1013	1013	-	-	1.0	0.0	20.3	0.0	-	0.0	0.0	
WS112	2	2.72	18/10/2016 12:40:00	-	1012	$0.0_{(I)}$	2.55	0.0	0.0	20.8	0.0	-	-	-	
WS112	2	---	15 secs	-	1012	$0.0_{(SS)}$	-	0.1	0.0	20.8	0.0	-	-	-	
WS112	2	---	30 secs	-	1012	-	-	0.3	0.0	20.7	0.0	-	-	-	
WS112	2	---	60 secs	-	1012	-	-	0.5	0.0	20.6	0.0	-	-	-	
WS112	2	---	90 secs	-	1012	-	-	0.7	0.0	20.5	0.0	-	-	-	
WS112	2	---	120 secs	-	1012	-	-	0.9	0.0	20.4	0.0	-	-	-	

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HP3 9RT

Compiled By	Date	Checked By	Date	Contract Ref:
R. Speight	26/10/16			28722

Contract: **Woodcroft Farm**

AGS

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Monitoring Round	Installation Depth (mbgl)	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
WS112	2	---	180 secs	-	1012	-	-	1.0	0.0	20.4	0.0	-	-	-	
WS112	3	2.72	25/10/2016 14:50:00	-	1014	0.0(I)	2.41	0.1	0.0	21.5	0.0	-	-	-	
WS112	3	---	15 secs	-	-	0.0(SS)	-	1.6	0.0	20.8	0.0	-	-	-	
WS112	3	---	30 secs	-	-	-	-	1.6	0.0	20.6	0.0	-	-	-	
WS112	3	---	60 secs	-	-	-	-	1.6	0.0	20.6	0.0	-	-	-	
WS112	3	---	90 secs	-	-	-	-	1.6	0.0	20.6	0.0	-	-	-	
WS112	3	---	120 secs	-	-	-	-	1.6	0.0	20.6	0.0	-	-	-	
WS113	1	2.88	19/09/2016 08:50:00	1013	1013	0.0(I)	1.28	0.1	0.0	20.8	0.0	0.2	0.0	0.0	
WS113	1	---	15 secs	1013	1013	0.0(SS)	-	1.3	0.0	20.5	0.0	-	1.0	0.0	
WS113	1	---	30 secs	1013	1013	-	-	1.3	0.0	20.0	0.0	-	0.0	0.0	
WS113	1	---	60 secs	1013	1013	-	-	1.6	0.0	19.8	0.0	-	0.0	0.0	
WS113	1	---	90 secs	1013	1013	-	-	1.9	0.0	19.5	0.0	-	0.0	0.0	
WS113	1	---	120 secs	1013	1013	-	-	2.3	0.0	19.3	0.0	-	0.0	0.0	
WS113	1	---	180 secs	1013	1013	-	-	2.3	0.0	19.2	0.0	-	0.0	0.0	
WS113	1	---	240 secs	1013	1013	-	-	2.3	0.0	19.1	0.0	-	0.0	0.0	
WS113	1	---	300 secs	1013	1013	-	-	2.2	0.0	19.2	0.0	-	0.0	0.0	
WS113	2	2.87	18/10/2016 12:58:00	-	1012	0.0(I)	1.26	0.0	0.0	21.0	0.0	-	-	-	
WS113	2	---	15 secs	-	1012	0.0(SS)	-	1.7	0.0	20.7	0.0	-	-	-	
WS113	2	---	30 secs	-	1012	-	-	1.7	0.0	19.9	0.0	-	-	-	
WS113	2	---	60 secs	-	1012	-	-	1.7	0.0	19.9	0.0	-	-	-	
WS113	2	---	90 secs	-	1012	-	-	1.7	0.0	19.9	0.0	-	-	-	
WS113	2	---	120 secs	-	1012	-	-	1.7	0.0	19.9	0.0	-	-	-	
WS113	3	2.87	25/10/2016 15:06:00	-	1014	0.0(I)	1.35	0.1	0.0	21.2	0.0	-	-	-	
WS113	3	---	15 secs	-	-	0.0(SS)	-	1.7	0.0	20.7	0.0	-	-	-	

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R. Speight	26/10/16			28722

Contract: **Woodcroft Farm**

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Monitoring Round	Installation Depth (mbgl)	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
WS113	3	---	30 secs	-	-	-	-	1.8	0.0	20.2	0.0	-	-	-	
WS113	3	---	60 secs	-	-	-	-	1.8	0.0	20.2	0.0	-	-	-	
WS113	3	---	90 secs	-	-	-	-	1.8	0.0	20.2	0.0	-	-	-	
WS113	3	---	120 secs	-	-	-	-	1.8	0.0	20.2	0.0	-	-	-	

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

RSK Environment Ltd
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Compiled By	Date	Checked By	Date	Contract Ref:
R. Speight	26/10/16			28722

Contract: **Woodcroft Farm**

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Project: Woodcroft Farm - Remediation
Ref: GE16943
Client: Grainger PLC

Geo-Environmental

Location	Date	Time (sec)	CH_4 (%)	CO_2 (%)	O_2 (%)	Flow (l/hr)	VOC (ppm)	Pressure (mb)	GWL (m bgl)	GSV/Qhgs		Characteristic Situation		CS1 Limiting Value Check			NHBC			
										CH_4	CO_2	BS8485 & C665		Flow	CH_4	CO_2	CH_4		CO_2	
												CH_4	CO_2				GSV	Conc.	GSV	Conc.
WS401	30/05/18	0	0.0	0.0	20.8	0.0	0.3	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	30/05/18	10	0.0	4.4	15.5	0.0	0.3	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	30/05/18	20	0.0	4.5	13.9	0.0	0.3	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	30/05/18	30	0.0	4.5	14.9	0.0	0.3	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	30/05/18	60	0.0	4.0	16.0	0.0	0.3	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	30/05/18	90	0.0	3.3	16.9	0.0	0.3	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	30/05/18	120	0.0	3.3	17.3	0.0	0.3	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	30/05/18	180	0.0	3.1	17.3	0.0	0.3	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	30/05/18	0	0.0	0.0	20.8	0.0	0.5	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	30/05/18	10	0.0	1.5	18.0	0.0	0.5	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	30/05/18	20	0.0	2.0	16.8	0.0	0.5	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	30/05/18	30	0.0	1.9	16.9	0.0	0.5	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	30/05/18	60	0.0	1.7	17.2	0.0	0.5	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	30/05/18	90	0.0	1.5	17.4	0.0	0.5	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	30/05/18	120	0.0	1.4	17.6	0.0	0.5	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	30/05/18	180	0.0	0.4	19.2	0.0	0.5	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	30/05/18	0	0.0	0.0	20.8	0.0	0.6	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	30/05/18	10	0.0	3.7	14.8	0.0	0.6	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	30/05/18	20	0.0	4.1	13.8	0.0	0.6	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	30/05/18	30	0.0	4.2	13.3	0.0	0.6	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	30/05/18	60	0.0	4.2	13.2	0.0	0.6	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	30/05/18	90	0.0	4.1	13.4	0.0	0.6	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	30/05/18	120	0.0	4.1	13.4	0.0	0.6	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	30/05/18	180	0.0	4.1	13.4	0.0	0.6	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	30/05/18	0	0.0	0.0	20.8	0.0	2.5	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	30/05/18	10	0.0	0.0	20.1	0.0	2.5	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	30/05/18	20	0.0	0.1	20.0	0.0	2.5	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	30/05/18	30	0.0	0.1	20.0	0.0	2.5	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	30/05/18	60	0.0	0.0	20.1	0.0	2.5	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	30/05/18	90	0.0	0.0	20.1	0.0	2.5	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	30/05/18	120	0.0	0.0	20.2	0.0	2.5	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	30/05/18	180	0.0	0.0	20.2	0.0	2.5	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	30/05/18	0	0.0	0.0	20.8	0.0	0.0	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	30/05/18	10	0.0	2.5	14.6	0.0	0.0	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	30/05/18	20	0.0	3.3	11.9	0.0	0.0	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	30/05/18	30	0.0	3.8	11.1	0.0	0.0	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	30/05/18	60	0.0	5.0	9.7	0.0	0.0	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	AMBER 1
WS405	30/05/18	90	0.0	6.2	8.5	0.0	0.0	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS405	30/05/18	120	0.0	6.4	8.2	0.0	0.0	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS405	30/05/18	180	0.0	6.4	8.2	0.0	0.0	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS406	30/05/18	0	0.0	0.0	20.8	0.0	0.3	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	30/05/18	10	0.0	0.5	19.1	0.0	0.3	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	30/05/18	20	0.0	0.6	18.6	0.0	0.3	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	30/05/18	30	0.0	0.6	18.5	0.0	0.3	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	30/05/18	60	0.0	0.6	18.5	0.0	0.3	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	30/05/18	90	0.0	0.6	18.4	0.0	0.3	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN

Project: Woodcroft Farm - Remediation
Ref: GE16943
Client: Grainger PLC

Geo-Environmental

Location	Date	Time (sec)	CH_4 (%)	CO_2 (%)	O_2 (%)	Flow (l/hr)	VOC (ppm)	Pressure (mb)	GWL (m bgl)	GSV/Qhgs		Characteristic Situation		CS1 Limiting Value Check			NHBC			
												BS8485 & C665					CH_4		CO_2	
										CH_4	CO_2	CH_4	CO_2	Flow	CH_4	CO_2	GSV	Conc.	GSV	Conc.
WS406	30/05/18	120	0.0	0.7	18.2	0.0	0.3	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	30/05/18	180	0.0	0.7	18.2	0.0	0.3	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	30/05/18	0	0.0	0.0	20.8	0.0	0.1	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	30/05/18	10	0.0	0.0	18.0	0.0	0.1	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	30/05/18	20	0.0	0.0	18.0	0.0	0.1	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	30/05/18	30	0.0	0.0	17.9	0.0	0.1	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	30/05/18	60	0.0	0.0	17.1	0.0	0.1	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	30/05/18	90	0.0	1.7	15.0	0.0	0.1	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	30/05/18	120	0.0	3.2	13.4	0.0	0.1	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	30/05/18	180	0.0	3.4	13.5	0.0	0.1	1004	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	06/06/18	0	0.0	0.0	20.9	0.0	0.2	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	06/06/18	10	0.0	2.1	18.1	0.0	0.2	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	06/06/18	20	0.0	3.0	17.0	0.0	0.2	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	06/06/18	30	0.0	3.3	16.2	0.0	0.2	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	06/06/18	60	0.0	6.4	11.5	0.0	0.2	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS401	06/06/18	90	0.0	6.7	11.1	0.0	0.2	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS401	06/06/18	120	0.0	6.7	11.1	0.0	0.2	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS401	06/06/18	180	0.0	6.9	11.0	0.0	0.2	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS402	06/06/18	0	0.0	0.0	20.9	0.0	0.5	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	06/06/18	10	0.0	0.4	19.9	0.0	0.5	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	06/06/18	20	0.0	0.5	19.5	0.0	0.5	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	06/06/18	30	0.0	0.7	18.9	0.0	0.5	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	06/06/18	60	0.0	1.0	17.7	0.0	0.5	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	06/06/18	90	0.0	4.0	12.1	0.0	0.5	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	06/06/18	120	0.0	4.6	10.7	0.0	0.5	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	06/06/18	180	0.0	4.7	10.7	0.0	0.5	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	06/06/18	0	0.0	0.0	20.9	0.0	1.7	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	06/06/18	10	0.0	0.3	20.1	0.0	1.7	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	06/06/18	20	0.0	0.3	20.1	0.0	1.7	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	06/06/18	30	0.0	0.3	20.1	0.0	1.7	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	06/06/18	60	0.0	0.3	19.5	0.0	1.7	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	06/06/18	90	0.0	0.3	19.5	0.0	1.7	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	06/06/18	120	0.0	0.3	19.5	0.0	1.7	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	06/06/18	180	0.0	0.3	19.5	0.0	1.7	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	06/06/18	0	0.0	0.0	20.9	0.0	0.2	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	06/06/18	10	0.0	6.0	12.0	0.0	0.2	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS405	06/06/18	20	0.0	11.2	1.8	0.0	0.2	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 2
WS405	06/06/18	30	0.0	11.4	1.7	0.0	0.2	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 2
WS405	06/06/18	60	0.0	11.5	1.7	0.0	0.2	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 2
WS405	06/06/18	90	0.0	11.5	1.7	0.0	0.2	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 2
WS405	06/06/18	120	0.0	11.5	1.8	0.0	0.2	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 2
WS405	06/06/18	180	0.0	11.5	1.8	0.0	0.2	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 2
WS406	06/06/18	0	0.0	0.0	20.9	0.0	0.1	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	06/06/18	10	0.0	0.0	20.5	0.0	0.1	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	06/06/18	20	0.0	0.0	20.5	0.0	0.1	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	06/06/18	30	0.0	0.0	20.4	0.0	0.1	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN

Project: Woodcroft Farm - Remediation
Ref: GE16943
Client: Grainger PLC

Geo-Environmental

Location	Date	Time (sec)	CH_4 (%)	CO_2 (%)	O_2 (%)	Flow (l/hr)	VOC (ppm)	Pressure (mb)	GWL (m bgl)	GSV/Qhgs		Characteristic Situation		CS1 Limiting Value Check			NHBC			
												BS8485 & C665					CH_4		CO_2	
										CH_4	CO_2	CH_4	CO_2	Flow	CH_4	CO_2	GSV	Conc.	GSV	Conc.
WS406	06/06/18	60	0.0	0.1	20.3	0.0	0.1	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	06/06/18	90	0.0	0.1	20.3	0.0	0.1	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	06/06/18	120	0.0	0.1	20.3	0.0	0.1	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	06/06/18	180	0.0	0.1	20.3	0.0	0.1	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	06/06/18	0	0.0	0.0	20.9	0.0	0.0	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	06/06/18	10	0.0	8.5	12.4	0.0	0.0	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS407	06/06/18	20	0.0	9.4	10.7	0.0	0.0	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS407	06/06/18	30	0.0	9.5	10.5	0.0	0.0	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS407	06/06/18	60	0.0	9.7	10.4	0.0	0.0	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS407	06/06/18	90	0.0	9.8	10.4	0.0	0.0	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS407	06/06/18	120	0.0	10.1	10.3	0.0	0.0	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 2
WS407	06/06/18	180	0.0	10.1	10.3	0.0	0.0	1005	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 2
WS401	20/06/18	0	0.0	0.0	20.9	0.0	1.1	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	20/06/18	10	0.0	4.5	16.2	0.0	1.1	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	20/06/18	20	0.0	4.6	15.6	0.0	1.1	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	20/06/18	30	0.0	4.8	15.1	0.0	1.1	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	20/06/18	60	0.0	5.2	14.0	0.0	1.1	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS401	20/06/18	90	0.0	6.3	12.4	0.0	1.1	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS401	20/06/18	120	0.0	7.0	10.8	0.0	1.1	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS401	20/06/18	180	0.0	7.3	10.2	0.0	1.1	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS402	20/06/18	0	0.0	0.0	20.9	0.0	0.3	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	20/06/18	10	0.0	3.0	17.7	0.0	0.3	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	20/06/18	20	0.0	3.2	17.3	0.0	0.3	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	20/06/18	30	0.0	3.3	17.0	0.0	0.3	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	20/06/18	60	0.0	3.4	16.6	0.0	0.3	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	20/06/18	90	0.0	5.8	12.0	0.0	0.3	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS402	20/06/18	120	0.0	6.4	10.6	0.0	0.3	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS402	20/06/18	180	0.0	7.0	9.8	0.0	0.3	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS403	20/06/18	0	0.0	0.0	20.9	0.0	1.8	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	20/06/18	10	0.0	4.6	16.4	0.0	1.8	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	20/06/18	20	0.0	4.9	15.8	0.0	1.8	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	20/06/18	30	0.0	5.0	15.8	0.0	1.8	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	AMBER 1
WS403	20/06/18	60	0.0	5.0	15.7	0.0	1.8	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	AMBER 1
WS403	20/06/18	90	0.0	5.1	15.7	0.0	1.8	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS403	20/06/18	120	0.0	5.1	15.8	0.0	1.8	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS403	20/06/18	180	0.0	5.2	15.7	0.0	1.8	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS404	20/06/18	0	0.0	0.0	20.9	0.0	1.6	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	20/06/18	10	0.0	0.5	19.6	0.0	1.6	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	20/06/18	20	0.0	0.6	19.3	0.0	1.6	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	20/06/18	30	0.0	0.6	18.6	0.0	1.6	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	20/06/18	60	0.0	0.6	18.3	0.0	1.6	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	20/06/18	90	0.0	0.6	18.2	0.0	1.6	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	20/06/18	120	0.0	0.6	18.2	0.0	1.6	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	20/06/18	180	0.0	0.7	18.2	0.0	1.6	1011	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	20/06/18	0	0.0	0.0	20.9	0.0	0.3	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	20/06/18	10	0.0	2.9	16.5	0.0	0.3	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN

Project: Woodcroft Farm - Remediation
Ref: GE16943
Client: Grainger PLC

Geo-Environmental

Location	Date	Time (sec)	CH_4 (%)	CO_2 (%)	O_2 (%)	Flow (l/hr)	VOC (ppm)	Pressure (mb)	GWL (m bgl)	GSV/Qhgs		Characteristic Situation		CS1 Limiting Value Check			NHBC			
												BS8485 & C665					CH_4		CO_2	
										CH_4	CO_2	CH_4	CO_2	Flow	CH_4	CO_2	GSV	Conc.	GSV	Conc.
WS405	20/06/18	20	0.0	3.0	16.2	0.0	0.3	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	20/06/18	30	0.0	3.1	16.1	0.0	0.3	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	20/06/18	60	0.0	3.2	15.8	0.0	0.3	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	20/06/18	90	0.0	3.4	15.5	0.0	0.3	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	20/06/18	120	0.0	3.5	15.2	0.0	0.3	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	20/06/18	180	0.0	3.6	14.9	0.0	0.3	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	20/06/18	0	0.0	0.0	20.9	0.0	0.0	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	20/06/18	10	0.0	1.8	19.3	0.0	0.0	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	20/06/18	20	0.0	1.8	19.3	0.0	0.0	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	20/06/18	30	0.0	1.8	19.2	0.0	0.0	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	20/06/18	60	0.0	1.9	19.1	0.0	0.0	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	20/06/18	90	0.0	2.0	18.0	0.0	0.0	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	20/06/18	120	0.0	2.0	18.8	0.0	0.0	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	20/06/18	180	0.0	2.0	18.8	0.0	0.0	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	20/06/18	0	0.0	0.0	20.9	0.0	0.4	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	20/06/18	10	0.0	7.9	15.1	0.0	0.4	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS407	20/06/18	20	0.0	8.0	14.9	0.0	0.4	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS407	20/06/18	30	0.0	8.0	14.9	0.0	0.4	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS407	20/06/18	60	0.0	8.2	14.8	0.0	0.4	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS407	20/06/18	90	0.0	8.3	14.7	0.0	0.4	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS407	20/06/18	120	0.0	8.9	14.2	0.0	0.4	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS407	20/06/18	180	0.0	9.1	13.9	0.0	0.4	1012	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS401	10/07/18	0	0.0	0.0	20.9	0.0	0.0	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	10/07/18	10	0.0	4.3	17.0	0.0	0.0	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	10/07/18	20	0.0	4.5	16.5	0.0	0.0	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	10/07/18	30	0.0	4.6	15.9	0.0	0.0	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	10/07/18	60	0.0	4.6	15.9	0.0	0.0	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	10/07/18	90	0.0	5.0	15.4	0.0	0.0	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	AMBER 1
WS401	10/07/18	120	0.0	5.0	15.4	0.0	0.0	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	AMBER 1
WS401	10/07/18	180	0.0	5.0	15.4	0.0	0.0	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	AMBER 1
WS402	10/07/18	0	0.0	0.0	20.9	0.0	0.7	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	10/07/18	10	0.0	3.2	18.3	0.0	0.7	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	10/07/18	20	0.0	3.3	18.2	0.0	0.7	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	10/07/18	30	0.0	3.3	18.1	0.0	0.7	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	10/07/18	60	0.0	3.3	18.0	0.0	0.7	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	10/07/18	90	0.0	2.2	19.2	0.0	0.7	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	10/07/18	120	0.0	2.1	19.5	0.0	0.7	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	10/07/18	180	0.0	2.0	19.7	0.0	0.7	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	10/07/18	0	0.0	0.0	20.9	0.0	1.5	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	10/07/18	10	0.0	3.4	18.3	0.0	1.5	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	10/07/18	20	0.0	3.5	18.2	0.0	1.5	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	10/07/18	30	0.0	3.5	18.2	0.0	1.5	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	10/07/18	60	0.0	3.5	18.2	0.0	1.5	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	10/07/18	90	0.0	3.7	18.1	0.0	1.5	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	10/07/18	120	0.0	3.7	18.1	0.0	1.5	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	10/07/18	180	0.0	3.7	18.1	0.0	1.5	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN

Project: Woodcroft Farm - Remediation
Ref: GE16943
Client: Grainger PLC

Geo-Environmental

Location	Date	Time (sec)	CH_4 (%)	CO_2 (%)	O_2 (%)	Flow (l/hr)	VOC (ppm)	Pressure (mb)	GWL (m bgl)	GSV/Qhgs		Characteristic Situation		CS1 Limiting Value Check			NHBC			
										CH_4	CO_2	BS8485 & C665		Flow	CH_4	CO_2	CH_4		CO_2	
												CH_4	CO_2				GSV	Conc.	GSV	Conc.
WS404	10/07/18	0	0.0	0.0	20.9	0.0	1.3	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	10/07/18	10	0.0	1.1	19.7	0.0	1.3	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	10/07/18	20	0.0	1.2	19.5	0.0	1.3	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	10/07/18	30	0.0	1.3	19.5	0.0	1.3	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	10/07/18	60	0.0	1.4	19.4	0.0	1.3	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	10/07/18	90	0.0	1.4	19.4	0.0	1.3	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	10/07/18	120	0.0	1.4	19.4	0.0	1.3	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	10/07/18	180	0.0	1.4	19.4	0.0	1.3	1017	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	10/07/18	0	0.0	0.0	20.9	0.0	0.3	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	10/07/18	10	0.0	2.9	18.1	0.0	0.3	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	10/07/18	20	0.0	3.0	18.0	0.0	0.3	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	10/07/18	30	0.0	3.1	18.1	0.0	0.3	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	10/07/18	60	0.0	3.0	18.3	0.0	0.3	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	10/07/18	90	0.0	3.0	18.3	0.0	0.3	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	10/07/18	120	0.0	3.0	18.5	0.0	0.3	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	10/07/18	180	0.0	3.0	18.8	0.0	0.3	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	10/07/18	0	0.0	0.0	20.9	0.0	0.1	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	10/07/18	10	0.0	1.9	19.7	0.0	0.1	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	10/07/18	20	0.0	2.2	19.2	0.0	0.1	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	10/07/18	30	0.0	2.2	19.1	0.0	0.1	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	10/07/18	60	0.0	2.0	19.1	0.0	0.1	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	10/07/18	90	0.0	2.0	19.2	0.0	0.1	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	10/07/18	120	0.0	2.0	19.4	0.0	0.1	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	10/07/18	180	0.0	2.0	19.4	0.0	0.1	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	10/07/18	0	0.0	0.0	20.9	0.0	0.8	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	10/07/18	10	0.0	3.2	18.8	0.0	0.8	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	10/07/18	20	0.0	3.6	18.1	0.0	0.8	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	10/07/18	30	0.0	3.7	18.1	0.0	0.8	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	10/07/18	60	0.0	3.8	18.0	0.0	0.8	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	10/07/18	90	0.0	3.9	18.0	0.0	0.8	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	10/07/18	120	0.0	4.4	17.5	0.0	0.8	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	10/07/18	180	0.0	4.6	17.4	0.0	0.8	1016	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	26/07/18	0	0.0	0.0	20.9	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	26/07/18	10	0.0	5.3	13.5	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS401	26/07/18	20	0.0	5.7	13.0	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS401	26/07/18	30	0.0	8.3	7.8	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS401	26/07/18	60	0.0	8.3	7.8	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS401	26/07/18	90	0.0	9.0	7.5	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS401	26/07/18	120	0.0	9.0	7.5	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS401	26/07/18	180	0.0	9.0	7.5	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS402	26/07/18	0	0.0	0.0	20.9	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	26/07/18	10	0.0	3.3	16.7	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	26/07/18	20	0.0	3.8	15.7	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	26/07/18	30	0.0	4.4	14.5	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	26/07/18	60	0.0	7.0	11.2	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS402	26/07/18	90	0.0	7.3	10.9	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1

Project: Woodcroft Farm - Remediation
Ref: GE16943
Client: Grainger PLC

Geo-Environmental

Location	Date	Time (sec)	CH_4 (%)	CO_2 (%)	O_2 (%)	Flow (l/hr)	VOC (ppm)	Pressure (mb)	GWL (m bgl)	GSV/Qhgs		Characteristic Situation		CS1 Limiting Value Check			NHBC			
												BS8485 & C665					CH_4		CO_2	
										CH_4	CO_2	CH_4	CO_2	Flow	CH_4	CO_2	GSV	Conc.	GSV	Conc.
WS402	26/07/18	120	0.0	7.3	10.3	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS402	26/07/18	180	0.0	7.3	10.3	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS403	26/07/18	0	0.0	0.0	20.9	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	26/07/18	10	0.0	3.0	18.1	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	26/07/18	20	0.0	3.1	18.0	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	26/07/18	30	0.0	3.3	17.9	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	26/07/18	60	0.0	3.4	17.8	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	26/07/18	90	0.0	3.4	17.9	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	26/07/18	120	0.0	3.4	17.9	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	26/07/18	180	0.0	3.4	17.9	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	26/07/18	0	0.0	0.0	20.9	0.0	0.0	1008	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	26/07/18	10	0.0	0.9	20.1	0.0	0.0	1008	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	26/07/18	20	0.0	1.1	19.6	0.0	0.0	1008	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	26/07/18	30	0.0	1.4	19.0	0.0	0.0	1008	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	26/07/18	60	0.0	1.6	18.9	0.0	0.0	1008	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	26/07/18	90	0.0	1.6	18.9	0.0	0.0	1008	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	26/07/18	120	0.0	1.6	18.9	0.0	0.0	1008	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	26/07/18	180	0.0	1.6	18.9	0.0	0.0	1008	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	26/07/18	0	0.0	0.0	20.9	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	26/07/18	10	0.0	3.1	17.1	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	26/07/18	20	0.0	3.8	15.0	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	26/07/18	30	0.0	3.9	15.0	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	26/07/18	60	0.0	3.9	15.0	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	26/07/18	90	0.0	3.9	15.0	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	26/07/18	120	0.0	3.9	14.9	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	26/07/18	180	0.0	3.9	14.9	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	26/07/18	0	0.0	0.0	20.9	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	26/07/18	10	0.0	1.5	19.4	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	26/07/18	20	0.0	2.0	19.0	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	26/07/18	30	0.0	2.7	18.2	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	26/07/18	60	0.0	2.7	18.2	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	26/07/18	90	0.0	2.7	18.2	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	26/07/18	120	0.0	2.7	18.2	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	26/07/18	180	0.0	2.7	18.2	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	26/07/18	0	0.0	0.0	20.9	0.0	0.4	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	26/07/18	10	0.0	2.0	19.2	0.0	0.4	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	26/07/18	20	0.0	2.2	18.9	0.0	0.4	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	26/07/18	30	0.0	3.2	18.0	0.0	0.4	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	26/07/18	60	0.0	4.7	16.8	0.0	0.4	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	26/07/18	90	0.0	4.7	16.8	0.0	0.4	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	26/07/18	120	0.0	4.7	16.8	0.0	0.4	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	26/07/18	180	0.0	4.7	16.8	0.0	0.4	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	06/08/18	0	0.0	0.0	20.9	0.0	0.7	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	06/08/18	10	0.0	5.7	15.0	0.0	0.7	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS401	06/08/18	20	0.0	6.0	14.5	0.0	0.7	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS401	06/08/18	30	0.0	6.1	14.4	0.0	0.7	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1

Project: Woodcroft Farm - Remediation
Ref: GE16943
Client: Grainger PLC

Geo-Environmental

Location	Date	Time (sec)	CH_4 (%)	CO_2 (%)	O_2 (%)	Flow (l/hr)	VOC (ppm)	Pressure (mb)	GWL (m bgl)	GSV/Qhgs		Characteristic Situation		CS1 Limiting Value Check			NHBC			
												BS8485 & C665					CH_4		CO_2	
										CH_4	CO_2	CH_4	CO_2	Flow	CH_4	CO_2	GSV	Conc.	GSV	Conc.
WS401	06/08/18	60	0.0	6.1	14.7	0.0	0.7	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS401	06/08/18	90	0.0	6.0	14.8	0.0	0.7	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS401	06/08/18	120	0.0	6.0	14.7	0.0	0.7	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS401	06/08/18	180	0.0	6.0	14.7	0.0	0.7	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS402	06/08/18	0	0.0	0.0	20.9	0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	06/08/18	10	0.0	4.7	15.2	0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	06/08/18	20	0.0	4.9	14.8	0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	06/08/18	30	0.0	4.8	14.8	0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	06/08/18	60	0.0	4.8	14.9	0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	06/08/18	90	0.0	5.2	14.3	0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS402	06/08/18	120	0.0	5.4	14.2	0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS402	06/08/18	180	0.0	5.5	14.0	0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS403	06/08/18	0	0.0	0.0	20.9	0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	06/08/18	10	0.0	3.7	16.5	0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	06/08/18	20	0.0	3.8	16.0	0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	06/08/18	30	0.0	3.9	16.0	0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	06/08/18	60	0.0	3.9	16.0	0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	06/08/18	90	0.0	3.9	15.9	0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	06/08/18	120	0.0	4.0	15.8	0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	06/08/18	180	0.0	4.0	15.8	0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	06/08/18	0	0.0	0.0	20.9	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	06/08/18	10	0.0	1.9	19.2	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	06/08/18	20	0.0	2.1	18.7	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	06/08/18	30	0.0	2.1	18.6	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	06/08/18	60	0.0	2.2	18.5	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	06/08/18	90	0.0	2.2	18.3	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	06/08/18	120	0.0	2.3	18.2	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	06/08/18	180	0.0	2.3	18.3	0.0	0.1	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	06/08/18	0	0.0	0.0	20.9	0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	06/08/18	10	0.0	3.6	15.9	0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	06/08/18	20	0.0	3.7	15.5	0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	06/08/18	30	0.0	3.8	15.1	0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	06/08/18	60	0.0	3.9	15.4	0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	06/08/18	90	0.0	3.9	15.4	0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	06/08/18	120	0.0	3.9	15.4	0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	06/08/18	180	0.0			0.0	0.3	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	06/08/18	0	0.0	0.0	20.9	0.0	0.3	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	06/08/18	10	0.0	2.4	17.4	0.0	0.3	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	06/08/18	20	0.0	2.5	17.1	0.0	0.3	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	06/08/18	30	0.0	2.3	17.0	0.0	0.3	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	06/08/18	60	0.0	2.8	16.9	0.0	0.3	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	06/08/18	90	0.0	2.9	16.8	0.0	0.3	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	06/08/18	120	0.0	2.9	16.8	0.0	0.3	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	06/08/18	180	0.0	2.9	16.9	0.0	0.3	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	06/08/18	0	0.0	0.0	20.6	0.0	0.3	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	06/08/18	10	0.0	3.7	16.5	0.0	0.3	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN

Project: Woodcroft Farm - Remediation
Ref: GE16943
Client: Grainger PLC

Geo-Environmental

Location	Date	Time (sec)	CH_4 (%)	CO_2 (%)	O_2 (%)	Flow (l/hr)	VOC (ppm)	Pressure (mb)	GWL (m bgl)	GSV/Qhgs		Characteristic Situation		CS1 Limiting Value Check			NHBC			
												BS8485 & C665					CH_4		CO_2	
										CH_4	CO_2	CH_4	CO_2	Flow	CH_4	CO_2	GSV	Conc.	GSV	Conc.
WS407	06/08/18	20	0.0	3.7	16.3	0.0	0.3	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	06/08/18	30	0.0	3.8	15.8	0.0	0.3	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	06/08/18	60	0.0	3.9	16.0	0.0	0.3	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	06/08/18	90	0.0	4.0	15.9	0.0	0.3	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	06/08/18	120	0.0	4.5	15.3	0.0	0.3	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	06/08/18	180	0.0	4.9	14.7	0.0	0.3	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	22/08/18	0	0.0	0.0	20.9	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	22/08/18	10	0.0	2.4	19.0	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS401	22/08/18	20	0.0	5.9	13.9	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS401	22/08/18	30	0.0	5.9	13.8	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS401	22/08/18	60	0.0	6.0	13.7	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS401	22/08/18	90	0.0	6.0	13.7	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS401	22/08/18	120	0.0	6.0	13.7	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS401	22/08/18	180	0.0	6.0	13.7	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS402	22/08/18	0	0.0	0.0	20.9	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	22/08/18	10	0.0	4.0	16.5	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	22/08/18	20	0.0	4.3	15.7	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	22/08/18	30	0.0	4.4	15.3	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	22/08/18	60	0.0	4.0	14.3	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS402	22/08/18	90	0.0	5.4	13.1	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS402	22/08/18	120	0.0	5.1	12.3	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS402	22/08/18	180	0.0	5.4	12.1	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 1
WS403	22/08/18	0	0.0	0.0	20.9	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	22/08/18	10	0.0	4.0	15.3	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	22/08/18	20	0.0	4.2	14.8	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	22/08/18	30	0.0	4.2	14.7	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	22/08/18	60	0.0	4.3	14.6	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	22/08/18	90	0.0	4.3	14.6	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	22/08/18	120	0.0	4.7	13.9	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS403	22/08/18	180	0.0	4.7	13.9	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	22/08/18	0	0.0	0.0	20.9	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	22/08/18	10	0.0	1.9	19.0	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	22/08/18	20	0.0	2.0	18.9	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	22/08/18	30	0.0	2.0	18.9	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	22/08/18	60	0.0	2.1	18.7	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	22/08/18	90	0.0	2.1	18.7	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	22/08/18	120	0.0	2.2	18.6	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS404	22/08/18	180	0.0	2.2	18.6	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	22/08/18	0				0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	22/08/18	10	0.0	4.3	14.8	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	22/08/18	20	0.0	4.4	14.5	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	22/08/18	30	0.0	4.4	14.5	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	22/08/18	60	0.0	4.4	14.5	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	22/08/18	90	0.0	4.6	13.6	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	22/08/18	120	0.0	4.7	13.4	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS405	22/08/18	180	0.0	4.7	13.4	0.0	0.0	1009	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN

Project: Woodcroft Farm - Remediation
Ref: GE16943
Client: Grainger PLC

Geo-Environmental

Location	Date	Time (sec)	CH_4 (%)	CO_2 (%)	O_2 (%)	Flow (l/hr)	VOC (ppm)	Pressure (mb)	GWL (m bgl)	GSV/Qhgs		Characteristic Situation		CS1 Limiting Value Check			NHBC			
										CH_4	CO_2	BS8485 & C665		Flow	CH_4	CO_2	CH_4		CO_2	
												CH_4	CO_2				GSV	Conc.	GSV	Conc.
WS406	22/08/18	0	0.0	0.0	20.9	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	22/08/18	10	0.0	2.4	17.6	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	22/08/18	20	0.0	2.5	17.1	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	22/08/18	30	0.0	2.5	17.1	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	22/08/18	60	0.0	2.6	17.0	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	22/08/18	90	0.0	3.2	16.2	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	22/08/18	120	0.0	3.3	16.1	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS406	22/08/18	180	0.0	3.3	16.1	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	22/08/18	0	0.0	0.0	20.9	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	22/08/18	10	0.0	3.5	15.9	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	22/08/18	20	0.0	3.7	15.5	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	22/08/18	30	0.0	3.8	15.3	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	22/08/18	60	0.0	3.9	15.1	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	22/08/18	90	0.0	4.7	13.9	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	22/08/18	120	0.0	4.4	13.9	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS407	22/08/18	180	0.0	4.4	13.9	0.0	0.0	1010	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
Max values			0.0	11.5	20.9	0.0	2.5	1017.0	0.0	0.000	0.000	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 2
Min Vaules			0.0	0.0	1.7	0.0	0.0	1004.0	0.0	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH Flow LoD check			0.0	11.5	20.9	0.1	-	-	-	0.000	0.012	CS1	CS1	NO	NO	CO2>CS1 limit	GREEN	GREEN	GREEN	AMBER 2

Appendix B

Surface emissions survey

 © EPG LTD

Woodcroft Farm

Methane Emissions Mapping Survey

September 2018

Mansfield Business Centre
Ashfield Avenue
Mansfield
NG18 2BU
www.enitial.co.uk

Approval Sheet

Customer: Geo-Environmental Services Limited

Site: Woodcroft Farm

Project title: Emissions Mapping (TDL) Survey

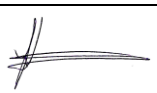
Project Manager: J Freestone

Project Staff: J Freestone, T Freestone

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Fax: 01902 798711

Issue	Status	Date	Prepared By	Signature	Date
1	Final	21/09/2018	J Freestone		21/09/2018
			Checked By	**Signature**	**Date**
			C Keightley		21/09/2018

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2. Surface Emissions Mapping Survey Summary
   - 2.1 Survey Overview 4
   - 2.2 Site Personnel and Equipment 5
   - 2.3 Weather Conditions and Meteorological Data 5

3. Surface Emissions Mapping Survey Results
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Appendix

A Survey Route and Data Logging Points
B Methane Concentration Plot
C HeatWave Methane Plot
D TDL500 Calibration Certificate

1.0 Introduction

1.1 Brief and Desk Study

enitial were commissioned by Geo-Environmental Services Limited (GESL) to undertake a Methane Surface Emissions Mapping (TDL) Survey at their Woodcroft Farm Site on 18 September 2018.

Woodcroft Farm is located to the North of Waterlooville in Hampshire, off Woodcroft Lane at National Grid Reference SU681120. It is understood that the area of Woodcroft Farm surveyed consists of a former chalk pit which has been filled with inert waste at some point in the latter 1900's. The site is currently earmarked for residential development.

The desk study for the Emissions Mapping Survey consisted of gathering mapping information and producing survey grid GIS design and files. Information was created for use with enitial's bespoke HeatWave GIS PDA based software for mapping emissions on site.

2.0 Surface Emissions Mapping Survey Summary

2.1 Survey Overview

The Surface Emissions Mapping Survey was undertaken on 18 September 2018.

A TDL500 Laser Methane Detector instrument was used to undertake the survey which detects methane from 0ppm to 100% v/v with a resolution of 1ppm. A Getac PS236 PDA utilising a sub-metre Differential GPS receiver was connected to the TDL500 providing continuous GPS and time stamped data logging.

The survey was undertaken on a 5m transect spacing using the site grid setup as part of the desk study. Data logging was set at 3 second intervals. During the survey, the surface was scanned at a distance not exceeding 5cm above

the surface where possible whilst a steady walking pace was maintained. Areas of the site had established vegetation in the form of grassland and occasional perennial weeds. To ensure accurate emissions data, the TDL probe was poked through any vegetation, where surface scanning was not possible, this was done in tandem with each stride giving a distance of approximately 1m between surface readings.

A plan showing the survey route taken and data logging points is presented in Appendix A.

2.2 Site Personnel and Equipment

Table 2.2 details the personnel on site during the survey and the equipment used including serial number and calibration expiry details. A gas check was undertaken prior to and upon completion of the survey, details of which are also shown in Table 2.2.

Table 2.2 Site Personnel and Equipment

Date	Personnel	Instrument Type	Instrument Serial Number	Calibration Due	110ppm Gas Check
18/09/2018	J Freestone	Geotech TDL500	6940315	18/01/2019	107.7

The calibration certificate for the instrument used is presented in Appendix D.

2.3 Weather Conditions and Meteorological Data

In order to ensure that monitoring was undertaken in accordance with best practice for Surface Emissions surveying, meteorological data was recorded from on site observations and details from www.metoffice.gov.uk. Table 2.3 details conditions and observations made during the survey. Wind speeds of 18 to 19mph were recorded during the survey which are at the upper limits for undertaking an Emissions Mapping Survey, however wind speeds within the survey area were significantly lower due to the trees and dense hedges to the southern and western boundaries providing a sheltering effect from the wind.

Table 2.3 Weather Conditions and Meteorological Data

Date / Time Period	Weather Conditions	Ground Conditions	Pressure (mbar)	Temp (°C)	Wind Speed (mph)	Wind Direction
18/09/2018 09:00	Medium-level cloud	Moist	1008	17	18	WSW
18/09/2018 11:00	Low-level cloud	Moist	1010	19	19	WSW

3.0 Surface Emissions Mapping Survey Results

3.1 Results Overview

The TDL500 raw data GPS records were converted from Latitude and Longitude to British National Grid co-ordinates using the Ordnance Survey GridInquest software and a WGS84 to OSGB36 transformation setting. Data was plotted on the plans in Appendix A and B showing the data logging locations and also the methane levels as a coloured contour plot. A HeatWave aerial plot showing methane readings is presented in Appendix C.

3.2 Surface Results

Background levels of methane in the UK vary dependant on location but are widely reported as being 1.7 to 1.8ppm. A total of 835 readings were recorded at Woodcroft Farm of which 87% were ≤1.8ppm methane. Of the remaining 13% of readings above ≥1.8ppm methane, the average was 2.0ppm and can be considered as negligible levels in line with the uncertainty of measurement of the instrument used being 1ppm between 0 and 10ppm.

4.0 Conclusion

The Surface Emissions Mapping Survey undertaken on the historical landfill area of Woodcroft Farm has returned average values of methane below UK and background levels. The average methane level recorded was 1.6ppm. No methane levels were recorded above 2.2ppm.

5.0 Closure

enitial has used its best endeavours, experience and expertise to provide a meaningful, accurate and relevant representation of the works carried out. The works were based on a defined programme and scope of works and terms and conditions agreed with the Client.

The findings discussed in this document relating to information provided by the Client relate only to those to which we have had access. No attempt has been made to validate any data or information provided. It is acknowledged that certain aspects may be superseded or rendered irrelevant by information in documentation to which we have not accessed.

enitial cannot accept responsibility to any parties whatsoever, following the issue of this report, for any matters arising which may be considered outside the agreed scope of works.

This report is issued solely to the Client. enitial does not accept any responsibility to any third parties to whom this report may be circulated, in part or in full, and any such parties rely on the contents at their own risk.

Appendix A

Survey Route and Data Logging Points



KEY:

SURVEY ROUTE AND DATA LOGGING POINTS

Geo-Environmental

WOODCROFT FARM

EMISSIONS MAPPING SURVEY
TRACK LOG / SURVEY POINTS
SEPTEMBER 2018

DRAWN BY TF	DATE 20/09/2018
APPROVED BY JF	SCALE @ A3 1:350
DRAWING No 0918/WCF/01	STATUS FINAL

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fax +44 (0) 1902 798711
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Appendix B

Methane Concentration Plot

SCALE

METHANE CONCENTRATION

- >10,000ppm
- 1,000 to 10,000ppm
- 100 to 1,000ppm
- 50 to 100ppm
- 20 to 50ppm
- 10 to 20ppm
- 5 to 10ppm
- 0 to 5ppm

Geo-Environmental

WOODCROFT FARM

EMISSIONS MAPPING SURVEY
CONTOUR PLOT
SEPTEMBER 2018

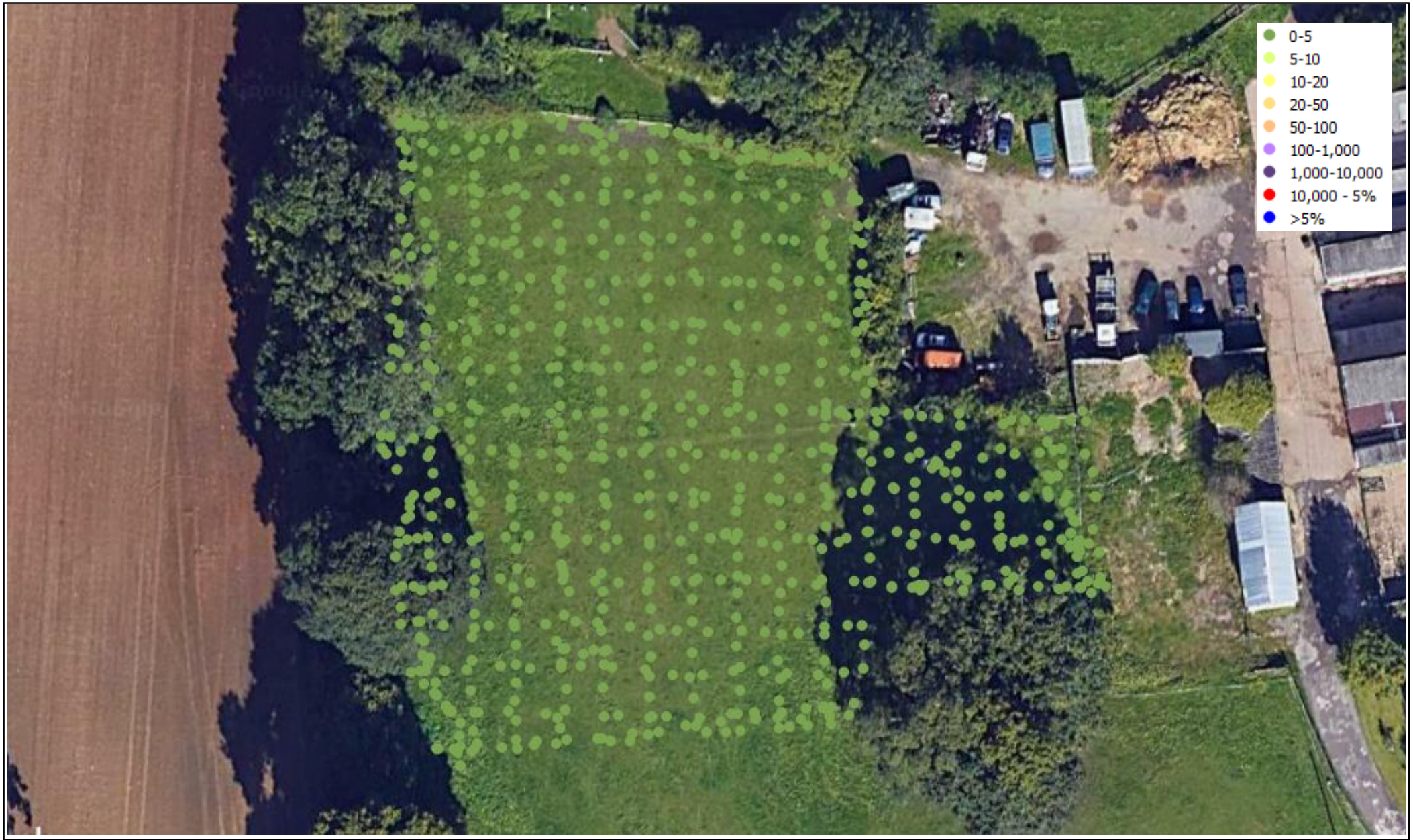
DRAWN BY TF	DATE 20/09/2018
APPROVED BY JF	SCALE @ A3 1:350
DRAWING No 0918/WCF/02	STATUS FINAL

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Appendix C

HeatWave Methane Plot



Woodcroft Farm Emissions Mapping Survey
HeatWave Data Plot September 2018

Appendix D

TDL500 Calibration Certificate

GAZOMAT™
an ecotec company

Certificate Of Calibration

Delivered to : ENITIAL - UK

Date of the report : 18/01/2018

Identifier of the detector

Detector name	: Inspectra Laser	Serial Number	: **6940315**
Scale numbers	: 1	Next visit	: 18/01/2019

Method of Checking

Internal procedures : ATE04226
Calibration Bench n° : 13

Each scale of the checked apparatus was the subject of a measurement for zero value, and of a measurement for the value of the concentration of the gas standard injected .

Scale	Gaz	Concentration of the gas standard	Traceability of the gas (N° of production)	Specifications (awaited posted values)	Uncertainty on the concentration of the gas standard
PPM	**CH4**	0,001% GAS	17-0979	10 PPM(± 10% relative)	± 2% relative
PPM	**CH4**	0,05% GAS	040006249472	500 PPM(± 10% relative)	± 2% relative
PPM	**CH4**	0,25% GAS	040006249830	2507 PPM(± 10% relative)	± 2% relative
PPM	**CH4**	1% GAS	040006024895	10000 PPM(± 10% relative)	± 2% relative
PPM	**CH4**	2% GAS	17-0360	20040 PPM(± 10% relative)	± 2% relative
PPM	**CH4**	100% GAS	82A-2850906	999950 PPM(± 10% relative)	± 2% relative

Base : CH4

Name	Gaz	Usual gas injected	Awaited value	Value read on the detector	Corrected value	Tolerance	Result
PPM	AZOTE	0 PPM	0 PPM	0 PPM	Without	5 PPM	Conforms
PPM	CH4	10 PPM	10 PPM	9,5 PPM	Without	10 %	Conforms
PPM	CH4	500 PPM	500 PPM	508,6 PPM	Without	10 %	Conforms
PPM	CH4	2500 PPM	2524 PPM	2574,7 PPM	Without	10 %	Conforms
PPM	CH4	10000 PPM	9990 PPM	10382,9 PPM	Without	10 %	Conforms
PPM	CH4	20000 PPM	20030 PPM	20352,9 PPM	Without	10 %	Conforms
PPM	CH4	1000000 PPM	999950 PPM	1021300 PPM	Without	10 %	Conforms

Result of the checking

The detector is considered to be in conformity with the specifications of reference

After sale manager

This document includes 1 page.

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This document is carried out according to the recommendations of the booklet of documentation X 07-011 defining the report of checking. It can be used to show the connection of the means of measurement to the national or international standards, provided it answers the recommendations of the booklet of documentation X 07-015.

Appendix C

Diffusive flow modelling

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Modified Johnson and Ettinger approach

Methane

Equilibrium concentration in building

C_v, Equilibrium concentration in building $= \frac{E}{Q_{FV}}$

Q_{FV}	Volumetric fresh air flow through building	cm^3/s	1333.3	
Air changes in building	Air changes per hour in building	No/h	0.5	SR3, Table 4.21, default for residential.
	Air changes per day in building	No/day	12	
Hv	Height of ground floor space	cm	240	SR3, Table 4.21, default for residential.
	Width of building	cm	200	Default for small bathroom. Note this is not a sensitive input parameter because the area of ingress is proportionate to the volume of the space.
	Length of building	cm	200	Default for small bathroom. Note this is not a sensitive input parameter because the area of ingress is proportionate to the volume of the space.
C_v	**Equilibrium vapour concentration in building**	**mg/m^3**	**1.93E+02**	Using ventilation equation from J&E method (same as CIRIA C149)
		g/cm^3	**1.93E-07**	
		%	**0.028**	= C_{ppm} (12.187 x MW)/(273.15 + T) - at an ambient pressure of 1 atmosphere.
				ASSUMES NO RETARDATION FROM FLOOR SLAB

Rate of mass transfer by diffusion

E, Rate of mass transfer by diffusion (g/s) $E = \frac{A_B\left(C_{source} - C_{g0}\right)D^{eff}}{L}$

	Width of building	cm	200	Default for small bathroom. Note this is not a sensitive input parameter because the area of ingress is proportionate to the volume of the space.
	Length of building	cm	200	Default for small bathroom. Note this is not a sensitive input parameter because the area of ingress is proportionate to the volume of the space.
A_B	Cross sectional area of migration pathway	cm^2	4.00E+04	Area of migration pathway
C_{source}	Vapour concentration in soil	g/cm^3	3.09E-04	From measured gas concentration
C_{g0}	Vapour concentration at top of soil	g/cm^3	0.00E+00	Assume = zero (to give worst case)
D^{eff}	Effective diffusion coefficient of soil	cm^2/s	0.001041	D^{eff} is calculated in same way as in J&E method
L	Depth of migration pathway (depth to source in soil)	cm	50	Assume gas is within capillary fringe above water table
E	**Rate of mass transfer into building by diffusion**	**g/s**	**0.000257**	Diffusion of vapour through ground into building.

Effective diffusion coefficient through soil

$D^{eff} = \frac{\theta_v^{3.33}}{\theta_T^2} D^{air} + \frac{1}{H}\frac{\theta_w^{3.33}}{\theta_T^2} D^{w}$

θ_v	Volumetric content of soil vapour	cm^3 - vapour/cm^3 -	0.15	Loam
θ_w	Volumetric content of soil pore water	cm^3 - water/cm^3 - s	0.36	Loam
θ_T	Total volumetric content of pore space in soil	cm^3 /cm^3 - soil	0.51	
D^{air}	Diffusion coefficient in air - chemical specific	cm^2/s	1.50E-01	Diffusion coefficients in water usualy around 10,000 times less than air values
D^{w}	Diffusion coefficient in water - chemical specific	cm^2/s	1.50E-05	From *Local Authority guide to ground gas*
H	Henry's Law constant - chemical specific	(cm3-H2O)/(cm3-air)	29	Kjeldsen P (1996) *Landfill gas migration in soil*. In landfilling wastes: biogas.
D^{eff}	**Calculated value**	**cm^2/s**	**0.00104**	

Conversion of vapour concentration to g/cm^3

Volumetric concentration (mg/m^3) = C_{ppm} (12.187 x MW)/(273.15 + T) - at an ambient pressure of 1 atmosphere.

MW	Molecular weight of the gas or vapour.		16	From *Local Authority guide to ground gas*
T	Ambient temperature	°C	10	Typical in ground temperature in UK
C_{source}	Concentration of gas at source	%	42.5	Maximum methane concentration recorded on site.
$C_{receptor}$	Concentration of gas at receptor	%	0	
C_{source}	Concentration of gas or vapour in g/cm^3	**g/cm^3**	3.09E-04	
$C_{receptor}$	Concentration of gas or vapour in g/cm^3	**g/cm^3**	0.00E+00	

Geo-Environmental

Technical Note

Site:	Woodcroft Farm Phase 2B (Farmyard Area)	**Ref:**	GE16943-FG-TN01-191205
Client:	Linden Homes South	**Date:**	December 05, 2019
To:	Jonathan Driver – Havant Borough Council	**Cc:**	K McGuire - Linden Homes South

RE: Woodcroft Farm Development Site (Phase 2B) – Discharge of condition 11, further investigation, risk assessment, remediation method and verification reporting

This technical note provides a response to the queries raised by Havant Borough Council in relation to controlled waters with regards to the discharge of condition 11 for Phase 2B of the Woodcroft Farm development.

The superficial deposits beneath the site (Head Deposits) were noted to be classified as a Secondary 'A' Aquifer. The bedrock geology beneath the site was shown to be located on the boundary of two classifications, Principal Aquifer (Tarrant Chalk) and Secondary 'A' Aquifer (Lambeth Group).

The site was indicated to be located within a Source Protection Zone, Inner Zone (Zone 1), with regards to the protection of groundwater for potable supply.

Several phases of site investigation works have been undertaken by Geo-Environmental reported within a Soil Contamination Assessment Letter Report ref; GE16662-FG02-170929, dated 29th September 2017 and Remediation Strategy and Verification Plan (Farmyard) ref; GE16943-RSVP-FY- JUN18, dated 28th June 2018.

Groundwater was not encountered during any of these phases of investigation or during any subsequent monitoring rounds. Boreholes were constructed to a maximum depth of 25m bgl and therefore it is assumed that groundwater is present at a depth greater than 25m bgl, i.e. there is a substantial thickness of unsaturated zone beneath this site.

Within the farmyard area, encountered ground conditions were found to comprise a mantle of Topsoil or Made Ground overlying soft to firm CLAY and sandy CLAY inferred to be of the Head Deposits and/or Lambeth Group, which in turn was found to overlie structureless weathered 'putty' CHALK inferred to be the highly weathered upper profile of the Tarrant Chalk Member.

Made Ground was found to be present to depths of between 0.25m and 2.2m bgl, the clays and sandy clays of either the Head Deposits or the Lambeth Group were found to be present up to depths of 1.8m and 2.5m bgl. The weathered structureless chalk was only encountered within two of the trial pits excavated within the farmyard area, other pits terminating at shallower depths. Investigation across the wider site also encountered a highly weathered chalk and thus structureless chalk is considered prevalent across the site.

The presence of clays and weathered structureless putty chalk encountered within the farmyard area provide a very low permeability layer, which would act as an aquitard that sits above the structured chalk of the Tarrant Chalk Member the Principal Aquifer. Therefore, the soils encountered within the investigation locations beneath the farmyard area, to a maximum depth of 2.5m bgl, are of very low permeability and would inhibit any mobilisation or migration of contaminants identified within these soils. In addition, it was also considered that the contaminants identified within the soils in the farmyard area of the site were likely to be bound within the clays encountered and therefore not mobile.

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Groundwater has not been encountered during any phases of investigation undertaken by Geo-Environmental and is considered to be present at depth i.e. greater than 25m bgl, therefore groundwater is are not in contact with the encountered contaminants within the shallow soils, nor is there a plausible migration pathway due to the presence of an aquitard layer.

Arsenic and Nickel were encountered at elevated concentrations within TP314 at a depth of 1.6m bgl within the natural clays at this location. The identified contaminants were bound to the soil and are not considered to be mobile. In addition, groundwater is not in contact with these soils and there is a significant thickness of unsaturated zone (>25m) within which dilution, attenuation and degradation mechanisms would prevail. A review of the BGS normal background concentrations for both these metals was undertaken. For both metals, the site falls within the Principal classification, therefore the background concentration for Arsenic is 32mg/kg and for Nickel is 42mg/kg (albeit this tends to relate to Topsoil and not necessarily the underlying natural soils). The recorded concentrations of both determinands within TP314 were above the respective normal background concentrations. It may be that these recorded elevated concentrations are representative of the variation in natural concentration within the soils, or as a possible result of pesticide storage/use on the site. However, given the depth at which they were encountered, that this relates to one small/localised point on site (therefore of very limited volume), their lack of apparent mobility and the lack of any pollutant pathways they are not considered to represent a risk to either human health or controlled waters, and therefore no remedial measures or further action are considered to be necessary in relation to these elevated concentrations of Arsenic and Nickel.

It is considered that development proposals within the farmyard area (Phase 2B) will not impact on groundwater, which is anticipated (from investigation) to be present at depth (>25m bgl). Development and construction works will be undertaken within the shallow soils, in the Made Ground or Topsoil, and the Head Deposits and Lambeth Group, these soils are considered to be of negligible permeability and to be acting as an aquitard to the Principal Aquifer situated at depth beneath the site. Development proposals are not considered to create any new pathways to controlled waters beneath the site and encountered contaminants (within the Made Ground and natural soils) are not considered to be mobile, nor are pathways for mobilisation considered to be present. The development proposals are not considered to present or create a risk of harm to the Principal Aquifer or groundwater resource at significant depth beneath the site. Therefore, no remedial measures in regard to controlled waters are considered to be necessary.

For and on Behalf of Geo-Environmental



FIONA GOODE BSc (Hons), MSc, FGS, MIEnvSc, RSoBRA
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4th March 2020

Our ref: GE18761/FG02/200304

Kieran McGuire
Linden Homes South (Vistry Homes Southern)
1A Guildford Business Park
Guildford
Surrey
GU2 8XG

Dear Kieran,

RE: WOODCROFT FARM (PHASE 2B), WOODCROFT LANE, LOVEDEAN – LEACHATE TESTING

Geo-Environmental Services Limited (Geo-Environmental) was instructed by Linden Homes to undertake the excavation of a single trial pit in the vicinity of previously located TP314 to collect soil samples for leachate testing in order to address concerns raised by the Local Authority with regards to contaminants identified within the natural soils in this area during the investigation works undertaken in May 2018 and reported in GE16943/RSVP-FY/JUN18 and to assess their leachability.

The purpose of this investigation was to collect environmental samples from the representative natural soils, where contaminants had previously been identified (1.60m bgl) to address concerns about possible leachability in order to progress the discharge of planning conditions on the site.

Scope of Works

The following scope of works was agreed with the Client:

- The excavation of 1No. machine dug trial pit to a provisional depths of 2.00m bgl. (Located in the vicinity of TP314);
- Collection of soil samples from depths representative of previously identified contaminants within the natural soils in this vicinity. (Contaminants previously identified at 1.60m bgl);
- Analysis of soil samples, leachate testing, for a suite of heavy metals as previously identified within the natural soils in the vicinity of TP314.

The intrusive investigation was undertaken on 19th February 2020 with the works being supervised by an engineer from Geo-Environmental.

Ground Conditions

In total, the intrusive investigation comprised the excavation of 1No. trial pit to a depth of 2.00m bgl. Figure 2 presents the exploratory hole location.

The ground conditions encountered during the investigation were broadly consistent with the anticipated published sequence of strata and previously encountered ground conditions. In summary, ground conditions typically comprised of soils inferred to be of the Lambeth Group overlying chalk inferred to be the highly weather upper profile of the Tarrant Chalk Member.

Soils inferred to be Lambeth Group were encountered from ground level to 1.75m bgl. The deposits encountered comprised firm to stiff orange and grey mottled slightly sandy clay, becoming gravelly and flinty from 1.20m bgl.

Chalk inferred to be the highly weather upper profile of the Tarrant Chalk Member, was encountered from 1.75m bgl to the full extent of the investigation, i.e. 2.00m bgl. The chalk encountered comprised structureless putty like off white chalk with medium strength chalk clasts in a granular matrix (CIRIA class Dm/Dc).

Figure 2 presents the investigation locations along with the location of the previously undertaken TP314. For more detailed descriptions of the ground conditions, reference should be made to the exploratory hole logs enclosed in Appendix A.

Groundwater

Groundwater was not encountered within the investigation location undertaken.

Groundwater has not been encountered during any of the phases of investigation works undertaken by Geo-Environmental to date or during any subsequent monitoring rounds. Boreholes were constructed to a maximum depth of 25.00m bgl and therefore it is assumed that groundwater is present at a depth greater than 25.00m bgl, i.e. there is a substantial thickness of unsaturated zone beneath this site.

Visual and Olfactory Contamination

No visual or olfactory evidence of contamination was identified during the additional investigation.

Leachate Assessment

Three soil samples were collected from the trial pit for leachate testing. The samples were analysed for a suite of metal contaminants consistent with the previously identified contaminants within the natural soils at this location to address concerns regarding potential contaminant leachability.

The trial pit was located in the vicinity of TP314 so as to provide targeted coverage to address concerns relating to the leachability of previously identified elevated levels of Arsenic and Nickel within the natural soils at a depth of 1.60m bgl as part of the May 2018 investigation. Soil samples were collected from 1.40m, 1.60m and 1.80m bgl from within the Lambeth Group and the Chalk. These depths were selected so that samples were taken from above and below the previously identified contaminants and within the different strata so as to assess whether contaminants may have leached/may be leaching into the chalk. Analysis was undertaken on the soil samples collected from these depths.

The results of the leachate analyses undertaken were compared against the Water Supply (Water Quality) Regulations 2000.

Leachable concentrations of both Arsenic and Nickel were found to be below the laboratory limit of detection for all samples tested, i.e. <5ug/l. The only recorded concentrations of any metals tested above the limit of detection were within the samples from 1.4m bgl for Copper and Zinc. When compared against the standards set out in the Water Supply Regulations for Water Intended for Human Consumption, the results for both of these metals are below the respective standards. In addition, Copper and Zinc were only identified with the sample from 1.4m bgl they were not identified within either sample analysed from depths below this (i.e. 1.60m and 1.80m bgl).

Based on the leachate analysis undertaken it is considered that the Arsenic and Nickel previously identified within the natural soils at 1.60m bgl in TP314 have a very low leachability and do not pose a risk to groundwater beneath

the site, which is likely to be at depths in excess of 25m bgl based on the investigation undertaken on the site to date.

The testing supports the original assessment put forward by Geo-Environmental that, the presence of clays and weathered structureless putty chalk encountered within the farmyard area provide a very low permeability layer, which would act as an aquitard that sits above the structured chalk of the Tarrant Chalk Member the Principal Aquifer. The soils encountered within the investigation locations beneath the farmyard area, to a maximum depth of 2.50m bgl, have been demonstrated to be of very low permeability and would likely inhibit any mobilisation or migration of contaminants identified within the shallow soils in this area. The identified contaminants, Arsenic and Nickel, within the natural soils within TP314, have been demonstrated to be bound to the soil matrix and are not considered to be mobile. In addition, groundwater is not in contact with these soils and there is a significant thickness of unsaturated zone (>25m) within which attenuation and degradation mechanisms would prevail together with dilution within the groundwater present at depth.

Given the depth at which Arsenic and Nickel were encountered and that the concentration appear to relate to one small/localised point on site (therefore of very limited volume), given their lack of apparent mobility and the lack of any pollutant pathways they are not considered to represent a risk to either human health or controlled waters.

Based on the above assessment and the results of the leachate analysis it is considered that the concerns relating to contaminant leachability have been addressed and that no remedial measures or further action are considered to be necessary in relation to the elevated concentrations of Arsenic and Nickel identified within TP314 as part of the May 2018 investigation.

Closure

We trust we have interpreted your request correctly and provided sufficient information for your current requirements. If you have any questions or queries in relation the information provided at this stage please let us know.

Yours sincerely
For and on Behalf of Geo-Environmental



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Enc Figure 1 – Site Location Plan
Figure 2 – Exploratory Location Plan
Appendix A – Exploratory Hole Logs
Appendix B – Geochemical Laboratory Test Results

Figures



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Site Location Plan
Client:	Linden Homes South			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE18761	**Revision:**	0		
Drawn:	FG	**Date:**	11/05/2018		
Figure:	1	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Exploratory Hole Location Plan
Client:	Linden Homes South			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE18761	**Revision:**	0		
Drawn:	FG	**Date:**	04/03/2020		
Figure:	2	**Scale:**	Not To Scale		

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APPENDIX A

Exploratory Hole Logs



Geo-Environmental
Unit 7, Danworth Farm
Hurstpierpoint
BN6 9GL
www.gesl.net

Trial Pit Log

TrialPit No
TP414
Sheet 1 of 1

Project Name:	Woodcroft Farm - Leachate Testing	Project No. GE18761	Co-ords: 468120.00 - 112025.00 Level:
Location:	Waterlooville	Dimensions (m):	Depth 2.00
Client:	Linden Homes South	2.40 / 0.40	Logged FG

Date 19/02/2020
Scale 1:25

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Grass over firm to stiff orange and grey mottled slightly sandy CLAY with occasional rootlets. Sand is fine LAMBETH GROUP
				1.20			
	1.40	ES					Firm to stiff orange and grey mottled gravelly CLAY. Gravel is fine to medium sub angular to sub rounded of flint LAMBETH GROUP
				1.50			
	1.60	ES		1.60			Firm to stiff orange and grey mottled very gravelly CLAY. Gravel is fine to coarse sub angular to sub rounded of flint and chalk LAMBETH GROUP
	1.80	ES		1.75			Firm to stiff orange and off white mottled gravelly CLAY. Gravel is fine to medium of chalk LAMBETH GROUP
				2.00			Recovered as structureless off white putty like CHALK with medium strength chalk clasts in a granular matrix. TARRANT CHALK MEMBER
							End of Pit at 2.00m

1
2
3
4
5

Water Strikes
Depth Strike | Rose to (mbgl)

Remarks

Stability Sides Stable

AGS

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APPENDIX B

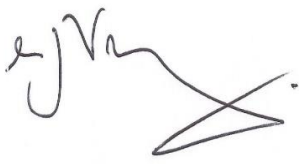
Geochemical Laboratory Results



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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	20-27168
Issue:	1
Date of Issue:	27/02/2020
Contact:	Fiona Goode
Customer Details:	GESL Unit 7 Danworth Farm Hurstpierpoint West SussexBN6 9GL
Quotation No:	Q19-01488
Order No:	PO-2514
Customer Reference:	GE18761
Date Received:	21/02/2020
Date Approved:	27/02/2020
Details:	Woodcroft Farm
Approved by:	

Mike Varley, Technical Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

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Sample Summary

Report No.: 20-27168, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
197872	TP414 1.40	19/02/2020	21/02/2020	Sandy silty loam	
197873	TP414 1.60	19/02/2020	21/02/2020	Silty loam	
197874	TP414 1.80	19/02/2020	21/02/2020	Chalk	

Results Summary

Report No.: 20-27168, issue number 1

			ELAB Reference	197872	197873	197874
			Customer Reference			
			Sample ID			
			Sample Type	SOIL	SOIL	SOIL
			Sample Location	TP414	TP414	TP414
			Sample Depth (m)	1.40	1.60	1.80
			Sampling Date	19/02/2020	19/02/2020	19/02/2020
Determinand	**Codes**	**Units**	**LOD**			
Metals						
Arsenic 10:1 extract	N	ug/l	5	< 5	< 5	< 5
Cadmium 10:1 extract	N	ug/l	1	< 1	< 1	< 1
Chromium 10:1 extract	N	ug/l	5	< 5	< 5	< 5
Copper 10:1 extract	N	ug/l	5	8	< 5	< 5
Lead 10:1 extract	N	ug/l	5	< 5	< 5	< 5
Mercury 10:1 extract	N	ug/l	0.1	< 0.1	< 0.1	< 0.1
Nickel 10:1 extract	N	ug/l	5	< 5	< 5	< 5
Selenium 10:1 extract	N	ug/l	5	< 5	< 5	< 5
Zinc 10:1 extract	N	ug/l	5	5	< 5	< 5
Inorganics						
Hexavalent chromium	N	ug/l	100	< 100	< 100	< 100

Method Summary

Report No.: 20-27168, issue number 1

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Leachate metals 10:1 extract	N		25/02/2020	101	ICPMS

Tests marked N are not UKAS accredited

Report Information

Report No.: 20-27168, issue number 1

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.
ELAB are unable to provide an interpretation or opinion on the content of this report.
The results relate only to the sample received.
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request
Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage

Geo-Environmental

REMEDIATION STRATEGY & VERIFICATION PLAN

for the land at

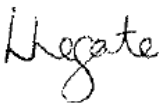
CHALK PIT AREA (CP), WOODCROFT FARM,

WOODCROFT LANE, LOVEDEAN, PO8 9QA

on behalf of

VISTRY HOMES SOUTHERN



Report:	**REMEDIATION STRATEGY & VERIFICATION PLAN**
Site:	**CHALK PIT AREA (CP), WOODCROFT FARM, WOODCROFT LANE, LOVEDEAN, PO8 9QA**
Client:	**VISTRY HOMES SOUTHERN**
Date:	**22/12/20**
Reference:	**GE16943-RSVP-CP-V6.0-DEC20**
Version:	**6.0**
Prepared by:	
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Authorised by:	
	GAVIN ROBERTS CGeol, BEng (Hons), MSc, FGS **TECHNICAL DIRECTOR**

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AMENDMENT RECORD

Revision ref.	Date	Reasons for amendment	Author	Reviewed By	Authorised by
1.0	28/06/2018	First issue	FG	GR	GR
2.0	26/10/2018	Accounts for findings of Detailed Quantitative Gas Risk Assessment	FG/GR	GR	GR
3.0	13/02/2020	Revision to reflect clarification of development levels	GR	GR	GR
4.0	27/03/2020	Revision to reflect proposed development levels	GR	GR	GR
5.0	24/08/2020	Revision to reflect proposed development levels	FG	LL	GE
6.0	22/12/2020	Revision to reflect amended proposed development levels	FG	LL	GR

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FIGURES

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FIGURE 3	Exploratory Hole Location Plan (Trial Pits and Trial Trenches)
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FIGURE 5	Extent of Made Ground (Trial Pits and Trial Trenches)
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FIGURE 8	Development Levels Plan (RSVP-CP-v6.0)– Phase 3 Farmyard and Chalk Pit
FIGURE 9	Development Levels Plan (RSVP-CP-v6.0)– Phase 3 Horse Arena, Chalk Pit and Farmyard
FIGURE 10	Remediation Strategy Plan (RSVP-CP-v6.0)– Phase 3 Farmyard and Chalk Pit Volumes
FIGURE 11	Remediation Strategy Plan (RSVP-CP-v6.0)– Phase 3 Horse Arena, Chalk Pit and Farmyard Volumes

APPENDICES

APPENDIX A	Exploratory Hole Logs
APPENDIX B	Geochemical Laboratory Results and Statistical Assessments
APPENDIX C	Soil Import Criteria

1.0 INTRODUCTION

1.1 General

Following a Phase I and Phase II assessment of the site undertaken by third parties, detailed within reports listed below, Geo-Environmental was appointed by Grainger PLC and subsequently Vistry Homes, to undertake supplementary investigation and formulate a Remediation Strategy in relation to the proposed development at Woodcroft Farm, Woodcroft Lane, Lovedean, PO8 9QA herein referred to as 'the site' (Figures 1 and 2). Three distinct areas of the development site were identified as being impacted by contamination. Separate Remediation Strategies will be written for each of these distinct areas, therefore this Remediation Strategy is specific to the area of the development site known as the former chalk pit and landfill area, as shown in Figure 2.

This Remediation Strategy & Verification Plan for the Chalk Pit and Landfill Area (RSVP-CP v6.0), should be read in conjunction with the Remediation Strategy & Verification Plans for the former farmyard (RSVP-FY v6.0) and horse arena (RSVP-HA v5.0), dated December 2020.

The site as a whole, has been the subject to Phase I Ground Condition Report, ref 21834, dated 2010 prepared by Peter Brett Associates (PBA), which included a desk study and preliminary risk assessment for the overall Woodcroft Farm site; a Factual Report, ref RML 4750, dated October 2011 prepared by Risk Management Limited, which included ground investigation and laboratory test results; and a Geoenvironmental and Geotechnical Ground Investigation Report, ref 21834-030-R02, dated July 2013 prepared by PBA, which presented an interpretative assessment of the overall Woodcroft Farm site.

In addition to the above reports, Geo-Environmental was commissioned in 2017 to undertake a review of these reports, and supplementary testing and assessment. This was reported within a Soil Contamination Assessment ref. GE16662-FG02-170929, dated 29th September 2017. An additional phase of investigation, testing and monitoring was also commissioned in 2018 and reported on herein. Subsequently, a Detailed Quantitative Gas Risk Assessment (DQGRA) was commissioned from The Environmental Protection Group Ltd (EPG), ref. EPG/8938/2018/DQGRA/V1 dated October 2018, in relation to the infilled former chalk pit. The findings of the DQGRA have informed this RSVP.

The remedial strategy presented herein has been developed to reflect the findings from all phases of the assessments undertaken on this site, in respect to the chalk pit area. Based on the findings of the investigations it is considered that remediation works would be required with respect to soil contamination identified within the Made Ground within the chalk pit area on the site.

The revised strategy (V6.0) reflects clarification of development ground levels, as discussed with the Client and the Developer, and presented on Odyssey's engineering layout drawing ref: 17-110/2210, prepared July 2020 and Ardent's development levels plans ref: 192931-073, 192931-074 and 192931-075, prepared November 2020.

1.2 Objectives

The Remediation Strategy & Verification Plan (RSVP) sets out the proposed remedial works to be undertaken on the subject site to support its development for a proposed residential end use with private gardens.

1.3 Planning Permission

It is understood that a planning application has been approved for the site by Havant Borough Council under Planning Reference APP/13/00804. The following pre-commencement planning conditions have been attached to the application which relate to the remediation and validation of land contamination on the site.

11. Prior to the commencement of construction within any specified phase or defined area the development approved by this Planning Permission (as may be agreed in writing by the Local Planning Authority), a scheme to deal with the risks associated with contamination of the site shall be submitted to and approved in writing by the Local Planning Authority. That scheme shall include all of the following elements unless specifically excluded in writing by the Local Planning Authority.

1. *A scheme of further investigation, based on the previously submitted GeoEnvironmental & Geotechnical report. The scope of the investigation shall be sufficient to:*
   - *confirm the preliminary assessment of the nature and extent of contamination at the site,*
   - *inform an appropriate assessment of the risks to all receptors that may be affected, including controlled waters, and;*
   - *enable the appropriate design of remediation and/or risk mitigation measures (if required).*
2. *The results of the further investigation and risk assessment (1) and if appropriate, a method statement based on these results giving full details of the remediation and/or risk mitigation measures required, and how they are to be undertaken.*
3. *A verification report or statement (as appropriate) upon completion of the works set out in (2) [if any], confirming that measures undertaken have been implemented in accordance with the method statement, and have achieved the required performance standards. The verification report / statement shall provide details of any measures necessary for maintenance, further monitoring and reporting.*

All elements shall be adhered to unless agreed in writing by the Local Planning Authority.

Reason: To prevent future occupants of proposed residential properties being exposed to unacceptable risks from identified contamination & soil gas associated with automotive repair and landfill activity previously undertaken at the site, and to ensure that the site does not pose an unacceptable risk to the groundwater Source Protection Zone 1; having due regard to policies and proposals E1 of the Hampshire County Structure plan 1996-2011 (Review), and DM10 of the Havant Borough Adopted Core Strategy (2011), and DM17 of the Draft Local Plan (Allocations) 2012.

12. Prior to the commencement of construction of any part of the development approved by this Planning Permission, a protocol for the identification & assessment of any unforeseen ground conditions shall be submitted to and approved in writing by the Local Planning Authority. The provisions of the approved protocol shall be observed throughout the undertaking of all relevant construction activities.

Reason: For the protection of workers and the general public during the development of potentially contaminated land, and to prevent future occupants of proposed residential properties being exposed to unacceptable risks from unidentified &/or unexpected contamination that may be associated with previous activities undertaken at the site; having due regard to policies and proposals E1 of the Hampshire County Structure plan 1996-2011 (Review), and DM10 of the Havant Borough Adopted Core Strategy (2011), and DM17 of the Draft Local Plan (Allocations) 2012.

13. If, during development, contamination not previously identified at the site is found to be present, then no further development (unless otherwise agreed in writing with the Local Planning Authority) shall be carried out until the developer has submitted, and obtained written approval from the Local Planning Authority for an addendum to the Method Statement required under Condition 1, (2). This addendum shall detail how this unexpected contamination shall be dealt with, and the development shall not be carried out other than in accordance with the approved details.

Reason: For the protection of workers and the general public during the development of potentially contaminated land, and to prevent future occupants of proposed residential properties being exposed to unacceptable risks from unidentified &/or unexpected contamination that may be associated with previous activities undertaken at the site; having due regard to policies and proposals E1 of the Hampshire County Structure plan 1996-2011 (Review), and DM10 of the Havant Borough Adopted Core Strategy (2011), and DM17 of the Draft Local Plan (Allocations) 2012.

2.0 BACKGROUND

This Remediation Strategy & Verification Plan (RSVP) has been developed from the findings of the various phases of assessment.

A brief overview of salient findings of the reports is presented below. For further information, the individual reports should be referred to directly.

2.1 Overview

The wider site's previous uses included use as a farm with associated barns and buildings, scrapyard and the former chalk pit being infilled as an inert landfill. The portion of the site considered specifically herein comprised the former chalk pit and landfill area, as shown in Figure 2.

The ground conditions encountered within the former chalk pit and landfill area comprised a variable thickness of Topsoil overlying Made Ground, overlying gravelly clay and sandy clay on the northern boundary of this area and overlying the Chalk in the main body of the former chalk pit/landfill. On the periphery of the former chalk pit Made Ground was not encountered and the ground conditions were found to comprise a mantle of Topsoil overlying gravelly clay and sandy clay with flint gravel.

Made Ground was encountered within the majority of investigation locations at depths between 0.50m bgl and 5.00m+ bgl, and was found to comprise, sandy clay with brick, chalk gravel, concrete, tile, decaying roots, ashy deposits, plastic, wood and charcoal; sandy gravelly clay with brick, tile, slate, wood and glass; firm clay with brick, wood, rope, flint gravel, chalk gravel, plastic chipboard and cement; clayey sandy chalk and flint gravel with tarmac, chalk fragments, brick, tile, charcoal, wood, concrete and glass.

Within the main body of the former chalk pit/landfill the Made Ground was underlain directly by the Chalk. Around the outer edges of the chalk pit the Made Ground was found to be underlain by soft to firm clay, gravelly clay and sandy clay with occasional bands of flint cobbles.

Previous investigation and testing by third parties identified the presence of asbestos within the Made Ground in the former chalk pit and landfill area of the site. Previous investigation by Geo-Environmental identified elevated concentrations of Beryllium and the PAH compound Dibenzo(a,h)anthracene along with the presence of Asbestos, as well as identifying the need for a detailed ground gas risk assessment based on the presence of Made Ground/landfill deposits of variable composition and limited monitoring data. Therefore, further investigation and testing was undertaken to inform this RSVP and is presented herein.

The recent investigation and testing of soils identified contaminant concentrations of concern primarily within the Made Ground in relation to Beryllium, the PAH compound Dibenzo(a,h)anthracene and Asbestos. On the basis of the testing conducted to date, it is considered that remedial action would be warranted to protect end users of a residential development from the soil based contaminants identified.

Groundwater was not encountered within any of the investigation locations and is anticipated to be present at depths in excess of 25.00m bgl.

Some of the phases of investigation included limited periods of ground gas monitoring and a requirement for more detailed investigation and assessment was identified, which was subsequently completed and report with the detailed ground gas risk assessment for the site.

2.2 Supplementary Intrusive Investigation Works – Chalk Pit and Landfill Area

As part of the formulation of a remedial strategy further intrusive investigation works were undertaken between 14th May 2018 and 18th May 2018, in order to install ground gas monitoring wells, establish the extent of the landfill/Made Ground and gather forensic information of encountered materials to inform the detailed ground gas risk assessment. In relation to the former chalk pit and landfill area these works comprised the excavation of 5No. trial pits to depths of up to 3.00m bgl and 7No. window sampler boreholes to depths of up to 5.00m bgl with gas monitoring well installations, forensic description/analysis of the encountered Made Ground and associated environmental sampling for total organic matter content, along with 4No. trial trenches to depths of up to 2.00m bgl to establish the extent of the area of landfill/Made Ground. Gas monitoring wells were installed at varying depths within 7No. locations to target the landfill/Made Ground and natural ground on the periphery, to facilitate both spot and continuous gas monitoring. The location of the trial pits, boreholes and trenches are presented in Figure 3 and Figure 4, with the exploratory hole logs presented in Appendix A and results of the geochemical analysis and statistical assessments presented in Appendix B.

Subsequent to the several phases of intrusive investigation and ground gas monitoring, and a surface emissions survey, a Detailed Quantitative Gas Risk Assessment was undertaken by EPG, dated October 2018 in relation to the infilled chalk pit. The DQGRA concluded that ground gas protection measures were not required for the proposed residential development.

Further discussion relating to the implications of these supplementary investigation works is presented in Section 3 of this report.

2.3 Proposed Site Use

The proposed development is understood to comprise the development of 288No. residential units, associated car parking, open space and landscaping. The former chalk pit and landfill area covers c. 30-40 houses and associated private gardens.

2.4 Conceptual Site Model

Assessment of the investigation findings have identified particular hazards, or potential hazards which were considered to require intervention (remediation) to mitigate the risk of harm. Remediation works are proposed to break the identified plausible pollutant linkages associated with respect to contaminants of concern above respective assessment criteria within residential buildings and private garden areas proposed within the former chalk pit and landfill area, thereby mitigating the associated risk of harm to human health.

This would be undertaken as several phases of works on site and reflects the proposed development levels and requirement for a variable depth of reduced dig to accommodate a soil cover system. Reference should be made to Figures 8-9 which show proposed changes in ground level to achieve the development levels and associated reduced dig depths on individual plots:

1) Reduced dig to the minimum depths indicated on Figures 8-9 to achieve the required formation level to accommodate the required soil cover system thickness, or the full extent of the Made Ground where Made Ground is shallower. (Plots requiring a reduced dig are listed in Section 4.2).
2) It is proposed to retain and re-use the excavated soils where suitable for use (without treatment) within garden plots (under the soil cover system) where levels require raising and hence a requirement for the volume of excavated soil being generated from the reduced dig. (Figures 10-11 present the required volumes within specific Plots). These works would be undertaken in line with a Materials Management

Plan (MMP), subject to the appropriate documentation, Definition of Waste Code of Practice (DoWCoP) assessment, Qualified Person (QP as defined in DoWCoP) declaration and agreement of the Regulators.

3) If excavated soils are to be stored on site prior to their removal they will need to be placed on and covered with sheeting to prevent the spread of any asbestos or asbestos containing material. It is preferable for excavated soils from the reduced dig to be relocate directly to the final placement/re-use location without stockpiling so as to avoid double handling, stockpile controls and the like. In addition, the placed/re-used soils can then be covered at the earliest practicable opportunity.
4) Material re-use is subject to the requirements of this and associated remedial strategies which apply to the development within the overall site boundary and no materials are to be excavated or moved until a Materials Management Plan is in place and the required QP Declaration has been submitted to and accepted by CL:AIRE who subsequently notify the Environment Agency (EA). Movement of materials outside of these protocols would be considered an illegal waste process and subject to legal action and financial penalties applied by the regulators to the developer and/or groundworks contractor.
5) Installation of a soil cover system in garden areas and areas of soft landscaping to break the pollutant linkage for the contaminants identified within the Made Ground soils in the farmyard area, and to also provide suitable growing media. Where the reduced dig does not remove all of the Made Ground and hence the cover system is to be laid over Made Ground, or where development levels dictate that no reduced dig is required and Made Ground is to remain, the soil cover system shall incorporate a 150mm thick break layer formed of stone or crushed concrete with a geotextile membrane laid above and beneath, and overlain by a deter to dig geofabric to act as a visible deterrent overlain by a minimum 300mm thickness of subsoil and a minimum of 300mm of Topsoil. Where the reduced dig removes all Made Ground and exposes uncontaminated natural strata (and is validated as such), the soil cover system shall comprise clean subsoil and a minimum 300mm of suitable Topsoil, the thickness of subsoil in this scenario will be defined by the difference between the finished garden level (minus 300mm Topsoil) and the reduced dig level. The cover system is likely to be completed with Topsoil placement towards the end of plot specific development with the placement of Topsoil.

The aim of the remediation is not to remove all contamination identified on site but to reduce the identified risk to an acceptable level with respect to human health, the built environment and controlled waters.

It should be noted that the NHBC would not accept the deposition of asbestos impacted soils beneath house footprints as part of development related works on this site. In addition, the EA may not accept the deposition of asbestos impacted soils under roads where such soils then require compaction as this can potentially cause breakdown of the asbestos containing materials.

3.0 GROUND GAS

Intrusive ground investigation works undertaken over several phases identified the presence of deep Made Ground and/or landfill material within the former chalk pit located adjacent to the farmyard area. A maximum depth of c. 5.00m of Made Ground was established through intrusive investigation. The most recent intrusive investigation included forensic examination and description of the Made Ground infill within the chalk pit and Total Organic Carbon testing of Made Ground samples recovered from exploratory hole. The investigations have included several phases of ground gas monitoring and most recently, a surface emissions survey.

The findings of the various phases of investigation and monitoring have been assessed in detail by EPG as part of completion of a DQGRA, which concluded that no ground gas protection measures were required for the proposed residential development on the chalk pit area.

4.0 SOILS

The ground conditions within the chalk pit/landfill area have been established through several phases of intrusive investigation. Encountered soils comprised a mantle of Topsoil overlying Made Ground overlying gravelly clay and sandy clay on the northern boundary of this area and overlying the Chalk in the main body of landfill/Made Ground. On the outer edges of the former chalk pit Made Ground was not encountered and the ground conditions were found to comprise a thickness of Topsoil overlying gravelly clay and sandy clay with flint gravel.

Made Ground was encountered within the majority of investigation locations at depths between 0.50m bgl and 5.00m+ bgl, and was found to comprise, sandy clay with brick, chalk gravel, concrete, tile, decaying roots, ashy deposits, plastic, wood and charcoal; sandy gravelly clay with brick, tile, slate, wood and glass; firm clay with brick, wood, rope, flint gravel, chalk gravel, plastic chipboard and cement; clayey sandy chalk and flint gravel with tarmac, chalk fragments, brick, tile, charcoal, wood, concrete and glass. Possible asbestos was noted to be present within TP213 between 0.80m and 1.70m bgl and within TP303 between 0.10m and 0.35m bgl.

A review of chemical analysis of the soil samples from the chalk pit/landfill area was undertaken, and the results compared individually against the relevant GAC, SSAC or C4SL for a proposed residential end use (with plant uptake). Individual exceedances above the respective assessment criteria were identified for Beryllium, and PAH as summarised in Table 1.

Determinand	Tier 1 Criteria mg/kg	Depth m bgl	Concentration mg/kg	Geology
Beryllium	S4UL – 1.7 SSAC – 1.72	TP217 at 0.2	2.5	Topsoil
Dibenzo(a,h)anthracene	S4UL – 0.24 SSAC – 0.39	TP213 at 1.0	0.5	Made Ground

Table 1 Summary of exceedances against Tier 1 assessment criteria

The tier 1 exceedances where screened against the Site Specific Assessment Criteria (SSAC) calculated for the site. All of the exceedances identified were also found to exceed the calculated SSAC for residential end use with plant uptake. The noted exceedances of the calculated SSAC have all been identified as being within the Topsoil and Made Ground within the former chalk pit/landfill area.

Therefore the results were assessed further through statistical assessment as described below.

Statistical analysis of the samples within the dataset was undertaken in accordance with guidance contained in the CIEH/CL:AIRE report 'Comparing Soil Contamination Data with a Critical Concentration' (May 2008). If the contamination status of the soils is considered in a planning context, the null hypothesis tested by the analysis is whether the true mean concentration is equal to or greater than the critical concentration for a given determinand, with the critical concentration being the relevant SSAC or GAC (the soil screening value) for that determinand in the context of the intended end use of the site. If the analysis shows that the true mean concentration is less than the critical concentration the null hypothesis can be rejected. The guidance recommends that for the null hypothesis to be rejected the analysis should show that there is a 95% (or higher) likelihood that the true mean concentration is below the critical concentration. Where this is the case the site is considered to be acceptable for the planned end use without any necessary remedial measures.

Statistical assessment was undertaken on all results of geochemical testing undertaken by Geo-Environmental, for heavy metals and PAH from within the former chalk pit and landfill area of the site only. Due to the depth and extent of Made Ground encountered within the former chalk pit/ landfill area, it was deemed appropriate to assess

the results from this area in isolation as they were not representative of the Made Ground or natural soils encountered elsewhere on site.

The dataset of soils sampled for chemical analysis from within the former chalk pit and landfill area was limited. However, initial assessment of the datasets for both Beryllium and Dibenzo(a,h)anthracene indicated that the null hypothesis could not be rejected. Whilst statistical outliers were identified for a number for other substances, all reported concentrations (and statistical upper confidence limit concentrations) were below the relevant SSAC. The results of the statistical assessments are presented within Appendix B.

In addition, all samples were submitted for asbestos screening and where asbestos was identified quantification testing was carried out. The locations where asbestos was identified are summarised in Table 2.

Location and Depth (m bgl)	Type	Free Fibres (%)	Total (%)
TP213 at 1.0	Chrysotile and Crocidolite	<0.001	2.66
TP302 at 0.2	Chrysotile	<0.001	0.726
WS407 at 3.0 – 4.0	Chrysotile	<0.001	0.147

Table 2 Summary of locations of asbestos identified

Due to the extent and variation of the Made Ground/landfill encountered it is considered prudent to assume the potential for sporadic presence of ACM within the Made Ground across the former chalk pit/landfill area. In addition, previous investigations undertaken by third parties also identified the presence of asbestos within the Made Ground in the former chalk pit and landfill area.

Based on the above assessment it is considered that remedial action would be warranted to protect end users of a residential development on this site in relation to the concentrations of Asbestos, Beryllium and Dibenzo(a,h)anthracene identified within the Made Ground within the former chalk pit and landfill area, as shown on Figure 7. Remedial action to protect end users from impacted soil is discussed in Section 4.2 below.

4.1 Site Workers

It is the responsibility of the Principal Contractor and their appointed sub-contractors to implement and manage safe systems of work, prepare their own risk assessments in accordance with Health and Safety legislation in order to protect persons in their employ, as well as mitigate the risk of harm to others due to works in their control. Special consideration should be given to the provisions of the Construction (Design & Management) Regulations 2015, Health and Safety at Work Act and the Control of Substances Hazardous to Human Health regulations to protect the safety of persons in their employment. Additional guidance can be sought from the CIRIA publications entitled "A Guide for Safe Working on Contaminated Sites" and “Environmental Good Practice on site guide (fourth edition)”.

In addition to the safe systems of works to be implemented alongside appropriate risk assessments and method statements, all site personnel shall benefit from on-site hygiene facilities including wash area, toilets and drying room.

Separate canteen area and welfare facilities should be provided. All eating and drinking should be restricted to the canteen area and only once site personnel have removed outer PPE and washed exposed skin.

In the event of dry spells, or where the exposed surface becomes dry, regular damping down of the surface of the site will be required to prevent the release of soil dust which could impact on site operatives or migrate off-site, thereby mitigating both off-site exposure and nuisance for neighbours.

4.2 End Users

Asbestos containing materials (ACM) and asbestos fibres have been identified both visually and within chemical analysis to be present within the Made Ground/landfill material within the former chalk pit/landfill area along with elevated concentrations of both Beryllium and Dibenzo(a,h)anthracene.

The installation of a clean cover system within private gardens and areas of soft landscaping will be required within the former chalk pit/landfill area.

A combination of a reduced dig (as shown in Figures 8-11), to accommodate the soil cover system in the finished level, or complete removal of the Made Ground where Made Ground is found to be shallower, and the installation of a clean cover system within private gardens and areas of communal soft landscaping will be required within the Chalk Pit area. Table 3 below presents minimum reduced dig depths required to accommodate the soil cover system and achieve the development levels for specific plots within the Chalk Pit area.

Plot Number	Minimum Depth of Reduced Dig (m bgl)
100	0.01
101	0.10
102-103	0.23
104	1.11 or full extent of Made Ground if Made Ground shallower than reduced dig depth
105	1.04 or full extent of Made Ground if Made Ground shallower than reduced dig depth
106	1.34 or full extent of Made Ground if Made Ground shallower than reduced dig depth
107	0.85
108	0.62
109-111	0.89
112	0.59
114	0.21
115	0.17
133-135	0.41
136-138	0.44

Table 3 Specific Plots in Chalk Pit area requiring reduced dig

In order to achieve the development levels, soils won from reduced dig areas are to be relocated to garden plots where they can be accommodated below the soil cover system. The movement of materials shall not commence until such time as an MMP is in place and QP Declaration submitted to, and accepted CL:AIRE who subsequently notify the EA. It is preferable, and thus proposed, that the excavated soils shall be relocated directly from the reduced dig area to their final placement location without any requirement for stockpiling.

Validation inspections will be undertaken at the base and sides of the excavation to demonstrate that a reduced dig has been undertaken and where the full extent of the Made Ground has been removed.

Given the nature of the contaminants identified within the Made Ground across the former chalk pit/landfill area (principal risk driver is Asbestos) a soil cover system will be installed within all gardens and soft landscaping areas. The cover systems should comprise certifiably 'clean' Topsoil and subsoil. Both aspects of the cover system should be both chemically and physically suitable for the proposed end use. Given the presence of asbestos a BRE Soil

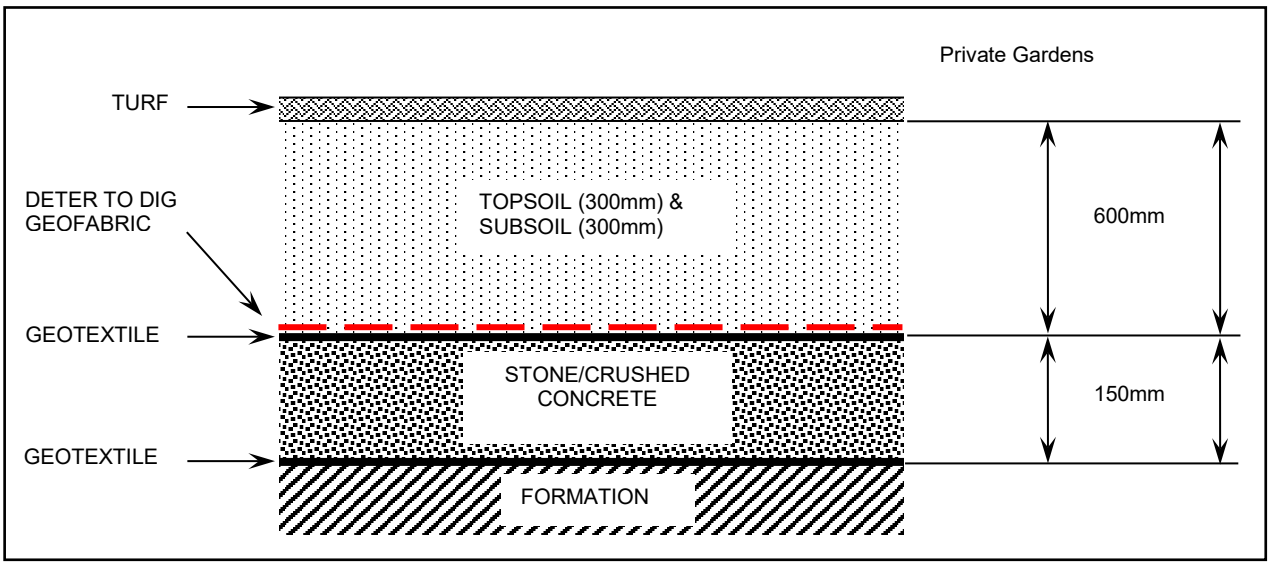
Cover system with a minimum soil cover thickness of 600mm would be required in proposed gardens and 450mm in areas of soft landscaping. The upper 300mm of a cover system should comprise Topsoil.

Where the reduced dig removes all of the Made Ground, subject to verification inspection and testing if required, the cover system shall comprise subsoil and a minimum 300mm thickness of Topsoil.

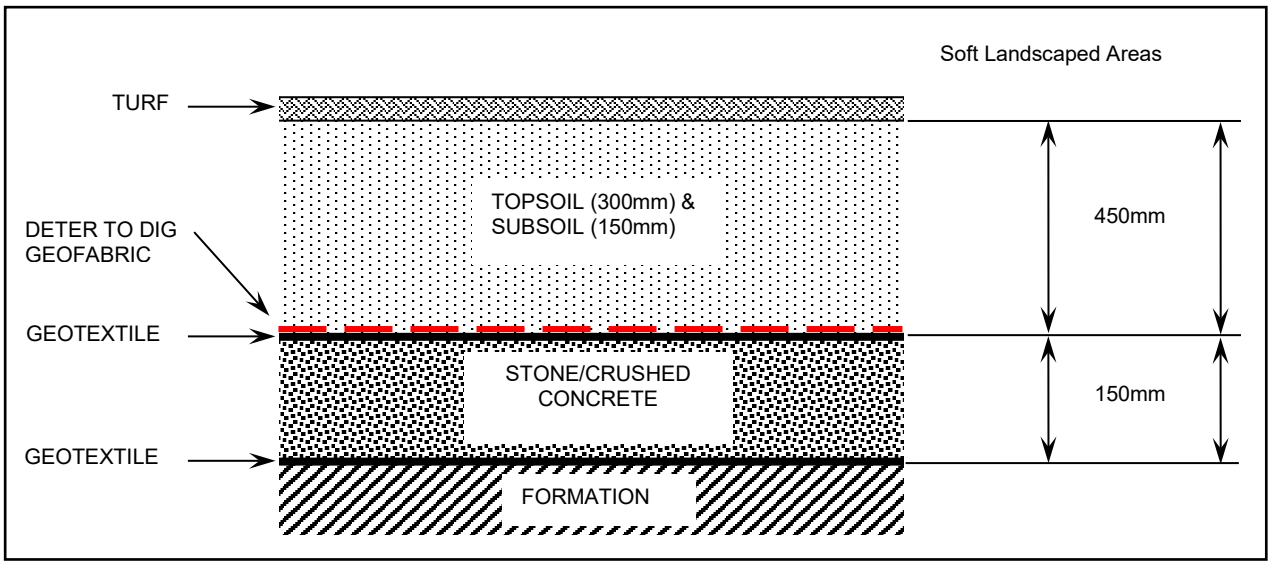
Where Made Ground remains in place following the reduced dig, or where a reduced dig is not required due to proposed final site levels, the cover system should incorporate a capillary break layer comprising 150mm depth of stone or crushed concrete, between two layers of geotextile. A high visibility deter to dig geofabric shall be laid over the upper geotextile to provide a visible deterrent to excavation. Any soils imported onto the site should be verified free from contamination with chemical testing undertaken to confirm their suitability for use within private gardens and areas of soft landscaping.

The reduced dig areas, anticipated depths and approximate volumes are presented on Figures 8-11.

An example of the recommended cover system for use in private gardens where Made Ground is to remain in-situ is provided below:



An example of the recommended cover system for use in areas of communal soft landscaping where Made Ground is to remain in-situ is provided below:



With regards to private gardens and areas of communal soft landscaping, it is recommended that Topsoil is placed to provide a suitable growing medium for proposed planting areas as part of the cover system described above.

It is anticipated that site won Topsoil stripped from uncontaminated areas of the wider site will be available for deposition as part of the cover system in gardens and soft landscaping. Thus, it is considered unlikely that it will be necessary to import Topsoil to the site, however if it is necessary to import topsoil on to the development then, prior to importation, the chemical, physical and nutritional suitability is to be verified by the Contractor. Importation of Topsoil or subsoil from unverified or unsuitable sources would require their removal from site and replacement with suitable materials. As a matter of good practice, it is recommended that the location, approximate extent and thickness of any imported topsoil are recorded and presented in the Validation/Verification Report to be prepared by the Environmental Consultant. Soil importation criteria is detailed in Appendix C.

Where impacted soils remain beneath building footprints or hard standing, the plausible pollutant linkage for direct contact is removed and thus risk of harm to end users from exposure to the contaminants is removed, as roads, buildings and permanent hard cover would sever the pollutant linkage and thus the impacted shallow soils could remain in these areas. Re-use of asbestos impacted soils beneath house footprints is not acceptable to the NHBC and deposition of such soils as fill beneath roads and hard standing is unlikely to be acceptable to the EA due to compaction changing the condition of the asbestos contaminating materials. However, limited works may be required in these areas to provide a suitable working platform for development to proceed.

Any soils imported onto the site should be verified free from contamination with chemical testing undertaken to confirm their suitability for use within areas of soft landscaping.

The proposed re-use of Made Ground and contaminated soils from impacted areas of the site (Farmyard and Chalk Pit), on the site of origin means that a Materials Management Plan will be required for the site under the Code of Practice.

As such excavated soils on site will be re-used under the CL:AIRE Definition of Waste, Code of Practice where it can be demonstrated that there is a need for the use of the materials and where the risk is demonstrated to be

acceptable under an MMP. The MMP must be completed and approved prior to commencement of material movement on site. Where a RSVP is in place for the site, agreement of re-use must also be agreed with the regulators.

4.3 Inspection/Validation

Verification of remediation measures shall be required through regular inspection at key stages of the works to include:

- Reduced dig and Made Ground excavation;
- Transfer of the excavated Made Ground and/or contaminated soils to the final placement/re-use location;
- The placement of a cover system, including verification of any additional subsoil and/or Topsoil in order to allow for the installation of the cover system required in private gardens and soft landscaping areas.

It is likely that verification will be undertaken in stages, i.e. site preparation, reduced dig, re-profiling; geotextiles, crushed stone/crushed concrete layer and deter to dig membrane; subsoil placement and topsoil placement. As such, final verification of the completed cover system is likely to be at the end of construction for any given plot.

Details of these works would be presented within a verification report for the site, to include the requirements of the Code of Practice should materials be proposed to be re-used under the Definition of Waste Code of Practice.

Two stage verification reporting is proposed, i.e. the first verification report addressing the reduced dig works and relocation of the excavated soils to their final placement/re-use locations; and a second report stage on completion of the soil cover system on the individual plots (anticipated verification as batches of plots as development progresses).

4.4 Built Environment

Buried plastics laid in contact with contaminated soils may be susceptible to attack by aggressive chemicals; therefore, potable water supplies may potentially become contaminated or tainted. With reference to UKWIR guidance the results of the relevant chemical analyses for the site indicate elevated concentrations of Beryllium and Dibenzo(a,h)anthracene within the Made Ground/landfill material. In addition, the Made Ground/landfill material was variable in composition and extended to a maximum proven depth of c.5.00m bgl. The use of barrier pipe possibly with cast iron connections is likely to be required for potable water supplies.

The utility company should be consulted in order to confirm their specific requirements in this respect. Potable supply pipe installation should be confirmed and verified through inspection during construction.

As a matter of good practice and to maximise the protection to maintenance workers, clean, granular backfill should be used in service runs and marker tapes for all buried services. This would not mitigate the requirement for the water supply pipe.

5.0 WASTE

5.1 Waste Classification and Segregation

Waste may be defined as any substance or object in Annex 1 of the Waste Framework Directive which the holder discards, intends to discard, or is required to discard. The holder of waste is anyone in possession of waste or generates it and therefore both the contractor and ultimately the developer are responsible for safe disposal of waste.

The following information is provided for preliminary guidance purposes, as different facilities or operators may have differing acceptance criteria and further Waste Acceptance Criteria (WAC) analysis may be required to confirm the exact classification.

Waste Acceptance Criteria (WAC) testing was undertaken as part of the wider site investigations on representative samples not specific to the former chalk pit and landfill area. In addition, asbestos was identified within the Made Ground in the former chalk pit and landfill area. As such, it is recommended that once/if materials for disposal have been identified, then further WAC testing should be undertaken to further classify the materials for the purpose of disposal.

In the event of dry spells, or where the exposed surface becomes dry, it is recommended that the surface of the site is regularly damped down to prevent the release of soil dust which could migrate off-site and thereby mitigate both off-site exposure and nuisance for neighbours.

It is proposed to re-use materials on site under a Materials Management Plan which will be developed for the construction works on this site. This will include contingency plans in any unexpected contamination is encountered during the development. Soils (including Made Ground) demonstrated to contain low concentrations of asbestos fibres can (with the agreement of the Local Authority Environmental Health Officer and Environment Agency) be re-used at depth beneath a suitable capping layer, where it can be demonstrated that there is a requirement for such materials and where the risk is acceptable and demonstrated to have not increased from baseline levels determine for the site, i.e. the source, pathway, receptor linkage has been severed. This should also take consideration of longer term maintenance works that may be required across the site.

In accordance with CL:AIRE Code of Practice (2011) materials are only considered waste if ‘they are discarded, intended to be discarded or required to be discarded by the holder’. Current guidance recommends the retention and re-use of site won soils where there is a need for the materials and where the risk is acceptable

The Code of Practice therefore allows soils to be reused on site where the following criteria are met:

- Pollution of the environment and harm to human health is prevented and not increased in reusing the excavated materials;
- The material are suitable for use (without any further processing);
- There is certainty of use; and
- The quantity that is absolutely necessary (and no more) is used.

In order to comply with the Code of Practice, a Material Management Plan (MMP) that confirms the above criteria are met has to be prepared. The material management plan must be reviewed by a ‘Qualified Person’ who then issues a declaration to the Environment Agency. Geo-Environmental can provide this service should it be required.

Where materials do not meet the required criteria, it may be possible to treat them under an environmental permit so that they may be re-used on site.

Should material be required and reused under the Definition of Waste Code of Practice, the reuse of material will need to be fully documented and included within the Verification Report produced on completion of the works.

6.0 DISCOVERY STRATEGY

Whilst the site has been the subject of several phases of investigation and assessment, it remains possible that previously unexpected soil conditions may be encountered during the process of site preparation and construction.

Examples may include oily pockets within the soil, pockets of cement boarding or fibrous materials within the soil, black ashy materials, soils exhibiting strong odours, brightly coloured materials, and former structures or brickwork.

Should previously undiscovered contamination be encountered during the demolition/construction of the new buildings the following course of action should be adhered to:

- Works in the area of the suspected contamination should seize immediately. The ground workers should report any suspected contamination immediately to the Client's site supervisor. The supervisor should contact the Environmental Consultant, who should visit the site to assess the extent of the 'contamination'.

- The Environmental Consultant shall make records of their inspection, and pass details of these to the Local Authority.

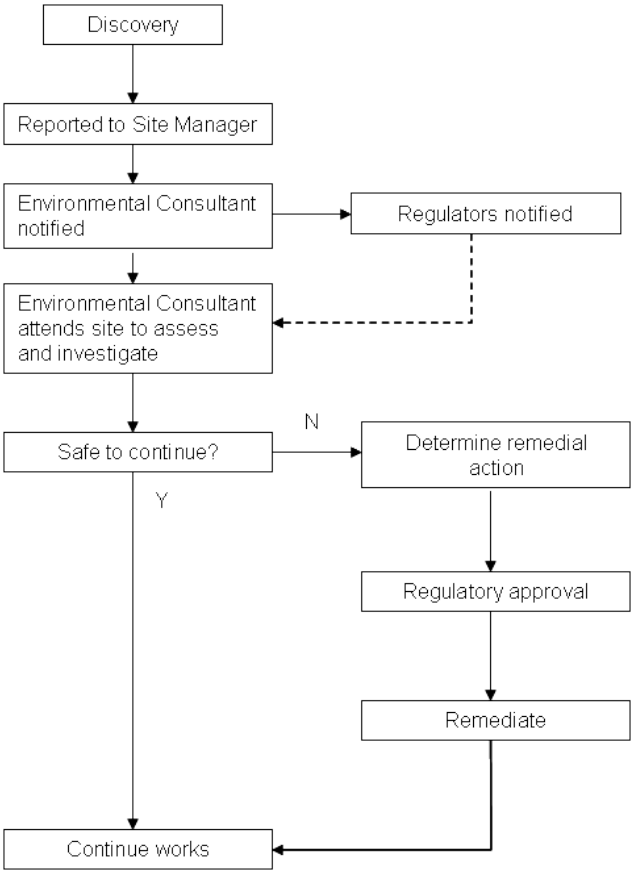
- Where the conditions revealed differ from those previously anticipated, the Environmental Consultant shall take samples as deemed appropriate to be dispatched for appropriate chemical testing.

- Depending on the results of the testing either: 1) no further work will be required; 2) a further detailed risk assessment will be required; and/or 3) localised specific remedial measures will be necessary. Appraisal criteria will vary depending on the nature of the assessment.

- The results of any such testing will be sent to the Regulatory Authority for consultation. If further remediation is required, the Regulatory Authority will be informed of the date and time of the proposed works.

- Any further remediation will be undertaken in accordance with a method statement submitted to the Local Authority for approval. The works shall be supervised by the Environmental Consultant who shall provide a Verification Report for the Local Authorities purposes.

The process is summarised overleaf:



A copy of this strategy should be lodged on site, and provisions made to ensure that all workers are made aware of their responsibility to observe, report, and act on any potentially suspicious or contaminated materials they may encounter.

7.0 VERIFICATION

Verification is required to be undertaken throughout the course of the remediation works. The Verification Report will be submitted to the Client, NHBC, CL:AIRE and Local Authority for formal approval and Environment Agency if requested as part of any works completed under the Definition of Waste Code of Practice.

The Verification Report will refer to the works as set out within this RSVP and as required by any relevant planning conditions. The report will detail findings of any further investigation works (if undertaken on the site) in relation to Asbestos, Beryllium and Dibenzo(a,h)anthracene within the Made Ground of the chalk pit/landfill area within proposed private gardens and areas of managed soft landscaping, as well as include relevant site based information such as records from site inspections, locations where the impacted soils were excavated and re-used on site or disposed of and validation sampling where required.

Photographs of specific remedial or waste handling measures and an audit trail for any imported subsoil and Topsoil, including source, provenance, analytical results, placement location and thickness (should subsoil and/or Topsoil be imported).

A summary of verification proposals is presented in Table 4 below.

The remedial works will be inspected and validated by the Environmental Consultant (Geo-Environmental). In addition, the MMP and any QP review and declaration will be prepared by Geo-Environmental.

Reference	Principal requirements	Design or construction related	Site visit required by Qualified Geo-Environmental Engineer	Supporting documentation
1.0 Verification general principles	Geo-Environmental are supervising remedial works within the former chalk pit area at Woodcroft Farm, Lovedean. These works require the installation of a soil cover system within private gardens and areas of soft landscaping. The aforementioned work is in line with the approach adopted for site investigation and risk assessment and previously undertaken by Geo-Environmental in respect of the development.	Construction	**Yes –** See below	Details of construction programme to be provided by client/contractor.
2.0 Excavation of Impacted Soils	Reduced dig exercise to excavate areas of Made Ground within the chalk pit to accommodate the soil cover system thickness or to natural strata if shallower. To be overseen and verified by Geo-Environmental.	Construction	**Yes – 5 days' notice required**	Regular visits to site required to confirm works being undertaken, validation sampling within the natural soils following removal of the impacted material. Excavation areas, reduced dig depths and approximate volumes shown on Figures 9-11 and are based on engineering layout drawing ref 17-110/2210 and development levels plans ref 192931-073, 192931-074 and 192931-075. Verification reporting stage 1.
3.0 Re-location and Deposition of soils won from reduced dig areas	Made Ground and contaminated soils excavated as part of the reduced dig works are to be relocated to final deposition locations (under soil cover system) in accordance with an approved remedial strategy and MMP.	Construction	**Yes - 5 days' notice required**	Regular visits to site required to confirm works being undertaken in accordance with the RSVP and MMP. Deposition locations and volume requirements are shown on Figures 10-11 and are based on engineering layout drawing ref 17-110/2210 and development levels plans ref 192931-073, 192931-074 and 192931-075. Verification reporting stage 1.

Reference	Principal requirements	Design or construction related	Site visit required by Qualified Geo-Environmental Engineer	Supporting documentation
4.0 Cover System	Cover system to be constructed by the ground workers and inspected by the Environmental Consultant	Construction	**Yes - 5 days' notice required**	Provenance of site won soils used to raise levels under the soil cover system are to be verified by the groundworks contractor. Source of Topsoil and subsoil (uncontaminated, naturally occurring site won soils) to be used in the soil cover system are to be evidenced by the groundworks contractor. Thickness and construction of cover system to be verified. Verification reporting stage 2.
5.0 Water Supply Pipes	It is anticipated that barrier pipe possibly with cast iron connections, will be required for water supply pipes. Confirmation is to be sought from water utility company	Design	**Yes – 5 days' notice required**	Evidence of water supply pipe material to be supplied. Installed pipework should also be inspected and recorded during verification visit(s).
6.0 Waste Management	Waste soils arisings from the construction works will be disposed of appropriately with WAC testing undertake once soils for disposal have been identified. The results should be presented to the landfill site prior to removal for confirmation of the classification.	Design and Construction	**No (unless further testing required where 5 days' notice required)**	Chemical test results (WAC) only required if waste soils generated
	Waste tickets for the removal of arisings should be compiled for submission as part of the verification report for each phase of the development. The waste tickets will be required to demonstrate that the approximate amount of material being removed is equal to the summed volume on the waste tickets.			Waste tickets

Reference	Principal requirements	Design or construction related	Site visit required by Qualified Geo-Environmental Engineer	Supporting documentation
	Where is it demonstrated that there is a need for materials to be re-used on site and that the risk is acceptable, soils may be re-used on site under the Definition of Waste Code of Practice under a Materials Management Plan for the site.			Records of material movements on site to be provided for inclusion in the validation report. It is assumed that tracking of soil movements around the site will be recorded by the groundworks contractor, with periodic independent inspections by Geo-Environmental.
7.0 Imported Soils	In-situ testing of any soils imported onto site for landscaping purposes will be carried out after placement at a frequency of one sample per 50m^3 or one sample per landscaped area (whichever is the smallest) with comparison of results to assessment criteria for residential end use.	Construction	**Yes**	Pre import certification verifying the chemical quality of the topsoil and subsoil to be provided to the Environmental Consultant for review prior to Importation.

Table 4 Details of verification visits required on site

FIGURES



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Site Location Plan
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16943	**Revision:**	0		
Drawn:	FG	**Date:**	11/05/2018		
Figure:	1	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Location of Former Chalk Pit Area
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16943	**Revision:**	0		
Drawn:	FG	**Date:**	25/06/2018		
Figure:	2	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Exploratory Hole Locations - Trial Pit and Trenches - Chalk Pit Area
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16943	**Revision:**	0		
Drawn:	FG	**Date:**	22/06/2018		
Figure:	3	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Extent of Made Ground - Window Sampler Boreholes - Chalk Pit Area
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16943	**Revision:**	0		
Drawn:	FG	**Date:**	22/06/2018		
Figure:	4	**Scale:**	Not To Scale		



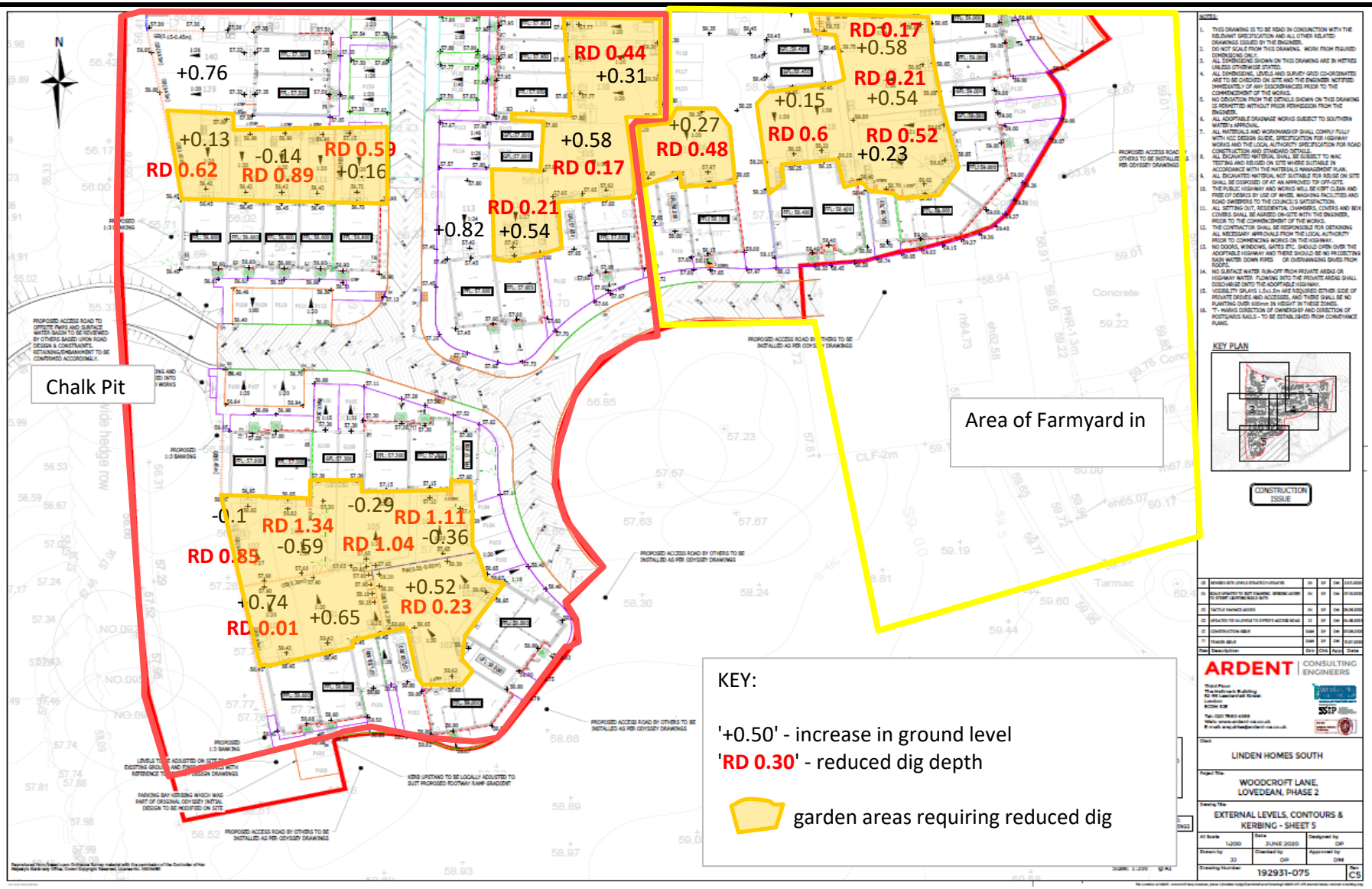
Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Extent of Made Ground - Trial Pit and Trenches - Chalk Pit Area
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16943	**Revision:**	0		
Drawn:	FG	**Date:**	22/06/2018		
Figure:	5	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Extent of Made Ground - Window Sampler Boreholes - Chalk Pit Area
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16943	**Revision:**	0		
Drawn:	FG	**Date:**	22/06/2018		
Figure:	6	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Soil Contamination Exceedances - Chalk Pit Area
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16943	**Revision:**	0		
Drawn:	FG	**Date:**	25/06/2018		
Figure:	7	**Scale:**	Not To Scale		



Project:	Woodcroft Farm Lovedean PO8 9QA	**Title**	Development Levels Plan - Phase 3 Farmyard and Chalk Pit (RSVP-CP-v6.0)
Client:	Vistry Homes Southern		
Ref No:	GE16943	**Revision:**	2
Drawn:	FG	**Date:**	17/12/2020
Figure:	RSVP-CP 8	**Scale:**	Not To Scale

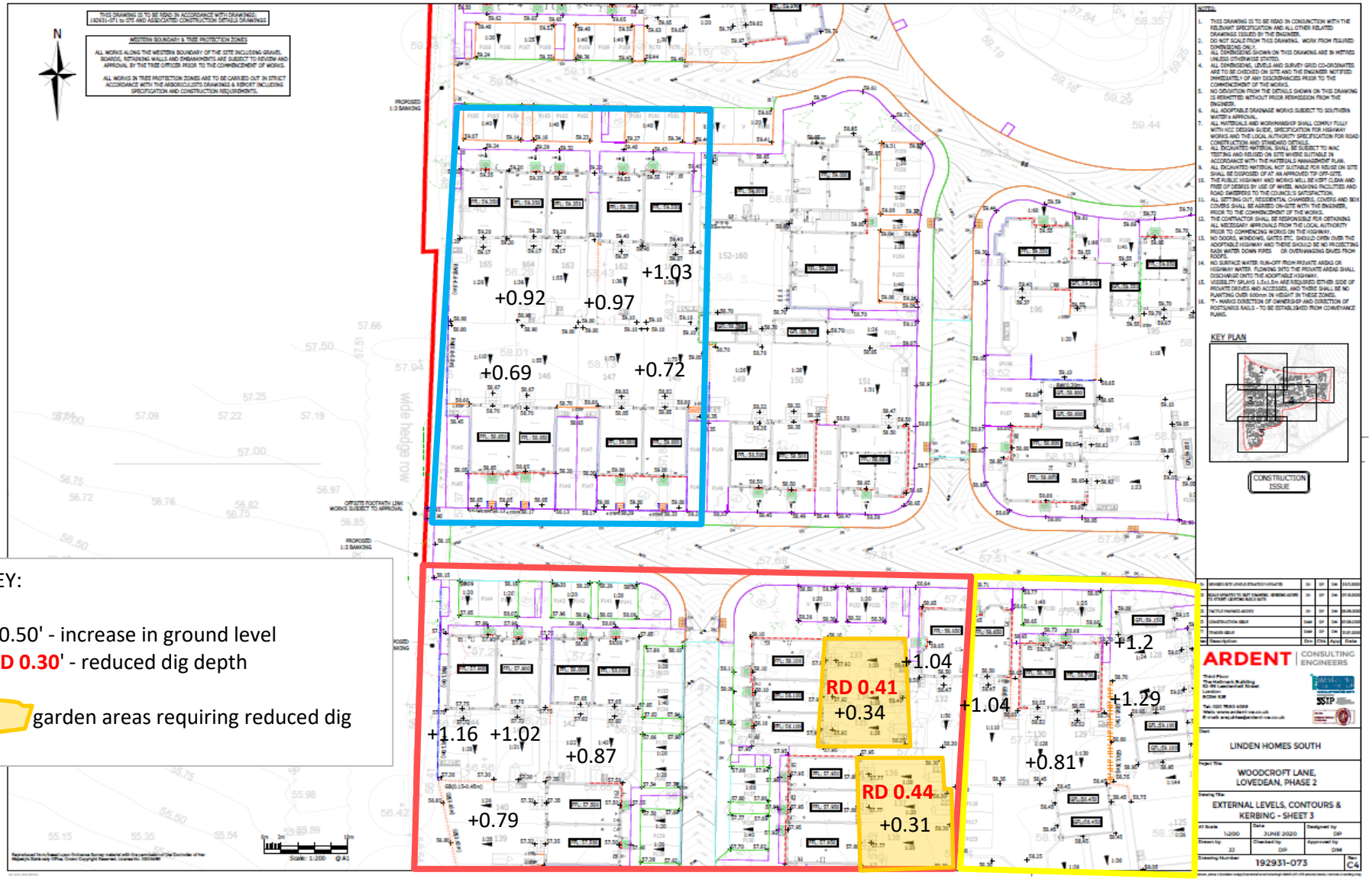
Geo-Environmental Services Ltd

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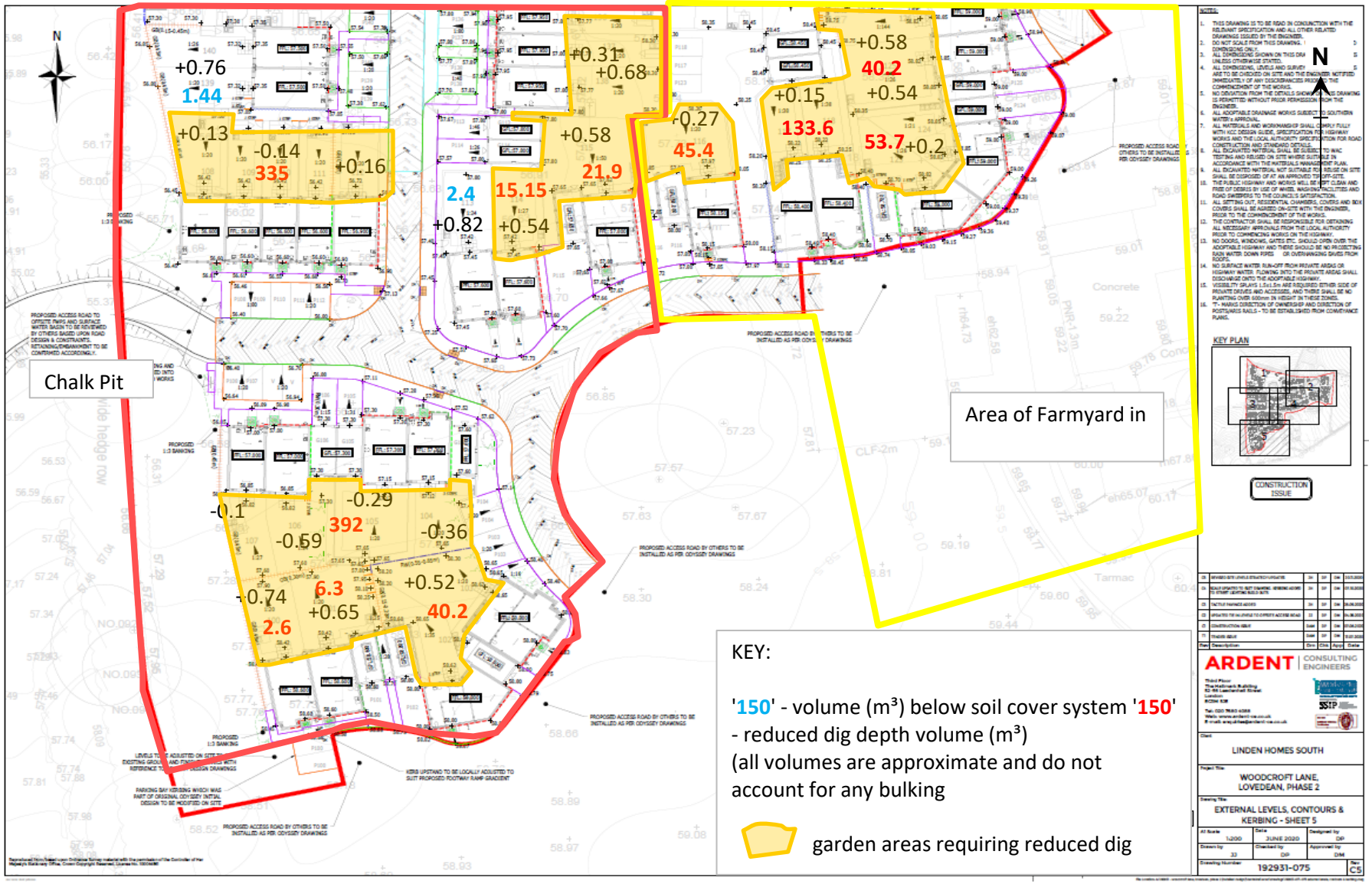
Geo-Environmental



Project:	Woodcroft Farm Lovedean PO8 9QA	**Title**	Development Levels Plan - Phase 3 Horse Arena, Chalk Pit and Farmyard (RSVP-CP-v6.0)
Client:	Vistry Homes Southern		
Ref No:	GE16943	**Revision:**	2
Drawn:	FG	**Date:**	17/12/2020
Figure:	RSVP-CP 9	**Scale:**	Not To Scale

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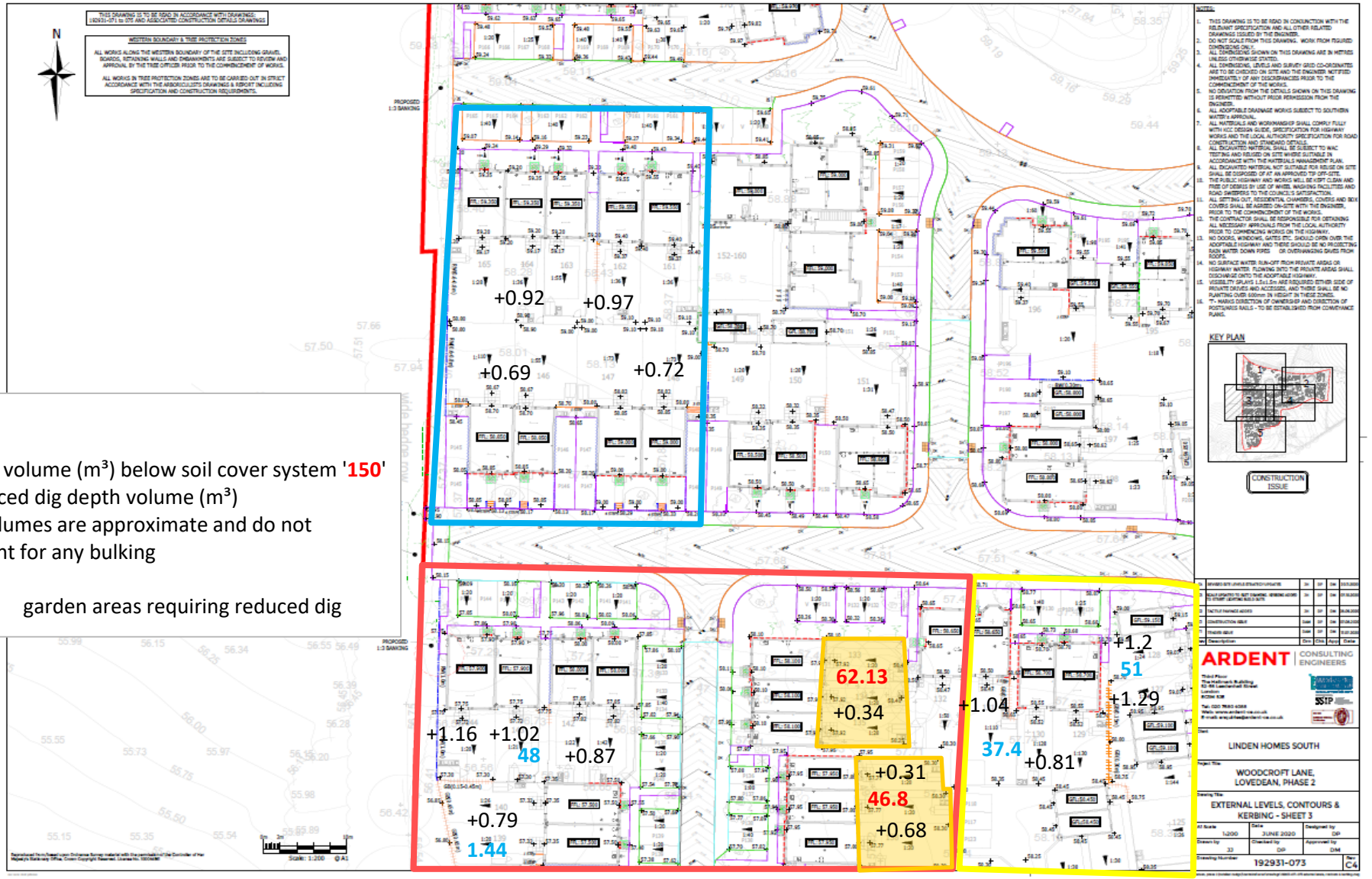
Geo-Environmental



Project:	Woodcroft Farm Lovedean PO8 9QA	**Title**	Remediation Strategy Plan - Phase 3 Farmyard and Chalk Pit Volumes (RSVP-CP-v6.0)
Client:	Vistry Homes Southern		
Ref No:	GE16943	**Revision:**	2
Drawn:	FG	**Date:**	17/12/2020
Figure:	RSVP-CP 10	**Scale:**	Not To Scale

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Project:	Woodcroft Farm Lovedean PO8 9QA	**Title**	Remediation Strategy Plan - Phase 3 Horse Arena, Chalk Pit & Farmyard Volumes (RSVP-CP-v6.0)
Client:	Vistry Homes Southern		
Ref No:	GE16943	**Revision:**	2
Drawn:	FG	**Date:**	17/12/2020
Figure:	RSVP-CP 11	**Scale:**	Not To Scale

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APPENDIX A

Exploratory Hole Logs

and In-situ Test Results



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Trial Pit Log

TrialPit No
TP205
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468335.00 - 112129.00 Level: 69.34	Date 23/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.70 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.25	69.09		Grass over, Light brown sandy, gravelly CLAY, with frequent roots (2-4mm) and rootlets TOPSOIL
	0.50 0.50 0.50	B D ES					Firm orange and grey mottled slightly sandy CLAY with frequent roots (2-4mm) and rootlets. Sand is medium (large roots (7-10mm) at 0.4m)
	1.00	D		1.20	68.14		
				1.40	67.94		Firm orange and grey mottled slightly sandy CLAY with frequent rootlets. Sand is medium
	1.70	D		1.70	67.64		Firm orange and grey mottled slightly sandy CLAY with red bandings of sandy clay and frequent rootlets. Sand is medium
							End of Pit at 1.70m

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No: TP206
Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords: 468329.00 - 112033.00 Level: 66.23	Date 23/08/2017
Location:	Woodcroft Farm, Lovedean,	Dimensions (m): Depth 1.80	1.20 × 0.60	Scale 1:25
Client:	Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.25	65.98		Grass over, Light brown sandy, gravelly CLAY, with frequent flint gravels and rootlets TOPSOIL
				0.30	65.93		Stiff orange and grey mottled sandy, gravelly CLAY with abundant roots (4-7mm). Sand is medium (Large roots (50mm) at 0.3m)
	0.50	B					
	0.50	D					Firm orange and grey mottled very sandy CLAY with frequent roots (2-6mm). Sand is medium
	0.50	ES		0.60	65.63		Stiff orange and grey mottled slightly sandy CLAY with roots (2-4mm). Sand is medium
	1.00	D					
				1.20	65.03		Stiff orange and grey mottled slightly sandy CLAY with red bandings of sandy clay and roots (2-4mm). Sand is medium
	1.80	D		1.80	64.43		End of Pit at 1.80m

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No: TP207
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468244.00 - 112050.00 Level: 64.18	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 2.00 x 0.60 Depth 2.00	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	63.98		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets and occasional flint gravel TOPSOIL
	0.30	ES					Firm orange and grey mottled CLAY with occasional sandy red banding and rootlets (charcoal fragments at 1m and decaying roots)
	0.50	B					
	0.80	D					
				1.20	62.98		Firm red and grey mottled slightly sandy CLAY (charcoal fragments at 1.4m)
				1.60	62.58		Firm red and grey mottled sandy CLAY
	2.00	D		2.00	62.18		End of Pit at 2.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No: TP208
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468227.00 - 112031.00 Level: 63.03	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 2.00 x 0.60 Depth 2.00	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.15	62.88		Grass over, Dark brown clayey sand with abundant tree roots (2-5mm) and rootlets (large tree root (50mm) at 0.15m) TOPSOIL
	0.50	D					Firm orange brown sandy CLAY. Sand is fine to medium (large tree root (20mm) at 0.9m)
	1.00	D		1.10	61.93		Stiff orange slightly sandy CLAY with abundant roots (between 2mm and 8mm). Sand is medium
	1.50	D		1.50	61.53		Stiff grey and orange mottled slightly sandy CLAY with occasional roots between 2mm and 6mm (no roots from 1.7m)
	2.00	D		2.00	61.03		End of Pit at 2.00m

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP209
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468200.00 - 112025.00 Level: 61.57	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 2.00 — 2.00 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES					Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets and occasional flint gravel TOPSOIL
				0.30	61.27		Firm orange brown slightly gravelly CLAY with occasional cobbles of flint. Gravel is medium sub-angular of flint (roots (10mm) at 0.5m)
	0.50	D					
				0.80	60.77		Firm orange brown slightly sandy CLAY with frequent cobbles of flint. Sand is medium
				1.50	60.07		Firm orange and grey mottled slightly sandy CLAY. Sand is fine to medium
	2.00	D		2.00	59.57		End of Pit at 2.00m

1 2 3 4 5

Water Strikes
Depth Strike | Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP210
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468151.00 - 112030.00 Level: 58.51	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.40 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.15	58.36		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.50	B					Firm grey and orange mottled slightly sandy CLAY with rootlets. Sand is medium
	1.00	D		0.90	57.61		Firm grey and orange mottled slightly sandy CLAY. Sand is medium (charcoal fragments at 1.35m)
				1.40	57.11		End of Pit at 1.40m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP211
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468148.00 - 112098.00 Level: 58.65	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.30 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.10	58.55		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.30	58.35		Brown sandy clay with flint cobbles, chalk fragments and occasional brick fragments MADE GROUND
	0.50	D					Firm brown slightly sandy CLAY with occasional rootlets. Sand is medium
				0.80	57.85		Firm red brown sandy CLAY. Sand is medium
	1.00	D					
				1.30	57.35		End of Pit at 1.30m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP212
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468050.00 - 112055.00 Level: 57.68	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.40	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.15	57.53		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.35	57.33		Soft orange brown very sandy CLAY with occasional sub-angular flint gravel. Sand is medium
	0.50 0.50	B D					Firm orange brown CLAY with frequent flint cobbles and chalk fragments
	0.80	D					
	1.10	D		1.10	56.58		Structureless CHALK composed of: medium to coarse sub-angular white GRAVEL. Fragments are weak CIRIA Grade DM
				1.40	56.28		End of Pit at 1.40m

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468023.00 - 112009.00 Level: 56.66	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 2.20	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	56.56		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.20	56.46		Brown sandy clay with brick fragments and chalk gravel MADE GROUND
	0.50	B					Stiff light brown gravelly CLAY MADE GROUND
	0.50	D					
				0.80	55.86		Brown sandy clay with brick, concrete fragments, possible asbestos tiles, and decaying roots MADE GROUND
	1.00	ES					
				1.70	54.96		Soft light grey CLAY (decaying root (3mm) at 2m)
	2.00	D					
				2.20	54.46		End of Pit at 2.20m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No: TP214
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468056.00 - 112002.00 Level: 57.16	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 2.00	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	57.06		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.20	56.96		Brown clay with bricks and chalk cobbles MADE GROUND
	0.50	B					Firm light brown and grey mottled CLAY, with frequent flint gravel (decaying root (4mm) at 0.5m) MADE GROUND
	0.50	D					
	0.90	ES		0.90	56.26		Dark brown clay with ashy deposits, plastic, brick fragments, chalk gravel, and wood MADE GROUND
				1.90	55.26		Firm light brown and grey mottled CLAY
	2.00	D		2.00	55.16		End of Pit at 2.00m

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Water Strikes
Depth Strike | Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP215
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468082.00 - 111995.00 Level: 57.87	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 2.90	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30	ES					Ashy deposits overlying brown gravelly clay with bricks, concrete, flint cobbles, tarmac and chalk fragments MADE GROUND
				1.00	56.87		Soft orange brown sandy re-worked CLAY MADE GROUND
				1.70	56.17		Structureless CHALK composed of: medium to coarse sub-angular white sandy GRAVEL, sand is medium and fragments are weak CIRIA Grade DM
				2.30	55.57		Structureless CHALK composed of: medium to coarse sub-angular white sandy GRAVEL, fragments are weak CIRIA Grade DM
	2.90 2.90	D D		2.90	54.97		End of Pit at 2.90m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No: TP216
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468060.00 - 111982.00 Level: 56.78	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.00	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	56.68		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.20	56.58		Brown sandy clay with charcoal and brick fragments MADE GROUND
	0.50 0.50 0.60	B D ES					Firm light brown and grey mottled gravelly CLAY. Gravel is medium, sub angular of flint
	1.00	D		1.00	55.78		End of Pit at 1.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP217
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468063.00 - 111949.00 Level: 58.26	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.00 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.05	58.21		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.20	ES					Firm light brown and grey mottled CLAY, with frequent rootlets
	0.50	D					
	1.00	D		1.00	57.26		End of Pit at 1.00m

1 2 3 4 5

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP218
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468068.00 - 111932.00 Level: 58.52	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 0.90 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.15	ES		0.15	58.37		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.50 0.50	B D					Firm light brown and grey mottled CLAY
	1.00	D		0.90	57.62		End of Pit at 0.90m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP219
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468127.00 - 111929.00 Level: 59.42	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.00	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	59.22		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets and chalk fragments TOPSOIL
							Firm light brown and grey mottled CLAY
	0.50	D					
	1.00 1.00	D ES		1.00	58.42		End of Pit at 1.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP220
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468116.00 - 111958.00 Level: 59.41	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 2.00 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES					Grass over, dark brown gravelly clay with chalk and brick fragments MADE GROUND
				0.60	58.81		Soft brown and grey mottled CLAY
				0.80	58.61		Firm brown and grey mottled CLAY, with red sandy banding at 1.5m
	1.00 1.00	D ES					
				2.00	57.41		End of Pit at 2.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP221
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468161.00 - 111926.00 Level: 60.74	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.20 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES					Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.30	60.44		Soft orange brown slightly sandy CLAY with occasional chalk fragments and roots (1-3mm)
	0.50	D					
	0.50	ES					
				0.70	60.04		Firm orange and grey mottled slightly sandy CLAY with roots (1-3mm) and rootlets
	1.00	D					
				1.20	59.54		End of Pit at 1.20m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP222
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468221.00 - 111986.00 Level: 61.18	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.50 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.25	60.93		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.40	ES		0.50	60.68		Firm orange brown slightly sandy CLAY with occasional flint gravels and roots (1-2mm). Sandy is medium
	1.00	D		1.00	60.18		Firm orange brown slightly sandy CLAY with occasional flint gravels. Sandy is medium
				1.50	59.68		Stiff orange brown slightly sandy, slightly gravelly CLAY. Sand is medium, gravel is medium, sub-angular of flint End of Pit at 1.50m

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468126.00 - 111996.00 Level: 58.54	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.10	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.05	58.49		Concrete MADE GROUND
				0.25	58.29		Brown gravelly clay with concrete and brick fragments MADE GROUND
	0.40	ES					Soft grey and orange mottled slightly sandy CLAY
	0.50	D					
	0.50	ES					
	1.00	D					
				1.10	57.44		End of Pit at 1.10m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468077.00 - 112011.00 Level: 57.74	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 2.20 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES					Ashy deposits overlying brown gravelly clay with bricks, flint cobbles, chalk fragments and tarmac MADE GROUND
				0.70	57.04		Soft blue grey re-worked CLAY with bricks MADE GROUND
				1.60	56.14		Firm grey brown CLAY (Large flint cobble at 1.8m)
	2.20 2.20	D D		2.20	55.54		End of Pit at 2.20m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP225
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468112.00 - 111991.00 Level: 58.45	Date 23/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 0.60 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	58.30		Chippings over tarmac MADE GROUND
	0.25 0.30	ES ES					Brown gravelly clay with tarmac, brick fragments, chalk fragments, flint gravel, ash and charcoal (concrete encountered at 0.6m) MADE GROUND
				0.60	57.85		End of Pit at 0.60m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks Concrete encounted at 0.6m, pit terminated

Stability

AGS

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Trial Pit Log

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TP226
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468103.00 - 112028.00 Level: 57.24	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.10 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.20	57.04		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.40	D					Firm orange brown slightly sandy CLAY. Sand is medium
				0.80	56.44		Firm orange brown slightly sandy CLAY with frequent cobbles of flint and occasional charcoal fragments. Sand is medium
				1.10	56.14		End of Pit at 1.10m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP227
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468105.00 - 112061.00 Level: 57.53	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.00 — 0.60 × 1.20	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES					Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.25	57.28		
	0.40	D					Firm orange brown slightly sandy, slightly gravelly CLAY. Sand is medium and gravel is fine to medium, sub-angular of flint
				0.70	56.83		Firm orange brown CLAY
				0.90	56.63		
				1.00	56.53		Structureless CHALK composed of: medium to coarse sub-angular white GRAVEL. Fragments are weak CIRIA Grade DM
							End of Pit at 1.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP228
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468169.00 - 112048.00 Level: 60.35	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.70 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.15	ES		0.25	60.10		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.50	D					Soft brown orange sandy CLAY with occasional flint gravel and rootlets. Sand is medium
	1.20	D		1.10	59.25		Yellow fine medium SAND
				1.70	58.65		End of Pit at 1.70m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP229
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468030.00 - 112090.00 Level: 58.55	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.80 — 0.60 × 1.20	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Grass over, Orange brown sandy CLAY with frequent rootlets TOPSOIL
	0.60 0.60	D ES		0.60	57.95		Firm orange brown very sandy CLAY with occasional flint cobbles. Sand is medium
				0.80	57.75		Firm orange brown CLAY with occasional flint cobbles
	1.00	D					
				1.40	57.15		Firm grey slightly sandy CLAY with frequent cobbles of flint. Sand is medium
	1.50	D					
				1.80	56.75		End of Pit at 1.80m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP230
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468086.00 - 112103.00 Level: 59.34	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.20 (1.20 × 0.60)	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	59.19		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.30	ES					Soft orange brown very sandy CLAY. Sand is medium
	0.50	D					
				0.70	58.64		Firm grey and orange mottled CLAY with frequent flint cobbles
	1.10	D					
				1.20	58.14		End of Pit at 1.20m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP231
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468130.00 - 112119.00 Level: 59.64	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.20 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	59.44		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.40	ES					Soft orange brown very gravelly sandy CLAY. Gravel is medium, sub-angular of flint and sand is medium
				0.60	59.04		
	0.80	D					Firm orange brown slightly sandy CLAY with occasional rootlets. Sand is medium
				1.20	58.44		End of Pit at 1.20m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP232
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468210.00 - 112065.00 Level: 62.16	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.30 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES					Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.30	61.86		Firm orange and grey mottled slightly sandy CLAY. Sand is fine to medium
				0.70	61.46		
	0.80	D					Firm orange and grey mottled sandy CLAY. Sand is fine to medium
				1.30	60.86		End of Pit at 1.30m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP233
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468228.00 - 112111.00 Level: 64.08	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.10 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	63.78		Grass over, Brown sandy, gravelly CLAY with frequent roots and rootlets TOPSOIL
	0.40 0.40	ES ES					Firm orange brown gravelly CLAY. Gravel is medium to coarse sub-angular of flint
				0.65	63.43		Stiff grey and orange mottled CLAY with occasional red bands of sandy CLAY
	0.80	D					
				1.10	62.98		End of Pit at 1.10m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP234
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468242.00 - 112136.00 Level: 65.41	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.00 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	65.21		Grass over, Brown sandy, gravelly CLAY with frequent roots and rootlets TOPSOIL
	0.30	ES					Firm brown very gravelly CLAY. Gravel is medium to coarse sub-angular of flint
				0.45	64.96		Stiff orange and grey mottled CLAY (Large tree root (70mm) at 0.7m and tree root (4mm) at 1m)
	1.00	D		1.00	64.41		End of Pit at 1.00m

1 2 3 4 5

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP235
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468165.00 - 112133.00 Level: 60.77	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 2.20	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.25	60.52		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.50 0.50	D ES					Orange brown clayey medium SAND with occasional flint gravel
	1.00	D					
				1.80	58.97		Grey and orange fine to medium SAND
				2.20	58.57		End of Pit at 2.20m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP236
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468115.00 - 112146.00 Level: 60.93	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.70	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30	ES		0.40	60.53		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	1.00	D		1.00	59.93		Soft orange brown slightly gravelly sandy CLAY. Sand is medium and gravel is medium, sub-angular of flint
				1.70	59.23		Orange slightly clayey medium SAND End of Pit at 1.70m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP237
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468036.00 - 112164.00 Level: 62.19	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.00	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	62.04		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.40	ES					Soft orange brown very sandy CLAY. Sand is medium
	0.50	D					
				0.85	61.34		Firm orange brown CLAY
	1.00	D		1.00	61.19		End of Pit at 1.00m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP238
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468045.00 - 112137.00 Level: 60.22	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.00	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.25	59.97		Grass over, Orange brown sandy CLAY with frequent rootlets TOPSOIL
	0.50	D					Stiff orange brown CLAY with occasional cobbles of sub angular flint
	0.80	ES					
	1.00	D		1.00	59.22		End of Pit at 1.00m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No: TP239
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468112.00 - 112015.00 Level: 58.28	Date 23/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.80, 0.60 x 1.20	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES					Grass over brown sandy gravelly clay with brick, chalk fragments, concrete, and flint gravel MADE GROUND
	0.50	ES		0.50	57.78		
				0.60	57.68		Brown sandy clay with tiles of possible asbestos, chalk fragments, concrete and brick MADE GROUND
							Soft brown very sandy CLAY. Sand is medium
				1.40	56.88		Soft brown very sandy CLAY. Sand is medium
	1.50	ES					
	1.80	D		1.80	56.48		End of Pit at 1.80m

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **WS201** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords:	468236E - 111994N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level:	62.76	Scale 1:25
Client:	Grainger PLC and Linden Homes South		Dates:	05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.25	D		0.20	62.56		Grass over, brown sandy clay with flint gravel and frequent rootlets TOPSOIL
		0.25	PP	1.3kg/cm2				Firm orange and grey mottled slightly sandy CLAY. Sand is medium
		0.50	D					
		0.50	PP	0.7kg/cm2				
		0.75	D		0.80	61.96		
		0.75	PP	0.7kg/cm2				Firm orange and grey mottled slightly sandy CLAY with occasional bands of red sandy clay. Sand is medium
		1.00	D		1.10	61.66		
		1.00	PP	0.9kg/cm2				Stiff orange and grey mottled sandy CLAY. Sand is medium
		1.25	D					
		1.25	PP	1.3kg/cm2				
		1.50	D					
		1.50	PP	1.3kg/cm2				
		1.75	D					
		1.75	PP	1.7kg/cm2				
		2.00	D		2.00	60.76		
		2.00	PP	1.2kg/cm2				Firm orange very sandy CLAY. Sand is fine
		2.25	D		2.30	60.46		
		2.25	PP	0.5kg/cm2				Yellow greyish clayey fine SAND
		2.50	D					
		2.75	D					
		3.00	D		3.00	59.76		End of Borehole at 3.00m

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Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS202** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords:	468174E - 111973N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level:	60.57	Scale 1:25
Client:	Grainger PLC and Linden Homes South		Dates:	05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	60.27		Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
		0.50 0.50	D PP	1.6kg/cm2				Stiff orange, red and grey mottled slightly sandy CLAY with occasional rootlets. Sand is medium
		0.75 0.75	D PP	1.7kg/cm2				
		1.00 1.00	D PP	1.8kg/cm2				*.....Occasional roots (1-3mm)*
		1.25 1.25	D PP	2.0kg/cm2	1.10	59.47		Stiff orange and grey mottled sandy CLAY with occasional roots (2mm) and occasional red banding of sandy clay. *.....Occasional roots (2mm)*
		1.50 1.50	D PP	1.8kg/cm2				
		1.75 1.75	D PP	1.7kg/cm2				*.....Large root (5mm)*
		2.00 2.00	D PP	1.6kg/cm2				
		2.25 2.25	D PP	1.5kg/cm2				
		2.50 2.50	D PP	0.7kg/cm2	2.40	58.17		Firm orange and grey mottled very sandy CLAY with occasional roots (2-4mm) and rootlets. Sand is medium *.....Occasional roots (2-4mm)*
		2.75 2.75	D PP	0.5kg/cm2	2.80	57.77		Yellow/ Orange fine SAND
		3.00	D		3.00	57.57		End of Borehole at 3.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS203** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords: 468173E - 111996N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level: 60.57	Scale 1:25
Client:	Grainger PLC and Linden Homes South		Dates: 05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.15	60.42		Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
		0.25 0.25	D PP	1.6kg/cm2				Firm orange brown gravelly CLAY with occasional flint cobbles. Gravel is medium sub angular to sub rounded of flint
		0.50 0.50	D PP	0.9kg/cm2				
		0.75 0.75	D PP	1.1kg/cm2	0.70	59.87		Firm orange, red and grey mottled slightly sandy CLAY. Sand is fine
		1.00 1.00	D PP	0.5kg/cm2				
		1.25 1.25	D PP	1.0kg/cm2	1.10	59.47		Firm orange and grey mottled sandy CLAY. Sand is fine
		1.50 1.50	D PP	0.8kg/cm2				
		1.75 1.75	D PP	1.3kg/cm2				
		2.00 2.00	D PP	1.5kg/cm2	1.90	58.67		Firm orange and grey mottled very sandy CLAY. Sand is fine
		2.25 2.25	D PP	0.9kg/cm2				
		2.50	D		2.30	58.27		Yellow/ Orange fine SAND
		2.75	D					
		3.00	D		3.00	57.57		End of Borehole at 3.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS204** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords:	468179E - 112013N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level:	60.47	Scale 1:25
Client:	Grainger PLC and Linden Homes South		Dates:	05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	60.17		Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
		0.50 0.50	D PP	0.9kg/cm2				Stiff orange/ brown slightly sandy CLAY with frequent rootlets. Sand is fine
		0.75 0.75	D PP	1.0kg/cm2				
		1.00 1.00	D PP	1.2kg/cm2	1.10	59.37		
		1.25 1.25	D PP	1.4kg/cm2				Stiff orange/ brown slightly sandy CLAY with rare rootlets. Sand is fine
		1.50 1.50	D PP	1.5kg/cm2				
		1.75 1.75	D PP	1.3kg/cm2				
		2.00 2.00	D PP	1.0kg/cm2				
		2.25 2.25	D PP	1.1kg/cm2	2.30	58.17		Firm orange and grey mottled sandy CLAY. Sand is fine
		2.50 2.50	D PP	0.9kg/cm2				
		2.75 2.75	D PP	0.7kg/cm2				
		3.00 3.00	D PP	0.8kg/cm2	3.00	57.47		End of Borehole at 3.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS205** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords:	468150E - 112033N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level:	58.83	Scale 1:25
Client:	Grainger PLC and Linden Homes South		Dates:	05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.25	58.58		Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
		0.50	D					Brown clayey fine SAND
		0.75	D					
					0.90	57.93		
		1.00	D					Orange fine SAND
		1.25	D					
		1.50	D					
					1.70	57.13		
		1.75	D					Orange clayey fine SAND
		2.00	D		2.00	56.83		
		2.00	PP	1.1kg/cm2				Stiff grey slightly sandy CLAY. Sand is fine
		2.25	D					
		2.25	PP	1.2kg/cm2				
		2.50	D					
		2.50	PP	1.0kg/cm2				
					2.60	56.23		Soft brown slightly sandy CLAY. Sand is fine
		2.75	D					
		2.75	PP	0.4kg/cm2	2.80	56.03		Structureless CHALK composed of: medium to coarse sub-angular white sandy GRAVEL, sand is medium and fragments are weak CIRIA Grade DM
		3.00	D		3.00	55.83		End of Borehole at 3.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

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Borehole Log

Borehole No.
WS206
Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords: 468081E - 111960N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level: 57.22	Scale 1:25
Client:	Grainger PLC and Linden Homes South		Dates: 05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.50 0.50	D PP	1.2kg/cm2	0.35	56.87		Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
		0.75 0.75	D PP	1.6kg/cm2				Firm brown orange slightly sandy gravelly CLAY with frequent rootlets. Sand is fine, gravel is medium sub angular to sub rounded of flint.
		1.00 1.00	D PP	1.5kg/cm2				
		1.25 1.25	D PP	1.1kg/cm2				
		1.50 1.50	D PP	0.8kg/cm2				
		1.75 1.75	D PP	1.3kg/cm2	1.90	55.32		Firm brown very gravelly CLAY. Gravel is medium sub angular to sub rounded of flint.
		2.00 2.00	D PP	1.8kg/cm2				
		2.25 2.25	D PP	1.7kg/cm2				
		2.50 2.50	D PP	1.5kg/cm2				
		2.75 2.75	D PP	1.6kg/cm2				
		3.00 3.00	D PP	1.5kg/cm2	3.00	54.22		End of Borehole at 3.00m

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Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks
Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS207** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords:	468075E - 111938N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level:	58.31	Scale 1:25
Client:	Grainger PLC and Linden Homes South		Dates:	05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.15	58.16		Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
		0.25 0.25	D PP	 1.0kg/cm2				Firm orange and grey mottled CLAY with frequent rootlets and occasional flint gravel
		0.50 0.50	D PP	 1.0kg/cm2				
		0.75 0.75	D PP	 0.7kg/cm2				
		1.00 1.00	D PP	 0.6kg/cm2				
								.....Decaying root (6mm)
		1.25 1.25	D PP	 0.9kg/cm2	1.20	57.11		Stiff orange and grey mottled slightly sandy CLAY with occasional rootlets. Sand is fine
					1.40	56.91		*.....Occasional roots (2mm)*
		1.50 1.50	D PP	 1.5kg/cm2				Stiff orange and grey mottled slightly sandy CLAY with occasional rootlets and red banding of sandy clay. Sand is fine
		1.75 1.75	D PP	 1.5kg/cm2				*.....Occasional roots (2mm)*
		2.00 2.00	D PP	 1.5kg/cm2				
		2.25 2.25	D PP	 1.7kg/cm2	2.20	56.11		Stiff orange and grey mottled slightly sandy CLAY with frequent rootlets. Sand is fine
		2.50 2.50	D PP	 1.5kg/cm2				
		2.75 2.75	D PP	 1.7kg/cm2	2.80	55.51		Stiff grey CLAY with chalk fragments
		3.00 3.00	D PP	 1.8kg/cm2	3.00	55.31		End of Borehole at 3.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

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Trial Pit Log

TrialPit No: TP301
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468021.00 - 112011.00 Level: 56.66	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.40 × 0.60 Depth 2.70	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	56.46		Grass over dark brown sandy gravelly CLAY with abundant roots and rootlets TOPSOIL
	0.25	ES					
	0.40	ES		0.45	56.21		Made Ground comprising dark brown soft sandy, gravelly CLAY with brick, brick fragments, tile, slate, wood, and glass. Sand is medium and gravel is fine to medium sub angular to sub rounded of flint. Made Ground comprising Fines 60%, Coarse 30%, Brick 5%, Wood 4%, Glass 0.5%, Slate 0.5% MADE GROUND
				0.90	55.76		Made Ground comprising light brown firm slightly sandy CLAY with flint gravel, brick and wood/decaying roots. Sand is medium. Made Ground comprising Fines 50%, Coarse 30%, Gravel 10%, Brick 5% and Wood 5% MADE GROUND
				1.30	55.36		Made Ground comprising light brown firm CLAY with brick, wood, rope and flint gravel. Made Ground comprising Fines 60%, Coarse 20%, Brick 5% and Wood 5%. (At 0.95m bgl large concrete slab - 1.1m x 0.2m and 0.2m thick) MADE GROUND
	1.40	ES					
							Made Ground comprising light grey and black soft CLAY with wood, chalk gravel, brick and plastic. Made Ground comprising Fines 40%, Coarse 20%, Wood 15%, Brick 15% and Plastic 10%. (At 1.4m bgl large decaying tree root - 1.2m x 0.2m) MADE GROUND
				2.70	53.96		End of Pit at 2.70m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP302
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468063.00 - 112007.00 Level: 57.59	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.40 × 0.60 Depth 2.80	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.25	57.34		Grass over Made Ground comprising clayey sandy fine to coarse sub angular to sub rounded GRAVEL with tarmac, calk fragments, brick, tile, charcoal and wood. Made Ground comprising Fines 25%, Coarse 70%, Brick 3%, Wood 2%. (At 0.1m bgl large piece of tarmac) MADE GROUND
	0.50	ES		0.40	57.19		Made Ground comprising light brown and grey with black and dark grey staining firm CLAY with brick and decaying roots. Made Ground comprising Fines 70%, Coarse 20%, Brick 5%, Wood 5% MADE GROUND
							Made Ground comprising dark grey and grey mottled firm CLAY with wood, brick, cement, plastic and chipboard. Made Ground comprising Fines 60%, Coarse 20%, Wood 10%, Brick 5%, Plastic 3% and Cement 2% MADE GROUND
	1.30	ES		1.20	56.39		Made Ground comprising brown with occasional black staining soft gravelly sandy CLAY with wood, brick, charcoal and plastic. Sand is medium and gravel is fine to medium sub angular to sub rounded of flint. Made Ground comprising Fines 60%, Coarse 20%, Wood 10%, Brick 5%, Charcoal 3% and Plastic 2% MADE GROUND
	2.70	ES		2.80	54.79		End of Pit at 2.80m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP303
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468094.00 - 111975.00 Level: 57.47	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.20 × 0.60 Depth 2.40	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	57.37		Grass over dark brown silty sandy CLAY with frequent roots and rootlets TOPSOIL
	0.30	ES		0.35	57.12		Made Ground comprising light brown soft slightly sandy CLAY with brick, glass, flint gravel, concrete, wood and possible asbestos. Sand is medium. Made Ground comprising Fines 70%, Coarse 20%, Gravel 5%, Brick 3%, Concrete 1%, Glass 0.5% and Wood 0.5% MADE GROUND
	0.70	ES		0.80	56.67		Made Ground comprising light brown firm CLAY with brick and chalk gravel, Fines 80%, Coarse 10%, Gravel 8% and Brick 2%. (Between 0.4m bgl and 0.5m bgl live tree roots) MADE GROUND
				1.20	56.27		Stiff light brown and grey mottled CLAY
				1.40	56.07		Firm light grey and brown sandy gravelly CLAY. Sand is medium and gravel is fine to medium sub angular to sub rounded of flint. (At 1.3m bgl and 1.5m bgl large flint cobbles)
				1.80	55.67		Firm brown very gravelly CLAY. Gravel is medium to coarse sub angular of chalk
	1.90	ES					White/light grey structureless very weak weather CHALK in communicated matrix CIRIA Grade DM
				2.40	55.07		End of Pit at 2.40m

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No: TP304
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468071.00 - 111965.00 Level: 56.82	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.10 × 0.60 Depth 2.40	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	56.72		Grass over dark brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
	0.30	ES					Made Ground comprising grey and brown mottled with frequent black staining soft sandy CLAY with chalk gravel, brick, wood, plastic occasional glass and charcoal. Sand is medium. Made Ground comprising Fines 50%, Coarse 25%, Gravel 15%, Brick 5%, Wood 3%, Plastic 1.5% Other 0.5% MADE GROUND
				0.60	56.22		Made Ground comprising light brown and grey mottled with occasional black staining soft CLAY with chalk gravel and brick MADE GROUND
				1.00	55.82		Soft light brown gravelly CLAY. Gravel is fine to medium sub angular to sub rounded of flint. (Large flint cobbles at 1m bgl)
	1.20	ES		1.20	55.62		Stiff light brown and grey mottled slightly sandy CLAY. Sand is medium. (Large flint cobbles at 2.2m bgl)
				2.40	54.42		End of Pit at 2.40m

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP305
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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468037.00 - 111960.00 Level: 57.32	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): Depth 1.20, 1.80 x 0.60	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	57.12		Grass over dark brown silty sandy CLAY with abundant roots and rootlets, and occasional flint gravel TOPSOIL
	0.80	ES		0.90	56.42		Made Ground comprising firm brown and grey mottled slightly sandy CLAY with occasional flint gravel. (At 0.85m large piece of metal) MADE GROUND
	1.10	ES		1.20	56.12		Made Ground comprising light grey with occasional black staining firm slightly sandy CLAY with wood and decaying tree roots. Made Ground comprising Fines 70%, Coarse 20% and Wood/ Tree roots 10% MADE GROUND
							End of Pit at 1.20m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks Rapid groundwater ingress at 1.1m bgl. Pit abandoned due to instability caused by rapid water ingress

Stability

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Trial Pit Log

TrialPit No
TP306
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468024.00 - 112109.00 Level: 59.05	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): Depth 2.80, 0.60 x 2.10	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.30	58.75		Grass over soft brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
	0.40	ES					Firm orange/brown slightly sandy CLAY with occasional flint gravel. Sand is fine
	0.80	ES					
				1.60	57.45		Firm orange/brown and grey mottled slightly sandy CLAY. Sand is medium
				2.10	56.95		Soft orange/brown very sandy CLAY. Sand is medium
				2.60	56.45		Stiff grey CLAY with frequent sub rounded flint cobbles
				2.80	56.25		End of Pit at 2.80m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP307
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468040.00 - 112091.00 Level: 58.94	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 1.90 × 0.60 Depth 2.60	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	58.74		Grass over soft brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
	0.30	ES					Soft orange/brown slightly sandy CLAY with occasional flint gravel. Sand is fine
				0.70	58.24		
	0.80	ES					Firm grey and orange/brown mottled CLAY with frequent flint cobbles
				1.00	57.94		
	1.20	ES					Orange and yellow medium SAND
				2.10	56.84		White/cream structureless weak, highly weather CHALK in comminuted matrix with frequent sub rounded flint cobbles CIRIA Grade DM/CM
				2.60	56.34		End of Pit at 2.60m

1 2 3 4 5

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No: TP308
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468023.00 - 112077.00 Level: 58.20	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.00 × 0.60 Depth 2.60	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.25	57.95		Grass over soft brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
	0.30	ES					Soft brown very sandy CLAY with occasional flint gravel. Sand is fine
	0.70	ES		0.80	57.40		Stiff brown/grey gravelly CLAY. Gravel is medium to coarse sub angular to sub rounded of flint
				1.70	56.50		White/cream structureless weak, highly weather CHALK in comminuted matrix with frequent sub rounded flint cobbles CIRIA Grade DM/CM
				2.60	55.60		End of Pit at 2.60m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No: TP309
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468042.00 - 112072.00 Level: 58.36	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 1.90 × 0.60 Depth 2.10	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	58.26		Soft brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
	0.25	ES		0.30	58.06		Made Ground comprising brown sandy CLAY with flint gravel, flint cobbles and occasional black staining MADE GROUND
	0.50	ES					Firm brown/orange slightly sandy CLAY with frequent flint cobbles. (At 0.6-0.7m bgl chalk gravel and chalk fragments. At 0.8m bgl large flint cobbles)
	0.65	ES					
				1.15	57.21		White/cream structureless weak, highly weather CHALK in comminuted matrix with frequent sub rounded flint cobbles
				2.10	56.26		End of Pit at 2.10m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP310
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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468022.00 - 112039.00 Level: 57.56	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): Depth 2.10 — 0.60 × 2.10	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.10	57.46		Soft brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
							Soft brown/orange sandy desiccated CLAY. Sand is medium
	0.50	ES		0.40	57.16		Stiff brown slightly sandy CLAY with frequent flint cobbles. Sand is medium
	1.50	ES		1.20	56.36		White/cream structureless weak, highly weather CHALK in comminuted matrix with frequent sub rounded flint cobbles CIRIA Grade DM/CM
				2.10	55.46		End of Pit at 2.10m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP311
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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468040.00 - 112038.00 Level: 57.21	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 1.80 × 0.60 Depth 2.00	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.10	57.11		Soft brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
				0.30	56.91		Firm brown slightly silty sandy CLAY. Sand is fine
	0.40	ES					Firm brown slightly sandy CLAY with occasional flint gravel. Sand is fine
	0.80	ES		0.90	56.31		Firm orange/brown slightly sandy, slightly gravelly CLAY with occasional cobbles of flint. Sand is fine and gravel is fine to medium sub angular to sub rounded of flint
				1.45	55.76		White/cream structureless weak, highly weather CHALK in comminuted matrix with frequent sub rounded flint cobbles CIRIA Grade DM/CM
				2.00	55.21		End of Pit at 2.00m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP312
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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468087.00 - 112016.00 Level: 57.59	Date 17/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.10 × 0.60 Depth 2.40	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.10	57.49		Made Ground comprising light brown clayey fine to coarse flint GRAVEL with brick and concrete. Made Ground comprising Fines 30%, Coarse 60%, Brick 15% and Concrete 5% MADE GROUND
							Made Ground comprising white/brown clayey fine to coarse chalk GRAVEL with brick, concrete, tarmac, and large pieces of tree. Made Ground comprising Fines 25%, Coarse 60%, Tarmac 10%, Brick 5%, Concrete 3% and Tree 2% MADE GROUND
	0.90	ES		0.80	56.79		Made Ground comprising dark brown/grey soft slightly sandy CLAY with plastic, decaying roots and flint gravel. Sand is medium. Made Ground comprising Fines 70%, Coarse 20%, Gravel 7%, Roots 2% and Plastic 1% MADE GROUND
	1.45	ES		1.40	56.19		Firm orange/brown and grey mottled slightly sandy CLAY with occasional flint gravel. Sand is medium. (Large flint cobbles at 1.5m bgl)
				2.30	55.29		White/cream structureless weak weather CHALK in communicated matrix with flint gravel CIRIA Grade DM
				2.40	55.19		End of Pit at 2.40m

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Water Strikes
Depth Strike | Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468113.00 - 112026.00 Level: 58.03	Date 17/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 1.80 × 0.60 Depth 2.50	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	57.93		Grass over dark brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
	0.25	ES		0.30	57.73		Made Ground comprising white/brown clayey fine to coarse sub angular to sub rounded chalk GRAVEL with large flint cobbles MADE GROUND
	0.50	ES					
				0.60	57.43		Brown very clayey fine to medium sub angular to sub rounded flint GRAVEL
							Firm orange/brown and grey mottled CLAY with occasional bands of orange medium SAND.
				1.50	56.53		
	1.55	ES					Orange medium SAND
				1.60	56.43		Stiff orange/brown sandy CLAY with occasional flint gravel. Sand is medium
				1.80	56.23		Orange/brown medium SAND with bands of grey firm CLAY
				2.50	55.53		End of Pit at 2.50m

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP314
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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468124.00 - 112027.00 Level: 58.20	Date 17/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.30 × 0.60 Depth 2.50	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	58.10		Grass over dark brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
	0.30	ES					Firm orange/brown slightly sandy CLAY with frequent tree roots (3mm-6mm). Sand is medium
	0.70	ES		0.60	57.60		Stiff orange/brown and slightly grey mottled CLAY with occasional bands of orange medium SAND. (Tree roots at 0.9m bgl, band of off white structureless weak weathered CHALK at 1.8m bgl)
	1.60	ES					
				2.50	55.70		End of Pit at 2.50m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP315
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468081.00 - 111991.00 Level: 57.67	Date 17/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.20 × 0.60 Depth 2.40	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES					Loose chippings over brown/grey clayey flint and chalk GRAVEL with tarmac, brick and concrete. Made Ground comprising Fines 30%, Coarse 60%, Brick 5%, Concrete 3% and Tarmac 2% MADE GROUND
				0.50	57.17		
	0.60	ES					Made Ground comprising brown and dark grey firm CLAY with brick, concrete, tree roots, flint cobbles and lead pipe. Made Ground comprising Fines 70%, Coarse 20%, Brick 5%, Other 3%, Concrete 2% MADE GROUND
				2.20	55.47		
	2.30	ES					Firm brown and grey mottled CLAY with occasional bands of orange medium SAND
				2.40	55.27		End of Pit at 2.40m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP316
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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468111.00 - 111958.00 Level: 59.73	Date 17/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.30 × 0.60 Depth 2.20	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES					Grass over light brown sandy CLAY with brick, concrete, plastic and glass. Made Ground comprising Fines 40%, Coarse 20%, Brick 20%, Concrete 15% and other 5% MADE GROUND
	0.90	ES		0.80	58.93		Firm orange/brown and grey mottled slightly sandy desiccated CLAY. Sand is medium
	1.90	ES		1.80	57.93		Stiff orange/brown, grey and red mottled CLAY
				2.20	57.53		End of Pit at 2.20m

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP317
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468146.00 - 111985.00 Level: 58.97	Date 17/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 1.90 × 0.60 Depth 2.20	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.15	ES		0.15	58.82		Loose chippings over dark brown silty sandy CLAY with frequent roots and rootlets and occasional brick rubble and gravel. (Plastic drainage pipe at 0.1m bgl) MADE GROUND
				0.25	58.72		Made Ground comprising soft dark brown silty CLAY MADE GROUND
	0.65	ES					Firm orange/brown sandy CLAY. Sand is medium
	1.40	ES		1.35	57.62		Orange/brown clayey medium SAND
				1.60	57.37		Orange/brown fine to medium SAND with occasional bands of CLAY
				2.20	56.77		End of Pit at 2.20m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP318
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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468116.00 - 111949.00 Level: 59.78	Date 17/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.40 × 0.60 Depth 1.90	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.15	ES		0.15	59.63		Grass over dark brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
				0.60	59.18		Made Ground comprising dark brown soft very gravelly CLAY with flint and brick. Gravel is fine to coarse of chalk. Made Ground comprising Fines 50%, Coarse 30%, Gravel 15% and Brick 5% MADE GROUND
	0.70	ES		0.80	58.98		Firm orange/brown and grey mottled CLAY with frequent flint gravel
	1.80	ES		1.90	57.88		Stiff orange/brown and grey mottled CLAY with occasional flint gravel End of Pit at 1.90m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
Trench 01
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468158.00 - 111950.00 Level: 60.98	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 3.40 × 0.60 Depth 1.00	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	60.88		Dark brown slightly sandy silty CLAY with abundant roots and rootlets TOPSOIL
							Firm grey and orange mottled slightly sandy CLAY
				1.00	59.98		End of Pit at 1.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
Trench 02
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468157.00 - 111967.00 Level: 60.20	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 6.40 × 0.60 Depth 0.70	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	60.00		Made Ground comprising dark brown sandy silty CLAY with slate, brick, gravel and wood MADE GROUND
							Firm orange/brown slightly sandy CLAY. Sand is fine
				0.70	59.50		End of Pit at 0.70m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks Private water pipe running through trench

Stability

AGS

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Trial Pit Log

TrialPit No
Trench 03
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468145.00 - 112001.00 Level: 59.01	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 4.60 × 0.60 Depth 1.00	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Made Ground comprising dark brown sandy silty CLAY with wood, gravel, brick, pipe and concrete MADE GROUND
				0.50	58.51		Firm grey sandy CLAY. Sand is fine
				1.00	58.01		End of Pit at 1.00m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
Trench 04
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468133.00 - 112020.00 Level: 58.36	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 4.80 × 0.60 Depth 0.50	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.50	57.86		Firm orange/brown sandy CLAY with occasional flint gravel. Sand is fine End of Pit at 0.50m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
Trench 05
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468164.00 - 112017.00 Level: 60.06	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 3.60 x 0.60 Depth 0.75	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	59.91		Dark brown slightly sandy silty CLAY with abundant roots and rootlets TOPSOIL
							Soft brown very sandy CLAY. Sand is fine
				0.75	59.31		End of Pit at 0.75m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
Trench 06
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468169.00 - 111997.00 Level: 59.91	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 4.20 × 0.60 Depth 0.70	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	59.76		Dark brown slightly sandy silty CLAY with abundant roots and rootlets TOPSOIL
							Soft light brown sandy CLAY. Sand is fine
				0.70	59.21		End of Pit at 0.70m

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
Trench 07
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468033.00 - 112020.00 Level: 57.17	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.80 × 0.60 Depth 1.10	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Grass over Made Ground comprising light brown clayey sandy fine to coarse sub angular to sub rounded chalk and flint GRAVEL with tarmac, flint cobbles, wood, charcoal and glass. Made Ground comprising Fines 30%, Coarse 60%, Tarmac 5%, Wood 3%and Other 2%. Sand is medium MADE GROUND
				0.50	56.67		Firm orange/ brown slightly gravelly desiccated CLAY. Gravel is fine to medium sub angular to sub rounded of flint
				1.10	56.07		End of Pit at 1.10m

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
Trench 08
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468046.00 - 112019.00 Level: 57.41	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 3.80 × 0.60 Depth 1.15	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Made Ground comprising brown and white clayey sandy fine to coarse sub angular to sub rounded chalk and flint GRAVEL with brick, tile and concrete. Sand is medium. Made Ground comprising Fines 30%, Coarse 63%, Brick 3%, Tile 2% and Concrete 2% MADE GROUND
				0.70	56.71		Soft orange/brown gravelly CLAY. Gravel is fine to medium sub angular to sub rounded of flint (Flint cobbles in base of pit)
				1.15	56.26		End of Pit at 1.15m

1
2
3
4
5

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
Trench 09
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468068.00 - 112013.00 Level: 57.70	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.50 × 0.60 Depth 1.10	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Made Ground comprising brown and white clayey sandy fine to coarse sub angular to sub rounded chalk and flint GRAVEL with brick, tarmac and flint cobbles. Sand is medium. Made Ground comprising Fines 30%, Coarse 60%, Brick 5% and Tarmac 5% MADE GROUND
				0.70	57.00		Firm orange/ brown slightly sandy desiccated CLAY. Sand is medium
				1.10	56.60		End of Pit at 1.10m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
Trench 10
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468068.00 - 112008.00 Level: 57.60	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 4.20 × 0.60 Depth 1.20	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Made Ground comprising light brown clayey sandy fine to coarse sub angular to sub rounded flint and chalk GRAVEL with brick, concrete, tree roots, clay pipe. Sand is medium. Made Ground comprising Fines 30% Coarse 60%, Brick 4%, Concrete 4% and Other 2% MADE GROUND
				0.50	57.10		Made Ground comprising dark grey and grey mottled soft CLAY with brick, plastic, roots, wood, chalk fragments, flint gravel and tile. Made Ground comprising Fines 60%, Coarse 20%, Brick 3%, Plastic 2%, Wood/Roots 2%, Other 3% MADE GROUND
				1.20	56.40		End of Pit at 1.20m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS401** Sheet 1 of 2

Project Name:	Woodcroft	Project No. GE16943	Co-ords: 468050E - 112012N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level: 56.60	Scale 1:25
Client:	Grainger plc		Dates: 15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	56.50		Grass over brown slightly fine and medium gravelly clay with rootlets TOPSOIL
		0.60 - 0.80	ES					Brown clay with gravel of flint and red brick MADE GROUND
					0.90	55.70		Grey clay with flint gravel ash wood and red brick fragments MADE GROUND
		1.40 - 1.70	ES					
					2.00	54.60		Grey clay with chalk and flint gravel. Red brick at 3.6-3.7m bgl MADE GROUND
		2.30 - 2.60	ES					
					3.70	52.90		Brown clay with abundant fine chalk gravel and rare red brick fragments MADE GROUND
					4.80	51.80		Off white CHALK recovered as silty chalk matrix and fine gravel size weak chalk clasts CIRIA Grade
					5.00	51.60		Continued on Next Sheet

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

No water encountered

AGS

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Unit 7, Danworth Farm
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BN6 9GL
www.gesl.net

Borehole Log

Borehole No.
WS401
Sheet 2 of 2

Project Name:	Woodcroft	Project No. GE16943	Co-ords: 468050E - 112012N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level: 56.60	Scale 1:25
Client:	Grainger plc		Dates: 15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								DM/CM End of Borehole at 5.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks
No water encountered

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS402** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16943	Co-ords: 468056E - 111983N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level: 56.73	Scale 1:25
Client:	Grainger plc		Dates: 15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	56.63		Grass over brown slightly fine and medium gravelly clay with rootlets TOPSOIL
		0.50	ES					Firm to stiff brown and grey mottled silty clay MADE GROUND
					0.90	55.83		Brown and grey clay with some gravel of flint red brick and slate MADE GROUND
		1.50	ES		1.40	55.33		Grey clay with pockets of light grey sandy gravel possibly concrete fragments ash charcoal dead roots and wood fragments and abundant concrete fragments at 2.7-2.8m MADE GROUND
		2.50	ES					
					2.80	53.93		Brown and grey clay with concrete fragments MADE GROUND
		3.70 - 4.00	ES		3.70	53.03		Dark grey to black fibrous material possibly decomposed paper and wood fragments with red brick. Wood at4.2-4.5m MADE GROUND
					4.50	52.23		Off white grey and black chalk with ashy or possibly fine organic matter in matrix MADE GROUND
					5.00	51.73		End of Borehole at 5.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

No water encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS403** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16943	Co-ords: 468054E - 111977N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level: 56.75	Scale 1:25
Client:	Grainger plc		Dates: 15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	56.65		Grass over brown slightly fine and medium gravelly clay with rootlets TOPSOIL
		0.30 - 0.50	ES					Brown clay with some fine to medium flint gravel and rare red brick fragments MADE GROUND
					1.10	55.65		Grey clay with clinker ah red brick fragments and occasional wood fragments MADE GROUND
		1.50 - 1.60	ES					
					1.70	55.05		Brown and grey clay with occasional gravel of flint and chalk and occasional inclusions of possible ash ferruginous fragments and red brick MADE GROUND
		2.40 - 2.60	ES					
					3.90	52.85		Off white CHALK recovered as structureless mass with some localised orange brown staining CIRIA Grade DM
					5.00	51.75		End of Borehole at 5.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

No water encountered

AGS

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Borehole Log

Borehole No.
WS404
Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16943	Co-ords: 468054E - 111963N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level: 58.00	Scale 1:25
Client:	Grainger plc		Dates: 15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20 - 0.40	ES		0.10	57.90		Grass over brown slightly fine and medium gravelly clay with rootlets TOPSOIL
								Dark grey silty gravelly clay. Gravel of flint and brick MADE GROUND
					0.60	57.40		Stiff light grey and orange brown mottled silty CLAY. Becoming very gravelly from 1.7m bgl
		1.10 - 1.30	ES					
					1.90	56.10		White CHALK composed of silt chalk matrix with moderately strong chalk clasts. Unable to penetrate beyond 2.5m bgl CIRIA Grade DM/CM
					2.80	55.20		End of Borehole at 2.80m

1 2 3 4 5

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks
No water encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS405** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16943	Co-ords:	468038E - 111989N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level:	56.56	Scale 1:25
Client:	Grainger plc		Dates:	15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.20	ES					Grass over brown slightly fine and medium gravelly clay with rootlets TOPSOIL
					0.20	56.36		
		0.40 - 0.60	ES					Brown and grey clay with occasional roots flint gravel decomposed plant remains and wood MADE GROUND
					1.00	55.56		
		1.20	ES					Grey clay with gravel of flint red brick and concrete MADE GROUND
					2.50	54.06		
								off white chalk recovered as structureless mass with some localised orange brown staining and flint CIRIA Grade DM
					3.00	53.56		End of Borehole at 3.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

No water encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS406** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16943	Co-ords:	468060E - 111985N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level:	56.79	Scale 1:25
Client:	Grainger plc		Dates:	15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20 - 0.50	ES		0.10	56.69		Grass over brown slightly fine and medium gravelly clay with rootlets TOPSOIL
								Brown and grey mottled silty clay with pockets of sandy gravel of concrete occasional red brick and ash and rare wood MADE GROUND
								Bituminous felt (roofing felt) fragments
		1.60 - 1.90	ES					
		3.10 - 3.50	ES		3.10	53.69		Dark grey to black clay with decomposed wood and plant fragments with red brick. MADE GROUND
					3.70	53.09		Off white CHALK recovered as structureless mass with some localised orange brown staining CIRIA Grade DM
					5.00	51.79		End of Borehole at 5.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

No water encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **WS407** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16943	Co-ords:	468073E - 111977N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level:	57.22	Scale 1:25
Client:	Grainger plc		Dates:	15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30 - 0.50	ES		0.10	57.12		Grass over brown slightly fine and medium gravelly clay with rootlets TOPSOIL Brown clay with some to much gravel of flint and red brick MADE GROUND	
		1.00 - 2.00	ES		1.00	56.22		Grey silty sand with much ash charcoal and red brick and occasional glass. Poor recovery MADE GROUND	1
		3.00 - 4.00	ES						2
					4.00	53.22		Off white CHALK recovered as structureless silty matrix with weal chalk clasts of fine to medium gravel size CIRIA Grade DM/CM	3
					5.00	52.22		End of Borehole at 5.00m	4
									5

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

No water encountered

AGS

Geo-Environmental

APPENDIX B

Geochemical Laboratory Results

and Statistical Assessments



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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	17-13705
Issue:	1
Date of Issue:	31/08/2017
Contact:	Fiona Goode
Customer Details:	GESL Unit 7 Danworth Farm Hurstpierpoint West SussexBN6 9GL
Quotation No:	Q14-00021
Order No:	2253
Customer Reference:	GE16662
Date Received:	24/08/2017
Date Approved:	31/08/2017
Details:	Woodcroft
Approved by:	

John Wilson, Operations Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

Sample Summary

Report No.: 17-13705

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
109920	TP201 0.10	23/08/2017	24/08/2017		
109921	TP201 0.50	23/08/2017	24/08/2017		
109922	TP202 0.10	23/08/2017	24/08/2017	Silty loam	
109923	TP202 0.50	23/08/2017	24/08/2017		
109924	TP203 0.10	23/08/2017	24/08/2017		
109925	TP203 0.50	23/08/2017	24/08/2017	Silty clayey loam	
109926	TP204 0.10	22/08/2017	24/08/2017		
109927	TP204 0.50	22/08/2017	24/08/2017	Silty clayey loam	
109928	TP205 0.10	23/08/2017	24/08/2017		
109929	TP205 0.50	23/08/2017	24/08/2017	Clayey loam	
109930	TP206 0.10	23/08/2017	24/08/2017	Silty loam	
109931	TP206 0.50	23/08/2017	24/08/2017		
109932	TP207 0.30	21/08/2017	24/08/2017	Silty clayey loam	
109933	TP208 0.10	21/08/2017	24/08/2017		
109934	TP209 0.10	21/08/2017	24/08/2017		
109935	TP210 0.10	21/08/2017	24/08/2017		
109936	TP211 0.10	22/08/2017	24/08/2017		
109937	TP212 0.20	21/08/2017	24/08/2017		
109938	TP213 1.00	21/08/2017	24/08/2017	Silty loam	
109939	TP214 0.90	21/08/2017	24/08/2017	Silty loam	
109940	TP215 0.30	22/08/2017	24/08/2017	Sandy silty loam	
109941	TP215 2.90	23/08/2017	24/08/2017	Chalk	
109942	TP216 0.60	21/08/2017	24/08/2017		
109943	TP217 0.20	21/08/2017	24/08/2017	Silty clayey loam	
109944	TP218 0.15	21/08/2017	24/08/2017		
109945	TP219 1.00	21/08/2017	24/08/2017		
109946	TP220 0.20	22/08/2017	24/08/2017	Sandy silty loam	
109947	TP220 1.00	22/08/2017	24/08/2017	Silty clayey loam	
109948	TP221 0.10	22/08/2017	24/08/2017	Silty loam	
109949	TP221 0.50	22/08/2017	24/08/2017		
109950	TP222 0.40	21/08/2017	24/08/2017	Silty clayey loam	
109951	TP223 0.40	22/08/2017	24/08/2017	Clayey loam	
109952	TP223 0.50	22/08/2017	24/08/2017	Clayey loam	
109953	TP224 0.20	22/08/2017	24/08/2017	Sandy silty loam + Chalk	
109954	TP224 2.20	22/08/2017	24/08/2017	Silty loam	
109955	TP225 0.25	23/08/2017	24/08/2017	Sandy silty loam	
109956	TP225 0.30	23/08/2017	24/08/2017	Sandy loam	
109957	TP226 0.10	21/08/2017	24/08/2017	Silty loam	c
109958	TP227 0.10	21/08/2017	24/08/2017		
109959	TP228 0.15	22/08/2017	24/08/2017	Silty loam	
109960	TP229 0.60	21/08/2017	24/08/2017	Loamy sand	
109961	TP230 0.30	21/08/2017	24/08/2017		
109962	TP231 0.40	21/08/2017	24/08/2017	Sandy silty loam	
109963	TP232 0.10	21/08/2017	24/08/2017	Silty loam	
109964	TP233 0.40	21/08/2017	24/08/2017	Silty clayey loam	
109965	TP234 0.30	21/08/2017	24/08/2017	Silty loam	
109966	TP235 0.50	22/08/2017	24/08/2017	Loamy sand	
109967	TP236 0.30	21/08/2017	24/08/2017	Loamy sand	
109968	TP237 0.40	21/08/2017	24/08/2017	Silty loam	
109969	TP238 0.80	21/08/2017	24/08/2017		
109970	TP239 0.20	23/08/2017	24/08/2017	Sandy loam	
109971	TP239 0.50	23/08/2017	24/08/2017		
109972	TP239 1.50	23/08/2017	24/08/2017	Loamy sand	
109973	TP224 0.30	22/08/2017	24/08/2017		

Results Summary

Report No.: 17-13705

	ELAB Reference	109922	109925	109927	109929	109930	109932
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP202	TP203	TP204	TP205	TP206	TP207
	Sample Depth (m)	0.10	0.50	0.50	0.50	0.10	0.30
	Sampling Date	23/08/2017	23/08/2017	22/08/2017	23/08/2017	23/08/2017	21/08/2017
Determinand	**Codes** / **Units** / **LOD**						
Metals							
Arsenic	M / mg/kg / 1	9.5	11.1	9.9	12.1	4.5	11.8
Barium	U / mg/kg / 10	34.6	48.8	45.9	17.2	16.7	30.1
Beryllium	U / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cadmium	M / mg/kg / 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	M / mg/kg / 5	34.7	60.8	53.7	30.9	12.4	38.0
Copper	M / mg/kg / 5	20.3	29.5	23.9	14.6	8.0	20.3
Lead	M / mg/kg / 5	21.0	24.3	18.8	27.0	11.5	15.3
Mercury	M / mg/kg / 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M / mg/kg / 5	18.3	21.5	22.0	8.9	5.4	9.2
Selenium	M / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium	M / mg/kg / 5	33.5	86.7	77.1	69.9	23.4	54.1
Zinc	M / mg/kg / 5	41.1	52.1	58.4	28.8	17.6	27.1
Anions							
Water Soluble Chloride	M / mg/kg / 40	48	54	45	53	< 40	70
Water Soluble Sulphate	M / g/l / 0.02	0.06	0.05	0.04	0.04	0.03	0.05
Inorganics							
Elemental Sulphur	N / mg/kg / 20	< 20	< 20	< 20	< 20	< 20	< 20
Hexavalent Chromium	N / mg/kg / 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N / mg/kg / 2	< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M / mg/kg / 1	1.1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U / % / 0.02	0.07	0.11	0.04	0.07	0.04	0.05
Water Soluble Boron	N / mg/kg / 0.5	0.8	0.5	< 0.5	0.8	< 0.5	< 0.5
Miscellaneous							
Acid Neutralisation Capacity	N / mol/kg / 0.1	n/t	n/t	n/t	n/t	n/t	n/t
Loss On Ignition (450°C)	M / % / 0.01	n/t	n/t	n/t	n/t	n/t	n/t
pH	M / pH units / 0.1	7.7	7.4	7.5	5.7	5.7	7.6
Total Organic Carbon	N / % / 0.01	0.50	0.54	0.23	0.19	0.36	0.19
Phenols							
Total Phenols	N / mg/kg / 6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons							
Naphthalene	M / mg/kg / 0.1	0.9	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	M / mg/kg / 0.1	0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1
Benzo(a)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo (b) fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo (a) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno (1,2,3-cd) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total PAH(16)	M / mg/kg / 0.4	1.1	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Total PAH (Including Coronene)	N / mg/kg / 2	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 17-13705

	ELAB Reference	109922	109925	109927	109929	109930	109932
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP202	TP203	TP204	TP205	TP206	TP207
	Sample Depth (m)	0.10	0.50	0.50	0.50	0.10	0.30
	Sampling Date	23/08/2017	23/08/2017	22/08/2017	23/08/2017	23/08/2017	21/08/2017
Determinand	**Codes** / **Units** / **LOD**						
BTEX							
Benzene	M / ug/kg / 10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M / ug/kg / 10	35.9	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M / ug/kg / 10	40.3	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M / ug/kg / 10	312	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Total BTEX	M / mg/kg / 0.01	n/t	n/t	n/t	n/t	n/t	n/t
TPH CWG							
>C5-C6 Aliphatic	N / mg/kg / 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N / mg/kg / 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N / mg/kg / 1	1.8	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N / mg/kg / 1	3.3	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N / mg/kg / 1	2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N / mg/kg / 1	1.8	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N / mg/kg / 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N / mg/kg / 0.01	0.04	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N / mg/kg / 1	9.0	< 1.0	3.2	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N / mg/kg / 1	14.4	< 1.0	5.3	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N / mg/kg / 1	3.2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aromatic	N / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N / mg/kg / 1	35.5	< 1.0	8.5	< 1.0	< 1.0	< 1.0
Total Petroleum Hydrocarbons							
Mineral Oil	U / mg/kg / 5	n/t	n/t	n/t	n/t	n/t	n/t
PCB (ICES 7 congeners)							
PCB (Total of 7 Congeners)	M / mg/kg / 0.03	n/t	n/t	n/t	n/t	n/t	n/t

Results Summary

Report No.: 17-13705

	ELAB Reference	109938	109939	109940	109941	109943	109946
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP213	TP214	TP215	TP215	TP217	TP220
	Sample Depth (m)	1.00	0.90	0.30	2.90	0.20	0.20
	Sampling Date	21/08/2017	21/08/2017	22/08/2017	23/08/2017	21/08/2017	22/08/2017
Determinand	**Codes** / **Units** / **LOD**						
Metals							
Arsenic	M / mg/kg / 1	9.0	13.8	10.4	^ 4.7	32.6	25.7
Barium	U / mg/kg / 10	61.4	72.5	162	11.5	86.2	373
Beryllium	U / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	2.5	3.0
Cadmium	M / mg/kg / 0.5	0.5	< 0.5	0.8	^ 0.6	< 0.5	1.1
Chromium	M / mg/kg / 5	18.4	36.4	26.0	^ 8.6	63.2	36.9
Copper	M / mg/kg / 5	14.7	20.4	22.0	^ 6.9	37.4	93.0
Lead	M / mg/kg / 5	62.6	56.0	44.4	^ < 5.0	24.3	170
Mercury	M / mg/kg / 0.5	< 0.5	< 0.5	< 0.5	^ < 0.5	< 0.5	< 0.5
Nickel	M / mg/kg / 5	16.7	19.4	18.0	^ 11.8	19.1	56.2
Selenium	M / mg/kg / 1	< 1.0	< 1.0	< 1.0	^ < 1.0	< 1.0	< 1.0
Vanadium	M / mg/kg / 5	27.7	59.1	32.2	^ 7.8	117	133
Zinc	M / mg/kg / 5	72.7	101	121	^ 15.9	30.3	335
Anions							
Water Soluble Chloride	M / mg/kg / 40	< 40	50	55	^ < 40	53	< 40
Water Soluble Sulphate	M / g/l / 0.02	0.03	0.30	0.16	^ 0.04	0.05	0.03
Inorganics							
Elemental Sulphur	N / mg/kg / 20	< 20	1050	< 20	< 20	< 20	< 20
Hexavalent Chromium	N / mg/kg / 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N / mg/kg / 2	< 2	8	< 2	< 2	< 2	< 2
Total Cyanide	M / mg/kg / 1	< 1.0	< 1.0	< 1.0	^ < 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U / % / 0.02	0.07	0.13	0.11	0.04	0.06	0.08
Water Soluble Boron	N / mg/kg / 0.5	0.6	1.7	0.6	< 0.5	< 0.5	1.0
Miscellaneous							
Acid Neutralisation Capacity	N / mol/kg / 0.1	n/t	n/t	n/t	n/t	n/t	n/t
Loss On Ignition (450°C)	M / % / 0.01	n/t	n/t	n/t	n/t	n/t	n/t
pH	M / pH units / 0.1	8.4	8.0	10.0	^ 8.8	8.2	8.2
Total Organic Carbon	N / % / 0.01	0.49	0.92	0.47	0.02	0.32	4.9
Phenols							
Total Phenols	N / mg/kg / 6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons							
Naphthalene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	^ < 0.1	< 0.1	0.2
Acenaphthylene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	^ < 0.1	< 0.1	< 0.1
Acenaphthene	M / mg/kg / 0.1	< 0.1	< 0.1	0.3	^ < 0.1	< 0.1	< 0.1
Fluorene	M / mg/kg / 0.1	< 0.1	< 0.1	0.3	^ < 0.1	< 0.1	< 0.1
Phenanthrene	M / mg/kg / 0.1	0.4	0.2	2.4	^ < 0.1	< 0.1	0.3
Anthracene	M / mg/kg / 0.1	0.1	< 0.1	0.9	^ < 0.1	< 0.1	< 0.1
Fluoranthene	M / mg/kg / 0.1	1.3	0.6	5.9	^ < 0.1	< 0.1	0.7
Pyrene	M / mg/kg / 0.1	1.3	0.6	5.1	^ 0.1	< 0.1	0.8
Benzo(a)anthracene	M / mg/kg / 0.1	0.8	0.3	2.9	^ < 0.1	< 0.1	0.4
Chrysene	M / mg/kg / 0.1	0.8	0.4	3.0	^ < 0.1	< 0.1	0.5
Benzo (b) fluoranthene	M / mg/kg / 0.1	1.1	< 0.1	3.0	^ < 0.1	< 0.1	0.6
Benzo(k)fluoranthene	M / mg/kg / 0.1	1.0	< 0.1	2.9	^ < 0.1	< 0.1	0.6
Benzo (a) pyrene	M / mg/kg / 0.1	1.0	0.4	3.1	^ 0.2	< 0.1	0.5
Indeno (1,2,3-cd) pyrene	M / mg/kg / 0.1	0.9	0.2	2.2	^ < 0.1	< 0.1	0.4
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	0.5	0.2	0.6	^ < 0.1	< 0.1	0.2
Benzo[g,h,i]perylene	M / mg/kg / 0.1	0.9	0.3	2.1	^ < 0.1	< 0.1	0.5
Total PAH(16)	M / mg/kg / 0.4	10.4	3.2	34.6	^ < 0.4	< 0.4	5.8
Total PAH (Including Coronene)	N / mg/kg / 2	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 17-13705

			ELAB Reference	109938	109939	109940	109941	109943	109946
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP213	TP214	TP215	TP215	TP217	TP220
			Sample Depth (m)	1.00	0.90	0.30	2.90	0.20	0.20
			Sampling Date	21/08/2017	21/08/2017	22/08/2017	23/08/2017	21/08/2017	22/08/2017
Determinand	**Codes**	**Units**	**LOD**						
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0
Total BTEX	M	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	2.9	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	14.4	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	2.1	< 1.0	18.8	9.2	< 1.0	3.3
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	3.5	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	6.9	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	7.1	< 1.0	28.2	10.9	< 1.0	7.2
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	14.6	< 1.0	< 1.0	1.8
Total (>C5-C40) Ali/Aro	N	mg/kg	1	9.3	< 1.0	65.1	44.4	< 1.0	12.3
Total Petroleum Hydrocarbons									
Mineral Oil	U	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
PCB (ICES 7 congeners)									
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t	n/t	n/t	n/t	n/t

Results Summary

Report No.: 17-13705

	ELAB Reference	109947	109948	109950	109951	109952	109953
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP220	TP221	TP222	TP223	TP223	TP224
	Sample Depth (m)	1.00	0.10	0.40	0.40	0.50	0.20
	Sampling Date	22/08/2017	22/08/2017	21/08/2017	22/08/2017	22/08/2017	22/08/2017
Determinand	**Codes** / **Units** / **LOD**						
Metals							
Arsenic	M / mg/kg / 1	11.0	8.6	12.1	9.5	n/t	^ 7.8
Barium	U / mg/kg / 10	99.6	42.6	45.7	30.9	n/t	65.4
Beryllium	U / mg/kg / 1	1.2	< 1.0	< 1.0	1.0	n/t	< 1.0
Cadmium	M / mg/kg / 0.5	< 0.5	< 0.5	< 0.5	< 0.5	n/t	^ 0.5
Chromium	M / mg/kg / 5	39.5	24.2	42.3	33.0	n/t	^ 19.5
Copper	M / mg/kg / 5	21.6	26.3	20.6	19.7	n/t	^ 16.4
Lead	M / mg/kg / 5	20.1	26.5	16.9	18.1	n/t	^ 37.9
Mercury	M / mg/kg / 0.5	< 0.5	< 0.5	< 0.5	< 0.5	n/t	^ < 0.5
Nickel	M / mg/kg / 5	20.6	15.2	17.4	20.4	n/t	^ 16.4
Selenium	M / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	^ < 1.0
Vanadium	M / mg/kg / 5	74.6	37.3	62.6	41.2	n/t	^ 27.3
Zinc	M / mg/kg / 5	39.7	53.8	43.6	41.0	n/t	^ 51.1
Anions							
Water Soluble Chloride	M / mg/kg / 40	48	41	49	92	n/t	^ 167
Water Soluble Sulphate	M / g/l / 0.02	0.08	0.04	0.04	0.06	n/t	^ 0.09
Inorganics							
Elemental Sulphur	N / mg/kg / 20	< 20	< 20	< 20	< 20	n/t	< 20
Hexavalent Chromium	N / mg/kg / 0.8	< 0.8	< 0.8	< 0.8	< 0.8	n/t	< 0.8
Total Sulphide	N / mg/kg / 2	4	< 2	< 2	< 2	n/t	< 2
Total Cyanide	M / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	^ < 1.0
Acid Soluble Sulphate (SO4)	U / % / 0.02	0.07	0.06	0.05	0.06	n/t	0.07
Water Soluble Boron	N / mg/kg / 0.5	< 0.5	0.5	< 0.5	0.5	n/t	< 0.5
Miscellaneous							
Acid Neutralisation Capacity	N / mol/kg / 0.1	n/t	n/t	n/t	n/t	< 0.1	n/t
Loss On Ignition (450°C)	M / % / 0.01	n/t	n/t	n/t	n/t	2.82	n/t
pH	M / pH units / 0.1	7.3	7.7	7.5	8.3	7.7	^ 8.3
Total Organic Carbon	N / % / 0.01	0.29	0.69	0.19	0.15	0.18	0.10
Phenols							
Total Phenols	N / mg/kg / 6	< 6	< 6	< 6	< 6	n/t	< 6
Polyaromatic hydrocarbons							
Naphthalene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ < 0.1
Acenaphthylene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ < 0.1
Acenaphthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ < 0.1
Fluorene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ < 0.1
Phenanthrene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ 0.5
Anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ 0.1
Fluoranthene	M / mg/kg / 0.1	< 0.1	0.1	< 0.1	< 0.1	n/t	^ 1.0
Pyrene	M / mg/kg / 0.1	< 0.1	0.1	< 0.1	< 0.1	n/t	^ 0.9
Benzo(a)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ 0.6
Chrysene	M / mg/kg / 0.1	< 0.1	0.1	< 0.1	< 0.1	n/t	^ 0.7
Benzo (b) fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ 0.6
Benzo(k)fluoranthene	M / mg/kg / 0.1	< 0.1	0.1	< 0.1	< 0.1	n/t	^ 0.6
Benzo (a) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	0.2	< 0.1	n/t	^ 0.6
Indeno (1,2,3-cd) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	0.2	< 0.1	n/t	^ 0.6
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	0.3	< 0.1	n/t	^ 0.2
Benzo[g,h,i]perylene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ 0.5
Total PAH(16)	M / mg/kg / 0.4	< 0.4	< 0.4	0.9	< 0.4	n/t	^ 7.0
Total PAH (Including Coronene)	N / mg/kg / 2	n/t	n/t	n/t	n/t	< 2	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 17-13705

			ELAB Reference	109947	109948	109950	109951	109952	109953
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP220	TP221	TP222	TP223	TP223	TP224
			Sample Depth (m)	1.00	0.10	0.40	0.40	0.50	0.20
			Sampling Date	22/08/2017	22/08/2017	21/08/2017	22/08/2017	22/08/2017	22/08/2017
Determinand	**Codes**	**Units**	**LOD**						
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	n/t	^ < 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	n/t	^ < 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	n/t	^ < 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	n/t	^ < 10.0
Total BTEX	M	mg/kg	0.01	n/t	n/t	n/t	n/t	< 0.01	n/t
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	n/t	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	n/t	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	11.3
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	5.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	n/t	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	n/t	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	1.5
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	41.2
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	28.5
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	87.5
Total Petroleum Hydrocarbons									
Mineral Oil	U	mg/kg	5	n/t	n/t	n/t	n/t	< 5	n/t
PCB (ICES 7 congeners)									
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t	n/t	n/t	< 0.03	n/t

Results Summary

Report No.: 17-13705

	ELAB Reference	109954	109955	109956	109957	109959	109960
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP224	TP225	TP225	TP226	TP228	TP229
	Sample Depth (m)	2.20	0.25	0.30	0.10	0.15	0.60
	Sampling Date	22/08/2017	23/08/2017	23/08/2017	21/08/2017	22/08/2017	21/08/2017
Determinand	**Codes** / **Units** / **LOD**						
Metals							
Arsenic	M / mg/kg / 1	6.6	13.2	n/t	11.5	10.4	38.2
Barium	U / mg/kg / 10	63.4	124	n/t	46.0	40.0	51.2
Beryllium	U / mg/kg / 1	1.1	< 1.0	n/t	< 1.0	< 1.0	1.8
Cadmium	M / mg/kg / 0.5	< 0.5	0.5	n/t	< 0.5	< 0.5	< 0.5
Chromium	M / mg/kg / 5	28.9	52.8	n/t	21.7	19.5	37.3
Copper	M / mg/kg / 5	18.4	59.3	n/t	16.1	12.2	23.7
Lead	M / mg/kg / 5	18.5	82.9	n/t	25.9	23.7	18.9
Mercury	M / mg/kg / 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5	< 0.5
Nickel	M / mg/kg / 5	30.5	43.4	n/t	24.5	19.1	52.0
Selenium	M / mg/kg / 1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	1.1
Vanadium	M / mg/kg / 5	41.5	32.9	n/t	33.8	33.8	61.2
Zinc	M / mg/kg / 5	64.4	230	n/t	64.7	50.3	98.9
Anions							
Water Soluble Chloride	M / mg/kg / 40	56	140	n/t	65	< 40	< 40
Water Soluble Sulphate	M / g/l / 0.02	0.04	0.35	n/t	0.11	0.04	0.03
Inorganics							
Elemental Sulphur	N / mg/kg / 20	< 20	< 20	n/t	< 20	< 20	< 20
Hexavalent Chromium	N / mg/kg / 0.8	< 0.8	< 0.8	n/t	< 0.8	< 0.8	< 0.8
Total Sulphide	N / mg/kg / 2	< 2	< 2	n/t	< 2	< 2	< 2
Total Cyanide	M / mg/kg / 1	1.0	1.1	n/t	2.4	1.1	< 1.0
Acid Soluble Sulphate (SO4)	U / % / 0.02	0.05	0.77	n/t	0.12	0.07	0.05
Water Soluble Boron	N / mg/kg / 0.5	< 0.5	0.7	n/t	0.6	0.7	< 0.5
Miscellaneous							
Acid Neutralisation Capacity	N / mol/kg / 0.1	n/t	n/t	0.2	n/t	n/t	n/t
Loss On Ignition (450°C)	M / % / 0.01	n/t	n/t	2.63	n/t	n/t	n/t
pH	M / pH units / 0.1	7.7	11.1	11.4	9.2	7.4	7.2
Total Organic Carbon	N / % / 0.01	0.33	0.41	0.40	1.1	0.69	0.10
Phenols							
Total Phenols	N / mg/kg / 6	< 6	< 6	n/t	c < 6	< 6	< 6
Polyaromatic hydrocarbons							
Naphthalene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	c < 0.1	< 0.1	< 0.1
Acenaphthylene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	c < 0.1	< 0.1	< 0.1
Acenaphthene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	c < 0.1	< 0.1	< 0.1
Fluorene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	c < 0.1	< 0.1	< 0.1
Phenanthrene	M / mg/kg / 0.1	< 0.1	0.4	n/t	c < 0.1	< 0.1	< 0.1
Anthracene	M / mg/kg / 0.1	< 0.1	0.1	n/t	c < 0.1	< 0.1	< 0.1
Fluoranthene	M / mg/kg / 0.1	0.2	1.2	n/t	c 0.3	< 0.1	< 0.1
Pyrene	M / mg/kg / 0.1	< 0.1	1.1	n/t	c 0.3	0.1	< 0.1
Benzo(a)anthracene	M / mg/kg / 0.1	< 0.1	0.8	n/t	c 0.2	< 0.1	< 0.1
Chrysene	M / mg/kg / 0.1	< 0.1	0.9	n/t	c 0.2	< 0.1	< 0.1
Benzo (b) fluoranthene	M / mg/kg / 0.1	< 0.1	0.9	n/t	c 0.3	< 0.1	< 0.1
Benzo(k)fluoranthene	M / mg/kg / 0.1	< 0.1	1.0	n/t	c 0.5	< 0.1	< 0.1
Benzo (a) pyrene	M / mg/kg / 0.1	< 0.1	1.0	n/t	c 0.3	< 0.1	< 0.1
Indeno (1,2,3-cd) pyrene	M / mg/kg / 0.1	< 0.1	0.8	n/t	c 0.3	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	< 0.1	0.3	n/t	c 0.3	< 0.1	< 0.1
Benzo[g,h,i]perylene	M / mg/kg / 0.1	< 0.1	0.8	n/t	c 0.2	< 0.1	< 0.1
Total PAH(16)	M / mg/kg / 0.4	< 0.4	9.4	n/t	c 3.0	< 0.4	< 0.4
Total PAH (Including Coronene)	N / mg/kg / 2	n/t	n/t	25	n/t	n/t	n/t

Results Summary

Report No.: 17-13705

			ELAB Reference	109954	109955	109956	109957	109959	109960
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP224	TP225	TP225	TP226	TP228	TP229
			Sample Depth (m)	2.20	0.25	0.30	0.10	0.15	0.60
			Sampling Date	22/08/2017	23/08/2017	23/08/2017	21/08/2017	22/08/2017	21/08/2017
Determinand	**Codes**	**Units**	**LOD**						
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	n/t	c < 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	n/t	c < 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	n/t	c < 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	n/t	c < 10.0	< 10.0	< 10.0
Total BTEX	M	mg/kg	0.01	n/t	n/t	< 0.01	n/t	n/t	n/t
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	c < 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	c < 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	6.4	n/t	c < 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	c < 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	c < 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	12.3	n/t	c 3.4	< 1.0	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	4.2	n/t	c 1.4	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	22.9	n/t	c 4.9	< 1.0	< 1.0
Total Petroleum Hydrocarbons									
Mineral Oil	U	mg/kg	5	n/t	n/t	11	n/t	n/t	n/t
PCB (ICES 7 congeners)									
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t	< 0.03	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 17-13705

	ELAB Reference	109962	109963	109964	109965	109966	109967
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP231	TP232	TP233	TP234	TP235	TP236
	Sample Depth (m)	0.40	0.10	0.40	0.30	0.50	0.30
	Sampling Date	21/08/2017	21/08/2017	21/08/2017	21/08/2017	22/08/2017	21/08/2017
Determinand	**Codes** / **Units** / **LOD**						
Metals							
Arsenic	M / mg/kg / 1	33.1	5.6	n/t	6.9	14.7	30.4
Barium	U / mg/kg / 10	31.8	27.5	n/t	30.8	18.9	38.8
Beryllium	U / mg/kg / 1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	1.5
Cadmium	M / mg/kg / 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5	< 0.5
Chromium	M / mg/kg / 5	31.6	17.6	n/t	21.3	13.2	41.5
Copper	M / mg/kg / 5	17.8	12.8	n/t	12.5	8.9	22.0
Lead	M / mg/kg / 5	14.6	17.3	n/t	26.3	12.9	19.6
Mercury	M / mg/kg / 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5	< 0.5
Nickel	M / mg/kg / 5	18.9	14.3	n/t	8.2	7.2	30.2
Selenium	M / mg/kg / 1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
Vanadium	M / mg/kg / 5	63.1	26.9	n/t	33.7	27.5	84.2
Zinc	M / mg/kg / 5	38.5	38.3	n/t	37.5	25.8	71.7
Anions							
Water Soluble Chloride	M / mg/kg / 40	42	< 40	n/t	41	44	< 40
Water Soluble Sulphate	M / g/l / 0.02	0.03	0.03	n/t	0.03	0.03	< 0.02
Inorganics							
Elemental Sulphur	N / mg/kg / 20	< 20	< 20	n/t	< 20	< 20	< 20
Hexavalent Chromium	N / mg/kg / 0.8	< 0.8	< 0.8	n/t	< 0.8	< 0.8	< 0.8
Total Sulphide	N / mg/kg / 2	< 2	< 2	n/t	< 2	< 2	< 2
Total Cyanide	M / mg/kg / 1	1.1	1.3	n/t	1.6	1.8	< 1.0
Acid Soluble Sulphate (SO4)	U / % / 0.02	0.06	0.08	n/t	0.07	0.05	0.07
Water Soluble Boron	N / mg/kg / 0.5	< 0.5	0.6	n/t	1.0	< 0.5	< 0.5
Miscellaneous							
Acid Neutralisation Capacity	N / mol/kg / 0.1	n/t	n/t	< 0.1	n/t	n/t	n/t
Loss On Ignition (450°C)	M / % / 0.01	n/t	n/t	1.81	n/t	n/t	n/t
pH	M / pH units / 0.1	6.2	6.6	6.7	6.2	5.9	5.3
Total Organic Carbon	N / % / 0.01	0.30	1.4	0.15	1.4	0.14	0.10
Phenols							
Total Phenols	N / mg/kg / 6	< 6	< 6	n/t	< 6	< 6	< 6
Polyaromatic hydrocarbons							
Naphthalene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Acenaphthylene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Acenaphthene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Fluorene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Phenanthrene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Pyrene	M / mg/kg / 0.1	0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Chrysene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Benzo (b) fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Benzo (a) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Indeno (1,2,3-cd) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	0.3	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	0.2	< 0.1	< 0.1
Total PAH(16)	M / mg/kg / 0.4	< 0.4	< 0.4	n/t	0.7	< 0.4	< 0.4
Total PAH (Including Coronene)	N / mg/kg / 2	n/t	n/t	< 2	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 17-13705

			ELAB Reference	109962	109963	109964	109965	109966	109967
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP231	TP232	TP233	TP234	TP235	TP236
			Sample Depth (m)	0.40	0.10	0.40	0.30	0.50	0.30
			Sampling Date	21/08/2017	21/08/2017	21/08/2017	21/08/2017	22/08/2017	21/08/2017
Determinand	**Codes**	**Units**	**LOD**						
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	n/t	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	n/t	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	n/t	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	n/t	< 10.0	< 10.0	< 10.0
Total BTEX	M	mg/kg	0.01	n/t	n/t	< 0.01	n/t	n/t	n/t
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
Total Petroleum Hydrocarbons									
Mineral Oil	U	mg/kg	5	n/t	n/t	< 5	n/t	n/t	n/t
PCB (ICES 7 congeners)									
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t	< 0.03	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 17-13705

			ELAB Reference	109968	109970	109972
			Customer Reference			
			Sample ID			
			Sample Type	SOIL	SOIL	SOIL
			Sample Location	TP237	TP239	TP239
			Sample Depth (m)	0.40	0.20	1.50
			Sampling Date	21/08/2017	23/08/2017	23/08/2017
Determinand	**Codes**	**Units**	**LOD**			
Metals						
Arsenic	M	mg/kg	1	14.1	4.5	17.5
Barium	U	mg/kg	10	81.7	33.9	42.2
Beryllium	U	mg/kg	1	1.4	< 1.0	1.3
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	40.8	17.4	32.7
Copper	M	mg/kg	5	21.1	13.1	15.9
Lead	M	mg/kg	5	16.2	13.4	20.1
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	28.8	11.3	21.3
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0
Vanadium	M	mg/kg	5	58.3	18.4	90.2
Zinc	M	mg/kg	5	62.9	31.0	43.6
Anions						
Water Soluble Chloride	M	mg/kg	40	54	126	107
Water Soluble Sulphate	M	g/l	0.02	0.03	0.10	0.04
Inorganics						
Elemental Sulphur	N	mg/kg	20	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.04	0.04	0.10
Water Soluble Boron	N	mg/kg	0.5	< 0.5	0.5	< 0.5
Miscellaneous						
Acid Neutralisation Capacity	N	mol/kg	0.1	n/t	n/t	n/t
Loss On Ignition (450°C)	M	%	0.01	n/t	n/t	n/t
pH	M	pH units	0.1	6.6	8.8	7.9
Total Organic Carbon	N	%	0.01	0.16	0.21	0.09
Phenols						
Total Phenols	N	mg/kg	6	< 6	< 6	< 6
Polyaromatic hydrocarbons						
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	< 0.1	0.5	< 0.1
Pyrene	M	mg/kg	0.1	< 0.1	0.6	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	0.5	< 0.1
Chrysene	M	mg/kg	0.1	< 0.1	0.5	< 0.1
Benzo (b) fluoranthene	M	mg/kg	0.1	< 0.1	0.5	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	0.7	< 0.1
Benzo (a) pyrene	M	mg/kg	0.1	< 0.1	0.5	< 0.1
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	0.6	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	0.3	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	0.4	< 0.1
Total PAH(16)	M	mg/kg	0.4	< 0.4	5.2	< 0.4
Total PAH (Including Coronene)	N	mg/kg	2	n/t	n/t	n/t

Results Summary

Report No.: 17-13705

			ELAB Reference	109968	109970	109972
			Customer Reference			
			Sample ID			
			Sample Type	SOIL	SOIL	SOIL
			Sample Location	TP237	TP239	TP239
			Sample Depth (m)	0.40	0.20	1.50
			Sampling Date	21/08/2017	23/08/2017	23/08/2017
Determinand	**Codes**	**Units**	**LOD**			
BTEX						
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Total BTEX	M	mg/kg	0.01	n/t	n/t	n/t
TPH CWG						
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	4.6	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	4.6	< 1.0
Total Petroleum Hydrocarbons						
Mineral Oil	U	mg/kg	5	n/t	n/t	n/t
PCB (ICES 7 congeners)						
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t	n/t

Results Summary

Report No.: 17-13705

WAC Analysis								
Elab Ref:	109964					**Landfill Waste Acceptance Criteria Limits**		
Sample Date:	21/08/2017					**Inert Waste Landfill**	**Stable Non-reactive Hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:	TP233							
Depth (m)	0.4							
Site:	Woodcroft							
Determinand		**Code**	**Units**					
Total Organic Carbon		N	%		0.15	3	5	6
Loss on Ignition		M	%		1.8	--	--	10
Total BTEX		M	mg/kg		< 0.01	6	--	--
Total PCBs (7 congeners)		M	mg/kg		< 0.03	1	--	--
TPH Total WAC		M	mg/kg		< 5	500	--	--
Total (of 17) PAHs		N	mg/kg		< 2	100	--	--
pH		M			6.7	--	>6	--
Acid Neutralisation Capacity		N	mol/kg		< 0.1	--	To evaluate	To evaluate
Eluate Analysis			**10:1**		**10:1**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
			mg/l		**mg/kg**			
Arsenic		N	< 0.005		< 0.05	0.5	2	25
Barium		N	< 0.005		< 0.05	20	100	300
Cadmium		N	< 0.001		< 0.01	0.04	1	5
Chromium		N	< 0.005		< 0.05	0.5	10	70
Copper		N	< 0.005		< 0.05	2	50	100
Mercury		N	< 0.005		< 0.01	0.01	0.2	2
Molybdenum		N	< 0.005		< 0.05	0.5	10	30
Nickel		N	< 0.001		< 0.05	0.4	10	40
Lead		N	< 0.001		< 0.05	0.5	10	50
Antimony		N	< 0.005		< 0.05	0.06	0.7	5
Selenium		N	< 0.005		< 0.05	0.1	0.5	7
Zinc		N	< 0.005		< 0.05	4	50	200
Chloride		N	< 5		< 50	800	15000	25000
Fluoride		N	< 5		< 10	10	150	500
Sulphate		N	5		45.70	1000	20000	50000
Total Dissolved Solids		N	< 10		< 100	4000	60000	100000
Phenol Index		N	< 0.01		< 0.10	1	-	-
Dissolved Organic Carbon		N	9.780		98.00	500	800	1000
Leach Test Information								
pH		N	5.7					
Conductivity (uS/cm)		N	28					
Dry mass of test portion (g)			100.000					
Dry Matter (%)			83					
Moisture (%)			21					
Eluent Volume (ml)			952					

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ELAB cannot be held responsible for any discrepencies with current legislation

Results Summary

Report No.: 17-13705

WAC Analysis								
Elab Ref:	109956					**Landfill Waste Acceptance Criteria Limits**		
Sample Date:	23/08/2017					**Inert Waste Landfill**	**Stable Non-reactive Hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:	TP225							
Depth (m)	0.3							
Site:	Woodcroft							
Determinand		**Code**	**Units**					
Total Organic Carbon		N	%		0.40	3	5	6
Loss on Ignition		M	%		2.6	--	--	10
Total BTEX		M	mg/kg		< 0.01	6	--	--
Total PCBs (7 congeners)		M	mg/kg		< 0.03	1	--	--
TPH Total WAC		M	mg/kg		11	500	--	--
Total (of 17) PAHs		N	mg/kg		25.0	100	--	--
pH		M			11.4	--	>6	--
Acid Neutralisation Capacity		N	mol/kg		0.2	--	To evaluate	To evaluate
Eluate Analysis			**10:1**		**10:1**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
			mg/l		**mg/kg**			
Arsenic		N	0.009		0.09	0.5	2	25
Barium		N	0.010		0.10	20	100	300
Cadmium		N	< 0.001		< 0.01	0.04	1	5
Chromium		N	< 0.005		< 0.05	0.5	10	70
Copper		N	0.016		0.16	2	50	100
Mercury		N	< 0.005		< 0.01	0.01	0.2	2
Molybdenum		N	< 0.005		< 0.05	0.5	10	30
Nickel		N	0.003		< 0.05	0.4	10	40
Lead		N	0.007		0.07	0.5	10	50
Antimony		N	< 0.005		< 0.05	0.06	0.7	5
Selenium		N	< 0.005		< 0.05	0.1	0.5	7
Zinc		N	0.016		0.16	4	50	200
Chloride		N	7		67.00	800	15000	25000
Fluoride		N	< 5		< 10	10	150	500
Sulphate		N	12		120.00	1000	20000	50000
Total Dissolved Solids		N	< 10		< 100	4000	60000	100000
Phenol Index		N	< 0.01		< 0.10	1	-	-
Dissolved Organic Carbon		N	12.300		123.00	500	800	1000
Leach Test Information								
pH		N	8.3					
Conductivity (uS/cm)		N	154					
Dry mass of test portion (g)			100.000					
Dry Matter (%)			81					
Moisture (%)			24					
Eluent Volume (ml)			953					

Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Results Summary

Report No.: 17-13705

WAC Analysis								
Elab Ref:	109952					**Landfill Waste Acceptance Criteria Limits**		
Sample Date:	22/08/2017					**Inert Waste Landfill**	**Stable Non-reactive Hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:	TP223							
Depth (m)	0.5							
Site:	Woodcroft							
Determinand		**Code**	**Units**					
Total Organic Carbon		N	%		0.18	3	5	6
Loss on Ignition		M	%		2.8	--	--	10
Total BTEX		M	mg/kg		< 0.01	6	--	--
Total PCBs (7 congeners)		M	mg/kg		< 0.03	1	--	--
TPH Total WAC		M	mg/kg		< 5	500	--	--
Total (of 17) PAHs		N	mg/kg		< 2	100	--	--
pH		M			7.7	--	>6	--
Acid Neutralisation Capacity		N	mol/kg		< 0.1	--	To evaluate	To evaluate
Eluate Analysis			**10:1**		**10:1**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
			mg/l		**mg/kg**			
Arsenic		N	< 0.005		< 0.05	0.5	2	25
Barium		N	< 0.005		< 0.05	20	100	300
Cadmium		N	< 0.001		< 0.01	0.04	1	5
Chromium		N	< 0.005		< 0.05	0.5	10	70
Copper		N	0.011		0.11	2	50	100
Mercury		N	< 0.005		< 0.01	0.01	0.2	2
Molybdenum		N	< 0.005		< 0.05	0.5	10	30
Nickel		N	0.003		< 0.05	0.4	10	40
Lead		N	< 0.001		< 0.05	0.5	10	50
Antimony		N	< 0.005		< 0.05	0.06	0.7	5
Selenium		N	< 0.005		< 0.05	0.1	0.5	7
Zinc		N	< 0.005		< 0.05	4	50	200
Chloride		N	6		65.00	800	15000	25000
Fluoride		N	< 5		< 10	10	150	500
Sulphate		N	6		58.00	1000	20000	50000
Total Dissolved Solids		N	< 10		< 100	4000	60000	100000
Phenol Index		N	< 0.01		< 0.10	1	-	-
Dissolved Organic Carbon		N	54.400		544.00	**500**	800	1000
Leach Test Information								
pH		N	7.7					
Conductivity (uS/cm)		N	117					
Dry mass of test portion (g)			100.000					
Dry Matter (%)			79					
Moisture (%)			27					
Eluent Volume (ml)			931					

Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Results Summary

Report No.: 17-13705

Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #)
in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
109922	0.10	TP202	Brown sandy soil, stones, organics	No asbestos detected	n/t	n/t	n/t	n/t
109925	0.50	TP203	Brown sandy soil, stones, organics	No asbestos detected	n/t	n/t	n/t	n/t
109927	0.50	TP204	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
109929	0.50	TP205	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
109930	0.10	TP206	Brown sandy soil, stones, organics	No asbestos detected	n/t	n/t	n/t	n/t
109932	0.30	TP207	Clay, stones	No asbestos detected	n/t	n/t	n/t	n/t
109938	1.00	TP213	Brown sandy soil, stones, concrete, brick, clinker	Chrysotile Crocidolite (asbestos cement)	2.66	Asbestos cement (2.663%)	< 0.001	2.66
109939	0.90	TP214	Brown sandy soil, stones, brick, clinker, wood	No asbestos detected	n/t	n/t	n/t	n/t
109940	0.30	TP215	Brown sandy soil, stones, concrete, brick, clinker	No asbestos detected	n/t	n/t	n/t	n/t
109941	2.90	TP215	Chalk, stones	No asbestos detected	n/t	n/t	n/t	n/t
109943	0.20	TP217	Clay, stones	No asbestos detected	n/t	n/t	n/t	n/t
109946	0.20	TP220	Brown sandy soil, stones, chalk, brick, clinker	No asbestos detected	n/t	n/t	n/t	n/t
109947	1.00	TP220	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
109948	0.10	TP221	Brown sandy soil, stones, chalk, organics	No asbestos detected	n/t	n/t	n/t	n/t
109950	0.40	TP222	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109951	0.40	TP223	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109953	0.20	TP224	Brown soil,Stones,Brick	No asbestos detected	n/t	n/t	n/t	n/t
109954	2.20	TP224	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
109955	0.25	TP225	Brown sandy soil,Stones,Brick	Chrysotile (Cement Fragment)	3.54	Cement Fragment (3.543)	< 0.001	3.54
109957	0.10	TP226	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
109959	0.15	TP228	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109960	0.60	TP229	Brown sandy soil	No asbestos detected	n/t	n/t	n/t	n/t
109962	0.40	TP231	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109963	0.10	TP232	Brown soil,stones	No asbestos detected	n/t	n/t	n/t	n/t
109965	0.30	TP234	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109966	0.50	TP235	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
109967	0.30	TP236	Brown sandy soil,stones	No asbestos detected	n/t	n/t	n/t	n/t
109968	0.40	TP237	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109970	0.20	TP239	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109971	0.50	TP239	Cement fragment	Chrysotile	25.0	Cement Fragment (25)	< 0.001	25.0
109972	1.50	TP239	Sand	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 17-13705

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Sulphide	N	As submitted sample	25/08/2017	109	Colorimetry
Hexavalent chromium	N	As submitted sample	25/08/2017	110	Colorimetry
Acid Soluble Sulphate	U	Air dried sample	29/08/2017	115	Ion Chromatography
Aqua regia extractable metals	M	Air dried sample	25/08/2017	118	ICPMS
Phenols in solids	N	As submitted sample	25/08/2017	121	HPLC
Elemental Sulphur	N	Air dried sample	25/08/2017	122	HPLC
PAH (GC-FID)	M	As submitted sample	29/08/2017	133	GC-FID
Water soluble anions	M	Air dried sample	25/08/2017	172	Ion Chromatography
Water soluble boron	N	Air dried sample	25/08/2017	202	Colorimetry
Total cyanide	M	As submitted sample	25/08/2017	204	Colorimetry
Aliphatic hydrocarbons in soil	N	As submitted sample	29/08/2017	214	GC-FID
Aliphatic/Aromatic hydrocarbons in soil	N	As submitted sample	29/08/2017	214	GC-FID
Aromatic hydrocarbons in soil	N	As submitted sample	29/08/2017	214	GC-FID
Low range Aliphatic hydrocarbons soil	N	As submitted sample	25/08/2017	214	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	25/08/2017	214	GC-MS
Asbestos identification	U	As submitted sample	25/08/2017	260	Microscopy
Leachate					
Arsenic*	N		30/08/2017	101	ICPMS
Cadmium*	N		30/08/2017	101	ICPMS
Chromium*	N		30/08/2017	101	ICPMS
Lead*	N		30/08/2017	101	ICPMS
Nickel*	N		30/08/2017	101	ICPMS
Copper*	N		30/08/2017	101	ICPMS
Zinc*	N		30/08/2017	101	ICPMS
Mercury*	N		30/08/2017	101	ICPMS
Selenium*	N		30/08/2017	101	ICPMS
Antimony	N		30/08/2017	101	ICPMS
Barium*	N		30/08/2017	101	ICPMS
Molybdenum*	N		30/08/2017	101	ICPMS
pH Value*	N		30/08/2017	113	Electrometric
Electrical Conductivity*	N		30/08/2017	136	Probe
Dissolved Organic Carbon	N		30/08/2017	102	TOC analyser
Chloride*	N		30/08/2017	131	Ion Chromatography
Fluoride*	N		30/08/2017	131	Ion Chromatography
Sulphate*	N		30/08/2017	131	Ion Chromatography
Total Dissolved Solids	N		30/08/2017	144	Gravimetric
Phenol index	N		30/08/2017	121	HPLC
WAC Solids analysis	N				
pH Value**	M	Air dried sample	29/08/2017	113	Electrometric
Total Organic Carbon	N	Air dried sample	29/08/2017	210	IR
Loss on Ignition**	M	Air dried sample	30/08/2017	129	Gravimetric
Acid Neutralization Capacity to pH 7	N	Air dried sample	29/08/2017	NEN 737	Electrometric
Total BTEX**	M	As submitted sample	25/08/2017	181	GCMS
Mineral Oil**	U	As submitted sample	29/08/2017	117	GCFID
Total PCBs (7 congeners)	M	Air dried sample	25/08/2017	120	GCMS
Total PAH (17)**	N	As submitted sample	29/08/2017	133	GCFID

Tests marked N are not UKAS accredited

Report Information

Report No.: 17-13705

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis (dried at < 30°C)
Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

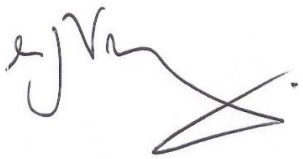
Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage

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2683

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	18-17643
Issue:	1
Date of Issue:	30/05/2018
Contact:	Fiona Goode
Customer Details:	GESL Unit 7 Danworth Farm Hurstpierpoint West Sussex BN6 9GL
Quotation No:	Q14-00021
Order No:	PO-0331
Customer Reference:	GE16943
Date Received:	21/05/2018
Date Approved:	30/05/2018
Details:	Woodcroft, Waterlooville
Approved by:	

Mike Varley, Technical Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)

Sample Summary

Report No.: 18-17643

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
136637	WS401 0.60 - 0.80	15/05/2018	21/05/2018	Clayey loam	
136638	WS401 1.40 - 1.70	15/05/2018	21/05/2018	Silty loam	
136639	WS401 2.30 - 2.60	15/05/2018	21/05/2018	Silty loam	
136640	WS402 0.50	15/05/2018	21/05/2018	Silty clayey loam	
136641	WS402 1.50	15/05/2018	21/05/2018	Silty loam	
136642	WS402 2.50	15/05/2018	21/05/2018	Silty clayey loam	
136643	WS402 3.70 - 4.00	15/05/2018	21/05/2018	Silty loam	
136644	WS403 0.30 - 0.50	15/05/2018	21/05/2018	Silty clayey loam	
136645	WS403 1.50 - 1.60	15/05/2018	21/05/2018	Silty clayey loam	
136646	WS403 2.40 - 2.60	15/05/2018	21/05/2018	Silty loam	
136647	WS404 0.20 - 0.40	15/05/2018	21/05/2018	Silty loam	
136648	WS404 1.10 - 1.30	15/05/2018	21/05/2018	Clayey loam	
136649	WS405 0.00 - 0.20	15/05/2018	21/05/2018	Silty loam	
136650	WS405 0.40 - 0.60	15/05/2018	21/05/2018	Silty clayey loam	
136651	WS405 1.20	15/05/2018	21/05/2018	Silty clayey loam	
136652	WS406 0.20 - 0.50	15/05/2018	21/05/2018	Silty loam	
136653	WS406 1.60 - 1.90	15/05/2018	21/05/2018	Silty loam	
136654	WS406 3.10 - 3.50	15/05/2018	21/05/2018	Silty loam	
136655	WS407 0.30 - 0.50	15/05/2018	21/05/2018	Sandy silty loam	
136656	WS407 1.00 - 2.00	15/05/2018	21/05/2018	Silty loam	
136657	WS407 3.00 - 4.00	15/05/2018	21/05/2018	Silty loam	
136658	TP301 0.25	16/05/2018	21/05/2018	Silty loam	
136659	TP301 0.40	16/05/2018	21/05/2018	Silty loam	
136660	TP301 1.40	16/05/2018	21/05/2018	Silty loam	
136661	TP302 0.20	16/05/2018	21/05/2018	Silty loam	
136662	TP302 0.50	16/05/2018	21/05/2018	Silty clayey loam	
136663	TP302 1.30	16/05/2018	21/05/2018	Silty loam	
136664	TP302 2.70	16/05/2018	21/05/2018	Silty loam	
136665	TP303 0.30	16/05/2018	21/05/2018	Silty loam	
136666	TP303 0.70	16/05/2018	21/05/2018	Silty clayey loam	
136667	TP303 1.90	16/05/2018	21/05/2018	chalk	
136668	TP304 0.30	16/05/2018	21/05/2018	Silty loam	
136669	TP304 1.20	16/05/2018	21/05/2018	Silty clayey loam	
136670	TP305 0.80	16/05/2018	21/05/2018	Clayey loam	
136671	TP305 1.10	16/05/2018	21/05/2018	Clayey loam	
136672	TP306 0.20	15/05/2018	21/05/2018	Silty loam	
136673	TP306 0.40	15/05/2018	21/05/2018	Silty loam	
136674	TP306 0.80	15/05/2018	21/05/2018	Sandy silty loam	
136675	TP307 0.30	15/05/2018	21/05/2018	Silty loam	
136676	TP307 0.80	15/05/2018	21/05/2018	Silty clayey loam	
136677	TP307 1.20	15/05/2018	21/05/2018	Sand	
136678	TP308 0.10	15/05/2018	21/05/2018	Silty loam	
136679	TP308 0.30	15/05/2018	21/05/2018	Sandy silty loam	
136680	TP308 0.70	15/05/2018	21/05/2018	Silty clayey loam	
136681	TP309 0.25	15/05/2018	21/05/2018	Silty loam	
136682	TP309 0.50	15/05/2018	21/05/2018	Silty loam	
136683	TP309 0.65	15/05/2018	21/05/2018	Silty clayey loam	
136684	TP310 0.20	15/05/2018	21/05/2018	Silty loam	
136685	TP310 0.50	15/05/2018	21/05/2018	Silty loam	
136686	TP310 1.50	15/05/2018	21/05/2018	chalk	
136687	TP311 0.20	15/05/2018	21/05/2018	Silty loam	
136688	TP311 0.40	15/05/2018	21/05/2018	Silty loam	
136689	TP311 0.80	15/05/2018	21/05/2018	Silty loam	
136690	TP312 0.20	17/05/2018	21/05/2018	Silty loam	
136691	TP312 0.90	17/05/2018	21/05/2018	Silty loam	
136692	TP312 1.45	17/05/2018	21/05/2018	Silty clayey loam	
136693	TP313 0.25	17/05/2018	21/05/2018	Silty loam + chalk	
136694	TP313 0.50	17/05/2018	21/05/2018	Sandy silty loam	
136695	TP313 1.55	17/05/2018	21/05/2018	Loamy sand	
136696	TP314 0.30	17/05/2018	21/05/2018	Clayey loam	
136697	TP314 0.70	17/05/2018	21/05/2018	Silty loam	
136698	TP314 1.60	17/05/2018	21/05/2018	Silty clayey loam	
136699	TP315 0.20	17/05/2018	21/05/2018	Silty loam	
136700	TP315 0.60	17/05/2018	21/05/2018	Silty loam	

Sample Summary

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Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
136701	TP315 2.30	17/05/2018	21/05/2018	Clayey loam	
136702	TP316 0.20	17/05/2018	21/05/2018	Sandy silty loam	
136703	TP316 0.90	17/05/2018	21/05/2018	Silty clayey loam	
136704	TP316 1.90	17/05/2018	21/05/2018	Clayey loam	
136705	TP317 0.15	17/05/2018	21/05/2018	Silty loam	
136706	TP317 0.65	17/05/2018	21/05/2018	Clayey loam	
136707	TP317 1.40	17/05/2018	21/05/2018	Sandy loam	
136708	TP318 0.15	17/05/2018	21/05/2018	Silty loam	
136709	TP318 0.70	17/05/2018	21/05/2018	Silty clayey loam	
136710	TP319 1.80	17/05/2018	21/05/2018	Clayey loam	

Results Summary

Report No.: 18-17643

			ELAB Reference	136637	136638	136639	136640	136641	136642
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS401	WS401	WS401	WS402	WS402	WS402
			Sample Depth (m)	0.60 - 0.80	1.40 - 1.70	2.30 - 2.60	0.50	1.50	2.50
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Barium	U	mg/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Beryllium	U	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Cadmium	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Chromium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Copper	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Lead	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Mercury	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Nickel	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Selenium	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Vanadium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Zinc	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Anions									
Water Soluble Chloride	M	mg/kg	40	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Sulphate	M	g/l	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Inorganics									
Elemental Sulphur	M	mg/kg	20	n/t	n/t	n/t	n/t	n/t	n/t
Hexavalent Chromium	N	mg/kg	0.8	n/t	n/t	n/t	n/t	n/t	n/t
Total Sulphide	N	mg/kg	2	n/t	n/t	n/t	n/t	n/t	n/t
Total Cyanide	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Acid Soluble Sulphate (SO4)	U	%	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Boron	N	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Miscellaneous									
pH	M	pH units	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total Organic Carbon	N	%	0.01	0.51	1.9	2.2	0.47	1.4	0.49
Phenols									
Total Phenols	N	mg/kg	6	n/t	n/t	n/t	n/t	n/t	n/t
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluorene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Phenanthrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(a)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Chrysene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (b) fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(k)fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (a) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Dibenzo(a,h)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo[g,h,i]perylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total PAH(16)	M	mg/kg	0.4	n/t	n/t	n/t	n/t	n/t	n/t
BTEX									
Benzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Toluene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Ethylbenzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Xylenes	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136637	136638	136639	136640	136641	136642
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS401	WS401	WS401	WS402	WS402	WS402
			Sample Depth (m)	0.60 - 0.80	1.40 - 1.70	2.30 - 2.60	0.50	1.50	2.50
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C6-C8 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C5-C7 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C7-C8 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Total (>C5-C40) Ali/Aro	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

	ELAB Reference	136643	136644	136645	136646	136647	136648
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	WS402	WS403	WS403	WS403	WS404	WS404
	Sample Depth (m)	3.70 - 4.00	0.30 - 0.50	1.50 - 1.60	2.40 - 2.60	0.20 - 0.40	1.10 - 1.30
	Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Barium	U	mg/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Beryllium	U	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Cadmium	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Chromium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Copper	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Lead	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Mercury	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Nickel	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Selenium	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Vanadium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Zinc	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Anions									
Water Soluble Chloride	M	mg/kg	40	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Sulphate	M	g/l	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Inorganics									
Elemental Sulphur	M	mg/kg	20	n/t	n/t	n/t	n/t	n/t	n/t
Hexavalent Chromium	N	mg/kg	0.8	n/t	n/t	n/t	n/t	n/t	n/t
Total Sulphide	N	mg/kg	2	n/t	n/t	n/t	n/t	n/t	n/t
Total Cyanide	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Acid Soluble Sulphate (SO4)	U	%	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Boron	N	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Miscellaneous									
pH	M	pH units	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total Organic Carbon	N	%	0.01	0.68	0.61	0.69	0.19	2.5	0.20
Phenols									
Total Phenols	N	mg/kg	6	n/t	n/t	n/t	n/t	n/t	n/t
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluorene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Phenanthrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(a)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Chrysene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (b) fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(k)fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (a) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Dibenzo(a,h)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo[g,h,i]perylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total PAH(16)	M	mg/kg	0.4	n/t	n/t	n/t	n/t	n/t	n/t
BTEX									
Benzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Toluene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Ethylbenzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Xylenes	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136643	136644	136645	136646	136647	136648
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS402	WS403	WS403	WS403	WS404	WS404
			Sample Depth (m)	3.70 - 4.00	0.30 - 0.50	1.50 - 1.60	2.40 - 2.60	0.20 - 0.40	1.10 - 1.30
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C6-C8 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C5-C7 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C7-C8 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Total (>C5-C40) Ali/Aro	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136649	136650	136651	136652	136653	136654
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS405	WS405	WS405	WS406	WS406	WS406
			Sample Depth (m)	0.00 - 0.20	0.40 - 0.60	1.20	0.20 - 0.50	1.60 - 1.90	3.10 - 3.50
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Barium	U	mg/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Beryllium	U	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Cadmium	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Chromium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Copper	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Lead	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Mercury	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Nickel	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Selenium	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Vanadium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Zinc	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Anions									
Water Soluble Chloride	M	mg/kg	40	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Sulphate	M	g/l	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Inorganics									
Elemental Sulphur	M	mg/kg	20	n/t	n/t	n/t	n/t	n/t	n/t
Hexavalent Chromium	N	mg/kg	0.8	n/t	n/t	n/t	n/t	n/t	n/t
Total Sulphide	N	mg/kg	2	n/t	n/t	n/t	n/t	n/t	n/t
Total Cyanide	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Acid Soluble Sulphate (SO4)	U	%	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Boron	N	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Miscellaneous									
pH	M	pH units	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total Organic Carbon	N	%	0.01	1.6	1.0	0.87	0.98	1.4	3.8
Phenols									
Total Phenols	N	mg/kg	6	n/t	n/t	n/t	n/t	n/t	n/t
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluorene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Phenanthrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(a)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Chrysene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (b) fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(k)fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (a) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Dibenzo(a,h)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo[g,h,i]perylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total PAH(16)	M	mg/kg	0.4	n/t	n/t	n/t	n/t	n/t	n/t
BTEX									
Benzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Toluene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Ethylbenzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Xylenes	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136649	136650	136651	136652	136653	136654
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS405	WS405	WS405	WS406	WS406	WS406
			Sample Depth (m)	0.00 - 0.20	0.40 - 0.60	1.20	0.20 - 0.50	1.60 - 1.90	3.10 - 3.50
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C6-C8 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C5-C7 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C7-C8 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Total (>C5-C40) Ali/Aro	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136655	136656	136657	136658	136659	136660
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS407	WS407	WS407	TP301	TP301	TP301
			Sample Depth (m)	0.30 - 0.50	1.00 - 2.00	3.00 - 4.00	0.25	0.40	1.40
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	16/05/2018	16/05/2018	16/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Barium	U	mg/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Beryllium	U	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Cadmium	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Chromium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Copper	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Lead	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Mercury	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Nickel	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Selenium	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Vanadium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Zinc	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Anions									
Water Soluble Chloride	M	mg/kg	40	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Sulphate	M	g/l	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Inorganics									
Elemental Sulphur	M	mg/kg	20	n/t	n/t	n/t	n/t	n/t	n/t
Hexavalent Chromium	N	mg/kg	0.8	n/t	n/t	n/t	n/t	n/t	n/t
Total Sulphide	N	mg/kg	2	n/t	n/t	n/t	n/t	n/t	n/t
Total Cyanide	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Acid Soluble Sulphate (SO4)	U	%	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Boron	N	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Miscellaneous									
pH	M	pH units	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total Organic Carbon	N	%	0.01	0.72	1.2	2.1	1.7	0.80	2.3
Phenols									
Total Phenols	N	mg/kg	6	n/t	n/t	n/t	n/t	n/t	n/t
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluorene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Phenanthrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(a)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Chrysene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (b) fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(k)fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (a) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Dibenzo(a,h)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo[g,h,i]perylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total PAH(16)	M	mg/kg	0.4	n/t	n/t	n/t	n/t	n/t	n/t
BTEX									
Benzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Toluene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Ethylbenzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Xylenes	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136655	136656	136657	136658	136659	136660
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS407	WS407	WS407	TP301	TP301	TP301
			Sample Depth (m)	0.30 - 0.50	1.00 - 2.00	3.00 - 4.00	0.25	0.40	1.40
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	16/05/2018	16/05/2018	16/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C6-C8 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C5-C7 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C7-C8 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Total (>C5-C40) Ali/Aro	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136661	136662	136663	136664	136665	136666
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP302	TP302	TP302	TP302	TP303	TP303
			Sample Depth (m)	0.20	0.50	1.30	2.70	0.30	0.70
			Sampling Date	16/05/2018	16/05/2018	16/05/2018	16/05/2018	16/05/2018	16/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Barium	U	mg/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Beryllium	U	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Cadmium	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Chromium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Copper	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Lead	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Mercury	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Nickel	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Selenium	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Vanadium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Zinc	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Anions									
Water Soluble Chloride	M	mg/kg	40	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Sulphate	M	g/l	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Inorganics									
Elemental Sulphur	M	mg/kg	20	n/t	n/t	n/t	n/t	n/t	n/t
Hexavalent Chromium	N	mg/kg	0.8	n/t	n/t	n/t	n/t	n/t	n/t
Total Sulphide	N	mg/kg	2	n/t	n/t	n/t	n/t	n/t	n/t
Total Cyanide	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Acid Soluble Sulphate (SO4)	U	%	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Boron	N	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Miscellaneous									
pH	M	pH units	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total Organic Carbon	N	%	0.01	0.48	0.77	0.64	1.3	2.1	0.21
Phenols									
Total Phenols	N	mg/kg	6	n/t	n/t	n/t	n/t	n/t	n/t
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluorene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Phenanthrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(a)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Chrysene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (b) fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(k)fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (a) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Dibenzo(a,h)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo[g,h,i]perylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total PAH(16)	M	mg/kg	0.4	n/t	n/t	n/t	n/t	n/t	n/t
BTEX									
Benzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Toluene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Ethylbenzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Xylenes	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

	ELAB Reference	136661	136662	136663	136664	136665	136666
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP302	TP302	TP302	TP302	TP303	TP303
	Sample Depth (m)	0.20	0.50	1.30	2.70	0.30	0.70
	Sampling Date	16/05/2018	16/05/2018	16/05/2018	16/05/2018	16/05/2018	16/05/2018
Determinand	**Codes** / **Units** / **LOD**						
TPH CWG							
>C5-C6 Aliphatic	N / mg/kg / 0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C6-C8 Aliphatic	N / mg/kg / 0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aliphatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aliphatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aliphatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aliphatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aliphatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aliphatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C5-C7 Aromatic	N / mg/kg / 0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C7-C8 Aromatic	N / mg/kg / 0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aromatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aromatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aromatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aromatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aromatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aromatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
Total (>C5-C40) Ali/Aro	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136667	136668	136669	136670	136671	136672
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP303	TP304	TP304	TP305	TP305	TP306
			Sample Depth (m)	1.90	0.30	1.20	0.80	1.10	0.20
			Sampling Date	16/05/2018	16/05/2018	16/05/2018	16/05/2018	16/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	9.2
Barium	U	mg/kg	10	n/t	n/t	n/t	n/t	n/t	51.3
Beryllium	U	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
Cadmium	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	< 0.5
Chromium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	23.1
Copper	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	7.9
Lead	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	18.6
Mercury	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	< 0.5
Nickel	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	15.7
Selenium	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
Vanadium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	34.7
Zinc	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	55.8
Anions									
Water Soluble Chloride	M	mg/kg	40	n/t	n/t	n/t	n/t	n/t	< 40
Water Soluble Sulphate	M	g/l	0.02	n/t	n/t	n/t	n/t	n/t	< 0.02
Inorganics									
Elemental Sulphur	M	mg/kg	20	n/t	n/t	n/t	n/t	n/t	< 20
Hexavalent Chromium	N	mg/kg	0.8	n/t	n/t	n/t	n/t	n/t	< 0.8
Total Sulphide	N	mg/kg	2	n/t	n/t	n/t	n/t	n/t	< 2
Total Cyanide	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	n/t	n/t	n/t	n/t	n/t	0.07
Water Soluble Boron	N	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	0.7
Miscellaneous									
pH	M	pH units	0.1	n/t	n/t	n/t	n/t	n/t	6.1
Total Organic Carbon	N	%	0.01	0.05	2.7	0.20	0.74	1.2	0.48
Phenols									
Total Phenols	N	mg/kg	6	n/t	n/t	n/t	n/t	n/t	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Acenaphthylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Acenaphthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Fluorene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Phenanthrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Chrysene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Benzo (b) fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Benzo (a) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Total PAH(16)	M	mg/kg	0.4	n/t	n/t	n/t	n/t	n/t	< 0.4
BTEX									
Benzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	< 10.0
Toluene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	< 10.0
Ethylbenzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	< 10.0
Xylenes	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	< 10.0

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136667	136668	136669	136670	136671	136672
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP303	TP304	TP304	TP305	TP305	TP306
			Sample Depth (m)	1.90	0.30	1.20	0.80	1.10	0.20
			Sampling Date	16/05/2018	16/05/2018	16/05/2018	16/05/2018	16/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136673	136674	136675	136676	136677	136678
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP306	TP306	TP307	TP307	TP307	TP308
			Sample Depth (m)	0.40	0.80	0.30	0.80	1.20	0.10
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	19.0	30.7	14.6	19.6	76.9	15.6
Barium	U	mg/kg	10	82.6	63.1	52.6	71.7	36.8	35.7
Beryllium	U	mg/kg	1	1.2	2.0	1.6	6.4	2.9	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5	0.6	0.5	2.4	1.4	< 0.5
Chromium	M	mg/kg	5	43.5	39.1	32.0	47.0	37.8	20.4
Copper	M	mg/kg	5	18.2	18.0	11.9	14.6	21.1	7.8
Lead	M	mg/kg	5	17.7	17.2	17.5	16.2	20.4	15.7
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	29.5	27.7	34.2	174	69.3	15.0
Selenium	M	mg/kg	1	< 1.0	1.4	1.1	4.1	1.8	< 1.0
Vanadium	M	mg/kg	5	59.9	80.9	50.9	59.3	188	42.2
Zinc	M	mg/kg	5	58.6	55.8	73.5	91.5	56.6	40.6
Anions									
Water Soluble Chloride	M	mg/kg	40	< 40	< 40	< 40	< 40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.03
Inorganics									
Elemental Sulphur	M	mg/kg	20	< 20	< 20	< 20	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.06	0.05	0.06	0.06	0.05	0.05
Water Soluble Boron	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Miscellaneous									
pH	M	pH units	0.1	6.8	7.0	6.5	7.6	7.4	6.9
Total Organic Carbon	N	%	0.01	0.14	0.11	0.31	0.21	0.05	0.43
Phenols									
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo (b) fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	0.1
Benzo (a) pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0

Results Summary

Report No.: 18-17643

			ELAB Reference	136673	136674	136675	136676	136677	136678
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP306	TP306	TP307	TP307	TP307	TP308
			Sample Depth (m)	0.40	0.80	0.30	0.80	1.20	0.10
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results Summary

Report No.: 18-17643

			ELAB Reference	136679	136680	136681	136682	136683	136684
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP308	TP308	TP309	TP309	TP309	TP310
			Sample Depth (m)	0.30	0.70	0.25	0.50	0.65	0.20
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	95.8	68.0	23.1	65.6	20.9	15.6
Barium	U	mg/kg	10	48.9	65.2	56.4	83.1	17.6	46.7
Beryllium	U	mg/kg	1	1.4	1.8	1.4	5.1	1.2	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	0.5	1.0	< 0.5	< 0.5
Chromium	M	mg/kg	5	43.5	59.2	29.6	62.4	11.9	21.1
Copper	M	mg/kg	5	17.2	22.1	13.3	18.3	< 5.0	10.0
Lead	M	mg/kg	5	23.5	26.2	27.1	22.2	6.3	24.2
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	22.0	80.3	45.2	190	35.3	24.4
Selenium	M	mg/kg	1	1.9	2.0	1.2	1.6	< 1.0	< 1.0
Vanadium	M	mg/kg	5	127	168	51.0	103	16.8	43.8
Zinc	M	mg/kg	5	58.6	71.0	80.7	143	27.6	60.5
Anions									
Water Soluble Chloride	M	mg/kg	40	< 40	< 40	< 40	< 40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02	< 0.02	0.02	0.11	0.06	0.03	0.03
Inorganics									
Elemental Sulphur	M	mg/kg	20	< 20	< 20	38	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.05	0.06	0.11	0.07	0.03	0.07
Water Soluble Boron	N	mg/kg	0.5	< 0.5	< 0.5	1.6	< 0.5	< 0.5	0.6
Miscellaneous									
pH	M	pH units	0.1	6.9	7.3	6.6	7.3	8.0	6.7
Total Organic Carbon	N	%	0.01	0.12	0.12	1.7	0.44	0.05	0.03
Phenols									
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo (b) fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo (a) pyrene	M	mg/kg	0.1	0.3	< 0.1	< 0.1	0.3	< 0.1	< 0.1
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4	0.4	< 0.4	< 0.4	0.4	< 0.4	< 0.4
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0

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Results Summary

Report No.: 18-17643

			ELAB Reference	136679	136680	136681	136682	136683	136684
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP308	TP308	TP309	TP309	TP309	TP310
			Sample Depth (m)	0.30	0.70	0.25	0.50	0.65	0.20
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results Summary

Report No.: 18-17643

			ELAB Reference	136685	136686	136687	136688	136689	136690
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP310	TP310	TP311	TP311	TP311	TP312
			Sample Depth (m)	0.50	1.50	0.20	0.40	0.80	0.20
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	22.7	^ 4.7	15.3	22.7	27.4	5.0
Barium	U	mg/kg	10	73.8	17.9	51.7	60.6	61.9	120
Beryllium	U	mg/kg	1	1.3	< 1.0	1.0	2.3	2.6	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5	^ 1.0	< 0.5	< 0.5	1.4	0.7
Chromium	M	mg/kg	5	44.2	^ 6.9	23.3	45.9	54.0	11.3
Copper	M	mg/kg	5	19.2	^ < 5.0	11.3	18.1	24.7	9.9
Lead	M	mg/kg	5	21.8	^ < 5.0	27.6	22.1	17.2	16.0
Mercury	M	mg/kg	0.5	< 0.5	^ < 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	32.0	^ 13.9	29.3	66.7	200	14.3
Selenium	M	mg/kg	1	1.0	^ < 1.0	< 1.0	1.1	2.1	< 1.0
Vanadium	M	mg/kg	5	80.9	^ 9.8	46.8	75.9	66.1	16.3
Zinc	M	mg/kg	5	68.7	^ 21.5	64.1	104	97.9	45.8
Anions									
Water Soluble Chloride	M	mg/kg	40	< 40	^ < 40	< 40	< 40	< 40	103
Water Soluble Sulphate	M	g/l	0.02	0.02	^ < 0.02	0.04	0.05	0.02	0.10
Inorganics									
Elemental Sulphur	M	mg/kg	20	< 20	^ < 20	< 20	22	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	^ < 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.08	0.09	0.08	0.07	0.07	0.07
Water Soluble Boron	N	mg/kg	0.5	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5
Miscellaneous									
pH	M	pH units	0.1	6.7	^ 8.6	7.0	7.2	7.3	8.2
Total Organic Carbon	N	%	0.01	0.15	0.03	0.75	0.27	0.22	0.56
Phenols									
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	0.4
Anthracene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	0.2
Fluoranthene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	1.4
Pyrene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	1.4
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	1.3
Chrysene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	1.3
Benzo (b) fluoranthene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	1.7
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	^ < 0.1	0.2	< 0.1	< 0.1	2.1
Benzo (a) pyrene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	0.2	< 0.1	1.8
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	1.4
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	0.3
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	2.1
Total PAH(16)	M	mg/kg	0.4	< 0.4	^ < 0.4	< 0.4	< 0.4	< 0.4	15.5
BTEX									
Benzene	M	ug/kg	10	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0

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Results Summary

Report No.: 18-17643

			ELAB Reference	136685	136686	136687	136688	136689	136690
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP310	TP310	TP311	TP311	TP311	TP312
			Sample Depth (m)	0.50	1.50	0.20	0.40	0.80	0.20
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	3.1
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	135
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	9.3
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	4.2
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	136
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	17.1
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	304

Results Summary

Report No.: 18-17643

				ELAB Reference	136691	136692	136693	136694	136695	136696
				Customer Reference						
				Sample ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Location	TP312	TP312	TP313	TP313	TP313	TP314
				Sample Depth (m)	0.90	1.45	0.25	0.50	1.55	0.30
				Sampling Date	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**							
Metals										
Arsenic	M	mg/kg	1		11.2	20.3	^ 5.1	17.1	34.2	11.5
Barium	U	mg/kg	10		66.4	54.9	28.0	19.2	38.9	40.8
Beryllium	U	mg/kg	1		< 1.0	2.9	< 1.0	< 1.0	1.5	< 1.0
Cadmium	M	mg/kg	0.5		0.6	0.7	^ 0.6	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5		21.4	39.6	^ 10.2	14.5	20.4	34.0
Copper	M	mg/kg	5		18.5	23.8	^ 8.8	7.9	15.2	13.5
Lead	M	mg/kg	5		61.9	25.3	^ 12.3	14.1	20.5	17.3
Mercury	M	mg/kg	0.5		< 0.5	< 0.5	^ < 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5		29.3	93.1	^ 10.7	15.1	26.9	13.7
Selenium	M	mg/kg	1		1.1	1.8	^ < 1.0	< 1.0	< 1.0	< 1.0
Vanadium	M	mg/kg	5		39.2	64.6	^ 17.0	35.1	43.5	54.1
Zinc	M	mg/kg	5		129	136	^ 32.0	28.5	37.6	31.2
Anions										
Water Soluble Chloride	M	mg/kg	40		124	131	^ < 40	< 40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02		0.05	0.04	^ < 0.02	< 0.02	< 0.02	< 0.02
Inorganics										
Elemental Sulphur	M	mg/kg	20		< 20	< 20	^ < 20	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8		< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2		< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1		1.1	< 1.0	^ 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02		0.09	0.09	0.06	0.03	0.06	0.06
Water Soluble Boron	N	mg/kg	0.5		2.8	0.5	< 0.5	< 0.5	< 0.5	0.8
Miscellaneous										
pH	M	pH units	0.1		8.3	7.8	^ 8.3	8.1	8.1	7.7
Total Organic Carbon	N	%	0.01		2.6	0.42	0.28	0.12	0.08	0.24
Phenols										
Total Phenols	N	mg/kg	6		< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons										
Naphthalene	M	mg/kg	0.1		< 0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1		< 0.1	< 0.1	^ 0.2	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1		< 0.1	< 0.1	^ < 0.1	0.2	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1		< 0.1	< 0.1	^ < 0.1	0.2	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1		< 0.1	< 0.1	^ < 0.1	1.8	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1		< 0.1	< 0.1	^ 0.1	0.6	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1		0.1	< 0.1	^ 0.6	1.8	< 0.1	< 0.1
Pyrene	M	mg/kg	0.1		0.1	< 0.1	^ 0.6	1.5	< 0.1	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1		< 0.1	< 0.1	^ 0.9	0.8	< 0.1	< 0.1
Chrysene	M	mg/kg	0.1		< 0.1	< 0.1	^ 0.8	0.8	< 0.1	< 0.1
Benzo (b) fluoranthene	M	mg/kg	0.1		0.2	< 0.1	^ 1.1	0.5	< 0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1		0.3	0.3	^ 1.5	0.8	< 0.1	< 0.1
Benzo (a) pyrene	M	mg/kg	0.1		0.1	< 0.1	^ 1.2	0.7	< 0.1	0.2
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1		< 0.1	< 0.1	^ 1.2	0.4	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1		< 0.1	< 0.1	^ 0.3	0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1		< 0.1	0.1	^ 1.3	0.3	< 0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4		0.9	0.4	^ 9.9	10.5	< 0.4	< 0.4
BTEX										
Benzene	M	ug/kg	10		< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10		< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10		< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10		< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0

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Results Summary

Report No.: 18-17643

			ELAB Reference	136691	136692	136693	136694	136695	136696
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP312	TP312	TP313	TP313	TP313	TP314
			Sample Depth (m)	0.90	1.45	0.25	0.50	1.55	0.30
			Sampling Date	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	1.7	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	7.1	< 1.0	< 1.0	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	1.6	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	10.3	< 1.0	< 1.0	< 1.0

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136697	136698	136699	136700	136701	136702
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP314	TP314	TP315	TP315	TP315	TP316
			Sample Depth (m)	0.70	1.60	0.20	0.60	2.30	0.20
			Sampling Date	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	10.6	243	15.5	11.0	8.7	11.1
Barium	U	mg/kg	10	38.3	90.8	359	85.8	305	257
Beryllium	U	mg/kg	1	< 1.0	3.7	< 1.0	< 1.0	2.1	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5	3.5	0.7	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	19.3	37.4	15.5	30.8	59.1	23.7
Copper	M	mg/kg	5	7.8	24.4	30.2	13.3	25.7	23.2
Lead	M	mg/kg	5	14.8	28.5	220	64.6	27.2	146
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	11.9	271	16.1	15.0	25.3	15.5
Selenium	M	mg/kg	1	< 1.0	1.1	< 1.0	< 1.0	1.1	< 1.0
Vanadium	M	mg/kg	5	35.8	69.2	23.7	52.0	101	38.4
Zinc	M	mg/kg	5	36.9	139	91.1	58.2	62.5	107
Anions									
Water Soluble Chloride	M	mg/kg	40	< 40	< 40	< 40	< 40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02	< 0.02	0.05	0.03	0.06	< 0.02	0.05
Inorganics									
Elemental Sulphur	M	mg/kg	20	< 20	< 20	< 20	188	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.05	0.07	0.08	0.09	0.07	0.11
Water Soluble Boron	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	1.1	0.6	0.7
Miscellaneous									
pH	M	pH units	0.1	7.4	7.5	9.1	7.9	6.2	9.3
Total Organic Carbon	N	%	0.01	0.21	0.11	0.88	1.1	0.35	0.70
Phenols									
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	0.3	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1	1.9	< 0.1	< 0.1	0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	0.7	< 0.1	< 0.1	0.3
Fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	3.6	< 0.1	< 0.1	0.7
Pyrene	M	mg/kg	0.1	< 0.1	< 0.1	3.3	< 0.1	< 0.1	0.6
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	2.1	< 0.1	< 0.1	0.4
Chrysene	M	mg/kg	0.1	< 0.1	< 0.1	2.3	< 0.1	0.1	0.4
Benzo (b) fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	3.1	0.3	0.1	0.6
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	2.5	< 0.1	< 0.1	0.4
Benzo (a) pyrene	M	mg/kg	0.1	0.1	0.1	2.7	< 0.1	0.3	0.3
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	< 0.1	2.3	< 0.1	< 0.1	0.3
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	0.5	< 0.1	< 0.1	0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	< 0.1	3.0	0.1	< 0.1	0.4
Total PAH(16)	M	mg/kg	0.4	< 0.4	< 0.4	28.7	0.6	0.6	4.7
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136697	136698	136699	136700	136701	136702
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP314	TP314	TP315	TP315	TP315	TP316
			Sample Depth (m)	0.70	1.60	0.20	0.60	2.30	0.20
			Sampling Date	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	2.7	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	39.7	< 1.0	< 1.0	8.1
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	9.3	< 1.0	< 1.0	1.4
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	2.3	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	14.8	< 1.0	< 1.0	1.3
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	131	1.3	< 1.0	15.1
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	41.1	< 1.0	< 1.0	6.5
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	241	1.3	< 1.0	32.4

Results Summary

Report No.: 18-17643

			ELAB Reference	136703	136704	136705	136706	136707	136708
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP316	TP316	TP317	TP317	TP317	TP318
			Sample Depth (m)	0.90	1.90	0.15	0.65	1.40	0.15
			Sampling Date	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	10.1	4.8	16.3	11.4	5.7	9.7
Barium	U	mg/kg	10	75.6	76.8	180	36.7	28.2	169
Beryllium	U	mg/kg	1	< 1.0	1.7	1.4	6.9	1.4	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	0.6	5.2	< 0.5	0.7
Chromium	M	mg/kg	5	35.8	28.4	28.9	35.0	24.1	20.3
Copper	M	mg/kg	5	14.8	11.3	60.8	21.3	17.7	30.0
Lead	M	mg/kg	5	36.7	13.4	165	22.3	15.7	104
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	12.8	20.2	27.2	33.1	26.1	15.5
Selenium	M	mg/kg	1	< 1.0	< 1.0	1.4	1.1	< 1.0	< 1.0
Vanadium	M	mg/kg	5	64.1	47.5	49.0	49.9	39.1	34.5
Zinc	M	mg/kg	5	47.4	27.1	235	59.5	48.0	159
Anions									
Water Soluble Chloride	M	mg/kg	40	< 40	< 40	< 40	< 40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02	0.05	0.08	< 0.02	< 0.02	< 0.02	0.03
Inorganics									
Elemental Sulphur	M	mg/kg	20	< 20	< 20	< 20	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	1.2	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.08	0.07	0.08	0.05	0.06	0.07
Water Soluble Boron	N	mg/kg	0.5	0.8	0.7	1.3	0.7	< 0.5	0.7
Miscellaneous									
pH	M	pH units	0.1	8.1	5.5	7.6	7.9	7.4	8.5
Total Organic Carbon	N	%	0.01	0.60	0.06	2.9	0.32	0.08	1.9
Phenols									
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1
Chrysene	M	mg/kg	0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	0.2
Benzo (b) fluoranthene	M	mg/kg	0.1	0.1	0.1	0.1	< 0.1	< 0.1	0.4
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	0.3
Benzo (a) pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Total PAH(16)	M	mg/kg	0.4	< 0.4	< 0.4	0.7	< 0.4	< 0.4	2.1
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0

Results Summary

Report No.: 18-17643

			ELAB Reference	136703	136704	136705	136706	136707	136708
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP316	TP316	TP317	TP317	TP317	TP318
			Sample Depth (m)	0.90	1.90	0.15	0.65	1.40	0.15
			Sampling Date	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.7
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	3.7
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.6
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	7.0

Results Summary

Report No.: 18-17643

			ELAB Reference	136709	136710
			Customer Reference		
			Sample ID		
			Sample Type	SOIL	SOIL
			Sample Location	TP318	TP319
			Sample Depth (m)	0.70	1.80
			Sampling Date	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**		
Metals					
Arsenic	M	mg/kg	1	10.5	17.2
Barium	U	mg/kg	10	35.0	49.9
Beryllium	U	mg/kg	1	< 1.0	1.5
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	34.6	58.1
Copper	M	mg/kg	5	16.1	32.6
Lead	M	mg/kg	5	15.1	27.9
Mercury	M	mg/kg	0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	11.9	15.9
Selenium	M	mg/kg	1	< 1.0	1.2
Vanadium	M	mg/kg	5	55.4	106
Zinc	M	mg/kg	5	37.5	37.5
Anions					
Water Soluble Chloride	M	mg/kg	40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02	0.02	0.07
Inorganics					
Elemental Sulphur	M	mg/kg	20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.05	0.07
Water Soluble Boron	N	mg/kg	0.5	< 0.5	0.8
Miscellaneous					
pH	M	pH units	0.1	8.1	7.3
Total Organic Carbon	N	%	0.01	0.13	0.22
Phenols					
Total Phenols	N	mg/kg	6	< 6	< 6
Polyaromatic hydrocarbons					
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1
Pyrene	M	mg/kg	0.1	< 0.1	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	< 0.1
Chrysene	M	mg/kg	0.1	< 0.1	< 0.1
Benzo (b) fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1
Benzo (a) pyrene	M	mg/kg	0.1	< 0.1	< 0.1
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4	< 0.4	< 0.4
BTEX					
Benzene	M	ug/kg	10	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136709	136710
			Customer Reference		
			Sample ID		
			Sample Type	SOIL	SOIL
			Sample Location	TP318	TP319
			Sample Depth (m)	0.70	1.80
			Sampling Date	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**		
TPH CWG					
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0

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Results Summary

Report No.: 18-17643

Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #)
in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric	Gravimetric Analysis by ACM Type	Free Fibre	Total
136637	0.60 - 0.80	WS401	Brown clay, stones, clinker	No asbestos detected	n/t	n/t	n/t	n/t
136640	0.50	WS402	Brown clay, stones	No asbestos detected	n/t	n/t	n/t	n/t
136645	1.50 - 1.60	WS403	Brown sandy soil, stones, concrete, brick, clinker, organics	No asbestos detected	n/t	n/t	n/t	n/t
136650	0.40 - 0.60	WS405	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
136651	1.20	WS405	Brown sandy soil, stones, concrete, brick, wood	No asbestos detected	n/t	n/t	n/t	n/t
136653	1.60 - 1.90	WS406	Brown sandy soil, stones, concrete, brick, clinker, glass	No asbestos detected	n/t	n/t	n/t	n/t
136655	0.30 - 0.50	WS407	Brown sandy soil, stones, clinker	No asbestos detected	n/t	n/t	n/t	n/t
136657	3.00 - 4.00	WS407	Brown sandy soil, stones, concrete, brick, clinker, chalk, organics	Chrysotile (asbestos cement)	0.729	Asbestos cement (0.729%)	< 0.001	0.729
136658	0.25	TP301	Brown sandy soil, stones, concrete, brick, clinker, organics	No asbestos detected	n/t	n/t	n/t	n/t
136659	0.40	TP301	Brown sandy soil, stones, clinker, wood	No asbestos detected	n/t	n/t	n/t	n/t
136660	1.40	TP301	Brown sandy soil, stones, brick, clinker, organics	No asbestos detected	n/t	n/t	n/t	n/t
136661	0.20	TP302	Brown sandy soil, stones, chalk, clinker, organics	Chrysotile (asbestos cement)	0.147	Asbestos cement (0.147%)	< 0.001	0.147
136662	0.50	TP302	Brown sandy soil, stones, clinker, organics	No asbestos detected	n/t	n/t	n/t	n/t
136664	2.70	TP302	Brown sandy soil, stones, concrete, clinker	No asbestos detected	n/t	n/t	n/t	n/t
136666	0.70	TP303	Brown sandy soil, stones, concrete, clinker	No asbestos detected	n/t	n/t	n/t	n/t
136669	1.20	TP304	Brown sandy clay, stones, clinker	No asbestos detected	n/t	n/t	n/t	n/t
136670	0.80	TP305	Brown sandy clay, stones, clinker	No asbestos detected	n/t	n/t	n/t	n/t
136672	0.20	TP306	Brown sandy soil, stones, organics	No asbestos detected	n/t	n/t	n/t	n/t
136673	0.40	TP306	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
136674	0.80	TP306	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
136675	0.30	TP307	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136676	0.80	TP307	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136677	1.20	TP307	Brown sandy soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136678	0.10	TP308	Brown sandy soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136679	0.30	TP308	Brown sandy soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136680	0.70	TP308	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136681	0.25	TP309	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136682	0.50	TP309	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136683	0.65	TP309	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136684	0.20	TP310	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136685	0.50	TP310	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136686	1.50	TP310	Chalk	No asbestos detected	n/t	n/t	n/t	n/t
136687	0.20	TP311	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136688	0.40	TP311	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136689	0.80	TP311	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
136690	0.20	TP312	Brown chalky soil with stones and brick	No asbestos detected	n/t	n/t	n/t	n/t
136691	0.90	TP312	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136692	1.45	TP312	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136693	0.25	TP313	Brown chalky soil with stones and clinker	No asbestos detected	n/t	n/t	n/t	n/t
136694	0.50	TP313	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136695	1.55	TP313	Sand	No asbestos detected	n/t	n/t	n/t	n/t
136696	0.30	TP314	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
136697	0.70	TP314	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
136698	1.60	TP314	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
136699	0.20	TP315	Brown sandy soil,Stones,concrete,brick	Chrysotile (fibre bundle)	< 0.001	Fibre bundle (<0.001)	< 0.001	< 0.001
136700	0.60	TP315	Brown sandy soil	No asbestos detected	n/t	n/t	n/t	n/t
136701	2.30	TP315	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
136702	0.20	TP316	Brown sandy soil,Stones,brick,clinker	No asbestos detected	n/t	n/t	n/t	n/t
136703	0.90	TP316	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
136704	1.90	TP316	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
136705	0.15	TP317	Brown sandy soil,Stones,glass,clinker	No asbestos detected	n/t	n/t	n/t	n/t
136706	0.65	TP317	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
136707	1.40	TP317	Brown sandy soil,stones	No asbestos detected	n/t	n/t	n/t	n/t
136708	0.15	TP318	Brown sandy soil,Stones,brick	No asbestos detected	n/t	n/t	n/t	n/t
136709	0.70	TP318	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
136710	1.80	TP319	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 18-17643

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Sulphide	N	As submitted sample	23/05/2018	109	Colorimetry
Hexavalent chromium	N	As submitted sample	23/05/2018	110	Colorimetry
pH	M	Air dried sample	24/05/2018	113	Electromeric
Acid Soluble Sulphate	U	Air dried sample	24/05/2018	115	Ion Chromatography
Aqua regia extractable metals	M	Air dried sample	23/05/2018	118	ICPMS
Phenols in solids	N	As submitted sample	23/05/2018	121	HPLC
Elemental Sulphur	M	Air dried sample	23/05/2018	122	HPLC
PAH (GC-FID)	M	As submitted sample	23/05/2018	133	GC-FID
Water soluble anions	M	Air dried sample	23/05/2018	172	Ion Chromatography
Low range Aliphatic hydrocarbons soil	N	As submitted sample	24/05/2018	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	24/05/2018	181	GC-MS
BTEX in solids	M	As submitted sample	24/05/2018	181A	GC-MS
Water soluble boron	N	Air dried sample	23/05/2018	202	Colorimetry
Total cyanide	M	As submitted sample	23/05/2018	204	Colorimetry
Total organic carbon/Total sulphur	N	Air dried sample	24/05/2018	210	IR
Aliphatic hydrocarbons in soil	N	As submitted sample	23/05/2018	214	GC-FID
Aliphatic/Aromatic hydrocarbons in soil	N	As submitted sample	25/05/2018	214	GC-FID
Aromatic hydrocarbons in soil	N	As submitted sample	23/05/2018	214	GC-FID
Asbestos identification	U	Air dried sample	23/05/2018	260	Microscopy

Tests marked N are not UKAS accredited

Report Information

Report No.: 18-17643

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis (dried at < 30°C)
Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage

CLEA Software Version 1.071

Report generated 21/06/2018

Report title Woodcroft Farm, Lovedean

Created by FG at GESL

BASIC SETTINGS

Land Use Residential with produce (C4SL)

Building Small terraced house
Receptor Female (res C4SL) Start age class 1 End age class 6 Exposure Duration 6 years
Soil Sandy loam

Exposure Pathways

Direct soil and dust ingestion	✓	Dermal contact with indoor dust	✓	Inhalation of indoor dust	✓
Consumption of homegrown produce	✓	Dermal contact with soil	✓	Inhalation of soil dust	✓
Soil attached to homegrown produce	✓			Inhalation of indoor vapour	✓
				Inhalation of outdoor vapour	✓

Land Use Residential with produce (C4SL) **Receptor** Female (res C4SL)

Age Class	Exposure Frequencies (days yr^{-1})						Occupation Periods (hr day^{-1})		Soil to skin adherence factors (mg cm^{2})		Direct soil ingestion rate (g day^{-1})	Body weight (kg)	Body height (m)	Inhalation rate (m^{3} day^{-1})	Max exposed skin factor		Total skin area (m^{2})
	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with indoor dust	Dermal contact with soil	Inhalation of dust and vapour, indoor	Inhalation of dust and vapour, outdoor	Indoors	Outdoors	Indoor	Outdoor					Indoor (m^{2} m^{-2})	Outdoor (m^{2} m^{-2})	
1	180	180	180	170	365	365	23.0	1.0	0.06	0.10	0.10	5.60	0.7	5.4	0.32	0.26	3.43E-01
2	365	365	365	170	365	365	23.0	1.0	0.06	0.10	0.10	9.80	0.8	8.0	0.33	0.26	4.84E-01
3	365	365	365	170	365	365	23.0	1.0	0.06	0.10	0.10	12.70	0.9	8.9	0.32	0.25	5.82E-01
4	365	365	365	170	365	365	23.0	1.0	0.06	0.10	0.10	15.10	0.9	10.1	0.35	0.28	6.36E-01
5	365	365	365	170	365	365	19.0	1.0	0.06	0.10	0.10	16.90	1.0	10.1	0.35	0.28	7.04E-01
6	365	365	365	170	365	365	19.0	1.0	0.06	0.10	0.10	19.70	1.1	10.1	0.33	0.26	7.94E-01
7	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	22.10	1.2	12.0	0.22	0.15	8.73E-01
8	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	25.30	1.2	12.0	0.22	0.15	9.36E-01
9	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	27.50	1.3	12.0	0.22	0.15	1.01E+00
10	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	31.40	1.3	12.0	0.22	0.15	1.08E+00
11	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	35.70	1.4	12.0	0.22	0.14	1.19E+00
12	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	41.30	1.4	15.2	0.22	0.14	1.29E+00
13	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	47.20	1.5	15.2	0.22	0.14	1.42E+00
14	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	51.20	1.6	15.2	0.22	0.14	1.52E+00
15	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	56.70	1.6	15.2	0.21	0.14	1.60E+00
16	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	59.00	1.6	15.2	0.21	0.14	1.63E+00
17	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.00	1.6	15.7	0.33	0.27	1.78E+00
18	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.90	1.6	13.6	0.33	0.27	1.80E+00

Consumption Rates

Environment Agency

Consumption rates (g FW kg^{-1} bodyweight day^{-1}) by Produce Group

Age Class	MEAN RATES						90TH PERCENTILE RATES					
	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit
1	3.47E+00	5.22E+00	9.22E+00	8.90E-01	1.07E+00	1.87E+00	7.12E+00	1.07E+01	1.60E+01	1.83E+00	2.23E+00	3.82E+00
2	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
3	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
4	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
5	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
6	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
7	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
8	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
9	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
10	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
11	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
12	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
13	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
14	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
15	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
16	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
17	1.26E+00	6.00E-01	1.18E+00	6.90E-01	9.00E-02	1.27E+00	2.36E+00	1.12E+00	2.35E+00	1.29E+00	1.80E-01	2.38E+00
18	1.35E+00	6.40E-01	1.25E+00	7.40E-01	1.00E-01	1.36E+00	2.34E+00	1.12E+00	2.36E+00	1.28E+00	1.80E-01	2.37E+00

Top 2 applied? Yes

Where top 2 method is applied, two produce categories use 90th percentile rates, while the remainder use the mean. Produce categories vary on a chemical-by-chemical basis. Where top 2 method is not used, all produce categories for all chemicals assume 90th percentile rates.

Building Small terraced house

Soil Sandy loam

Building footprint (m^2)	2.80E+01
Living space air exchange rate (hr^{-1})	5.00E-01
Living space height (above ground, m)	4.80E+00
Living space height (below ground, m)	0.00E+00
Pressure difference (soil to enclosed space, Pa)	3.10E+00
Foundation thickness (m)	1.50E-01
Floor crack area (cm^2)	4.23E+02
Dust loading factor ($\mu g\ m^{-3}$)	5.00E+01

Porosity, Total ($cm^3\ cm^{-3}$)	5.30E-01
Porosity, Air-Filled ($cm^3\ cm^{-3}$)	2.00E-01
Porosity, Water-Filled ($cm^3\ cm^{-3}$)	3.30E-01
Residual soil water content ($cm^3\ cm^{-3}$)	1.20E-01
Saturated hydraulic conductivity ($cm\ s^{-1}$)	3.56E-03
van Genuchten shape parameter *m* (dimensionless)	3.20E-01
Bulk density ($g\ cm^{-3}$)	1.21E+00
Threshold value of wind speed at 10m ($m\ s^{-1}$)	7.20E+00
Empirical function (F_x) for dust model (dimensionless)	1.22E+00
Ambient soil temperature (K)	2.83E+02
Soil pH	7.40E+00
Soil Organic Matter content (%)	8.60E-01
Fraction of organic carbon ($g\ g^{-1}$)	4.99E-03
Effective total fluid saturation (unitless)	5.12E-01
Intrinsic soil permeability (cm^2)	4.75E-08
Relative soil air permeability (unitless)	6.42E-01
Effective air permeability (cm^2)	3.05E-08

Soil - Vapour Model

Depth to top of source (no building) (cm)	0
Depth to top of source (beneath building) (cm)	65
Default soil gas ingress rate?	Yes
Soil gas ingress rate ($cm^3\ s^{-1}$)	2.50E+01
Building ventilation rate ($cm^3\ s^{-1}$)	1.87E+04
Averaging time surface emissions (yr)	6
Finite vapour source model?	No
Thickness of contaminated layer (cm)	200

Air Dispersion Model

Mean annual windspeed at 10m ($m\ s^{-1}$)		5.00
Air dispersion factor at height of 0.8m *		2400.00
Air dispersion factor at height of 1.6m *		0.00
Fraction of site cover ($m^2\ m^{-2}$)		0.75

* Air dispersion factor in $g\ m^{-2}\ s^{-1}$ per $kg\ m^{-3}$

Soil - Plant Model

	Dry weight conversion factor	Homegrown fraction		Soil loading factor	Preparation correction factor
		Average	High		
	g DW g^{-1} FW	dimensionless		g g^{-1} DW	dimensionless
Green vegetables	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	0.103	0.06	0.40	1.00E-03	1.00E+00
Tuber vegetables	0.210	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	0.058	0.06	0.40	1.00E-03	6.00E-01
Shrub fruit	0.166	0.09	0.60	1.00E-03	6.00E-01
Tree fruit	0.157	0.04	0.27	1.00E-03	6.00E-01

Gardener type Average

CLEA Software Version 1.071

Report generated	21-Jun-18
Report title	Woodcroft Farm, Lovedean
Created by	FG at GESL

RESULTS

Environment Agency

		Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?		Top Two applied?	Apply Top 2 Approach to Produce Group					
		oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal		Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
1	Arsenic	3.80E+01	1.21E+02	NR	1.00	0.31	NR	NR	No	No	Yes	No	No	No	No	No	No
2	Beryllium	1.29E+02	1.72E+00	NR	0.01	1.00	NR	NR	Yes	Yes	Yes	No	No	No	No	No	No
3	Benzo(a)pyrene	3.93E+00	1.57E+01	NR	1.00	0.25	NR	7.83E-01 (vap)	No	No	Yes	No	No	No	No	No	No
4	Dibenz(ah)anthracene	3.93E-01	1.40E+00	NR	1.00	0.28	NR	3.38E-03 (vap)	No	No	Yes	No	No	No	No	No	No
5	Nickel	1.49E+02	1.81E+02	NR	1.00	0.70	NR	NR	Yes	Yes	Yes	No	No	No	No	No	No
6	Lead (C4SL adult)	9.04E+01	NR	NR	1.00	NR	NR	NR	No	No	Yes	Yes	No	Yes	No	No	No
7	Benzo(b)fluoranthene	4.94E+00	1.89E+01	NR	1.00	0.26	NR	1.05E+00 (sol)	No	No	Yes	No	No	No	No	No	No
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Environment Agency

	Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?		Top Two applied?	Apply Top 2 Approach to Produce Group					
	oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal		Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
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Environment Agency

		Soil Distribution				Media Concentrations													
		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
		%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
1	Arsenic	99.9	0.1	0.0	100.0	3.80E+01	NR	1.90E+01	1.62E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.64E-02	1.52E-02	8.75E-03	1.26E-02	7.61E-03	4.18E-02
2	Beryllium	100.0	0.0	0.0	100.0	1.72E+00	NR	8.62E-01	7.34E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.21E-02	2.07E-03	2.07E-03	2.07E-03	2.07E-03	2.07E-03
3	Benzo(a)pyrene	100.0	0.0	0.0	100.0	3.93E+00	1.08E-05	1.96E+00	1.67E-09	0.00E+00	1.42E-08	3.33E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4	Dibenz(ah)anthracene	100.0	0.0	0.0	100.0	3.93E-01	2.28E-06	1.96E-01	1.67E-10	0.00E+00	2.83E-09	2.68E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5	Nickel	99.9	0.1	0.0	100.0	1.49E+02	NR	7.45E+01	6.34E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.66E-01	6.41E-01	2.83E-01	3.73E-01	3.73E-01	5.07E-01
6	Lead (C4SL adult)	100.0	0.0	0.0	100.0	9.04E+01	NR	4.52E+01	3.85E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.79E-01	3.63E-01	6.61E-01	6.77E-02	1.85E-02	2.07E-02
7	Benzo(b)fluoranthene	99.9	0.1	0.0	100.0	4.94E+00	1.94E-05	2.47E+00	2.10E-09	0.00E+00	2.53E-08	4.62E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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Environment Agency

	Soil Distribution				Media Concentrations													
	Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
	%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
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Environment Agency

		Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
		Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
1	Arsenic	2.82E-04	1.42E-05	3.77E-06	6.29E-07	0.00E+00	0.00E+00	0.00E+00	94.03	4.72	1.26	0.00	0.00	0.00	0.00	0.00
2	Beryllium	1.28E-05	2.67E-06	0.00E+00	2.85E-08	0.00E+00	8.44E-04	9.09E-08	0.00	0.00	0.00	50.00	0.00	0.00	0.00	50.00
3	Benzo(a)pyrene	2.91E-05	1.84E-07	1.69E-06	6.49E-08	1.02E-08	6.19E-06	3.64E-07	93.96	0.59	5.45	0.00	0.00	0.00	0.00	0.00
4	Dibenz(ah)anthracene	2.91E-06	1.84E-08	1.69E-07	6.49E-09	1.92E-09	2.25E-06	2.00E-06	93.96	0.59	5.45	0.00	0.00	0.00	0.00	0.00
5	Nickel	1.11E-03	2.90E-04	2.46E-06	2.46E-06	0.00E+00	7.54E-03	1.57E-05	39.46	10.36	0.09	0.09	0.00	0.00	49.90	0.10
6	Lead (C4SL adult)	4.02E-04	2.27E-04	0.00E+00	9.56E-07	0.00E+00	0.00E+00	0.00E+00	63.85	35.99	0.00	0.15	0.00	0.00	0.00	0.00
7	Benzo(b)fluoranthene	3.66E-05	2.31E-07	2.12E-06	8.17E-08	1.78E-08	6.19E-06	7.88E-07	93.96	0.59	5.45	0.00	0.00	0.00	0.00	0.00
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Environment Agency

	Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
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Environment Agency

		Oral Health Criteria Value (µg kg^{-1} BW day^{-1})		Inhalation Health Criteria Value (µg kg^{-1} BW day^{-1})		Oral Mean Daily Intake (µg day^{-1})	Inhalation Mean Daily Intake (µg day^{-1})	Air-water partition coefficient (K_{aw}) (cm^3 cm^{-3})	Coefficient of Diffusion in Air (m^2 s^{-1})	Coefficient of Diffusion in Water (m^2 s^{-1})	log K_{oc} (cm^3 g^{-1})	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor (g g^{-1} DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
1	Arsenic	ID	0.3	ID	0.002	NR	NR	NR	NR	NR	NR	NR	0.03	0.5	1	1	1
2	Beryllium	TDI	2	TDI	0.000057	15	0.0015	NR	NR	NR	NR	NR	0	0.5	1	1	1
3	Benzo(a)pyrene	ID	0.031	ID	0.0003	0.11	0.006	1.76E-06	4.38E-06	3.67E-10	5.11	6.18	0.13	0.5	1	1	1
4	Dibenz(ah)anthracene	ID	0.0031	ID	0.00003	0.04	0.033	5.40E-06	4.08E-06	3.40E-10	5.27	6.38	0.13	0.5	1	1	1
5	Nickel	TDI	2.8	TDI	0.006	134	0.259	NR	NR	NR	NR	NR	0.005	0.5	1	1	1
6	Lead (C4SL adult)	ID	0.63	NR	0	NR	NR	NR	NR	NR	NR	NR	0	0.5	1	0.6	0.64
7	Benzo(b)fluoranthene	ID	0.039	ID	0.00038	0.11	0.013	2.05E-06	4.36E-06	3.62E-10	5.02	6.08	0.13	0.5	1	1	1
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	Oral Health Criteria Value (µg kg^{-1} BW day^{-1})		Inhalation Health Criteria Value (µg kg^{-1} BW day^{-1})		Oral Mean Daily Intake (µg day^{-1})	Inhalation Mean Daily Intake (µg day^{-1})	Air-water partition coefficient (K_{aw}) (cm^3 cm^{-3})	Coefficient of Diffusion in Air (m^2 s^{-1})	Coefficient of Diffusion in Water (m^2 s^{-1})	log K_{oc} (cm^3 g^{-1})	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor (g g^{-1} DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
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		Soil-to-water partition coefficient ($cm^3\ g^{-1}$)	Vapour pressure (Pa)	Water solubility ($mg\ L^{-1}$)	Soil-to-plant concentration factor for green vegetables ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for root vegetables ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for tuber vegetables ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for herbaceous fruit ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for shrub fruit ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for tree fruit ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)
1	Arsenic	5.00E+02	NR	1.25E+06	0.00043 fw	0.0004 fw	0.00023 fw	0.00033 fw	0.0002 fw	0.0011 fw
2	Beryllium	1.70E+03	NR	1.66E+06	0.007 fw	0.0012 fw	0.0012 fw	0.0012 fw	0.0012 fw	0.0012 fw
3	Benzo(a)pyrene	6.43E+02	2.00E-08	3.80E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4	Dibenz(ah)anthracene	9.29E+02	1.66E-10	6.00E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5	Nickel	5.00E+02	NR	2.50E+06	0.0038 fw	0.0043 fw	0.0019 fw	0.0025 fw	0.0025 fw	0.0034 fw
6	Lead (C4SL adult)	1.00E+03	NR	2.96E+05	0.00419 fw	0.00402 fw	0.00731 fw	0.00074 fw	0.00020 fw	0.00022 fw
7	Benzo(b)fluoranthene	5.22E+02	6.34E-08	2.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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Environment Agency

	Soil-to-water partition coefficient (cm^3 g^{-1})	Vapour pressure (Pa)	Water solubility (mg L^{-1})	Soil-to-plant concentration factor for green vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for root vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for herbaceous fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for shrub fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tree fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)
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Client/client ref: Grainger PLC
Project ref: GE16943
Site ref: Woodcroft Farm, Woodcroft Lane, Lovedean, PO8 9QA - Chalk Pit and Landfill
Data description:
Contaminant(s): Metals
Test scenario: Planning
Date: 22 June 2018
User details: EC

	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)	Hexavalent Chromium (mg/kg)	Total Cyanide (mg/kg)
Critical concentration, C_c	**33.03**	**1330**	**1.72**	**11**	**910**	**2400**	**200**	**40**	**180**	**250**	**410**	**3700**	**4.3**	**2**
Notes														
Full dataset size	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Outliers present?	No	No	Yes	Yes	No	No	No	No	No	No	No	No	No	No
Number of outliers temporarily excluded			0											
Number removed by filter	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sample size, n	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
Sample mean, $\bar{x}$	18.4666667	73.3666667	1.16666667	0.33333333	39.3333333	24.1666667	47.6333333	0.25	18.4	0.5	67.9333333	68	0.4	0.5
Standard deviation, s	12.472904	12.4226943	1.15470054	0.14433757	22.5435874	11.8094595	20.474944	0	1.47986486	0	45.3005887	35.5835636	6.7987E-17	0
Number of non-detects	0	0	**2**	**2**	0	0	0	**3**	0	**3**	0	0	**3**	**3**
Set non-detect values to:	Detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Distribution	Normal	Normal	Non-normal	Non-normal	Normal	Normal	Normal	Single value	Normal	Single value	Normal	Normal	Non-normal	Single value
Statistical approach	Auto: One-sample t-	Auto: One-sample t-	Auto: Chebychev	Auto: Chebychev	Auto: One-sample t-	Auto: One-sample t-	Auto: One-sample t-	Auto: Chebychev	Auto: One-sample t-	Auto: Chebychev	Auto: One-sample t-	Auto: One-sample t-	Auto: Chebychev	Auto: Chebychev

Test scenario:	Planning: is true mean lower than critical concentration (μ < Cc)?				**Evidence level required:**		**95%**	Use Normal distribution to test for outliers						
t statistic, t_0 (or k_0)	-2.022338449	-175.2077874	-0.83	-128	-66.89436227	-348.4549017	-12.88925662	N/A	-189.1384939	N/A	-13.07878912	-176.789728	-9.93572E+16	N/A
Upper confidence limit (on true mean concentration, μ)	39.4941675	94.3095212	4.0725993	0.69657491	77.3385407	44.0756966	82.1511091	0.25	20.8948368	0.5	144.303533	127.988709	0.4	0.5
Evidence level	**91%**	**100%**	**41%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Base decision on:	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level
Result	**μ ≈≥ Cc**	**μ < Cc**	**μ ≥ Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**
Select dataset	○	○	●	○	○	○	○	○	○	○	○	○	○	○

Back to data | **Go to outlier test** | **Go to normality test** | **Show individual summary**

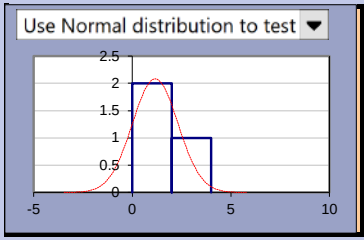
Test Results

Beryllium (mg/kg)

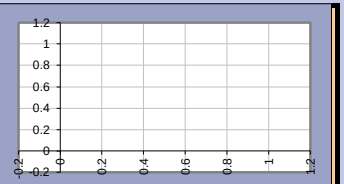
Client/client ref: Grainger PLC Site ref: Woodcroft Farm, Woodcroft Lane, Lovede Date: 22-Jun-2018

Project ref: GE16943 Data description: User details: FG

Dataset: Beryllium (mg/kg)	
Sample mean (mg/kg), $\overline{x}$	1.1667
Sample standard deviation, s	1.1547
Sample size, n	3
Critical concentration, Cc (mg/kg)	1.72



Outliers & non-detects	
Outliers present?	Yes
Significance level	5%
Outliers excluded	0
Non-detects	2

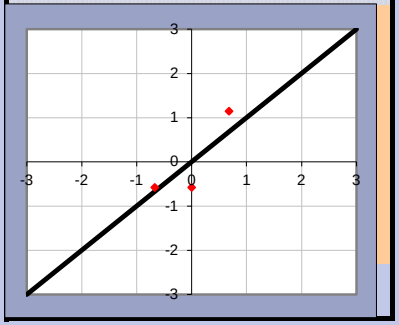


Normality test

Significance le: 5%

Non-normal distribution

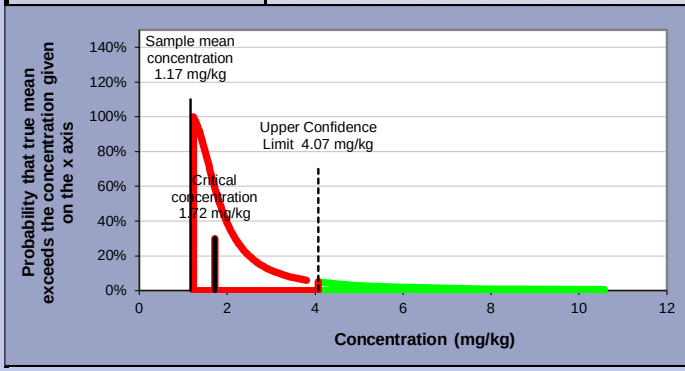
Use: Auto: Chebychev



Test scenario:

Planning: is true mean lower than critical concentration (μ < Cc)?

Null hypothesis:	The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc
Alternative hypothesis:	The true mean concentration is less than the critical concentration: μ < Cc

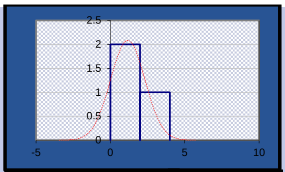


Evidence against Null hypothesis:	**41%**
Base decision on:	evidence level
Evidence level required:	**95%**
Balance of probability?	N/A
Reject Null Hypothesis?	No

μ ≥ Cc

Back to data | Back to summary | Go to outlier test | Go to normality test

Sample ID	Include?	Beryllium		Outliers
TP213	Y	0.5		
TP214	Y	0.5		
TP217	Y	2.5	Outlier	
	Y			
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Sample mean, $\bar{x}$

1.167

Standard deviation, s

1.155

Sample size, n

3

Maxiumum

2.500

Outlier Test Applicability

Not Applicable (n<3)

Level of Significance, α

5%

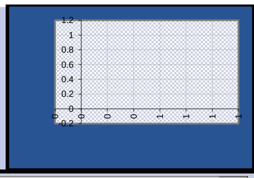
Tn = 1.155

Tcrit = 1.153

Outliers?

Yes

(None selected)



Dataset Beryllium (mg/kg)

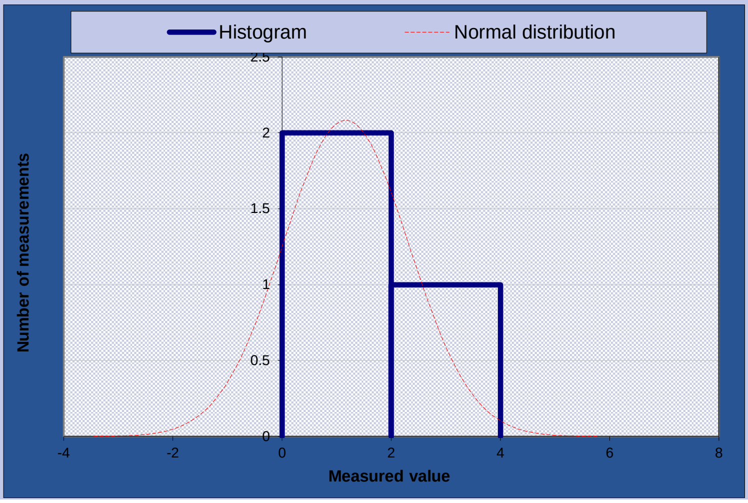
Use Normal distribution to test for outliers

Exclude identified outliers

Show individual summary

Back to summary

Back to data



Client/client ref: Grainger PLC
Project ref: GE16943
Site ref: Woodcroft Farm, Woodcroft Lane, Lovedean, PO8 9QA - Chalk Pit
Data description:
Contaminant(s): PAH
Test scenario: Planning
Date: 25th June 2018
User details: FC

	Naphthalene (mg/kg)	Acenaphthylene (mg/kg)	Acenaphthene (mg/kg)	Fluorene (mg/kg)	Phenanthrene (mg/kg)	Anthracene (mg/kg)	Fluoranthene (mg/kg)	Pyrene (mg/kg)	Benzo(a)anthracene (mg/kg)	Chrysene (mg/kg)	Benzo (b) fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Benzo (a) pyrene (mg/kg)	Indeno (1,2,3-cd) pyrene (mg/kg)
Critical concentration, C_c	**2.3**	**170**	**210**	**170**	**95**	**2400**	**280**	**620**	**7.2**	**15**	**2.6**	**77**	**3.93**	**27**
Notes														
Full dataset size	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Outliers present?	No	No	No	No	No	Yes	No	No	No	No	Yes	Yes	No	No
Number of outliers temporarily excluded														
Number removed by filter	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sample size, n	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
Sample mean, $\bar{x}$	0.05	0.05	0.05	0.05	0.21666667	0.06666667	0.65	0.65	0.38333333	0.41666667	0.4	0.36666667	0.48333333	0.38333333
Standard deviation, s	8.4984E-18	8.4984E-18	8.4984E-18	8.4984E-18	0.17559423	0.02886751	0.6264982	0.6264982	0.38188131	0.37527767	0.60621778	0.54848276	0.48045118	0.45368859
Number of non-detects	**3**	**3**	**3**	**3**	**1**	**2**	**1**	**1**	**1**	**1**	**2**	**2**	**1**	**1**
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Distribution	Non-normal	Non-normal	Non-normal	Non-normal	Normal	Non-normal	Normal	Normal	Normal	Normal	Non-normal	Non-normal	Normal	Normal
Statistical approach	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: One-sample t-	Auto: Chebychev	Auto: One-sample t-	Auto: One-sample t-	Auto: One-sample t-	Auto: One-sample t-	Auto: Chebychev	Auto: Chebychev	Auto: One-sample t-	Auto: One-sample t-
Test scenario:	Planning: is true mean lower than critical concentration (μ < Cc)?				**Evidence level required:**		**95%**	Use Normal distribution to test for outliers						
t statistic, t_0 (or k_0)	-4.58572E+17	-3.46375E+19	-4.27898E+19	-3.46375E+19	-934.9370408	-143996	-772.3061132	-1712.288495	-30.91749389	-67.30769231	-6.285714286	-242	-12.42540776	-101.6146766
Upper confidence limit (on true mean concentration, μ)	0.05	0.05	0.05	0.05	0.51269298	0.13931498	1.70618479	1.70618479	1.02712964	1.04933021	1.92561463	1.74698467	1.29330409	1.14818626
Evidence level	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**98%**	**100%**	**100%**	**100%**
Base decision on:	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level
Result	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**
Select dataset	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Back to data | **Go to outlier test** | **Go to normality test** | **Show individual summary**

Client/client ref: Grainger PLC
Project ref: GE16943
Site ref: Woodcroft Farm, Woodcroft Lane, Lovedean, PO8 9QA - Chalk Pit
Data description:
Contaminant(s): PAH
Test scenario: Planning
Date: 25th June 2018
User details: EC

	Dibenzo(a,h)anthracene (mg/kg)	Benzo[g,h,i]perylene (mg/kg)				
Critical concentration, C_c	**0.39**	**320**				
Notes						
Full dataset size	3	3	0	0	0	0
Outliers present?	No	No				
Number of outliers temporarily excluded	0					
Number removed by filter	0	0	0	0	0	0
Sample size, n	**3**	**3**	**0**	**0**	**0**	**0**
Sample mean, $\bar{x}$	0.25	0.41666667	No Data	No Data	No Data	No Data
Standard deviation, s	0.22912878	0.43684475				
Number of non-detects	**1**	**1**	0	0	0	0
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Distribution	Normal	Normal				
Statistical approach	Auto: One-sample t-	Auto: One-sample t-	Auto	Auto	Auto	Auto

Test scenario:						
t statistic, t_o (or k_0)	-1.058300524	-1267.119666				
Upper confidence limit (on true mean concentration, μ)	0.63627778	1.15312333				
Evidence level	**80%**	**100%**				
Base decision on:	evidence level	evidence level				
Result	**μ ≈≥ Cc**	**μ < Cc**				
Select dataset	●	○	○	○	○	○

Back to data

Test Results

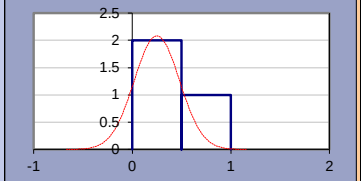
Dibenzo(a,h)anthracene (mg/kg)

Client/client ref: Grainger PLC | Site ref: Woodcroft Farm, Woodcroft Lane, Lovede | Date: 25th June 2018

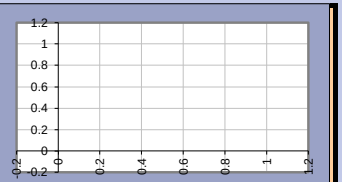
Project ref: GE16943 | Data description: | User details: FG

Dataset: Dibenzo(a,h)anthracene (mg/kg)	
Sample mean (mg/kg), $\bar{x}$	0.25
Sample standard deviation, s	0.2291
Sample size, n	3
Critical concentration, Cc (mg/kg)	0.39

Use Normal distribution to test



Outliers & non-detects	
Outliers present?	No
Significance level	5%
Outliers excluded	0
Non-detects	1

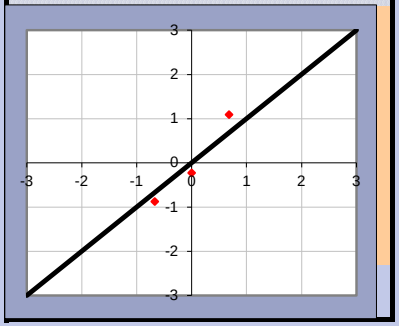


Normality test

Significance le: 5%

Normal distribution

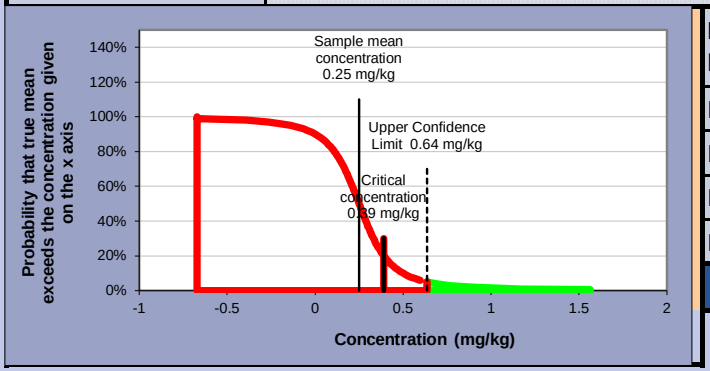
Use: Auto: One-sample



Test scenario:

Planning: is true mean lower than critical concentration (μ < Cc)?

Null hypothesis:	The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc
Alternative hypothesis:	The true mean concentration is less than the critical concentration: μ < Cc

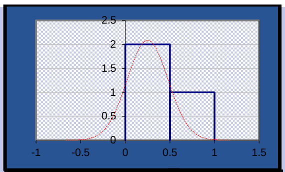


Evidence against Null hypothesis:	**80%**
Base decision on:	evidence level
Evidence level required:	**95%**
Balance of probability?	N/A
Reject Null Hypothesis?	No

Not enough evidence

Back to data | Back to summary | Go to outlier test | Go to normality test

Sample ID	Include?	Dibenzo(a,h)anthracene	Outliers
TP213	Y	0.5	
TP214	Y	0.2	
TP217	Y	0.05	
	Y		
	Y		
	Y		
	Y		
	Y		
	Y		
	Y		
	Y		
	N		
	Y		
	Y		
	Y		
	Y		
	N		
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	Y		
	Y		
	Y		
	Y		
	Y		
	Y		
	Y		



Sample mean, x̄

0.250

Standard deviation, s

0.229

Sample size, n

3

Maxiumum

0.500

Outlier Test Applicability

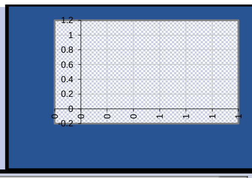
Not Applicable (n<3)

Level of Significance, α

5%

Tn = 1.091
Tcrit = 1.153

Outliers?
No
(None selected)



Dataset Dibenzo(a,h)anthracene (mg/kg)

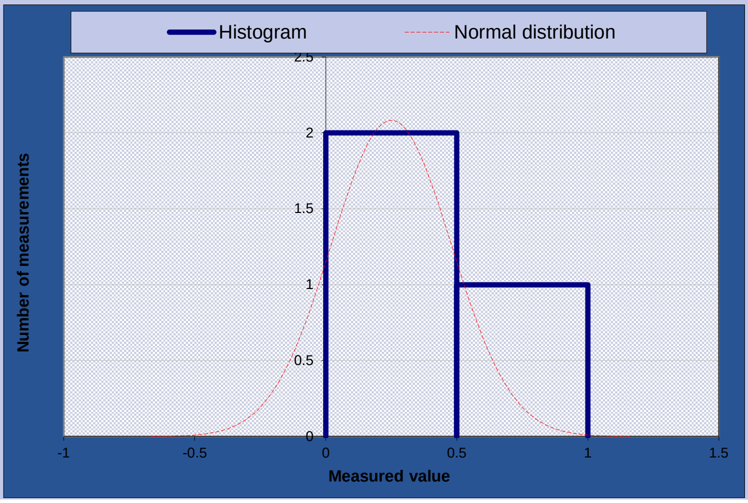
Use Normal distribution to test for outliers

Exclude identified outliers

Show individual summary

Back to summary

Back to data



Geo-Environmental

APPENDIX C

Imported Soils

Criteria



Geo-Environmental

IMPORTED SOIL SPECIFICATION

for the site at

WOODCROFT FARM, WOODCROFT LANE,

LOVEDEAN, HAMPSHIRE, PO8 9QA

on behalf of

GRAINGER PLC



Report:	**IMPORTED SOIL SPECIFICATION**
Site:	**WOODCROFT FARM, WOODCROFT LANE, LOVEDEAN, HAMPSHIRE, PO8 9QA**
Client:	**GRAINGER PLC**
Date:	**28-06-2018**
Reference:	**GE16943-ISS-180628**
Revision:	**1.0**
Prepared by:	
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Reviewed by:	
	GAVIN ROBERTS CGeol, BEng (Hons), MSc, FGS **TECHNICAL DIRECTOR**

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AMENDMENT RECORD

Revision ref.	Date	Reasons for amendment	Author's initials
1.0	28/06/2018	First issue	FG

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2.0	Chemical Composition	1
3.0	Nutritional Composition	5
4.0	Physical Composition	5
5.0	Source Requirements	6
6.0	Testing Rates and Compliance	6

1.0 Introduction

This document sets out the requirements for imported subsoil and Topsoil materials for any project undergoing redevelopment or other works where capping work is required.

Within the specification reference has been made to topsoil and subsoil. Topsoil relates to the top layer of natural soil that can support healthy vegetation growth. Subsoil relates to the layer of soil immediately below the topsoil to the depth of the underlying broken rock or geological parent material.

The specification considers the chemical, nutritional and physical properties of soils that are to be imported onto site in order to ensure materials used are suitable for their intended use and do not introduce any new hazard or pollutant linkage on to the site.

Where there is any discrepancy between this specification and BS3882:2015 or BS8601:2013, the latter documents shall take precedence unless otherwise formally confirmed by the relevant regulator.

2.0 Chemical Composition

The chemical criteria listed below are based on the published Category 4 Screening Levels (C4SLs) by DEFRA and/or the relevant Suitable for Use Levels (S4ULs) published by LQM, for a residential end use with plant uptake. From time to time these values may change in line with regulatory or UK policy changes. Such changes will require revision and re-issue of this document.

Where C4SLs or S4ULs are published for a range of Soil Organic Matter (SOM) values, these ranges and their respective SOM values have been presented and would be considered when assessing compliance with this Specification.

2.1 Method of Analysis

Samples should be analysed using UKAS or MCERTS accredited laboratories. For TPH analysis sample preparation must not include air drying.

2.1.1 Poly Aromatic Hydrocarbon (PAH)

The PAH analysis must include the EPA priority 16.

2.1.2 Total Petroleum Hydrocarbons (TPH)

The analysis for TPH should be undertaken on the ‘as received’ sample and not be subject to any pre-treatment and shall include aliphatic and aromatic carbon banding split.

2.2 Topsoil (0-300mm depth)

Tables 1, 1a, 1b and 1c provide a list of the maximum acceptable concentrations for a range of determinants for imported topsoil.

Determinant	Maximum concentration (mg/kg)
Inorganic	**SOM 6%**
Arsenic (total)	37
Boron (water soluble)	290
Cadmium (total)	11
Chromium (total)	130
Copper (total)	2400
Cyanide (total)	250
Lead (total)	200
Mercury (total inorganic)	40
Nickel (total)	180
pH	5.5 – 7.8
Selenium (total)	250
Sulphate (total)	2000
Zinc (total)	3700
Asbestos	Absent
Organic	
Phenols (total)	110
Poly Aromatic Hydrocarbon (speciated)	See Table 1a
Total Petroleum Hydrocarbon (speciated)	See Table 1b

Table 1 Chemical Specification for Topsoil

Determinant	Maximum Concentration (mg/kg)		
	1% SOM	2.5% SOM	6% SOM
Acenaphthene	210	510	1100
Acenaphthylene	170	420	920
Anthracene	2400	5400	11000
Benz(a)anthracene	7.2	11	13
Benzo(a)pyrene	2.2	2.7	3.0
Benzo(b)fluoranthene	2.6	3.3	3.7
Benzo(ghi)perylene	320	340	350
Benzo(k)fluoranthene	77	93	100
Chrysene	15	22	27
Dibenz(ah)anthracene	0.24	0.28	0.30
Fluoranthene	280	560	890
Fluorene	170	400	860
Indeno(1,2,3CD)pyrene	27	36	41
Naphthalene	2.3	5.6	13.0
Phenanthrene	95	220	440
Pyrene	620	1200	2000

Table 1a Topsoil Specification for Speciated PAH

Determinant	Maximum Concentration (mg/kg)		
	1% SOM	2.5% SOM	6% SOM
Aliphatic			
EC 5-6	42	78	160
EC >6-8	100	230	530
EC >8-10	27	65	150
EC >10-12	130	330	760

Determinant	Maximum Concentration (mg/kg)		
	1% SOM	2.5% SOM	6% SOM
EC >12-16	1100	2400	4300
EC >16-35	65000	92000	110000
EC >35-44	65000	92000	110000
Aromatic			
EC 5-7 (benzene)	70	140	300
EC >7-8 (toluene)	130	290	660
EC >8-10	34	83	190
EC >10-12	74	180	380
EC >12-16	140	330	660
EC >16-21	260	540	930
EC >21-35	1100	1500	1700
EC >35-44	1100	1500	1700
Aliphatic and Aromatic			
EC >44-70	1600	1800	1900

Table 1b Topsoil Specification for Speciated TPH

Determinant	Phytotoxicity GAC (mg/kg)		
	pH <6.0	pH 6.0-7.0	pH >7.0
Zinc	200	200	300
Copper	100	135	200
Nickel	60	75	110

Table 1c Topsoil Specification for phytotoxicity

2.3 Subsoil (300-1000mm depth)

Tables 2, 2a, 2b and 2c provide a list of the maximum acceptable concentrations for a range of determinants for imported subsoil.

Determinant	Maximum concentration (mg/kg)
Inorganic	SOM 6%
Arsenic (total)	37
Boron (water soluble)	290
Cadmium (total)	11
Chromium (total)	130
Copper (total)	2400
Cyanide (total)	250
Lead (total)	200
Mercury (total inorganic)	40
Nickel (total)	180
pH	5.5 – 7.8
Selenium (total)	250
Sulphate (total)	2000
Zinc (total)	3700
Asbestos	Absent
Organic	
Phenols (total)	110
Poly Aromatic Hydrocarbon (speciated)	See Table 2a

Determinant	Maximum concentration (mg/kg)
Inorganic	**SOM 6%**
Total Petroleum Hydrocarbon (speciated)	See Table 2b

Table 2 Chemical Specification for Subsoil

Determinant	Maximum Concentration (mg/kg)		
	1% SOM	2.5% SOM	6% SOM
Acenaphthene	210	510	1100
Acenaphthylene	170	420	920
Anthracene	2400	5400	11000
Benz(a)anthracene	7.2	11	13
Benzo(a)pyrene	2.2	2.7	3.0
Benzo(b)fluoranthene	2.6	3.3	3.7
Benzo(ghi)perylene	320	340	350
Benzo(k)fluoranthene	77	93	100
Chrysene	15	22	27
Dibenz(ah)anthracene	0.24	0.28	0.30
Fluoranthene	280	560	890
Fluorene	170	400	860
Indeno(1,2,3CD)pyrene	27	36	41
Naphthalene	2.3	5.6	13.0
Phenanthrene	95	220	440
Pyrene	620	1200	2000

Table 2a Subsoil Specification for Speciated PAH

Determinant	Maximum Concentration (mg/kg)		
	1% SOM	2.5% SOM	6% SOM
Aliphatic			
EC 5-6	42	78	160
EC >6-8	100	230	530
EC >8-10	27	65	150
EC >10-12	130	330	760
EC >12-16	1100	2400	4300
EC >16-35	65000	92000	110000
EC >35-44	65000	92000	110000
Aromatic			
EC 5-7 (benzene)	70	140	300
EC >7-8 (toluene)	130	290	660
EC >8-10	34	83	190
EC >10-12	74	180	380
EC >12-16	140	330	660
EC >16-21	260	540	930
EC >21-35	1100	1500	1700
EC >35-44	1100	1500	1700
Aliphatic and Aromatic			
EC >44-70	1600	1800	1900

Table 2b Subsoil Specification for Speciated TPH

Determinant	Phytotoxicity GAC (mg/kg)		
	pH <6.0	pH 6.0-7.0	pH >7.0
Zinc	200	200	300
Copper	100	135	200
Nickel	60	75	110

Table 2c Subsoil Specification for phytotoxicity

3.0 Nutritional Composition

The nutritional criteria listed below are based on BS3882:2015 for topsoil and BS8601:2013 for subsoil. In the absence of published criteria, current guidance and best practice has been applied to derive appropriate criteria.

3.1 Topsoil & Subsoil

Table 3 details the minimum acceptable concentrations for imported topsoil and subsoil. The nutrient concentrations set out in Table 3 for Topsoil are based on those set out in BS3882:2015 which states *"Multipurpose topsoil is the grade suited to most situations where topsoil is required; however, there can be situations where specific purpose topsoil is required"*. In the event that an alternative specific Topsoil grade is required, i.e. acidic; calcareous; low fertility; low fertility acidic; or low fertility calcareous, the compliance criteria set out in BS3882:2015 shall be applicable in place of those set out in Table 3 below.

Topsoil/Subsoil	Parameter	Concentration
Topsoil (multipurpose grade only)	Phosphorous	16 – 140 mg/l
	Potassium	121 – 1500 mg/l
	Magnesium	51 – 600 mg/l
	Nitrogen	0.15 % m/m
	Carbon:nitrogen ratio	<20:1
Subsoil	Phosphorous	16 mg/l
	Potassium	121 mg/l
	Magnesium	51 mg/l
	Nitrogen	0.15 %
	Carbon:nitrogen ratio	<20:1

Table 3 Nutritional Specification for Topsoil and Subsoil

4.0 Physical Composition

The physical criteria listed below are based on BS3882:2015 Specification for Topsoil. In the absence of published criteria, current guidance and best practice has been applied to derive appropriate criteria.

4.1 Topsoil

Table 4 details the physical suitability requirements for imported topsoil and subsoil. Table 4 sets out acceptability criteria from BS3882:2015 for multipurpose Topsoil. In the event that an alternative specific Topsoil grade is required, i.e. acidic; calcareous; low fertility; low fertility acidic; or low fertility calcareous, the compliance criteria set out in BS3882:2015 shall be applicable in place of those set out in Table 4 below.

Topsoil/Subsoil	Parameter	Specification requirements
Topsoil (multipurpose Topsoil only)	Textural Classification	Sandy clay loam, sandy loam, loamy sand, sandy silt loam (as defined in BS3882:2015, Figure 1)
	Loss on Ignition	3 - 20% (for 5-20% clay soil) 5 - 20% (for 20-35% clay soil)
	Maximum Stone content:	>2mm = 30% >20mm = 10% >50mm = 0%
Subsoil	Textural Classification	Refer to BS8601:2013 Figure 1
	Loss on Ignition	2%
	Maximum Stone content:	>2mm = 40% >20mm = 20% >75mm = 0%

NB: Topsoil and Subsoil must be free from glass, brick fragments, plastic, metal, asbestos and other deleterious materials.

Table 4 Physical Specification for Topsoil & Subsoil

5.0 Source Requirements

5.1 Topsoil and Subsoil

The following will be provided with all soils imported to site:

- A site plan detailing the location and address of the source site, including grid reference.
- Location description of source material, including historic and current site uses.
- Sample analysis results of material at source, including details of laboratory, date of sampling, date samples received by laboratory etc.

5.2 Manufactured soils

Where natural soils are unavailable manufactured soils may be utilised, and the following should be provided:

- Details of the soil manufacturing process, including criteria for received soils, quality control procedure and validation protocol.
- Soils should be tested at a minimum ratio of one sample per 50m^3.

6.0 Testing Rates and Compliance

Sampling shall be undertaken in accordance with BS3882:2015 and BS8601:2013.

6.1 Topsoil

Where natural sourcing is proposed, the provenance of the material shall be determined by analysis of the soils at a minimum rate of 3No. samples per source site (up to 250m^3) and 1 sample per 250m^3 thereafter. Imported soils should be sampled once it has been laid on the site to support the analysis provided by the source supplier.

Where Topsoil is derived from a manufactured source, testing would be undertaken at a rate of 1 sample per 50m^3, with a minimum of 3No. tests for any given potential source material (or production batch).

6.2 Subsoil

Where the source of the material is known validation sampling should be undertaken at a minimum rate of 3 samples per source (up to 250m³) and 1 sample per 250m³ thereafter. Imported soils should be sampled once it has been laid on the site to support the analysis provided by the source supplier.

Where subsoil is derived from a manufactured source, testing would be undertaken at a rate of 1 sample per 50m³, with a minimum of 3No. tests for any given potential source material (or production batch)

Where the source of the material is not known the validation sampling should be undertaken in-line with the testing rates as set out for cover systems to ensure the materials are suitable for their intended use. Further guidance on minimum testing under this scenario is presented in Section 6.3 below.

6.3 Cover Systems

Where a cover system/ capping layer is proposed as part of the required remedial measures, sampling frequency will follow the guidance set out by the NHBC in their guidance for clean cover systems (2010) and supplemented within NHBC Technical Extra Guidance Issue 8, November 2012, outlined below:

- Sites with more than 30 plots testing should be conducted at a rate of one plot in four, with a minimum of 10 tests across the site;
- Sites with between 20 – 30 plots testing should be conducted at a rate of one plot in three, with a minimum of 7 tests across the site;
- Sites with between 5 -20 plots testing should be conducted at a rate of one plot in two with a minimum of 5 tests across the site;
- Sites with fewer than 5 plots testing should be conducted in every plot with a minimum of 3 tests across the site.

6.4 Sample failure

In the event that a sample fails to meet the specified criteria for any parameter the Environmental Consultant should be contacted for advice on the suitability of the materials.

Further testing may be required to provide reassurance that the exceedances are not representative of the soil and to provide clarification whether the soil is suitable for importation and/or proposed use.

6.5 Timing

Sampling and analysis undertaken by a manufactured topsoil supplier shall be no earlier than two weeks from the date of import, any results which are older than two weeks will be deemed not to be representative of the soils to be imported and rejected. Results showing consistency of batching may be requested to demonstrate consistency of the physical, chemical and nutritional composition of the material.

Imported soil suppliers and groundwork contractors are required to take reasonably practicable measures to ensure that compliance with this Specification does not hinder formal completion of individual plots or developments.

6.6 General Compliance

All analytical suites shall correspond with the chemical, nutritional and physical compliance criteria (as set out in Tables 1 to 4). The soil supplier shall ensure that the analytical limits of detection are equal or lower than the compliance values presented within this Specification. Where either testing suites or limits of detection do not comply with this Specification, the entire set of results shall be rejected.

Geo-Environmental

REMEDIATION STRATEGY & VERIFICATION PLAN

for the land at

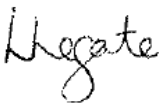
FARMYARD (FY), WOODCROFT FARM,

WOODCROFT LANE, LOVEDEAN, PO8 9QA

on behalf of

VISTRY HOMES SOUTHERN



Report:	**REMEDIATION STRATEGY & VERIFICATION PLAN**
Site:	**FARMYARD (FY), WOODCROFT FARM, WOODCROFT LANE, LOVEDEAN, PO8 9QA**
Client:	**VISTRY HOMES SOUTHERN**
Date:	**22/12/20**
Reference:	**GE16943-RSVP-FY-V6.0-DEC20**
Version:	**6.0**
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AMENDMENT RECORD

Revision ref.	Date	Reasons for amendment	Author	Reviewed By	Authorised by
1.0	28/06/2018	First issue	FG	GR	GR
2.0	26/10/2018	Accounts for findings of Detailed Quantitative Gas Risk Assessment	FG/GR	GR	GR
3.0	13/02/2020	Revision to reflect clarification of development levels	GR	GR	GR
4.0	27/03/2020	Revision to reflect proposed development levels	GR	GR	GR
5.0	24/08/2020	Revision to reflect proposed development levels	FG	LL	GE
6.0	22/12/2020	Revision to reflect amended proposed development levels	FG	LL	GR

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APPENDICES

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1.0 INTRODUCTION

1.1 General

Following a Phase I and Phase II assessment of the site undertaken by third parties, detailed within reports listed below, Geo-Environmental was appointed by Grainger PLC and subsequently Vistry Homes, to undertake supplementary investigation and to formulate a Remediation Strategy in relation to the proposed development at Woodcroft Farm, Woodcroft Lane, Lovedean, PO8 9QA herein referred to as 'the site' (Figures 1 and 2). Three distinct areas of the development site were identified as being impacted by contamination. Separate Remediation Strategies will be written for each of these distinct areas, therefore this Remediation Strategy is specific to the area of the development site known as the former farmyard area, as shown in Figure 2.

This Remediation Strategy & Verification Plan for the Farmyard (RSVP-FY v6.0), should be read in conjunction with the Remediation Strategy & Verification Plans for the former chalk pit (RSVP-CP v6.0) and horse arena (RSVP-HA v5.0) dated December 2020.

The site as a whole, has been the subject to Phase I Ground Condition Report, ref 21834, dated 2010 prepared by Peter Brett Associates (PBA), which included a desk study and preliminary risk assessment for the overall Woodcroft Farm site; a Factual Report, ref RML 4750, dated October 2011 prepared by Risk Management Limited, which included ground investigation and laboratory test results; and a Geoenvironmental and Geotechnical Ground Investigation Report, ref 21834-030-R02, dated July 2013 prepared by PBA, which presented an interpretative assessment of the overall Woodcroft Farm site.

In addition to the above reports, Geo-Environmental was commissioned in 2017 to undertake a review of these reports, and supplementary testing and assessment. This was reported within a Soil Contamination Assessment ref. GE16662-FG02-170929, dated 29th September 2017. An additional phase of investigation was also commissioned in 2018 to support development of the remedial strategy and the findings are incorporated herein. Subsequently, a Detailed Quantitative Gas Risk Assessment (DQGRA) was commissioned from The Environmental Protection Group Ltd (EPG), ref. EPG/8938/2018/DQGRA/V1 dated October 2018, in relation to the infilled former chalk pit located to the west of the farmyard area. The findings of the DQGRA have relevance to the farmyard area and thus are referred to in this RSVP.

The remedial strategy presented herein has been developed to reflect the findings from all phases of the assessments undertaken on this site, in respect to the farmyard area. Based on the findings of the investigations it is considered that remediation works would be required with respect to soil contamination identified within the Made Ground within the farmyard area on the site.

The revised strategy (V6.0) reflects clarification of development ground levels, as discussed with the Client and the Developer, and presented on Odyssey's engineering layout drawing ref 17-110/2210, prepared July 2020 and Ardent's development levels plans ref 192931-073, 192931-074 and 192931-075, prepared November 2020.

1.2 Objectives

The Remediation Strategy & Verification Plan (RSVP) sets out the proposed remedial works to be undertaken on the subject site to support its development for a proposed residential end use with private gardens and communal open spaces.

1.3 Planning Permission

It is understood that a planning application has been approved for the site by Havant Borough Council under Planning Reference APP/13/00804. The following pre-commencement planning conditions have been attached to the application which relate to the remediation and validation of land contamination on the site.

11. Prior to the commencement of construction within any specified phase or defined area the development approved by this Planning Permission (as may be agreed in writing by the Local Planning Authority), a scheme to deal with the risks associated with contamination of the site shall be submitted to and approved in writing by the Local Planning Authority. That scheme shall include all of the following elements unless specifically excluded in writing by the Local Planning Authority.

1. *A scheme of further investigation, based on the previously submitted GeoEnvironmental & Geotechnical report. The scope of the investigation shall be sufficient to:*
    - *confirm the preliminary assessment of the nature and extent of contamination at the site,*
    - *inform an appropriate assessment of the risks to all receptors that may be affected, including controlled waters, and;*
    - *enable the appropriate design of remediation and/or risk mitigation measures (if required).*
2. *The results of the further investigation and risk assessment (1) and if appropriate, a method statement based on these results giving full details of the remediation and/or risk mitigation measures required, and how they are to be undertaken.*
3. *A verification report or statement (as appropriate) upon completion of the works set out in (2) [if any], confirming that measures undertaken have been implemented in accordance with the method statement, and have achieved the required performance standards. The verification report / statement shall provide details of any measures necessary for maintenance, further monitoring and reporting.*

All elements shall be adhered to unless agreed in writing by the Local Planning Authority.

Reason: To prevent future occupants of proposed residential properties being exposed to unacceptable risks from identified contamination & soil gas associated with automotive repair and landfill activity previously undertaken at the site, and to ensure that the site does not pose an unacceptable risk to the groundwater Source Protection Zone 1; having due regard to policies and proposals E1 of the Hampshire County Structure plan 1996-2011 (Review), and DM10 of the Havant Borough Adopted Core Strategy (2011), and DM17 of the Draft Local Plan (Allocations) 2012.

12. Prior to the commencement of construction of any part of the development approved by this Planning Permission, a protocol for the identification & assessment of any unforeseen ground conditions shall be submitted to and approved in writing by the Local Planning Authority. The provisions of the approved protocol shall be observed throughout the undertaking of all relevant construction activities.

Reason: For the protection of workers and the general public during the development of potentially contaminated land, and to prevent future occupants of proposed residential properties being exposed to unacceptable risks from unidentified &/or unexpected contamination that may be associated with previous activities undertaken at the site; having due regard to policies and proposals E1 of the Hampshire County Structure plan 1996-2011 (Review), and DM10 of the Havant Borough Adopted Core Strategy (2011), and DM17 of the Draft Local Plan (Allocations) 2012.

13. If, during development, contamination not previously identified at the site is found to be present, then no further development (unless otherwise agreed in writing with the Local Planning Authority) shall be carried out

until the developer has submitted, and obtained written approval from the Local Planning Authority for an addendum to the Method Statement required under Condition 1, (2). This addendum shall detail how this unexpected contamination shall be dealt with, and the development shall not be carried out other than in accordance with the approved details.

Reason: For the protection of workers and the general public during the development of potentially contaminated land, and to prevent future occupants of proposed residential properties being exposed to unacceptable risks from unidentified &/or unexpected contamination that may be associated with previous activities undertaken at the site; having due regard to policies and proposals E1 of the Hampshire County Structure plan 1996-2011 (Review), and DM10 of the Havant Borough Adopted Core Strategy (2011), and DM17 of the Draft Local Plan (Allocations) 2012.

2.0 BACKGROUND

This Remediation Strategy & Verification Plan (RSVP) has been developed from the findings of the various phases of assessment.

A brief overview of salient findings of the reports is presented below. For further information, the individual reports should be referred to directly.

2.1 Overview

The wider site's previous uses included use as a farm with associated barns and buildings, scrapyard, horse arena and a former chalk pit which was infilled as an inert landfill. The portion of the site considered specifically herein comprised the former farmyard area, as shown in Figure 2.

The ground conditions encountered within the farmyard comprised Made Ground and/or in isolated locations a mantle of Topsoil, overlying sandy clay and clay with occasional bands of sand. Chalk was encountered within two locations, TP215 and TP312. Made Ground was encountered within the majority of investigation locations to depths between 0.25m bgl and 2.20m bgl, and comprised, gravelly clay with brick, concrete, flint cobbles, tarmac and chalk fragments, ash and charcoal; clayey fine to coarse flint and chalk gravel with brick, concrete, tarmac and pieces of tree; sandy clay with plastic, decaying roots, flint gravel and glass. Cement tile and cement sheet fragments were observed to be present sporadically across the farmyard area following demolition and clearance. It was considered that these surface fragments potentially comprised Asbestos Containing Material and could require a 'litter picking' exercise to be completed prior to commencing any remediation or ground works.

The Made Ground and/or Topsoil was underlain by soft to firm clay and sandy clay in the majority of locations with occasional bands of sand overlying the Chalk. The Chalk was only encountered within two locations, TP215 and TP312 within the farmyard area from a depth of between 1.70m bgl and 2.30m bgl.

Previous investigation and testing by third parties identified exceedances of metals and PAH along with the presence of asbestos within the Made Ground in the farmyard area of the site. Therefore, further investigation and testing was undertaken to inform this RSVP and is presented herein.

The recent investigation and testing of soils on site identified contaminant concentrations of concern within the Made Ground in relation to Arsenic, Beryllium, Lead, Nickel, PAH and Asbestos. It is considered that remedial action would be warranted to protect end users of a residential development on this site in relation to the contaminants identified.

Groundwater was not encountered within any of the investigation locations and is anticipated to be present at depths in excess of 25.00m bgl.

Subsequent to several phases of intrusive investigation and ground gas monitoring, and a surface emissions survey, a Detailed Quantitative Gas Risk Assessment was undertaken by EPG in relation to the infilled chalk pit located immediately to the west of the farmyard area. The DQGRA concluded that ground gas protection measures were not required for the proposed residential development.

2.2 Supplementary Intrusive Investigation Works – Farmyard

As part of the formulation of a remedial strategy further intrusive investigation works were undertaken between 14th May 2018 and 18th May 2018, in order to delineate areas of previously identified contamination. In relation to the farmyard area these works comprised the excavation of 7No. trial pits to depths of up to 3.00m bgl with

associated environmental sampling and testing at various depths, and 6No. trial trenches to depths of up to 2.00m bgl to establish the extent of the area of Made Ground, and access areas previously densely vegetated. The locations of the trial pits and trenches are presented in Figure 3 with the exploratory hole logs presented in Appendix A and the results of the geochemical analysis and statistical assessments presented in Appendix B.

Further discussion relating to the implications of these supplementary investigation works is presented in Section 3 of this report.

2.3 Proposed Site Use

The proposed wider development is understood to comprise the construction of 288 residential units, associated car parking, open space and landscaping. The farmyard area covers c. 30-40 plots (houses and flats) and associated gardens/areas of soft landscaping.

2.4 Conceptual Site Model

Assessment of the investigation findings have identified particular hazards, or potential hazards which were considered to require intervention (remediation) to mitigate the risk of harm. Remediation works are proposed to break the identified plausible pollutant linkages associated with respect to soil contamination within private garden areas proposed within the farmyard area, thereby mitigating the associated risk of harm to human health.

This would be undertaken as several phases of works on site and reflects the proposed development levels and requirement for a variable depth of reduced dig to accommodate a soil cover system. Reference should be made to Figures 6-9 which show proposed changes in ground level to achieve the development levels and associated reduced dig depths on individual plots:

1) Reduced dig to the minimum depths indicated on Figures 6-9 to achieve the required formation level to accommodate the required soil cover system thickness, or the full extent of the Made Ground where Made Ground is shallower. (Plots requiring a reduced dig are listed in Section 4.2).
2) It is proposed to retain and re-use the excavated soils where suitable for use (without treatment) within garden plots (under the soil cover system) where levels require raising and hence a requirement for the volume of excavated soil being generated from the reduced dig. (Figures 10-13 present the required volumes within specific Plots). These works would be undertaken in line with a Materials Management Plan (MMP), subject to the appropriate documentation, Definition of Waste Code of Practice (DoWCoP) assessment, Qualified Person (QP as defined in DoWCoP) declaration and agreement of the Regulators.
3) If excavated soils are to be stored on site prior to their removal they will need to be placed on and covered with sheeting to prevent the spread of any asbestos or asbestos containing material. It is preferable for excavated soils from the reduced dig to be relocate directly to the final placement/re-use location without stockpiling so as to avoid double handling, stockpile controls and the like. In addition, the placed/re-used soils can then be covered at the earliest practicable opportunity.
4) Material re-use is subject to the requirements of this and associated remedial strategies which apply to the development within the overall site boundary and no materials are to be excavated or moved until a Materials Management Plan is in place and the required QP Declaration has been submitted to and accepted CL:AIRE who subsequently notify by the Environment Agency (EA). Movement of materials outside of these protocols would be considered an illegal waste process and subject to legal action and financial penalties applied by the regulators to the developer and/or groundworks contractor.
5) Installation of a soil cover system in garden areas and areas of soft landscaping to break the pollutant linkage for the contaminants identified within the Made Ground soils in the farmyard area, and to also provide suitable growing media. Where the reduced dig does not remove all of the Made Ground and hence the cover system is to be laid over Made Ground, or where development levels dictate that no

reduced dig is required and Made Ground is to remain, the soil cover system shall incorporate a 150mm thick break layer formed of stone or crushed concrete with a geotextile membrane laid above and beneath, and overlain by a deter to dig geofabric to act as a visible deterrent overlain by a minimum 300mm thickness of subsoil and a minimum of 300mm of Topsoil. Where the reduced dig removes all Made Ground and exposes uncontaminated natural strata (and is validated as such), the soil cover system shall comprise clean subsoil and a minimum 300mm of suitable Topsoil, the thickness of subsoil in this scenario will be defined by the difference between the finished garden level (minus 300mm Topsoil) and the reduced dig level. The cover system is likely to be completed with Topsoil placement towards the end of plot specific development with the placement of Topsoil.

The aim of the remediation is not to remove all contamination identified on site but to reduce the identified risk to an acceptable level with respect to human health, the built environment and controlled waters.

It should be noted that the NHBC would not accept the deposition of asbestos impacted soils beneath house footprints as part of development related works on this site. In addition, the EA may not accept the deposition of asbestos impacted soils under roads where such soils then require compaction as this can potentially cause breakdown of the asbestos containing materials.

3.0 GROUND GAS

Intrusive ground investigation works undertaken over several phases identified the presence of deep Made Ground and/or landfill material within the former chalk pit located adjacent to the farmyard area. The investigations have included several phases of ground gas monitoring and most recently, a surface emissions survey. The findings of the various phases of investigation and monitoring have been assessed in detail by EPG as part of completion of a DQGRA, which concluded that no ground gas protection measures were required for the proposed residential development on the chalk pit area and thus no protection measures are required for plots bordering the former chalk pit area.

4.0 SOILS

The ground conditions within the farmyard have been established through several phases of intrusive investigation. Encountered soils comprised Made Ground and/or in isolated locations a mantle of Topsoil, overlying sandy clay and clay with occasional bands of sand, overlying Chalk.

Made Ground was encountered within the majority of investigation locations to depths between 0.25m bgl and 2.20m bgl, and was found to comprise gravelly clay with brick, concrete, flint cobbles, tarmac and chalk fragments, ash and charcoal; clayey fine to coarse flint and chalk gravel with brick, concrete, tarmac and pieces of tree; sandy clay with plastic, decaying roots, flint gravel and glass. Possible asbestos tiles were noted to be present at c.0.50m bgl within TP239.

Cement tile and cement sheet fragments were observed to be present sporadically across the farmyard area following demolition and clearance. It was considered that these surface fragments potentially comprised Asbestos Containing Material and could require a 'forensic litter picking' exercise to be completed prior to commencing any remediation or ground works.

A review of chemical analysis of the soil samples from the farmyard area was undertaken, including the most recent samples taken for delineation purposes, and the results compared individually against the relevant GAC, SSAC or C4SL for a proposed residential end use (with plant uptake). Individual exceedances above the respective assessment criteria were identified for Arsenic, Beryllium, Lead, Nickel, and PAH compounds as summarised in Table 1.

Determinand	Tier 1 Criteria mg/kg	Depth m bgl	Concentration mg/kg	Geology
Arsenic	S4UL – 37 SSAC – 38.03	TP314 at 1.6	243	Natural
Beryllium	S4UL – 1.7 SSAC – 1.72	TP220 at 0.2 TP312 at 1.45 TP315 at 2.3 TP316 at 1.9 TP317 at 0.65	3.0 2.9 2.1 1.7 6.9	Made Ground Natural
Lead	S4UL – 200	TP315 at 0.2	220	Made Ground
Nickel	S4UL – 180 SSAC – 149	TP314 at 1.6	271	Natural
Benzo(b)fluoranthene	S4UL – 2.6 SSAC – 4.94	TP215 at 0.3 TP315 at 0.2	3.0 3.1	Made Ground
Benzo(a)pyrene	S4UL – 2.2 SSAC – 3.93	TP215 at 0.3 TP315 at 0.2	3.1 2.7	Made Ground
Dibenzo(a,h)anthracene	S4UL – 0.24 SSAC – 0.39	TP215 at 0.3 TP225 at 0.25 TP239 at 0.3 TP312 at 0.2 TP313 at 0.25 TP315 at 0.2	0.6 0.8 0.3 0.3 0.3 0.5	Made Ground

Table 1 Summary of exceedances against Tier 1 assessment criteria

The tier 1 exceedances where screened against the Site Specific Assessment Criteria (SSAC) calculated for the site. A number of those initially identified as exceedances were found to be below the calculated SSAC. The following initial exceedances were found to be below the SSAC:

- Beryllium, TP316 at 1.9m, identified 1.70mg/kg compared to a SSAC of 1.72mg/kg;
- Benzo(b)fluoranthene TP215 at 0.3m and TP315 at 0.20m, identified 3mg/kg and 3.1mg/kg compared to a SSAC of 4.94mg/kg;
- Benzo(a)pyrene, TP215 at 0.30m and TP315 at 0.20m, identified 3.1mg/kg and 2.7mg/kg compared to a SSAC of 3.93mg/kg;
- Dibenzo(a,h)anthracene, TP239 at 0.30m, TP312 at 0.20m, and TP313 at 0.25m, all reported as 0.3mg/kg compared to a SSAC of 0.39mg/kg.

The calculated SSAC were based on a residential exposure scenario with plant uptake so as to provide a conservative assessment and cover the most sensitive end use scenario. It is therefore considered that the initial exceedances found to be below the calculated SSAC do not require further assessment nor is further remedial action warranted with respect to these substances and/or locations.

Table 2 summarises the results that were found to exceed the calculated SSAC for a residential end use with plant uptake.

Determinand	Tier 1 Criteria mg/kg	Depth m bgl	Concentration mg/kg	Geology
Arsenic	S4UL – 37 SSAC – 38.03	TP314 at 1.6	243	Natural
Beryllium	S4UL – 1.7 SSAC – 1.72	TP220 at 0.2 TP312 at 1.45 TP315 at 2.3 TP317 at 0.65	3.0 2.9 2.1 6.9	Made Ground Natural
Lead	S4UL – 200	TP315 at 0.2	220	Made Ground
Nickel	S4UL – 180 SSAC – 149	TP314 at 1.6	271	Natural
Dibenzo(a,h)anthracene	S4UL – 0.24 SSAC – 0.39	TP215 at 0.3 TP225 at 0.25 TP315 at 0.2	0.6 0.8 0.5	Made Ground

Table 2 Summary of exceedances against the calculated SSAC

Therefore, the results were assessed further through statistical assessment as described below.

Statistical analysis of the samples within the dataset was undertaken in accordance with guidance contained in the CIEH/CL:AIRE report 'Comparing Soil Contamination Data with a Critical Concentration' (May 2008). If the contamination status of the soils is considered in a planning context, the null hypothesis tested by the analysis is whether the true mean concentration is equal to or greater than the critical concentration for a given determinand, with the critical concentration being the relevant SSAC or GAC (the soil screening value) for that determinand in the context of the intended end use of the site. If the analysis shows that the true mean concentration is less than the critical concentration the null hypothesis can be rejected. The guidance recommends that for the null hypothesis to be rejected the analysis should show that there is a 95% (or higher) likelihood that the true mean concentration is below the critical concentration. Where this is the case the site is considered to be acceptable for the planned end use without any necessary remedial measures.

Statistical assessment was undertaken on all results of geochemical testing undertaken by Geo-Environmental, for heavy metals and PAH from within the farmyard area of the site only. Due to the depth and extent of Made Ground

encountered within the farmyard area, it was deemed appropriate to assess the results from this area in isolation as they were not deemed to be representative of the soils encountered elsewhere on the wider site.

The statistical analysis showed that whilst potential statistical outliers were recorded within the datasets the null hypothesis could be rejected for Arsenic, Beryllium, Lead and Nickel. Initial assessment of the dataset for Dibenzo(a,h)anthracene indicated that the null hypothesis could be rejected, however further detailed assessment that assessed the results solely from the Made Ground beneath the farmyard area showed that the null hypothesis could not be rejected. As such the identified elevated concentrations of Dibenzo(a,h)anthracene were considered representative of the Made Ground beneath the farmyard area. Whilst statistical outliers were identified for a number for other substances, all reported concentrations (and statistical upper confidence limit concentrations) were below the relevant SSAC. The results of the statistical assessments are presented within Appendix B.

In addition, the identified elevated concentrations of both Arsenic and Nickel were found within a soil sample from 1.60m bgl (TP314). Given the depth that these elevated concentrations were identified it is considered unlikely that sensitive receptors would be exposed to these identified elevated concentrations, assuming finished development levels are similar to or higher than current ground level. Notwithstanding this, remedial measures to address other identified contaminants within the Made Ground are required.

All samples were submitted for asbestos screening and where asbestos was identified quantification testing was carried out. The locations where asbestos was identified are summarised in Table 3.

Location and Depth (m bgl)	Type	Free Fibres (%)	Total (%)
TP225 at 0.25	Chrysotile	<0.001	3.54
TP239 at 0.5	Chrysotile	<0.001	25.0
TP315 at 0.2	Chrysotile (fibre bundle)	<0.001	<0.001

Table 3 Summary of locations of asbestos identified

The asbestos identified within TP239 was in the form of asbestos tiling. The tile fragments discovered were relatively intact within the ground. During the additional delineation investigation works carried out in May 2018, demolition of the farm buildings within the farmyard area had been completed and the resultant crushed materials were being stockpiled within this area. Potential asbestos containing materials (ACM) were observed by engineers from Geo-Environmental within these stockpiled materials and also as sporadic occurrences at ground level across the farmyard area. It is therefore considered prudent to assume the presence or likely presence of ACM within the surface soils across the farmyard area. Photographs taken of these materials showing their location within the farmyard area are presented within Appendix C. In addition, previous investigations undertaken by third parties also identified the presence of asbestos within soils in the farmyard complex area.

Based on the above assessment it is considered that remedial action would be warranted to protect end users of a residential development on this site in relation to the presence Asbestos and concentrations of Dibenzo(a,h)anthracene identified within the Made Ground within the farmyard area, as shown on Figure 4 and Figure 5. Remedial action to protect end users from impacted soil is discussed in Section 4.2 below.

4.1 Site Workers

It is the responsibility of the Principal Contractor and their appointed sub-contractors to implement and manage safe systems of work, prepare their own risk assessments in accordance with Health and Safety legislation in order to protect persons in their employ, as well as mitigate the risk of harm to others due to works in their control. Special consideration should be given to the provisions of the Construction (Design & Management) Regulations 2015, Health and Safety at Work Act and the Control of Substances Hazardous to Human Health regulations to protect the safety of persons in their employment. Additional guidance can be sought from the CIRIA publications

entitled "A Guide for Safe Working on Contaminated Sites" and “Environmental Good Practice on site guide (fourth edition)”.

In addition to the safe systems of works to be implemented alongside appropriate risk assessments and method statements, all site personnel shall benefit from on-site hygiene facilities including wash area, toilets and drying room.

Separate canteen area and welfare facilities should be provided. All eating and drinking should be restricted to the canteen area and only once site personnel have removed outer PPE and washed exposed skin.

In the event of dry spells, or where the exposed surface becomes dry, regular damping down of the surface of the site will be required to prevent the release of soil dust which could impact on site operatives or migrate off-site, thereby mitigating both off-site exposure and nuisance for neighbours.

4.2 End Users

The tier 1 contamination assessment has identified several locations where reported concentrations were either elevated or exceeded the Tier 1 screening criteria within the Made Ground of the farmyard area. In addition, ACMs and asbestos fibres have been identified both visually and within chemical analysis to be present within the Made Ground. Potential ACM was also observed to be present as sporadic occurrence at ground level following demolition and clearance of the former farm buildings.

A combination of a reduced dig (as shown in Figures 6-13), to accommodate the soil cover system in the finished level, or complete removal of the Made Ground where Made Ground is found to be shallower, and the installation of a clean cover system within private gardens and areas of communal soft landscaping will be required within the farmyard area. Table 4 below presents minimum reduced dig depths required to accommodate the soil cover system and achieve the development levels for specific plots within the Farmyard area.

Plot Number	Minimum Depth of Reduced Dig (m bgl)
79 -80	0.68 or full extent of Made Ground if Made Ground shallower than reduced dig depth
Former Farmhouse	0.75 or full extent of Made Ground if Made Ground shallower than reduced dig depth
116	0.48 or full extent of Made Ground if Made Ground shallower than reduced dig depth
117 - 118	0.60 or full extent of Made Ground if Made Ground shallower than reduced dig depth
119 - 122	0.44 in areas of proposed soft landscaping
123 - 124	0.52 or full extent of Made Ground if Made Ground shallower than reduced dig depth
125	0.21
126	0.17

Table 4 Specific Plots in Farmyard area requiring reduced dig

In order to achieve the development levels, soils won from reduced dig areas are to be relocated to garden plots where they can be accommodated below the soil cover system. The movement of materials shall not commence until such time as an MMP is in place and QP Declaration submitted to, and accepted by CL:AIRE who subsequently notify the EA. It is preferable, and thus proposed, that the excavated soils shall be relocated directly from the reduced dig area to their final placement location without any requirement for stockpiling.

Validation inspections will be undertaken at the base and sides of the excavation to demonstrate that a reduced dig has been undertaken and where the full extent of the Made Ground has been removed.

Given the nature of the contaminants identified within the Made Ground across the farmyard area (principal risk driver is Asbestos) a soil cover system will be installed within all gardens and soft landscaping areas. The cover systems should comprise certifiably 'clean' Topsoil and subsoil. Both aspects of the cover system should be both chemically and physically suitable for the proposed end use. Given the presence of asbestos a BRE Soil Cover system with a minimum soil cover thickness of 600mm would be required in proposed gardens and 450mm in areas of soft landscaping. The upper 300mm of a cover system should comprise Topsoil.

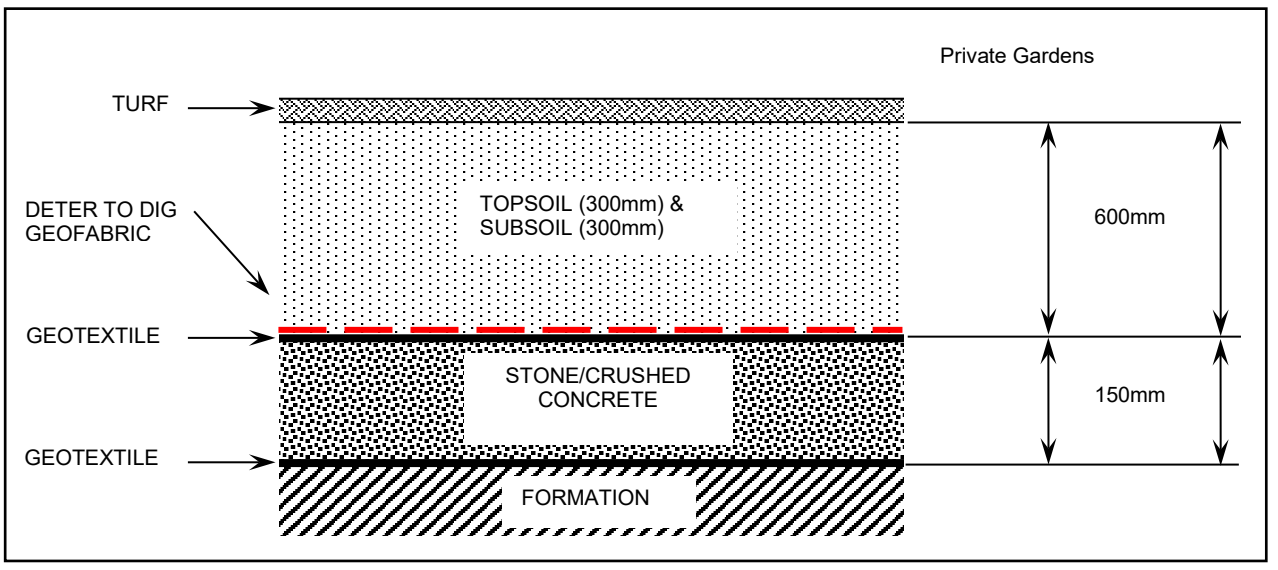
Where the reduced dig removes all of the Made Ground, subject to verification inspection and testing if required, the cover system shall comprise subsoil and a minimum 300mm thickness of Topsoil.

Prior to commencement of the reduced dig exercise, a 'forensic litter picking' exercise will be required to remove ACM from the ground surface. This shall be undertaken by the appropriate contractor and verified by the Environmental Consultant.

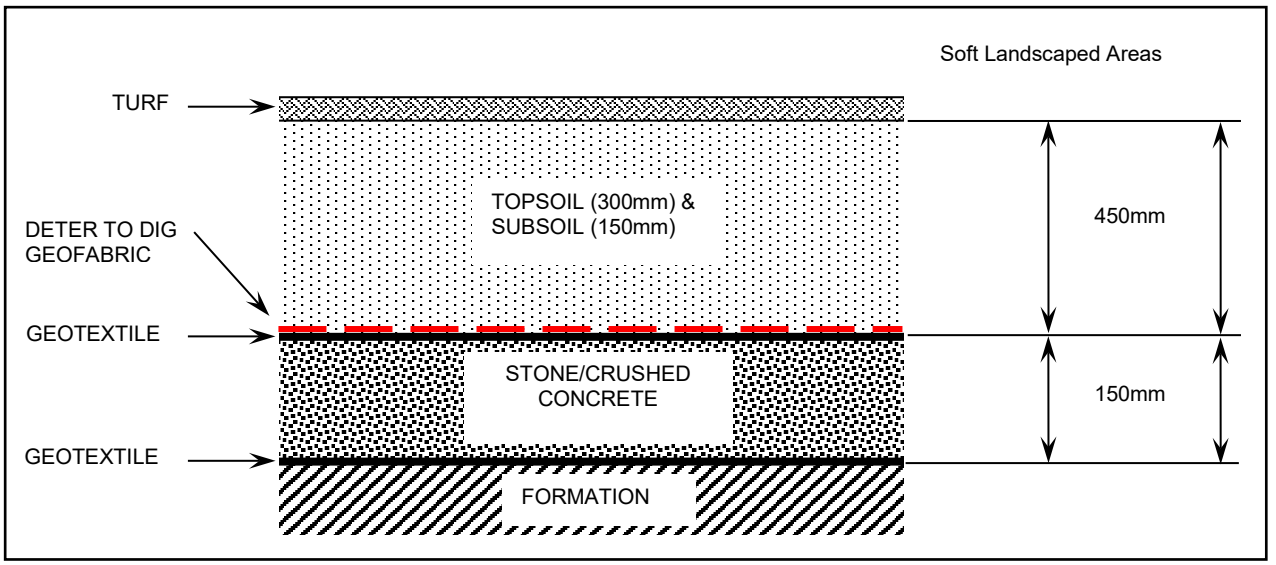
Where Made Ground remains in place following the reduced dig, or where a reduced dig is not required due to proposed final site levels, the cover system should incorporate a capillary break layer comprising 150mm depth of stone or crushed concrete, between two layers of geotextile. A high visibility deter to dig geofabric shall be laid over the upper geotextile to provide a visible deterrent to excavation. Any soils imported onto the site should be verified free from contamination with chemical testing undertaken to confirm their suitability for use within private gardens and areas of soft landscaping.

The reduced dig areas, anticipated depths and approximate volumes are presented on Figures 10-13.

An example of the recommended cover system for use in private gardens where Made Ground is to remain in-situ is provided below:



An example of the recommended cover system for use in areas of communal soft landscaping where Made Ground is to remain in-situ is provided below:



With regards to private gardens and areas of soft landscaping, it is recommended that Topsoil is placed to provide a suitable growing medium for proposed planting areas as part of the cover system described above.

It is anticipated that site won Topsoil stripped from uncontaminated areas of the wider site will be available for deposition as part of the cover system in gardens and soft landscaping. Thus, it is considered unlikely that it will be necessary to import Topsoil to the site, however if it is necessary to import topsoil on to the development then, prior to importation, the chemical, physical and nutritional suitability is to be verified by the Contractor. Importation of Topsoil or subsoil from unverified or unsuitable sources would require their removal from site and replacement with suitable materials. As a matter of good practice, it is recommended that the location, approximate extent and thickness of any imported topsoil are recorded and presented in the Validation/Verification Report to be prepared by the Environmental Consultant. Soil importation criteria is detailed in Appendix D.

Where impacted soils remain beneath building footprints or hard standing, the plausible pollutant linkage for direct contact is removed and thus risk of harm to end users from exposure to the contaminants is removed, as roads, buildings and permanent hard cover would sever the pollutant linkage and thus the impacted shallow soils could remain in these areas. Deposition of asbestos impacted soils beneath house footprints is not acceptable to the NHBC and deposition of such soils as fill beneath roads and hard standing is unlikely to be acceptable to the EA due to compaction changing the condition of the asbestos contaminating materials. However, limited works may be required in these areas to provide a suitable working platform for development to proceed.

Any soils imported onto the site should be verified free from contamination with chemical testing undertaken to confirm their suitability for use within areas of soft landscaping.

The proposed re-use of Made Ground and contaminated soils from impacted areas of the site (Farmyard and Chalk Pit), on the site of origin means that a Materials Management Plan will be required for the site under the Code of Practice.

As such excavated soils on site will be re-used under the CL:AIRE Definition of Waste, Code of Practice where it can be demonstrated that there is a need for the use of the materials and where the risk is demonstrated to be

acceptable under an MMP. The MMP must be completed and approved prior to commencement of material movement on site. Where a RSVP is in place for the site, agreement of re-use must also be agreed with the regulators.

4.3 Inspection/Validation

Verification of remediation measures shall be required through regular inspection at key stages of the works to include:

- Reduced dig and Made Ground excavation;
- Transfer of the excavated Made Ground and/or contaminated soils to the final placement/re-use location;
- The placement of a cover system, including verification of any additional subsoil and/or Topsoil in order to allow for the installation of the cover system required in private gardens and soft landscaping areas.

It is likely that verification will be undertaken in stages, i.e. site preparation, reduced dig, re-profiling; geotextiles, crushed stone/crushed concrete layer and deter to dig membrane; subsoil placement and topsoil placement. As such, final verification of the completed cover system is likely to be at the end of construction for any given plot.

Details of these works would be presented within a verification report for the site, to include the requirements of the Code of Practice should materials be proposed to be re-used under the Definition of Waste Code of Practice.

Two stage verification reporting is proposed, i.e. the first verification report addressing the reduced dig works and relocation of the excavated soils to their final placement/re-use locations; and a second report stage on completion of the soil cover system on the individual plots (anticipated verification as batches of plots as development progresses).

4.4 Built Environment

Buried plastics laid in contact with contaminated soils may be susceptible to attack by aggressive chemicals; therefore, potable water supplies may potentially become contaminated or tainted. Proposed remedial measures to address contaminants found within the Made Ground in the farmyard area include a reduced dig of either 1.00m bgl or the depth of the Made Ground if shallower. Whilst the upper metre of impacted materials will be removed from garden areas water supply pipes are likely to be installed within Made Ground soils.

The use of barrier pipe possibly with cast iron connections is likely to be required for potable water supplies through the farmyard area.

The utility company should be consulted in order to confirm their specific requirements in this respect. Potable supply pipe installation should be confirmed and verified through inspection during construction.

As a matter of good practice and to maximise the protection to maintenance workers, clean, granular backfill should be used in service runs and marker tapes for all buried services. This would not mitigate the requirement for the water supply pipe.

5.0 WASTE

5.1 Waste Classification and Segregation

Waste may be defined as any substance or object in Annex 1 of the Waste Framework Directive which the holder discards, intends to discard, or is required to discard. The holder of waste is anyone in possession of waste or generates it and therefore both the contractor and ultimately the developer are responsible for safe disposal of waste.

The following information is provided for preliminary guidance purposes, as different facilities or operators may have differing acceptance criteria and further Waste Acceptance Criteria (WAC) analysis may be required to confirm the exact classification.

Waste Acceptance Criteria (WAC) testing was undertaken on samples of the Made Ground within the farmyard area from TP225 at 0.3m bgl and details are provided below:

- TP225 at 0.3m bgl (Made Ground) soils classified as 'Inert Waste'.

However, asbestos was identified within the Made Ground in the farmyard area. Quantification of this asbestos was undertaken and based on these results Made Ground within the farmyard area would have an initial classification of Hazardous for waste disposal purposes. As such, it is recommended that once materials for disposal have been identified, then further WAC testing should be undertaken to further classify the materials for the purpose of disposal. However, it is understood that wherever possible, site won materials including Made Ground from the farmyard area will be retained for re-use where suitable and subject to regulatory approval.

In the event of dry spells, or where the exposed surface becomes dry, it is recommended that the surface of the site is regularly damped down to prevent the release of soil dust which could migrate off-site and thereby mitigate both off-site exposure and nuisance for neighbours.

It is proposed to re-use materials on site under a Materials Management Plan which will be developed for the construction works on this site. This will include contingency plans in any unexpected contamination is encountered during the development. Soils (including Made Ground) demonstrated to contain low concentrations of asbestos fibres can (with the agreement of the Local Authority Environmental Health Officer and Environment Agency) be re-used at depth beneath a suitable capping layer, where it can be demonstrated that there is a requirement for such materials and where the risk is acceptable and demonstrated to have not increased from baseline levels determine for the site, i.e. the source, pathway, receptor linkage has been severed. This should also take consideration of longer term maintenance works that may be required across the site.

In accordance with CL:AIRE Code of Practice (2011) materials are only considered waste if 'they are discarded, intended to be discarded or required to be discarded by the holder'. Current guidance recommends the retention and re-use of site won soils where there is a need for the materials and where the risk is acceptable

The Code of Practice therefore allows soils to be reused on site where the following criteria are met:

- Pollution of the environment and harm to human health is prevented and not increased in reusing the excavated materials;
- The material are suitable for use (without any further processing);
- There is certainty of use; and
- The quantity that is absolutely necessary (and no more) is used.

In order to comply with the Code of Practice, a Material Management Plan (MMP) that confirms the above criteria are met has to be prepared. The material management plan must be reviewed by a 'Qualified Person' who then issues a declaration to the Environment Agency. Geo-Environmental can provide this service should it be required.

Where materials do not meet the required criteria, it may be possible to treat them under an environmental permit so that they may be re-used on site.

Should material be required and reused under the Definition of Waste Code of Practice, the reuse of material will need to be fully documented and included within the Verification Report produced on completion of the works.

6.0 DISCOVERY STRATEGY

Whilst the site has been the subject of several phases of investigation and assessment, it remains possible that previously unexpected soil conditions may be encountered during the process of site preparation and construction.

Examples may include oily pockets within the soil, pockets of cement boarding or fibrous materials within the soil, black ashy materials, soils exhibiting strong odours, brightly coloured materials, and former structures or brickwork.

Should previously undiscovered contamination be encountered during the demolition/construction of the new buildings the following course of action should be adhered to:

- Works in the area of the suspected contamination should seize immediately. The ground workers should report any suspected contamination immediately to the Client's site supervisor. The supervisor should contact the Environmental Consultant, who should visit the site to assess the extent of the 'contamination'.

- The Environmental Consultant shall make records of their inspection, and pass details of these to the Local Authority.

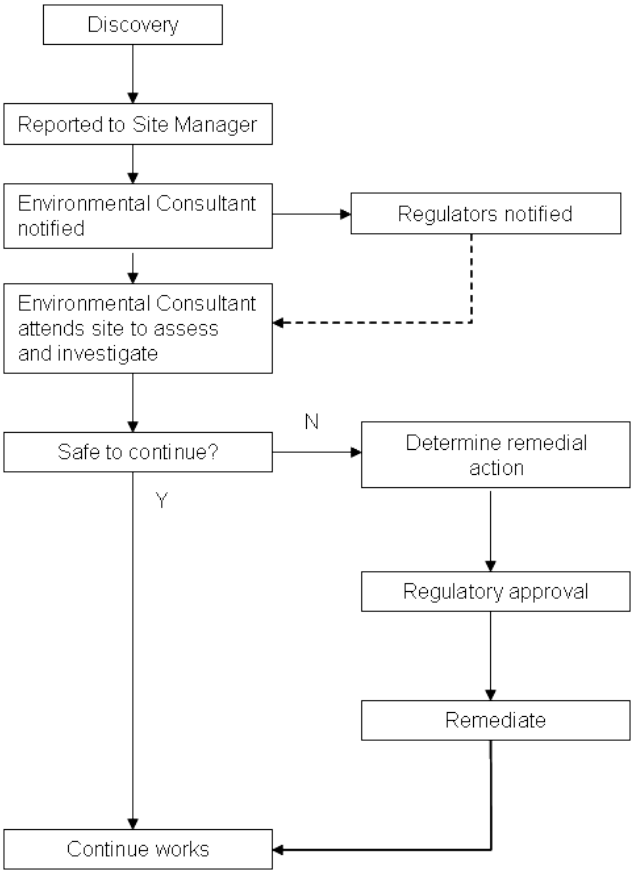
- Where the conditions revealed differ from those previously anticipated, the Environmental Consultant shall take samples as deemed appropriate to be dispatched for appropriate chemical testing.

- Depending on the results of the testing either: 1) no further work will be required; 2) a further detailed risk assessment will be required; and/or 3) localised specific remedial measures will be necessary. Appraisal criteria will vary depending on the nature of the assessment.

- The results of any such testing will be sent to the Regulatory Authority for consultation. If further remediation is required, the Regulatory Authority will be informed of the date and time of the proposed works.

- Any further remediation will be undertaken in accordance with a method statement submitted to the Local Authority for approval. The works shall be supervised by the Environmental Consultant who shall provide a Verification Report for the Local Authorities purposes.

The process is summarised overleaf:



A copy of this strategy should be lodged on site, and provisions made to ensure that all workers are made aware of their responsibility to observe, report, and act on any potentially suspicious or contaminated materials they may encounter.

7.0 VERIFICATION

Verification is required to be undertaken throughout the course of the remediation works. The Verification Report will be submitted to the Client, NHBC CL:AIRE and Local Authority for formal approval and Environment Agency if requested as part of any works completed under the Definition of Waste Code of Practice.

The Verification Report will refer to the works as set out within this RSVP and as required by any relevant planning conditions. The report will detail findings of any further investigation works (if undertaken on the site) in relation to Asbestos and Dibenzo(a,h)anthracene within the Made Ground of the farmyard area within proposed private gardens and areas of managed soft landscaping, as well as include relevant site based information such as records from site inspections, locations where the impacted soils were excavated and re-used on site or disposed of and validation sampling where required.

Photographs of specific remedial or waste handling measures and an audit trail for any imported subsoil and Topsoil, including source, provenance, analytical results, placement location and thickness (should subsoil and/or Topsoil be imported).

A summary of verification proposals is presented in Table 5 below.

The remedial works will be inspected and validated by the Environmental Consultant (Geo-Environmental). In addition, the MMP and any QP review and declaration will be prepared by Geo-Environmental.

Reference	Principal requirements	Design or construction related	Site visit required by Qualified Geo-Environmental Engineer	Supporting documentation
1.0 Verification general principles	Geo-Environmental have been commissioned to supervise remedial works within the Farmyard Area at Woodcroft Farm, Lovedean. These works require excavations of impacted Made Ground and installation of a soil cover system within private gardens and areas of soft landscaping. The aforementioned work is in line with the approach adopted for site investigation and risk assessment and previously undertaken by Geo-Environmental in respect of the development.	Construction	**Yes –** See below	Details of construction programme to be provided by client/contractor.
2.0 Excavation of Made Ground	Reduced dig exercise to excavate areas of Made Ground within the farmyard to accommodate the soil cover system thickness or to natural strata if shallower to be overseen and verified by Geo-Environmental.	Construction	**Yes – 5 days' notice required**	Regular visits to site required to confirm works being undertaken, validation sampling within the natural soils following removal of the impacted material. Excavation areas, reduced dig depths and approximate volumes shown on Figures 6-13 and are based on engineering layout drawing ref 17-110/2210 and development levels plans ref 192931-073, 192931-074 and 192931-075. Verification reporting stage 1.
3.0 Re-location and deposition of soils won from reduced dig areas	Made Ground and contaminated soils excavated as part of the reduced dig works are to be relocated to final deposition locations (under soil cover system) in accordance with an approved remedial strategy and MMP.	Construction	**Yes – 5 days' notice required**	Regular visits to site required to confirm works being undertaken in accordance with the RSVP and MMP. Deposition locations and volume requirements are shown on Figures 10-13 and are based on engineering layout drawing ref 17-110/2210 and development levels plans ref 192931-073, 192931-074 and 192931-075. Verification reporting stage 1.

Reference	Principal requirements	Design or construction related	Site visit required by Qualified Geo-Environmental Engineer	Supporting documentation
4.0 Cover System	Cover system to be constructed by the ground workers and inspected by the Environmental Consultant	Construction	**Yes - 5 days' notice required**	Provenance of site won soils used to raise levels under the soil cover system are to be verified by the groundworks contractor. Source of Topsoil and subsoil (uncontaminated, naturally occurring site won soils) to be used in the soil cover system are to be evidenced by the groundworks contractor. Thickness and construction of cover system to be verified. Verification reporting stage 2.
5.0 Waste Management	Waste soils arisings from the site strip will be disposed of appropriately with WAC testing undertake once soils for disposal have been identified. The results should be presented to the landfill site prior to removal for confirmation of the classification.	Design and Construction	**No (unless further testing required where 5 days' notice required)**	Chemical test results (WAC) only required if waste soils generated.
	Waste tickets for the removal of arisings should be compiled for submission as part of the verification report for each phase of the development. The waste tickets will be required to demonstrate that the approximate amount of material being removed is equal to the summed volume on the waste tickets.			Waste tickets
	Where is it demonstrated that there is a need for materials to be re-used on site and that the risk is acceptable, soils may be re-used on site under the Definition of Waste Code of Practice under a Materials Management Plan for the site.			Records of material movements on site to be provided by the Contractor for inclusion in the validation report. It is assumed that tracking of soil movements around the site will be recorded by the

Reference	Principal requirements	Design or construction related	Site visit required by Qualified Geo-Environmental Engineer	Supporting documentation
				groundworks contractor, with periodic independent inspections by Geo- Environmental.
6.0 Imported Soils	In-situ testing of any soils imported onto site for landscaping purposes will be carried out after placement at a frequency of one sample per 50m^3 or one sample per landscaped area (whichever is the smallest) with comparison of results to assessment criteria for residential end use.	Construction	**Yes**	Pre import certification verifying the chemical quality of the topsoil and subsoil to be provided to the Environmental Consultant for review prior to Importation.

Table 5 Details of verification visits required on site

FIGURES



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Site Location Plan
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16943	**Revision:**	0		
Drawn:	FG	**Date:**	11/05/2018		
Figure:	1	**Scale:**	Not To Scale		



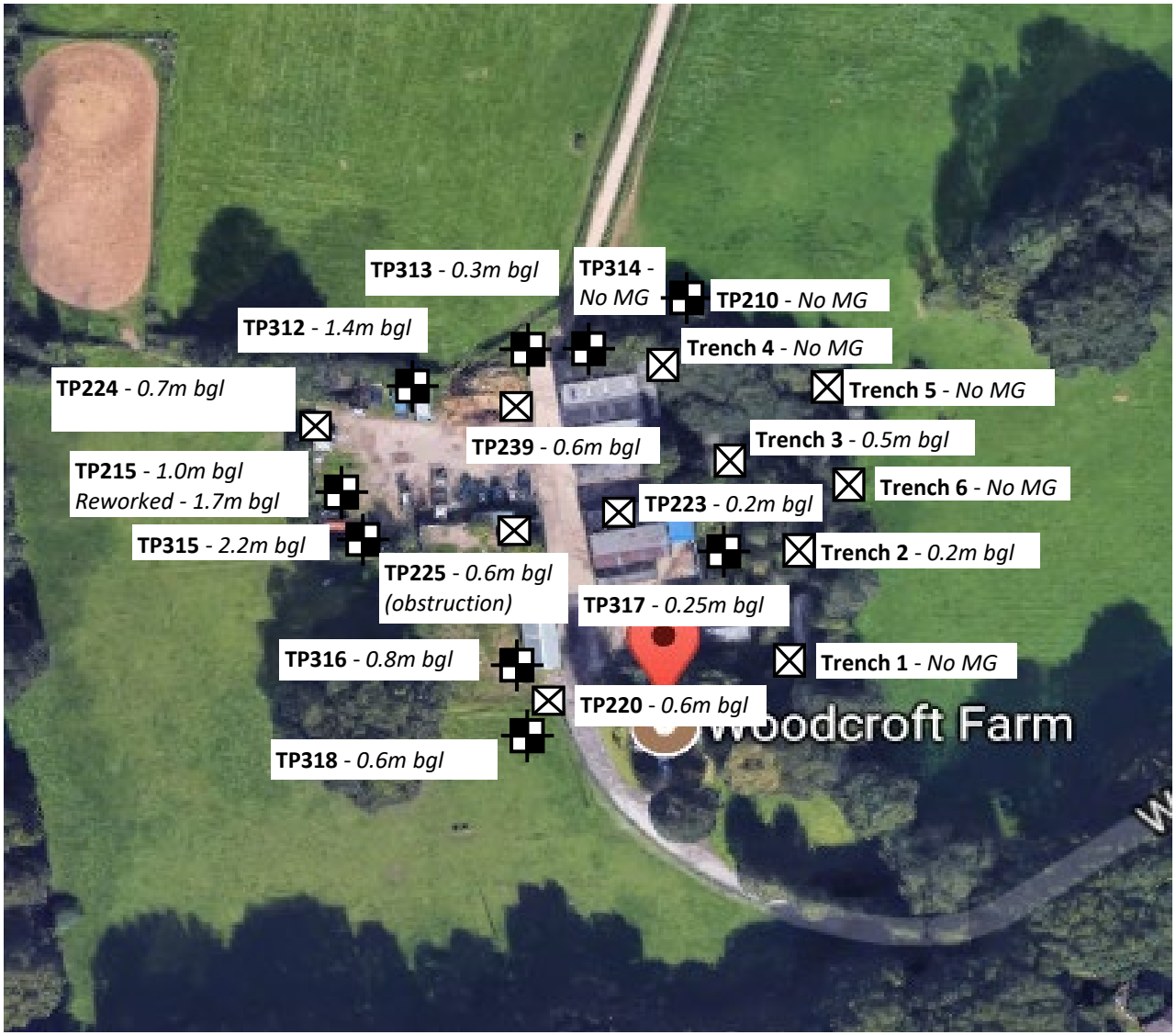
Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Location of Farmyard Area
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16943	**Revision:**	0		
Drawn:	FG	**Date:**	25/06/2018		
Figure:	2	**Scale:**	Not To Scale		



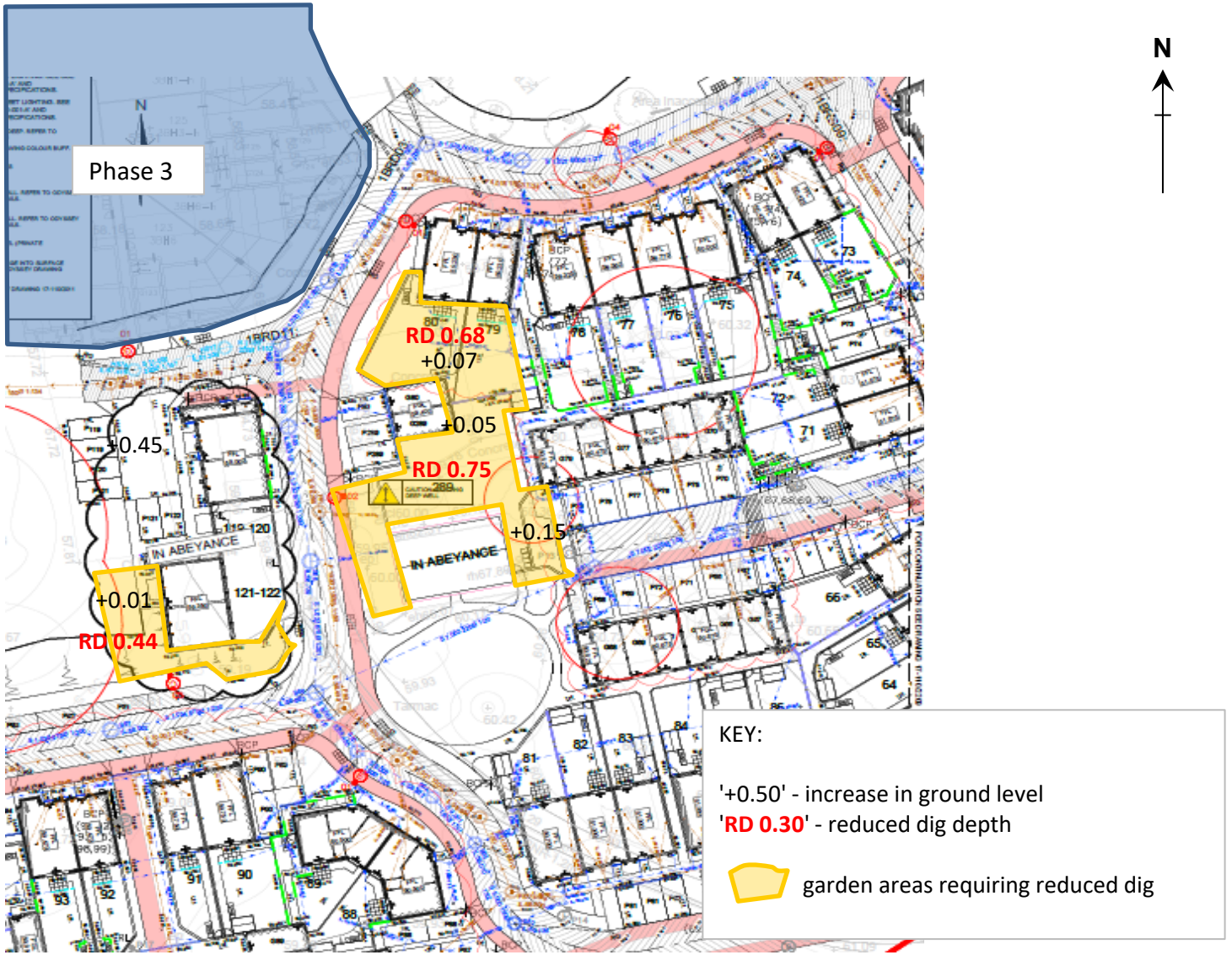
Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Exploratory Hole Locations - Farmyard Area
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16943	**Revision:**	0		
Drawn:	FG	**Date:**	11/05/2018		
Figure:	3	**Scale:**	Not To Scale		



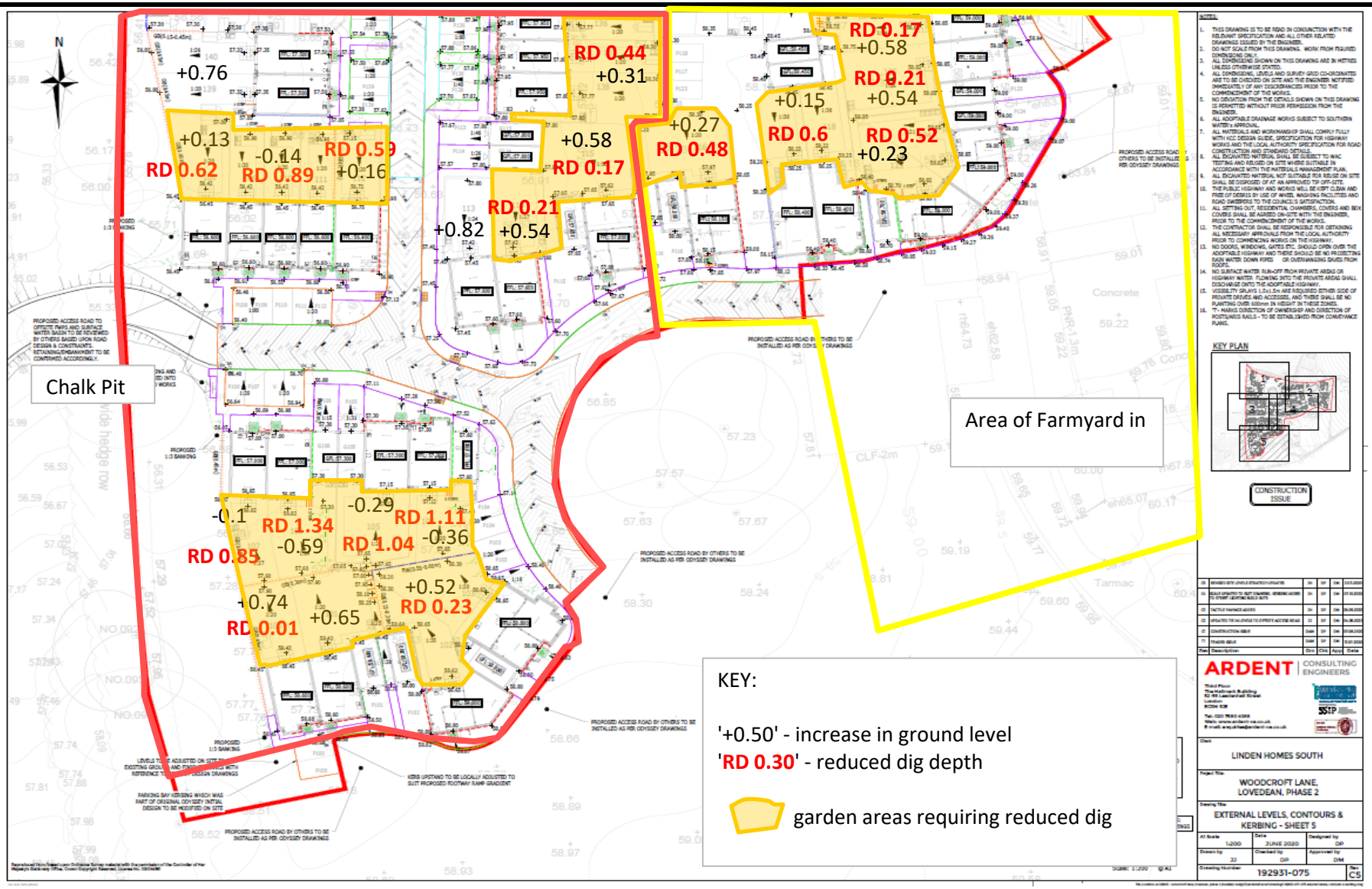
Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Soil Contamination Exceedances - Farmyard Area
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16943	**Revision:**	0		
Drawn:	FG	**Date:**	11/05/2018		
Figure:	4	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Depth of Made Ground - Farmyard Area
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16943	**Revision:**	0		
Drawn:	FG	**Date:**	20/06/2018		
Figure:	5	**Scale:**	Not To Scale		



Project:	Woodcroft Farm Lovedean PO8 9QA			**Title**	Development Levels Plan - Phase 2B Farmyard (RSVP-FY-v6.0)
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16943	**Revision:**	2		
Drawn:	FG	**Date:**	18/12/2020		
Figure:	RSVP-FY 6	**Scale:**	Not To Scale		



Project:	Woodcroft Farm Lovedean PO8 9QA	**Title**	Development Levels Plan - Phase 3 Farmyard and Chalk Pit (RSVP-FY-v6.0)
Client:	Vistry Homes Southern		
Ref No:	GE16943	**Revision:**	2
Drawn:	FG	**Date:**	17/12/2020
Figure:	RSVP-FY 7	**Scale:**	Not To Scale

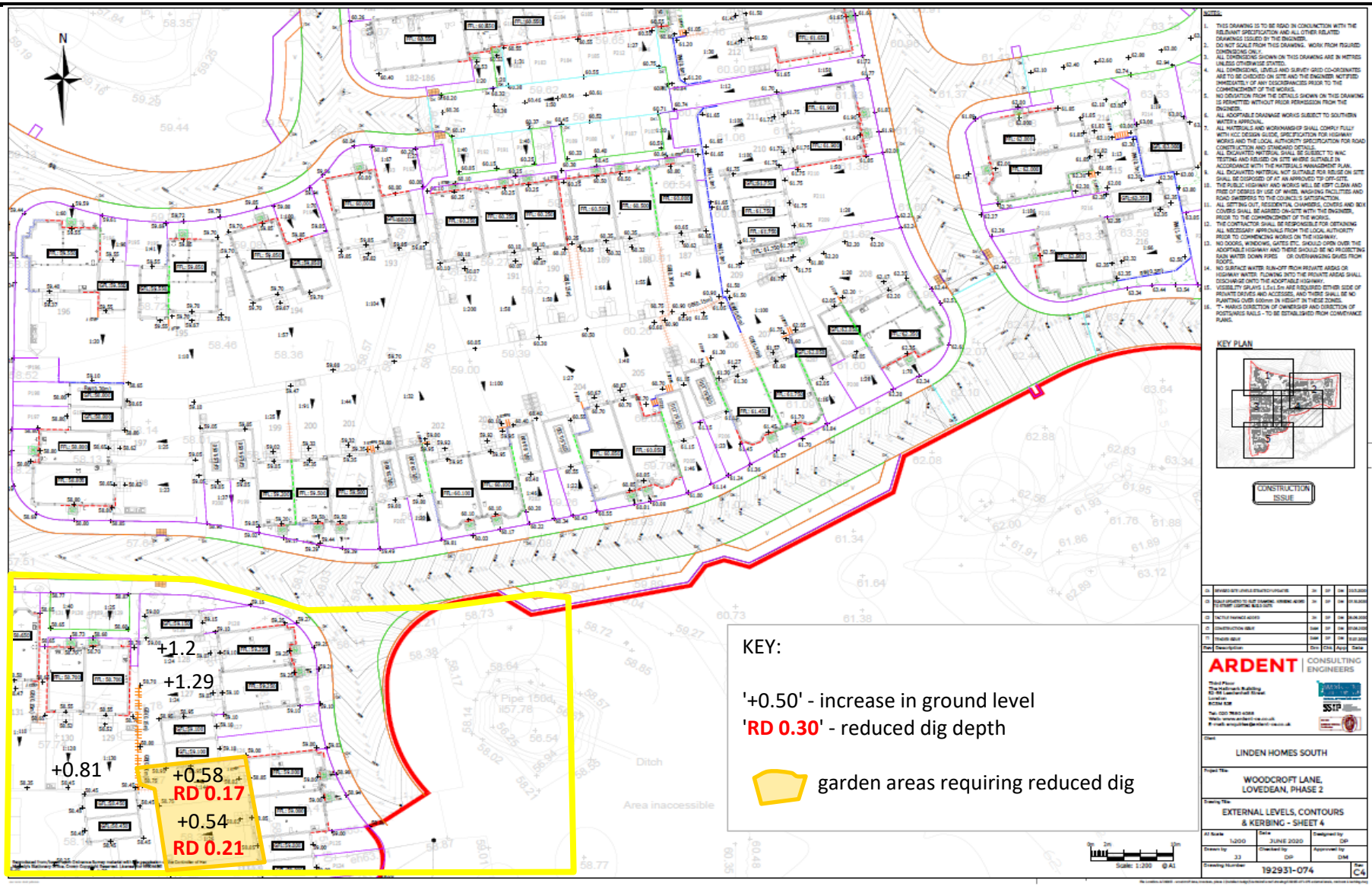
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Project:	Woodcroft Farm Lovedean PO8 9QA	**Title**	Development Levels Plan - Phase 3 Farmyard (RSVP-FY-v6.0)
Client:	Vistry Homes Southern		
Ref No:	GE16943	**Revision:**	2
Drawn:	FG	**Date:**	17/12/2020
Figure:	RSVP-FY 8	**Scale:**	Not To Scale

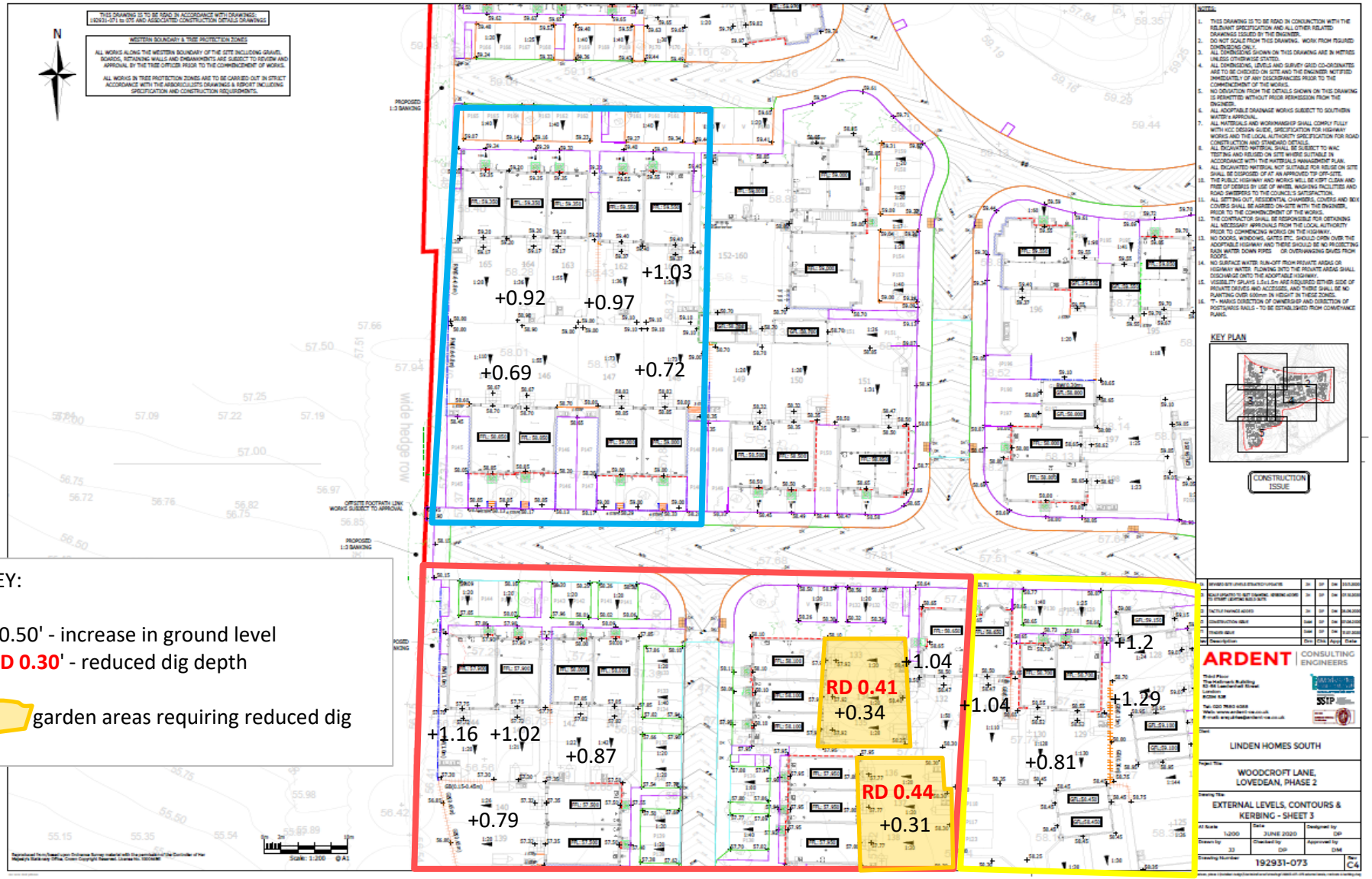
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Project:	Woodcroft Farm Lovedean PO8 9QA	**Title**	Development Levels Plan - Phase 3 Horse Arena, Chalk Pit and Farmyard (RSVP-FY-v6.0)
Client:	Vistry Homes Southern		
Ref No:	GE16943	**Revision:**	2
Drawn:	FG	**Date:**	17/12/2020
Figure:	RSVP-FY 9	**Scale:**	Not To Scale

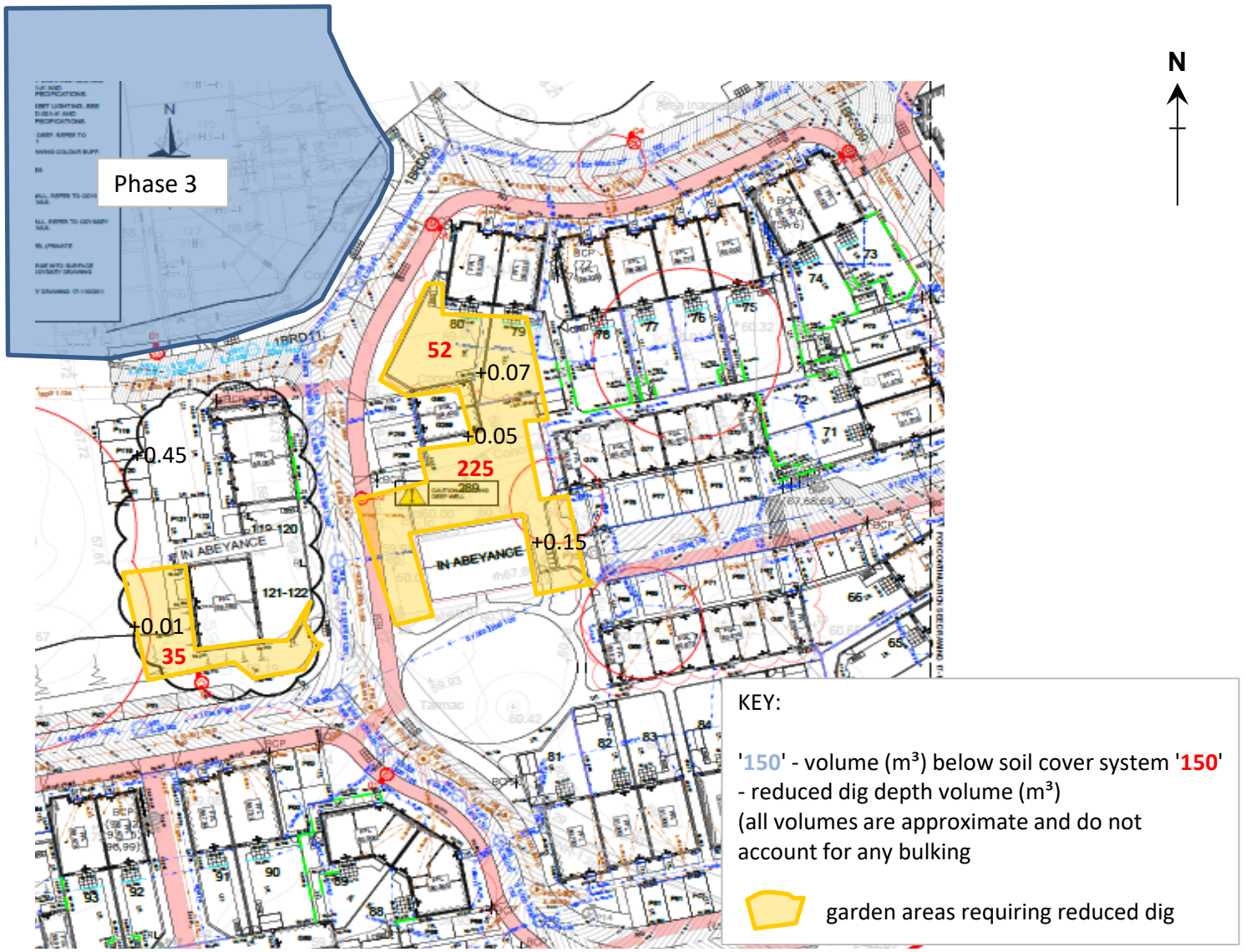
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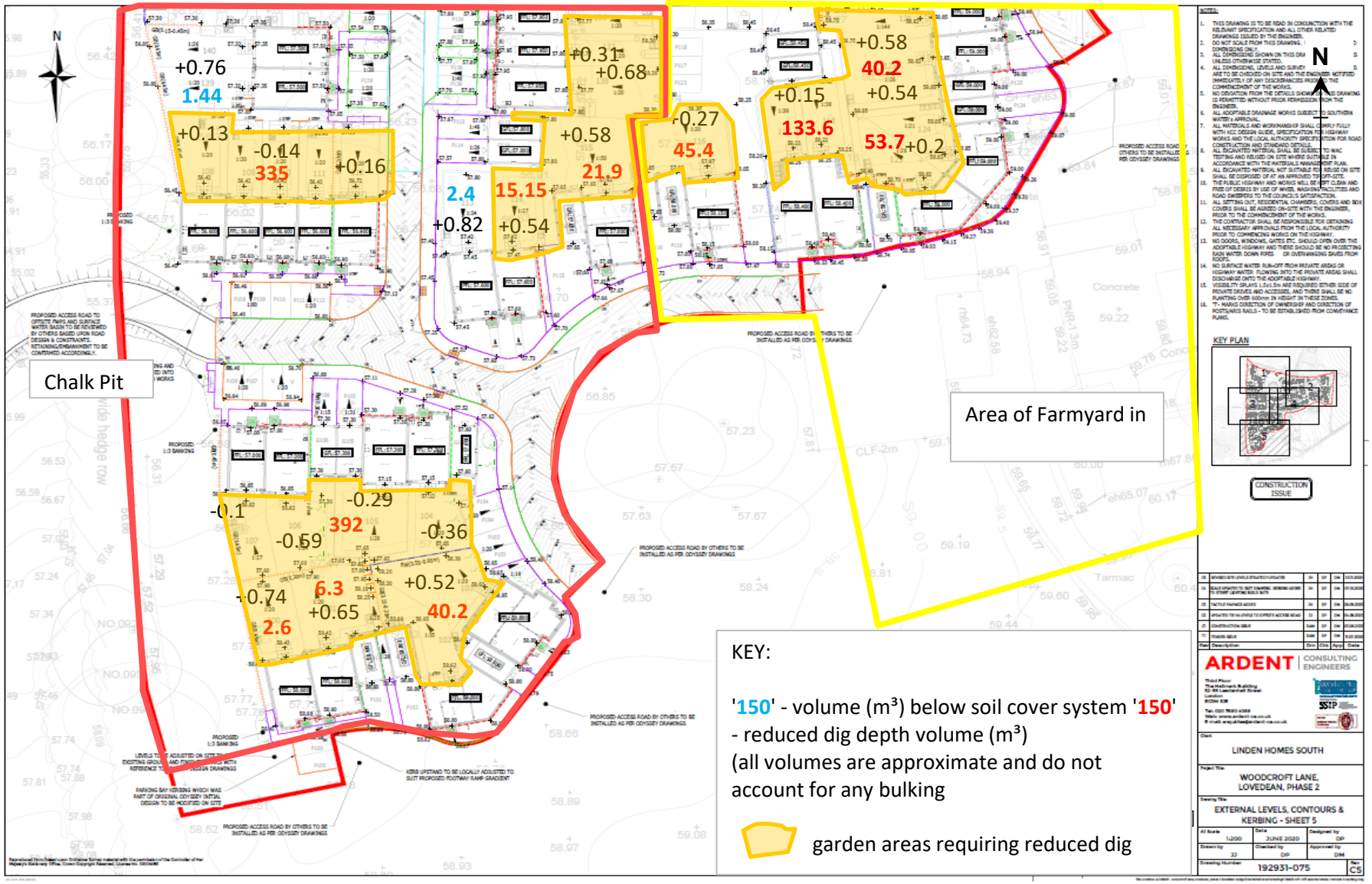
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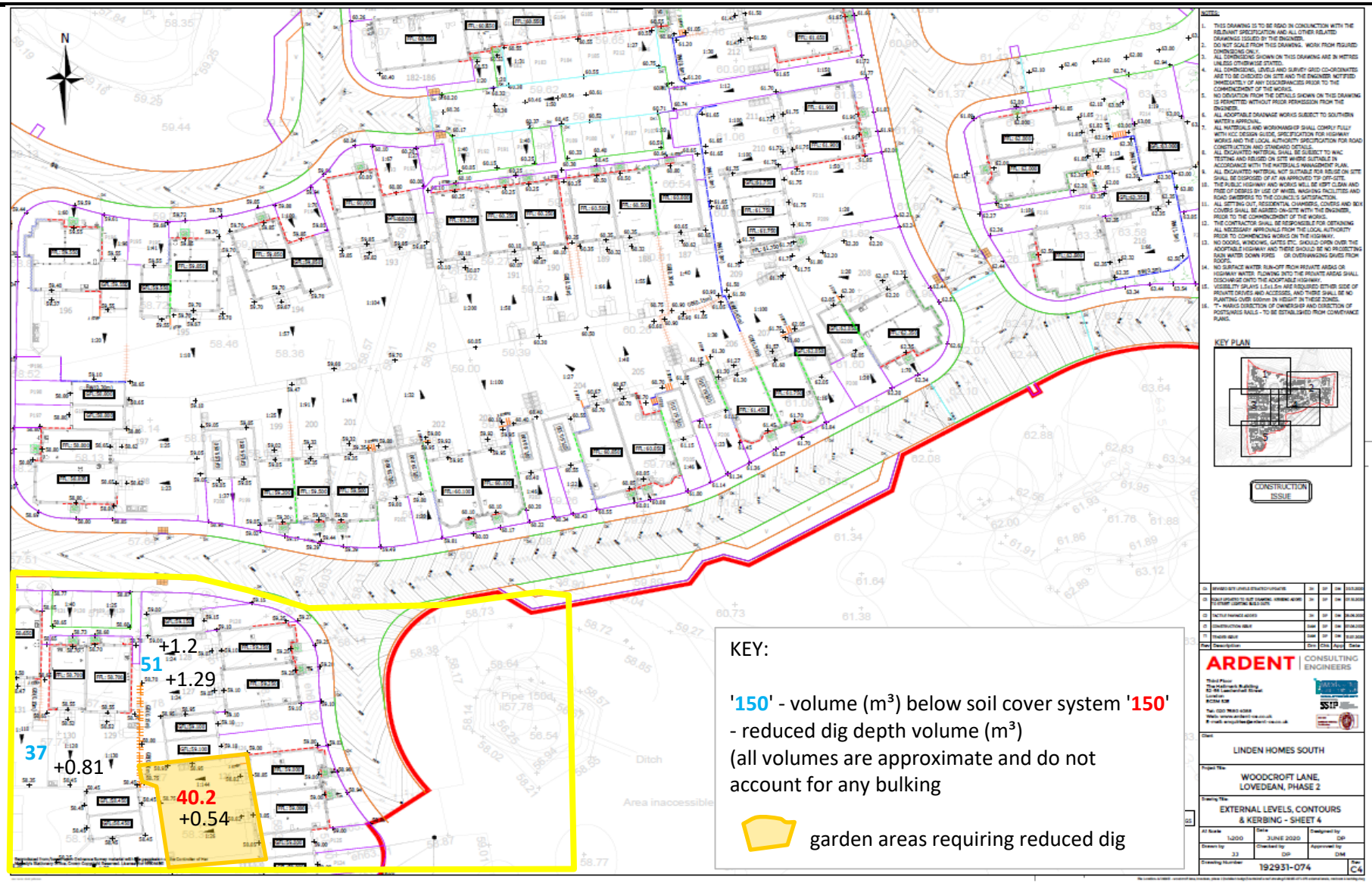
Project:	Woodcroft Farm Lovedean PO8 9QA	**Title**	Remediation Strategy Plan - Phase 2B Farmyard Volumes (RSVP-FY-v6.0)
Client:	Vistry Homes Southern		
Ref No:	GE16943 **Revision:** 0		
Drawn:	FG **Date:** 21/08/2020		
Figure:	RSVP-FY 10 **Scale:** Not To Scale		

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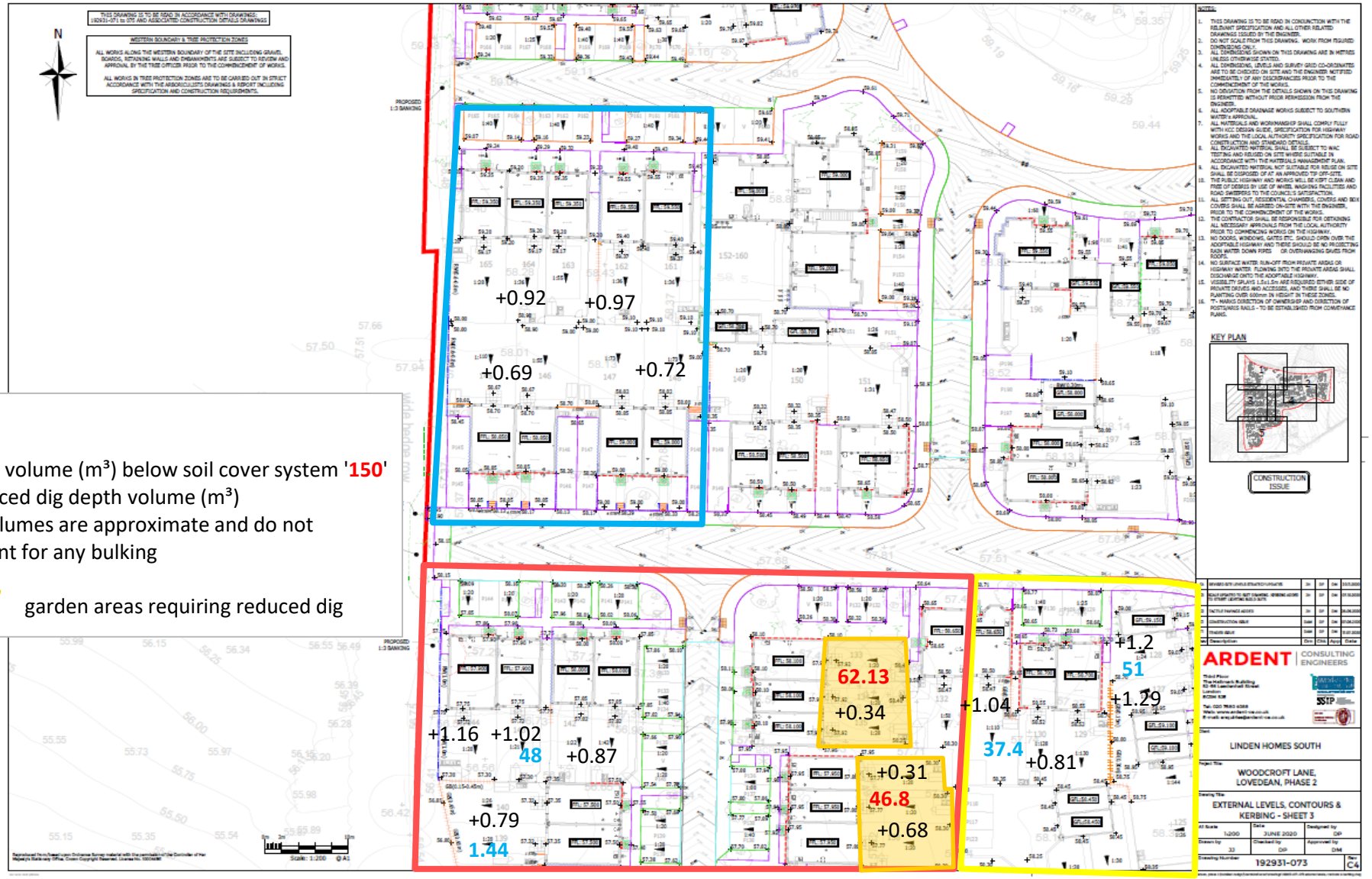
Project:	Woodcroft Farm Lovedean PO8 9QA			**Title**	Remediation Strategy Plan - Phase 3 Farmyard and Chalk Pit Volumes (RSVP-FY-v6.0)
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16943	**Revision:**	2		
Drawn:	FG	**Date:**	17/12/2020		
Figure:	RSVP-FY 11	**Scale:**	Not To Scale		



Project:	Woodcroft Farm Lovedean PO8 9QA	**Title**	Remediation Strategy Plan - Phase 3 Farmyard Volumes (RSVP-FY-v6.0)
Client:	Vistry Homes Southern		
Ref No:	GE16943	**Revision:**	2
Drawn:	FG	**Date:**	17/12/2020
Figure:	RSVP-FY 12	**Scale:**	Not To Scale

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Project:	Woodcroft Farm Lovedean PO8 9QA	**Title**	Remediation Strategy Plan - Phase 3 Horse Arena, Chalk Pit & Farmyard Volumes (RSVP-FY-v6.0)
Client:	Vistry Homes Southern		
Ref No:	GE16943	**Revision:**	2
Drawn:	FG	**Date:**	17/12/2020
Figure:	RSVP-FY F13	**Scale:**	Not To Scale

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APPENDIX A

Exploratory Hole Logs

and In-situ Test Results



Geo-Environmental
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Trial Pit Log

TrialPit No
TP205
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468335.00 - 112129.00 Level: 69.34	Date 23/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.70 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.25	69.09		Grass over, Light brown sandy, gravelly CLAY, with frequent roots (2-4mm) and rootlets TOPSOIL
	0.50 0.50 0.50	B D ES					Firm orange and grey mottled slightly sandy CLAY with frequent roots (2-4mm) and rootlets. Sand is medium (large roots (7-10mm) at 0.4m)
	1.00	D		1.20	68.14		
				1.40	67.94		Firm orange and grey mottled slightly sandy CLAY with frequent rootlets. Sand is medium
	1.70	D		1.70	67.64		Firm orange and grey mottled slightly sandy CLAY with red bandings of sandy clay and frequent rootlets. Sand is medium
							End of Pit at 1.70m

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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Project Name:	Woodcroft	Project No. GE16662	Co-ords: 468329.00 - 112033.00 Level: 66.23	Date 23/08/2017
Location:	Woodcroft Farm, Lovedean,	Dimensions (m): Depth 1.80	1.20 × 0.60	Scale 1:25
Client:	Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.25	65.98		Grass over, Light brown sandy, gravelly CLAY, with frequent flint gravels and rootlets TOPSOIL
				0.30	65.93		Stiff orange and grey mottled sandy, gravelly CLAY with abundant roots (4-7mm). Sand is medium (Large roots (50mm) at 0.3m)
	0.50	B					
	0.50	D					Firm orange and grey mottled very sandy CLAY with frequent roots (2-6mm). Sand is medium
	0.50	ES		0.60	65.63		Stiff orange and grey mottled slightly sandy CLAY with roots (2-4mm). Sand is medium
	1.00	D					
				1.20	65.03		Stiff orange and grey mottled slightly sandy CLAY with red bandings of sandy clay and roots (2-4mm). Sand is medium
	1.80	D		1.80	64.43		End of Pit at 1.80m

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No: TP207
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468244.00 - 112050.00 Level: 64.18	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 2.00 x 0.60 Depth 2.00	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	63.98		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets and occasional flint gravel TOPSOIL
	0.30	ES					Firm orange and grey mottled CLAY with occasional sandy red banding and rootlets (charcoal fragments at 1m and decaying roots)
	0.50	B					
	0.80	D					
				1.20	62.98		Firm red and grey mottled slightly sandy CLAY (charcoal fragments at 1.4m)
				1.60	62.58		Firm red and grey mottled sandy CLAY
	2.00	D		2.00	62.18		End of Pit at 2.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No: TP208
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468227.00 - 112031.00 Level: 63.03	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 2.00 x 0.60 Depth 2.00	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.15	62.88		Grass over, Dark brown clayey sand with abundant tree roots (2-5mm) and rootlets (large tree root (50mm) at 0.15m) TOPSOIL
	0.50	D					Firm orange brown sandy CLAY. Sand is fine to medium (large tree root (20mm) at 0.9m)
	1.00	D		1.10	61.93		Stiff orange slightly sandy CLAY with abundant roots (between 2mm and 8mm). Sand is medium
	1.50	D		1.50	61.53		Stiff grey and orange mottled slightly sandy CLAY with occasional roots between 2mm and 6mm (no roots from 1.7m)
	2.00	D		2.00	61.03		End of Pit at 2.00m

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP209
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468200.00 - 112025.00 Level: 61.57	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 2.00 — 2.00 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES					Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets and occasional flint gravel TOPSOIL
				0.30	61.27		Firm orange brown slightly gravelly CLAY with occasional cobbles of flint. Gravel is medium sub-angular of flint (roots (10mm) at 0.5m)
	0.50	D					
				0.80	60.77		Firm orange brown slightly sandy CLAY with frequent cobbles of flint. Sand is medium
				1.50	60.07		Firm orange and grey mottled slightly sandy CLAY. Sand is fine to medium
	2.00	D		2.00	59.57		End of Pit at 2.00m

1 2 3 4 5

Water Strikes
Depth Strike | Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP210
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468151.00 - 112030.00 Level: 58.51	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.40 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.15	58.36		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.50	B					Firm grey and orange mottled slightly sandy CLAY with rootlets. Sand is medium
	1.00	D		0.90	57.61		Firm grey and orange mottled slightly sandy CLAY. Sand is medium (charcoal fragments at 1.35m)
				1.40	57.11		End of Pit at 1.40m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP211
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468148.00 - 112098.00 Level: 58.65	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.30 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.10	58.55		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.30	58.35		Brown sandy clay with flint cobbles, chalk fragments and occasional brick fragments MADE GROUND
	0.50	D					Firm brown slightly sandy CLAY with occasional rootlets. Sand is medium
				0.80	57.85		Firm red brown sandy CLAY. Sand is medium
	1.00	D					
				1.30	57.35		End of Pit at 1.30m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP212
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468050.00 - 112055.00 Level: 57.68	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.40	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.15	57.53		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.35	57.33		Soft orange brown very sandy CLAY with occasional sub-angular flint gravel. Sand is medium
	0.50 0.50	B D					Firm orange brown CLAY with frequent flint cobbles and chalk fragments
	0.80	D					
	1.10	D		1.10	56.58		Structureless CHALK composed of: medium to coarse sub-angular white GRAVEL. Fragments are weak CIRIA Grade DM
				1.40	56.28		End of Pit at 1.40m

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468023.00 - 112009.00 Level: 56.66	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 2.20	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	56.56		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.20	56.46		Brown sandy clay with brick fragments and chalk gravel MADE GROUND
	0.50	B					Stiff light brown gravelly CLAY MADE GROUND
	0.50	D					
				0.80	55.86		Brown sandy clay with brick, concrete fragments, possible asbestos tiles, and decaying roots MADE GROUND
	1.00	ES					
				1.70	54.96		Soft light grey CLAY (decaying root (3mm) at 2m)
	2.00	D					
				2.20	54.46		End of Pit at 2.20m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468056.00 - 112002.00 Level: 57.16	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 2.00	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	57.06		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.20	56.96		Brown clay with bricks and chalk cobbles MADE GROUND
	0.50	B					Firm light brown and grey mottled CLAY, with frequent flint gravel (decaying root (4mm) at 0.5m) MADE GROUND
	0.50	D					
	0.90	ES		0.90	56.26		Dark brown clay with ashy deposits, plastic, brick fragments, chalk gravel, and wood MADE GROUND
				1.90	55.26		Firm light brown and grey mottled CLAY
	2.00	D		2.00	55.16		End of Pit at 2.00m

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Water Strikes
Depth Strike | Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP215
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468082.00 - 111995.00 Level: 57.87	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 2.90	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30	ES					Ashy deposits overlying brown gravelly clay with bricks, concrete, flint cobbles, tarmac and chalk fragments MADE GROUND
				1.00	56.87		Soft orange brown sandy re-worked CLAY MADE GROUND
				1.70	56.17		Structureless CHALK composed of: medium to coarse sub-angular white sandy GRAVEL, sand is medium and fragments are weak CIRIA Grade DM
				2.30	55.57		Structureless CHALK composed of: medium to coarse sub-angular white sandy GRAVEL, fragments are weak CIRIA Grade DM
	2.90 2.90	D D		2.90	54.97		End of Pit at 2.90m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468060.00 - 111982.00 Level: 56.78	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.00	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	56.68		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.20	56.58		Brown sandy clay with charcoal and brick fragments MADE GROUND
	0.50 0.50 0.60	B D ES					Firm light brown and grey mottled gravelly CLAY. Gravel is medium, sub angular of flint
	1.00	D		1.00	55.78		End of Pit at 1.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP217
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468063.00 - 111949.00 Level: 58.26	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.00 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.05	58.21		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.20	ES					Firm light brown and grey mottled CLAY, with frequent rootlets
	0.50	D					
	1.00	D		1.00	57.26		End of Pit at 1.00m

1 2 3 4 5

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP218
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468068.00 - 111932.00 Level: 58.52	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 0.90 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.15	ES		0.15	58.37		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.50 0.50	B D					Firm light brown and grey mottled CLAY
	1.00	D		0.90	57.62		End of Pit at 0.90m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP219
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468127.00 - 111929.00 Level: 59.42	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.00	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	59.22		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets and chalk fragments TOPSOIL
							Firm light brown and grey mottled CLAY
	0.50	D					
	1.00 1.00	D ES		1.00	58.42		End of Pit at 1.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP220
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468116.00 - 111958.00 Level: 59.41	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 2.00 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES					Grass over, dark brown gravelly clay with chalk and brick fragments MADE GROUND
				0.60	58.81		Soft brown and grey mottled CLAY
				0.80	58.61		Firm brown and grey mottled CLAY, with red sandy banding at 1.5m
	1.00 1.00	D ES					
				2.00	57.41		End of Pit at 2.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP221
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468161.00 - 111926.00 Level: 60.74	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.20 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES					Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.30	60.44		Soft orange brown slightly sandy CLAY with occasional chalk fragments and roots (1-3mm)
	0.50	D					
	0.50	ES					
				0.70	60.04		Firm orange and grey mottled slightly sandy CLAY with roots (1-3mm) and rootlets
	1.00	D					
				1.20	59.54		End of Pit at 1.20m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP222
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468221.00 - 111986.00 Level: 61.18	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.50 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.25	60.93		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.40	ES		0.50	60.68		Firm orange brown slightly sandy CLAY with occasional flint gravels and roots (1-2mm). Sandy is medium
	1.00	D		1.00	60.18		Firm orange brown slightly sandy CLAY with occasional flint gravels. Sandy is medium
				1.50	59.68		Stiff orange brown slightly sandy, slightly gravelly CLAY. Sand is medium, gravel is medium, sub-angular of flint End of Pit at 1.50m

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP223
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468126.00 - 111996.00 Level: 58.54	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.10	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.05	58.49		Concrete MADE GROUND
				0.25	58.29		Brown gravelly clay with concrete and brick fragments MADE GROUND
	0.40	ES					Soft grey and orange mottled slightly sandy CLAY
	0.50	D					
	0.50	ES					
	1.00	D					
				1.10	57.44		End of Pit at 1.10m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP224
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468077.00 - 112011.00 Level: 57.74	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 2.20 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES					Ashy deposits overlying brown gravelly clay with bricks, flint cobbles, chalk fragments and tarmac MADE GROUND
				0.70	57.04		Soft blue grey re-worked CLAY with bricks MADE GROUND
				1.60	56.14		Firm grey brown CLAY (Large flint cobble at 1.8m)
	2.20 2.20	D D		2.20	55.54		End of Pit at 2.20m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP225
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468112.00 - 111991.00 Level: 58.45	Date 23/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 0.60 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	58.30		Chippings over tarmac MADE GROUND
	0.25 0.30	ES ES					Brown gravelly clay with tarmac, brick fragments, chalk fragments, flint gravel, ash and charcoal (concrete encountered at 0.6m) MADE GROUND
				0.60	57.85		End of Pit at 0.60m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks Concrete encounted at 0.6m, pit terminated

Stability

AGS

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Trial Pit Log

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TP226
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468103.00 - 112028.00 Level: 57.24	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.10 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.20	57.04		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.40	D					Firm orange brown slightly sandy CLAY. Sand is medium
				0.80	56.44		Firm orange brown slightly sandy CLAY with frequent cobbles of flint and occasional charcoal fragments. Sand is medium
				1.10	56.14		End of Pit at 1.10m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP227
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468105.00 - 112061.00 Level: 57.53	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.00 — 0.60 × 1.20	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES					Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.25	57.28		
	0.40	D					Firm orange brown slightly sandy, slightly gravelly CLAY. Sand is medium and gravel is fine to medium, sub-angular of flint
				0.70	56.83		Firm orange brown CLAY
				0.90	56.63		
				1.00	56.53		Structureless CHALK composed of: medium to coarse sub-angular white GRAVEL. Fragments are weak CIRIA Grade DM
							End of Pit at 1.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP228
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468169.00 - 112048.00 Level: 60.35	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.70 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.15	ES		0.25	60.10		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.50	D					Soft brown orange sandy CLAY with occasional flint gravel and rootlets. Sand is medium
	1.20	D		1.10	59.25		Yellow fine medium SAND
				1.70	58.65		End of Pit at 1.70m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP229
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468030.00 - 112090.00 Level: 58.55	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.80 — 0.60 × 1.20	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Grass over, Orange brown sandy CLAY with frequent rootlets TOPSOIL
	0.60 0.60	D ES		0.60	57.95		Firm orange brown very sandy CLAY with occasional flint cobbles. Sand is medium
				0.80	57.75		Firm orange brown CLAY with occasional flint cobbles
	1.00	D					
				1.40	57.15		Firm grey slightly sandy CLAY with frequent cobbles of flint. Sand is medium
	1.50	D					
				1.80	56.75		End of Pit at 1.80m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP230
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468086.00 - 112103.00 Level: 59.34	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.20 (1.20 × 0.60)	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	59.19		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.30	ES					Soft orange brown very sandy CLAY. Sand is medium
	0.50	D					
				0.70	58.64		Firm grey and orange mottled CLAY with frequent flint cobbles
	1.10	D					
				1.20	58.14		End of Pit at 1.20m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP231
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468130.00 - 112119.00 Level: 59.64	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.20 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	59.44		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.40	ES					Soft orange brown very gravelly sandy CLAY. Gravel is medium, sub-angular of flint and sand is medium
				0.60	59.04		
	0.80	D					Firm orange brown slightly sandy CLAY with occasional rootlets. Sand is medium
				1.20	58.44		End of Pit at 1.20m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP232
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468210.00 - 112065.00 Level: 62.16	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.30 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES					Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.30	61.86		Firm orange and grey mottled slightly sandy CLAY. Sand is fine to medium
				0.70	61.46		
	0.80	D					Firm orange and grey mottled sandy CLAY. Sand is fine to medium
				1.30	60.86		End of Pit at 1.30m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP233
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468228.00 - 112111.00 Level: 64.08	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.10 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	63.78		Grass over, Brown sandy, gravelly CLAY with frequent roots and rootlets TOPSOIL
	0.40 0.40	ES ES					Firm orange brown gravelly CLAY. Gravel is medium to coarse sub-angular of flint
				0.65	63.43		Stiff grey and orange mottled CLAY with occasional red bands of sandy CLAY
	0.80	D					
				1.10	62.98		End of Pit at 1.10m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP234
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468242.00 - 112136.00 Level: 65.41	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.00 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	65.21		Grass over, Brown sandy, gravelly CLAY with frequent roots and rootlets TOPSOIL
	0.30	ES					Firm brown very gravelly CLAY. Gravel is medium to coarse sub-angular of flint
				0.45	64.96		Stiff orange and grey mottled CLAY (Large tree root (70mm) at 0.7m and tree root (4mm) at 1m)
	1.00	D		1.00	64.41		End of Pit at 1.00m

1 2 3 4 5

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP235
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468165.00 - 112133.00 Level: 60.77	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 2.20	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.25	60.52		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.50 0.50	D ES					Orange brown clayey medium SAND with occasional flint gravel
	1.00	D					
				1.80	58.97		Grey and orange fine to medium SAND
				2.20	58.57		End of Pit at 2.20m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP236
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468115.00 - 112146.00 Level: 60.93	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.70	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30	ES		0.40	60.53		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	1.00	D		1.00	59.93		Soft orange brown slightly gravelly sandy CLAY. Sand is medium and gravel is medium, sub-angular of flint
				1.70	59.23		Orange slightly clayey medium SAND End of Pit at 1.70m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP237
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468036.00 - 112164.00 Level: 62.19	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.00	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	62.04		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.40	ES					Soft orange brown very sandy CLAY. Sand is medium
	0.50	D					
				0.85	61.34		Firm orange brown CLAY
	1.00	D		1.00	61.19		End of Pit at 1.00m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP238
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468045.00 - 112137.00 Level: 60.22	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.00	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.25	59.97		Grass over, Orange brown sandy CLAY with frequent rootlets TOPSOIL
	0.50	D					Stiff orange brown CLAY with occasional cobbles of sub angular flint
	0.80	ES					
	1.00	D		1.00	59.22		End of Pit at 1.00m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No: TP239
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468112.00 - 112015.00 Level: 58.28	Date 23/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.80, 0.60 x 1.20	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES					Grass over brown sandy gravelly clay with brick, chalk fragments, concrete, and flint gravel MADE GROUND
	0.50	ES		0.50	57.78		
				0.60	57.68		Brown sandy clay with tiles of possible asbestos, chalk fragments, concrete and brick MADE GROUND
							Soft brown very sandy CLAY. Sand is medium
				1.40	56.88		Soft brown very sandy CLAY. Sand is medium
	1.50	ES					
	1.80	D		1.80	56.48		End of Pit at 1.80m

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **WS201** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords:	468236E - 111994N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level:	62.76	Scale 1:25
Client:	Grainger PLC and Linden Homes South		Dates:	05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.25	D		0.20	62.56		Grass over, brown sandy clay with flint gravel and frequent rootlets TOPSOIL
		0.25	PP	1.3kg/cm2				Firm orange and grey mottled slightly sandy CLAY. Sand is medium
		0.50	D					
		0.50	PP	0.7kg/cm2				
		0.75	D		0.80	61.96		
		0.75	PP	0.7kg/cm2				Firm orange and grey mottled slightly sandy CLAY with occasional bands of red sandy clay. Sand is medium
		1.00	D		1.10	61.66		
		1.00	PP	0.9kg/cm2				Stiff orange and grey mottled sandy CLAY. Sand is medium
		1.25	D					
		1.25	PP	1.3kg/cm2				
		1.50	D					
		1.50	PP	1.3kg/cm2				
		1.75	D					
		1.75	PP	1.7kg/cm2				
		2.00	D		2.00	60.76		
		2.00	PP	1.2kg/cm2				Firm orange very sandy CLAY. Sand is fine
		2.25	D		2.30	60.46		
		2.25	PP	0.5kg/cm2				Yellow greyish clayey fine SAND
		2.50	D					
		2.75	D					
		3.00	D		3.00	59.76		End of Borehole at 3.00m

1 2 3 4 5

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS202** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords:	468174E - 111973N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level:	60.57	Scale 1:25
Client:	Grainger PLC and Linden Homes South		Dates:	05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	60.27		Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
		0.50 0.50	D PP	1.6kg/cm2				Stiff orange, red and grey mottled slightly sandy CLAY with occasional rootlets. Sand is medium
		0.75 0.75	D PP	1.7kg/cm2				
		1.00 1.00	D PP	1.8kg/cm2				*.....Occasional roots (1-3mm)*
		1.25 1.25	D PP	2.0kg/cm2	1.10	59.47		Stiff orange and grey mottled sandy CLAY with occasional roots (2mm) and occasional red banding of sandy clay. *.....Occasional roots (2mm)*
		1.50 1.50	D PP	1.8kg/cm2				
		1.75 1.75	D PP	1.7kg/cm2				*.....Large root (5mm)*
		2.00 2.00	D PP	1.6kg/cm2				
		2.25 2.25	D PP	1.5kg/cm2				
		2.50 2.50	D PP	0.7kg/cm2	2.40	58.17		Firm orange and grey mottled very sandy CLAY with occasional roots (2-4mm) and rootlets. Sand is medium *.....Occasional roots (2-4mm)*
		2.75 2.75	D PP	0.5kg/cm2	2.80	57.77		Yellow/ Orange fine SAND
		3.00	D		3.00	57.57		End of Borehole at 3.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS203** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords: 468173E - 111996N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level: 60.57	Scale 1:25
Client:	Grainger PLC and Linden Homes South		Dates: 05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.15	60.42		Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
		0.25 0.25	D PP	1.6kg/cm2				Firm orange brown gravelly CLAY with occasional flint cobbles. Gravel is medium sub angular to sub rounded of flint
		0.50 0.50	D PP	0.9kg/cm2				
		0.75 0.75	D PP	1.1kg/cm2	0.70	59.87		Firm orange, red and grey mottled slightly sandy CLAY. Sand is fine
		1.00 1.00	D PP	0.5kg/cm2				
		1.25 1.25	D PP	1.0kg/cm2	1.10	59.47		Firm orange and grey mottled sandy CLAY. Sand is fine
		1.50 1.50	D PP	0.8kg/cm2				
		1.75 1.75	D PP	1.3kg/cm2				
		2.00 2.00	D PP	1.5kg/cm2	1.90	58.67		Firm orange and grey mottled very sandy CLAY. Sand is fine
		2.25 2.25	D PP	0.9kg/cm2				
		2.50	D		2.30	58.27		Yellow/ Orange fine SAND
		2.75	D					
		3.00	D		3.00	57.57		End of Borehole at 3.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS204** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords:	468179E - 112013N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level:	60.47	Scale 1:25
Client:	Grainger PLC and Linden Homes South		Dates:	05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	60.17		Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
		0.50 0.50	D PP	0.9kg/cm2				Stiff orange/ brown slightly sandy CLAY with frequent rootlets. Sand is fine
		0.75 0.75	D PP	1.0kg/cm2				
		1.00 1.00	D PP	1.2kg/cm2	1.10	59.37		
		1.25 1.25	D PP	1.4kg/cm2				Stiff orange/ brown slightly sandy CLAY with rare rootlets. Sand is fine
		1.50 1.50	D PP	1.5kg/cm2				
		1.75 1.75	D PP	1.3kg/cm2				
		2.00 2.00	D PP	1.0kg/cm2				
		2.25 2.25	D PP	1.1kg/cm2	2.30	58.17		Firm orange and grey mottled sandy CLAY. Sand is fine
		2.50 2.50	D PP	0.9kg/cm2				
		2.75 2.75	D PP	0.7kg/cm2				
		3.00 3.00	D PP	0.8kg/cm2	3.00	57.47		End of Borehole at 3.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS205** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords:	468150E - 112033N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level:	58.83	Scale 1:25
Client:	Grainger PLC and Linden Homes South		Dates:	05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.25	58.58		Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
		0.50	D					Brown clayey fine SAND
		0.75	D					
					0.90	57.93		
		1.00	D					Orange fine SAND
		1.25	D					
		1.50	D					
					1.70	57.13		
		1.75	D					Orange clayey fine SAND
		2.00	D		2.00	56.83		
		2.00	PP	1.1kg/cm2				Stiff grey slightly sandy CLAY. Sand is fine
		2.25	D					
		2.25	PP	1.2kg/cm2				
		2.50	D					
		2.50	PP	1.0kg/cm2				
					2.60	56.23		Soft brown slightly sandy CLAY. Sand is fine
		2.75	D					
		2.75	PP	0.4kg/cm2	2.80	56.03		Structureless CHALK composed of: medium to coarse sub-angular white sandy GRAVEL, sand is medium and fragments are weak CIRIA Grade DM
		3.00	D		3.00	55.83		End of Borehole at 3.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS206** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords: 468081E - 111960N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level: 57.22	Scale 1:25
Client:	Grainger PLC and Linden Homes South		Dates: 05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.35	56.87		Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
		0.50 0.50	D PP	1.2kg/cm2				Firm brown orange slightly sandy gravelly CLAY with frequent rootlets. Sand is fine, gravel is medium sub angular to sub rounded of flint.
		0.75 0.75	D PP	1.6kg/cm2				
		1.00 1.00	D PP	1.5kg/cm2				
		1.25 1.25	D PP	1.1kg/cm2				
		1.50 1.50	D PP	0.8kg/cm2				
		1.75 1.75	D PP	1.3kg/cm2				
					1.90	55.32		Firm brown very gravelly CLAY. Gravel is medium sub angular to sub rounded of flint.
		2.00 2.00	D PP	1.8kg/cm2				
		2.25 2.25	D PP	1.7kg/cm2				
		2.50 2.50	D PP	1.5kg/cm2				
		2.75 2.75	D PP	1.6kg/cm2				
		3.00 3.00	D PP	1.5kg/cm2	3.00	54.22		End of Borehole at 3.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS207** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords:	468075E - 111938N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level:	58.31	Scale 1:25
Client:	Grainger PLC and Linden Homes South		Dates:	05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.15	58.16		Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
		0.25 0.25	D PP	 1.0kg/cm2				Firm orange and grey mottled CLAY with frequent rootlets and occasional flint gravel
		0.50 0.50	D PP	 1.0kg/cm2				
		0.75 0.75	D PP	 0.7kg/cm2				
		1.00 1.00	D PP	 0.6kg/cm2				
								.....Decaying root (6mm)
		1.25 1.25	D PP	 0.9kg/cm2	1.20	57.11		Stiff orange and grey mottled slightly sandy CLAY with occasional rootlets. Sand is fine
					1.40	56.91		*.....Occasional roots (2mm)*
		1.50 1.50	D PP	 1.5kg/cm2				Stiff orange and grey mottled slightly sandy CLAY with occasional rootlets and red banding of sandy clay. Sand is fine
		1.75 1.75	D PP	 1.5kg/cm2				*.....Occasional roots (2mm)*
		2.00 2.00	D PP	 1.5kg/cm2				
		2.25 2.25	D PP	 1.7kg/cm2	2.20	56.11		Stiff orange and grey mottled slightly sandy CLAY with frequent rootlets. Sand is fine
		2.50 2.50	D PP	 1.5kg/cm2				
		2.75 2.75	D PP	 1.7kg/cm2	2.80	55.51		Stiff grey CLAY with chalk fragments
		3.00 3.00	D PP	 1.8kg/cm2	3.00	55.31		End of Borehole at 3.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

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Trial Pit Log

TrialPit No: TP301
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468021.00 - 112011.00 Level: 56.66	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.40 × 0.60 Depth 2.70	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	56.46		Grass over dark brown sandy gravelly CLAY with abundant roots and rootlets TOPSOIL
	0.25	ES					
	0.40	ES		0.45	56.21		Made Ground comprising dark brown soft sandy, gravelly CLAY with brick, brick fragments, tile, slate, wood, and glass. Sand is medium and gravel is fine to medium sub angular to sub rounded of flint. Made Ground comprising Fines 60%, Coarse 30%, Brick 5%, Wood 4%, Glass 0.5%, Slate 0.5% MADE GROUND
				0.90	55.76		Made Ground comprising light brown firm slightly sandy CLAY with flint gravel, brick and wood/decaying roots. Sand is medium. Made Ground comprising Fines 50%, Coarse 30%, Gravel 10%, Brick 5% and Wood 5% MADE GROUND
				1.30	55.36		Made Ground comprising light brown firm CLAY with brick, wood, rope and flint gravel. Made Ground comprising Fines 60%, Coarse 20%, Brick 5% and Wood 5%. (At 0.95m bgl large concrete slab - 1.1m x 0.2m and 0.2m thick) MADE GROUND
	1.40	ES					
							Made Ground comprising light grey and black soft CLAY with wood, chalk gravel, brick and plastic. Made Ground comprising Fines 40%, Coarse 20%, Wood 15%, Brick 15% and Plastic 10%. (At 1.4m bgl large decaying tree root - 1.2m x 0.2m) MADE GROUND
				2.70	53.96		End of Pit at 2.70m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP302
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468063.00 - 112007.00 Level: 57.59	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.40 × 0.60 Depth 2.80	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.25	57.34		Grass over Made Ground comprising clayey sandy fine to coarse sub angular to sub rounded GRAVEL with tarmac, calk fragments, brick, tile, charcoal and wood. Made Ground comprising Fines 25%, Coarse 70%, Brick 3%, Wood 2%. (At 0.1m bgl large piece of tarmac) MADE GROUND
	0.50	ES		0.40	57.19		Made Ground comprising light brown and grey with black and dark grey staining firm CLAY with brick and decaying roots. Made Ground comprising Fines 70%, Coarse 20%, Brick 5%, Wood 5% MADE GROUND
							Made Ground comprising dark grey and grey mottled firm CLAY with wood, brick, cement, plastic and chipboard. Made Ground comprising Fines 60%, Coarse 20%, Wood 10%, Brick 5%, Plastic 3% and Cement 2% MADE GROUND
	1.30	ES		1.20	56.39		Made Ground comprising brown with occasional black staining soft gravelly sandy CLAY with wood, brick, charcoal and plastic. Sand is medium and gravel is fine to medium sub angular to sub rounded of flint. Made Ground comprising Fines 60%, Coarse 20%, Wood 10%, Brick 5%, Charcoal 3% and Plastic 2% MADE GROUND
	2.70	ES		2.80	54.79		End of Pit at 2.80m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP303
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468094.00 - 111975.00 Level: 57.47	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.20 × 0.60 Depth 2.40	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	57.37		Grass over dark brown silty sandy CLAY with frequent roots and rootlets TOPSOIL
	0.30	ES		0.35	57.12		Made Ground comprising light brown soft slightly sandy CLAY with brick, glass, flint gravel, concrete, wood and possible asbestos. Sand is medium. Made Ground comprising Fines 70%, Coarse 20%, Gravel 5%, Brick 3%, Concrete 1%, Glass 0.5% and Wood 0.5% MADE GROUND
	0.70	ES		0.80	56.67		Made Ground comprising light brown firm CLAY with brick and chalk gravel, Fines 80%, Coarse 10%, Gravel 8% and Brick 2%. (Between 0.4m bgl and 0.5m bgl live tree roots) MADE GROUND
				1.20	56.27		Stiff light brown and grey mottled CLAY
				1.40	56.07		Firm light grey and brown sandy gravelly CLAY. Sand is medium and gravel is fine to medium sub angular to sub rounded of flint. (At 1.3m bgl and 1.5m bgl large flint cobbles)
				1.80	55.67		Firm brown very gravelly CLAY. Gravel is medium to coarse sub angular of chalk
	1.90	ES					White/light grey structureless very weak weather CHALK in communicated matrix CIRIA Grade DM
				2.40	55.07		End of Pit at 2.40m

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No: TP304
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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468071.00 - 111965.00 Level: 56.82	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.10 × 0.60 Depth 2.40	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	56.72		Grass over dark brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
	0.30	ES					Made Ground comprising grey and brown mottled with frequent black staining soft sandy CLAY with chalk gravel, brick, wood, plastic occasional glass and charcoal. Sand is medium. Made Ground comprising Fines 50%, Coarse 25%, Gravel 15%, Brick 5%, Wood 3%, Plastic 1.5% Other 0.5% MADE GROUND
				0.60	56.22		Made Ground comprising light brown and grey mottled with occasional black staining soft CLAY with chalk gravel and brick MADE GROUND
				1.00	55.82		Soft light brown gravelly CLAY. Gravel is fine to medium sub angular to sub rounded of flint. (Large flint cobbles at 1m bgl)
	1.20	ES		1.20	55.62		Stiff light brown and grey mottled slightly sandy CLAY. Sand is medium. (Large flint cobbles at 2.2m bgl)
				2.40	54.42		End of Pit at 2.40m

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP305
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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468037.00 - 111960.00 Level: 57.32	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): Depth 1.20, 1.80 x 0.60	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	57.12		Grass over dark brown silty sandy CLAY with abundant roots and rootlets, and occasional flint gravel TOPSOIL
	0.80	ES		0.90	56.42		Made Ground comprising firm brown and grey mottled slightly sandy CLAY with occasional flint gravel. (At 0.85m large piece of metal) MADE GROUND
	1.10	ES		1.20	56.12		Made Ground comprising light grey with occasional black staining firm slightly sandy CLAY with wood and decaying tree roots. Made Ground comprising Fines 70%, Coarse 20% and Wood/ Tree roots 10% MADE GROUND
							End of Pit at 1.20m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks Rapid groundwater ingress at 1.1m bgl. Pit abandoned due to instability caused by rapid water ingress

Stability

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Trial Pit Log

TrialPit No
TP306
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468024.00 - 112109.00 Level: 59.05	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): Depth 2.80, 0.60 x 2.10	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.30	58.75		Grass over soft brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
	0.40	ES					Firm orange/brown slightly sandy CLAY with occasional flint gravel. Sand is fine
	0.80	ES					
				1.60	57.45		Firm orange/brown and grey mottled slightly sandy CLAY. Sand is medium
				2.10	56.95		Soft orange/brown very sandy CLAY. Sand is medium
				2.60	56.45		Stiff grey CLAY with frequent sub rounded flint cobbles
				2.80	56.25		End of Pit at 2.80m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP307
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468040.00 - 112091.00 Level: 58.94	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 1.90 × 0.60 Depth 2.60	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	58.74		Grass over soft brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
	0.30	ES					Soft orange/brown slightly sandy CLAY with occasional flint gravel. Sand is fine
				0.70	58.24		
	0.80	ES					Firm grey and orange/brown mottled CLAY with frequent flint cobbles
				1.00	57.94		
	1.20	ES					Orange and yellow medium SAND
				2.10	56.84		White/cream structureless weak, highly weather CHALK in comminuted matrix with frequent sub rounded flint cobbles CIRIA Grade DM/CM
				2.60	56.34		End of Pit at 2.60m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468023.00 - 112077.00 Level: 58.20	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.00 × 0.60 Depth 2.60	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.25	57.95		Grass over soft brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
	0.30	ES					Soft brown very sandy CLAY with occasional flint gravel. Sand is fine
	0.70	ES		0.80	57.40		Stiff brown/grey gravelly CLAY. Gravel is medium to coarse sub angular to sub rounded of flint
				1.70	56.50		White/cream structureless weak, highly weather CHALK in comminuted matrix with frequent sub rounded flint cobbles CIRIA Grade DM/CM
				2.60	55.60		End of Pit at 2.60m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No: TP309
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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468042.00 - 112072.00 Level: 58.36	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 1.90 × 0.60 Depth 2.10	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	58.26		Soft brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
	0.25	ES		0.30	58.06		Made Ground comprising brown sandy CLAY with flint gravel, flint cobbles and occasional black staining MADE GROUND
	0.50	ES					Firm brown/orange slightly sandy CLAY with frequent flint cobbles. (At 0.6-0.7m bgl chalk gravel and chalk fragments. At 0.8m bgl large flint cobbles)
	0.65	ES					
				1.15	57.21		White/cream structureless weak, highly weather CHALK in comminuted matrix with frequent sub rounded flint cobbles
				2.10	56.26		End of Pit at 2.10m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP310
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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468022.00 - 112039.00 Level: 57.56	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): Depth 2.10 — 0.60 × 2.10	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.10	57.46		Soft brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
							Soft brown/orange sandy desiccated CLAY. Sand is medium
	0.50	ES		0.40	57.16		Stiff brown slightly sandy CLAY with frequent flint cobbles. Sand is medium
	1.50	ES		1.20	56.36		White/cream structureless weak, highly weather CHALK in comminuted matrix with frequent sub rounded flint cobbles CIRIA Grade DM/CM
				2.10	55.46		End of Pit at 2.10m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP311
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468040.00 - 112038.00 Level: 57.21	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 1.80 × 0.60 Depth 2.00	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.10	57.11		Soft brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
				0.30	56.91		Firm brown slightly silty sandy CLAY. Sand is fine
	0.40	ES					Firm brown slightly sandy CLAY with occasional flint gravel. Sand is fine
	0.80	ES		0.90	56.31		Firm orange/brown slightly sandy, slightly gravelly CLAY with occasional cobbles of flint. Sand is fine and gravel is fine to medium sub angular to sub rounded of flint
				1.45	55.76		White/cream structureless weak, highly weather CHALK in comminuted matrix with frequent sub rounded flint cobbles CIRIA Grade DM/CM
				2.00	55.21		End of Pit at 2.00m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP312
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468087.00 - 112016.00 Level: 57.59	Date 17/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.10 × 0.60 Depth 2.40	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.10	57.49		Made Ground comprising light brown clayey fine to coarse flint GRAVEL with brick and concrete. Made Ground comprising Fines 30%, Coarse 60%, Brick 15% and Concrete 5% MADE GROUND
							Made Ground comprising white/brown clayey fine to coarse chalk GRAVEL with brick, concrete, tarmac, and large pieces of tree. Made Ground comprising Fines 25%, Coarse 60%, Tarmac 10%, Brick 5%, Concrete 3% and Tree 2% MADE GROUND
	0.90	ES		0.80	56.79		Made Ground comprising dark brown/grey soft slightly sandy CLAY with plastic, decaying roots and flint gravel. Sand is medium. Made Ground comprising Fines 70%, Coarse 20%, Gravel 7%, Roots 2% and Plastic 1% MADE GROUND
	1.45	ES		1.40	56.19		Firm orange/brown and grey mottled slightly sandy CLAY with occasional flint gravel. Sand is medium. (Large flint cobbles at 1.5m bgl)
				2.30	55.29		White/cream structureless weak weather CHALK in communicated matrix with flint gravel CIRIA Grade DM
				2.40	55.19		End of Pit at 2.40m

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Water Strikes
Depth Strike | Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468113.00 - 112026.00 Level: 58.03	Date 17/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 1.80 × 0.60 Depth 2.50	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	57.93		Grass over dark brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
	0.25	ES		0.30	57.73		Made Ground comprising white/brown clayey fine to coarse sub angular to sub rounded chalk GRAVEL with large flint cobbles MADE GROUND
	0.50	ES					
				0.60	57.43		Brown very clayey fine to medium sub angular to sub rounded flint GRAVEL
							Firm orange/brown and grey mottled CLAY with occasional bands of orange medium SAND.
				1.50	56.53		
	1.55	ES					Orange medium SAND
				1.60	56.43		Stiff orange/brown sandy CLAY with occasional flint gravel. Sand is medium
				1.80	56.23		Orange/brown medium SAND with bands of grey firm CLAY
				2.50	55.53		End of Pit at 2.50m

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP314
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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468124.00 - 112027.00 Level: 58.20	Date 17/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.30 × 0.60 Depth 2.50	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	58.10		Grass over dark brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
	0.30	ES					Firm orange/brown slightly sandy CLAY with frequent tree roots (3mm-6mm). Sand is medium
	0.70	ES		0.60	57.60		Stiff orange/brown and slightly grey mottled CLAY with occasional bands of orange medium SAND. (Tree roots at 0.9m bgl, band of off white structureless weak weathered CHALK at 1.8m bgl)
	1.60	ES					
				2.50	55.70		End of Pit at 2.50m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP315
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468081.00 - 111991.00 Level: 57.67	Date 17/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.20 × 0.60 Depth 2.40	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES					Loose chippings over brown/grey clayey flint and chalk GRAVEL with tarmac, brick and concrete. Made Ground comprising Fines 30%, Coarse 60%, Brick 5%, Concrete 3% and Tarmac 2% MADE GROUND
				0.50	57.17		
	0.60	ES					Made Ground comprising brown and dark grey firm CLAY with brick, concrete, tree roots, flint cobbles and lead pipe. Made Ground comprising Fines 70%, Coarse 20%, Brick 5%, Other 3%, Concrete 2% MADE GROUND
				2.20	55.47		
	2.30	ES					Firm brown and grey mottled CLAY with occasional bands of orange medium SAND
				2.40	55.27		End of Pit at 2.40m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP316
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468111.00 - 111958.00 Level: 59.73	Date 17/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.30 × 0.60 Depth 2.20	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES					Grass over light brown sandy CLAY with brick, concrete, plastic and glass. Made Ground comprising Fines 40%, Coarse 20%, Brick 20%, Concrete 15% and other 5% MADE GROUND
	0.90	ES		0.80	58.93		Firm orange/brown and grey mottled slightly sandy desiccated CLAY. Sand is medium
	1.90	ES		1.80	57.93		Stiff orange/brown, grey and red mottled CLAY
				2.20	57.53		End of Pit at 2.20m

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP317
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468146.00 - 111985.00 Level: 58.97	Date 17/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 1.90 × 0.60 Depth 2.20	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.15	ES		0.15	58.82		Loose chippings over dark brown silty sandy CLAY with frequent roots and rootlets and occasional brick rubble and gravel. (Plastic drainage pipe at 0.1m bgl) MADE GROUND
				0.25	58.72		Made Ground comprising soft dark brown silty CLAY MADE GROUND
	0.65	ES					Firm orange/brown sandy CLAY. Sand is medium
	1.40	ES		1.35	57.62		Orange/brown clayey medium SAND
				1.60	57.37		Orange/brown fine to medium SAND with occasional bands of CLAY
				2.20	56.77		End of Pit at 2.20m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP318
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468116.00 - 111949.00 Level: 59.78	Date 17/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.40 × 0.60 Depth 1.90	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.15	ES		0.15	59.63		Grass over dark brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
				0.60	59.18		Made Ground comprising dark brown soft very gravelly CLAY with flint and brick. Gravel is fine to coarse of chalk. Made Ground comprising Fines 50%, Coarse 30%, Gravel 15% and Brick 5% MADE GROUND
	0.70	ES		0.80	58.98		Firm orange/brown and grey mottled CLAY with frequent flint gravel
	1.80	ES		1.90	57.88		Stiff orange/brown and grey mottled CLAY with occasional flint gravel End of Pit at 1.90m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
Trench 01
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468158.00 - 111950.00 Level: 60.98	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 3.40 × 0.60 Depth 1.00	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	60.88		Dark brown slightly sandy silty CLAY with abundant roots and rootlets TOPSOIL
							Firm grey and orange mottled slightly sandy CLAY
				1.00	59.98		End of Pit at 1.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
Trench 02
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468157.00 - 111967.00 Level: 60.20	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 6.40 × 0.60 Depth 0.70	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	60.00		Made Ground comprising dark brown sandy silty CLAY with slate, brick, gravel and wood MADE GROUND
							Firm orange/brown slightly sandy CLAY. Sand is fine
				0.70	59.50		End of Pit at 0.70m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks Private water pipe running through trench

Stability

AGS

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Trial Pit Log

TrialPit No
Trench 03
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468145.00 - 112001.00 Level: 59.01	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 4.60 × 0.60 Depth 1.00	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Made Ground comprising dark brown sandy silty CLAY with wood, gravel, brick, pipe and concrete MADE GROUND
				0.50	58.51		Firm grey sandy CLAY. Sand is fine
				1.00	58.01		End of Pit at 1.00m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
Trench 04
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468133.00 - 112020.00 Level: 58.36	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 4.80 × 0.60 Depth 0.50	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.50	57.86		Firm orange/brown sandy CLAY with occasional flint gravel. Sand is fine End of Pit at 0.50m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
Trench 05
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468164.00 - 112017.00 Level: 60.06	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 3.60 x 0.60 Depth 0.75	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	59.91		Dark brown slightly sandy silty CLAY with abundant roots and rootlets TOPSOIL
							Soft brown very sandy CLAY. Sand is fine
				0.75	59.31		End of Pit at 0.75m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
Trench 06
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468169.00 - 111997.00 Level: 59.91	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 4.20 × 0.60 Depth 0.70	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	59.76		Dark brown slightly sandy silty CLAY with abundant roots and rootlets TOPSOIL
							Soft light brown sandy CLAY. Sand is fine
				0.70	59.21		End of Pit at 0.70m

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
Trench 07
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468033.00 - 112020.00 Level: 57.17	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.80 × 0.60 Depth 1.10	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Grass over Made Ground comprising light brown clayey sandy fine to coarse sub angular to sub rounded chalk and flint GRAVEL with tarmac, flint cobbles, wood, charcoal and glass. Made Ground comprising Fines 30%, Coarse 60%, Tarmac 5%, Wood 3%and Other 2%. Sand is medium MADE GROUND
				0.50	56.67		Firm orange/ brown slightly gravelly desiccated CLAY. Gravel is fine to medium sub angular to sub rounded of flint
				1.10	56.07		End of Pit at 1.10m

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
Trench 08
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468046.00 - 112019.00 Level: 57.41	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 3.80 × 0.60 Depth 1.15	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Made Ground comprising brown and white clayey sandy fine to coarse sub angular to sub rounded chalk and flint GRAVEL with brick, tile and concrete. Sand is medium. Made Ground comprising Fines 30%, Coarse 63%, Brick 3%, Tile 2% and Concrete 2% MADE GROUND
				0.70	56.71		Soft orange/brown gravelly CLAY. Gravel is fine to medium sub angular to sub rounded of flint (Flint cobbles in base of pit)
				1.15	56.26		End of Pit at 1.15m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
Trench 09
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468068.00 - 112013.00 Level: 57.70	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.50 × 0.60 Depth 1.10	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Made Ground comprising brown and white clayey sandy fine to coarse sub angular to sub rounded chalk and flint GRAVEL with brick, tarmac and flint cobbles. Sand is medium. Made Ground comprising Fines 30%, Coarse 60%, Brick 5% and Tarmac 5% MADE GROUND
				0.70	57.00		Firm orange/ brown slightly sandy desiccated CLAY. Sand is medium
				1.10	56.60		End of Pit at 1.10m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
Trench 10
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468068.00 - 112008.00 Level: 57.60	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 4.20 × 0.60 Depth 1.20	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Made Ground comprising light brown clayey sandy fine to coarse sub angular to sub rounded flint and chalk GRAVEL with brick, concrete, tree roots, clay pipe. Sand is medium. Made Ground comprising Fines 30% Coarse 60%, Brick 4%, Concrete 4% and Other 2% MADE GROUND
				0.50	57.10		Made Ground comprising dark grey and grey mottled soft CLAY with brick, plastic, roots, wood, chalk fragments, flint gravel and tile. Made Ground comprising Fines 60%, Coarse 20%, Brick 3%, Plastic 2%, Wood/Roots 2%, Other 3% MADE GROUND
				1.20	56.40		End of Pit at 1.20m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS401** Sheet 1 of 2

Project Name:	Woodcroft	Project No. GE16943	Co-ords: 468050E - 112012N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level: 56.60	Scale 1:25
Client:	Grainger plc		Dates: 15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	56.50		Grass over brown slightly fine and medium gravelly clay with rootlets TOPSOIL
		0.60 - 0.80	ES					Brown clay with gravel of flint and red brick MADE GROUND
					0.90	55.70		Grey clay with flint gravel ash wood and red brick fragments MADE GROUND
		1.40 - 1.70	ES					
					2.00	54.60		Grey clay with chalk and flint gravel. Red brick at 3.6-3.7m bgl MADE GROUND
		2.30 - 2.60	ES					
					3.70	52.90		Brown clay with abundant fine chalk gravel and rare red brick fragments MADE GROUND
					4.80	51.80		Off white CHALK recovered as silty chalk matrix and fine gravel size weak chalk clasts CIRIA Grade
					5.00	51.60		Continued on Next Sheet

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

No water encountered

AGS

Geo-Environmental
Unit 7, Danworth Farm
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Borehole Log

Borehole No.
WS401
Sheet 2 of 2

Project Name:	Woodcroft	Project No. GE16943	Co-ords: 468050E - 112012N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level: 56.60	Scale 1:25
Client:	Grainger plc		Dates: 15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								DM/CM End of Borehole at 5.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks
No water encountered

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS402** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16943	Co-ords: 468056E - 111983N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level: 56.73	Scale 1:25
Client:	Grainger plc		Dates: 15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	56.63		Grass over brown slightly fine and medium gravelly clay with rootlets TOPSOIL
		0.50	ES					Firm to stiff brown and grey mottled silty clay MADE GROUND
					0.90	55.83		Brown and grey clay with some gravel of flint red brick and slate MADE GROUND
		1.50	ES		1.40	55.33		Grey clay with pockets of light grey sandy gravel possibly concrete fragments ash charcoal dead roots and wood fragments and abundant concrete fragments at 2.7-2.8m MADE GROUND
		2.50	ES					
					2.80	53.93		Brown and grey clay with concrete fragments MADE GROUND
		3.70 - 4.00	ES		3.70	53.03		Dark grey to black fibrous material possibly decomposed paper and wood fragments with red brick. Wood at4.2-4.5m MADE GROUND
					4.50	52.23		Off white grey and black chalk with ashy or possibly fine organic matter in matrix MADE GROUND
					5.00	51.73		End of Borehole at 5.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

No water encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS403** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16943	Co-ords: 468054E - 111977N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level: 56.75	Scale 1:25
Client:	Grainger plc		Dates: 15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	56.65		Grass over brown slightly fine and medium gravelly clay with rootlets TOPSOIL
		0.30 - 0.50	ES					Brown clay with some fine to medium flint gravel and rare red brick fragments MADE GROUND
					1.10	55.65		Grey clay with clinker ah red brick fragments and occasional wood fragments MADE GROUND
		1.50 - 1.60	ES					
					1.70	55.05		Brown and grey clay with occasional gravel of flint and chalk and occasional inclusions of possible ash ferruginous fragments and red brick MADE GROUND
		2.40 - 2.60	ES					
					3.90	52.85		Off white CHALK recovered as structureless mass with some localised orange brown staining CIRIA Grade DM
					5.00	51.75		End of Borehole at 5.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

No water encountered

AGS

Geo-Environmental
Unit 7, Danworth Farm
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Borehole Log

Borehole No.
WS404
Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16943	Co-ords: 468054E - 111963N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level: 58.00	Scale 1:25
Client:	Grainger plc		Dates: 15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20 - 0.40	ES		0.10	57.90		Grass over brown slightly fine and medium gravelly clay with rootlets TOPSOIL
								Dark grey silty gravelly clay. Gravel of flint and brick MADE GROUND
					0.60	57.40		Stiff light grey and orange brown mottled silty CLAY. Becoming very gravelly from 1.7m bgl
		1.10 - 1.30	ES					
					1.90	56.10		White CHALK composed of silt chalk matrix with moderately strong chalk clasts. Unable to penetrate beyond 2.5m bgl CIRIA Grade DM/CM
					2.80	55.20		End of Borehole at 2.80m

1 2 3 4 5

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks
No water encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS405** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16943	Co-ords:	468038E - 111989N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level:	56.56	Scale 1:25
Client:	Grainger plc		Dates:	15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.20	ES					Grass over brown slightly fine and medium gravelly clay with rootlets TOPSOIL
					0.20	56.36		
		0.40 - 0.60	ES					Brown and grey clay with occasional roots flint gravel decomposed plant remains and wood MADE GROUND
					1.00	55.56		
		1.20	ES					Grey clay with gravel of flint red brick and concrete MADE GROUND
					2.50	54.06		
								off white chalk recovered as structureless mass with some localised orange brown staining and flint CIRIA Grade DM
					3.00	53.56		End of Borehole at 3.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

No water encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS406** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16943	Co-ords:	468060E - 111985N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level:	56.79	Scale 1:25
Client:	Grainger plc		Dates:	15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20 - 0.50	ES		0.10	56.69		Grass over brown slightly fine and medium gravelly clay with rootlets TOPSOIL
								Brown and grey mottled silty clay with pockets of sandy gravel of concrete occasional red brick and ash and rare wood MADE GROUND
								Bituminous felt (roofing felt) fragments
		1.60 - 1.90	ES					
		3.10 - 3.50	ES		3.10	53.69		Dark grey to black clay with decomposed wood and plant fragments with red brick. MADE GROUND
					3.70	53.09		Off white CHALK recovered as structureless mass with some localised orange brown staining CIRIA Grade DM
					5.00	51.79		End of Borehole at 5.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

No water encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **WS407** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16943	Co-ords:	468073E - 111977N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level:	57.22	Scale 1:25
Client:	Grainger plc		Dates:	15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30 - 0.50	ES		0.10	57.12		Grass over brown slightly fine and medium gravelly clay with rootlets TOPSOIL Brown clay with some to much gravel of flint and red brick MADE GROUND	
		1.00 - 2.00	ES		1.00	56.22		Grey silty sand with much ash charcoal and red brick and occasional glass. Poor recovery MADE GROUND	1
		3.00 - 4.00	ES						2
					4.00	53.22		Off white CHALK recovered as structureless silty matrix with weal chalk clasts of fine to medium gravel size CIRIA Grade DM/CM	3
					5.00	52.22		End of Borehole at 5.00m	4
									5

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

No water encountered

AGS

Geo-Environmental

APPENDIX B

Geochemical Laboratory Results

and Statistical Assessment



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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	17-13705
Issue:	1
Date of Issue:	31/08/2017
Contact:	Fiona Goode
Customer Details:	GESL Unit 7 Danworth Farm Hurstpierpoint West SussexBN6 9GL
Quotation No:	Q14-00021
Order No:	2253
Customer Reference:	GE16662
Date Received:	24/08/2017
Date Approved:	31/08/2017
Details:	Woodcroft
Approved by:	

John Wilson, Operations Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

Sample Summary

Report No.: 17-13705

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
109920	TP201 0.10	23/08/2017	24/08/2017		
109921	TP201 0.50	23/08/2017	24/08/2017		
109922	TP202 0.10	23/08/2017	24/08/2017	Silty loam	
109923	TP202 0.50	23/08/2017	24/08/2017		
109924	TP203 0.10	23/08/2017	24/08/2017		
109925	TP203 0.50	23/08/2017	24/08/2017	Silty clayey loam	
109926	TP204 0.10	22/08/2017	24/08/2017		
109927	TP204 0.50	22/08/2017	24/08/2017	Silty clayey loam	
109928	TP205 0.10	23/08/2017	24/08/2017		
109929	TP205 0.50	23/08/2017	24/08/2017	Clayey loam	
109930	TP206 0.10	23/08/2017	24/08/2017	Silty loam	
109931	TP206 0.50	23/08/2017	24/08/2017		
109932	TP207 0.30	21/08/2017	24/08/2017	Silty clayey loam	
109933	TP208 0.10	21/08/2017	24/08/2017		
109934	TP209 0.10	21/08/2017	24/08/2017		
109935	TP210 0.10	21/08/2017	24/08/2017		
109936	TP211 0.10	22/08/2017	24/08/2017		
109937	TP212 0.20	21/08/2017	24/08/2017		
109938	TP213 1.00	21/08/2017	24/08/2017	Silty loam	
109939	TP214 0.90	21/08/2017	24/08/2017	Silty loam	
109940	TP215 0.30	22/08/2017	24/08/2017	Sandy silty loam	
109941	TP215 2.90	23/08/2017	24/08/2017	Chalk	
109942	TP216 0.60	21/08/2017	24/08/2017		
109943	TP217 0.20	21/08/2017	24/08/2017	Silty clayey loam	
109944	TP218 0.15	21/08/2017	24/08/2017		
109945	TP219 1.00	21/08/2017	24/08/2017		
109946	TP220 0.20	22/08/2017	24/08/2017	Sandy silty loam	
109947	TP220 1.00	22/08/2017	24/08/2017	Silty clayey loam	
109948	TP221 0.10	22/08/2017	24/08/2017	Silty loam	
109949	TP221 0.50	22/08/2017	24/08/2017		
109950	TP222 0.40	21/08/2017	24/08/2017	Silty clayey loam	
109951	TP223 0.40	22/08/2017	24/08/2017	Clayey loam	
109952	TP223 0.50	22/08/2017	24/08/2017	Clayey loam	
109953	TP224 0.20	22/08/2017	24/08/2017	Sandy silty loam + Chalk	
109954	TP224 2.20	22/08/2017	24/08/2017	Silty loam	
109955	TP225 0.25	23/08/2017	24/08/2017	Sandy silty loam	
109956	TP225 0.30	23/08/2017	24/08/2017	Sandy loam	
109957	TP226 0.10	21/08/2017	24/08/2017	Silty loam	c
109958	TP227 0.10	21/08/2017	24/08/2017		
109959	TP228 0.15	22/08/2017	24/08/2017	Silty loam	
109960	TP229 0.60	21/08/2017	24/08/2017	Loamy sand	
109961	TP230 0.30	21/08/2017	24/08/2017		
109962	TP231 0.40	21/08/2017	24/08/2017	Sandy silty loam	
109963	TP232 0.10	21/08/2017	24/08/2017	Silty loam	
109964	TP233 0.40	21/08/2017	24/08/2017	Silty clayey loam	
109965	TP234 0.30	21/08/2017	24/08/2017	Silty loam	
109966	TP235 0.50	22/08/2017	24/08/2017	Loamy sand	
109967	TP236 0.30	21/08/2017	24/08/2017	Loamy sand	
109968	TP237 0.40	21/08/2017	24/08/2017	Silty loam	
109969	TP238 0.80	21/08/2017	24/08/2017		
109970	TP239 0.20	23/08/2017	24/08/2017	Sandy loam	
109971	TP239 0.50	23/08/2017	24/08/2017		
109972	TP239 1.50	23/08/2017	24/08/2017	Loamy sand	
109973	TP224 0.30	22/08/2017	24/08/2017		

Results Summary

Report No.: 17-13705

	ELAB Reference	109922	109925	109927	109929	109930	109932
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP202	TP203	TP204	TP205	TP206	TP207
	Sample Depth (m)	0.10	0.50	0.50	0.50	0.10	0.30
	Sampling Date	23/08/2017	23/08/2017	22/08/2017	23/08/2017	23/08/2017	21/08/2017
Determinand	**Codes** / **Units** / **LOD**						
Metals							
Arsenic	M / mg/kg / 1	9.5	11.1	9.9	12.1	4.5	11.8
Barium	U / mg/kg / 10	34.6	48.8	45.9	17.2	16.7	30.1
Beryllium	U / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cadmium	M / mg/kg / 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	M / mg/kg / 5	34.7	60.8	53.7	30.9	12.4	38.0
Copper	M / mg/kg / 5	20.3	29.5	23.9	14.6	8.0	20.3
Lead	M / mg/kg / 5	21.0	24.3	18.8	27.0	11.5	15.3
Mercury	M / mg/kg / 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M / mg/kg / 5	18.3	21.5	22.0	8.9	5.4	9.2
Selenium	M / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium	M / mg/kg / 5	33.5	86.7	77.1	69.9	23.4	54.1
Zinc	M / mg/kg / 5	41.1	52.1	58.4	28.8	17.6	27.1
Anions							
Water Soluble Chloride	M / mg/kg / 40	48	54	45	53	< 40	70
Water Soluble Sulphate	M / g/l / 0.02	0.06	0.05	0.04	0.04	0.03	0.05
Inorganics							
Elemental Sulphur	N / mg/kg / 20	< 20	< 20	< 20	< 20	< 20	< 20
Hexavalent Chromium	N / mg/kg / 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N / mg/kg / 2	< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M / mg/kg / 1	1.1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U / % / 0.02	0.07	0.11	0.04	0.07	0.04	0.05
Water Soluble Boron	N / mg/kg / 0.5	0.8	0.5	< 0.5	0.8	< 0.5	< 0.5
Miscellaneous							
Acid Neutralisation Capacity	N / mol/kg / 0.1	n/t	n/t	n/t	n/t	n/t	n/t
Loss On Ignition (450°C)	M / % / 0.01	n/t	n/t	n/t	n/t	n/t	n/t
pH	M / pH units / 0.1	7.7	7.4	7.5	5.7	5.7	7.6
Total Organic Carbon	N / % / 0.01	0.50	0.54	0.23	0.19	0.36	0.19
Phenols							
Total Phenols	N / mg/kg / 6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons							
Naphthalene	M / mg/kg / 0.1	0.9	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	M / mg/kg / 0.1	0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1
Benzo(a)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo (b) fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo (a) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno (1,2,3-cd) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total PAH(16)	M / mg/kg / 0.4	1.1	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Total PAH (Including Coronene)	N / mg/kg / 2	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 17-13705

	ELAB Reference	109922	109925	109927	109929	109930	109932
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP202	TP203	TP204	TP205	TP206	TP207
	Sample Depth (m)	0.10	0.50	0.50	0.50	0.10	0.30
	Sampling Date	23/08/2017	23/08/2017	22/08/2017	23/08/2017	23/08/2017	21/08/2017
Determinand	**Codes** / **Units** / **LOD**						
BTEX							
Benzene	M / ug/kg / 10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M / ug/kg / 10	35.9	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M / ug/kg / 10	40.3	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M / ug/kg / 10	312	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Total BTEX	M / mg/kg / 0.01	n/t	n/t	n/t	n/t	n/t	n/t
TPH CWG							
>C5-C6 Aliphatic	N / mg/kg / 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N / mg/kg / 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N / mg/kg / 1	1.8	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N / mg/kg / 1	3.3	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N / mg/kg / 1	2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N / mg/kg / 1	1.8	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N / mg/kg / 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N / mg/kg / 0.01	0.04	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N / mg/kg / 1	9.0	< 1.0	3.2	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N / mg/kg / 1	14.4	< 1.0	5.3	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N / mg/kg / 1	3.2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aromatic	N / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N / mg/kg / 1	35.5	< 1.0	8.5	< 1.0	< 1.0	< 1.0
Total Petroleum Hydrocarbons							
Mineral Oil	U / mg/kg / 5	n/t	n/t	n/t	n/t	n/t	n/t
PCB (ICES 7 congeners)							
PCB (Total of 7 Congeners)	M / mg/kg / 0.03	n/t	n/t	n/t	n/t	n/t	n/t

Results Summary

Report No.: 17-13705

	ELAB Reference	109938	109939	109940	109941	109943	109946
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP213	TP214	TP215	TP215	TP217	TP220
	Sample Depth (m)	1.00	0.90	0.30	2.90	0.20	0.20
	Sampling Date	21/08/2017	21/08/2017	22/08/2017	23/08/2017	21/08/2017	22/08/2017
Determinand	**Codes** / **Units** / **LOD**						
Metals							
Arsenic	M / mg/kg / 1	9.0	13.8	10.4	^ 4.7	32.6	25.7
Barium	U / mg/kg / 10	61.4	72.5	162	11.5	86.2	373
Beryllium	U / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	2.5	3.0
Cadmium	M / mg/kg / 0.5	0.5	< 0.5	0.8	^ 0.6	< 0.5	1.1
Chromium	M / mg/kg / 5	18.4	36.4	26.0	^ 8.6	63.2	36.9
Copper	M / mg/kg / 5	14.7	20.4	22.0	^ 6.9	37.4	93.0
Lead	M / mg/kg / 5	62.6	56.0	44.4	^ < 5.0	24.3	170
Mercury	M / mg/kg / 0.5	< 0.5	< 0.5	< 0.5	^ < 0.5	< 0.5	< 0.5
Nickel	M / mg/kg / 5	16.7	19.4	18.0	^ 11.8	19.1	56.2
Selenium	M / mg/kg / 1	< 1.0	< 1.0	< 1.0	^ < 1.0	< 1.0	< 1.0
Vanadium	M / mg/kg / 5	27.7	59.1	32.2	^ 7.8	117	133
Zinc	M / mg/kg / 5	72.7	101	121	^ 15.9	30.3	335
Anions							
Water Soluble Chloride	M / mg/kg / 40	< 40	50	55	^ < 40	53	< 40
Water Soluble Sulphate	M / g/l / 0.02	0.03	0.30	0.16	^ 0.04	0.05	0.03
Inorganics							
Elemental Sulphur	N / mg/kg / 20	< 20	1050	< 20	< 20	< 20	< 20
Hexavalent Chromium	N / mg/kg / 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N / mg/kg / 2	< 2	8	< 2	< 2	< 2	< 2
Total Cyanide	M / mg/kg / 1	< 1.0	< 1.0	< 1.0	^ < 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U / % / 0.02	0.07	0.13	0.11	0.04	0.06	0.08
Water Soluble Boron	N / mg/kg / 0.5	0.6	1.7	0.6	< 0.5	< 0.5	1.0
Miscellaneous							
Acid Neutralisation Capacity	N / mol/kg / 0.1	n/t	n/t	n/t	n/t	n/t	n/t
Loss On Ignition (450°C)	M / % / 0.01	n/t	n/t	n/t	n/t	n/t	n/t
pH	M / pH units / 0.1	8.4	8.0	10.0	^ 8.8	8.2	8.2
Total Organic Carbon	N / % / 0.01	0.49	0.92	0.47	0.02	0.32	4.9
Phenols							
Total Phenols	N / mg/kg / 6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons							
Naphthalene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	^ < 0.1	< 0.1	0.2
Acenaphthylene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	^ < 0.1	< 0.1	< 0.1
Acenaphthene	M / mg/kg / 0.1	< 0.1	< 0.1	0.3	^ < 0.1	< 0.1	< 0.1
Fluorene	M / mg/kg / 0.1	< 0.1	< 0.1	0.3	^ < 0.1	< 0.1	< 0.1
Phenanthrene	M / mg/kg / 0.1	0.4	0.2	2.4	^ < 0.1	< 0.1	0.3
Anthracene	M / mg/kg / 0.1	0.1	< 0.1	0.9	^ < 0.1	< 0.1	< 0.1
Fluoranthene	M / mg/kg / 0.1	1.3	0.6	5.9	^ < 0.1	< 0.1	0.7
Pyrene	M / mg/kg / 0.1	1.3	0.6	5.1	^ 0.1	< 0.1	0.8
Benzo(a)anthracene	M / mg/kg / 0.1	0.8	0.3	2.9	^ < 0.1	< 0.1	0.4
Chrysene	M / mg/kg / 0.1	0.8	0.4	3.0	^ < 0.1	< 0.1	0.5
Benzo (b) fluoranthene	M / mg/kg / 0.1	1.1	< 0.1	3.0	^ < 0.1	< 0.1	0.6
Benzo(k)fluoranthene	M / mg/kg / 0.1	1.0	< 0.1	2.9	^ < 0.1	< 0.1	0.6
Benzo (a) pyrene	M / mg/kg / 0.1	1.0	0.4	3.1	^ 0.2	< 0.1	0.5
Indeno (1,2,3-cd) pyrene	M / mg/kg / 0.1	0.9	0.2	2.2	^ < 0.1	< 0.1	0.4
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	0.5	0.2	0.6	^ < 0.1	< 0.1	0.2
Benzo[g,h,i]perylene	M / mg/kg / 0.1	0.9	0.3	2.1	^ < 0.1	< 0.1	0.5
Total PAH(16)	M / mg/kg / 0.4	10.4	3.2	34.6	^ < 0.4	< 0.4	5.8
Total PAH (Including Coronene)	N / mg/kg / 2	n/t	n/t	n/t	n/t	n/t	n/t

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Results Summary

Report No.: 17-13705

			ELAB Reference	109938	109939	109940	109941	109943	109946
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP213	TP214	TP215	TP215	TP217	TP220
			Sample Depth (m)	1.00	0.90	0.30	2.90	0.20	0.20
			Sampling Date	21/08/2017	21/08/2017	22/08/2017	23/08/2017	21/08/2017	22/08/2017
Determinand	**Codes**	**Units**	**LOD**						
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0
Total BTEX	M	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	2.9	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	14.4	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	2.1	< 1.0	18.8	9.2	< 1.0	3.3
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	3.5	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	6.9	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	7.1	< 1.0	28.2	10.9	< 1.0	7.2
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	14.6	< 1.0	< 1.0	1.8
Total (>C5-C40) Ali/Aro	N	mg/kg	1	9.3	< 1.0	65.1	44.4	< 1.0	12.3
Total Petroleum Hydrocarbons									
Mineral Oil	U	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
PCB (ICES 7 congeners)									
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t	n/t	n/t	n/t	n/t

Results Summary

Report No.: 17-13705

	ELAB Reference	109947	109948	109950	109951	109952	109953
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP220	TP221	TP222	TP223	TP223	TP224
	Sample Depth (m)	1.00	0.10	0.40	0.40	0.50	0.20
	Sampling Date	22/08/2017	22/08/2017	21/08/2017	22/08/2017	22/08/2017	22/08/2017
Determinand	**Codes** / **Units** / **LOD**						
Metals							
Arsenic	M / mg/kg / 1	11.0	8.6	12.1	9.5	n/t	^ 7.8
Barium	U / mg/kg / 10	99.6	42.6	45.7	30.9	n/t	65.4
Beryllium	U / mg/kg / 1	1.2	< 1.0	< 1.0	1.0	n/t	< 1.0
Cadmium	M / mg/kg / 0.5	< 0.5	< 0.5	< 0.5	< 0.5	n/t	^ 0.5
Chromium	M / mg/kg / 5	39.5	24.2	42.3	33.0	n/t	^ 19.5
Copper	M / mg/kg / 5	21.6	26.3	20.6	19.7	n/t	^ 16.4
Lead	M / mg/kg / 5	20.1	26.5	16.9	18.1	n/t	^ 37.9
Mercury	M / mg/kg / 0.5	< 0.5	< 0.5	< 0.5	< 0.5	n/t	^ < 0.5
Nickel	M / mg/kg / 5	20.6	15.2	17.4	20.4	n/t	^ 16.4
Selenium	M / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	^ < 1.0
Vanadium	M / mg/kg / 5	74.6	37.3	62.6	41.2	n/t	^ 27.3
Zinc	M / mg/kg / 5	39.7	53.8	43.6	41.0	n/t	^ 51.1
Anions							
Water Soluble Chloride	M / mg/kg / 40	48	41	49	92	n/t	^ 167
Water Soluble Sulphate	M / g/l / 0.02	0.08	0.04	0.04	0.06	n/t	^ 0.09
Inorganics							
Elemental Sulphur	N / mg/kg / 20	< 20	< 20	< 20	< 20	n/t	< 20
Hexavalent Chromium	N / mg/kg / 0.8	< 0.8	< 0.8	< 0.8	< 0.8	n/t	< 0.8
Total Sulphide	N / mg/kg / 2	4	< 2	< 2	< 2	n/t	< 2
Total Cyanide	M / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	^ < 1.0
Acid Soluble Sulphate (SO4)	U / % / 0.02	0.07	0.06	0.05	0.06	n/t	0.07
Water Soluble Boron	N / mg/kg / 0.5	< 0.5	0.5	< 0.5	0.5	n/t	< 0.5
Miscellaneous							
Acid Neutralisation Capacity	N / mol/kg / 0.1	n/t	n/t	n/t	n/t	< 0.1	n/t
Loss On Ignition (450°C)	M / % / 0.01	n/t	n/t	n/t	n/t	2.82	n/t
pH	M / pH units / 0.1	7.3	7.7	7.5	8.3	7.7	^ 8.3
Total Organic Carbon	N / % / 0.01	0.29	0.69	0.19	0.15	0.18	0.10
Phenols							
Total Phenols	N / mg/kg / 6	< 6	< 6	< 6	< 6	n/t	< 6
Polyaromatic hydrocarbons							
Naphthalene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ < 0.1
Acenaphthylene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ < 0.1
Acenaphthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ < 0.1
Fluorene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ < 0.1
Phenanthrene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ 0.5
Anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ 0.1
Fluoranthene	M / mg/kg / 0.1	< 0.1	0.1	< 0.1	< 0.1	n/t	^ 1.0
Pyrene	M / mg/kg / 0.1	< 0.1	0.1	< 0.1	< 0.1	n/t	^ 0.9
Benzo(a)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ 0.6
Chrysene	M / mg/kg / 0.1	< 0.1	0.1	< 0.1	< 0.1	n/t	^ 0.7
Benzo (b) fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ 0.6
Benzo(k)fluoranthene	M / mg/kg / 0.1	< 0.1	0.1	< 0.1	< 0.1	n/t	^ 0.6
Benzo (a) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	0.2	< 0.1	n/t	^ 0.6
Indeno (1,2,3-cd) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	0.2	< 0.1	n/t	^ 0.6
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	0.3	< 0.1	n/t	^ 0.2
Benzo[g,h,i]perylene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ 0.5
Total PAH(16)	M / mg/kg / 0.4	< 0.4	< 0.4	0.9	< 0.4	n/t	^ 7.0
Total PAH (Including Coronene)	N / mg/kg / 2	n/t	n/t	n/t	n/t	< 2	n/t

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Results Summary

Report No.: 17-13705

			ELAB Reference	109947	109948	109950	109951	109952	109953
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP220	TP221	TP222	TP223	TP223	TP224
			Sample Depth (m)	1.00	0.10	0.40	0.40	0.50	0.20
			Sampling Date	22/08/2017	22/08/2017	21/08/2017	22/08/2017	22/08/2017	22/08/2017
Determinand	**Codes**	**Units**	**LOD**						
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	n/t	^ < 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	n/t	^ < 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	n/t	^ < 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	n/t	^ < 10.0
Total BTEX	M	mg/kg	0.01	n/t	n/t	n/t	n/t	< 0.01	n/t
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	n/t	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	n/t	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	11.3
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	5.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	n/t	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	n/t	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	1.5
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	41.2
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	28.5
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	87.5
Total Petroleum Hydrocarbons									
Mineral Oil	U	mg/kg	5	n/t	n/t	n/t	n/t	< 5	n/t
PCB (ICES 7 congeners)									
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t	n/t	n/t	< 0.03	n/t

Results Summary

Report No.: 17-13705

	ELAB Reference	109954	109955	109956	109957	109959	109960
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP224	TP225	TP225	TP226	TP228	TP229
	Sample Depth (m)	2.20	0.25	0.30	0.10	0.15	0.60
	Sampling Date	22/08/2017	23/08/2017	23/08/2017	21/08/2017	22/08/2017	21/08/2017
Determinand	**Codes** / **Units** / **LOD**						
Metals							
Arsenic	M / mg/kg / 1	6.6	13.2	n/t	11.5	10.4	38.2
Barium	U / mg/kg / 10	63.4	124	n/t	46.0	40.0	51.2
Beryllium	U / mg/kg / 1	1.1	< 1.0	n/t	< 1.0	< 1.0	1.8
Cadmium	M / mg/kg / 0.5	< 0.5	0.5	n/t	< 0.5	< 0.5	< 0.5
Chromium	M / mg/kg / 5	28.9	52.8	n/t	21.7	19.5	37.3
Copper	M / mg/kg / 5	18.4	59.3	n/t	16.1	12.2	23.7
Lead	M / mg/kg / 5	18.5	82.9	n/t	25.9	23.7	18.9
Mercury	M / mg/kg / 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5	< 0.5
Nickel	M / mg/kg / 5	30.5	43.4	n/t	24.5	19.1	52.0
Selenium	M / mg/kg / 1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	1.1
Vanadium	M / mg/kg / 5	41.5	32.9	n/t	33.8	33.8	61.2
Zinc	M / mg/kg / 5	64.4	230	n/t	64.7	50.3	98.9
Anions							
Water Soluble Chloride	M / mg/kg / 40	56	140	n/t	65	< 40	< 40
Water Soluble Sulphate	M / g/l / 0.02	0.04	0.35	n/t	0.11	0.04	0.03
Inorganics							
Elemental Sulphur	N / mg/kg / 20	< 20	< 20	n/t	< 20	< 20	< 20
Hexavalent Chromium	N / mg/kg / 0.8	< 0.8	< 0.8	n/t	< 0.8	< 0.8	< 0.8
Total Sulphide	N / mg/kg / 2	< 2	< 2	n/t	< 2	< 2	< 2
Total Cyanide	M / mg/kg / 1	1.0	1.1	n/t	2.4	1.1	< 1.0
Acid Soluble Sulphate (SO4)	U / % / 0.02	0.05	0.77	n/t	0.12	0.07	0.05
Water Soluble Boron	N / mg/kg / 0.5	< 0.5	0.7	n/t	0.6	0.7	< 0.5
Miscellaneous							
Acid Neutralisation Capacity	N / mol/kg / 0.1	n/t	n/t	0.2	n/t	n/t	n/t
Loss On Ignition (450°C)	M / % / 0.01	n/t	n/t	2.63	n/t	n/t	n/t
pH	M / pH units / 0.1	7.7	11.1	11.4	9.2	7.4	7.2
Total Organic Carbon	N / % / 0.01	0.33	0.41	0.40	1.1	0.69	0.10
Phenols							
Total Phenols	N / mg/kg / 6	< 6	< 6	n/t	c < 6	< 6	< 6
Polyaromatic hydrocarbons							
Naphthalene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	c < 0.1	< 0.1	< 0.1
Acenaphthylene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	c < 0.1	< 0.1	< 0.1
Acenaphthene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	c < 0.1	< 0.1	< 0.1
Fluorene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	c < 0.1	< 0.1	< 0.1
Phenanthrene	M / mg/kg / 0.1	< 0.1	0.4	n/t	c < 0.1	< 0.1	< 0.1
Anthracene	M / mg/kg / 0.1	< 0.1	0.1	n/t	c < 0.1	< 0.1	< 0.1
Fluoranthene	M / mg/kg / 0.1	0.2	1.2	n/t	c 0.3	< 0.1	< 0.1
Pyrene	M / mg/kg / 0.1	< 0.1	1.1	n/t	c 0.3	0.1	< 0.1
Benzo(a)anthracene	M / mg/kg / 0.1	< 0.1	0.8	n/t	c 0.2	< 0.1	< 0.1
Chrysene	M / mg/kg / 0.1	< 0.1	0.9	n/t	c 0.2	< 0.1	< 0.1
Benzo (b) fluoranthene	M / mg/kg / 0.1	< 0.1	0.9	n/t	c 0.3	< 0.1	< 0.1
Benzo(k)fluoranthene	M / mg/kg / 0.1	< 0.1	1.0	n/t	c 0.5	< 0.1	< 0.1
Benzo (a) pyrene	M / mg/kg / 0.1	< 0.1	1.0	n/t	c 0.3	< 0.1	< 0.1
Indeno (1,2,3-cd) pyrene	M / mg/kg / 0.1	< 0.1	0.8	n/t	c 0.3	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	< 0.1	0.3	n/t	c 0.3	< 0.1	< 0.1
Benzo[g,h,i]perylene	M / mg/kg / 0.1	< 0.1	0.8	n/t	c 0.2	< 0.1	< 0.1
Total PAH(16)	M / mg/kg / 0.4	< 0.4	9.4	n/t	c 3.0	< 0.4	< 0.4
Total PAH (Including Coronene)	N / mg/kg / 2	n/t	n/t	25	n/t	n/t	n/t

Results Summary

Report No.: 17-13705

			ELAB Reference	109954	109955	109956	109957	109959	109960
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP224	TP225	TP225	TP226	TP228	TP229
			Sample Depth (m)	2.20	0.25	0.30	0.10	0.15	0.60
			Sampling Date	22/08/2017	23/08/2017	23/08/2017	21/08/2017	22/08/2017	21/08/2017
Determinand	**Codes**	**Units**	**LOD**						
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	n/t	c < 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	n/t	c < 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	n/t	c < 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	n/t	c < 10.0	< 10.0	< 10.0
Total BTEX	M	mg/kg	0.01	n/t	n/t	< 0.01	n/t	n/t	n/t
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	c < 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	c < 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	6.4	n/t	c < 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	c < 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	c < 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	12.3	n/t	c 3.4	< 1.0	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	4.2	n/t	c 1.4	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	22.9	n/t	c 4.9	< 1.0	< 1.0
Total Petroleum Hydrocarbons									
Mineral Oil	U	mg/kg	5	n/t	n/t	11	n/t	n/t	n/t
PCB (ICES 7 congeners)									
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t	< 0.03	n/t	n/t	n/t

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Results Summary

Report No.: 17-13705

	ELAB Reference	109962	109963	109964	109965	109966	109967
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP231	TP232	TP233	TP234	TP235	TP236
	Sample Depth (m)	0.40	0.10	0.40	0.30	0.50	0.30
	Sampling Date	21/08/2017	21/08/2017	21/08/2017	21/08/2017	22/08/2017	21/08/2017
Determinand	**Codes** / **Units** / **LOD**						
Metals							
Arsenic	M / mg/kg / 1	33.1	5.6	n/t	6.9	14.7	30.4
Barium	U / mg/kg / 10	31.8	27.5	n/t	30.8	18.9	38.8
Beryllium	U / mg/kg / 1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	1.5
Cadmium	M / mg/kg / 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5	< 0.5
Chromium	M / mg/kg / 5	31.6	17.6	n/t	21.3	13.2	41.5
Copper	M / mg/kg / 5	17.8	12.8	n/t	12.5	8.9	22.0
Lead	M / mg/kg / 5	14.6	17.3	n/t	26.3	12.9	19.6
Mercury	M / mg/kg / 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5	< 0.5
Nickel	M / mg/kg / 5	18.9	14.3	n/t	8.2	7.2	30.2
Selenium	M / mg/kg / 1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
Vanadium	M / mg/kg / 5	63.1	26.9	n/t	33.7	27.5	84.2
Zinc	M / mg/kg / 5	38.5	38.3	n/t	37.5	25.8	71.7
Anions							
Water Soluble Chloride	M / mg/kg / 40	42	< 40	n/t	41	44	< 40
Water Soluble Sulphate	M / g/l / 0.02	0.03	0.03	n/t	0.03	0.03	< 0.02
Inorganics							
Elemental Sulphur	N / mg/kg / 20	< 20	< 20	n/t	< 20	< 20	< 20
Hexavalent Chromium	N / mg/kg / 0.8	< 0.8	< 0.8	n/t	< 0.8	< 0.8	< 0.8
Total Sulphide	N / mg/kg / 2	< 2	< 2	n/t	< 2	< 2	< 2
Total Cyanide	M / mg/kg / 1	1.1	1.3	n/t	1.6	1.8	< 1.0
Acid Soluble Sulphate (SO4)	U / % / 0.02	0.06	0.08	n/t	0.07	0.05	0.07
Water Soluble Boron	N / mg/kg / 0.5	< 0.5	0.6	n/t	1.0	< 0.5	< 0.5
Miscellaneous							
Acid Neutralisation Capacity	N / mol/kg / 0.1	n/t	n/t	< 0.1	n/t	n/t	n/t
Loss On Ignition (450°C)	M / % / 0.01	n/t	n/t	1.81	n/t	n/t	n/t
pH	M / pH units / 0.1	6.2	6.6	6.7	6.2	5.9	5.3
Total Organic Carbon	N / % / 0.01	0.30	1.4	0.15	1.4	0.14	0.10
Phenols							
Total Phenols	N / mg/kg / 6	< 6	< 6	n/t	< 6	< 6	< 6
Polyaromatic hydrocarbons							
Naphthalene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Acenaphthylene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Acenaphthene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Fluorene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Phenanthrene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Pyrene	M / mg/kg / 0.1	0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Chrysene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Benzo (b) fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Benzo (a) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Indeno (1,2,3-cd) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	0.3	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	0.2	< 0.1	< 0.1
Total PAH(16)	M / mg/kg / 0.4	< 0.4	< 0.4	n/t	0.7	< 0.4	< 0.4
Total PAH (Including Coronene)	N / mg/kg / 2	n/t	n/t	< 2	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 17-13705

			ELAB Reference	109962	109963	109964	109965	109966	109967
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP231	TP232	TP233	TP234	TP235	TP236
			Sample Depth (m)	0.40	0.10	0.40	0.30	0.50	0.30
			Sampling Date	21/08/2017	21/08/2017	21/08/2017	21/08/2017	22/08/2017	21/08/2017
Determinand	**Codes**	**Units**	**LOD**						
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	n/t	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	n/t	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	n/t	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	n/t	< 10.0	< 10.0	< 10.0
Total BTEX	M	mg/kg	0.01	n/t	n/t	< 0.01	n/t	n/t	n/t
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
Total Petroleum Hydrocarbons									
Mineral Oil	U	mg/kg	5	n/t	n/t	< 5	n/t	n/t	n/t
PCB (ICES 7 congeners)									
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t	< 0.03	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 17-13705

			ELAB Reference	109968	109970	109972
			Customer Reference			
			Sample ID			
			Sample Type	SOIL	SOIL	SOIL
			Sample Location	TP237	TP239	TP239
			Sample Depth (m)	0.40	0.20	1.50
			Sampling Date	21/08/2017	23/08/2017	23/08/2017
Determinand	**Codes**	**Units**	**LOD**			
Metals						
Arsenic	M	mg/kg	1	14.1	4.5	17.5
Barium	U	mg/kg	10	81.7	33.9	42.2
Beryllium	U	mg/kg	1	1.4	< 1.0	1.3
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	40.8	17.4	32.7
Copper	M	mg/kg	5	21.1	13.1	15.9
Lead	M	mg/kg	5	16.2	13.4	20.1
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	28.8	11.3	21.3
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0
Vanadium	M	mg/kg	5	58.3	18.4	90.2
Zinc	M	mg/kg	5	62.9	31.0	43.6
Anions						
Water Soluble Chloride	M	mg/kg	40	54	126	107
Water Soluble Sulphate	M	g/l	0.02	0.03	0.10	0.04
Inorganics						
Elemental Sulphur	N	mg/kg	20	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.04	0.04	0.10
Water Soluble Boron	N	mg/kg	0.5	< 0.5	0.5	< 0.5
Miscellaneous						
Acid Neutralisation Capacity	N	mol/kg	0.1	n/t	n/t	n/t
Loss On Ignition (450°C)	M	%	0.01	n/t	n/t	n/t
pH	M	pH units	0.1	6.6	8.8	7.9
Total Organic Carbon	N	%	0.01	0.16	0.21	0.09
Phenols						
Total Phenols	N	mg/kg	6	< 6	< 6	< 6
Polyaromatic hydrocarbons						
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	< 0.1	0.5	< 0.1
Pyrene	M	mg/kg	0.1	< 0.1	0.6	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	0.5	< 0.1
Chrysene	M	mg/kg	0.1	< 0.1	0.5	< 0.1
Benzo (b) fluoranthene	M	mg/kg	0.1	< 0.1	0.5	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	0.7	< 0.1
Benzo (a) pyrene	M	mg/kg	0.1	< 0.1	0.5	< 0.1
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	0.6	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	0.3	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	0.4	< 0.1
Total PAH(16)	M	mg/kg	0.4	< 0.4	5.2	< 0.4
Total PAH (Including Coronene)	N	mg/kg	2	n/t	n/t	n/t

Results Summary

Report No.: 17-13705

			ELAB Reference	109968	109970	109972
			Customer Reference			
			Sample ID			
			Sample Type	SOIL	SOIL	SOIL
			Sample Location	TP237	TP239	TP239
			Sample Depth (m)	0.40	0.20	1.50
			Sampling Date	21/08/2017	23/08/2017	23/08/2017
Determinand	**Codes**	**Units**	**LOD**			
BTEX						
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Total BTEX	M	mg/kg	0.01	n/t	n/t	n/t
TPH CWG						
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	4.6	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	4.6	< 1.0
Total Petroleum Hydrocarbons						
Mineral Oil	U	mg/kg	5	n/t	n/t	n/t
PCB (ICES 7 congeners)						
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t	n/t

Results Summary

Report No.: 17-13705

WAC Analysis								
Elab Ref:	109964					**Landfill Waste Acceptance Criteria Limits**		
Sample Date:	21/08/2017					**Inert Waste Landfill**	**Stable Non-reactive Hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:	TP233							
Depth (m)	0.4							
Site:	Woodcroft							
Determinand		**Code**	**Units**					
Total Organic Carbon		N	%		0.15	3	5	6
Loss on Ignition		M	%		1.8	--	--	10
Total BTEX		M	mg/kg		< 0.01	6	--	--
Total PCBs (7 congeners)		M	mg/kg		< 0.03	1	--	--
TPH Total WAC		M	mg/kg		< 5	500	--	--
Total (of 17) PAHs		N	mg/kg		< 2	100	--	--
pH		M			6.7	--	>6	--
Acid Neutralisation Capacity		N	mol/kg		< 0.1	--	To evaluate	To evaluate
Eluate Analysis			**10:1**		**10:1**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
			mg/l		**mg/kg**			
Arsenic		N	< 0.005		< 0.05	0.5	2	25
Barium		N	< 0.005		< 0.05	20	100	300
Cadmium		N	< 0.001		< 0.01	0.04	1	5
Chromium		N	< 0.005		< 0.05	0.5	10	70
Copper		N	< 0.005		< 0.05	2	50	100
Mercury		N	< 0.005		< 0.01	0.01	0.2	2
Molybdenum		N	< 0.005		< 0.05	0.5	10	30
Nickel		N	< 0.001		< 0.05	0.4	10	40
Lead		N	< 0.001		< 0.05	0.5	10	50
Antimony		N	< 0.005		< 0.05	0.06	0.7	5
Selenium		N	< 0.005		< 0.05	0.1	0.5	7
Zinc		N	< 0.005		< 0.05	4	50	200
Chloride		N	< 5		< 50	800	15000	25000
Fluoride		N	< 5		< 10	10	150	500
Sulphate		N	5		45.70	1000	20000	50000
Total Dissolved Solids		N	< 10		< 100	4000	60000	100000
Phenol Index		N	< 0.01		< 0.10	1	-	-
Dissolved Organic Carbon		N	9.780		98.00	500	800	1000
Leach Test Information								
pH		N	5.7					
Conductivity (uS/cm)		N	28					
Dry mass of test portion (g)			100.000					
Dry Matter (%)			83					
Moisture (%)			21					
Eluent Volume (ml)			952					

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ELAB cannot be held responsible for any discrepencies with current legislation

Results Summary

Report No.: 17-13705

WAC Analysis								
Elab Ref:	109956					**Landfill Waste Acceptance Criteria Limits**		
Sample Date:	23/08/2017					**Inert Waste Landfill**	**Stable Non-reactive Hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:	TP225							
Depth (m)	0.3							
Site:	Woodcroft							
Determinand		**Code**	**Units**					
Total Organic Carbon		N	%		0.40	3	5	6
Loss on Ignition		M	%		2.6	--	--	10
Total BTEX		M	mg/kg		< 0.01	6	--	--
Total PCBs (7 congeners)		M	mg/kg		< 0.03	1	--	--
TPH Total WAC		M	mg/kg		11	500	--	--
Total (of 17) PAHs		N	mg/kg		25.0	100	--	--
pH		M			11.4	--	>6	--
Acid Neutralisation Capacity		N	mol/kg		0.2	--	To evaluate	To evaluate
Eluate Analysis			**10:1**		**10:1**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
			mg/l		**mg/kg**			
Arsenic		N	0.009		0.09	0.5	2	25
Barium		N	0.010		0.10	20	100	300
Cadmium		N	< 0.001		< 0.01	0.04	1	5
Chromium		N	< 0.005		< 0.05	0.5	10	70
Copper		N	0.016		0.16	2	50	100
Mercury		N	< 0.005		< 0.01	0.01	0.2	2
Molybdenum		N	< 0.005		< 0.05	0.5	10	30
Nickel		N	0.003		< 0.05	0.4	10	40
Lead		N	0.007		0.07	0.5	10	50
Antimony		N	< 0.005		< 0.05	0.06	0.7	5
Selenium		N	< 0.005		< 0.05	0.1	0.5	7
Zinc		N	0.016		0.16	4	50	200
Chloride		N	7		67.00	800	15000	25000
Fluoride		N	< 5		< 10	10	150	500
Sulphate		N	12		120.00	1000	20000	50000
Total Dissolved Solids		N	< 10		< 100	4000	60000	100000
Phenol Index		N	< 0.01		< 0.10	1	-	-
Dissolved Organic Carbon		N	12.300		123.00	500	800	1000
Leach Test Information								
pH		N	8.3					
Conductivity (uS/cm)		N	154					
Dry mass of test portion (g)			100.000					
Dry Matter (%)			81					
Moisture (%)			24					
Eluent Volume (ml)			953					

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ELAB cannot be held responsible for any discrepencies with current legislation

Results Summary

Report No.: 17-13705

WAC Analysis								
Elab Ref:	109952					**Landfill Waste Acceptance Criteria Limits**		
Sample Date:	22/08/2017					**Inert Waste Landfill**	**Stable Non-reactive Hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:	TP223							
Depth (m)	0.5							
Site:	Woodcroft							
Determinand		**Code**	**Units**					
Total Organic Carbon		N	%		0.18	3	5	6
Loss on Ignition		M	%		2.8	--	--	10
Total BTEX		M	mg/kg		< 0.01	6	--	--
Total PCBs (7 congeners)		M	mg/kg		< 0.03	1	--	--
TPH Total WAC		M	mg/kg		< 5	500	--	--
Total (of 17) PAHs		N	mg/kg		< 2	100	--	--
pH		M			7.7	--	>6	--
Acid Neutralisation Capacity		N	mol/kg		< 0.1	--	To evaluate	To evaluate
Eluate Analysis			**10:1**		**10:1**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
			mg/l		**mg/kg**			
Arsenic		N	< 0.005		< 0.05	0.5	2	25
Barium		N	< 0.005		< 0.05	20	100	300
Cadmium		N	< 0.001		< 0.01	0.04	1	5
Chromium		N	< 0.005		< 0.05	0.5	10	70
Copper		N	0.011		0.11	2	50	100
Mercury		N	< 0.005		< 0.01	0.01	0.2	2
Molybdenum		N	< 0.005		< 0.05	0.5	10	30
Nickel		N	0.003		< 0.05	0.4	10	40
Lead		N	< 0.001		< 0.05	0.5	10	50
Antimony		N	< 0.005		< 0.05	0.06	0.7	5
Selenium		N	< 0.005		< 0.05	0.1	0.5	7
Zinc		N	< 0.005		< 0.05	4	50	200
Chloride		N	6		65.00	800	15000	25000
Fluoride		N	< 5		< 10	10	150	500
Sulphate		N	6		58.00	1000	20000	50000
Total Dissolved Solids		N	< 10		< 100	4000	60000	100000
Phenol Index		N	< 0.01		< 0.10	1	-	-
Dissolved Organic Carbon		N	54.400		544.00	**500**	800	1000
Leach Test Information								
pH		N	7.7					
Conductivity (uS/cm)		N	117					
Dry mass of test portion (g)			100.000					
Dry Matter (%)			79					
Moisture (%)			27					
Eluent Volume (ml)			931					

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ELAB cannot be held responsible for any discrepencies with current legislation

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Results Summary

Report No.: 17-13705

Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #)
in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
109922	0.10	TP202	Brown sandy soil, stones, organics	No asbestos detected	n/t	n/t	n/t	n/t
109925	0.50	TP203	Brown sandy soil, stones, organics	No asbestos detected	n/t	n/t	n/t	n/t
109927	0.50	TP204	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
109929	0.50	TP205	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
109930	0.10	TP206	Brown sandy soil, stones, organics	No asbestos detected	n/t	n/t	n/t	n/t
109932	0.30	TP207	Clay, stones	No asbestos detected	n/t	n/t	n/t	n/t
109938	1.00	TP213	Brown sandy soil, stones, concrete, brick, clinker	Chrysotile Crocidolite (asbestos cement)	2.66	Asbestos cement (2.663%)	< 0.001	2.66
109939	0.90	TP214	Brown sandy soil, stones, brick, clinker, wood	No asbestos detected	n/t	n/t	n/t	n/t
109940	0.30	TP215	Brown sandy soil, stones, concrete, brick, clinker	No asbestos detected	n/t	n/t	n/t	n/t
109941	2.90	TP215	Chalk, stones	No asbestos detected	n/t	n/t	n/t	n/t
109943	0.20	TP217	Clay, stones	No asbestos detected	n/t	n/t	n/t	n/t
109946	0.20	TP220	Brown sandy soil, stones, chalk, brick, clinker	No asbestos detected	n/t	n/t	n/t	n/t
109947	1.00	TP220	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
109948	0.10	TP221	Brown sandy soil, stones, chalk, organics	No asbestos detected	n/t	n/t	n/t	n/t
109950	0.40	TP222	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109951	0.40	TP223	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109953	0.20	TP224	Brown soil,Stones,Brick	No asbestos detected	n/t	n/t	n/t	n/t
109954	2.20	TP224	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
109955	0.25	TP225	Brown sandy soil,Stones,Brick	Chrysotile (Cement Fragment)	3.54	Cement Fragment (3.543)	< 0.001	3.54
109957	0.10	TP226	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
109959	0.15	TP228	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109960	0.60	TP229	Brown sandy soil	No asbestos detected	n/t	n/t	n/t	n/t
109962	0.40	TP231	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109963	0.10	TP232	Brown soil,stones	No asbestos detected	n/t	n/t	n/t	n/t
109965	0.30	TP234	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109966	0.50	TP235	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
109967	0.30	TP236	Brown sandy soil,stones	No asbestos detected	n/t	n/t	n/t	n/t
109968	0.40	TP237	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109970	0.20	TP239	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109971	0.50	TP239	Cement fragment	Chrysotile	25.0	Cement Fragment (25)	< 0.001	25.0
109972	1.50	TP239	Sand	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 17-13705

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Sulphide	N	As submitted sample	25/08/2017	109	Colorimetry
Hexavalent chromium	N	As submitted sample	25/08/2017	110	Colorimetry
Acid Soluble Sulphate	U	Air dried sample	29/08/2017	115	Ion Chromatography
Aqua regia extractable metals	M	Air dried sample	25/08/2017	118	ICPMS
Phenols in solids	N	As submitted sample	25/08/2017	121	HPLC
Elemental Sulphur	N	Air dried sample	25/08/2017	122	HPLC
PAH (GC-FID)	M	As submitted sample	29/08/2017	133	GC-FID
Water soluble anions	M	Air dried sample	25/08/2017	172	Ion Chromatography
Water soluble boron	N	Air dried sample	25/08/2017	202	Colorimetry
Total cyanide	M	As submitted sample	25/08/2017	204	Colorimetry
Aliphatic hydrocarbons in soil	N	As submitted sample	29/08/2017	214	GC-FID
Aliphatic/Aromatic hydrocarbons in soil	N	As submitted sample	29/08/2017	214	GC-FID
Aromatic hydrocarbons in soil	N	As submitted sample	29/08/2017	214	GC-FID
Low range Aliphatic hydrocarbons soil	N	As submitted sample	25/08/2017	214	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	25/08/2017	214	GC-MS
Asbestos identification	U	As submitted sample	25/08/2017	260	Microscopy
Leachate					
Arsenic*	N		30/08/2017	101	ICPMS
Cadmium*	N		30/08/2017	101	ICPMS
Chromium*	N		30/08/2017	101	ICPMS
Lead*	N		30/08/2017	101	ICPMS
Nickel*	N		30/08/2017	101	ICPMS
Copper*	N		30/08/2017	101	ICPMS
Zinc*	N		30/08/2017	101	ICPMS
Mercury*	N		30/08/2017	101	ICPMS
Selenium*	N		30/08/2017	101	ICPMS
Antimony	N		30/08/2017	101	ICPMS
Barium*	N		30/08/2017	101	ICPMS
Molybdenum*	N		30/08/2017	101	ICPMS
pH Value*	N		30/08/2017	113	Electrometric
Electrical Conductivity*	N		30/08/2017	136	Probe
Dissolved Organic Carbon	N		30/08/2017	102	TOC analyser
Chloride*	N		30/08/2017	131	Ion Chromatography
Fluoride*	N		30/08/2017	131	Ion Chromatography
Sulphate*	N		30/08/2017	131	Ion Chromatography
Total Dissolved Solids	N		30/08/2017	144	Gravimetric
Phenol index	N		30/08/2017	121	HPLC
WAC Solids analysis	N				
pH Value**	M	Air dried sample	29/08/2017	113	Electrometric
Total Organic Carbon	N	Air dried sample	29/08/2017	210	IR
Loss on Ignition**	M	Air dried sample	30/08/2017	129	Gravimetric
Acid Neutralization Capacity to pH 7	N	Air dried sample	29/08/2017	NEN 737	Electrometric
Total BTEX**	M	As submitted sample	25/08/2017	181	GCMS
Mineral Oil**	U	As submitted sample	29/08/2017	117	GCFID
Total PCBs (7 congeners)	M	Air dried sample	25/08/2017	120	GCMS
Total PAH (17)**	N	As submitted sample	29/08/2017	133	GCFID

Tests marked N are not UKAS accredited

Report Information

Report No.: 17-13705

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis (dried at < 30°C)
Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

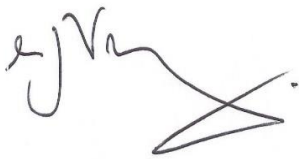
Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage

Unit A2
Windmill Road
Ponswood Industrial Estate
St Leonards on Sea
East Sussex
TN38 9BY
Telephone: (01424) 718618
Facsimile: (01424) 729911
info@elab-uk.co.uk

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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	18-17643
Issue:	1
Date of Issue:	30/05/2018
Contact:	Fiona Goode
Customer Details:	GESL Unit 7 Danworth Farm Hurstpierpoint West Sussex BN6 9GL
Quotation No:	Q14-00021
Order No:	PO-0331
Customer Reference:	GE16943
Date Received:	21/05/2018
Date Approved:	30/05/2018
Details:	Woodcroft, Waterlooville
Approved by:	

Mike Varley, Technical Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)

Sample Summary

Report No.: 18-17643

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
136637	WS401 0.60 - 0.80	15/05/2018	21/05/2018	Clayey loam	
136638	WS401 1.40 - 1.70	15/05/2018	21/05/2018	Silty loam	
136639	WS401 2.30 - 2.60	15/05/2018	21/05/2018	Silty loam	
136640	WS402 0.50	15/05/2018	21/05/2018	Silty clayey loam	
136641	WS402 1.50	15/05/2018	21/05/2018	Silty loam	
136642	WS402 2.50	15/05/2018	21/05/2018	Silty clayey loam	
136643	WS402 3.70 - 4.00	15/05/2018	21/05/2018	Silty loam	
136644	WS403 0.30 - 0.50	15/05/2018	21/05/2018	Silty clayey loam	
136645	WS403 1.50 - 1.60	15/05/2018	21/05/2018	Silty clayey loam	
136646	WS403 2.40 - 2.60	15/05/2018	21/05/2018	Silty loam	
136647	WS404 0.20 - 0.40	15/05/2018	21/05/2018	Silty loam	
136648	WS404 1.10 - 1.30	15/05/2018	21/05/2018	Clayey loam	
136649	WS405 0.00 - 0.20	15/05/2018	21/05/2018	Silty loam	
136650	WS405 0.40 - 0.60	15/05/2018	21/05/2018	Silty clayey loam	
136651	WS405 1.20	15/05/2018	21/05/2018	Silty clayey loam	
136652	WS406 0.20 - 0.50	15/05/2018	21/05/2018	Silty loam	
136653	WS406 1.60 - 1.90	15/05/2018	21/05/2018	Silty loam	
136654	WS406 3.10 - 3.50	15/05/2018	21/05/2018	Silty loam	
136655	WS407 0.30 - 0.50	15/05/2018	21/05/2018	Sandy silty loam	
136656	WS407 1.00 - 2.00	15/05/2018	21/05/2018	Silty loam	
136657	WS407 3.00 - 4.00	15/05/2018	21/05/2018	Silty loam	
136658	TP301 0.25	16/05/2018	21/05/2018	Silty loam	
136659	TP301 0.40	16/05/2018	21/05/2018	Silty loam	
136660	TP301 1.40	16/05/2018	21/05/2018	Silty loam	
136661	TP302 0.20	16/05/2018	21/05/2018	Silty loam	
136662	TP302 0.50	16/05/2018	21/05/2018	Silty clayey loam	
136663	TP302 1.30	16/05/2018	21/05/2018	Silty loam	
136664	TP302 2.70	16/05/2018	21/05/2018	Silty loam	
136665	TP303 0.30	16/05/2018	21/05/2018	Silty loam	
136666	TP303 0.70	16/05/2018	21/05/2018	Silty clayey loam	
136667	TP303 1.90	16/05/2018	21/05/2018	chalk	
136668	TP304 0.30	16/05/2018	21/05/2018	Silty loam	
136669	TP304 1.20	16/05/2018	21/05/2018	Silty clayey loam	
136670	TP305 0.80	16/05/2018	21/05/2018	Clayey loam	
136671	TP305 1.10	16/05/2018	21/05/2018	Clayey loam	
136672	TP306 0.20	15/05/2018	21/05/2018	Silty loam	
136673	TP306 0.40	15/05/2018	21/05/2018	Silty loam	
136674	TP306 0.80	15/05/2018	21/05/2018	Sandy silty loam	
136675	TP307 0.30	15/05/2018	21/05/2018	Silty loam	
136676	TP307 0.80	15/05/2018	21/05/2018	Silty clayey loam	
136677	TP307 1.20	15/05/2018	21/05/2018	Sand	
136678	TP308 0.10	15/05/2018	21/05/2018	Silty loam	
136679	TP308 0.30	15/05/2018	21/05/2018	Sandy silty loam	
136680	TP308 0.70	15/05/2018	21/05/2018	Silty clayey loam	
136681	TP309 0.25	15/05/2018	21/05/2018	Silty loam	
136682	TP309 0.50	15/05/2018	21/05/2018	Silty loam	
136683	TP309 0.65	15/05/2018	21/05/2018	Silty clayey loam	
136684	TP310 0.20	15/05/2018	21/05/2018	Silty loam	
136685	TP310 0.50	15/05/2018	21/05/2018	Silty loam	
136686	TP310 1.50	15/05/2018	21/05/2018	chalk	
136687	TP311 0.20	15/05/2018	21/05/2018	Silty loam	
136688	TP311 0.40	15/05/2018	21/05/2018	Silty loam	
136689	TP311 0.80	15/05/2018	21/05/2018	Silty loam	
136690	TP312 0.20	17/05/2018	21/05/2018	Silty loam	
136691	TP312 0.90	17/05/2018	21/05/2018	Silty loam	
136692	TP312 1.45	17/05/2018	21/05/2018	Silty clayey loam	
136693	TP313 0.25	17/05/2018	21/05/2018	Silty loam + chalk	
136694	TP313 0.50	17/05/2018	21/05/2018	Sandy silty loam	
136695	TP313 1.55	17/05/2018	21/05/2018	Loamy sand	
136696	TP314 0.30	17/05/2018	21/05/2018	Clayey loam	
136697	TP314 0.70	17/05/2018	21/05/2018	Silty loam	
136698	TP314 1.60	17/05/2018	21/05/2018	Silty clayey loam	
136699	TP315 0.20	17/05/2018	21/05/2018	Silty loam	
136700	TP315 0.60	17/05/2018	21/05/2018	Silty loam	

Sample Summary

Report No.: 18-17643

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
136701	TP315 2.30	17/05/2018	21/05/2018	Clayey loam	
136702	TP316 0.20	17/05/2018	21/05/2018	Sandy silty loam	
136703	TP316 0.90	17/05/2018	21/05/2018	Silty clayey loam	
136704	TP316 1.90	17/05/2018	21/05/2018	Clayey loam	
136705	TP317 0.15	17/05/2018	21/05/2018	Silty loam	
136706	TP317 0.65	17/05/2018	21/05/2018	Clayey loam	
136707	TP317 1.40	17/05/2018	21/05/2018	Sandy loam	
136708	TP318 0.15	17/05/2018	21/05/2018	Silty loam	
136709	TP318 0.70	17/05/2018	21/05/2018	Silty clayey loam	
136710	TP319 1.80	17/05/2018	21/05/2018	Clayey loam	

Results Summary

Report No.: 18-17643

			ELAB Reference	136637	136638	136639	136640	136641	136642
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS401	WS401	WS401	WS402	WS402	WS402
			Sample Depth (m)	0.60 - 0.80	1.40 - 1.70	2.30 - 2.60	0.50	1.50	2.50
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Barium	U	mg/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Beryllium	U	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Cadmium	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Chromium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Copper	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Lead	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Mercury	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Nickel	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Selenium	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Vanadium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Zinc	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Anions									
Water Soluble Chloride	M	mg/kg	40	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Sulphate	M	g/l	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Inorganics									
Elemental Sulphur	M	mg/kg	20	n/t	n/t	n/t	n/t	n/t	n/t
Hexavalent Chromium	N	mg/kg	0.8	n/t	n/t	n/t	n/t	n/t	n/t
Total Sulphide	N	mg/kg	2	n/t	n/t	n/t	n/t	n/t	n/t
Total Cyanide	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Acid Soluble Sulphate (SO4)	U	%	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Boron	N	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Miscellaneous									
pH	M	pH units	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total Organic Carbon	N	%	0.01	0.51	1.9	2.2	0.47	1.4	0.49
Phenols									
Total Phenols	N	mg/kg	6	n/t	n/t	n/t	n/t	n/t	n/t
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluorene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Phenanthrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(a)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Chrysene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (b) fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(k)fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (a) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Dibenzo(a,h)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo[g,h,i]perylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total PAH(16)	M	mg/kg	0.4	n/t	n/t	n/t	n/t	n/t	n/t
BTEX									
Benzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Toluene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Ethylbenzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Xylenes	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136637	136638	136639	136640	136641	136642
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS401	WS401	WS401	WS402	WS402	WS402
			Sample Depth (m)	0.60 - 0.80	1.40 - 1.70	2.30 - 2.60	0.50	1.50	2.50
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C6-C8 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C5-C7 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C7-C8 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Total (>C5-C40) Ali/Aro	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

	ELAB Reference	136643	136644	136645	136646	136647	136648
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	WS402	WS403	WS403	WS403	WS404	WS404
	Sample Depth (m)	3.70 - 4.00	0.30 - 0.50	1.50 - 1.60	2.40 - 2.60	0.20 - 0.40	1.10 - 1.30
	Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Barium	U	mg/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Beryllium	U	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Cadmium	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Chromium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Copper	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Lead	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Mercury	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Nickel	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Selenium	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Vanadium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Zinc	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Anions									
Water Soluble Chloride	M	mg/kg	40	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Sulphate	M	g/l	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Inorganics									
Elemental Sulphur	M	mg/kg	20	n/t	n/t	n/t	n/t	n/t	n/t
Hexavalent Chromium	N	mg/kg	0.8	n/t	n/t	n/t	n/t	n/t	n/t
Total Sulphide	N	mg/kg	2	n/t	n/t	n/t	n/t	n/t	n/t
Total Cyanide	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Acid Soluble Sulphate (SO4)	U	%	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Boron	N	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Miscellaneous									
pH	M	pH units	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total Organic Carbon	N	%	0.01	0.68	0.61	0.69	0.19	2.5	0.20
Phenols									
Total Phenols	N	mg/kg	6	n/t	n/t	n/t	n/t	n/t	n/t
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluorene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Phenanthrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(a)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Chrysene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (b) fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(k)fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (a) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Dibenzo(a,h)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo[g,h,i]perylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total PAH(16)	M	mg/kg	0.4	n/t	n/t	n/t	n/t	n/t	n/t
BTEX									
Benzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Toluene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Ethylbenzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Xylenes	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136643	136644	136645	136646	136647	136648
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS402	WS403	WS403	WS403	WS404	WS404
			Sample Depth (m)	3.70 - 4.00	0.30 - 0.50	1.50 - 1.60	2.40 - 2.60	0.20 - 0.40	1.10 - 1.30
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C6-C8 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C5-C7 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C7-C8 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Total (>C5-C40) Ali/Aro	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136649	136650	136651	136652	136653	136654
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS405	WS405	WS405	WS406	WS406	WS406
			Sample Depth (m)	0.00 - 0.20	0.40 - 0.60	1.20	0.20 - 0.50	1.60 - 1.90	3.10 - 3.50
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Barium	U	mg/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Beryllium	U	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Cadmium	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Chromium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Copper	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Lead	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Mercury	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Nickel	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Selenium	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Vanadium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Zinc	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Anions									
Water Soluble Chloride	M	mg/kg	40	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Sulphate	M	g/l	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Inorganics									
Elemental Sulphur	M	mg/kg	20	n/t	n/t	n/t	n/t	n/t	n/t
Hexavalent Chromium	N	mg/kg	0.8	n/t	n/t	n/t	n/t	n/t	n/t
Total Sulphide	N	mg/kg	2	n/t	n/t	n/t	n/t	n/t	n/t
Total Cyanide	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Acid Soluble Sulphate (SO4)	U	%	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Boron	N	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Miscellaneous									
pH	M	pH units	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total Organic Carbon	N	%	0.01	1.6	1.0	0.87	0.98	1.4	3.8
Phenols									
Total Phenols	N	mg/kg	6	n/t	n/t	n/t	n/t	n/t	n/t
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluorene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Phenanthrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(a)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Chrysene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (b) fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(k)fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (a) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Dibenzo(a,h)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo[g,h,i]perylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total PAH(16)	M	mg/kg	0.4	n/t	n/t	n/t	n/t	n/t	n/t
BTEX									
Benzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Toluene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Ethylbenzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Xylenes	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136649	136650	136651	136652	136653	136654
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS405	WS405	WS405	WS406	WS406	WS406
			Sample Depth (m)	0.00 - 0.20	0.40 - 0.60	1.20	0.20 - 0.50	1.60 - 1.90	3.10 - 3.50
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C6-C8 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C5-C7 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C7-C8 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Total (>C5-C40) Ali/Aro	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136655	136656	136657	136658	136659	136660
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS407	WS407	WS407	TP301	TP301	TP301
			Sample Depth (m)	0.30 - 0.50	1.00 - 2.00	3.00 - 4.00	0.25	0.40	1.40
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	16/05/2018	16/05/2018	16/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Barium	U	mg/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Beryllium	U	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Cadmium	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Chromium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Copper	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Lead	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Mercury	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Nickel	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Selenium	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Vanadium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Zinc	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Anions									
Water Soluble Chloride	M	mg/kg	40	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Sulphate	M	g/l	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Inorganics									
Elemental Sulphur	M	mg/kg	20	n/t	n/t	n/t	n/t	n/t	n/t
Hexavalent Chromium	N	mg/kg	0.8	n/t	n/t	n/t	n/t	n/t	n/t
Total Sulphide	N	mg/kg	2	n/t	n/t	n/t	n/t	n/t	n/t
Total Cyanide	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Acid Soluble Sulphate (SO4)	U	%	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Boron	N	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Miscellaneous									
pH	M	pH units	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total Organic Carbon	N	%	0.01	0.72	1.2	2.1	1.7	0.80	2.3
Phenols									
Total Phenols	N	mg/kg	6	n/t	n/t	n/t	n/t	n/t	n/t
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluorene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Phenanthrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(a)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Chrysene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (b) fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(k)fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (a) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Dibenzo(a,h)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo[g,h,i]perylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total PAH(16)	M	mg/kg	0.4	n/t	n/t	n/t	n/t	n/t	n/t
BTEX									
Benzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Toluene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Ethylbenzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Xylenes	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136655	136656	136657	136658	136659	136660
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS407	WS407	WS407	TP301	TP301	TP301
			Sample Depth (m)	0.30 - 0.50	1.00 - 2.00	3.00 - 4.00	0.25	0.40	1.40
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	16/05/2018	16/05/2018	16/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C6-C8 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C5-C7 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C7-C8 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Total (>C5-C40) Ali/Aro	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136661	136662	136663	136664	136665	136666
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP302	TP302	TP302	TP302	TP303	TP303
			Sample Depth (m)	0.20	0.50	1.30	2.70	0.30	0.70
			Sampling Date	16/05/2018	16/05/2018	16/05/2018	16/05/2018	16/05/2018	16/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Barium	U	mg/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Beryllium	U	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Cadmium	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Chromium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Copper	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Lead	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Mercury	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Nickel	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Selenium	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Vanadium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Zinc	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Anions									
Water Soluble Chloride	M	mg/kg	40	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Sulphate	M	g/l	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Inorganics									
Elemental Sulphur	M	mg/kg	20	n/t	n/t	n/t	n/t	n/t	n/t
Hexavalent Chromium	N	mg/kg	0.8	n/t	n/t	n/t	n/t	n/t	n/t
Total Sulphide	N	mg/kg	2	n/t	n/t	n/t	n/t	n/t	n/t
Total Cyanide	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Acid Soluble Sulphate (SO4)	U	%	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Boron	N	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Miscellaneous									
pH	M	pH units	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total Organic Carbon	N	%	0.01	0.48	0.77	0.64	1.3	2.1	0.21
Phenols									
Total Phenols	N	mg/kg	6	n/t	n/t	n/t	n/t	n/t	n/t
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluorene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Phenanthrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(a)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Chrysene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (b) fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(k)fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (a) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Dibenzo(a,h)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo[g,h,i]perylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total PAH(16)	M	mg/kg	0.4	n/t	n/t	n/t	n/t	n/t	n/t
BTEX									
Benzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Toluene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Ethylbenzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Xylenes	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t

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Results Summary

Report No.: 18-17643

	ELAB Reference	136661	136662	136663	136664	136665	136666
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP302	TP302	TP302	TP302	TP303	TP303
	Sample Depth (m)	0.20	0.50	1.30	2.70	0.30	0.70
	Sampling Date	16/05/2018	16/05/2018	16/05/2018	16/05/2018	16/05/2018	16/05/2018
Determinand	**Codes** / **Units** / **LOD**						
TPH CWG							
>C5-C6 Aliphatic	N / mg/kg / 0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C6-C8 Aliphatic	N / mg/kg / 0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aliphatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aliphatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aliphatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aliphatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aliphatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aliphatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C5-C7 Aromatic	N / mg/kg / 0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C7-C8 Aromatic	N / mg/kg / 0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aromatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aromatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aromatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aromatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aromatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aromatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
Total (>C5-C40) Ali/Aro	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136667	136668	136669	136670	136671	136672
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP303	TP304	TP304	TP305	TP305	TP306
			Sample Depth (m)	1.90	0.30	1.20	0.80	1.10	0.20
			Sampling Date	16/05/2018	16/05/2018	16/05/2018	16/05/2018	16/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	9.2
Barium	U	mg/kg	10	n/t	n/t	n/t	n/t	n/t	51.3
Beryllium	U	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
Cadmium	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	< 0.5
Chromium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	23.1
Copper	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	7.9
Lead	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	18.6
Mercury	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	< 0.5
Nickel	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	15.7
Selenium	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
Vanadium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	34.7
Zinc	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	55.8
Anions									
Water Soluble Chloride	M	mg/kg	40	n/t	n/t	n/t	n/t	n/t	< 40
Water Soluble Sulphate	M	g/l	0.02	n/t	n/t	n/t	n/t	n/t	< 0.02
Inorganics									
Elemental Sulphur	M	mg/kg	20	n/t	n/t	n/t	n/t	n/t	< 20
Hexavalent Chromium	N	mg/kg	0.8	n/t	n/t	n/t	n/t	n/t	< 0.8
Total Sulphide	N	mg/kg	2	n/t	n/t	n/t	n/t	n/t	< 2
Total Cyanide	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	n/t	n/t	n/t	n/t	n/t	0.07
Water Soluble Boron	N	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	0.7
Miscellaneous									
pH	M	pH units	0.1	n/t	n/t	n/t	n/t	n/t	6.1
Total Organic Carbon	N	%	0.01	0.05	2.7	0.20	0.74	1.2	0.48
Phenols									
Total Phenols	N	mg/kg	6	n/t	n/t	n/t	n/t	n/t	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Acenaphthylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Acenaphthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Fluorene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Phenanthrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Chrysene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Benzo (b) fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Benzo (a) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Total PAH(16)	M	mg/kg	0.4	n/t	n/t	n/t	n/t	n/t	< 0.4
BTEX									
Benzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	< 10.0
Toluene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	< 10.0
Ethylbenzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	< 10.0
Xylenes	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	< 10.0

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Results Summary

Report No.: 18-17643

			ELAB Reference	136667	136668	136669	136670	136671	136672
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP303	TP304	TP304	TP305	TP305	TP306
			Sample Depth (m)	1.90	0.30	1.20	0.80	1.10	0.20
			Sampling Date	16/05/2018	16/05/2018	16/05/2018	16/05/2018	16/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0

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Results Summary

Report No.: 18-17643

			ELAB Reference	136673	136674	136675	136676	136677	136678
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP306	TP306	TP307	TP307	TP307	TP308
			Sample Depth (m)	0.40	0.80	0.30	0.80	1.20	0.10
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	19.0	30.7	14.6	19.6	76.9	15.6
Barium	U	mg/kg	10	82.6	63.1	52.6	71.7	36.8	35.7
Beryllium	U	mg/kg	1	1.2	2.0	1.6	6.4	2.9	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5	0.6	0.5	2.4	1.4	< 0.5
Chromium	M	mg/kg	5	43.5	39.1	32.0	47.0	37.8	20.4
Copper	M	mg/kg	5	18.2	18.0	11.9	14.6	21.1	7.8
Lead	M	mg/kg	5	17.7	17.2	17.5	16.2	20.4	15.7
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	29.5	27.7	34.2	174	69.3	15.0
Selenium	M	mg/kg	1	< 1.0	1.4	1.1	4.1	1.8	< 1.0
Vanadium	M	mg/kg	5	59.9	80.9	50.9	59.3	188	42.2
Zinc	M	mg/kg	5	58.6	55.8	73.5	91.5	56.6	40.6
Anions									
Water Soluble Chloride	M	mg/kg	40	< 40	< 40	< 40	< 40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.03
Inorganics									
Elemental Sulphur	M	mg/kg	20	< 20	< 20	< 20	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.06	0.05	0.06	0.06	0.05	0.05
Water Soluble Boron	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Miscellaneous									
pH	M	pH units	0.1	6.8	7.0	6.5	7.6	7.4	6.9
Total Organic Carbon	N	%	0.01	0.14	0.11	0.31	0.21	0.05	0.43
Phenols									
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo (b) fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	0.1
Benzo (a) pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0

Results Summary

Report No.: 18-17643

			ELAB Reference	136673	136674	136675	136676	136677	136678
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP306	TP306	TP307	TP307	TP307	TP308
			Sample Depth (m)	0.40	0.80	0.30	0.80	1.20	0.10
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results Summary

Report No.: 18-17643

			ELAB Reference	136679	136680	136681	136682	136683	136684
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP308	TP308	TP309	TP309	TP309	TP310
			Sample Depth (m)	0.30	0.70	0.25	0.50	0.65	0.20
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	95.8	68.0	23.1	65.6	20.9	15.6
Barium	U	mg/kg	10	48.9	65.2	56.4	83.1	17.6	46.7
Beryllium	U	mg/kg	1	1.4	1.8	1.4	5.1	1.2	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	0.5	1.0	< 0.5	< 0.5
Chromium	M	mg/kg	5	43.5	59.2	29.6	62.4	11.9	21.1
Copper	M	mg/kg	5	17.2	22.1	13.3	18.3	< 5.0	10.0
Lead	M	mg/kg	5	23.5	26.2	27.1	22.2	6.3	24.2
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	22.0	80.3	45.2	190	35.3	24.4
Selenium	M	mg/kg	1	1.9	2.0	1.2	1.6	< 1.0	< 1.0
Vanadium	M	mg/kg	5	127	168	51.0	103	16.8	43.8
Zinc	M	mg/kg	5	58.6	71.0	80.7	143	27.6	60.5
Anions									
Water Soluble Chloride	M	mg/kg	40	< 40	< 40	< 40	< 40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02	< 0.02	0.02	0.11	0.06	0.03	0.03
Inorganics									
Elemental Sulphur	M	mg/kg	20	< 20	< 20	38	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.05	0.06	0.11	0.07	0.03	0.07
Water Soluble Boron	N	mg/kg	0.5	< 0.5	< 0.5	1.6	< 0.5	< 0.5	0.6
Miscellaneous									
pH	M	pH units	0.1	6.9	7.3	6.6	7.3	8.0	6.7
Total Organic Carbon	N	%	0.01	0.12	0.12	1.7	0.44	0.05	0.03
Phenols									
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo (b) fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo (a) pyrene	M	mg/kg	0.1	0.3	< 0.1	< 0.1	0.3	< 0.1	< 0.1
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4	0.4	< 0.4	< 0.4	0.4	< 0.4	< 0.4
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0

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Results Summary

Report No.: 18-17643

			ELAB Reference	136679	136680	136681	136682	136683	136684
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP308	TP308	TP309	TP309	TP309	TP310
			Sample Depth (m)	0.30	0.70	0.25	0.50	0.65	0.20
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results Summary

Report No.: 18-17643

			ELAB Reference	136685	136686	136687	136688	136689	136690
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP310	TP310	TP311	TP311	TP311	TP312
			Sample Depth (m)	0.50	1.50	0.20	0.40	0.80	0.20
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	22.7	^ 4.7	15.3	22.7	27.4	5.0
Barium	U	mg/kg	10	73.8	17.9	51.7	60.6	61.9	120
Beryllium	U	mg/kg	1	1.3	< 1.0	1.0	2.3	2.6	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5	^ 1.0	< 0.5	< 0.5	1.4	0.7
Chromium	M	mg/kg	5	44.2	^ 6.9	23.3	45.9	54.0	11.3
Copper	M	mg/kg	5	19.2	^ < 5.0	11.3	18.1	24.7	9.9
Lead	M	mg/kg	5	21.8	^ < 5.0	27.6	22.1	17.2	16.0
Mercury	M	mg/kg	0.5	< 0.5	^ < 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	32.0	^ 13.9	29.3	66.7	200	14.3
Selenium	M	mg/kg	1	1.0	^ < 1.0	< 1.0	1.1	2.1	< 1.0
Vanadium	M	mg/kg	5	80.9	^ 9.8	46.8	75.9	66.1	16.3
Zinc	M	mg/kg	5	68.7	^ 21.5	64.1	104	97.9	45.8
Anions									
Water Soluble Chloride	M	mg/kg	40	< 40	^ < 40	< 40	< 40	< 40	103
Water Soluble Sulphate	M	g/l	0.02	0.02	^ < 0.02	0.04	0.05	0.02	0.10
Inorganics									
Elemental Sulphur	M	mg/kg	20	< 20	^ < 20	< 20	22	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	^ < 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.08	0.09	0.08	0.07	0.07	0.07
Water Soluble Boron	N	mg/kg	0.5	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5
Miscellaneous									
pH	M	pH units	0.1	6.7	^ 8.6	7.0	7.2	7.3	8.2
Total Organic Carbon	N	%	0.01	0.15	0.03	0.75	0.27	0.22	0.56
Phenols									
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	0.4
Anthracene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	0.2
Fluoranthene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	1.4
Pyrene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	1.4
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	1.3
Chrysene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	1.3
Benzo (b) fluoranthene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	1.7
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	^ < 0.1	0.2	< 0.1	< 0.1	2.1
Benzo (a) pyrene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	0.2	< 0.1	1.8
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	1.4
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	0.3
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	2.1
Total PAH(16)	M	mg/kg	0.4	< 0.4	^ < 0.4	< 0.4	< 0.4	< 0.4	15.5
BTEX									
Benzene	M	ug/kg	10	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0

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Results Summary

Report No.: 18-17643

			ELAB Reference	136685	136686	136687	136688	136689	136690
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP310	TP310	TP311	TP311	TP311	TP312
			Sample Depth (m)	0.50	1.50	0.20	0.40	0.80	0.20
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	3.1
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	135
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	9.3
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	4.2
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	136
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	17.1
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	304

Results Summary

Report No.: 18-17643

				ELAB Reference	136691	136692	136693	136694	136695	136696
				Customer Reference						
				Sample ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Location	TP312	TP312	TP313	TP313	TP313	TP314
				Sample Depth (m)	0.90	1.45	0.25	0.50	1.55	0.30
				Sampling Date	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**							
Metals										
Arsenic	M	mg/kg	1		11.2	20.3	^ 5.1	17.1	34.2	11.5
Barium	U	mg/kg	10		66.4	54.9	28.0	19.2	38.9	40.8
Beryllium	U	mg/kg	1		< 1.0	2.9	< 1.0	< 1.0	1.5	< 1.0
Cadmium	M	mg/kg	0.5		0.6	0.7	^ 0.6	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5		21.4	39.6	^ 10.2	14.5	20.4	34.0
Copper	M	mg/kg	5		18.5	23.8	^ 8.8	7.9	15.2	13.5
Lead	M	mg/kg	5		61.9	25.3	^ 12.3	14.1	20.5	17.3
Mercury	M	mg/kg	0.5		< 0.5	< 0.5	^ < 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5		29.3	93.1	^ 10.7	15.1	26.9	13.7
Selenium	M	mg/kg	1		1.1	1.8	^ < 1.0	< 1.0	< 1.0	< 1.0
Vanadium	M	mg/kg	5		39.2	64.6	^ 17.0	35.1	43.5	54.1
Zinc	M	mg/kg	5		129	136	^ 32.0	28.5	37.6	31.2
Anions										
Water Soluble Chloride	M	mg/kg	40		124	131	^ < 40	< 40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02		0.05	0.04	^ < 0.02	< 0.02	< 0.02	< 0.02
Inorganics										
Elemental Sulphur	M	mg/kg	20		< 20	< 20	^ < 20	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8		< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2		< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1		1.1	< 1.0	^ 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02		0.09	0.09	0.06	0.03	0.06	0.06
Water Soluble Boron	N	mg/kg	0.5		2.8	0.5	< 0.5	< 0.5	< 0.5	0.8
Miscellaneous										
pH	M	pH units	0.1		8.3	7.8	^ 8.3	8.1	8.1	7.7
Total Organic Carbon	N	%	0.01		2.6	0.42	0.28	0.12	0.08	0.24
Phenols										
Total Phenols	N	mg/kg	6		< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons										
Naphthalene	M	mg/kg	0.1		< 0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1		< 0.1	< 0.1	^ 0.2	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1		< 0.1	< 0.1	^ < 0.1	0.2	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1		< 0.1	< 0.1	^ < 0.1	0.2	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1		< 0.1	< 0.1	^ < 0.1	1.8	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1		< 0.1	< 0.1	^ 0.1	0.6	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1		0.1	< 0.1	^ 0.6	1.8	< 0.1	< 0.1
Pyrene	M	mg/kg	0.1		0.1	< 0.1	^ 0.6	1.5	< 0.1	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1		< 0.1	< 0.1	^ 0.9	0.8	< 0.1	< 0.1
Chrysene	M	mg/kg	0.1		< 0.1	< 0.1	^ 0.8	0.8	< 0.1	< 0.1
Benzo (b) fluoranthene	M	mg/kg	0.1		0.2	< 0.1	^ 1.1	0.5	< 0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1		0.3	0.3	^ 1.5	0.8	< 0.1	< 0.1
Benzo (a) pyrene	M	mg/kg	0.1		0.1	< 0.1	^ 1.2	0.7	< 0.1	0.2
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1		< 0.1	< 0.1	^ 1.2	0.4	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1		< 0.1	< 0.1	^ 0.3	0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1		< 0.1	0.1	^ 1.3	0.3	< 0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4		0.9	0.4	^ 9.9	10.5	< 0.4	< 0.4
BTEX										
Benzene	M	ug/kg	10		< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10		< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10		< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10		< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0

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Results Summary

Report No.: 18-17643

			ELAB Reference	136691	136692	136693	136694	136695	136696
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP312	TP312	TP313	TP313	TP313	TP314
			Sample Depth (m)	0.90	1.45	0.25	0.50	1.55	0.30
			Sampling Date	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	1.7	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	7.1	< 1.0	< 1.0	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	1.6	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	10.3	< 1.0	< 1.0	< 1.0

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Results Summary

Report No.: 18-17643

			ELAB Reference	136697	136698	136699	136700	136701	136702
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP314	TP314	TP315	TP315	TP315	TP316
			Sample Depth (m)	0.70	1.60	0.20	0.60	2.30	0.20
			Sampling Date	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	10.6	243	15.5	11.0	8.7	11.1
Barium	U	mg/kg	10	38.3	90.8	359	85.8	305	257
Beryllium	U	mg/kg	1	< 1.0	3.7	< 1.0	< 1.0	2.1	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5	3.5	0.7	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	19.3	37.4	15.5	30.8	59.1	23.7
Copper	M	mg/kg	5	7.8	24.4	30.2	13.3	25.7	23.2
Lead	M	mg/kg	5	14.8	28.5	220	64.6	27.2	146
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	11.9	271	16.1	15.0	25.3	15.5
Selenium	M	mg/kg	1	< 1.0	1.1	< 1.0	< 1.0	1.1	< 1.0
Vanadium	M	mg/kg	5	35.8	69.2	23.7	52.0	101	38.4
Zinc	M	mg/kg	5	36.9	139	91.1	58.2	62.5	107
Anions									
Water Soluble Chloride	M	mg/kg	40	< 40	< 40	< 40	< 40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02	< 0.02	0.05	0.03	0.06	< 0.02	0.05
Inorganics									
Elemental Sulphur	M	mg/kg	20	< 20	< 20	< 20	188	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.05	0.07	0.08	0.09	0.07	0.11
Water Soluble Boron	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	1.1	0.6	0.7
Miscellaneous									
pH	M	pH units	0.1	7.4	7.5	9.1	7.9	6.2	9.3
Total Organic Carbon	N	%	0.01	0.21	0.11	0.88	1.1	0.35	0.70
Phenols									
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	0.3	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1	1.9	< 0.1	< 0.1	0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	0.7	< 0.1	< 0.1	0.3
Fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	3.6	< 0.1	< 0.1	0.7
Pyrene	M	mg/kg	0.1	< 0.1	< 0.1	3.3	< 0.1	< 0.1	0.6
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	2.1	< 0.1	< 0.1	0.4
Chrysene	M	mg/kg	0.1	< 0.1	< 0.1	2.3	< 0.1	0.1	0.4
Benzo (b) fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	3.1	0.3	0.1	0.6
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	2.5	< 0.1	< 0.1	0.4
Benzo (a) pyrene	M	mg/kg	0.1	0.1	0.1	2.7	< 0.1	0.3	0.3
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	< 0.1	2.3	< 0.1	< 0.1	0.3
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	0.5	< 0.1	< 0.1	0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	< 0.1	3.0	0.1	< 0.1	0.4
Total PAH(16)	M	mg/kg	0.4	< 0.4	< 0.4	28.7	0.6	0.6	4.7
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136697	136698	136699	136700	136701	136702
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP314	TP314	TP315	TP315	TP315	TP316
			Sample Depth (m)	0.70	1.60	0.20	0.60	2.30	0.20
			Sampling Date	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	2.7	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	39.7	< 1.0	< 1.0	8.1
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	9.3	< 1.0	< 1.0	1.4
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	2.3	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	14.8	< 1.0	< 1.0	1.3
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	131	1.3	< 1.0	15.1
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	41.1	< 1.0	< 1.0	6.5
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	241	1.3	< 1.0	32.4

Results Summary

Report No.: 18-17643

			ELAB Reference	136703	136704	136705	136706	136707	136708
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP316	TP316	TP317	TP317	TP317	TP318
			Sample Depth (m)	0.90	1.90	0.15	0.65	1.40	0.15
			Sampling Date	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	10.1	4.8	16.3	11.4	5.7	9.7
Barium	U	mg/kg	10	75.6	76.8	180	36.7	28.2	169
Beryllium	U	mg/kg	1	< 1.0	1.7	1.4	6.9	1.4	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	0.6	5.2	< 0.5	0.7
Chromium	M	mg/kg	5	35.8	28.4	28.9	35.0	24.1	20.3
Copper	M	mg/kg	5	14.8	11.3	60.8	21.3	17.7	30.0
Lead	M	mg/kg	5	36.7	13.4	165	22.3	15.7	104
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	12.8	20.2	27.2	33.1	26.1	15.5
Selenium	M	mg/kg	1	< 1.0	< 1.0	1.4	1.1	< 1.0	< 1.0
Vanadium	M	mg/kg	5	64.1	47.5	49.0	49.9	39.1	34.5
Zinc	M	mg/kg	5	47.4	27.1	235	59.5	48.0	159
Anions									
Water Soluble Chloride	M	mg/kg	40	< 40	< 40	< 40	< 40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02	0.05	0.08	< 0.02	< 0.02	< 0.02	0.03
Inorganics									
Elemental Sulphur	M	mg/kg	20	< 20	< 20	< 20	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	1.2	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.08	0.07	0.08	0.05	0.06	0.07
Water Soluble Boron	N	mg/kg	0.5	0.8	0.7	1.3	0.7	< 0.5	0.7
Miscellaneous									
pH	M	pH units	0.1	8.1	5.5	7.6	7.9	7.4	8.5
Total Organic Carbon	N	%	0.01	0.60	0.06	2.9	0.32	0.08	1.9
Phenols									
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1
Chrysene	M	mg/kg	0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	0.2
Benzo (b) fluoranthene	M	mg/kg	0.1	0.1	0.1	0.1	< 0.1	< 0.1	0.4
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	0.3
Benzo (a) pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Total PAH(16)	M	mg/kg	0.4	< 0.4	< 0.4	0.7	< 0.4	< 0.4	2.1
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0

Results Summary

Report No.: 18-17643

			ELAB Reference	136703	136704	136705	136706	136707	136708
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP316	TP316	TP317	TP317	TP317	TP318
			Sample Depth (m)	0.90	1.90	0.15	0.65	1.40	0.15
			Sampling Date	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.7
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	3.7
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.6
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	7.0

Results Summary

Report No.: 18-17643

			ELAB Reference	136709	136710
			Customer Reference		
			Sample ID		
			Sample Type	SOIL	SOIL
			Sample Location	TP318	TP319
			Sample Depth (m)	0.70	1.80
			Sampling Date	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**		
Metals					
Arsenic	M	mg/kg	1	10.5	17.2
Barium	U	mg/kg	10	35.0	49.9
Beryllium	U	mg/kg	1	< 1.0	1.5
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	34.6	58.1
Copper	M	mg/kg	5	16.1	32.6
Lead	M	mg/kg	5	15.1	27.9
Mercury	M	mg/kg	0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	11.9	15.9
Selenium	M	mg/kg	1	< 1.0	1.2
Vanadium	M	mg/kg	5	55.4	106
Zinc	M	mg/kg	5	37.5	37.5
Anions					
Water Soluble Chloride	M	mg/kg	40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02	0.02	0.07
Inorganics					
Elemental Sulphur	M	mg/kg	20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.05	0.07
Water Soluble Boron	N	mg/kg	0.5	< 0.5	0.8
Miscellaneous					
pH	M	pH units	0.1	8.1	7.3
Total Organic Carbon	N	%	0.01	0.13	0.22
Phenols					
Total Phenols	N	mg/kg	6	< 6	< 6
Polyaromatic hydrocarbons					
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1
Pyrene	M	mg/kg	0.1	< 0.1	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	< 0.1
Chrysene	M	mg/kg	0.1	< 0.1	< 0.1
Benzo (b) fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1
Benzo (a) pyrene	M	mg/kg	0.1	< 0.1	< 0.1
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4	< 0.4	< 0.4
BTEX					
Benzene	M	ug/kg	10	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136709	136710
			Customer Reference		
			Sample ID		
			Sample Type	SOIL	SOIL
			Sample Location	TP318	TP319
			Sample Depth (m)	0.70	1.80
			Sampling Date	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**		
TPH CWG					
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonards on Sea, East Sussex, TN38 9BY
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Results Summary

Report No.: 18-17643

Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #)
in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric	Gravimetric Analysis by ACM Type	Free Fibre	Total
136637	0.60 - 0.80	WS401	Brown clay, stones, clinker	No asbestos detected	n/t	n/t	n/t	n/t
136640	0.50	WS402	Brown clay, stones	No asbestos detected	n/t	n/t	n/t	n/t
136645	1.50 - 1.60	WS403	Brown sandy soil, stones, concrete, brick, clinker, organics	No asbestos detected	n/t	n/t	n/t	n/t
136650	0.40 - 0.60	WS405	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
136651	1.20	WS405	Brown sandy soil, stones, concrete, brick, wood	No asbestos detected	n/t	n/t	n/t	n/t
136653	1.60 - 1.90	WS406	Brown sandy soil, stones, concrete, brick, clinker, glass	No asbestos detected	n/t	n/t	n/t	n/t
136655	0.30 - 0.50	WS407	Brown sandy soil, stones, clinker	No asbestos detected	n/t	n/t	n/t	n/t
136657	3.00 - 4.00	WS407	Brown sandy soil, stones, concrete, brick, clinker, chalk, organics	Chrysotile (asbestos cement)	0.729	Asbestos cement (0.729%)	< 0.001	0.729
136658	0.25	TP301	Brown sandy soil, stones, concrete, brick, clinker, organics	No asbestos detected	n/t	n/t	n/t	n/t
136659	0.40	TP301	Brown sandy soil, stones, clinker, wood	No asbestos detected	n/t	n/t	n/t	n/t
136660	1.40	TP301	Brown sandy soil, stones, brick, clinker, organics	No asbestos detected	n/t	n/t	n/t	n/t
136661	0.20	TP302	Brown sandy soil, stones, chalk, clinker, organics	Chrysotile (asbestos cement)	0.147	Asbestos cement (0.147%)	< 0.001	0.147
136662	0.50	TP302	Brown sandy soil, stones, clinker, organics	No asbestos detected	n/t	n/t	n/t	n/t
136664	2.70	TP302	Brown sandy soil, stones, concrete, clinker	No asbestos detected	n/t	n/t	n/t	n/t
136666	0.70	TP303	Brown sandy soil, stones, concrete, clinker	No asbestos detected	n/t	n/t	n/t	n/t
136669	1.20	TP304	Brown sandy clay, stones, clinker	No asbestos detected	n/t	n/t	n/t	n/t
136670	0.80	TP305	Brown sandy clay, stones, clinker	No asbestos detected	n/t	n/t	n/t	n/t
136672	0.20	TP306	Brown sandy soil, stones, organics	No asbestos detected	n/t	n/t	n/t	n/t
136673	0.40	TP306	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
136674	0.80	TP306	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
136675	0.30	TP307	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136676	0.80	TP307	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136677	1.20	TP307	Brown sandy soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136678	0.10	TP308	Brown sandy soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136679	0.30	TP308	Brown sandy soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136680	0.70	TP308	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136681	0.25	TP309	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136682	0.50	TP309	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136683	0.65	TP309	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136684	0.20	TP310	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136685	0.50	TP310	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136686	1.50	TP310	Chalk	No asbestos detected	n/t	n/t	n/t	n/t
136687	0.20	TP311	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136688	0.40	TP311	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136689	0.80	TP311	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
136690	0.20	TP312	Brown chalky soil with stones and brick	No asbestos detected	n/t	n/t	n/t	n/t
136691	0.90	TP312	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136692	1.45	TP312	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136693	0.25	TP313	Brown chalky soil with stones and clinker	No asbestos detected	n/t	n/t	n/t	n/t
136694	0.50	TP313	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136695	1.55	TP313	Sand	No asbestos detected	n/t	n/t	n/t	n/t
136696	0.30	TP314	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
136697	0.70	TP314	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
136698	1.60	TP314	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
136699	0.20	TP315	Brown sandy soil,Stones,concrete,brick	Chrysotile (fibre bundle)	< 0.001	Fibre bundle (<0.001)	< 0.001	< 0.001
136700	0.60	TP315	Brown sandy soil	No asbestos detected	n/t	n/t	n/t	n/t
136701	2.30	TP315	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
136702	0.20	TP316	Brown sandy soil,Stones,brick,clinker	No asbestos detected	n/t	n/t	n/t	n/t
136703	0.90	TP316	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
136704	1.90	TP316	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
136705	0.15	TP317	Brown sandy soil,Stones,glass,clinker	No asbestos detected	n/t	n/t	n/t	n/t
136706	0.65	TP317	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
136707	1.40	TP317	Brown sandy soil,stones	No asbestos detected	n/t	n/t	n/t	n/t
136708	0.15	TP318	Brown sandy soil,Stones,brick	No asbestos detected	n/t	n/t	n/t	n/t
136709	0.70	TP318	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
136710	1.80	TP319	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 18-17643

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Sulphide	N	As submitted sample	23/05/2018	109	Colorimetry
Hexavalent chromium	N	As submitted sample	23/05/2018	110	Colorimetry
pH	M	Air dried sample	24/05/2018	113	Electromeric
Acid Soluble Sulphate	U	Air dried sample	24/05/2018	115	Ion Chromatography
Aqua regia extractable metals	M	Air dried sample	23/05/2018	118	ICPMS
Phenols in solids	N	As submitted sample	23/05/2018	121	HPLC
Elemental Sulphur	M	Air dried sample	23/05/2018	122	HPLC
PAH (GC-FID)	M	As submitted sample	23/05/2018	133	GC-FID
Water soluble anions	M	Air dried sample	23/05/2018	172	Ion Chromatography
Low range Aliphatic hydrocarbons soil	N	As submitted sample	24/05/2018	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	24/05/2018	181	GC-MS
BTEX in solids	M	As submitted sample	24/05/2018	181A	GC-MS
Water soluble boron	N	Air dried sample	23/05/2018	202	Colorimetry
Total cyanide	M	As submitted sample	23/05/2018	204	Colorimetry
Total organic carbon/Total sulphur	N	Air dried sample	24/05/2018	210	IR
Aliphatic hydrocarbons in soil	N	As submitted sample	23/05/2018	214	GC-FID
Aliphatic/Aromatic hydrocarbons in soil	N	As submitted sample	25/05/2018	214	GC-FID
Aromatic hydrocarbons in soil	N	As submitted sample	23/05/2018	214	GC-FID
Asbestos identification	U	Air dried sample	23/05/2018	260	Microscopy

Tests marked N are not UKAS accredited

Report Information

Report No.: 18-17643

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis (dried at < 30°C)
Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage

CLEA Software Version 1.071

Report generated 21/06/2018

Report title Woodcroft Farm, Lovedean

Created by FG at GESL

BASIC SETTINGS

Land Use Residential with produce (C4SL)

Building Small terraced house
Receptor Female (res C4SL) Start age class 1 End age class 6 Exposure Duration 6 years
Soil Sandy loam

Exposure Pathways

Direct soil and dust ingestion	✓	Dermal contact with indoor dust	✓	Inhalation of indoor dust	✓
Consumption of homegrown produce	✓	Dermal contact with soil	✓	Inhalation of soil dust	✓
Soil attached to homegrown produce	✓			Inhalation of indoor vapour	✓
				Inhalation of outdoor vapour	✓

Land Use Residential with produce (C4SL) **Receptor** Female (res C4SL)

Age Class	Exposure Frequencies (days yr^{-1})						Occupation Periods (hr day^{-1})		Soil to skin adherence factors (mg cm^{2})		Direct soil ingestion rate (g day^{-1})	Body weight (kg)	Body height (m)	Inhalation rate (m^{3} day^{-1})	Max exposed skin factor		Total skin area (m^{2})
	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with indoor dust	Dermal contact with soil	Inhalation of dust and vapour, indoor	Inhalation of dust and vapour, outdoor	Indoors	Outdoors	Indoor	Outdoor					Indoor (m^{2} m^{-2})	Outdoor (m^{2} m^{-2})	
1	180	180	180	170	365	365	23.0	1.0	0.06	0.10	0.10	5.60	0.7	5.4	0.32	0.26	3.43E-01
2	365	365	365	170	365	365	23.0	1.0	0.06	0.10	0.10	9.80	0.8	8.0	0.33	0.26	4.84E-01
3	365	365	365	170	365	365	23.0	1.0	0.06	0.10	0.10	12.70	0.9	8.9	0.32	0.25	5.82E-01
4	365	365	365	170	365	365	23.0	1.0	0.06	0.10	0.10	15.10	0.9	10.1	0.35	0.28	6.36E-01
5	365	365	365	170	365	365	19.0	1.0	0.06	0.10	0.10	16.90	1.0	10.1	0.35	0.28	7.04E-01
6	365	365	365	170	365	365	19.0	1.0	0.06	0.10	0.10	19.70	1.1	10.1	0.33	0.26	7.94E-01
7	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	22.10	1.2	12.0	0.22	0.15	8.73E-01
8	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	25.30	1.2	12.0	0.22	0.15	9.36E-01
9	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	27.50	1.3	12.0	0.22	0.15	1.01E+00
10	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	31.40	1.3	12.0	0.22	0.15	1.08E+00
11	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	35.70	1.4	12.0	0.22	0.14	1.19E+00
12	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	41.30	1.4	15.2	0.22	0.14	1.29E+00
13	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	47.20	1.5	15.2	0.22	0.14	1.42E+00
14	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	51.20	1.6	15.2	0.22	0.14	1.52E+00
15	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	56.70	1.6	15.2	0.21	0.14	1.60E+00
16	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	59.00	1.6	15.2	0.21	0.14	1.63E+00
17	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.00	1.6	15.7	0.33	0.27	1.78E+00
18	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.90	1.6	13.6	0.33	0.27	1.80E+00

Consumption Rates

Environment Agency

Consumption rates (g FW kg^{-1} bodyweight day^{-1}) by Produce Group

Age Class	MEAN RATES						90TH PERCENTILE RATES					
	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit
1	3.47E+00	5.22E+00	9.22E+00	8.90E-01	1.07E+00	1.87E+00	7.12E+00	1.07E+01	1.60E+01	1.83E+00	2.23E+00	3.82E+00
2	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
3	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
4	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
5	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
6	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
7	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
8	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
9	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
10	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
11	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
12	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
13	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
14	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
15	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
16	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
17	1.26E+00	6.00E-01	1.18E+00	6.90E-01	9.00E-02	1.27E+00	2.36E+00	1.12E+00	2.35E+00	1.29E+00	1.80E-01	2.38E+00
18	1.35E+00	6.40E-01	1.25E+00	7.40E-01	1.00E-01	1.36E+00	2.34E+00	1.12E+00	2.36E+00	1.28E+00	1.80E-01	2.37E+00

Top 2 applied? Yes

Where top 2 method is applied, two produce categories use 90th percentile rates, while the remainder use the mean. Produce categories vary on a chemical-by-chemical basis. Where top 2 method is not used, all produce categories for all chemicals assume 90th percentile rates.

Building Small terraced house

Soil Sandy loam

Building footprint (m^2)	2.80E+01
Living space air exchange rate (hr^{-1})	5.00E-01
Living space height (above ground, m)	4.80E+00
Living space height (below ground, m)	0.00E+00
Pressure difference (soil to enclosed space, Pa)	3.10E+00
Foundation thickness (m)	1.50E-01
Floor crack area (cm^2)	4.23E+02
Dust loading factor ($\mu g\ m^{-3}$)	5.00E+01

Porosity, Total ($cm^3\ cm^{-3}$)	5.30E-01
Porosity, Air-Filled ($cm^3\ cm^{-3}$)	2.00E-01
Porosity, Water-Filled ($cm^3\ cm^{-3}$)	3.30E-01
Residual soil water content ($cm^3\ cm^{-3}$)	1.20E-01
Saturated hydraulic conductivity ($cm\ s^{-1}$)	3.56E-03
van Genuchten shape parameter *m* (dimensionless)	3.20E-01
Bulk density ($g\ cm^{-3}$)	1.21E+00
Threshold value of wind speed at 10m ($m\ s^{-1}$)	7.20E+00
Empirical function (F_x) for dust model (dimensionless)	1.22E+00
Ambient soil temperature (K)	2.83E+02
Soil pH	7.40E+00
Soil Organic Matter content (%)	8.60E-01
Fraction of organic carbon ($g\ g^{-1}$)	4.99E-03
Effective total fluid saturation (unitless)	5.12E-01
Intrinsic soil permeability (cm^2)	4.75E-08
Relative soil air permeability (unitless)	6.42E-01
Effective air permeability (cm^2)	3.05E-08

Soil - Vapour Model

Depth to top of source (no building) (cm)	0
Depth to top of source (beneath building) (cm)	65
Default soil gas ingress rate?	Yes
Soil gas ingress rate ($cm^3\ s^{-1}$)	2.50E+01
Building ventilation rate ($cm^3\ s^{-1}$)	1.87E+04
Averaging time surface emissions (yr)	6
Finite vapour source model?	No
Thickness of contaminated layer (cm)	200

Air Dispersion Model

Mean annual windspeed at 10m ($m\ s^{-1}$)		5.00
Air dispersion factor at height of 0.8m *		2400.00
Air dispersion factor at height of 1.6m *		0.00
Fraction of site cover ($m^2\ m^{-2}$)		0.75

* Air dispersion factor in $g\ m^{-2}\ s^{-1}$ per $kg\ m^{-3}$

Soil - Plant Model

	Dry weight conversion factor	Homegrown fraction		Soil loading factor	Preparation correction factor
		Average	High		
	g DW g^{-1} FW	dimensionless		g g^{-1} DW	dimensionless
Green vegetables	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	0.103	0.06	0.40	1.00E-03	1.00E+00
Tuber vegetables	0.210	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	0.058	0.06	0.40	1.00E-03	6.00E-01
Shrub fruit	0.166	0.09	0.60	1.00E-03	6.00E-01
Tree fruit	0.157	0.04	0.27	1.00E-03	6.00E-01

Gardener type Average

CLEA Software Version 1.071

Report generated	21-Jun-18
Report title	Woodcroft Farm, Lovedean
Created by	FG at GESL

RESULTS

Environment Agency

		Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?		Top Two applied?	Apply Top 2 Approach to Produce Group					
		oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal		Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
1	Arsenic	3.80E+01	1.21E+02	NR	1.00	0.31	NR	NR	No	No	Yes	No	No	No	No	No	No
2	Beryllium	1.29E+02	1.72E+00	NR	0.01	1.00	NR	NR	Yes	Yes	Yes	No	No	No	No	No	No
3	Benzo(a)pyrene	3.93E+00	1.57E+01	NR	1.00	0.25	NR	7.83E-01 (vap)	No	No	Yes	No	No	No	No	No	No
4	Dibenz(ah)anthracene	3.93E-01	1.40E+00	NR	1.00	0.28	NR	3.38E-03 (vap)	No	No	Yes	No	No	No	No	No	No
5	Nickel	1.49E+02	1.81E+02	NR	1.00	0.70	NR	NR	Yes	Yes	Yes	No	No	No	No	No	No
6	Lead (C4SL adult)	9.04E+01	NR	NR	1.00	NR	NR	NR	No	No	Yes	Yes	No	Yes	No	No	No
7	Benzo(b)fluoranthene	4.94E+00	1.89E+01	NR	1.00	0.26	NR	1.05E+00 (sol)	No	No	Yes	No	No	No	No	No	No
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Environment Agency

	Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?		Top Two applied?	Apply Top 2 Approach to Produce Group					
	oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal		Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
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Environment Agency

		Soil Distribution				Media Concentrations													
		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
		%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
1	Arsenic	99.9	0.1	0.0	100.0	3.80E+01	NR	1.90E+01	1.62E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.64E-02	1.52E-02	8.75E-03	1.26E-02	7.61E-03	4.18E-02
2	Beryllium	100.0	0.0	0.0	100.0	1.72E+00	NR	8.62E-01	7.34E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.21E-02	2.07E-03	2.07E-03	2.07E-03	2.07E-03	2.07E-03
3	Benzo(a)pyrene	100.0	0.0	0.0	100.0	3.93E+00	1.08E-05	1.96E+00	1.67E-09	0.00E+00	1.42E-08	3.33E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4	Dibenz(ah)anthracene	100.0	0.0	0.0	100.0	3.93E-01	2.28E-06	1.96E-01	1.67E-10	0.00E+00	2.83E-09	2.68E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5	Nickel	99.9	0.1	0.0	100.0	1.49E+02	NR	7.45E+01	6.34E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.66E-01	6.41E-01	2.83E-01	3.73E-01	3.73E-01	5.07E-01
6	Lead (C4SL adult)	100.0	0.0	0.0	100.0	9.04E+01	NR	4.52E+01	3.85E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.79E-01	3.63E-01	6.61E-01	6.77E-02	1.85E-02	2.07E-02
7	Benzo(b)fluoranthene	99.9	0.1	0.0	100.0	4.94E+00	1.94E-05	2.47E+00	2.10E-09	0.00E+00	2.53E-08	4.62E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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Environment Agency

	Soil Distribution				Media Concentrations													
	Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
	%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
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Environment Agency

		Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
		Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
1	Arsenic	2.82E-04	1.42E-05	3.77E-06	6.29E-07	0.00E+00	0.00E+00	0.00E+00	94.03	4.72	1.26	0.00	0.00	0.00	0.00	0.00
2	Beryllium	1.28E-05	2.67E-06	0.00E+00	2.85E-08	0.00E+00	8.44E-04	9.09E-08	0.00	0.00	0.00	50.00	0.00	0.00	0.00	50.00
3	Benzo(a)pyrene	2.91E-05	1.84E-07	1.69E-06	6.49E-08	1.02E-08	6.19E-06	3.64E-07	93.96	0.59	5.45	0.00	0.00	0.00	0.00	0.00
4	Dibenz(ah)anthracene	2.91E-06	1.84E-08	1.69E-07	6.49E-09	1.92E-09	2.25E-06	2.00E-06	93.96	0.59	5.45	0.00	0.00	0.00	0.00	0.00
5	Nickel	1.11E-03	2.90E-04	2.46E-06	2.46E-06	0.00E+00	7.54E-03	1.57E-05	39.46	10.36	0.09	0.09	0.00	0.00	49.90	0.10
6	Lead (C4SL adult)	4.02E-04	2.27E-04	0.00E+00	9.56E-07	0.00E+00	0.00E+00	0.00E+00	63.85	35.99	0.00	0.15	0.00	0.00	0.00	0.00
7	Benzo(b)fluoranthene	3.66E-05	2.31E-07	2.12E-06	8.17E-08	1.78E-08	6.19E-06	7.88E-07	93.96	0.59	5.45	0.00	0.00	0.00	0.00	0.00
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Environment Agency

	Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
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		Oral Health Criteria Value (µg kg^{-1} BW day^{-1})		Inhalation Health Criteria Value (µg kg^{-1} BW day^{-1})		Oral Mean Daily Intake (µg day^{-1})	Inhalation Mean Daily Intake (µg day^{-1})	Air-water partition coefficient (K_{aw}) (cm^3 cm^{-3})	Coefficient of Diffusion in Air (m^2 s^{-1})	Coefficient of Diffusion in Water (m^2 s^{-1})	log K_{oc} (cm^3 g^{-1})	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor (g g^{-1} DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
1	Arsenic	ID	0.3	ID	0.002	NR	NR	NR	NR	NR	NR	NR	0.03	0.5	1	1	1
2	Beryllium	TDI	2	TDI	0.000057	15	0.0015	NR	NR	NR	NR	NR	0	0.5	1	1	1
3	Benzo(a)pyrene	ID	0.031	ID	0.0003	0.11	0.006	1.76E-06	4.38E-06	3.67E-10	5.11	6.18	0.13	0.5	1	1	1
4	Dibenz(ah)anthracene	ID	0.0031	ID	0.00003	0.04	0.033	5.40E-06	4.08E-06	3.40E-10	5.27	6.38	0.13	0.5	1	1	1
5	Nickel	TDI	2.8	TDI	0.006	134	0.259	NR	NR	NR	NR	NR	0.005	0.5	1	1	1
6	Lead (C4SL adult)	ID	0.63	NR	0	NR	NR	NR	NR	NR	NR	NR	0	0.5	1	0.6	0.64
7	Benzo(b)fluoranthene	ID	0.039	ID	0.00038	0.11	0.013	2.05E-06	4.36E-06	3.62E-10	5.02	6.08	0.13	0.5	1	1	1
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	Oral Health Criteria Value (µg kg^{-1} BW day^{-1})		Inhalation Health Criteria Value (µg kg^{-1} BW day^{-1})		Oral Mean Daily Intake (µg day^{-1})	Inhalation Mean Daily Intake (µg day^{-1})	Air-water partition coefficient (K_{aw}) (cm^3 cm^{-3})	Coefficient of Diffusion in Air (m^2 s^{-1})	Coefficient of Diffusion in Water (m^2 s^{-1})	log K_{oc} (cm^3 g^{-1})	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor (g g^{-1} DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
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		Soil-to-water partition coefficient ($cm^3\ g^{-1}$)	Vapour pressure (Pa)	Water solubility ($mg\ L^{-1}$)	Soil-to-plant concentration factor for green vegetables ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for root vegetables ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for tuber vegetables ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for herbaceous fruit ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for shrub fruit ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for tree fruit ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)
1	Arsenic	5.00E+02	NR	1.25E+06	0.00043 fw	0.0004 fw	0.00023 fw	0.00033 fw	0.0002 fw	0.0011 fw
2	Beryllium	1.70E+03	NR	1.66E+06	0.007 fw	0.0012 fw	0.0012 fw	0.0012 fw	0.0012 fw	0.0012 fw
3	Benzo(a)pyrene	6.43E+02	2.00E-08	3.80E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4	Dibenz(ah)anthracene	9.29E+02	1.66E-10	6.00E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5	Nickel	5.00E+02	NR	2.50E+06	0.0038 fw	0.0043 fw	0.0019 fw	0.0025 fw	0.0025 fw	0.0034 fw
6	Lead (C4SL adult)	1.00E+03	NR	2.96E+05	0.00419 fw	0.00402 fw	0.00731 fw	0.00074 fw	0.00020 fw	0.00022 fw
7	Benzo(b)fluoranthene	5.22E+02	6.34E-08	2.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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Environment Agency

	Soil-to-water partition coefficient (cm^3 g^{-1})	Vapour pressure (Pa)	Water solubility (mg L^{-1})	Soil-to-plant concentration factor for green vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for root vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for herbaceous fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for shrub fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tree fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									

Client/client ref: Grainger PLC
Project ref: GE16943
Site ref: Woodcroft Farm - Farmyard
Data description:
Contaminant(s): Metals
Test scenario: Planning
Date: 11 June 2018
User details: FG

	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)	Hexavalent Chromium (mg/kg)	Total Cyanide (mg/kg)
Critical concentration, C_c	**38.03**	**1330**	**1.72**	**11**	**910**	**2400**	**200**	**40**	**180**	**250**	**410**	**3700**	~~6~~	~~2~~
Notes														
Full dataset size	31	31	31	31	31	31	31	31	31	31	31	31	0	0
Outliers present?	Yes	No	Yes	Yes	#REF!	Yes	Yes	No	Yes	Yes	Yes	Yes		
Number of outliers temporarily excluded	0													
Number removed by filter	0	0	0	0	2	0	0	0	0	0	0	0	0	0
Sample size, n	**31**	**31**	**31**	**31**	**29**	**31**	**31**	**31**	**31**	**31**	**31**	**31**	**0**	**0**
Sample mean, $\bar{x}$	19.383871	101.974194	1.26451613	0.67903226	#REF!	29.4935484	48.2741935	0.25	31.3064516	0.67096774	49.5	82.5322581	No Data	No Data
Standard deviation, s	41.998842	98.3591276	1.34723133	1.02970661	#REF!	33.5433246	55.1896184	0	47.3983821	0.34272783	28.1208464	73.7256101		
Number of non-detects	0	0	**17**	**17**	0	0	**1**	**31**	0	**24**	0	0	0	0
Set non-detect values to:	Detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Distribution	Non-normal	Non-normal	Non-normal	Non-normal	#REF!	Non-normal	Non-normal	Single value	Non-normal	Non-normal	Non-normal	Non-normal		
Statistical approach	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	#REF!	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto	Auto

Test scenario: Planning: is true mean lower than critical concentration (μ < Cc)? **Evidence level required:** 95% Use Normal distribution to test for outliers

t statistic, t_0 (or k_0)	-2.471907503	-69.51422293	-1.882398967	-55.80688317	#REF!	-393.4738584	-15.30674722	N/A	-17.46664345	-4050.459805	-71.37690762	-273.1914722		
Upper confidence limit (on true mean concentration, μ)	52.2639816	178.977721	2.31923843	1.48517037	#REF!	55.753992	91.4811171	0.25	68.4137615	0.93928297	71.5152865	140.250664		
Evidence level	**86%**	**100%**	**78%**	**100%**	**#REF!**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**		
Base decision on:	evidence level	evidence level	evidence level	evidence level	lower bound	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level		
Result	**μ ≈≥ Cc**	**μ < Cc**	**μ ≈≥ Cc**	**μ < Cc**	**#REF!**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**		
Select dataset	●	○	○	○	○	○	○	○	○	○	○	○	○	○

Back to data | Go to outlier test | Go to normality test | Show individual summary

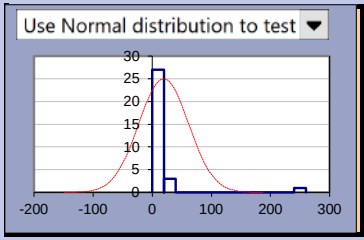
Test Results

Arsenic (mg/kg)

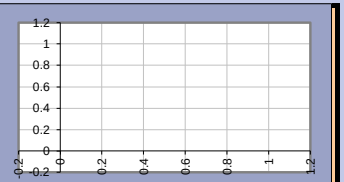
Client/client ref: Grainger PLC | Site ref: Woodcroft Farm - Farmyard | Date: 11-Jun-2018

Project ref: GE16943 | Data description: | User details: FG

Dataset: Arsenic (mg/kg)	
Sample mean (mg/kg), $\overline{x}$	19.384
Sample standard deviation, s	41.999
Sample size, n	31
Critical concentration, Cc (mg/kg)	38.03



Outliers & non-detects	
Outliers present?	Yes
Significance level	5%
Outliers excluded	0
Non-detects	0

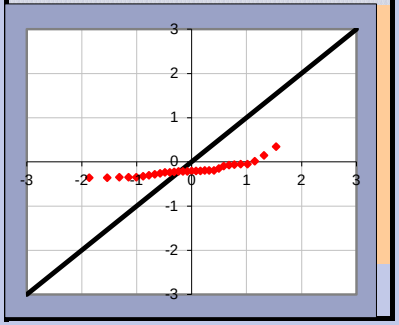


Normality test

Significance le: 5%

Non-normal distribution

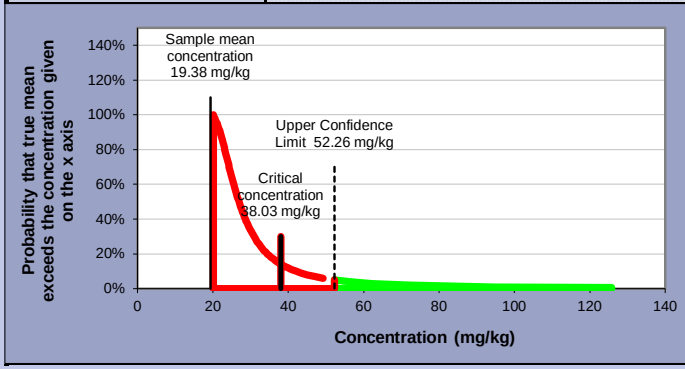
Use: Auto: Chebychev



Test scenario:

Planning: is true mean lower than critical concentration (μ < Cc)?

Null hypothesis:	The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc
Alternative hypothesis:	The true mean concentration is less than the critical concentration: μ < Cc

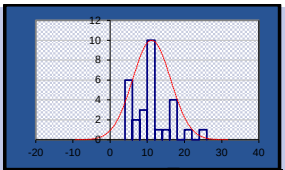


Evidence against Null hypothesis:	**86%**
Base decision on:	evidence level
Evidence level required:	**95%**
Balance of probability?	N/A
Reject Null Hypothesis?	No

Not enough evidence

Back to data | Back to summary | Go to outlier test | Go to normality test

Sample ID	Include?	Arsenic		Outliers
TP215	Y	10.4		
TP215	Y	4.7		
TP220	Y	25.7	Outlier	
TP220	Y	11		
TP223	Y	9.5		
TP224	Y	7.8		
TP224	Y	6.6		
TP225	Y	13.2		
TP239	Y	4.5		
TP239	Y	17.5		
TP312	Y	5		
TP312	Y	11.2		
TP312	Y	20.3		
TP313	Y	5.1		
TP313	Y	17.1		
TP313	N			34.2
TP314	Y	11.5		
TP314	Y	10.6		
TP314	N			243
TP315	Y	15.5		
TP315	Y	11		
TP315	Y	8.7		
TP316	Y	11.1		
TP316	Y	10.1		
TP316	Y	4.8		
TP317	Y	16.3		
TP317	Y	11.4		
TP317	Y	5.7		
TP318	Y	9.7		
TP318	Y	10.5		
TP318	Y	17.2		
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			



Sample mean, $\bar{x}$
11.162

Standard deviation, s
5.117

Sample size, n
29

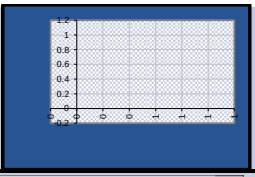
Maxiumum
25.700

Outlier Test Applicability
Applicable

Level of Significance, α
5%

Tn = 2.841
Tcrit = 2.730

Outliers?
Yes
(2 selected)



Dataset: Arsenic (mg/kg) O/T:29/31

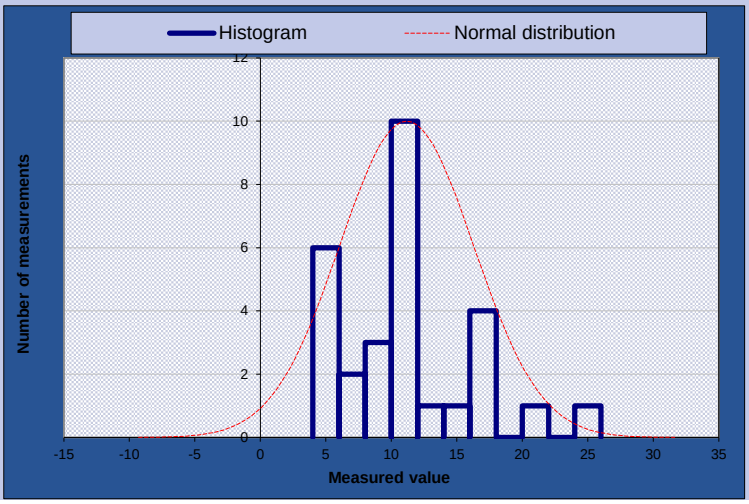
Use Normal distribution to test for outliers

Exclude identified outliers

Show individual summary

Back to summary

Back to data



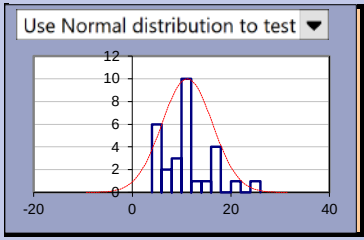
Test Results

Arsenic (mg/kg) O/T:29/31

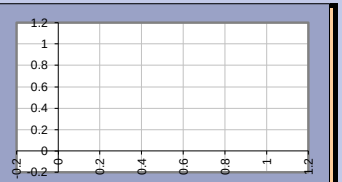
Client/client ref: Grainger PLC | Site ref: Woodcroft Farm - Farmyard | Date: 11-Jun-2018

Project ref: GE16943 | Data description: | User details: FG

Dataset: Arsenic (mg/kg) O/T:29/31	
Sample mean (mg/kg), $\overline{x}$	11.162
Sample standard deviation, s	5.1167
Sample size, n	29
Critical concentration, Cc (mg/kg)	38.03



Outliers & non-detects	
Outliers present?	Yes
Significance level	5%
Outliers excluded	2
Non-detects	#NAME?

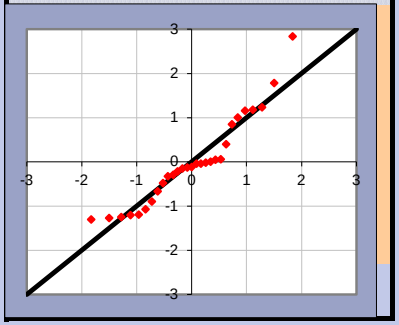


Normality test

Significance le: 5%

Non-normal distribution

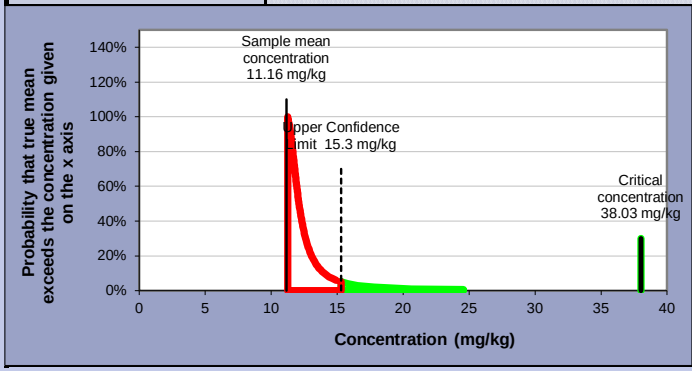
Use: Auto: Chebychev



Test scenario:

Planning: is true mean lower than critical concentration (μ < Cc)?

Null hypothesis:	The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc
Alternative hypothesis:	The true mean concentration is less than the critical concentration: μ < Cc



Evidence against Null hypothesis:	**100%**
Base decision on:	evidence level
Evidence level required:	**95%**
Balance of probability?	N/A
Reject Null Hypothesis?	Yes

μ < Cc (re this dataset)

Back to data | Back to summary | Go to outlier test | Go to normality test

Test Results

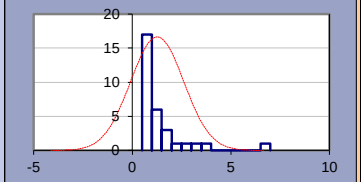
Beryllium (mg/kg)

Client/client ref: Grainger PLC | Site ref: Woodcroft Farm - Farmyard | Date: 11-Jun-2018

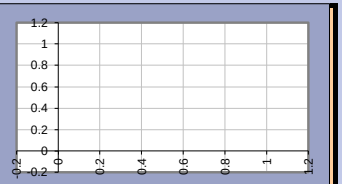
Project ref: GE16943 | Data description: | User details: FG

Dataset: Beryllium (mg/kg)	
Sample mean (mg/kg), $\overline{x}$	1.2645
Sample standard deviation, s	1.3472
Sample size, n	31
Critical concentration, Cc (mg/kg)	1.72

Use Normal distribution to test



Outliers & non-detects	
Outliers present?	Yes
Significance level	5%
Outliers excluded	0
Non-detects	#NAME?

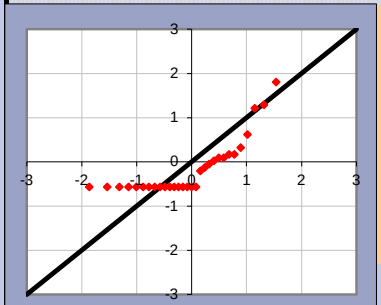


Normality test

Significance le: 5%

Non-normal distribution

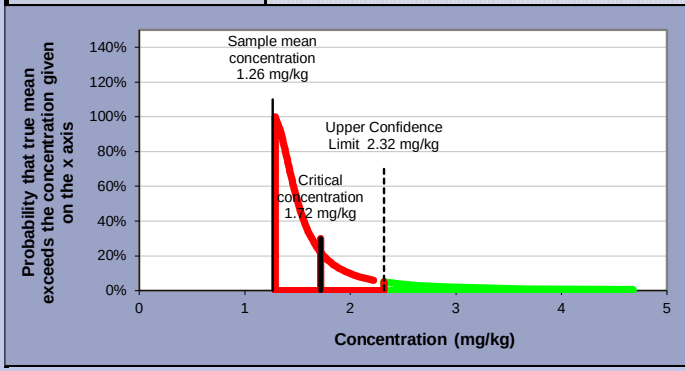
Use: Auto: Chebychev



Test scenario:

Planning: is true mean lower than critical concentration (μ < Cc)?

Null hypothesis:	The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc
Alternative hypothesis:	The true mean concentration is less than the critical concentration: μ < Cc

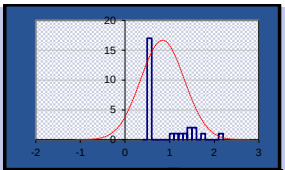


Evidence against Null hypothesis:	**78%**
Base decision on:	evidence level
Evidence level required:	**95%**
Balance of probability?	N/A
Reject Null Hypothesis?	No

Not enough evidence

Back to data | Back to summary | Go to outlier test | Go to normality test

Sample ID	Include?	Beryllium		Outliers
TP215	Y	0.5		
TP215	Y	0.5		
TP220	N			3
TP220	Y	1.2		
TP223	Y	1		
TP224	Y	0.5		
TP224	Y	1.1		
TP225	Y	0.5		
TP239	Y	0.5		
TP239	Y	1.3		
TP312	Y	0.5		
TP312	Y	0.5		
TP312	N			2.9
TP313	Y	0.5		
TP313	Y	0.5		
TP313	Y	1.5		
TP314	Y	0.5		
TP314	Y	0.5		
TP314	N			3.7
TP315	Y	0.5		
TP315	Y	0.5		
TP315	Y	2.1		
TP316	Y	0.5		
TP316	Y	0.5		
TP316	Y	1.7		
TP317	Y	1.4		
TP317	N			6.9
TP317	Y	1.4		
TP318	Y	0.5		
TP318	Y	0.5		
TP318	Y	1.5		
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			



Sample mean, $\bar{x}$
0.841

Standard deviation, s
0.489

Sample size, n
27

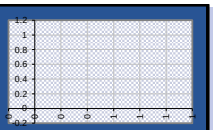
Maxiumum
2.100

Outlier Test Applicability
Not Applicable

Level of Significance, α
5%

Tn = 2.574
Tcrit = 2.698

Outliers?
No
(4 selected)



Dataset: Beryllium (mg/kg) O/T:27/31

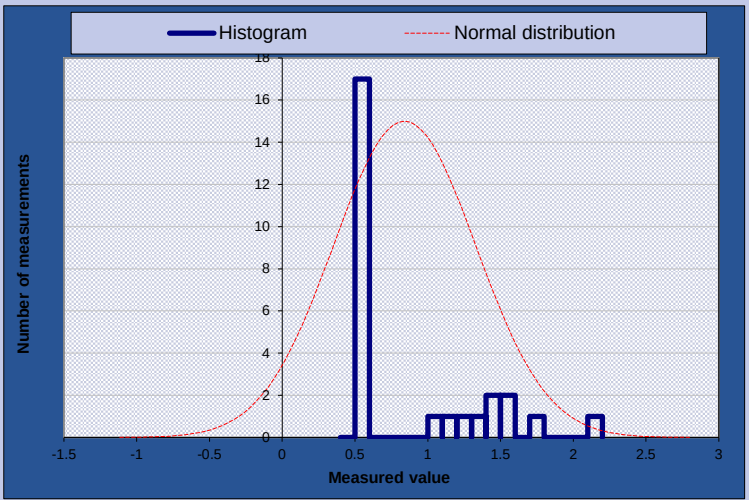
Use Normal distribution to test for outliers

Exclude identified outliers

Show individual summary

Back to summary

Back to data



Test Results

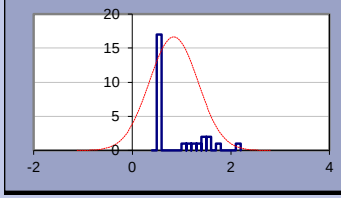
Beryllium (mg/kg) O/T:27/31

Client/client ref: Grainger PLC | Site ref: Woodcroft Farm - Farmyard | Date: 11-Jun-2018

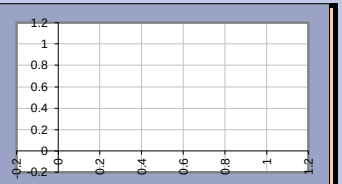
Project ref: GE16943 | Data description: | User details: FG

Dataset: Beryllium (mg/kg) O/T:27/31	
Sample mean (mg/kg), $\overline{x}$	0.8407
Sample standard deviation, s	0.4893
Sample size, n	27
Critical concentration, Cc (mg/kg)	1.72

Use Normal distribution to test



Outliers & non-detects	
Outliers present?	No
Significance level	5%
Outliers excluded	4
Non-detects	#NAME?

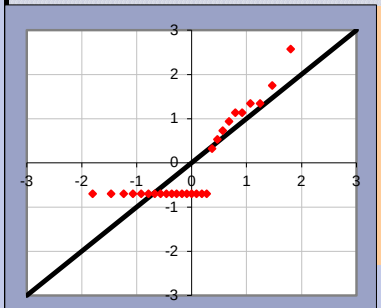


Normality test

Significance le: 5%

Non-normal distribution

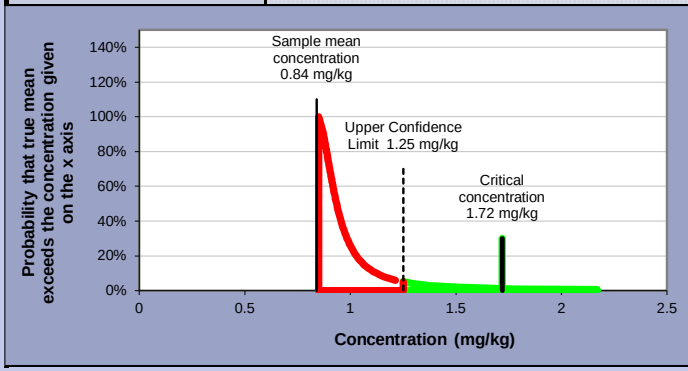
Use: Auto: Chebychev



Test scenario:

Planning: is true mean lower than critical concentration (μ < Cc)?

Null hypothesis:	The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc
Alternative hypothesis:	The true mean concentration is less than the critical concentration: μ < Cc



Evidence against Null hypothesis:	**99%**
Base decision on:	evidence level
Evidence level required:	**95%**
Balance of probability?	N/A
Reject Null Hypothesis?	Yes

μ < Cc (re this dataset)

Back to data | Back to summary | Go to outlier test | Go to normality test

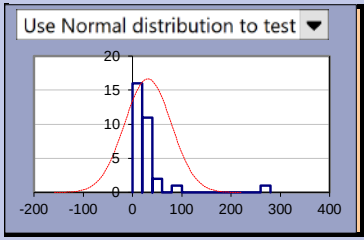
Test Results

Nickel (mg/kg)

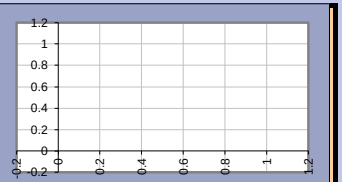
Client/client ref: Grainger PLC | Site ref: Woodcroft Farm - Farmyard | Date: 11-Jun-2018

Project ref: GE16943 | Data description: | User details: FG

Dataset: Nickel (mg/kg)	
Sample mean (mg/kg), $\overline{x}$	31.306
Sample standard deviation, s	47.398
Sample size, n	31
Critical concentration, Cc (mg/kg)	180



Outliers & non-detects	
Outliers present?	Yes
Significance level	5%
Outliers excluded	0
Non-detects	0

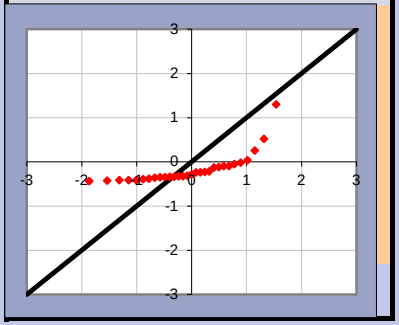


Normality test

Significance le: 5%

Non-normal distribution

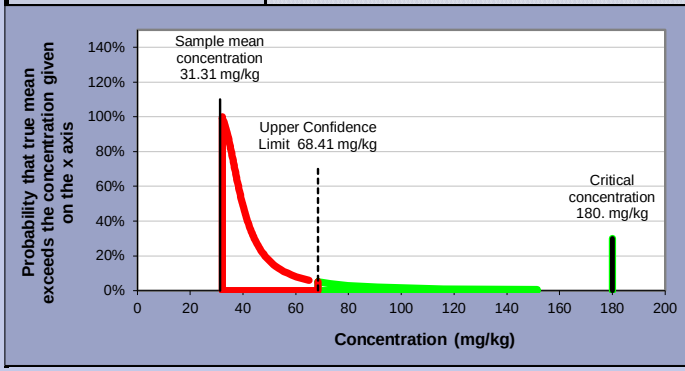
Use: Auto: Chebychev



Test scenario:

Planning: is true mean lower than critical concentration (μ < Cc)?

Null hypothesis:	The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc
Alternative hypothesis:	The true mean concentration is less than the critical concentration: μ < Cc



Evidence against Null hypothesis:	**100%**
Base decision on:	evidence level
Evidence level required:	**95%**
Balance of probability?	N/A
Reject Null Hypothesis?	Yes

μ < Cc (re this dataset)

Back to data | Back to summary | Go to outlier test | Go to normality test

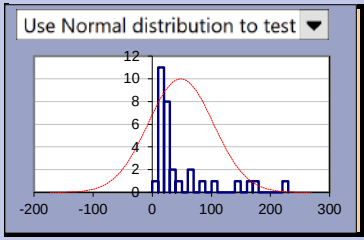
Test Results

Lead (mg/kg)

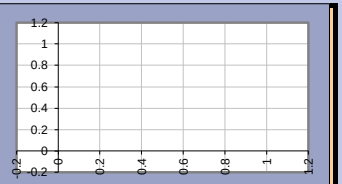
Client/client ref: Grainger PLC | Site ref: Woodcroft Farm - Farmyard | Date: 11-Jun-2018

Project ref: GE16943 | Data description: | User details: FG

Dataset: Lead (mg/kg)	
Sample mean (mg/kg), $\overline{x}$	48.274
Sample standard deviation, s	55.19
Sample size, n	31
Critical concentration, Cc (mg/kg)	200



Outliers & non-detects	
Outliers present?	Yes
Significance level	5%
Outliers excluded	0
Non-detects	#NAME?

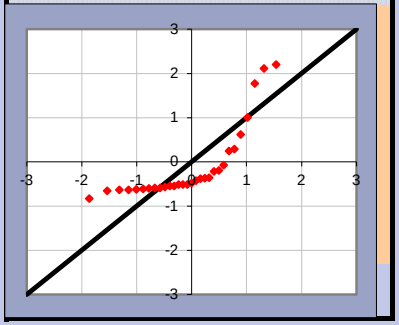


Normality test

Significance le: 5%

Non-normal distribution

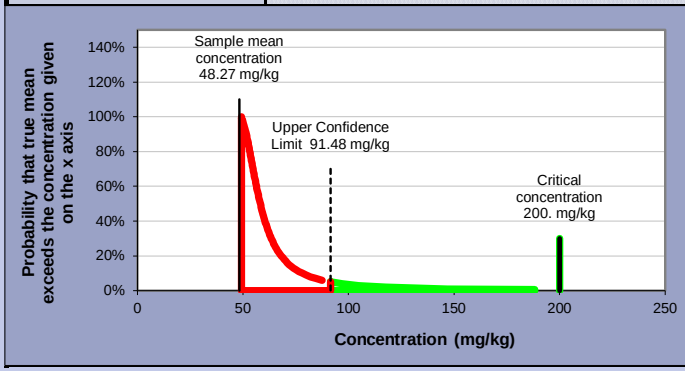
Use: Auto: Chebychev



Test scenario:

Planning: is true mean lower than critical concentration (μ < Cc)?

Null hypothesis:	The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc
Alternative hypothesis:	The true mean concentration is less than the critical concentration: μ < Cc



Evidence against Null hypothesis:	**100%**
Base decision on:	evidence level
Evidence level required:	**95%**
Balance of probability?	N/A
Reject Null Hypothesis?	Yes

μ < Cc (re this dataset)

Back to data | Back to summary | Go to outlier test | Go to normality test

Client/client ref: Grainger PLC
Project ref: GE16943
Site ref: Woodcroft Farm, Lovedean, PO8 9QA - Farmyard
Data description:
Contaminant(s): PAH
Test scenario: Planning
Date: 18 June 2018
User details: EC

	Naphthalene (mg/kg)	Acenaphthylene (mg/kg)	Acenaphthene (mg/kg)	Fluorene (mg/kg)	Phenanthrene (mg/kg)	Anthracene (mg/kg)	Fluoranthene (mg/kg)	Pyrene (mg/kg)	Benzo(a)anthracene (mg/kg)	Chrysene (mg/kg)	Benzo (b) fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Benzo (a) pyrene (mg/kg)	Indeno (1,2,3-cd) pyrene (mg/kg)
Critical concentration, C_c	**2.3**	**170**	**210**	**170**	**95**	**2400**	**280**	**620**	**7.2**	**15**	**2.6**	**77**	**3.93**	**27**
Notes														
Full dataset size	31	31	31	31	31	31	31	31	31	31	31	31	31	31
Outliers present?	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of outliers temporarily excluded														
Number removed by filter	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sample size, n	**31**	**31**	**31**	**31**	**31**	**31**	**31**	**31**	**31**	**31**	**31**	**31**	**31**	**31**
Sample mean, $\bar{x}$	0.05	0.05967742	0.07096774	0.06774194	0.28870968	0.13225806	0.60645161	0.55322581	0.38064516	0.40645161	0.47096774	0.48225806	0.44354839	0.36774194
Standard deviation, s	2.1161E-17	0.03745966	0.06680094	0.05707946	0.59870829	0.21037601	1.23468903	1.08719329	0.66076691	0.68880838	0.78716519	0.76251212	0.77068605	0.6109485
Number of non-detects	**31**	**29**	**28**	**28**	**23**	**24**	**18**	**19**	**20**	**18**	**14**	**17**	**15**	**20**
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Distribution	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal
Statistical approach	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev

Test scenario:	Planning: is true mean lower than critical concentration (μ < Cc)?				**Evidence level required:**		**95%**	Use Normal distribution to test for outliers						
t statistic, t_0 (or k_0)	-5.92014E+17	-25258.84592	-17497.28946	-16575.88921	-880.7797695	-63514.36293	-1259.910318	-3172.327965	-57.46135368	-117.9623253	-15.05903732	-558.7226042	-25.18761176	-242.7080816
Upper confidence limit (on true mean concentration, μ)	0.05	0.08900389	0.12326495	0.11242838	0.75742724	0.29695752	1.57306664	1.40436917	0.89794726	0.94570686	1.0872247	1.07921459	1.04690413	0.84604213
Evidence level	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Base decision on:	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level
Result	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**
Select dataset	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Back to data | **Go to outlier test** | **Go to normality test** | **Show individual summary**

Client/client ref: Grainger PLC
Project ref: GE16943
Site ref: Woodcroft Farm, Lovedean, PO8 9QA - Farmyard
Data description:
Contaminant(s): PAH
Test scenario: Planning
Date: 18 June 2018
User details: FC

	Dibenzo(a,h)anthracene (mg/kg)	Benzo[g,h,i]perylene (mg/kg)				
Critical concentration, C_c	**0.39**	**320**				
Notes						
Full dataset size	31	31	0	0	0	0
Outliers present?	Yes	Yes				
Number of outliers temporarily excluded	0					
Number removed by filter	0	0	0	0	0	0
Sample size, n	**31**	**31**	**0**	**0**	**0**	**0**
Sample mean, $\bar{x}$	0.12741935	0.3983871	No Data	No Data	No Data	No Data
Standard deviation, s	0.14366553	0.72508435				
Number of non-detects	**21**	**17**	0	0	0	0
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Distribution	Non-normal	Non-normal				
Statistical approach	Auto: Chebychev	Auto: Chebychev	Auto	Auto	Auto	Auto

Test scenario:						
t statistic, t_0 (or k_0)	-10.17632513	-2454.15099				
Upper confidence limit (on true mean concentration, μ)	0.23989242	0.96604212				
Evidence level	**99%**	**100%**				
Base decision on:	evidence level	evidence level				
Result	**μ < Cc**	**μ < Cc**				
Select dataset	●	○	○	○	○	○

Back to data

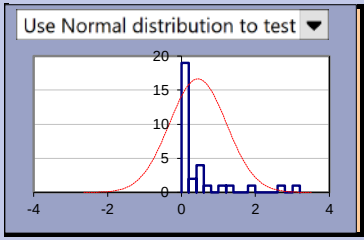
Test Results

Benzo (a) pyrene (mg/kg)

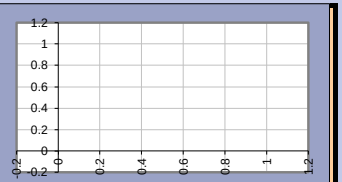
Client/client ref: Grainger PLC Site ref: Woodcroft Farm, Lovedean, PO8 9QA - F Date: 18-Jun-2018

Project ref: GE16943 Data description: User details: FG

Dataset: Benzo (a) pyrene (mg/kg)	
Sample mean (mg/kg), $\bar{x}$	0.4435
Sample standard deviation, s	0.7707
Sample size, n	31
Critical concentration, Cc (mg/kg)	3.93



Outliers & non-detects	
Outliers present?	Yes
Significance level	5%
Outliers excluded	0
Non-detects	#NAME?

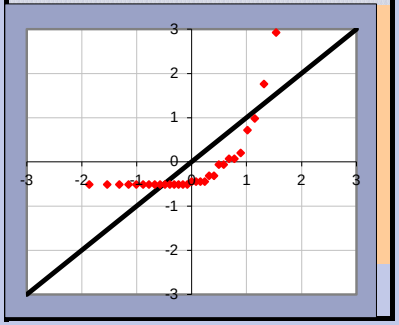


Normality test

Significance le: 5%

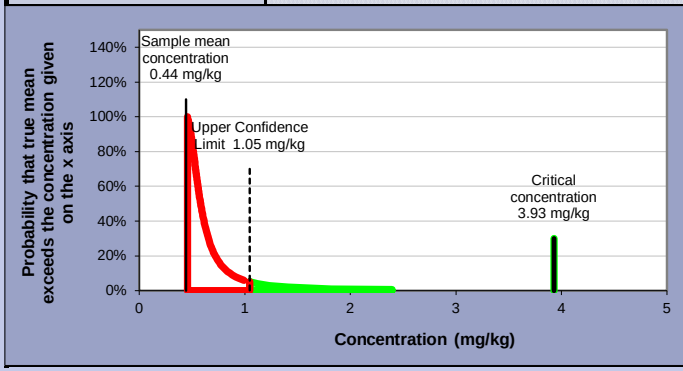
Non-normal distribution

Use: Auto: Chebychev



Test scenario: Planning: is true mean lower than critical concentration (μ < Cc)?

Null hypothesis:	The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc
Alternative hypothesis:	The true mean concentration is less than the critical concentration: μ < Cc

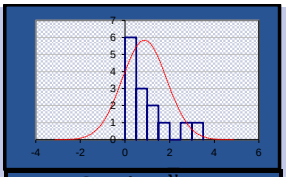


Evidence against Null hypothesis:	**100%**
Base decision on:	evidence level
Evidence level required:	95%
Balance of probability?	N/A
Reject Null Hypothesis?	Yes

μ < Cc (re this dataset)

Back to data | Back to summary | Go to outlier test | Go to normality test

Sample ID	Include?	Benzo (a) pyrene		Outliers
TP215	Y	3.1		
TP215	N			0.2
TP220	Y	0.5		
TP220	N			0.05
TP223	Y	0.05		
TP224	Y	0.6		
TP224	Y	0.05		
TP225	Y	1		
TP239	Y	0.5		
TP239	Y	0.05		
TP312	Y	1.8		
TP312	N			0.1
TP312	N			0.05
TP313	Y	1.2		
TP313	N			0.4
TP313	N			0.05
TP314	N			0.05
TP314	N			0.1
TP314	N			0.1
TP315	Y	2.7		
TP315	N			0.05
TP315	N			0.1
TP316	Y	0.4		
TP316	N			0.05
TP316	N			0.05
TP317	Y	0.05		
TP317	N			0.05
TP317	N			0.05
TP318	Y	0.2		
TP318	N			0.05
TP318	N			0.05
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			



Sample mean, $\bar{x}$
0.871

Standard deviation, s
1.001

Sample size, n
14

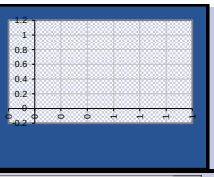
Maxiumum
3.100

Outlier Test Applicability
Not Applicable

Level of Significance
5%

Tn = 2.227
Tcrit = 2.372

Outliers?
No
(17 selected)



Dataset: Benzo (a) pyrene (mg/kg) O/T:14/31

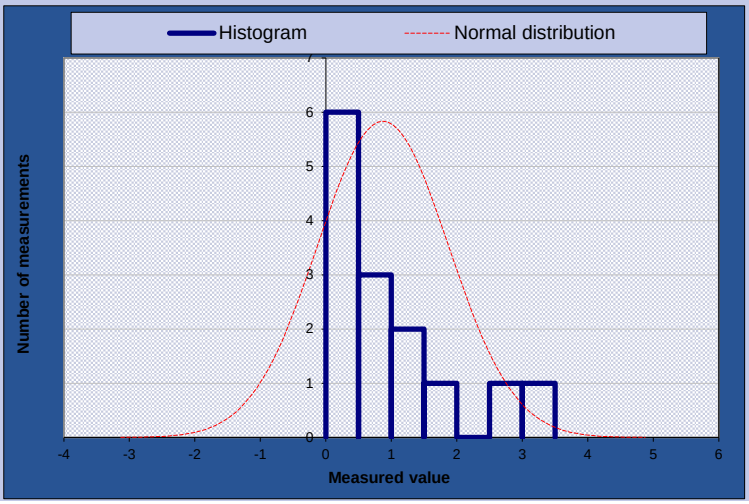
Use Normal distribution to test for outliers

Exclude identified outliers

Show individual summary

Back to summary

Back to data



Test Results

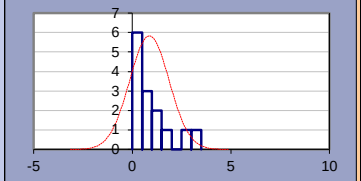
Client/client ref: Grainger PLC Site ref: Woodcroft Farm, Lovedean, PO8 9QA - F Date: 18-Jun-2018

Benzo (a) pyrene (mg/kg) O/T:14/31

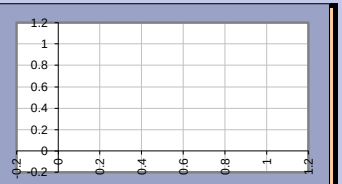
Project ref: GE16943 Data description: User details: FG

Dataset: Benzo (a) pyrene (mg/kg) O/T:14/31	
Sample mean (mg/kg), $\bar{x}$	0.8714
Sample standard deviation, s	1.0007
Sample size, n	14
Critical concentration, Cc (mg/kg)	3.93

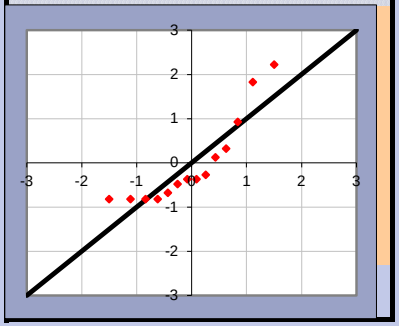
Use Normal distribution to test



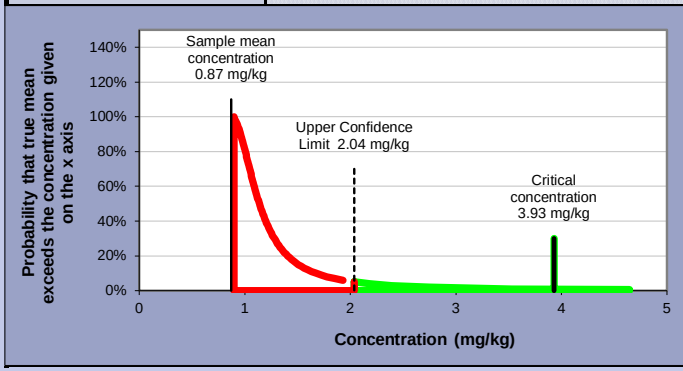
Outliers & non-detects	
Outliers present?	No
Significance level	5%
Outliers excluded	17
Non-detects	#NAME?



Normality test	
Significance le	5%
Non-normal distribution	
Use:	Auto: Chebychev



Test scenario:	Planning: is true mean lower than critical concentration (μ < Cc)?
Null hypothesis:	The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc
Alternative hypothesis:	The true mean concentration is less than the critical concentration: μ < Cc



Evidence against Null hypothesis:	**99%**
Base decision on:	evidence level
Evidence level required:	**95%**
Balance of probability?	N/A
Reject Null Hypothesis?	Yes

μ < Cc (re this dataset)

Back to data | Back to summary | Go to outlier test | Go to normality test

Test Results

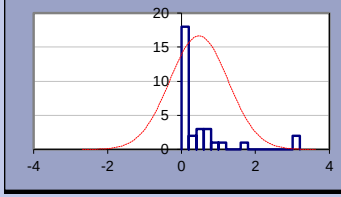
Benzo (b) fluoranthene (mg/kg)

Client/client ref: Grainger PLC | Site ref: Woodcroft Farm, Lovedean, PO8 9QA - F | Date: 18-Jun-2018

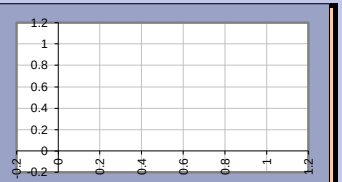
Project ref: GE16943 | Data description: | User details: FG

Dataset: Benzo (b) fluoranthene (mg/kg)	
Sample mean (mg/kg), $\overline{x}$	0.471
Sample standard deviation, s	0.7872
Sample size, n	31
Critical concentration, Cc (mg/kg)	2.6

Use Normal distribution to test



Outliers & non-detects	
Outliers present?	Yes
Significance level	5%
Outliers excluded	0
Non-detects	#NAME?

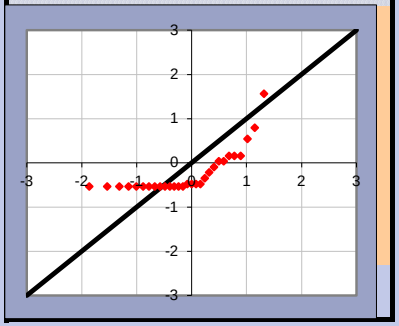


Normality test

Significance le: 5%

Non-normal distribution

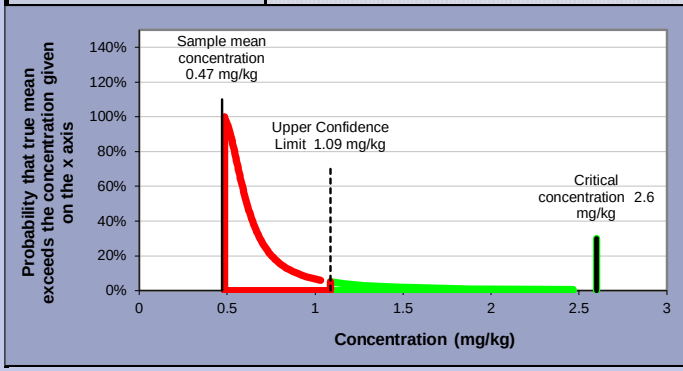
Use: Auto: Chebychev



Test scenario:

Planning: is true mean lower than critical concentration (μ < Cc)?

Null hypothesis:	The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc
Alternative hypothesis:	The true mean concentration is less than the critical concentration: μ < Cc

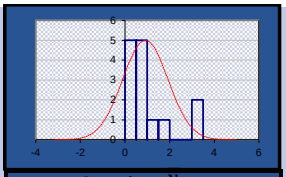


Evidence against Null hypothesis:	**100%**
Base decision on:	evidence level
Evidence level required:	**95%**
Balance of probability?	N/A
Reject Null Hypothesis?	Yes

μ < Cc (re this dataset)

Back to data | Back to summary | Go to outlier test | Go to normality test

Sample ID	Include?	Benzo (b) fluoranthene		Outliers
TP215	Y	3		
TP215	N			0.05
TP220	Y	0.6		
TP220	N			0.05
TP223	Y	0.05		
TP224	Y	0.6		
TP224	Y	0.05		
TP225	Y	0.9		
TP239	Y	0.5		
TP239	Y	0.05		
TP312	Y	1.7		
TP312	N			0.2
TP312	N			0.05
TP313	Y	1.1		
TP313	N			0.5
TP313	N			0.05
TP314	N			0.05
TP314	N			0.05
TP314	N			0.05
TP315	Y	3.1		
TP315	N			0.3
TP315	N			0.1
TP316	Y	0.6		
TP316	N			0.1
TP316	N			0.1
TP317	Y	0.1		
TP317	N			0.05
TP317	N			0.05
TP318	Y	0.4		
TP318	N			0.05
TP318	N			0.05
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			



Sample mean, $\bar{x}$
0.911

Standard deviation, s
1.016

Sample size, n
14

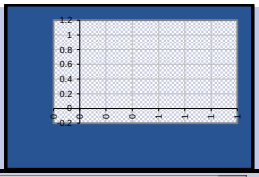
Maxiumum
3.100

Outlier Test Applicability
Not Applicable

Level of Significance, α
5%

Tn = 2.155
Tcrit = 2.372

Outliers?
No
(17 selected)



Dataset: Benzo (b) fluoranthene (mg/kg) O/T:14/31

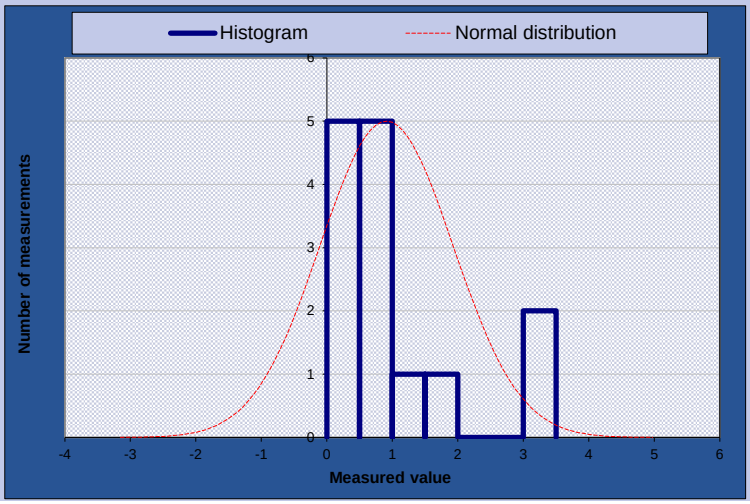
Use Normal distribution to test for outliers

Exclude identified outliers

Show individual summary

Back to summary

Back to data



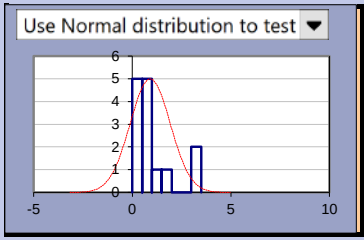
Test Results

Client/client ref: Grainger PLC | Site ref: Woodcroft Farm, Lovedean, PO8 9QA - F | Date: 18-Jun-2018

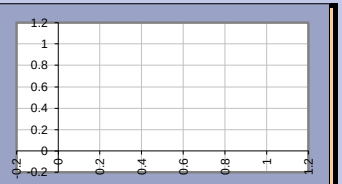
Benzo (b) fluoranthene (mg/kg) O/T:14/31

Project ref: GE16943 | Data description: | User details: FG

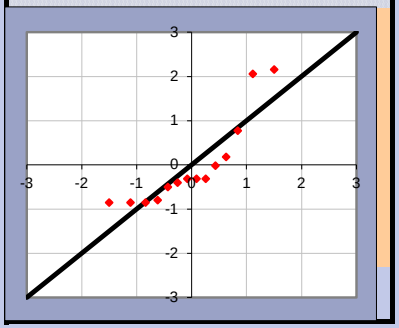
Dataset: Benzo (b) fluoranthene (mg/kg) O/T	
Sample mean (mg/kg), $\bar{x}$	0.9107
Sample standard deviation, s	1.0159
Sample size, n	14
Critical concentration, Cc (mg/kg)	2.6



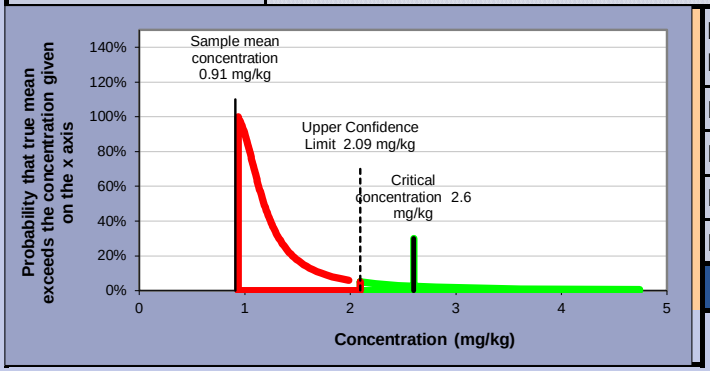
Outliers & non-detects	
Outliers present?	No
Significance level	5%
Outliers excluded	17
Non-detects	#NAME?



Normality test	
Significance le	5%
Non-normal distribution	
Use:	Auto: Chebychev



Test scenario:	Planning: is true mean lower than critical concentration (μ < Cc)?
Null hypothesis:	The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc
Alternative hypothesis:	The true mean concentration is less than the critical concentration: μ < Cc



Evidence against Null hypothesis:	**97%**
Base decision on:	evidence level
Evidence level required:	**95%**
Balance of probability?	N/A
Reject Null Hypothesis?	Yes

μ < Cc (re this dataset)

Back to data | Back to summary | Go to outlier test | Go to normality test

Test Results

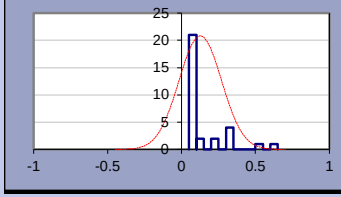
Dibenzo(a,h)anthracene (mg/kg)

Client/client ref: Grainger PLC | Site ref: Woodcroft Farm, Lovedean, PO8 9QA - F | Date: 18-Jun-2018

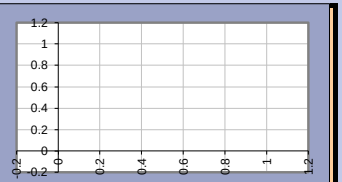
Project ref: GE16943 | Data description: | User details: FG

Dataset: Dibenzo(a,h)anthracene (mg/kg)	
Sample mean (mg/kg), $\bar{x}$	0.1274
Sample standard deviation, s	0.1437
Sample size, n	31
Critical concentration, Cc (mg/kg)	0.39

Use Normal distribution to test



Outliers & non-detects	
Outliers present?	Yes
Significance level	5%
Outliers excluded	0
Non-detects	#NAME?

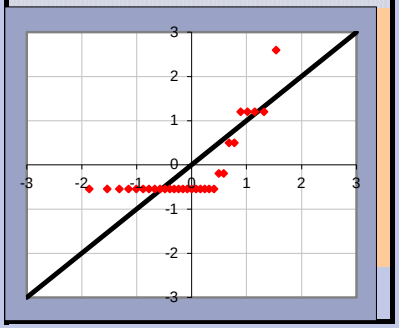


Normality test

Significance le: 5%

Non-normal distribution

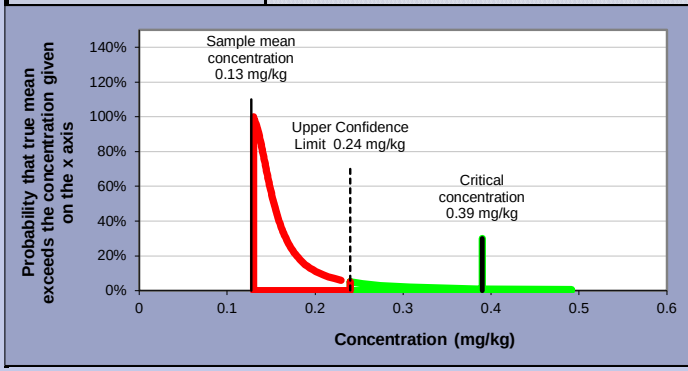
Use: Auto: Chebychev



Test scenario:

Planning: is true mean lower than critical concentration (μ < Cc)?

Null hypothesis:	The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc
Alternative hypothesis:	The true mean concentration is less than the critical concentration: μ < Cc

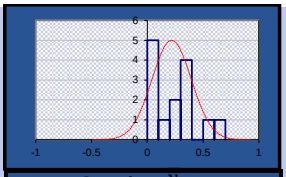


Evidence against Null hypothesis:	**99%**
Base decision on:	evidence level
Evidence level required:	**95%**
Balance of probability?	N/A
Reject Null Hypothesis?	Yes

μ < Cc (re this dataset)

Back to data | Back to summary | Go to outlier test | Go to normality test

Sample ID	Include?	Dibenzo(a,h)anthracene		Outliers
TP215	Y	0.6		
TP215	N			0.05
TP220	Y	0.2		
TP220	N			0.05
TP223	Y	0.05		
TP224	Y	0.2		
TP224	Y	0.05		
TP225	Y	0.3		
TP239	Y	0.3		
TP239	Y	0.05		
TP312	Y	0.3		
TP312	N			0.05
TP312	N			0.05
TP313	Y	0.3		
TP313	N			0.1
TP313	N			0.05
TP314	N			0.05
TP314	N			0.05
TP314	N			0.05
TP315	Y	0.5		
TP315	N			0.05
TP315	N			0.05
TP316	Y	0.1		
TP316	N			0.05
TP316	N			0.05
TP317	Y	0.05		
TP317	N			0.05
TP317	N			0.05
TP318	Y	0.05		
TP318	N			0.05
TP318	N			0.05
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			



Sample mean, $\bar{x}$
0.218

Standard deviation, s
0.177

Sample size, n
14

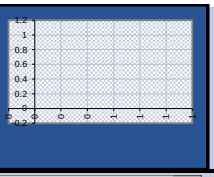
Maxiumum
0.600

Outlier Test Applicability
Not Applicable

Level of Significance
5%

Tn = 2.157
Tcrit = 2.372

Outliers?
No
(17 selected)



Dataset: Dibenzo(a,h)anthracene (mg/kg) O/T:14/31

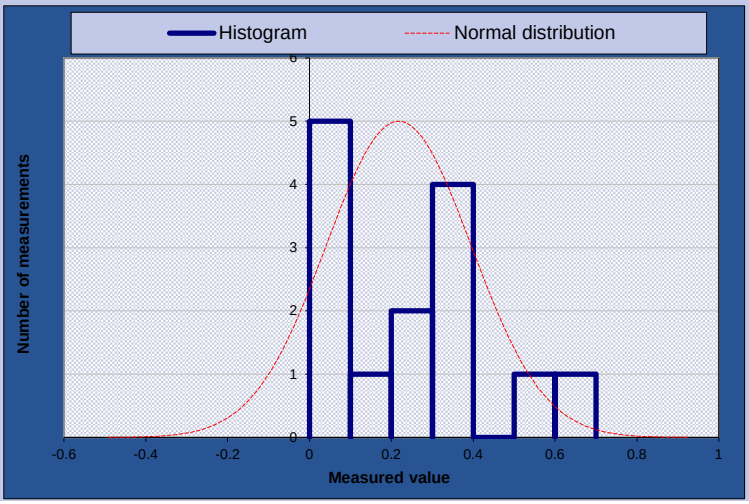
Use Normal distribution to test for outliers

Exclude identified outliers

Show individual summary

Back to summary

Back to data

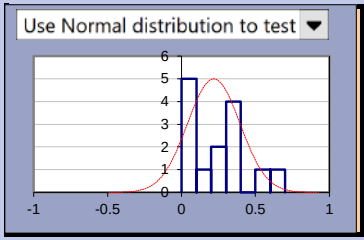


Test Results

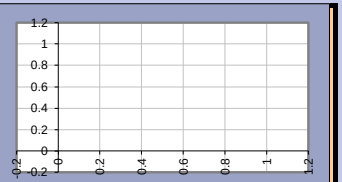
Client/client ref: Grainger PLC | Site ref: Woodcroft Farm, Lovedean, PO8 9QA - F | Date: 18-Jun-2018

Dibenzo(a,h)anthracene (mg/kg) O/T:14/31 | Project ref: GE16943 | Data description: | User details: FG

Dataset: Dibenzo(a,h)anthracene (mg/kg) O/	
Sample mean (mg/kg), $\bar{x}$	0.2179
Sample standard deviation, s	0.1772
Sample size, n	14
Critical concentration, Cc (mg/kg)	0.39



Outliers & non-detects	
Outliers present?	No
Significance level	5%
Outliers excluded	17
Non-detects	21

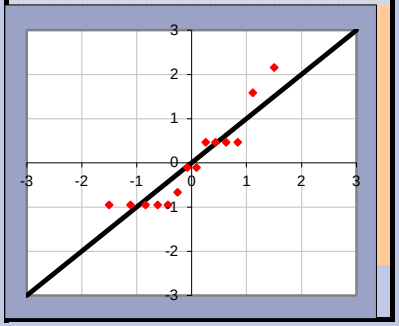


Normality test

Significance le: 5%

Non-normal distribution

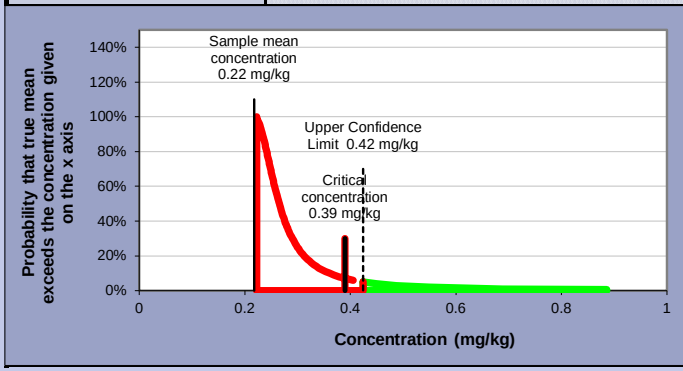
Use: Auto: Chebychev



Test scenario:

Planning: is true mean lower than critical concentration (μ < Cc)?

Null hypothesis:	The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc
Alternative hypothesis:	The true mean concentration is less than the critical concentration: μ < Cc



Evidence against Null hypothesis:	**93%**
Base decision on:	evidence level
Evidence level required:	**95%**
Balance of probability?	N/A
Reject Null Hypothesis?	No

Not enough evidence

Back to data | Back to summary | Go to outlier test | Go to normality test

Geo-Environmental

APPENDIX C

Site Photographs



Photos – 22/11/2017



Plate 1 View north east across the former farmyard and stable area



Plate 2 View of demolished former stables, with stockpiled wastes and possible ACM materials



Plate 3 View of partially covered stockpiled demolition waste including possible ACM's



Plate 4 View of former garage building associated with the farmhouse with possible asbestos sheeting stacked adjacent to building

Photos – 15/05/2018



Plate 5 View north of former farmyard area



Plate 6 View north east of former farmyard area



Plate 7 View of stockpiled crushed concrete material, stored in north western side of the farmyard area



Plate 8 View north west of crushed concrete stockpile



Plate 9 View south east towards farmhouse of former farmyard area



Plate 10 View north east across former farmyard area



Plate 11 View west towards horse arena area



Plate 12 View north across north edge of the former farmyard area

Geo-Environmental

APPENDIX D

Imported Soils Criteria



Geo-Environmental

IMPORTED SOIL SPECIFICATION

for the site at

WOODCROFT FARM, WOODCROFT LANE,

LOVEDEAN, HAMPSHIRE, PO8 9QA

on behalf of

GRAINGER PLC



Report:	**IMPORTED SOIL SPECIFICATION**
Site:	**WOODCROFT FARM, WOODCROFT LANE, LOVEDEAN, HAMPSHIRE, PO8 9QA**
Client:	**GRAINGER PLC**
Date:	**28-06-2018**
Reference:	**GE16943-ISS-180628**
Revision:	**1.0**
Prepared by:	
	FIONA GOODE BSc (Hons), MSc, FGS, MIEnvSc, RSoBRA **SENIOR CONSULTING ENGINEER**
Reviewed by:	
	GAVIN ROBERTS CGeol, BEng (Hons), MSc, FGS **TECHNICAL DIRECTOR**

Geo-Environmental Services Limited
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AMENDMENT RECORD

Revision ref.	Date	Reasons for amendment	Author's initials
1.0	28/06/2018	First issue	FG

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2.0	Chemical Composition	1
3.0	Nutritional Composition	5
4.0	Physical Composition	5
5.0	Source Requirements	6
6.0	Testing Rates and Compliance	6

1.0 Introduction

This document sets out the requirements for imported subsoil and Topsoil materials for any project undergoing redevelopment or other works where capping work is required.

Within the specification reference has been made to topsoil and subsoil. Topsoil relates to the top layer of natural soil that can support healthy vegetation growth. Subsoil relates to the layer of soil immediately below the topsoil to the depth of the underlying broken rock or geological parent material.

The specification considers the chemical, nutritional and physical properties of soils that are to be imported onto site in order to ensure materials used are suitable for their intended use and do not introduce any new hazard or pollutant linkage on to the site.

Where there is any discrepancy between this specification and BS3882:2015 or BS8601:2013, the latter documents shall take precedence unless otherwise formally confirmed by the relevant regulator.

2.0 Chemical Composition

The chemical criteria listed below are based on the published Category 4 Screening Levels (C4SLs) by DEFRA and/or the relevant Suitable for Use Levels (S4ULs) published by LQM, for a residential end use with plant uptake. From time to time these values may change in line with regulatory or UK policy changes. Such changes will require revision and re-issue of this document.

Where C4SLs or S4ULs are published for a range of Soil Organic Matter (SOM) values, these ranges and their respective SOM values have been presented and would be considered when assessing compliance with this Specification.

2.1 Method of Analysis

Samples should be analysed using UKAS or MCERTS accredited laboratories. For TPH analysis sample preparation must not include air drying.

2.1.1 Poly Aromatic Hydrocarbon (PAH)

The PAH analysis must include the EPA priority 16.

2.1.2 Total Petroleum Hydrocarbons (TPH)

The analysis for TPH should be undertaken on the ‘as received’ sample and not be subject to any pre-treatment and shall include aliphatic and aromatic carbon banding split.

2.2 Topsoil (0-300mm depth)

Tables 1, 1a, 1b and 1c provide a list of the maximum acceptable concentrations for a range of determinants for imported topsoil.

Determinant	Maximum concentration (mg/kg)
Inorganic	**SOM 6%**
Arsenic (total)	37
Boron (water soluble)	290
Cadmium (total)	11
Chromium (total)	130
Copper (total)	2400
Cyanide (total)	250
Lead (total)	200
Mercury (total inorganic)	40
Nickel (total)	180
pH	5.5 – 7.8
Selenium (total)	250
Sulphate (total)	2000
Zinc (total)	3700
Asbestos	Absent
Organic	
Phenols (total)	110
Poly Aromatic Hydrocarbon (speciated)	See Table 1a
Total Petroleum Hydrocarbon (speciated)	See Table 1b

Table 1 Chemical Specification for Topsoil

Determinant	Maximum Concentration (mg/kg)		
	1% SOM	2.5% SOM	6% SOM
Acenaphthene	210	510	1100
Acenaphthylene	170	420	920
Anthracene	2400	5400	11000
Benz(a)anthracene	7.2	11	13
Benzo(a)pyrene	2.2	2.7	3.0
Benzo(b)fluoranthene	2.6	3.3	3.7
Benzo(ghi)perylene	320	340	350
Benzo(k)fluoranthene	77	93	100
Chrysene	15	22	27
Dibenz(ah)anthracene	0.24	0.28	0.30
Fluoranthene	280	560	890
Fluorene	170	400	860
Indeno(1,2,3CD)pyrene	27	36	41
Naphthalene	2.3	5.6	13.0
Phenanthrene	95	220	440
Pyrene	620	1200	2000

Table 1a Topsoil Specification for Speciated PAH

Determinant	Maximum Concentration (mg/kg)		
	1% SOM	2.5% SOM	6% SOM
Aliphatic			
EC 5-6	42	78	160
EC >6-8	100	230	530
EC >8-10	27	65	150
EC >10-12	130	330	760

Determinant	Maximum Concentration (mg/kg)		
	1% SOM	2.5% SOM	6% SOM
EC >12-16	1100	2400	4300
EC >16-35	65000	92000	110000
EC >35-44	65000	92000	110000
Aromatic			
EC 5-7 (benzene)	70	140	300
EC >7-8 (toluene)	130	290	660
EC >8-10	34	83	190
EC >10-12	74	180	380
EC >12-16	140	330	660
EC >16-21	260	540	930
EC >21-35	1100	1500	1700
EC >35-44	1100	1500	1700
Aliphatic and Aromatic			
EC >44-70	1600	1800	1900

Table 1b Topsoil Specification for Speciated TPH

Determinant	Phytotoxicity GAC (mg/kg)		
	pH <6.0	pH 6.0-7.0	pH >7.0
Zinc	200	200	300
Copper	100	135	200
Nickel	60	75	110

Table 1c Topsoil Specification for phytotoxicity

2.3 Subsoil (300-1000mm depth)

Tables 2, 2a, 2b and 2c provide a list of the maximum acceptable concentrations for a range of determinants for imported subsoil.

Determinant	Maximum concentration (mg/kg)
Inorganic	SOM 6%
Arsenic (total)	37
Boron (water soluble)	290
Cadmium (total)	11
Chromium (total)	130
Copper (total)	2400
Cyanide (total)	250
Lead (total)	200
Mercury (total inorganic)	40
Nickel (total)	180
pH	5.5 – 7.8
Selenium (total)	250
Sulphate (total)	2000
Zinc (total)	3700
Asbestos	Absent
Organic	
Phenols (total)	110
Poly Aromatic Hydrocarbon (speciated)	See Table 2a

Determinant	Maximum concentration (mg/kg)
Inorganic	**SOM 6%**
Total Petroleum Hydrocarbon (speciated)	See Table 2b

Table 2 Chemical Specification for Subsoil

Determinant	Maximum Concentration (mg/kg)		
	1% SOM	2.5% SOM	6% SOM
Acenaphthene	210	510	1100
Acenaphthylene	170	420	920
Anthracene	2400	5400	11000
Benz(a)anthracene	7.2	11	13
Benzo(a)pyrene	2.2	2.7	3.0
Benzo(b)fluoranthene	2.6	3.3	3.7
Benzo(ghi)perylene	320	340	350
Benzo(k)fluoranthene	77	93	100
Chrysene	15	22	27
Dibenz(ah)anthracene	0.24	0.28	0.30
Fluoranthene	280	560	890
Fluorene	170	400	860
Indeno(1,2,3CD)pyrene	27	36	41
Naphthalene	2.3	5.6	13.0
Phenanthrene	95	220	440
Pyrene	620	1200	2000

Table 2a Subsoil Specification for Speciated PAH

Determinant	Maximum Concentration (mg/kg)		
	1% SOM	2.5% SOM	6% SOM
Aliphatic			
EC 5-6	42	78	160
EC >6-8	100	230	530
EC >8-10	27	65	150
EC >10-12	130	330	760
EC >12-16	1100	2400	4300
EC >16-35	65000	92000	110000
EC >35-44	65000	92000	110000
Aromatic			
EC 5-7 (benzene)	70	140	300
EC >7-8 (toluene)	130	290	660
EC >8-10	34	83	190
EC >10-12	74	180	380
EC >12-16	140	330	660
EC >16-21	260	540	930
EC >21-35	1100	1500	1700
EC >35-44	1100	1500	1700
Aliphatic and Aromatic			
EC >44-70	1600	1800	1900

Table 2b Subsoil Specification for Speciated TPH

Determinant	Phytotoxicity GAC (mg/kg)		
	pH <6.0	pH 6.0-7.0	pH >7.0
Zinc	200	200	300
Copper	100	135	200
Nickel	60	75	110

Table 2c Subsoil Specification for phytotoxicity

3.0 Nutritional Composition

The nutritional criteria listed below are based on BS3882:2015 for topsoil and BS8601:2013 for subsoil. In the absence of published criteria, current guidance and best practice has been applied to derive appropriate criteria.

3.1 Topsoil & Subsoil

Table 3 details the minimum acceptable concentrations for imported topsoil and subsoil. The nutrient concentrations set out in Table 3 for Topsoil are based on those set out in BS3882:2015 which states *"Multipurpose topsoil is the grade suited to most situations where topsoil is required; however, there can be situations where specific purpose topsoil is required"*. In the event that an alternative specific Topsoil grade is required, i.e. acidic; calcareous; low fertility; low fertility acidic; or low fertility calcareous, the compliance criteria set out in BS3882:2015 shall be applicable in place of those set out in Table 3 below.

Topsoil/Subsoil	Parameter	Concentration
Topsoil (multipurpose grade only)	Phosphorous	16 – 140 mg/l
	Potassium	121 – 1500 mg/l
	Magnesium	51 – 600 mg/l
	Nitrogen	0.15 % m/m
	Carbon:nitrogen ratio	<20:1
Subsoil	Phosphorous	16 mg/l
	Potassium	121 mg/l
	Magnesium	51 mg/l
	Nitrogen	0.15 %
	Carbon:nitrogen ratio	<20:1

Table 3 Nutritional Specification for Topsoil and Subsoil

4.0 Physical Composition

The physical criteria listed below are based on BS3882:2015 Specification for Topsoil. In the absence of published criteria, current guidance and best practice has been applied to derive appropriate criteria.

4.1 Topsoil

Table 4 details the physical suitability requirements for imported topsoil and subsoil. Table 4 sets out acceptability criteria from BS3882:2015 for multipurpose Topsoil. In the event that an alternative specific Topsoil grade is required, i.e. acidic; calcareous; low fertility; low fertility acidic; or low fertility calcareous, the compliance criteria set out in BS3882:2015 shall be applicable in place of those set out in Table 4 below.

Topsoil/Subsoil	Parameter	Specification requirements
Topsoil (multipurpose Topsoil only)	Textural Classification	Sandy clay loam, sandy loam, loamy sand, sandy silt loam (as defined in BS3882:2015, Figure 1)
	Loss on Ignition	3 - 20% (for 5-20% clay soil) 5 - 20% (for 20-35% clay soil)
	Maximum Stone content:	>2mm = 30% >20mm = 10% >50mm = 0%
Subsoil	Textural Classification	Refer to BS8601:2013 Figure 1
	Loss on Ignition	2%
	Maximum Stone content:	>2mm = 40% >20mm = 20% >75mm = 0%

NB: Topsoil and Subsoil must be free from glass, brick fragments, plastic, metal, asbestos and other deleterious materials.

Table 4 Physical Specification for Topsoil & Subsoil

5.0 Source Requirements

5.1 Topsoil and Subsoil

The following will be provided with all soils imported to site:

- A site plan detailing the location and address of the source site, including grid reference.
- Location description of source material, including historic and current site uses.
- Sample analysis results of material at source, including details of laboratory, date of sampling, date samples received by laboratory etc.

5.2 Manufactured soils

Where natural soils are unavailable manufactured soils may be utilised, and the following should be provided:

- Details of the soil manufacturing process, including criteria for received soils, quality control procedure and validation protocol.
- Soils should be tested at a minimum ratio of one sample per 50m^3.

6.0 Testing Rates and Compliance

Sampling shall be undertaken in accordance with BS3882:2015 and BS8601:2013.

6.1 Topsoil

Where natural sourcing is proposed, the provenance of the material shall be determined by analysis of the soils at a minimum rate of 3No. samples per source site (up to 250m^3) and 1 sample per 250m^3 thereafter. Imported soils should be sampled once it has been laid on the site to support the analysis provided by the source supplier.

Where Topsoil is derived from a manufactured source, testing would be undertaken at a rate of 1 sample per 50m^3, with a minimum of 3No. tests for any given potential source material (or production batch).

6.2 Subsoil

Where the source of the material is known validation sampling should be undertaken at a minimum rate of 3 samples per source (up to 250m³) and 1 sample per 250m³ thereafter. Imported soils should be sampled once it has been laid on the site to support the analysis provided by the source supplier.

Where subsoil is derived from a manufactured source, testing would be undertaken at a rate of 1 sample per 50m³, with a minimum of 3No. tests for any given potential source material (or production batch)

Where the source of the material is not known the validation sampling should be undertaken in-line with the testing rates as set out for cover systems to ensure the materials are suitable for their intended use. Further guidance on minimum testing under this scenario is presented in Section 6.3 below.

6.3 Cover Systems

Where a cover system/ capping layer is proposed as part of the required remedial measures, sampling frequency will follow the guidance set out by the NHBC in their guidance for clean cover systems (2010) and supplemented within NHBC Technical Extra Guidance Issue 8, November 2012, outlined below:

- Sites with more than 30 plots testing should be conducted at a rate of one plot in four, with a minimum of 10 tests across the site;
- Sites with between 20 – 30 plots testing should be conducted at a rate of one plot in three, with a minimum of 7 tests across the site;
- Sites with between 5 -20 plots testing should be conducted at a rate of one plot in two with a minimum of 5 tests across the site;
- Sites with fewer than 5 plots testing should be conducted in every plot with a minimum of 3 tests across the site.

6.4 Sample failure

In the event that a sample fails to meet the specified criteria for any parameter the Environmental Consultant should be contacted for advice on the suitability of the materials.

Further testing may be required to provide reassurance that the exceedances are not representative of the soil and to provide clarification whether the soil is suitable for importation and/or proposed use.

6.5 Timing

Sampling and analysis undertaken by a manufactured topsoil supplier shall be no earlier than two weeks from the date of import, any results which are older than two weeks will be deemed not to be representative of the soils to be imported and rejected. Results showing consistency of batching may be requested to demonstrate consistency of the physical, chemical and nutritional composition of the material.

Imported soil suppliers and groundwork contractors are required to take reasonably practicable measures to ensure that compliance with this Specification does not hinder formal completion of individual plots or developments.

6.6 General Compliance

All analytical suites shall correspond with the chemical, nutritional and physical compliance criteria (as set out in Tables 1 to 4). The soil supplier shall ensure that the analytical limits of detection are equal or lower than the compliance values presented within this Specification. Where either testing suites or limits of detection do not comply with this Specification, the entire set of results shall be rejected.

Geo-Environmental

REMEDIATION STRATEGY & VERIFICATION PLAN

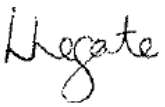
for the land at

HORSE ARENA (HA), WOODCROFT FARM,

WOODCROFT LANE, LOVEDEAN, PO8 9QA

on behalf of

VISTRY HOMES SOUTHERN

Report:	**REMEDIATION STRATEGY & VERIFICATION PLAN**
Site:	**HORSE ARENA (HA), WOODCROFT FARM, WOODCROFT LANE, LOVEDEAN, PO8 9QA**
Client:	**VISTRY HOMES SOUTHERN**
Date:	**11/02/21**
Reference:	**GE16943-RSVP-HA-V6.0-FEB21**
Version:	**6.0**
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AMENDMENT RECORD

Revision ref.	Date	Reasons for amendment	Author	Reviewed By	Authorised by
1.0	28/06/2018	First issue	FG	GR	GR
2.0	26/10/2018	Accounts for findings of Detailed Quantitative Gas Risk Assessment	FG/GR	GR	GR
3.0	27/03/2020	Revision to reflect proposed development levels	GR	GR	GR
4.0	24/08/2020	Revision to reflect proposed development levels	FG	LL	GE
5.0	22/12/2020	Revision to reflect changes to proposed development levels, revision to figures only	FG	LL	GR
6.0	11/02/2021	Revision to reflect changes to proposed soil cover system to include physical and visual barriers	FG	GR	GR

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1.0 INTRODUCTION

1.1 General

Following a Phase I and Phase II assessment of the site undertaken by third parties, detailed within reports listed below, Geo-Environmental was appointed by Grainger PLC and subsequently Vistry Southern, to undertake supplementary investigation and formulate a Remediation Strategy in relation to the proposed development at Woodcroft Farm, Woodcroft Lane, Lovedean, PO8 9QA herein referred to as 'the site' (Figures 1 and 2). Three distinct areas of the development site were identified as being impacted by contamination. Separate Remediation Strategies will be written for each of these distinct areas, therefore this Remediation Strategy is specific to the area of the development site known as the former Horse Arena area, located immediately to the north of the infilled chalk pit and to the north-west of the former farmyard area.

This Remediation Strategy & Verification Plan for the Horse Arena (RSVP-HA v6.0), should be read in conjunction with the Remediation Strategy & Verification Plans for the former chalk pit (RSVP-CPv6.0) and farmyard (RSVP-FY v6.0) dated December 2020.

The site as a whole, has been the subject to Phase I Ground Condition Report, ref 21834, dated 2010 prepared by Peter Brett Associates (PBA), which included a desk study and preliminary risk assessment for the overall Woodcroft Farm site; a Factual Report, ref RML 4750, dated October 2011 prepared by Risk Management Limited, which included ground investigation and laboratory test results; and a Geoenvironmental and Geotechnical Ground Investigation Report, ref 21834-030-R02, dated July 2013 prepared by PBA, which presented an interpretative assessment of the overall Woodcroft Farm site.

In addition to the above reports, Geo-Environmental was commissioned in 2017 to undertake a review of these reports, and supplementary testing and assessment. This was reported with a Soil Contamination Assessment ref. GE16662-FG02-170929, dated 29th September 2017.

The remedial strategy presented herein has been developed to reflect the findings from all phases of the assessments undertaken on this site, in respect to the horse arena area. Based on the findings of the investigations it is considered that remediation works would be required with respect to soil contamination identified within the natural soils within the horse arena area.

The revised remedial strategy (v6.0) accounts for clarification of development levels, as discussed with the Client and the Developer, and presented on Ardent's development levels plans ref 192931-073, 192931-074 and 192931-075, prepared November 2020.

1.2 Objectives

The Remediation Strategy & Verification Plan (RSVP) sets out the proposed remedial works to be undertaken on the subject site to support its development for a proposed residential end use with private gardens.

1.3 Planning Permission

It is understood that a planning application has been approved for the site by Havant Borough Council under Planning Reference APP/13/00804. The following pre-commencement planning conditions have been attached to the application which relate to the remediation and validation of land contamination on the site.

11. Prior to the commencement of construction within any specified phase or defined area the development approved by this Planning Permission (as may be agreed in writing by the Local Planning Authority), a scheme to deal with the risks associated with contamination of the site shall be submitted to and approved in writing by the Local Planning Authority. That scheme shall include all of the following elements unless specifically excluded in writing by the Local Planning Authority.

1. *A scheme of further investigation, based on the previously submitted GeoEnvironmental & Geotechnical report. The scope of the investigation shall be sufficient to:*
    - *confirm the preliminary assessment of the nature and extent of contamination at the site,*
    - *inform an appropriate assessment of the risks to all receptors that may be affected, including controlled waters, and;*
    - *enable the appropriate design of remediation and/or risk mitigation measures (if required).*
2. *The results of the further investigation and risk assessment (1) and if appropriate, a method statement based on these results giving full details of the remediation and/or risk mitigation measures required, and how they are to be undertaken.*
3. *A verification report or statement (as appropriate) upon completion of the works set out in (2) [if any], confirming that measures undertaken have been implemented in accordance with the method statement, and have achieved the required performance standards. The verification report / statement shall provide details of any measures necessary for maintenance, further monitoring and reporting.*

All elements shall be adhered to unless agreed in writing by the Local Planning Authority.

Reason: To prevent future occupants of proposed residential properties being exposed to unacceptable risks from identified contamination & soil gas associated with automotive repair and landfill activity previously undertaken at the site, and to ensure that the site does not pose an unacceptable risk to the groundwater Source Protection Zone 1; having due regard to policies and proposals E1 of the Hampshire County Structure plan 1996-2011 (Review), and DM10 of the Havant Borough Adopted Core Strategy (2011), and DM17 of the Draft Local Plan (Allocations) 2012.

12. Prior to the commencement of construction of any part of the development approved by this Planning Permission, a protocol for the identification & assessment of any unforeseen ground conditions shall be submitted to and approved in writing by the Local Planning Authority. The provisions of the approved protocol shall be observed throughout the undertaking of all relevant construction activities.

Reason: For the protection of workers and the general public during the development of potentially contaminated land, and to prevent future occupants of proposed residential properties being exposed to unacceptable risks from unidentified &/or unexpected contamination that may be associated with previous activities undertaken at the site; having due regard to policies and proposals E1 of the Hampshire County Structure plan 1996-2011 (Review), and DM10 of the Havant Borough Adopted Core Strategy (2011), and DM17 of the Draft Local Plan (Allocations) 2012.

13. If, during development, contamination not previously identified at the site is found to be present, then no further development (unless otherwise agreed in writing with the Local Planning Authority) shall be carried out until the developer has submitted, and obtained written approval from the Local Planning Authority for an addendum to the Method Statement required under Condition 1, (2). This addendum shall detail how this unexpected contamination shall be dealt with, and the development shall not be carried out other than in accordance with the approved details.

Reason: For the protection of workers and the general public during the development of potentially contaminated land, and to prevent future occupants of proposed residential properties being exposed to unacceptable risks from unidentified &/or unexpected contamination that may be associated with previous activities undertaken at the site; having due regard to policies and proposals E1 of the Hampshire County Structure plan 1996-2011 (Review), and DM10 of the Havant Borough Adopted Core Strategy (2011), and DM17 of the Draft Local Plan (Allocations) 2012.

2.0 BACKGROUND

This Remediation Strategy & Verification Plan (RSVP) has been developed from the findings of the various phases of assessment.

A brief overview of salient findings of the reports is presented below. For further information, the individual reports should be referred to directly.

2.1 Overview

The wider site's previous uses included use as a farm with associated barns and buildings, scrapyard and the former chalk pit being infilled as an inert landfill. The portion of the site considered specifically herein comprised a horse arena located to the north of the former chalk pit and north-west of the former farmyard, as shown in Figure 2.

The ground conditions encountered within the horse arena comprised a mantle of Topsoil and/or Made Ground overlying, sandy clay, and clay, with bands of flint cobbles overlying the Chalk. Made Ground was only encountered within one location, TP309.

The Topsoil and/or Made Ground was underlain by soft to firm clay and sandy clay (Head Deposits) in the majority of locations with a band of firm to stiff clay with flint cobbles tentatively identified as Lambeth Group overlying the Chalk. The Chalk was encountered within the majority of locations within the horse arena area from a depth of between 1.10m bgl and 2.10m bgl.

Previous investigation and testing by third parties identified exceedances of metals within the natural soils in the horse arena area of the site. Therefore, further investigation and testing was undertaken to inform this RSVP and is presented herein.

The supplementary investigation and testing of soils on site identified contaminant concentrations of concern within the natural soils in relation to Arsenic and Beryllium. It is considered that remedial action would be warranted to protect end users of a residential development on this site in relation to the isolated concentrations of Arsenic and Beryllium.

Groundwater was not encountered within any of the investigation locations and is anticipated to be present at depths in excess of 25.0m bgl.

Following a Detailed Ground Gas Risk Assessment in relation to the adjacent infilled chalk pit and in the absence of any plausible ground gas source on the Horse Arena area, no requirement for ground gas protection has been identified.

2.2 Supplementary Intrusive Investigation Works – Horse Arena

As part of the formulation of a remedial strategy further intrusive investigation works were undertaken between 14th May 2018 and 18th May 2018 in order to delineate areas of previously identified contamination. In relation to the Horse Arena area these works comprised the excavation of 6No. trial pits to depths of up to 3.00m bgl with associated environmental sampling and testing at various depths. The location of the trial pits is presented in Figure 3 with the results of the exploratory hole logs for the recent and previous phase of investigation presented in Appendix A, and the geochemical analysis and statistical assessments presented in Appendix B. Figure 6 shows the approximate extent of the area of impacted soils.

Further discussion relating to the implications of these supplementary investigation works is presented in Section 3 of this report.

2.3 Proposed Site Use

The proposed development for the wider site is understood to comprise the construction of 288 residential units, associated car parking, open space and landscaping. The horse arena area covers c. 10No. houses and associated gardens. The area of impacted soil extending slightly to the north and east of the Horse Arena fence as shown on Figure 6 such that the impacted area extends into an additional rear garden and area of communal garden to the east and some amenity soft landscaping in parking areas to the north.

The Levels Strategy indicates that finished development levels in gardens will be c. 0.70-1.0m higher than the predevelopment ground level, as shown in Figures 7 and 9.

2.4 Conceptual Site Model

Assessment of the investigation findings have identified particular hazards, or potential hazards which were considered to require intervention (remediation) to mitigate the risk of harm. Remediation works are proposed to break the identified plausible pollutant linkages associated with respect to contaminants of concern above respective assessment criteria within private garden areas proposed within the Horse Arena area, thereby mitigating the associated risk of harm to human health.

This would be undertaken as several phases of works on site:

1) Surface strip of sand dressing surface within the Horse Arena.
2) Surface strip of Topsoil within the vicinity of TP212, TP229, TP306 and TP307 (outside of the area where the sand dressing is present). The Topsoil from this area will be segregated and separately stockpiled awaiting further testing to demonstrate suitability for re-use.
3) Installation of a soil cover system in private garden areas and areas of soft landscaping to break the source, pathway receptor pollutant linkage for the contaminants identified within the Horse Arena area, and to also provide suitable growing media. The cover system shall incorporate a 150mm thick break layer formed of stone or crushed concrete with a geotextile membrane laid above and beneath, and overlain by a deter to dig geofabric to act as a visible deterrent overlain by a minimum of 450mm in thickness to include a minimum of 300mm of Topsoil. The cover system is likely to be completed with Topsoil placement towards the end of plot specific development.

Given the increase in ground levels indicated by the Levels Strategy drawing, there is no requirement to undertake a reduced dig to accommodate the soil cover system in gardens. Figure 8 shows the plots where a soil cover system is considered to be required.

The aim of the remediation is not to remove all contamination identified on site but to reduce the identified risk to an acceptable level with respect to human health, the built environment and controlled waters.

3.0 SOILS

The ground conditions within the Horse Arena have been established through several phases of intrusive investigation. Encountered soils comprised Topsoil, overlying Head Deposits, Lambeth Group and Chalk.

Made Ground was only encountered in one location, TP309 to a depth of 0.30m bgl, and was found to comprise brown sandy clay with flint gravel, flint cobbles and occasional black staining. No visual or olfactory evidence of contamination was identified on the site.

The sand dressed area of the Horse Arena was located within the vicinity of TP308 to TP311. This area was found to have sand dressing overlying a very limited thickness of Topsoil.

A review of chemical analysis of the soil samples from the Horse Arena area was undertaken, including the most recent samples taken for delineation purposes, and the results compared individually against the relevant GAC, SSAC or C4SL for a proposed residential end use (with plant uptake). Individual exceedances above the respective assessment criteria were identified for Arsenic, Beryllium and Nickel, as summarised in Table 1.

Determinand	Tier 1 Criteria mg/kg	Depth m bgl	Concentration mg/kg	Geology
Arsenic	S4UL – 37 SSAC – 38.03	TP229 at 0.6 TP307 at 1.2 TP308 at 0.3 TP308 at 0.7 TP309 at 0.5	38.2 76.9 95.8 68.0 65.6	Natural
Beryllium	S4UL – 1.7 SSAC – 1.72	TP306 at 0.8 TP307 at 0.8 TP307 at 1.2 TP308 at 0.7 TP309 at 0.5 TP311 at 0.4 TP311 at 0.8	2.0 6.4 2.9 1.8 5.1 2.3 2.6	Natural
Nickel	S4UL – 180 SSAC - 149	TP311 at 0.8	200	Natural

Table 1 Summary of exceedances against Tier 1 assessment criteria

The tier 1 exceedances where screened against the Site Specific Assessment Criteria (SSAC) calculated for the site. All of the exceedances identified were also found to exceed the calculated SSAC for residential end use with plant uptake. The noted exceedances of the calculated SSAC have all been identified as being within the natural soils beneath the Topsoil within the Horse Arena area.

The results were assessed further through statistical assessment as described below.

Statistical analysis of the samples within the dataset was undertaken in accordance with guidance contained in the CIEH/CL:AIRE report 'Comparing Soil Contamination Data with a Critical Concentration' (May 2008). If the contamination status of the soils is considered in a planning context, the null hypothesis tested by the analysis is whether the true mean concentration is equal to or greater than the critical concentration for a given determinand, with the critical concentration being the relevant SSAC or GAC (the soil screening value) for that determinand in the context of the intended end use of the site. If the analysis shows that the true mean concentration is less than the critical concentration the null hypothesis can be rejected. The guidance recommends that for the null hypothesis to be rejected the analysis should show that there is a 95% (or higher) likelihood that the true mean concentration is below the critical concentration. Where this is the case the site is considered to be

acceptable for the planned end use without any necessary remedial measures.

Statistical assessment was undertaken on all results of geochemical testing undertaken by Geo-Environmental, for heavy metals from within the natural soils from across the site excluding the farmyard area and chalk pit/landfill area. Due to the type and extent of Made Ground encountered within the farmyard and chalk pit/ landfill areas it was deemed that results from these areas were not representative of the natural soils across the site and were therefore not suitable for inclusion within the statistical assessments.

The statistical analysis showed that the null hypothesis could not be rejected for Arsenic or for Beryllium, but that the null hypothesis could be rejected for Nickel. Whilst statistical outliers were recorded within the datasets for both Arsenic and Beryllium, removal of the outliers, all of which were located within the horse arena area, from the dataset did allow the null hypothesis to be rejected for both contaminants. As such the statistical assessment has demonstrated that the elevated concentrations of Arsenic and Beryllium identified are representative of localised elevated concentrations of Arsenic and Beryllium within the Horse Arena area only and are not considered to be representative of elevated background concentrations within the natural soils across the wider site. Whilst statistical outliers were identified for a number for other substances, all reported concentrations (and statistical upper confidence limit concentrations) were below the relevant SSAC. The results of the statistical assessments are presented within Appendix B.

It is considered that the most likely cause of the impacted natural soil within the horse arena would be from the imported sand dressing utilised as a cover in this area. Through the use of the area as a horse arena and the disturbance of the cover this may have resulted in a mixing, albeit minimal, of the imported materials with underlying natural soils.

In addition, all of the samples from the Horse Area were screened for the presence of asbestos. Asbestos was not identified within the samples analysed.

Based on the above assessment it is considered that remedial action would be warranted to protect end users of a residential development on this site in relation to the concentrations of Arsenic and Beryllium identified within the natural soils within the Horse Arena area, as shown on Figure 4. Remedial action to protect end users from impacted soil is discussed in Section 3.2 below.

3.1 Site Workers

It is the responsibility of the Principal Contractor and their appointed sub-contractors to implement and manage safe systems of work, prepare their own risk assessments in accordance with Health and Safety legislation in order to protect persons in their employ, as well as mitigate the risk of harm to others due to works in their control. Special consideration should be given to the provisions of the Construction (Design & Management) Regulations 2015, Health and Safety at Work Act and the Control of Substances Hazardous to Human Health regulations to protect the safety of persons in their employment. Additional guidance can be sought from the CIRIA publications entitled "A Guide for Safe Working on Contaminated Sites" and “Environmental Good Practice on site guide (fourth edition)”.

In addition to the safe systems of works to be implemented alongside appropriate risk assessments and method statements, all site personnel shall benefit from on-site hygiene facilities including wash area, toilets and drying room.

Separate canteen area and welfare facilities should be provided. All eating and drinking should be restricted to the canteen area and only once site personnel have removed outer PPE and washed exposed skin.

In the event of dry spells, or where the exposed surface becomes dry, regular damping down of the surface of the site will be required to prevent the release of soil dust which could impact on site operatives or migrate off-site, thereby mitigating both off-site exposure and nuisance for neighbours.

3.2 End Users

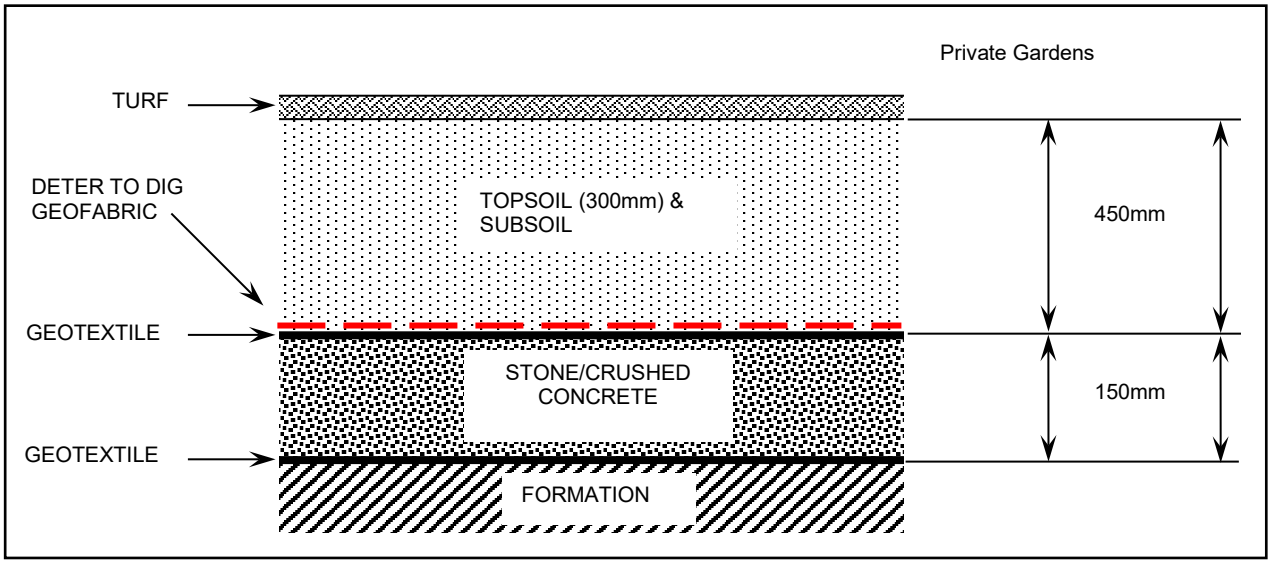
The tier 1 contamination assessment has identified several locations where reported concentrations were either elevated, or exceeded the Tier 1 screening criteria within the natural soils of the Horse Arena area.

Development levels have been determined from Ardent's development levels plans ref 192931-073, 192931-074 and 192931-075, prepared November 2020 for the developer and these show that ground levels are to be increased by 0.70-1.0m above the pre development level as summarised in Figure 7.

A soil cover system has been derived based on Soil Cover Systems for Land Regeneration by BRE, which indicated that a soil cover system of 450mm would be required within areas of private gardens and proposed soft landscaping areas. Due to the possible presence of impacted material beneath the proposed soil cover system the cover system should also incorporate a capillary break layer comprising 150mm depth of stone or crushed concrete, between two layers of geotextile. A high visibility deter to dig geofabric shall be laid over the upper geotextile to provide a visible deterrent to excavation. The cover system should include a minimum thickness of 150mm of Topsoil, although it is anticipated that the Local Planning Authority will require this to be increased to 300mm of Topsoil, i.e. thereby reducing the subsoil layer thickness to 150mm. The BRE cover system calculations are presented within Appendix C.

Given that the proposed development levels are to be increased by more than the minimum soil cover system thickness, it is anticipated that uncontaminated subsoil won from elsewhere on the site would be placed beneath the cover system to achieve the required levels. Contaminated soils from the adjacent chalk pit or farmyard area are not suitable for placement under the cover system on the Horse Arena.

An example of the recommended cover system for use in gardens and soft landscaping in the Horse Arena area is provided below, this recommendation is based on the formation being uncontaminated. This is required for the plots as shown in Figure 8.



With regards to private gardens and areas of communal soft landscaping, it is recommended that Topsoil is placed to provide a suitable growing medium for proposed planting areas as part of the cover system described above. During the intrusive investigation works it was established that there is a limited thickness of Topsoil beneath the sand dressed area of the Horse Arena. It would not be practical to isolate this limited thickness of Topsoil and as such it is not proposed to reuse this material from beneath the sand dressed area. The Topsoil within the Horse Arena area in the vicinity of trial pits TP212, TP229, TP306 and TP307, i.e. those areas located outside of the sand dressed arena area, may be suitable for reuse although this will need to be confirmed by additional testing. Therefore, it is proposed to strip and segregate this Topsoil to awaiting further testing to demonstrate suitability for reuse.

It is considered unlikely that it will be necessary to import Topsoil to the site, however if it is necessary to import topsoil on to the development then, prior to importation, the chemical, physical and nutritional suitability should be verified. Importation of Topsoil or subsoil from unverified or unsuitable sources would require their removal from site and replacement with suitable materials. As a matter of good practice, it is recommended that the location, approximate extent and thickness of any imported topsoil are recorded and presented in the Validation/Verification Report to be prepared by the Environmental Consultant. Soil importation criteria is detailed in Appendix D.

Any soils imported onto the site should be verified free from contamination with chemical testing undertaken to confirm their suitability for use within areas of soft landscaping.

Should any regrading works be required on site which propose re-use materials (to include Made Ground) on the site of origin a Materials Management Plan will be developed for the site under the Code of Practice where:

1.) They are suitable for use at the location in question both geotechnically and geochemically (without prior treatment);
2.) The reuse will not cause unacceptable or increased risks to human health, controlled waters or the environment;
3.) They are used in the required quantities (and no more);
4.) There is certainty of use not just a possibility.

As such excavated soils on site will be removed from site for disposal, treatment at an appropriately licensed facility or re-used under the CL:AIRE Definition of Waste, Code of Practice where it can be demonstrated that there is a need for the use of the materials and where the risk is demonstrated to be acceptable under a Materials Management Plan. Where a RSVP is in place for the site, agreement of re-use must also be agreed with the regulators.

Where contaminated soils are located in an area of permanent hard cover, e.g. building footprint, road, driveway or the like, then the hard cover would break the pollutant linkage and remediation would not be required in terms of the risk to human health, however limited works may be required in these areas to provide a suitable working platform for development to proceed.

3.3 Inspection/Validation

Whilst the increase in ground levels exceeds the minimum thickness for the soil cover system, this remedial strategy still includes placement of a soil cover system in order to verify that suitable soils have been used to mitigate the risk of harm to human health and to complete the soft landscaping to the plots within the affected area.

Verification of remediation measures shall be required through regular inspection at key stages of the works to include:

- Completion of the site strip and excavation of the Topsoil to expose the formation onto which clean soils are to be placed to raise ground levels;
- Placement of naturally occurring, uncontaminated site won soils as general bulk fill to raise levels to the underside of the soil cover system;
- Placement of a cover system, including verification of any additional subsoil and/or Topsoil in order to allow for the installation of the capping system required in private gardens and areas managed soft landscaping areas.

It is likely that verification will be undertaken in stages, such as site preparation, Topsoil strip, geotextiles, crushed stone/crushed concrete layer and deter to dig membrane, subsoil placement and topsoil placement. As such, final verification of the completed cover system is likely to be at the end of construction for any given plot. Inspections would be planned wherever possible to cover the main stages of site preparation, ground level raising and finishing with Topsoil.

The re-use of naturally occurring, uncontaminated soils does not strictly require a Materials Management Plan (MMP) or associated formal declaration by a Qualified Person under the Definition of Waste Code of Practice.

However, given that these are required for the remedial strategy in other areas of the site, the proposed placement/re-use of site won uncontaminated soils in the Horse Area would be included in a broader scope MMP as a matter of good practice.

Details of these works would be presented within a verification report for the site.

Staged verification reporting is proposed, i.e. the first verification report addressing the preparatory works and placement of site won soils as general fill to raise levels; and a second report stage on completion of the soil cover system on the individual plots (anticipated verification as batches of plots as development progresses).

3.4 Built Environment

Buried plastics laid in contact with contaminated soils may be susceptible to attack by aggressive chemicals; therefore, potable water supplies may potentially become contaminated or tainted. With reference to UKWIR guidance, report reference 10/WM/03/21 (re-issued 2010), the results of the relevant chemical analyses for the natural soils within the Horse Arena area do not exceed the limiting concentrations of contaminants for standard polythene supply pipe.

The utility company should be consulted in order to confirm their specific requirements in this respect. At this time, subject to further confirmation, it is considered that specific protection measures are not required for potable water supply. As a matter of good practice and to maximise the protection to maintenance workers, it is recommended that clean, granular backfill is used in service runs and that marker tapes are used for all buried services.

4.0 WASTE

4.1 Waste Classification and Segregation

Waste may be defined as any substance or object in Annex 1 of the Waste Framework Directive which the holder discards, intends to discard, or is required to discard. The holder of waste is anyone in possession of waste or generates it and therefore both the contractor and ultimately the developer are responsible for safe disposal of waste.

The following information is provided for preliminary guidance purposes, as different facilities or operators may have differing acceptance criteria and further Waste Acceptance Criteria (WAC) analysis may be required to confirm the exact classification.

Waste Acceptance Criteria (WAC) testing was undertaken as part of the wider site investigations on representative samples not specific to the Horse Arena Area. As such, it is recommended that once/if materials for disposal have been identified, then further WAC testing should be undertaken to further clarify the materials for the purpose of disposal. However, it is considered likely that materials will be looked to be re-used elsewhere on the development site.

In the event of dry spells, or where the exposed surface becomes dry, it is recommended that the surface of the site is regularly damped down to prevent the release of soil dust which could migrate off-site and thereby mitigate both off-site exposure and nuisance for neighbours.

It is proposed to re-use materials on site under a Materials Management Plan which will be developed for the construction works on this site. This will include contingency plans in any unexpected contamination is encountered during the development. Elevated levels of metals have been identified with the natural soils in the horse arena area, no Made Ground has been identified. As such, it is not deemed suitable to re-used Made Ground materials from elsewhere on the site within the Horse Arena area. Only the reuse of natural soils is deemed appropriate within this area of the site.

In accordance with CL:AIRE Code of Practice (2011) materials are only considered waste if 'they are discarded, intended to be discarded or required to be discarded by the holder'. Current guidance recommends the retention and re-use of site won soils where there is a need for the materials and where the risk is acceptable

The Code of Practice therefore allows soils to be reused on site where the following criteria are met:

- Pollution of the environment and harm to human health is prevented and not increased in reusing the excavated materials;
- The material are suitable for use (without any further processing);
- There is certainty of use; and
- The quantity that is absolutely necessary (and no more) is used.

In order to comply with the Code of Practice, a Material Management Plan (MMP) that confirms the above criteria are met has to be prepared. The material management plan must be reviewed by a 'Qualified Person' who then issues a declaration to the Environment Agency. Geo-Environmental can provide this service should it be required.

Where materials do not meet the required criteria, it may be possible to treat them under an environmental permit so that they may be re-used on site.

Should material be required and reused under the Definition of Waste Code of Practice, the reuse of material will need to be fully documented and included within the Verification Report produced on completion of the works.

5.0 DISCOVERY STRATEGY

Whilst the site has been the subject of several phases of investigation and assessment, it remains possible that previously unexpected soil conditions may be encountered during the process of site preparation and construction.

Examples may include oily pockets within the soil, pockets of cement boarding or fibrous materials within the soil, black ashy materials, soils exhibiting strong odours, brightly coloured materials, and former structures or brickwork.

Should previously undiscovered contamination be encountered during the demolition/construction of the new buildings the following course of action should be adhered to:

- Works in the area of the suspected contamination should seize immediately. The ground workers should report any suspected contamination immediately to the Client's site supervisor. The supervisor should contact the Environmental Consultant, who should visit the site to assess the extent of the 'contamination'.

- The Environmental Consultant shall make records of their inspection, and pass details of these to the Local Authority.

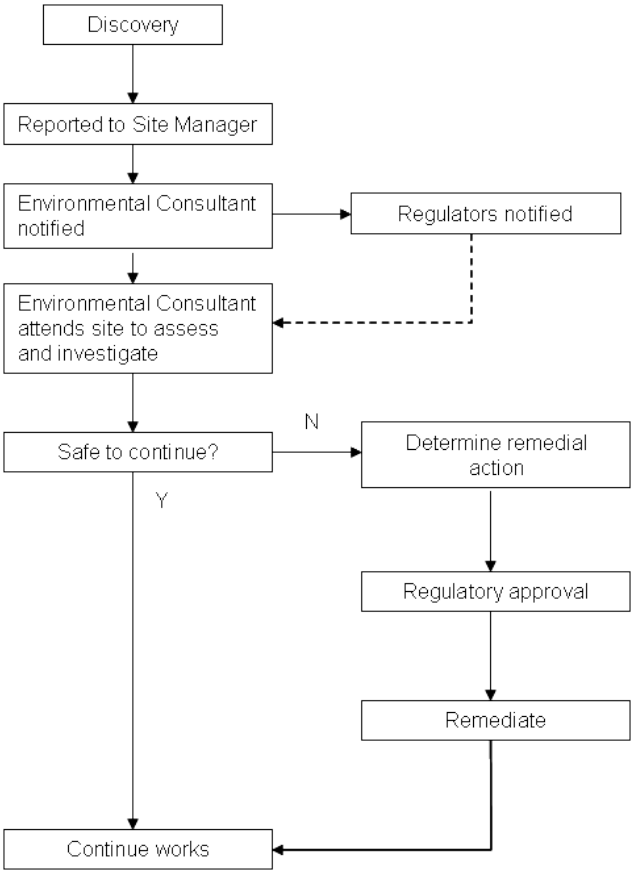
- Where the conditions revealed differ from those previously anticipated, the Environmental Consultant shall take samples as deemed appropriate to be dispatched for appropriate chemical testing.

- Depending on the results of the testing either: 1) no further work will be required; 2) a further detailed risk assessment will be required; and/or 3) localised specific remedial measures will be necessary. Appraisal criteria will vary depending on the nature of the assessment.

- The results of any such testing will be sent to the Regulatory Authority for consultation. If further remediation is required, the Regulatory Authority will be informed of the date and time of the proposed works.

- Any further remediation will be undertaken in accordance with a method statement submitted to the Local Authority for approval. The works shall be supervised by the Environmental Consultant who shall provide a Verification Report for the Local Authorities purposes.

The process is summarised overleaf:



A copy of this strategy should be lodged on site, and provisions made to ensure that all workers are made aware of their responsibility to observe, report, and act on any potentially suspicious or contaminated materials they may encounter.

6.0 VERIFICATION

Verification is required to be undertaken throughout the course of the remediation works. The Verification Report will be submitted to the Client, NHBC, CL:AIRE and Local Authority for formal approval and Environment Agency if requested as part of any works completed under the Definition of Waste Code of Practice.

The Verification Report will refer to the works as set out within this RSVP and as required by any relevant planning conditions. The report will detail findings of any further investigation works (if undertaken on the site) in relation to Arsenic and Beryllium within the shallow natural soils of the Horse Arena area within proposed private gardens and areas of managed soft landscaping, as well as include relevant site based information such as records from site inspections, locations where the impacted soils were excavated and re-used on site or disposed of and validation sampling where required. Along with details of soil cover system installation and validation of thicknesses. Photographs of specific remedial or waste handling measures and an audit trail for any imported subsoil and Topsoil, including source, provenance, analytical results, placement location and thickness (should subsoil and/or Topsoil be imported).

A summary of verification proposals is presented in Table 2 below.

The remedial works will be inspected and validated by the Environmental Consultant (Geo-Environmental). In addition, the MMP and any QP review and declaration will be prepared by Geo-Environmental.

Reference	Principal requirements	Design or construction related	Site visit required by Qualified Geo-Environmental Engineer	Supporting documentation
1.0 Verification general principles	Geo-Environmental are supervising remedial works within the Horse Arena Area at Woodcroft Farm, Lovedean. These works require site clearance, stripping and setting aside of Topsoil (from the area not covered by sand dressing) for further testing to demonstrate suitability for reuse, placement of site won uncontaminated soils to raise ground levels and installation of a soil cover system within gardens and areas of soft landscaping. The aforementioned work is in line with the approach adopted for site investigation and risk assessment and previously undertaken by Geo-Environmental in respect of the development.	Construction	**Yes –** See below	Details of construction programme to be provided by client/contractor.
2.0 Excavation of Impacted Soils	The development levels are to be increased by greater than the minimum soil cover system thickness and thus the remedial strategy does not require the excavation of impacted soils.	Construction	**Yes – 5 days' notice required**	Levels Strategy Plans 192931-073, 192931-074 and 192931-075 and RSVP Figure 7 demonstrate that this has been designed out.
3.0 Cover System	Cover system to be constructed by the ground workers and inspected by the Environmental Consultant	Construction	**Yes - 5 days' notice required**	Provenance of site won soils used to raise levels to be verified by the groundworks contractor. Placement of soils to be observed/inspected by Geo-Environmental. Thickness and construction of cover system to be verified by Geo-Environmental.

Reference	Principal requirements	Design or construction related	Site visit required by Qualified Geo-Environmental Engineer	Supporting documentation
4.0 Waste Management	Waste soils are not anticipated to be generated from the remedial strategy for the Horse Arena as there is a net requirement for suitable soils to be used as fill to raise ground levels. However, if any waste soils are generated, these will be disposed of appropriately with WAC testing undertaken once soils for disposal have been identified. The results should be presented to the landfill site prior to removal for confirmation of the classification.	Design and Construction	**No (unless further testing required where 5 days' notice required)**	Chemical test results (WAC) only required if waste soils are generated.
	Waste tickets for the removal of arisings should be compiled for submission as part of the verification report for each phase of the development. The waste tickets will be required to demonstrate that the approximate amount of material being removed is equal to the summed volume on the waste tickets.			Waste tickets
	Where is it demonstrated that there is a need for materials to be re-used on site and that the risk is acceptable, soils may be re-used on site under the Definition of Waste Code of Practice under a Materials Management Plan for the site.			Records of material movements on site to be provided for inclusion in the validation report. It is assumed that tracking of soil movements around the site will be recorded by the groundworks contractor, with periodic independent inspections by Geo-Environmental.
5.0 Imported Soils	In-situ testing of any soils imported onto site for landscaping purposes will be carried out after placement at a frequency of one sample per 50m^3 or one sample per landscaped area (whichever is	Construction	**Yes**	Pre import certification verifying the chemical quality of the topsoil and subsoil to be provided to the Environmental Consultant for review prior to Importation.

Reference	Principal requirements	Design or construction related	Site visit required by Qualified Geo-Environmental Engineer	Supporting documentation
	the smallest) with comparison of results to assessment criteria for residential end use.			

Table 2 Details of verification visits required on site

FIGURES



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Site Location Plan
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16943	**Revision:**	0		
Drawn:	FG	**Date:**	11/05/2018		
Figure:	1	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Location of Horse Arena Area
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16943	**Revision:**	0		
Drawn:	FG	**Date:**	25/06/2018		
Figure:	2	**Scale:**	Not To Scale		



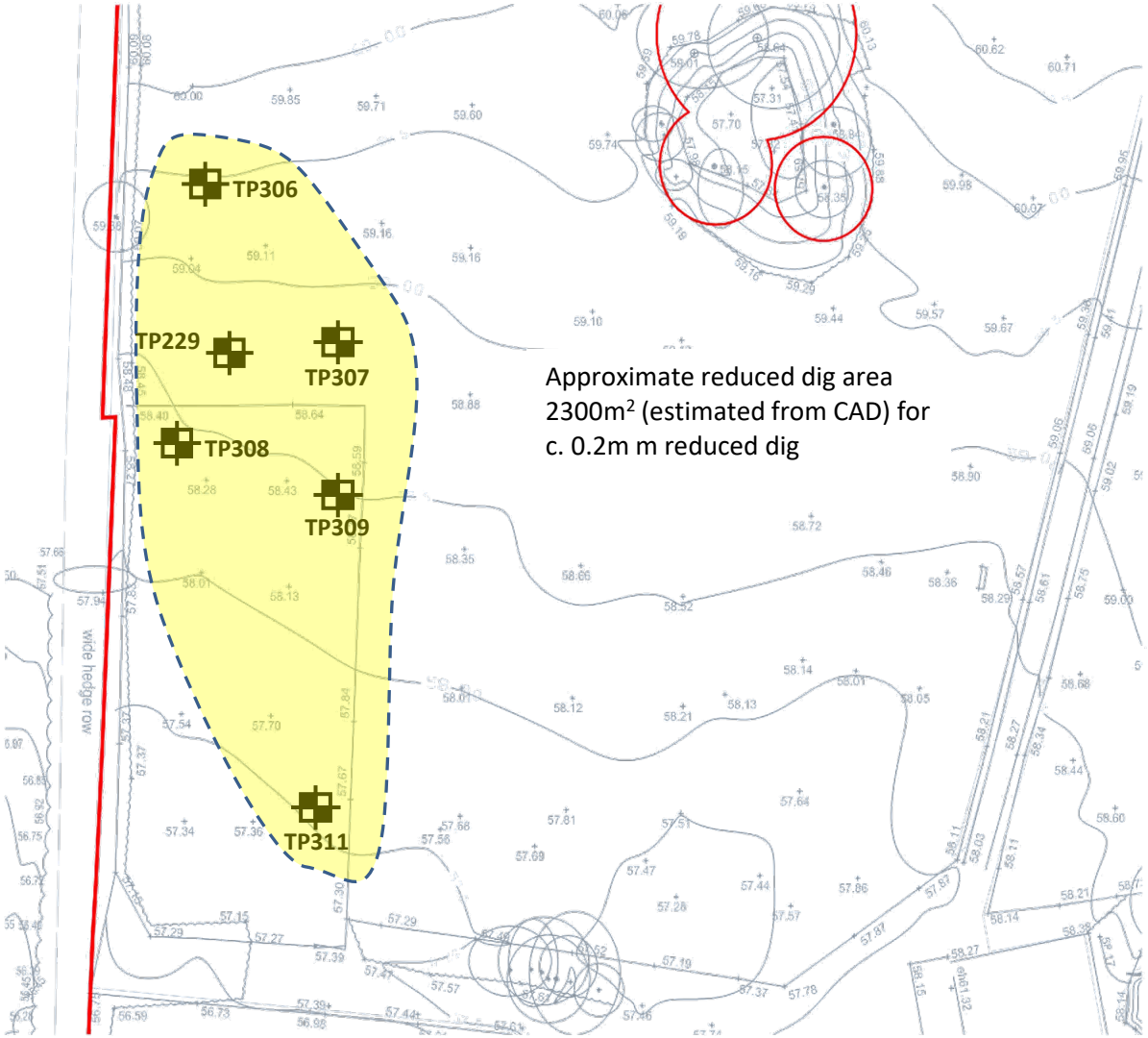
Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Exploratory Hole Locations - Horse Arena
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16943	**Revision:**	0		
Drawn:	FG	**Date:**	26/06/2018		
Figure:	3	**Scale:**	Not To Scale		



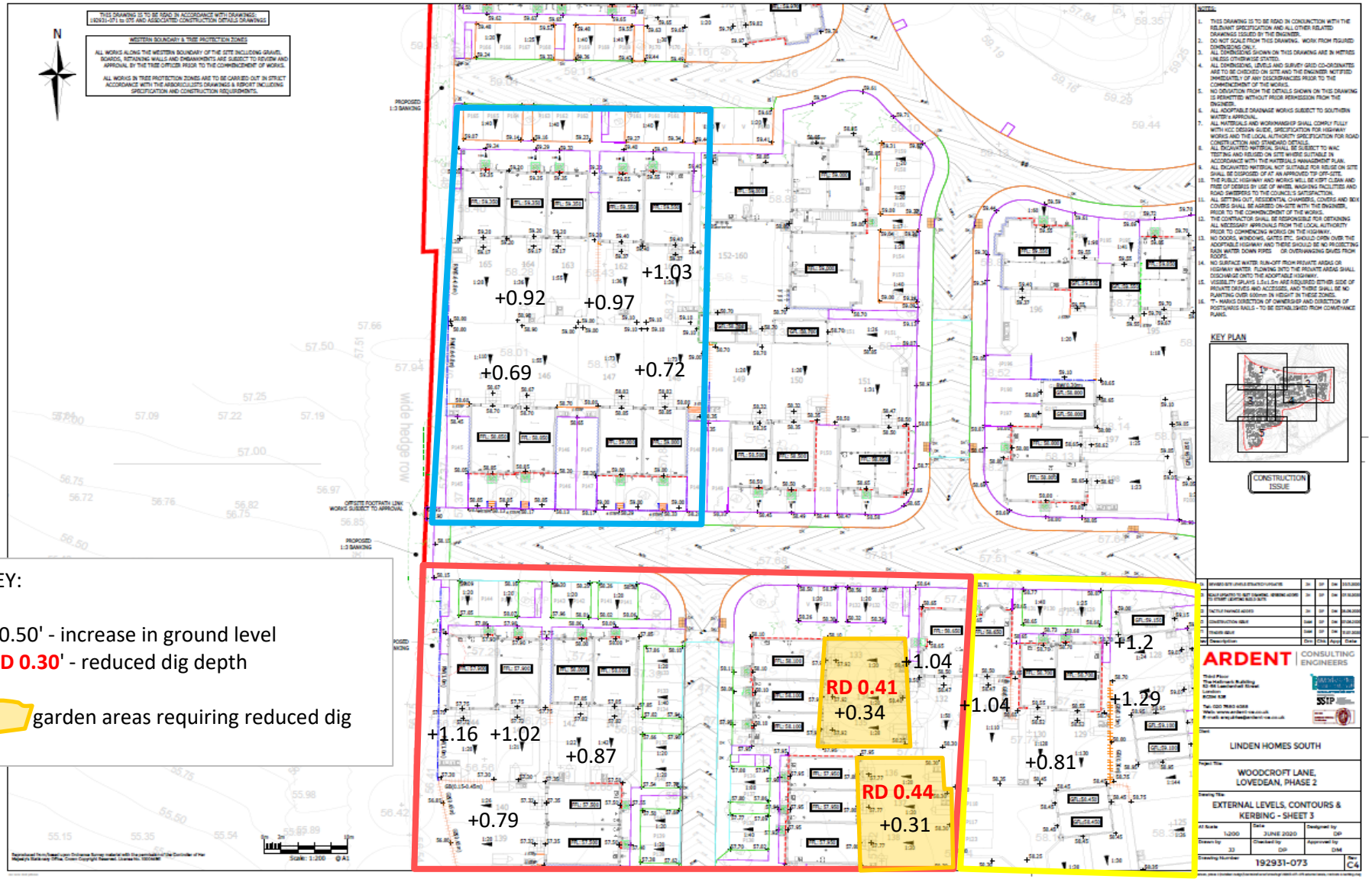
Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Exploratory Hole Location Plan (main site)
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	
Ref No:	GE16943	**Rev:**	0		
Drawn:	FG	**Date:**	26/06/2018		
Figure:	4	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Soil Contaminant Exceedances - Horse Arena
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16943	**Revision:**	0		
Drawn:	FG	**Date:**	07/06/2018		
Figure:	5	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean PO8 9QA			**Title**	Remedial Strategy Reduced dig areas - Horse Arena
Client:	Grainger PLC			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE16943	**Revision:**	0		
Drawn:	GR	**Date:**	12/02/2020		
Figure:	6	**Scale:**	Not To Scale		



Project:	Woodcroft Farm Lovedean PO8 9QA	**Title**	Development Levels Plan - Phase 3 Horse Arena, Chalk Pit and Farmyard (RSVP-HA-v6.0)
Client:	Vistry Homes Southern		
Ref No:	GE16943	**Revision:**	2.1
Drawn:	FG	**Date:**	11/02/2021
Figure:	RSVP-HA 7	**Scale:**	Not To Scale

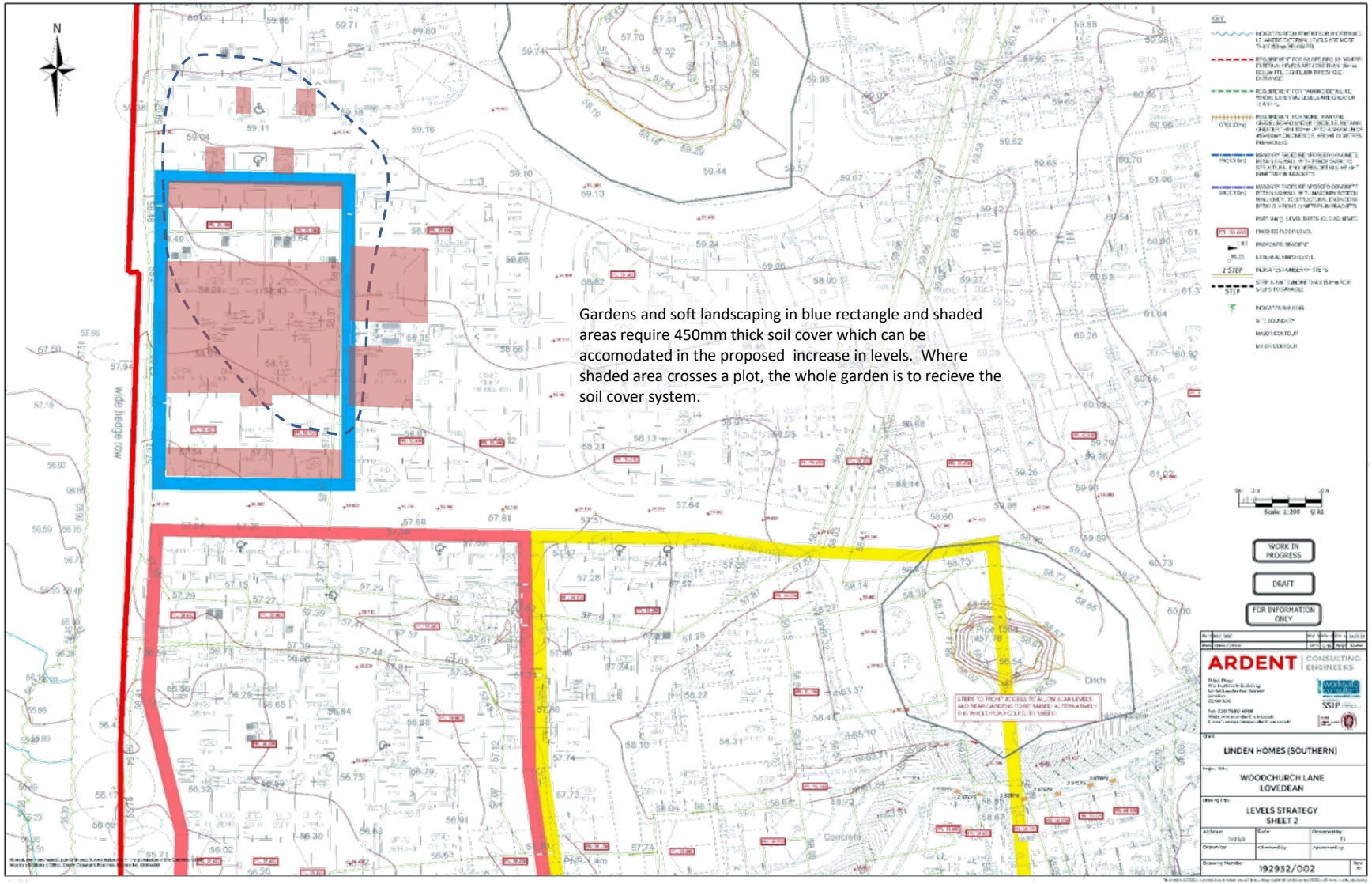
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Project:	Woodcroft Farm, Lovedean PO8 9QA	**Title**	Soil cover system plots plan
Client:	Grainger PLC		
Ref No:	GE16943	**Revision:**	1
Drawn:	GR	**Date:**	27/03/2020
Figure:	8	**Scale:**	Not To Scale

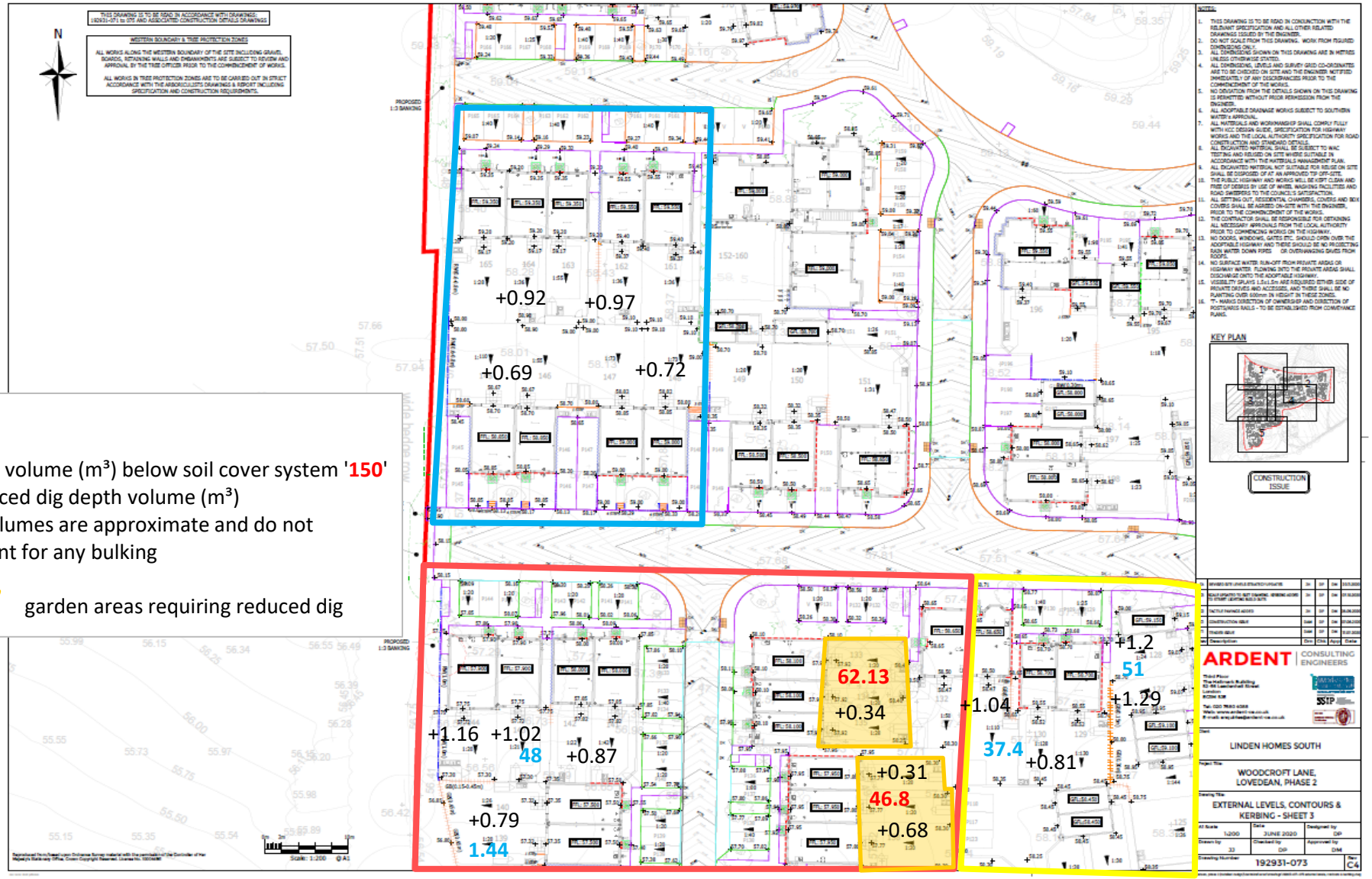
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Project:	Woodcroft Farm Lovedean PO8 9QA	**Title**	Remediation Strategy Plan - Phase 3 Horse Arena, Chalk Pit & Farmyard Volumes (RSVP-HA-v6.0)
Client:	Vistry Homes Southern		
Ref No:	GE16943	**Revision:**	2.1
Drawn:	FG	**Date:**	11/02/2021
Figure:	RSVP-HA 9	**Scale:**	Not To Scale

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APPENDIX A

Exploratory Hole Logs

and In-situ Test Results



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Trial Pit Log

TrialPit No
TP205
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468335.00 - 112129.00 Level: 69.34	Date 23/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.70 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.25	69.09		Grass over, Light brown sandy, gravelly CLAY, with frequent roots (2-4mm) and rootlets TOPSOIL
	0.50 0.50 0.50	B D ES					Firm orange and grey mottled slightly sandy CLAY with frequent roots (2-4mm) and rootlets. Sand is medium (large roots (7-10mm) at 0.4m)
	1.00	D		1.20	68.14		
				1.40	67.94		Firm orange and grey mottled slightly sandy CLAY with frequent rootlets. Sand is medium
	1.70	D		1.70	67.64		Firm orange and grey mottled slightly sandy CLAY with red bandings of sandy clay and frequent rootlets. Sand is medium
							End of Pit at 1.70m

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No: TP206
Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords: 468329.00 - 112033.00 Level: 66.23	Date 23/08/2017
Location:	Woodcroft Farm, Lovedean,	Dimensions (m): Depth 1.80	1.20 × 0.60	Scale 1:25
Client:	Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.25	65.98		Grass over, Light brown sandy, gravelly CLAY, with frequent flint gravels and rootlets TOPSOIL
				0.30	65.93		Stiff orange and grey mottled sandy, gravelly CLAY with abundant roots (4-7mm). Sand is medium (Large roots (50mm) at 0.3m)
	0.50	B					
	0.50	D					Firm orange and grey mottled very sandy CLAY with frequent roots (2-6mm). Sand is medium
	0.50	ES		0.60	65.63		Stiff orange and grey mottled slightly sandy CLAY with roots (2-4mm). Sand is medium
	1.00	D					
				1.20	65.03		Stiff orange and grey mottled slightly sandy CLAY with red bandings of sandy clay and roots (2-4mm). Sand is medium
	1.80	D		1.80	64.43		End of Pit at 1.80m

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No: TP207
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468244.00 - 112050.00 Level: 64.18	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 2.00 x 0.60 Depth 2.00	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	63.98		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets and occasional flint gravel TOPSOIL
	0.30	ES					Firm orange and grey mottled CLAY with occasional sandy red banding and rootlets (charcoal fragments at 1m and decaying roots)
	0.50	B					
	0.80	D					
				1.20	62.98		Firm red and grey mottled slightly sandy CLAY (charcoal fragments at 1.4m)
				1.60	62.58		Firm red and grey mottled sandy CLAY
	2.00	D		2.00	62.18		End of Pit at 2.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No: TP208
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468227.00 - 112031.00 Level: 63.03	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 2.00 x 0.60 Depth 2.00	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.15	62.88		Grass over, Dark brown clayey sand with abundant tree roots (2-5mm) and rootlets (large tree root (50mm) at 0.15m) TOPSOIL
	0.50	D					Firm orange brown sandy CLAY. Sand is fine to medium (large tree root (20mm) at 0.9m)
	1.00	D		1.10	61.93		Stiff orange slightly sandy CLAY with abundant roots (between 2mm and 8mm). Sand is medium
	1.50	D		1.50	61.53		Stiff grey and orange mottled slightly sandy CLAY with occasional roots between 2mm and 6mm (no roots from 1.7m)
	2.00	D		2.00	61.03		End of Pit at 2.00m

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP209
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468200.00 - 112025.00 Level: 61.57	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 2.00 — 2.00 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES					Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets and occasional flint gravel TOPSOIL
				0.30	61.27		Firm orange brown slightly gravelly CLAY with occasional cobbles of flint. Gravel is medium sub-angular of flint (roots (10mm) at 0.5m)
	0.50	D					
				0.80	60.77		Firm orange brown slightly sandy CLAY with frequent cobbles of flint. Sand is medium
				1.50	60.07		Firm orange and grey mottled slightly sandy CLAY. Sand is fine to medium
	2.00	D		2.00	59.57		End of Pit at 2.00m

1 2 3 4 5

Water Strikes
Depth Strike | Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP210
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468151.00 - 112030.00 Level: 58.51	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.40 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.15	58.36		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.50	B					Firm grey and orange mottled slightly sandy CLAY with rootlets. Sand is medium
	1.00	D		0.90	57.61		Firm grey and orange mottled slightly sandy CLAY. Sand is medium (charcoal fragments at 1.35m)
				1.40	57.11		End of Pit at 1.40m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP211
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468148.00 - 112098.00 Level: 58.65	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.30 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.10	58.55		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.30	58.35		Brown sandy clay with flint cobbles, chalk fragments and occasional brick fragments MADE GROUND
	0.50	D					Firm brown slightly sandy CLAY with occasional rootlets. Sand is medium
				0.80	57.85		Firm red brown sandy CLAY. Sand is medium
	1.00	D					
				1.30	57.35		End of Pit at 1.30m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP212
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468050.00 - 112055.00 Level: 57.68	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.40	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.15	57.53		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.35	57.33		Soft orange brown very sandy CLAY with occasional sub-angular flint gravel. Sand is medium
	0.50 0.50	B D					Firm orange brown CLAY with frequent flint cobbles and chalk fragments
	0.80	D					
	1.10	D		1.10	56.58		Structureless CHALK composed of: medium to coarse sub-angular white GRAVEL. Fragments are weak CIRIA Grade DM
				1.40	56.28		End of Pit at 1.40m

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No: TP213
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468023.00 - 112009.00 Level: 56.66	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 2.20	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	56.56		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.20	56.46		Brown sandy clay with brick fragments and chalk gravel MADE GROUND
	0.50	B					Stiff light brown gravelly CLAY MADE GROUND
	0.50	D					
				0.80	55.86		Brown sandy clay with brick, concrete fragments, possible asbestos tiles, and decaying roots MADE GROUND
	1.00	ES					
				1.70	54.96		Soft light grey CLAY (decaying root (3mm) at 2m)
	2.00	D					
				2.20	54.46		End of Pit at 2.20m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No: TP214
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468056.00 - 112002.00 Level: 57.16	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 2.00	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	57.06		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.20	56.96		Brown clay with bricks and chalk cobbles MADE GROUND
	0.50	B					Firm light brown and grey mottled CLAY, with frequent flint gravel (decaying root (4mm) at 0.5m) MADE GROUND
	0.50	D					
	0.90	ES		0.90	56.26		Dark brown clay with ashy deposits, plastic, brick fragments, chalk gravel, and wood MADE GROUND
				1.90	55.26		Firm light brown and grey mottled CLAY
	2.00	D		2.00	55.16		End of Pit at 2.00m

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Water Strikes
Depth Strike | Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP215
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468082.00 - 111995.00 Level: 57.87	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 2.90	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30	ES					Ashy deposits overlying brown gravelly clay with bricks, concrete, flint cobbles, tarmac and chalk fragments MADE GROUND
				1.00	56.87		Soft orange brown sandy re-worked CLAY MADE GROUND
				1.70	56.17		Structureless CHALK composed of: medium to coarse sub-angular white sandy GRAVEL, sand is medium and fragments are weak CIRIA Grade DM
				2.30	55.57		Structureless CHALK composed of: medium to coarse sub-angular white sandy GRAVEL, fragments are weak CIRIA Grade DM
	2.90 2.90	D D		2.90	54.97		End of Pit at 2.90m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468060.00 - 111982.00 Level: 56.78	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.00	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	56.68		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.20	56.58		Brown sandy clay with charcoal and brick fragments MADE GROUND
	0.50 0.50 0.60	B D ES					Firm light brown and grey mottled gravelly CLAY. Gravel is medium, sub angular of flint
	1.00	D		1.00	55.78		End of Pit at 1.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP217
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468063.00 - 111949.00 Level: 58.26	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.00 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.05	58.21		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.20	ES					Firm light brown and grey mottled CLAY, with frequent rootlets
	0.50	D					
	1.00	D		1.00	57.26		End of Pit at 1.00m

1 2 3 4 5

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP218
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468068.00 - 111932.00 Level: 58.52	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 0.90 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.15	ES		0.15	58.37		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.50 0.50	B D					Firm light brown and grey mottled CLAY
	1.00	D		0.90	57.62		End of Pit at 0.90m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP219
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468127.00 - 111929.00 Level: 59.42	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.00	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	59.22		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets and chalk fragments TOPSOIL
							Firm light brown and grey mottled CLAY
	0.50	D					
	1.00 1.00	D ES		1.00	58.42		End of Pit at 1.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP220
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468116.00 - 111958.00 Level: 59.41	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 2.00 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES					Grass over, dark brown gravelly clay with chalk and brick fragments MADE GROUND
				0.60	58.81		Soft brown and grey mottled CLAY
				0.80	58.61		Firm brown and grey mottled CLAY, with red sandy banding at 1.5m
	1.00 1.00	D ES					
				2.00	57.41		End of Pit at 2.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP221
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468161.00 - 111926.00 Level: 60.74	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.20 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES					Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.30	60.44		Soft orange brown slightly sandy CLAY with occasional chalk fragments and roots (1-3mm)
	0.50	D					
	0.50	ES					
				0.70	60.04		Firm orange and grey mottled slightly sandy CLAY with roots (1-3mm) and rootlets
	1.00	D					
				1.20	59.54		End of Pit at 1.20m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP222
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468221.00 - 111986.00 Level: 61.18	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.50 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.25	60.93		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.40	ES		0.50	60.68		Firm orange brown slightly sandy CLAY with occasional flint gravels and roots (1-2mm). Sandy is medium
	1.00	D		1.00	60.18		Firm orange brown slightly sandy CLAY with occasional flint gravels. Sandy is medium
				1.50	59.68		Stiff orange brown slightly sandy, slightly gravelly CLAY. Sand is medium, gravel is medium, sub-angular of flint End of Pit at 1.50m

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP223
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468126.00 - 111996.00 Level: 58.54	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.10	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.05	58.49		Concrete MADE GROUND
				0.25	58.29		Brown gravelly clay with concrete and brick fragments MADE GROUND
	0.40	ES					Soft grey and orange mottled slightly sandy CLAY
	0.50	D					
	0.50	ES					
	1.00	D					
				1.10	57.44		End of Pit at 1.10m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468077.00 - 112011.00 Level: 57.74	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 2.20 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES					Ashy deposits overlying brown gravelly clay with bricks, flint cobbles, chalk fragments and tarmac MADE GROUND
				0.70	57.04		Soft blue grey re-worked CLAY with bricks MADE GROUND
				1.60	56.14		Firm grey brown CLAY (Large flint cobble at 1.8m)
	2.20 2.20	D D		2.20	55.54		End of Pit at 2.20m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP225
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468112.00 - 111991.00 Level: 58.45	Date 23/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 0.60 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	58.30		Chippings over tarmac MADE GROUND
	0.25 0.30	ES ES					Brown gravelly clay with tarmac, brick fragments, chalk fragments, flint gravel, ash and charcoal (concrete encountered at 0.6m) MADE GROUND
				0.60	57.85		End of Pit at 0.60m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks Concrete encounted at 0.6m, pit terminated

Stability

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Trial Pit Log

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TP226
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468103.00 - 112028.00 Level: 57.24	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.10 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.20	57.04		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.40	D					Firm orange brown slightly sandy CLAY. Sand is medium
				0.80	56.44		Firm orange brown slightly sandy CLAY with frequent cobbles of flint and occasional charcoal fragments. Sand is medium
				1.10	56.14		End of Pit at 1.10m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP227
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468105.00 - 112061.00 Level: 57.53	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.00 — 0.60 × 1.20	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES					Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.25	57.28		
	0.40	D					Firm orange brown slightly sandy, slightly gravelly CLAY. Sand is medium and gravel is fine to medium, sub-angular of flint
				0.70	56.83		Firm orange brown CLAY
				0.90	56.63		
				1.00	56.53		Structureless CHALK composed of: medium to coarse sub-angular white GRAVEL. Fragments are weak CIRIA Grade DM
							End of Pit at 1.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP228
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468169.00 - 112048.00 Level: 60.35	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.70 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.15	ES		0.25	60.10		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.50	D					Soft brown orange sandy CLAY with occasional flint gravel and rootlets. Sand is medium
	1.20	D		1.10	59.25		Yellow fine medium SAND
				1.70	58.65		End of Pit at 1.70m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP229
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468030.00 - 112090.00 Level: 58.55	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.80 — 0.60 × 1.20	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Grass over, Orange brown sandy CLAY with frequent rootlets TOPSOIL
	0.60 0.60	D ES		0.60	57.95		Firm orange brown very sandy CLAY with occasional flint cobbles. Sand is medium
				0.80	57.75		Firm orange brown CLAY with occasional flint cobbles
	1.00	D					
				1.40	57.15		Firm grey slightly sandy CLAY with frequent cobbles of flint. Sand is medium
	1.50	D					
				1.80	56.75		End of Pit at 1.80m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP230
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468086.00 - 112103.00 Level: 59.34	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.20 (1.20 × 0.60)	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	59.19		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.30	ES					Soft orange brown very sandy CLAY. Sand is medium
	0.50	D					
				0.70	58.64		Firm grey and orange mottled CLAY with frequent flint cobbles
	1.10	D					
				1.20	58.14		End of Pit at 1.20m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP231
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468130.00 - 112119.00 Level: 59.64	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.20 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	59.44		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.40	ES					Soft orange brown very gravelly sandy CLAY. Gravel is medium, sub-angular of flint and sand is medium
				0.60	59.04		
	0.80	D					Firm orange brown slightly sandy CLAY with occasional rootlets. Sand is medium
				1.20	58.44		End of Pit at 1.20m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP232
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468210.00 - 112065.00 Level: 62.16	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.30 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES					Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
				0.30	61.86		Firm orange and grey mottled slightly sandy CLAY. Sand is fine to medium
				0.70	61.46		
	0.80	D					Firm orange and grey mottled sandy CLAY. Sand is fine to medium
				1.30	60.86		End of Pit at 1.30m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP233
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468228.00 - 112111.00 Level: 64.08	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.10 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	63.78		Grass over, Brown sandy, gravelly CLAY with frequent roots and rootlets TOPSOIL
	0.40 0.40	ES ES					Firm orange brown gravelly CLAY. Gravel is medium to coarse sub-angular of flint
				0.65	63.43		Stiff grey and orange mottled CLAY with occasional red bands of sandy CLAY
	0.80	D					
				1.10	62.98		End of Pit at 1.10m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468242.00 - 112136.00 Level: 65.41	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.00 — 1.20 × 0.60	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	65.21		Grass over, Brown sandy, gravelly CLAY with frequent roots and rootlets TOPSOIL
	0.30	ES					Firm brown very gravelly CLAY. Gravel is medium to coarse sub-angular of flint
				0.45	64.96		Stiff orange and grey mottled CLAY (Large tree root (70mm) at 0.7m and tree root (4mm) at 1m)
	1.00	D		1.00	64.41		End of Pit at 1.00m

1 2 3 4 5

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP235
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468165.00 - 112133.00 Level: 60.77	Date 22/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 2.20	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.25	60.52		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.50 0.50	D ES					Orange brown clayey medium SAND with occasional flint gravel
	1.00	D					
				1.80	58.97		Grey and orange fine to medium SAND
				2.20	58.57		End of Pit at 2.20m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP236
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468115.00 - 112146.00 Level: 60.93	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.70	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30	ES		0.40	60.53		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	1.00	D		1.00	59.93		Soft orange brown slightly gravelly sandy CLAY. Sand is medium and gravel is medium, sub-angular of flint
				1.70	59.23		Orange slightly clayey medium SAND End of Pit at 1.70m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP237
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Project Name: Woodcroft	Project No. GE16662	Co-ords: 468036.00 - 112164.00 Level: 62.19	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.00	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	62.04		Grass over, Light brown sandy, gravelly CLAY, with frequent rootlets TOPSOIL
	0.40	ES					Soft orange brown very sandy CLAY. Sand is medium
	0.50	D					
				0.85	61.34		Firm orange brown CLAY
	1.00	D		1.00	61.19		End of Pit at 1.00m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP238
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468045.00 - 112137.00 Level: 60.22	Date 21/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): 1.20 × 0.60 Depth 1.00	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.25	59.97		Grass over, Orange brown sandy CLAY with frequent rootlets TOPSOIL
	0.50	D					Stiff orange brown CLAY with occasional cobbles of sub angular flint
	0.80	ES					
	1.00	D		1.00	59.22		End of Pit at 1.00m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No: TP239
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16662	Co-ords: 468112.00 - 112015.00 Level: 58.28	Date 23/08/2017
Location: Woodcroft Farm, Lovedean,		Dimensions (m): Depth 1.80, 0.60 x 1.20	Scale 1:25
Client: Grainger PLC and Linden Homes South			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES					Grass over brown sandy gravelly clay with brick, chalk fragments, concrete, and flint gravel MADE GROUND
	0.50	ES		0.50	57.78		
				0.60	57.68		Brown sandy clay with tiles of possible asbestos, chalk fragments, concrete and brick MADE GROUND
							Soft brown very sandy CLAY. Sand is medium
				1.40	56.88		Soft brown very sandy CLAY. Sand is medium
	1.50	ES					
	1.80	D		1.80	56.48		End of Pit at 1.80m

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **WS201** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords:	468236E - 111994N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level:	62.76	Scale 1:25
Client:	Grainger PLC and Linden Homes South		Dates:	05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.25	D		0.20	62.56		Grass over, brown sandy clay with flint gravel and frequent rootlets TOPSOIL
		0.25	PP	1.3kg/cm2				Firm orange and grey mottled slightly sandy CLAY. Sand is medium
		0.50	D					
		0.50	PP	0.7kg/cm2				
		0.75	D		0.80	61.96		
		0.75	PP	0.7kg/cm2				Firm orange and grey mottled slightly sandy CLAY with occasional bands of red sandy clay. Sand is medium
		1.00	D		1.10	61.66		
		1.00	PP	0.9kg/cm2				Stiff orange and grey mottled sandy CLAY. Sand is medium
		1.25	D					
		1.25	PP	1.3kg/cm2				
		1.50	D					
		1.50	PP	1.3kg/cm2				
		1.75	D					
		1.75	PP	1.7kg/cm2				
		2.00	D		2.00	60.76		
		2.00	PP	1.2kg/cm2				Firm orange very sandy CLAY. Sand is fine
		2.25	D		2.30	60.46		
		2.25	PP	0.5kg/cm2				Yellow greyish clayey fine SAND
		2.50	D					
		2.75	D					
		3.00	D		3.00	59.76		End of Borehole at 3.00m

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Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS202** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords:	468174E - 111973N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level:	60.57	Scale 1:25
Client:	Grainger PLC and Linden Homes South		Dates:	05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	60.27		Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
		0.50 0.50	D PP	1.6kg/cm2				Stiff orange, red and grey mottled slightly sandy CLAY with occasional rootlets. Sand is medium
		0.75 0.75	D PP	1.7kg/cm2				
		1.00 1.00	D PP	1.8kg/cm2				*.....Occasional roots (1-3mm)*
		1.25 1.25	D PP	2.0kg/cm2	1.10	59.47		Stiff orange and grey mottled sandy CLAY with occasional roots (2mm) and occasional red banding of sandy clay. *.....Occasional roots (2mm)*
		1.50 1.50	D PP	1.8kg/cm2				
		1.75 1.75	D PP	1.7kg/cm2				*.....Large root (5mm)*
		2.00 2.00	D PP	1.6kg/cm2				
		2.25 2.25	D PP	1.5kg/cm2				
		2.50 2.50	D PP	0.7kg/cm2	2.40	58.17		Firm orange and grey mottled very sandy CLAY with occasional roots (2-4mm) and rootlets. Sand is medium *.....Occasional roots (2-4mm)*
		2.75 2.75	D PP	0.5kg/cm2	2.80	57.77		Yellow/ Orange fine SAND
		3.00	D		3.00	57.57		End of Borehole at 3.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS203** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords: 468173E - 111996N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level: 60.57	Scale 1:25
Client:	Grainger PLC and Linden Homes South		Dates: 05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.15	60.42		Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
		0.25 0.25	D PP	1.6kg/cm2				Firm orange brown gravelly CLAY with occasional flint cobbles. Gravel is medium sub angular to sub rounded of flint
		0.50 0.50	D PP	0.9kg/cm2				
		0.75 0.75	D PP	1.1kg/cm2	0.70	59.87		Firm orange, red and grey mottled slightly sandy CLAY. Sand is fine
		1.00 1.00	D PP	0.5kg/cm2				
		1.25 1.25	D PP	1.0kg/cm2	1.10	59.47		Firm orange and grey mottled sandy CLAY. Sand is fine
		1.50 1.50	D PP	0.8kg/cm2				
		1.75 1.75	D PP	1.3kg/cm2				
		2.00 2.00	D PP	1.5kg/cm2	1.90	58.67		Firm orange and grey mottled very sandy CLAY. Sand is fine
		2.25 2.25	D PP	0.9kg/cm2				
		2.50	D		2.30	58.27		Yellow/ Orange fine SAND
		2.75	D					
		3.00	D		3.00	57.57		End of Borehole at 3.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS204** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords:	468179E - 112013N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level:	60.47	Scale 1:25
Client:	Grainger PLC and Linden Homes South		Dates:	05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	60.17		Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
		0.50 0.50	D PP	0.9kg/cm2				Stiff orange/ brown slightly sandy CLAY with frequent rootlets. Sand is fine
		0.75 0.75	D PP	1.0kg/cm2				
		1.00 1.00	D PP	1.2kg/cm2	1.10	59.37		
		1.25 1.25	D PP	1.4kg/cm2				Stiff orange/ brown slightly sandy CLAY with rare rootlets. Sand is fine
		1.50 1.50	D PP	1.5kg/cm2				
		1.75 1.75	D PP	1.3kg/cm2				
		2.00 2.00	D PP	1.0kg/cm2				
		2.25 2.25	D PP	1.1kg/cm2	2.30	58.17		Firm orange and grey mottled sandy CLAY. Sand is fine
		2.50 2.50	D PP	0.9kg/cm2				
		2.75 2.75	D PP	0.7kg/cm2				
		3.00 3.00	D PP	0.8kg/cm2	3.00	57.47		End of Borehole at 3.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS205** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords:	468150E - 112033N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level:	58.83	Scale 1:25
Client:	Grainger PLC and Linden Homes South		Dates:	05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.25	58.58		Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
		0.50	D					Brown clayey fine SAND
		0.75	D					
					0.90	57.93		
		1.00	D					Orange fine SAND
		1.25	D					
		1.50	D					
					1.70	57.13		
		1.75	D					Orange clayey fine SAND
		2.00	D		2.00	56.83		
		2.00	PP	1.1kg/cm2				Stiff grey slightly sandy CLAY. Sand is fine
		2.25	D					
		2.25	PP	1.2kg/cm2				
		2.50	D					
		2.50	PP	1.0kg/cm2				
					2.60	56.23		Soft brown slightly sandy CLAY. Sand is fine
		2.75	D					
		2.75	PP	0.4kg/cm2	2.80	56.03		Structureless CHALK composed of: medium to coarse sub-angular white sandy GRAVEL, sand is medium and fragments are weak CIRIA Grade DM
		3.00	D		3.00	55.83		End of Borehole at 3.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

AGS

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Borehole Log

Borehole No.
WS206
Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords: 468081E - 111960N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level: 57.22	Scale 1:25
Client:	Grainger PLC and Linden Homes South		Dates: 05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.50 0.50	D PP	1.2kg/cm2	0.35	56.87		Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
		0.75 0.75	D PP	1.6kg/cm2				Firm brown orange slightly sandy gravelly CLAY with frequent rootlets. Sand is fine, gravel is medium sub angular to sub rounded of flint.
		1.00 1.00	D PP	1.5kg/cm2				
		1.25 1.25	D PP	1.1kg/cm2				
		1.50 1.50	D PP	0.8kg/cm2				
		1.75 1.75	D PP	1.3kg/cm2	1.90	55.32		Firm brown very gravelly CLAY. Gravel is medium sub angular to sub rounded of flint.
		2.00 2.00	D PP	1.8kg/cm2				
		2.25 2.25	D PP	1.7kg/cm2				
		2.50 2.50	D PP	1.5kg/cm2				
		2.75 2.75	D PP	1.6kg/cm2				
		3.00 3.00	D PP	1.5kg/cm2	3.00	54.22		End of Borehole at 3.00m

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Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks
Groundwater not encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS207** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16662	Co-ords:	468075E - 111938N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean,		Level:	58.31	Scale 1:25
Client:	Grainger PLC and Linden Homes South		Dates:	05/09/2017	Logged By FG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.15	58.16		Grass over brown sandy clay with frequent rootlets and occasional flint gravel TOPSOIL
		0.25 0.25	D PP	 1.0kg/cm2				Firm orange and grey mottled CLAY with frequent rootlets and occasional flint gravel
		0.50 0.50	D PP	 1.0kg/cm2				
		0.75 0.75	D PP	 0.7kg/cm2				
		1.00 1.00	D PP	 0.6kg/cm2				
								.....Decaying root (6mm)
		1.25 1.25	D PP	 0.9kg/cm2	1.20	57.11		Stiff orange and grey mottled slightly sandy CLAY with occasional rootlets. Sand is fine
					1.40	56.91		*.....Occasional roots (2mm)*
		1.50 1.50	D PP	 1.5kg/cm2				Stiff orange and grey mottled slightly sandy CLAY with occasional rootlets and red banding of sandy clay. Sand is fine
		1.75 1.75	D PP	 1.5kg/cm2				*.....Occasional roots (2mm)*
		2.00 2.00	D PP	 1.5kg/cm2				
		2.25 2.25	D PP	 1.7kg/cm2	2.20	56.11		Stiff orange and grey mottled slightly sandy CLAY with frequent rootlets. Sand is fine
		2.50 2.50	D PP	 1.5kg/cm2				
		2.75 2.75	D PP	 1.7kg/cm2	2.80	55.51		Stiff grey CLAY with chalk fragments
		3.00 3.00	D PP	 1.8kg/cm2	3.00	55.31		End of Borehole at 3.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

Groundwater not encountered

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Trial Pit Log

TrialPit No: TP301
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468021.00 - 112011.00 Level: 56.66	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.40 × 0.60 Depth 2.70	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	56.46		Grass over dark brown sandy gravelly CLAY with abundant roots and rootlets TOPSOIL
	0.25	ES					
	0.40	ES		0.45	56.21		Made Ground comprising dark brown soft sandy, gravelly CLAY with brick, brick fragments, tile, slate, wood, and glass. Sand is medium and gravel is fine to medium sub angular to sub rounded of flint. Made Ground comprising Fines 60%, Coarse 30%, Brick 5%, Wood 4%, Glass 0.5%, Slate 0.5% MADE GROUND
				0.90	55.76		Made Ground comprising light brown firm slightly sandy CLAY with flint gravel, brick and wood/decaying roots. Sand is medium. Made Ground comprising Fines 50%, Coarse 30%, Gravel 10%, Brick 5% and Wood 5% MADE GROUND
				1.30	55.36		Made Ground comprising light brown firm CLAY with brick, wood, rope and flint gravel. Made Ground comprising Fines 60%, Coarse 20%, Brick 5% and Wood 5%. (At 0.95m bgl large concrete slab - 1.1m x 0.2m and 0.2m thick) MADE GROUND
	1.40	ES					
							Made Ground comprising light grey and black soft CLAY with wood, chalk gravel, brick and plastic. Made Ground comprising Fines 40%, Coarse 20%, Wood 15%, Brick 15% and Plastic 10%. (At 1.4m bgl large decaying tree root - 1.2m x 0.2m) MADE GROUND
				2.70	53.96		End of Pit at 2.70m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP302
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468063.00 - 112007.00 Level: 57.59	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.40 × 0.60 Depth 2.80	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.25	57.34		Grass over Made Ground comprising clayey sandy fine to coarse sub angular to sub rounded GRAVEL with tarmac, calk fragments, brick, tile, charcoal and wood. Made Ground comprising Fines 25%, Coarse 70%, Brick 3%, Wood 2%. (At 0.1m bgl large piece of tarmac) MADE GROUND
	0.50	ES		0.40	57.19		Made Ground comprising light brown and grey with black and dark grey staining firm CLAY with brick and decaying roots. Made Ground comprising Fines 70%, Coarse 20%, Brick 5%, Wood 5% MADE GROUND
							Made Ground comprising dark grey and grey mottled firm CLAY with wood, brick, cement, plastic and chipboard. Made Ground comprising Fines 60%, Coarse 20%, Wood 10%, Brick 5%, Plastic 3% and Cement 2% MADE GROUND
	1.30	ES		1.20	56.39		Made Ground comprising brown with occasional black staining soft gravelly sandy CLAY with wood, brick, charcoal and plastic. Sand is medium and gravel is fine to medium sub angular to sub rounded of flint. Made Ground comprising Fines 60%, Coarse 20%, Wood 10%, Brick 5%, Charcoal 3% and Plastic 2% MADE GROUND
	2.70	ES		2.80	54.79		End of Pit at 2.80m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP303
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468094.00 - 111975.00 Level: 57.47	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.20 × 0.60 Depth 2.40	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	57.37		Grass over dark brown silty sandy CLAY with frequent roots and rootlets TOPSOIL
	0.30	ES		0.35	57.12		Made Ground comprising light brown soft slightly sandy CLAY with brick, glass, flint gravel, concrete, wood and possible asbestos. Sand is medium. Made Ground comprising Fines 70%, Coarse 20%, Gravel 5%, Brick 3%, Concrete 1%, Glass 0.5% and Wood 0.5% MADE GROUND
	0.70	ES		0.80	56.67		Made Ground comprising light brown firm CLAY with brick and chalk gravel, Fines 80%, Coarse 10%, Gravel 8% and Brick 2%. (Between 0.4m bgl and 0.5m bgl live tree roots) MADE GROUND
				1.20	56.27		Stiff light brown and grey mottled CLAY
				1.40	56.07		Firm light grey and brown sandy gravelly CLAY. Sand is medium and gravel is fine to medium sub angular to sub rounded of flint. (At 1.3m bgl and 1.5m bgl large flint cobbles)
				1.80	55.67		Firm brown very gravelly CLAY. Gravel is medium to coarse sub angular of chalk
	1.90	ES					White/light grey structureless very weak weather CHALK in communicated matrix CIRIA Grade DM
				2.40	55.07		End of Pit at 2.40m

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No: TP304
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468071.00 - 111965.00 Level: 56.82	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.10 × 0.60 Depth 2.40	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	56.72		Grass over dark brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
	0.30	ES					Made Ground comprising grey and brown mottled with frequent black staining soft sandy CLAY with chalk gravel, brick, wood, plastic occasional glass and charcoal. Sand is medium. Made Ground comprising Fines 50%, Coarse 25%, Gravel 15%, Brick 5%, Wood 3%, Plastic 1.5% Other 0.5% MADE GROUND
				0.60	56.22		Made Ground comprising light brown and grey mottled with occasional black staining soft CLAY with chalk gravel and brick MADE GROUND
				1.00	55.82		Soft light brown gravelly CLAY. Gravel is fine to medium sub angular to sub rounded of flint. (Large flint cobbles at 1m bgl)
	1.20	ES		1.20	55.62		Stiff light brown and grey mottled slightly sandy CLAY. Sand is medium. (Large flint cobbles at 2.2m bgl)
				2.40	54.42		End of Pit at 2.40m

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
TP305
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468037.00 - 111960.00 Level: 57.32	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): Depth 1.20, 1.80 x 0.60	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	57.12		Grass over dark brown silty sandy CLAY with abundant roots and rootlets, and occasional flint gravel TOPSOIL
	0.80	ES		0.90	56.42		Made Ground comprising firm brown and grey mottled slightly sandy CLAY with occasional flint gravel. (At 0.85m large piece of metal) MADE GROUND
	1.10	ES		1.20	56.12		Made Ground comprising light grey with occasional black staining firm slightly sandy CLAY with wood and decaying tree roots. Made Ground comprising Fines 70%, Coarse 20% and Wood/ Tree roots 10% MADE GROUND
							End of Pit at 1.20m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks Rapid groundwater ingress at 1.1m bgl. Pit abandoned due to instability caused by rapid water ingress

Stability

AGS

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Trial Pit Log

TrialPit No
TP306
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468024.00 - 112109.00 Level: 59.05	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): Depth 2.80, 0.60 x 2.10	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.30	58.75		Grass over soft brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
	0.40	ES					Firm orange/brown slightly sandy CLAY with occasional flint gravel. Sand is fine
	0.80	ES					
				1.60	57.45		Firm orange/brown and grey mottled slightly sandy CLAY. Sand is medium
				2.10	56.95		Soft orange/brown very sandy CLAY. Sand is medium
				2.60	56.45		Stiff grey CLAY with frequent sub rounded flint cobbles
				2.80	56.25		End of Pit at 2.80m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP307
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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468040.00 - 112091.00 Level: 58.94	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 1.90 × 0.60 Depth 2.60	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	58.74		Grass over soft brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
	0.30	ES					Soft orange/brown slightly sandy CLAY with occasional flint gravel. Sand is fine
				0.70	58.24		
	0.80	ES					Firm grey and orange/brown mottled CLAY with frequent flint cobbles
				1.00	57.94		
	1.20	ES					Orange and yellow medium SAND
				2.10	56.84		White/cream structureless weak, highly weather CHALK in comminuted matrix with frequent sub rounded flint cobbles CIRIA Grade DM/CM
				2.60	56.34		End of Pit at 2.60m

1 2 3 4 5

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No: TP308
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468023.00 - 112077.00 Level: 58.20	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.00 × 0.60 Depth 2.60	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.25	57.95		Grass over soft brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
	0.30	ES					Soft brown very sandy CLAY with occasional flint gravel. Sand is fine
	0.70	ES		0.80	57.40		Stiff brown/grey gravelly CLAY. Gravel is medium to coarse sub angular to sub rounded of flint
				1.70	56.50		White/cream structureless weak, highly weather CHALK in comminuted matrix with frequent sub rounded flint cobbles CIRIA Grade DM/CM
				2.60	55.60		End of Pit at 2.60m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No: TP309
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468042.00 - 112072.00 Level: 58.36	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 1.90 × 0.60 Depth 2.10	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	58.26		Soft brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
	0.25	ES		0.30	58.06		Made Ground comprising brown sandy CLAY with flint gravel, flint cobbles and occasional black staining MADE GROUND
	0.50	ES					Firm brown/orange slightly sandy CLAY with frequent flint cobbles. (At 0.6-0.7m bgl chalk gravel and chalk fragments. At 0.8m bgl large flint cobbles)
	0.65	ES					
				1.15	57.21		White/cream structureless weak, highly weather CHALK in comminuted matrix with frequent sub rounded flint cobbles
				2.10	56.26		End of Pit at 2.10m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468022.00 - 112039.00 Level: 57.56	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): Depth 2.10 — 0.60 × 2.10	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.10	57.46		Soft brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
							Soft brown/orange sandy desiccated CLAY. Sand is medium
	0.50	ES		0.40	57.16		Stiff brown slightly sandy CLAY with frequent flint cobbles. Sand is medium
	1.50	ES		1.20	56.36		White/cream structureless weak, highly weather CHALK in comminuted matrix with frequent sub rounded flint cobbles CIRIA Grade DM/CM
				2.10	55.46		End of Pit at 2.10m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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TP311
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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468040.00 - 112038.00 Level: 57.21	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 1.80 × 0.60 Depth 2.00	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.10	57.11		Soft brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
				0.30	56.91		Firm brown slightly silty sandy CLAY. Sand is fine
	0.40	ES					Firm brown slightly sandy CLAY with occasional flint gravel. Sand is fine
	0.80	ES		0.90	56.31		Firm orange/brown slightly sandy, slightly gravelly CLAY with occasional cobbles of flint. Sand is fine and gravel is fine to medium sub angular to sub rounded of flint
				1.45	55.76		White/cream structureless weak, highly weather CHALK in comminuted matrix with frequent sub rounded flint cobbles CIRIA Grade DM/CM
				2.00	55.21		End of Pit at 2.00m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP312
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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468087.00 - 112016.00 Level: 57.59	Date 17/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.10 × 0.60 Depth 2.40	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.10	57.49		Made Ground comprising light brown clayey fine to coarse flint GRAVEL with brick and concrete. Made Ground comprising Fines 30%, Coarse 60%, Brick 15% and Concrete 5% MADE GROUND
							Made Ground comprising white/brown clayey fine to coarse chalk GRAVEL with brick, concrete, tarmac, and large pieces of tree. Made Ground comprising Fines 25%, Coarse 60%, Tarmac 10%, Brick 5%, Concrete 3% and Tree 2% MADE GROUND
	0.90	ES		0.80	56.79		Made Ground comprising dark brown/grey soft slightly sandy CLAY with plastic, decaying roots and flint gravel. Sand is medium. Made Ground comprising Fines 70%, Coarse 20%, Gravel 7%, Roots 2% and Plastic 1% MADE GROUND
	1.45	ES		1.40	56.19		Firm orange/brown and grey mottled slightly sandy CLAY with occasional flint gravel. Sand is medium. (Large flint cobbles at 1.5m bgl)
				2.30	55.29		White/cream structureless weak weather CHALK in communicated matrix with flint gravel CIRIA Grade DM
				2.40	55.19		End of Pit at 2.40m

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Water Strikes
Depth Strike | Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468113.00 - 112026.00 Level: 58.03	Date 17/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 1.80 × 0.60 Depth 2.50	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	57.93		Grass over dark brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
	0.25	ES		0.30	57.73		Made Ground comprising white/brown clayey fine to coarse sub angular to sub rounded chalk GRAVEL with large flint cobbles MADE GROUND
	0.50	ES					
				0.60	57.43		Brown very clayey fine to medium sub angular to sub rounded flint GRAVEL
							Firm orange/brown and grey mottled CLAY with occasional bands of orange medium SAND.
				1.50	56.53		
	1.55	ES					Orange medium SAND
				1.60	56.43		Stiff orange/brown sandy CLAY with occasional flint gravel. Sand is medium
				1.80	56.23		Orange/brown medium SAND with bands of grey firm CLAY
				2.50	55.53		End of Pit at 2.50m

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP314
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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468124.00 - 112027.00 Level: 58.20	Date 17/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.30 × 0.60 Depth 2.50	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	58.10		Grass over dark brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
	0.30	ES					Firm orange/brown slightly sandy CLAY with frequent tree roots (3mm-6mm). Sand is medium
	0.70	ES		0.60	57.60		Stiff orange/brown and slightly grey mottled CLAY with occasional bands of orange medium SAND. (Tree roots at 0.9m bgl, band of off white structureless weak weathered CHALK at 1.8m bgl)
	1.60	ES					
				2.50	55.70		End of Pit at 2.50m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP315
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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468081.00 - 111991.00 Level: 57.67	Date 17/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.20 × 0.60 Depth 2.40	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES					Loose chippings over brown/grey clayey flint and chalk GRAVEL with tarmac, brick and concrete. Made Ground comprising Fines 30%, Coarse 60%, Brick 5%, Concrete 3% and Tarmac 2% MADE GROUND
				0.50	57.17		
	0.60	ES					Made Ground comprising brown and dark grey firm CLAY with brick, concrete, tree roots, flint cobbles and lead pipe. Made Ground comprising Fines 70%, Coarse 20%, Brick 5%, Other 3%, Concrete 2% MADE GROUND
				2.20	55.47		
	2.30	ES					Firm brown and grey mottled CLAY with occasional bands of orange medium SAND
				2.40	55.27		End of Pit at 2.40m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP316
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468111.00 - 111958.00 Level: 59.73	Date 17/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.30 × 0.60 Depth 2.20	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES					Grass over light brown sandy CLAY with brick, concrete, plastic and glass. Made Ground comprising Fines 40%, Coarse 20%, Brick 20%, Concrete 15% and other 5% MADE GROUND
	0.90	ES		0.80	58.93		Firm orange/brown and grey mottled slightly sandy desiccated CLAY. Sand is medium
	1.90	ES		1.80	57.93		Stiff orange/brown, grey and red mottled CLAY
				2.20	57.53		End of Pit at 2.20m

Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

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TP317
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468146.00 - 111985.00 Level: 58.97	Date 17/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 1.90 × 0.60 Depth 2.20	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.15	ES		0.15	58.82		Loose chippings over dark brown silty sandy CLAY with frequent roots and rootlets and occasional brick rubble and gravel. (Plastic drainage pipe at 0.1m bgl) MADE GROUND
				0.25	58.72		Made Ground comprising soft dark brown silty CLAY MADE GROUND
	0.65	ES					Firm orange/brown sandy CLAY. Sand is medium
	1.40	ES		1.35	57.62		Orange/brown clayey medium SAND
				1.60	57.37		Orange/brown fine to medium SAND with occasional bands of CLAY
				2.20	56.77		End of Pit at 2.20m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
TP318
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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468116.00 - 111949.00 Level: 59.78	Date 17/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.40 × 0.60 Depth 1.90	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.15	ES		0.15	59.63		Grass over dark brown silty sandy CLAY with abundant roots and rootlets TOPSOIL
				0.60	59.18		Made Ground comprising dark brown soft very gravelly CLAY with flint and brick. Gravel is fine to coarse of chalk. Made Ground comprising Fines 50%, Coarse 30%, Gravel 15% and Brick 5% MADE GROUND
	0.70	ES		0.80	58.98		Firm orange/brown and grey mottled CLAY with frequent flint gravel
	1.80	ES		1.90	57.88		Stiff orange/brown and grey mottled CLAY with occasional flint gravel End of Pit at 1.90m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
Trench 01
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468158.00 - 111950.00 Level: 60.98	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 3.40 × 0.60 Depth 1.00	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	60.88		Dark brown slightly sandy silty CLAY with abundant roots and rootlets TOPSOIL
							Firm grey and orange mottled slightly sandy CLAY
				1.00	59.98		End of Pit at 1.00m

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Water Strikes	
Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
Trench 02
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468157.00 - 111967.00 Level: 60.20	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 6.40 × 0.60 Depth 0.70	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	60.00		Made Ground comprising dark brown sandy silty CLAY with slate, brick, gravel and wood MADE GROUND
							Firm orange/brown slightly sandy CLAY. Sand is fine
				0.70	59.50		End of Pit at 0.70m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks Private water pipe running through trench

Stability

AGS

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Trial Pit Log

TrialPit No
Trench 03
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468145.00 - 112001.00 Level: 59.01	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 4.60 × 0.60 Depth 1.00	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Made Ground comprising dark brown sandy silty CLAY with wood, gravel, brick, pipe and concrete MADE GROUND
				0.50	58.51		Firm grey sandy CLAY. Sand is fine
				1.00	58.01		End of Pit at 1.00m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
Trench 04
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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468133.00 - 112020.00 Level: 58.36	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 4.80 × 0.60 Depth 0.50	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.50	57.86		Firm orange/brown sandy CLAY with occasional flint gravel. Sand is fine End of Pit at 0.50m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
Trench 05
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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468164.00 - 112017.00 Level: 60.06	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 3.60 x 0.60 Depth 0.75	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	59.91		Dark brown slightly sandy silty CLAY with abundant roots and rootlets TOPSOIL
							Soft brown very sandy CLAY. Sand is fine
				0.75	59.31		End of Pit at 0.75m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

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Trial Pit Log

TrialPit No
Trench 06
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Project Name: Woodcroft	Project No. GE16943	Co-ords: 468169.00 - 111997.00 Level: 59.91	Date 15/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 4.20 × 0.60 Depth 0.70	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	59.76		Dark brown slightly sandy silty CLAY with abundant roots and rootlets TOPSOIL
							Soft light brown sandy CLAY. Sand is fine
				0.70	59.21		End of Pit at 0.70m

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
Trench 07
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468033.00 - 112020.00 Level: 57.17	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.80 × 0.60 Depth 1.10	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Grass over Made Ground comprising light brown clayey sandy fine to coarse sub angular to sub rounded chalk and flint GRAVEL with tarmac, flint cobbles, wood, charcoal and glass. Made Ground comprising Fines 30%, Coarse 60%, Tarmac 5%, Wood 3%and Other 2%. Sand is medium MADE GROUND
				0.50	56.67		Firm orange/ brown slightly gravelly desiccated CLAY. Gravel is fine to medium sub angular to sub rounded of flint
				1.10	56.07		End of Pit at 1.10m

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
Trench 08
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468046.00 - 112019.00 Level: 57.41	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 3.80 × 0.60 Depth 1.15	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Made Ground comprising brown and white clayey sandy fine to coarse sub angular to sub rounded chalk and flint GRAVEL with brick, tile and concrete. Sand is medium. Made Ground comprising Fines 30%, Coarse 63%, Brick 3%, Tile 2% and Concrete 2% MADE GROUND
				0.70	56.71		Soft orange/brown gravelly CLAY. Gravel is fine to medium sub angular to sub rounded of flint (Flint cobbles in base of pit)
				1.15	56.26		End of Pit at 1.15m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
Trench 09
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468068.00 - 112013.00 Level: 57.70	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 2.50 × 0.60 Depth 1.10	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Made Ground comprising brown and white clayey sandy fine to coarse sub angular to sub rounded chalk and flint GRAVEL with brick, tarmac and flint cobbles. Sand is medium. Made Ground comprising Fines 30%, Coarse 60%, Brick 5% and Tarmac 5% MADE GROUND
				0.70	57.00		Firm orange/ brown slightly sandy desiccated CLAY. Sand is medium
				1.10	56.60		End of Pit at 1.10m

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Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

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Trial Pit Log

TrialPit No
Trench 10
Sheet 1 of 1

Project Name: Woodcroft	Project No. GE16943	Co-ords: 468068.00 - 112008.00 Level: 57.60	Date 16/05/2018
Location: Woodcroft Farm, Lovedean, Hampshire		Dimensions (m): 4.20 × 0.60 Depth 1.20	Scale 1:25
Client: Grainger plc			Logged FG

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Made Ground comprising light brown clayey sandy fine to coarse sub angular to sub rounded flint and chalk GRAVEL with brick, concrete, tree roots, clay pipe. Sand is medium. Made Ground comprising Fines 30% Coarse 60%, Brick 4%, Concrete 4% and Other 2% MADE GROUND
				0.50	57.10		Made Ground comprising dark grey and grey mottled soft CLAY with brick, plastic, roots, wood, chalk fragments, flint gravel and tile. Made Ground comprising Fines 60%, Coarse 20%, Brick 3%, Plastic 2%, Wood/Roots 2%, Other 3% MADE GROUND
				1.20	56.40		End of Pit at 1.20m

1
2
3
4
5

Water Strikes

Depth Strike	Rose to (mbgl)

Remarks

Stability

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS401** Sheet 1 of 2

Project Name:	Woodcroft	Project No. GE16943	Co-ords: 468050E - 112012N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level: 56.60	Scale 1:25
Client:	Grainger plc		Dates: 15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	56.50		Grass over brown slightly fine and medium gravelly clay with rootlets TOPSOIL
		0.60 - 0.80	ES					Brown clay with gravel of flint and red brick MADE GROUND
					0.90	55.70		Grey clay with flint gravel ash wood and red brick fragments MADE GROUND
		1.40 - 1.70	ES					
					2.00	54.60		Grey clay with chalk and flint gravel. Red brick at 3.6-3.7m bgl MADE GROUND
		2.30 - 2.60	ES					
					3.70	52.90		Brown clay with abundant fine chalk gravel and rare red brick fragments MADE GROUND
					4.80	51.80		Off white CHALK recovered as silty chalk matrix and fine gravel size weak chalk clasts CIRIA Grade
					5.00	51.60		Continued on Next Sheet

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

No water encountered

AGS

Geo-Environmental
Unit 7, Danworth Farm
Hurstpierpoint
BN6 9GL
www.gesl.net

Borehole Log

Borehole No.
WS401
Sheet 2 of 2

Project Name:	Woodcroft	Project No. GE16943	Co-ords: 468050E - 112012N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level: 56.60	Scale 1:25
Client:	Grainger plc		Dates: 15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								DM/CM End of Borehole at 5.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks
No water encountered

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS402** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16943	Co-ords: 468056E - 111983N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level: 56.73	Scale 1:25
Client:	Grainger plc		Dates: 15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	56.63		Grass over brown slightly fine and medium gravelly clay with rootlets TOPSOIL
		0.50	ES					Firm to stiff brown and grey mottled silty clay MADE GROUND
					0.90	55.83		Brown and grey clay with some gravel of flint red brick and slate MADE GROUND
		1.50	ES		1.40	55.33		Grey clay with pockets of light grey sandy gravel possibly concrete fragments ash charcoal dead roots and wood fragments and abundant concrete fragments at 2.7-2.8m MADE GROUND
		2.50	ES					
					2.80	53.93		Brown and grey clay with concrete fragments MADE GROUND
		3.70 - 4.00	ES		3.70	53.03		Dark grey to black fibrous material possibly decomposed paper and wood fragments with red brick. Wood at4.2-4.5m MADE GROUND
					4.50	52.23		Off white grey and black chalk with ashy or possibly fine organic matter in matrix MADE GROUND
					5.00	51.73		End of Borehole at 5.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

No water encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS403** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16943	Co-ords: 468054E - 111977N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level: 56.75	Scale 1:25
Client:	Grainger plc		Dates: 15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	56.65		Grass over brown slightly fine and medium gravelly clay with rootlets TOPSOIL
		0.30 - 0.50	ES					Brown clay with some fine to medium flint gravel and rare red brick fragments MADE GROUND
					1.10	55.65		Grey clay with clinker ah red brick fragments and occasional wood fragments MADE GROUND
		1.50 - 1.60	ES					
					1.70	55.05		Brown and grey clay with occasional gravel of flint and chalk and occasional inclusions of possible ash ferruginous fragments and red brick MADE GROUND
		2.40 - 2.60	ES					
					3.90	52.85		Off white CHALK recovered as structureless mass with some localised orange brown staining CIRIA Grade DM
					5.00	51.75		End of Borehole at 5.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

No water encountered

AGS

Geo-Environmental
Unit 7, Danworth Farm
Hurstpierpoint
BN6 9GL
www.gesl.net

Borehole Log

Borehole No.
WS404
Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16943	Co-ords: 468054E - 111963N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level: 58.00	Scale 1:25
Client:	Grainger plc		Dates: 15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20 - 0.40	ES		0.10	57.90		Grass over brown slightly fine and medium gravelly clay with rootlets TOPSOIL
								Dark grey silty gravelly clay. Gravel of flint and brick MADE GROUND
					0.60	57.40		Stiff light grey and orange brown mottled silty CLAY. Becoming very gravelly from 1.7m bgl
		1.10 - 1.30	ES					
					1.90	56.10		White CHALK composed of silt chalk matrix with moderately strong chalk clasts. Unable to penetrate beyond 2.5m bgl CIRIA Grade DM/CM
					2.80	55.20		End of Borehole at 2.80m

1 2 3 4 5

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks
No water encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS405** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16943	Co-ords:	468038E - 111989N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level:	56.56	Scale 1:25
Client:	Grainger plc		Dates:	15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.20	ES					Grass over brown slightly fine and medium gravelly clay with rootlets TOPSOIL
					0.20	56.36		
		0.40 - 0.60	ES					Brown and grey clay with occasional roots flint gravel decomposed plant remains and wood MADE GROUND
					1.00	55.56		
		1.20	ES					Grey clay with gravel of flint red brick and concrete MADE GROUND
					2.50	54.06		
								off white chalk recovered as structureless mass with some localised orange brown staining and flint CIRIA Grade DM
					3.00	53.56		End of Borehole at 3.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

No water encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**	Borehole No. **WS406** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16943	Co-ords:	468060E - 111985N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level:	56.79	Scale 1:25
Client:	Grainger plc		Dates:	15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20 - 0.50	ES		0.10	56.69		Grass over brown slightly fine and medium gravelly clay with rootlets TOPSOIL
								Brown and grey mottled silty clay with pockets of sandy gravel of concrete occasional red brick and ash and rare wood MADE GROUND
								Bituminous felt (roofing felt) fragments
		1.60 - 1.90	ES					
		3.10 - 3.50	ES		3.10	53.69		Dark grey to black clay with decomposed wood and plant fragments with red brick. MADE GROUND
					3.70	53.09		Off white CHALK recovered as structureless mass with some localised orange brown staining CIRIA Grade DM
					5.00	51.79		End of Borehole at 5.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

No water encountered

AGS

Geo-Environmental	Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	Borehole Log	Borehole No. **WS407** Sheet 1 of 1

Project Name:	Woodcroft	Project No. GE16943	Co-ords:	468073E - 111977N	Hole Type WLS
Location:	Woodcroft Farm, Lovedean, Hampshire		Level:	57.22	Scale 1:25
Client:	Grainger plc		Dates:	15/05/2018	Logged By GR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30 - 0.50	ES		0.10	57.12		Grass over brown slightly fine and medium gravelly clay with rootlets TOPSOIL Brown clay with some to much gravel of flint and red brick MADE GROUND	
		1.00 - 2.00	ES		1.00	56.22		Grey silty sand with much ash charcoal and red brick and occasional glass. Poor recovery MADE GROUND	1
		3.00 - 4.00	ES						2
					4.00	53.22		Off white CHALK recovered as structureless silty matrix with weal chalk clasts of fine to medium gravel size CIRIA Grade DM/CM	3
					5.00	52.22		End of Borehole at 5.00m	4
									5

Casing		Water Strikes (mbgl)		Chiselling (mbgl)	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to

Remarks

No water encountered

AGS

Geo-Environmental

APPENDIX B

Geochemical Laboratory Results

and Statistical Assessments



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2683

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	17-13705
Issue:	1
Date of Issue:	31/08/2017
Contact:	Fiona Goode
Customer Details:	GESL Unit 7 Danworth Farm Hurstpierpoint West SussexBN6 9GL
Quotation No:	Q14-00021
Order No:	2253
Customer Reference:	GE16662
Date Received:	24/08/2017
Date Approved:	31/08/2017
Details:	Woodcroft
Approved by:	

John Wilson, Operations Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

Sample Summary

Report No.: 17-13705

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
109920	TP201 0.10	23/08/2017	24/08/2017		
109921	TP201 0.50	23/08/2017	24/08/2017		
109922	TP202 0.10	23/08/2017	24/08/2017	Silty loam	
109923	TP202 0.50	23/08/2017	24/08/2017		
109924	TP203 0.10	23/08/2017	24/08/2017		
109925	TP203 0.50	23/08/2017	24/08/2017	Silty clayey loam	
109926	TP204 0.10	22/08/2017	24/08/2017		
109927	TP204 0.50	22/08/2017	24/08/2017	Silty clayey loam	
109928	TP205 0.10	23/08/2017	24/08/2017		
109929	TP205 0.50	23/08/2017	24/08/2017	Clayey loam	
109930	TP206 0.10	23/08/2017	24/08/2017	Silty loam	
109931	TP206 0.50	23/08/2017	24/08/2017		
109932	TP207 0.30	21/08/2017	24/08/2017	Silty clayey loam	
109933	TP208 0.10	21/08/2017	24/08/2017		
109934	TP209 0.10	21/08/2017	24/08/2017		
109935	TP210 0.10	21/08/2017	24/08/2017		
109936	TP211 0.10	22/08/2017	24/08/2017		
109937	TP212 0.20	21/08/2017	24/08/2017		
109938	TP213 1.00	21/08/2017	24/08/2017	Silty loam	
109939	TP214 0.90	21/08/2017	24/08/2017	Silty loam	
109940	TP215 0.30	22/08/2017	24/08/2017	Sandy silty loam	
109941	TP215 2.90	23/08/2017	24/08/2017	Chalk	
109942	TP216 0.60	21/08/2017	24/08/2017		
109943	TP217 0.20	21/08/2017	24/08/2017	Silty clayey loam	
109944	TP218 0.15	21/08/2017	24/08/2017		
109945	TP219 1.00	21/08/2017	24/08/2017		
109946	TP220 0.20	22/08/2017	24/08/2017	Sandy silty loam	
109947	TP220 1.00	22/08/2017	24/08/2017	Silty clayey loam	
109948	TP221 0.10	22/08/2017	24/08/2017	Silty loam	
109949	TP221 0.50	22/08/2017	24/08/2017		
109950	TP222 0.40	21/08/2017	24/08/2017	Silty clayey loam	
109951	TP223 0.40	22/08/2017	24/08/2017	Clayey loam	
109952	TP223 0.50	22/08/2017	24/08/2017	Clayey loam	
109953	TP224 0.20	22/08/2017	24/08/2017	Sandy silty loam + Chalk	
109954	TP224 2.20	22/08/2017	24/08/2017	Silty loam	
109955	TP225 0.25	23/08/2017	24/08/2017	Sandy silty loam	
109956	TP225 0.30	23/08/2017	24/08/2017	Sandy loam	
109957	TP226 0.10	21/08/2017	24/08/2017	Silty loam	c
109958	TP227 0.10	21/08/2017	24/08/2017		
109959	TP228 0.15	22/08/2017	24/08/2017	Silty loam	
109960	TP229 0.60	21/08/2017	24/08/2017	Loamy sand	
109961	TP230 0.30	21/08/2017	24/08/2017		
109962	TP231 0.40	21/08/2017	24/08/2017	Sandy silty loam	
109963	TP232 0.10	21/08/2017	24/08/2017	Silty loam	
109964	TP233 0.40	21/08/2017	24/08/2017	Silty clayey loam	
109965	TP234 0.30	21/08/2017	24/08/2017	Silty loam	
109966	TP235 0.50	22/08/2017	24/08/2017	Loamy sand	
109967	TP236 0.30	21/08/2017	24/08/2017	Loamy sand	
109968	TP237 0.40	21/08/2017	24/08/2017	Silty loam	
109969	TP238 0.80	21/08/2017	24/08/2017		
109970	TP239 0.20	23/08/2017	24/08/2017	Sandy loam	
109971	TP239 0.50	23/08/2017	24/08/2017		
109972	TP239 1.50	23/08/2017	24/08/2017	Loamy sand	
109973	TP224 0.30	22/08/2017	24/08/2017		

Results Summary

Report No.: 17-13705

	ELAB Reference	109922	109925	109927	109929	109930	109932
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP202	TP203	TP204	TP205	TP206	TP207
	Sample Depth (m)	0.10	0.50	0.50	0.50	0.10	0.30
	Sampling Date	23/08/2017	23/08/2017	22/08/2017	23/08/2017	23/08/2017	21/08/2017
Determinand	**Codes** / **Units** / **LOD**						
Metals							
Arsenic	M / mg/kg / 1	9.5	11.1	9.9	12.1	4.5	11.8
Barium	U / mg/kg / 10	34.6	48.8	45.9	17.2	16.7	30.1
Beryllium	U / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cadmium	M / mg/kg / 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	M / mg/kg / 5	34.7	60.8	53.7	30.9	12.4	38.0
Copper	M / mg/kg / 5	20.3	29.5	23.9	14.6	8.0	20.3
Lead	M / mg/kg / 5	21.0	24.3	18.8	27.0	11.5	15.3
Mercury	M / mg/kg / 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M / mg/kg / 5	18.3	21.5	22.0	8.9	5.4	9.2
Selenium	M / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium	M / mg/kg / 5	33.5	86.7	77.1	69.9	23.4	54.1
Zinc	M / mg/kg / 5	41.1	52.1	58.4	28.8	17.6	27.1
Anions							
Water Soluble Chloride	M / mg/kg / 40	48	54	45	53	< 40	70
Water Soluble Sulphate	M / g/l / 0.02	0.06	0.05	0.04	0.04	0.03	0.05
Inorganics							
Elemental Sulphur	N / mg/kg / 20	< 20	< 20	< 20	< 20	< 20	< 20
Hexavalent Chromium	N / mg/kg / 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N / mg/kg / 2	< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M / mg/kg / 1	1.1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U / % / 0.02	0.07	0.11	0.04	0.07	0.04	0.05
Water Soluble Boron	N / mg/kg / 0.5	0.8	0.5	< 0.5	0.8	< 0.5	< 0.5
Miscellaneous							
Acid Neutralisation Capacity	N / mol/kg / 0.1	n/t	n/t	n/t	n/t	n/t	n/t
Loss On Ignition (450°C)	M / % / 0.01	n/t	n/t	n/t	n/t	n/t	n/t
pH	M / pH units / 0.1	7.7	7.4	7.5	5.7	5.7	7.6
Total Organic Carbon	N / % / 0.01	0.50	0.54	0.23	0.19	0.36	0.19
Phenols							
Total Phenols	N / mg/kg / 6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons							
Naphthalene	M / mg/kg / 0.1	0.9	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	M / mg/kg / 0.1	0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1
Benzo(a)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo (b) fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo (a) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno (1,2,3-cd) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total PAH(16)	M / mg/kg / 0.4	1.1	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Total PAH (Including Coronene)	N / mg/kg / 2	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 17-13705

	ELAB Reference	109922	109925	109927	109929	109930	109932
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP202	TP203	TP204	TP205	TP206	TP207
	Sample Depth (m)	0.10	0.50	0.50	0.50	0.10	0.30
	Sampling Date	23/08/2017	23/08/2017	22/08/2017	23/08/2017	23/08/2017	21/08/2017
Determinand	**Codes** / **Units** / **LOD**						
BTEX							
Benzene	M / ug/kg / 10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M / ug/kg / 10	35.9	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M / ug/kg / 10	40.3	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M / ug/kg / 10	312	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Total BTEX	M / mg/kg / 0.01	n/t	n/t	n/t	n/t	n/t	n/t
TPH CWG							
>C5-C6 Aliphatic	N / mg/kg / 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N / mg/kg / 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N / mg/kg / 1	1.8	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N / mg/kg / 1	3.3	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N / mg/kg / 1	2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N / mg/kg / 1	1.8	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N / mg/kg / 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N / mg/kg / 0.01	0.04	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N / mg/kg / 1	9.0	< 1.0	3.2	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N / mg/kg / 1	14.4	< 1.0	5.3	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N / mg/kg / 1	3.2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aromatic	N / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N / mg/kg / 1	35.5	< 1.0	8.5	< 1.0	< 1.0	< 1.0
Total Petroleum Hydrocarbons							
Mineral Oil	U / mg/kg / 5	n/t	n/t	n/t	n/t	n/t	n/t
PCB (ICES 7 congeners)							
PCB (Total of 7 Congeners)	M / mg/kg / 0.03	n/t	n/t	n/t	n/t	n/t	n/t

Results Summary

Report No.: 17-13705

	ELAB Reference	109938	109939	109940	109941	109943	109946
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP213	TP214	TP215	TP215	TP217	TP220
	Sample Depth (m)	1.00	0.90	0.30	2.90	0.20	0.20
	Sampling Date	21/08/2017	21/08/2017	22/08/2017	23/08/2017	21/08/2017	22/08/2017
Determinand	**Codes** / **Units** / **LOD**						
Metals							
Arsenic	M / mg/kg / 1	9.0	13.8	10.4	^ 4.7	32.6	25.7
Barium	U / mg/kg / 10	61.4	72.5	162	11.5	86.2	373
Beryllium	U / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	2.5	3.0
Cadmium	M / mg/kg / 0.5	0.5	< 0.5	0.8	^ 0.6	< 0.5	1.1
Chromium	M / mg/kg / 5	18.4	36.4	26.0	^ 8.6	63.2	36.9
Copper	M / mg/kg / 5	14.7	20.4	22.0	^ 6.9	37.4	93.0
Lead	M / mg/kg / 5	62.6	56.0	44.4	^ < 5.0	24.3	170
Mercury	M / mg/kg / 0.5	< 0.5	< 0.5	< 0.5	^ < 0.5	< 0.5	< 0.5
Nickel	M / mg/kg / 5	16.7	19.4	18.0	^ 11.8	19.1	56.2
Selenium	M / mg/kg / 1	< 1.0	< 1.0	< 1.0	^ < 1.0	< 1.0	< 1.0
Vanadium	M / mg/kg / 5	27.7	59.1	32.2	^ 7.8	117	133
Zinc	M / mg/kg / 5	72.7	101	121	^ 15.9	30.3	335
Anions							
Water Soluble Chloride	M / mg/kg / 40	< 40	50	55	^ < 40	53	< 40
Water Soluble Sulphate	M / g/l / 0.02	0.03	0.30	0.16	^ 0.04	0.05	0.03
Inorganics							
Elemental Sulphur	N / mg/kg / 20	< 20	1050	< 20	< 20	< 20	< 20
Hexavalent Chromium	N / mg/kg / 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N / mg/kg / 2	< 2	8	< 2	< 2	< 2	< 2
Total Cyanide	M / mg/kg / 1	< 1.0	< 1.0	< 1.0	^ < 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U / % / 0.02	0.07	0.13	0.11	0.04	0.06	0.08
Water Soluble Boron	N / mg/kg / 0.5	0.6	1.7	0.6	< 0.5	< 0.5	1.0
Miscellaneous							
Acid Neutralisation Capacity	N / mol/kg / 0.1	n/t	n/t	n/t	n/t	n/t	n/t
Loss On Ignition (450°C)	M / % / 0.01	n/t	n/t	n/t	n/t	n/t	n/t
pH	M / pH units / 0.1	8.4	8.0	10.0	^ 8.8	8.2	8.2
Total Organic Carbon	N / % / 0.01	0.49	0.92	0.47	0.02	0.32	4.9
Phenols							
Total Phenols	N / mg/kg / 6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons							
Naphthalene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	^ < 0.1	< 0.1	0.2
Acenaphthylene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	^ < 0.1	< 0.1	< 0.1
Acenaphthene	M / mg/kg / 0.1	< 0.1	< 0.1	0.3	^ < 0.1	< 0.1	< 0.1
Fluorene	M / mg/kg / 0.1	< 0.1	< 0.1	0.3	^ < 0.1	< 0.1	< 0.1
Phenanthrene	M / mg/kg / 0.1	0.4	0.2	2.4	^ < 0.1	< 0.1	0.3
Anthracene	M / mg/kg / 0.1	0.1	< 0.1	0.9	^ < 0.1	< 0.1	< 0.1
Fluoranthene	M / mg/kg / 0.1	1.3	0.6	5.9	^ < 0.1	< 0.1	0.7
Pyrene	M / mg/kg / 0.1	1.3	0.6	5.1	^ 0.1	< 0.1	0.8
Benzo(a)anthracene	M / mg/kg / 0.1	0.8	0.3	2.9	^ < 0.1	< 0.1	0.4
Chrysene	M / mg/kg / 0.1	0.8	0.4	3.0	^ < 0.1	< 0.1	0.5
Benzo (b) fluoranthene	M / mg/kg / 0.1	1.1	< 0.1	3.0	^ < 0.1	< 0.1	0.6
Benzo(k)fluoranthene	M / mg/kg / 0.1	1.0	< 0.1	2.9	^ < 0.1	< 0.1	0.6
Benzo (a) pyrene	M / mg/kg / 0.1	1.0	0.4	3.1	^ 0.2	< 0.1	0.5
Indeno (1,2,3-cd) pyrene	M / mg/kg / 0.1	0.9	0.2	2.2	^ < 0.1	< 0.1	0.4
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	0.5	0.2	0.6	^ < 0.1	< 0.1	0.2
Benzo[g,h,i]perylene	M / mg/kg / 0.1	0.9	0.3	2.1	^ < 0.1	< 0.1	0.5
Total PAH(16)	M / mg/kg / 0.4	10.4	3.2	34.6	^ < 0.4	< 0.4	5.8
Total PAH (Including Coronene)	N / mg/kg / 2	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 17-13705

			ELAB Reference	109938	109939	109940	109941	109943	109946
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP213	TP214	TP215	TP215	TP217	TP220
			Sample Depth (m)	1.00	0.90	0.30	2.90	0.20	0.20
			Sampling Date	21/08/2017	21/08/2017	22/08/2017	23/08/2017	21/08/2017	22/08/2017
Determinand	**Codes**	**Units**	**LOD**						
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0
Total BTEX	M	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	2.9	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	14.4	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	2.1	< 1.0	18.8	9.2	< 1.0	3.3
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	3.5	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	6.9	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	7.1	< 1.0	28.2	10.9	< 1.0	7.2
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	14.6	< 1.0	< 1.0	1.8
Total (>C5-C40) Ali/Aro	N	mg/kg	1	9.3	< 1.0	65.1	44.4	< 1.0	12.3
Total Petroleum Hydrocarbons									
Mineral Oil	U	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
PCB (ICES 7 congeners)									
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t	n/t	n/t	n/t	n/t

Results Summary

Report No.: 17-13705

	ELAB Reference	109947	109948	109950	109951	109952	109953
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP220	TP221	TP222	TP223	TP223	TP224
	Sample Depth (m)	1.00	0.10	0.40	0.40	0.50	0.20
	Sampling Date	22/08/2017	22/08/2017	21/08/2017	22/08/2017	22/08/2017	22/08/2017
Determinand	**Codes** / **Units** / **LOD**						
Metals							
Arsenic	M / mg/kg / 1	11.0	8.6	12.1	9.5	n/t	^ 7.8
Barium	U / mg/kg / 10	99.6	42.6	45.7	30.9	n/t	65.4
Beryllium	U / mg/kg / 1	1.2	< 1.0	< 1.0	1.0	n/t	< 1.0
Cadmium	M / mg/kg / 0.5	< 0.5	< 0.5	< 0.5	< 0.5	n/t	^ 0.5
Chromium	M / mg/kg / 5	39.5	24.2	42.3	33.0	n/t	^ 19.5
Copper	M / mg/kg / 5	21.6	26.3	20.6	19.7	n/t	^ 16.4
Lead	M / mg/kg / 5	20.1	26.5	16.9	18.1	n/t	^ 37.9
Mercury	M / mg/kg / 0.5	< 0.5	< 0.5	< 0.5	< 0.5	n/t	^ < 0.5
Nickel	M / mg/kg / 5	20.6	15.2	17.4	20.4	n/t	^ 16.4
Selenium	M / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	^ < 1.0
Vanadium	M / mg/kg / 5	74.6	37.3	62.6	41.2	n/t	^ 27.3
Zinc	M / mg/kg / 5	39.7	53.8	43.6	41.0	n/t	^ 51.1
Anions							
Water Soluble Chloride	M / mg/kg / 40	48	41	49	92	n/t	^ 167
Water Soluble Sulphate	M / g/l / 0.02	0.08	0.04	0.04	0.06	n/t	^ 0.09
Inorganics							
Elemental Sulphur	N / mg/kg / 20	< 20	< 20	< 20	< 20	n/t	< 20
Hexavalent Chromium	N / mg/kg / 0.8	< 0.8	< 0.8	< 0.8	< 0.8	n/t	< 0.8
Total Sulphide	N / mg/kg / 2	4	< 2	< 2	< 2	n/t	< 2
Total Cyanide	M / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	^ < 1.0
Acid Soluble Sulphate (SO4)	U / % / 0.02	0.07	0.06	0.05	0.06	n/t	0.07
Water Soluble Boron	N / mg/kg / 0.5	< 0.5	0.5	< 0.5	0.5	n/t	< 0.5
Miscellaneous							
Acid Neutralisation Capacity	N / mol/kg / 0.1	n/t	n/t	n/t	n/t	< 0.1	n/t
Loss On Ignition (450°C)	M / % / 0.01	n/t	n/t	n/t	n/t	2.82	n/t
pH	M / pH units / 0.1	7.3	7.7	7.5	8.3	7.7	^ 8.3
Total Organic Carbon	N / % / 0.01	0.29	0.69	0.19	0.15	0.18	0.10
Phenols							
Total Phenols	N / mg/kg / 6	< 6	< 6	< 6	< 6	n/t	< 6
Polyaromatic hydrocarbons							
Naphthalene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ < 0.1
Acenaphthylene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ < 0.1
Acenaphthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ < 0.1
Fluorene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ < 0.1
Phenanthrene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ 0.5
Anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ 0.1
Fluoranthene	M / mg/kg / 0.1	< 0.1	0.1	< 0.1	< 0.1	n/t	^ 1.0
Pyrene	M / mg/kg / 0.1	< 0.1	0.1	< 0.1	< 0.1	n/t	^ 0.9
Benzo(a)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ 0.6
Chrysene	M / mg/kg / 0.1	< 0.1	0.1	< 0.1	< 0.1	n/t	^ 0.7
Benzo (b) fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ 0.6
Benzo(k)fluoranthene	M / mg/kg / 0.1	< 0.1	0.1	< 0.1	< 0.1	n/t	^ 0.6
Benzo (a) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	0.2	< 0.1	n/t	^ 0.6
Indeno (1,2,3-cd) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	0.2	< 0.1	n/t	^ 0.6
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	0.3	< 0.1	n/t	^ 0.2
Benzo[g,h,i]perylene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	n/t	^ 0.5
Total PAH(16)	M / mg/kg / 0.4	< 0.4	< 0.4	0.9	< 0.4	n/t	^ 7.0
Total PAH (Including Coronene)	N / mg/kg / 2	n/t	n/t	n/t	n/t	< 2	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 17-13705

			ELAB Reference	109947	109948	109950	109951	109952	109953
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP220	TP221	TP222	TP223	TP223	TP224
			Sample Depth (m)	1.00	0.10	0.40	0.40	0.50	0.20
			Sampling Date	22/08/2017	22/08/2017	21/08/2017	22/08/2017	22/08/2017	22/08/2017
Determinand	**Codes**	**Units**	**LOD**						
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	n/t	^ < 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	n/t	^ < 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	n/t	^ < 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	n/t	^ < 10.0
Total BTEX	M	mg/kg	0.01	n/t	n/t	n/t	n/t	< 0.01	n/t
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	n/t	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	n/t	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	11.3
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	5.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	n/t	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	n/t	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	1.5
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	41.2
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	28.5
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	n/t	87.5
Total Petroleum Hydrocarbons									
Mineral Oil	U	mg/kg	5	n/t	n/t	n/t	n/t	< 5	n/t
PCB (ICES 7 congeners)									
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t	n/t	n/t	< 0.03	n/t

Results Summary

Report No.: 17-13705

	ELAB Reference	109954	109955	109956	109957	109959	109960
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP224	TP225	TP225	TP226	TP228	TP229
	Sample Depth (m)	2.20	0.25	0.30	0.10	0.15	0.60
	Sampling Date	22/08/2017	23/08/2017	23/08/2017	21/08/2017	22/08/2017	21/08/2017
Determinand	**Codes** / **Units** / **LOD**						
Metals							
Arsenic	M / mg/kg / 1	6.6	13.2	n/t	11.5	10.4	38.2
Barium	U / mg/kg / 10	63.4	124	n/t	46.0	40.0	51.2
Beryllium	U / mg/kg / 1	1.1	< 1.0	n/t	< 1.0	< 1.0	1.8
Cadmium	M / mg/kg / 0.5	< 0.5	0.5	n/t	< 0.5	< 0.5	< 0.5
Chromium	M / mg/kg / 5	28.9	52.8	n/t	21.7	19.5	37.3
Copper	M / mg/kg / 5	18.4	59.3	n/t	16.1	12.2	23.7
Lead	M / mg/kg / 5	18.5	82.9	n/t	25.9	23.7	18.9
Mercury	M / mg/kg / 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5	< 0.5
Nickel	M / mg/kg / 5	30.5	43.4	n/t	24.5	19.1	52.0
Selenium	M / mg/kg / 1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	1.1
Vanadium	M / mg/kg / 5	41.5	32.9	n/t	33.8	33.8	61.2
Zinc	M / mg/kg / 5	64.4	230	n/t	64.7	50.3	98.9
Anions							
Water Soluble Chloride	M / mg/kg / 40	56	140	n/t	65	< 40	< 40
Water Soluble Sulphate	M / g/l / 0.02	0.04	0.35	n/t	0.11	0.04	0.03
Inorganics							
Elemental Sulphur	N / mg/kg / 20	< 20	< 20	n/t	< 20	< 20	< 20
Hexavalent Chromium	N / mg/kg / 0.8	< 0.8	< 0.8	n/t	< 0.8	< 0.8	< 0.8
Total Sulphide	N / mg/kg / 2	< 2	< 2	n/t	< 2	< 2	< 2
Total Cyanide	M / mg/kg / 1	1.0	1.1	n/t	2.4	1.1	< 1.0
Acid Soluble Sulphate (SO4)	U / % / 0.02	0.05	0.77	n/t	0.12	0.07	0.05
Water Soluble Boron	N / mg/kg / 0.5	< 0.5	0.7	n/t	0.6	0.7	< 0.5
Miscellaneous							
Acid Neutralisation Capacity	N / mol/kg / 0.1	n/t	n/t	0.2	n/t	n/t	n/t
Loss On Ignition (450°C)	M / % / 0.01	n/t	n/t	2.63	n/t	n/t	n/t
pH	M / pH units / 0.1	7.7	11.1	11.4	9.2	7.4	7.2
Total Organic Carbon	N / % / 0.01	0.33	0.41	0.40	1.1	0.69	0.10
Phenols							
Total Phenols	N / mg/kg / 6	< 6	< 6	n/t	c < 6	< 6	< 6
Polyaromatic hydrocarbons							
Naphthalene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	c < 0.1	< 0.1	< 0.1
Acenaphthylene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	c < 0.1	< 0.1	< 0.1
Acenaphthene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	c < 0.1	< 0.1	< 0.1
Fluorene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	c < 0.1	< 0.1	< 0.1
Phenanthrene	M / mg/kg / 0.1	< 0.1	0.4	n/t	c < 0.1	< 0.1	< 0.1
Anthracene	M / mg/kg / 0.1	< 0.1	0.1	n/t	c < 0.1	< 0.1	< 0.1
Fluoranthene	M / mg/kg / 0.1	0.2	1.2	n/t	c 0.3	< 0.1	< 0.1
Pyrene	M / mg/kg / 0.1	< 0.1	1.1	n/t	c 0.3	0.1	< 0.1
Benzo(a)anthracene	M / mg/kg / 0.1	< 0.1	0.8	n/t	c 0.2	< 0.1	< 0.1
Chrysene	M / mg/kg / 0.1	< 0.1	0.9	n/t	c 0.2	< 0.1	< 0.1
Benzo (b) fluoranthene	M / mg/kg / 0.1	< 0.1	0.9	n/t	c 0.3	< 0.1	< 0.1
Benzo(k)fluoranthene	M / mg/kg / 0.1	< 0.1	1.0	n/t	c 0.5	< 0.1	< 0.1
Benzo (a) pyrene	M / mg/kg / 0.1	< 0.1	1.0	n/t	c 0.3	< 0.1	< 0.1
Indeno (1,2,3-cd) pyrene	M / mg/kg / 0.1	< 0.1	0.8	n/t	c 0.3	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	< 0.1	0.3	n/t	c 0.3	< 0.1	< 0.1
Benzo[g,h,i]perylene	M / mg/kg / 0.1	< 0.1	0.8	n/t	c 0.2	< 0.1	< 0.1
Total PAH(16)	M / mg/kg / 0.4	< 0.4	9.4	n/t	c 3.0	< 0.4	< 0.4
Total PAH (Including Coronene)	N / mg/kg / 2	n/t	n/t	25	n/t	n/t	n/t

Results Summary

Report No.: 17-13705

			ELAB Reference	109954	109955	109956	109957	109959	109960
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP224	TP225	TP225	TP226	TP228	TP229
			Sample Depth (m)	2.20	0.25	0.30	0.10	0.15	0.60
			Sampling Date	22/08/2017	23/08/2017	23/08/2017	21/08/2017	22/08/2017	21/08/2017
Determinand	**Codes**	**Units**	**LOD**						
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	n/t	c < 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	n/t	c < 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	n/t	c < 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	n/t	c < 10.0	< 10.0	< 10.0
Total BTEX	M	mg/kg	0.01	n/t	n/t	< 0.01	n/t	n/t	n/t
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	c < 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	c < 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	6.4	n/t	c < 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	c < 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	c < 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	c < 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	12.3	n/t	c 3.4	< 1.0	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	4.2	n/t	c 1.4	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	22.9	n/t	c 4.9	< 1.0	< 1.0
Total Petroleum Hydrocarbons									
Mineral Oil	U	mg/kg	5	n/t	n/t	11	n/t	n/t	n/t
PCB (ICES 7 congeners)									
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t	< 0.03	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 17-13705

	ELAB Reference	109962	109963	109964	109965	109966	109967
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP231	TP232	TP233	TP234	TP235	TP236
	Sample Depth (m)	0.40	0.10	0.40	0.30	0.50	0.30
	Sampling Date	21/08/2017	21/08/2017	21/08/2017	21/08/2017	22/08/2017	21/08/2017
Determinand	**Codes** / **Units** / **LOD**						
Metals							
Arsenic	M / mg/kg / 1	33.1	5.6	n/t	6.9	14.7	30.4
Barium	U / mg/kg / 10	31.8	27.5	n/t	30.8	18.9	38.8
Beryllium	U / mg/kg / 1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	1.5
Cadmium	M / mg/kg / 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5	< 0.5
Chromium	M / mg/kg / 5	31.6	17.6	n/t	21.3	13.2	41.5
Copper	M / mg/kg / 5	17.8	12.8	n/t	12.5	8.9	22.0
Lead	M / mg/kg / 5	14.6	17.3	n/t	26.3	12.9	19.6
Mercury	M / mg/kg / 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5	< 0.5
Nickel	M / mg/kg / 5	18.9	14.3	n/t	8.2	7.2	30.2
Selenium	M / mg/kg / 1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
Vanadium	M / mg/kg / 5	63.1	26.9	n/t	33.7	27.5	84.2
Zinc	M / mg/kg / 5	38.5	38.3	n/t	37.5	25.8	71.7
Anions							
Water Soluble Chloride	M / mg/kg / 40	42	< 40	n/t	41	44	< 40
Water Soluble Sulphate	M / g/l / 0.02	0.03	0.03	n/t	0.03	0.03	< 0.02
Inorganics							
Elemental Sulphur	N / mg/kg / 20	< 20	< 20	n/t	< 20	< 20	< 20
Hexavalent Chromium	N / mg/kg / 0.8	< 0.8	< 0.8	n/t	< 0.8	< 0.8	< 0.8
Total Sulphide	N / mg/kg / 2	< 2	< 2	n/t	< 2	< 2	< 2
Total Cyanide	M / mg/kg / 1	1.1	1.3	n/t	1.6	1.8	< 1.0
Acid Soluble Sulphate (SO4)	U / % / 0.02	0.06	0.08	n/t	0.07	0.05	0.07
Water Soluble Boron	N / mg/kg / 0.5	< 0.5	0.6	n/t	1.0	< 0.5	< 0.5
Miscellaneous							
Acid Neutralisation Capacity	N / mol/kg / 0.1	n/t	n/t	< 0.1	n/t	n/t	n/t
Loss On Ignition (450°C)	M / % / 0.01	n/t	n/t	1.81	n/t	n/t	n/t
pH	M / pH units / 0.1	6.2	6.6	6.7	6.2	5.9	5.3
Total Organic Carbon	N / % / 0.01	0.30	1.4	0.15	1.4	0.14	0.10
Phenols							
Total Phenols	N / mg/kg / 6	< 6	< 6	n/t	< 6	< 6	< 6
Polyaromatic hydrocarbons							
Naphthalene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Acenaphthylene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Acenaphthene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Fluorene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Phenanthrene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Pyrene	M / mg/kg / 0.1	0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Chrysene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Benzo (b) fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Benzo (a) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Indeno (1,2,3-cd) pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	0.3	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	0.2	< 0.1	< 0.1
Total PAH(16)	M / mg/kg / 0.4	< 0.4	< 0.4	n/t	0.7	< 0.4	< 0.4
Total PAH (Including Coronene)	N / mg/kg / 2	n/t	n/t	< 2	n/t	n/t	n/t

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Results Summary

Report No.: 17-13705

			ELAB Reference	109962	109963	109964	109965	109966	109967
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP231	TP232	TP233	TP234	TP235	TP236
			Sample Depth (m)	0.40	0.10	0.40	0.30	0.50	0.30
			Sampling Date	21/08/2017	21/08/2017	21/08/2017	21/08/2017	22/08/2017	21/08/2017
Determinand	**Codes**	**Units**	**LOD**						
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	n/t	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	n/t	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	n/t	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	n/t	< 10.0	< 10.0	< 10.0
Total BTEX	M	mg/kg	0.01	n/t	n/t	< 0.01	n/t	n/t	n/t
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
Total Petroleum Hydrocarbons									
Mineral Oil	U	mg/kg	5	n/t	n/t	< 5	n/t	n/t	n/t
PCB (ICES 7 congeners)									
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t	< 0.03	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 17-13705

			ELAB Reference	109968	109970	109972
			Customer Reference			
			Sample ID			
			Sample Type	SOIL	SOIL	SOIL
			Sample Location	TP237	TP239	TP239
			Sample Depth (m)	0.40	0.20	1.50
			Sampling Date	21/08/2017	23/08/2017	23/08/2017
Determinand	**Codes**	**Units**	**LOD**			
Metals						
Arsenic	M	mg/kg	1	14.1	4.5	17.5
Barium	U	mg/kg	10	81.7	33.9	42.2
Beryllium	U	mg/kg	1	1.4	< 1.0	1.3
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	40.8	17.4	32.7
Copper	M	mg/kg	5	21.1	13.1	15.9
Lead	M	mg/kg	5	16.2	13.4	20.1
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	28.8	11.3	21.3
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0
Vanadium	M	mg/kg	5	58.3	18.4	90.2
Zinc	M	mg/kg	5	62.9	31.0	43.6
Anions						
Water Soluble Chloride	M	mg/kg	40	54	126	107
Water Soluble Sulphate	M	g/l	0.02	0.03	0.10	0.04
Inorganics						
Elemental Sulphur	N	mg/kg	20	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.04	0.04	0.10
Water Soluble Boron	N	mg/kg	0.5	< 0.5	0.5	< 0.5
Miscellaneous						
Acid Neutralisation Capacity	N	mol/kg	0.1	n/t	n/t	n/t
Loss On Ignition (450°C)	M	%	0.01	n/t	n/t	n/t
pH	M	pH units	0.1	6.6	8.8	7.9
Total Organic Carbon	N	%	0.01	0.16	0.21	0.09
Phenols						
Total Phenols	N	mg/kg	6	< 6	< 6	< 6
Polyaromatic hydrocarbons						
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	< 0.1	0.5	< 0.1
Pyrene	M	mg/kg	0.1	< 0.1	0.6	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	0.5	< 0.1
Chrysene	M	mg/kg	0.1	< 0.1	0.5	< 0.1
Benzo (b) fluoranthene	M	mg/kg	0.1	< 0.1	0.5	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	0.7	< 0.1
Benzo (a) pyrene	M	mg/kg	0.1	< 0.1	0.5	< 0.1
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	0.6	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	0.3	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	0.4	< 0.1
Total PAH(16)	M	mg/kg	0.4	< 0.4	5.2	< 0.4
Total PAH (Including Coronene)	N	mg/kg	2	n/t	n/t	n/t

Results Summary

Report No.: 17-13705

			ELAB Reference	109968	109970	109972
			Customer Reference			
			Sample ID			
			Sample Type	SOIL	SOIL	SOIL
			Sample Location	TP237	TP239	TP239
			Sample Depth (m)	0.40	0.20	1.50
			Sampling Date	21/08/2017	23/08/2017	23/08/2017
Determinand	**Codes**	**Units**	**LOD**			
BTEX						
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Total BTEX	M	mg/kg	0.01	n/t	n/t	n/t
TPH CWG						
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	4.6	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	4.6	< 1.0
Total Petroleum Hydrocarbons						
Mineral Oil	U	mg/kg	5	n/t	n/t	n/t
PCB (ICES 7 congeners)						
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t	n/t

Results Summary

Report No.: 17-13705

WAC Analysis								
Elab Ref:	109964					**Landfill Waste Acceptance Criteria Limits**		
Sample Date:	21/08/2017					**Inert Waste Landfill**	**Stable Non-reactive Hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:	TP233							
Depth (m)	0.4							
Site:	Woodcroft							
Determinand		**Code**	**Units**					
Total Organic Carbon		N	%		0.15	3	5	6
Loss on Ignition		M	%		1.8	--	--	10
Total BTEX		M	mg/kg		< 0.01	6	--	--
Total PCBs (7 congeners)		M	mg/kg		< 0.03	1	--	--
TPH Total WAC		M	mg/kg		< 5	500	--	--
Total (of 17) PAHs		N	mg/kg		< 2	100	--	--
pH		M			6.7	--	>6	--
Acid Neutralisation Capacity		N	mol/kg		< 0.1	--	To evaluate	To evaluate
Eluate Analysis			**10:1**		**10:1**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
			mg/l		**mg/kg**			
Arsenic		N	< 0.005		< 0.05	0.5	2	25
Barium		N	< 0.005		< 0.05	20	100	300
Cadmium		N	< 0.001		< 0.01	0.04	1	5
Chromium		N	< 0.005		< 0.05	0.5	10	70
Copper		N	< 0.005		< 0.05	2	50	100
Mercury		N	< 0.005		< 0.01	0.01	0.2	2
Molybdenum		N	< 0.005		< 0.05	0.5	10	30
Nickel		N	< 0.001		< 0.05	0.4	10	40
Lead		N	< 0.001		< 0.05	0.5	10	50
Antimony		N	< 0.005		< 0.05	0.06	0.7	5
Selenium		N	< 0.005		< 0.05	0.1	0.5	7
Zinc		N	< 0.005		< 0.05	4	50	200
Chloride		N	< 5		< 50	800	15000	25000
Fluoride		N	< 5		< 10	10	150	500
Sulphate		N	5		45.70	1000	20000	50000
Total Dissolved Solids		N	< 10		< 100	4000	60000	100000
Phenol Index		N	< 0.01		< 0.10	1	-	-
Dissolved Organic Carbon		N	9.780		98.00	500	800	1000
Leach Test Information								
pH		N	5.7					
Conductivity (uS/cm)		N	28					
Dry mass of test portion (g)			100.000					
Dry Matter (%)			83					
Moisture (%)			21					
Eluent Volume (ml)			952					

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ELAB cannot be held responsible for any discrepencies with current legislation

Results Summary

Report No.: 17-13705

WAC Analysis								
Elab Ref:	109956					**Landfill Waste Acceptance Criteria Limits**		
Sample Date:	23/08/2017					**Inert Waste Landfill**	**Stable Non-reactive Hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:	TP225							
Depth (m)	0.3							
Site:	Woodcroft							
Determinand		**Code**	**Units**					
Total Organic Carbon		N	%		0.40	3	5	6
Loss on Ignition		M	%		2.6	--	--	10
Total BTEX		M	mg/kg		< 0.01	6	--	--
Total PCBs (7 congeners)		M	mg/kg		< 0.03	1	--	--
TPH Total WAC		M	mg/kg		11	500	--	--
Total (of 17) PAHs		N	mg/kg		25.0	100	--	--
pH		M			11.4	--	>6	--
Acid Neutralisation Capacity		N	mol/kg		0.2	--	To evaluate	To evaluate
Eluate Analysis			**10:1**		**10:1**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
			mg/l		**mg/kg**			
Arsenic		N	0.009		0.09	0.5	2	25
Barium		N	0.010		0.10	20	100	300
Cadmium		N	< 0.001		< 0.01	0.04	1	5
Chromium		N	< 0.005		< 0.05	0.5	10	70
Copper		N	0.016		0.16	2	50	100
Mercury		N	< 0.005		< 0.01	0.01	0.2	2
Molybdenum		N	< 0.005		< 0.05	0.5	10	30
Nickel		N	0.003		< 0.05	0.4	10	40
Lead		N	0.007		0.07	0.5	10	50
Antimony		N	< 0.005		< 0.05	0.06	0.7	5
Selenium		N	< 0.005		< 0.05	0.1	0.5	7
Zinc		N	0.016		0.16	4	50	200
Chloride		N	7		67.00	800	15000	25000
Fluoride		N	< 5		< 10	10	150	500
Sulphate		N	12		120.00	1000	20000	50000
Total Dissolved Solids		N	< 10		< 100	4000	60000	100000
Phenol Index		N	< 0.01		< 0.10	1	-	-
Dissolved Organic Carbon		N	12.300		123.00	500	800	1000
Leach Test Information								
pH		N	8.3					
Conductivity (uS/cm)		N	154					
Dry mass of test portion (g)			100.000					
Dry Matter (%)			81					
Moisture (%)			24					
Eluent Volume (ml)			953					

Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Results Summary

Report No.: 17-13705

WAC Analysis								
Elab Ref:	109952					**Landfill Waste Acceptance Criteria Limits**		
Sample Date:	22/08/2017					**Inert Waste Landfill**	**Stable Non-reactive Hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:	TP223							
Depth (m)	0.5							
Site:	Woodcroft							
Determinand		**Code**	**Units**					
Total Organic Carbon		N	%		0.18	3	5	6
Loss on Ignition		M	%		2.8	--	--	10
Total BTEX		M	mg/kg		< 0.01	6	--	--
Total PCBs (7 congeners)		M	mg/kg		< 0.03	1	--	--
TPH Total WAC		M	mg/kg		< 5	500	--	--
Total (of 17) PAHs		N	mg/kg		< 2	100	--	--
pH		M			7.7	--	>6	--
Acid Neutralisation Capacity		N	mol/kg		< 0.1	--	To evaluate	To evaluate
Eluate Analysis			**10:1**		**10:1**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
			mg/l		**mg/kg**			
Arsenic		N	< 0.005		< 0.05	0.5	2	25
Barium		N	< 0.005		< 0.05	20	100	300
Cadmium		N	< 0.001		< 0.01	0.04	1	5
Chromium		N	< 0.005		< 0.05	0.5	10	70
Copper		N	0.011		0.11	2	50	100
Mercury		N	< 0.005		< 0.01	0.01	0.2	2
Molybdenum		N	< 0.005		< 0.05	0.5	10	30
Nickel		N	0.003		< 0.05	0.4	10	40
Lead		N	< 0.001		< 0.05	0.5	10	50
Antimony		N	< 0.005		< 0.05	0.06	0.7	5
Selenium		N	< 0.005		< 0.05	0.1	0.5	7
Zinc		N	< 0.005		< 0.05	4	50	200
Chloride		N	6		65.00	800	15000	25000
Fluoride		N	< 5		< 10	10	150	500
Sulphate		N	6		58.00	1000	20000	50000
Total Dissolved Solids		N	< 10		< 100	4000	60000	100000
Phenol Index		N	< 0.01		< 0.10	1	-	-
Dissolved Organic Carbon		N	54.400		544.00	**500**	800	1000
Leach Test Information								
pH		N	7.7					
Conductivity (uS/cm)		N	117					
Dry mass of test portion (g)			100.000					
Dry Matter (%)			79					
Moisture (%)			27					
Eluent Volume (ml)			931					

Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Results Summary

Report No.: 17-13705

Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #)
in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
109922	0.10	TP202	Brown sandy soil, stones, organics	No asbestos detected	n/t	n/t	n/t	n/t
109925	0.50	TP203	Brown sandy soil, stones, organics	No asbestos detected	n/t	n/t	n/t	n/t
109927	0.50	TP204	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
109929	0.50	TP205	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
109930	0.10	TP206	Brown sandy soil, stones, organics	No asbestos detected	n/t	n/t	n/t	n/t
109932	0.30	TP207	Clay, stones	No asbestos detected	n/t	n/t	n/t	n/t
109938	1.00	TP213	Brown sandy soil, stones, concrete, brick, clinker	Chrysotile Crocidolite (asbestos cement)	2.66	Asbestos cement (2.663%)	< 0.001	2.66
109939	0.90	TP214	Brown sandy soil, stones, brick, clinker, wood	No asbestos detected	n/t	n/t	n/t	n/t
109940	0.30	TP215	Brown sandy soil, stones, concrete, brick, clinker	No asbestos detected	n/t	n/t	n/t	n/t
109941	2.90	TP215	Chalk, stones	No asbestos detected	n/t	n/t	n/t	n/t
109943	0.20	TP217	Clay, stones	No asbestos detected	n/t	n/t	n/t	n/t
109946	0.20	TP220	Brown sandy soil, stones, chalk, brick, clinker	No asbestos detected	n/t	n/t	n/t	n/t
109947	1.00	TP220	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
109948	0.10	TP221	Brown sandy soil, stones, chalk, organics	No asbestos detected	n/t	n/t	n/t	n/t
109950	0.40	TP222	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109951	0.40	TP223	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109953	0.20	TP224	Brown soil,Stones,Brick	No asbestos detected	n/t	n/t	n/t	n/t
109954	2.20	TP224	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
109955	0.25	TP225	Brown sandy soil,Stones,Brick	Chrysotile (Cement Fragment)	3.54	Cement Fragment (3.543)	< 0.001	3.54
109957	0.10	TP226	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
109959	0.15	TP228	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109960	0.60	TP229	Brown sandy soil	No asbestos detected	n/t	n/t	n/t	n/t
109962	0.40	TP231	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109963	0.10	TP232	Brown soil,stones	No asbestos detected	n/t	n/t	n/t	n/t
109965	0.30	TP234	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109966	0.50	TP235	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
109967	0.30	TP236	Brown sandy soil,stones	No asbestos detected	n/t	n/t	n/t	n/t
109968	0.40	TP237	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109970	0.20	TP239	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
109971	0.50	TP239	Cement fragment	Chrysotile	25.0	Cement Fragment (25)	< 0.001	25.0
109972	1.50	TP239	Sand	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 17-13705

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Sulphide	N	As submitted sample	25/08/2017	109	Colorimetry
Hexavalent chromium	N	As submitted sample	25/08/2017	110	Colorimetry
Acid Soluble Sulphate	U	Air dried sample	29/08/2017	115	Ion Chromatography
Aqua regia extractable metals	M	Air dried sample	25/08/2017	118	ICPMS
Phenols in solids	N	As submitted sample	25/08/2017	121	HPLC
Elemental Sulphur	N	Air dried sample	25/08/2017	122	HPLC
PAH (GC-FID)	M	As submitted sample	29/08/2017	133	GC-FID
Water soluble anions	M	Air dried sample	25/08/2017	172	Ion Chromatography
Water soluble boron	N	Air dried sample	25/08/2017	202	Colorimetry
Total cyanide	M	As submitted sample	25/08/2017	204	Colorimetry
Aliphatic hydrocarbons in soil	N	As submitted sample	29/08/2017	214	GC-FID
Aliphatic/Aromatic hydrocarbons in soil	N	As submitted sample	29/08/2017	214	GC-FID
Aromatic hydrocarbons in soil	N	As submitted sample	29/08/2017	214	GC-FID
Low range Aliphatic hydrocarbons soil	N	As submitted sample	25/08/2017	214	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	25/08/2017	214	GC-MS
Asbestos identification	U	As submitted sample	25/08/2017	260	Microscopy
Leachate					
Arsenic*	N		30/08/2017	101	ICPMS
Cadmium*	N		30/08/2017	101	ICPMS
Chromium*	N		30/08/2017	101	ICPMS
Lead*	N		30/08/2017	101	ICPMS
Nickel*	N		30/08/2017	101	ICPMS
Copper*	N		30/08/2017	101	ICPMS
Zinc*	N		30/08/2017	101	ICPMS
Mercury*	N		30/08/2017	101	ICPMS
Selenium*	N		30/08/2017	101	ICPMS
Antimony	N		30/08/2017	101	ICPMS
Barium*	N		30/08/2017	101	ICPMS
Molybdenum*	N		30/08/2017	101	ICPMS
pH Value*	N		30/08/2017	113	Electrometric
Electrical Conductivity*	N		30/08/2017	136	Probe
Dissolved Organic Carbon	N		30/08/2017	102	TOC analyser
Chloride*	N		30/08/2017	131	Ion Chromatography
Fluoride*	N		30/08/2017	131	Ion Chromatography
Sulphate*	N		30/08/2017	131	Ion Chromatography
Total Dissolved Solids	N		30/08/2017	144	Gravimetric
Phenol index	N		30/08/2017	121	HPLC
WAC Solids analysis	N				
pH Value**	M	Air dried sample	29/08/2017	113	Electrometric
Total Organic Carbon	N	Air dried sample	29/08/2017	210	IR
Loss on Ignition**	M	Air dried sample	30/08/2017	129	Gravimetric
Acid Neutralization Capacity to pH 7	N	Air dried sample	29/08/2017	NEN 737	Electrometric
Total BTEX**	M	As submitted sample	25/08/2017	181	GCMS
Mineral Oil**	U	As submitted sample	29/08/2017	117	GCFID
Total PCBs (7 congeners)	M	Air dried sample	25/08/2017	120	GCMS
Total PAH (17)**	N	As submitted sample	29/08/2017	133	GCFID

Tests marked N are not UKAS accredited

Report Information

Report No.: 17-13705

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis (dried at < 30°C)
Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

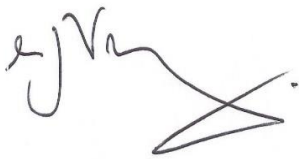
Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage

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2683

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	18-17643
Issue:	1
Date of Issue:	30/05/2018
Contact:	Fiona Goode
Customer Details:	GESL Unit 7 Danworth Farm Hurstpierpoint West Sussex BN6 9GL
Quotation No:	Q14-00021
Order No:	PO-0331
Customer Reference:	GE16943
Date Received:	21/05/2018
Date Approved:	30/05/2018
Details:	Woodcroft, Waterlooville
Approved by:	

Mike Varley, Technical Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)

Sample Summary

Report No.: 18-17643

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
136637	WS401 0.60 - 0.80	15/05/2018	21/05/2018	Clayey loam	
136638	WS401 1.40 - 1.70	15/05/2018	21/05/2018	Silty loam	
136639	WS401 2.30 - 2.60	15/05/2018	21/05/2018	Silty loam	
136640	WS402 0.50	15/05/2018	21/05/2018	Silty clayey loam	
136641	WS402 1.50	15/05/2018	21/05/2018	Silty loam	
136642	WS402 2.50	15/05/2018	21/05/2018	Silty clayey loam	
136643	WS402 3.70 - 4.00	15/05/2018	21/05/2018	Silty loam	
136644	WS403 0.30 - 0.50	15/05/2018	21/05/2018	Silty clayey loam	
136645	WS403 1.50 - 1.60	15/05/2018	21/05/2018	Silty clayey loam	
136646	WS403 2.40 - 2.60	15/05/2018	21/05/2018	Silty loam	
136647	WS404 0.20 - 0.40	15/05/2018	21/05/2018	Silty loam	
136648	WS404 1.10 - 1.30	15/05/2018	21/05/2018	Clayey loam	
136649	WS405 0.00 - 0.20	15/05/2018	21/05/2018	Silty loam	
136650	WS405 0.40 - 0.60	15/05/2018	21/05/2018	Silty clayey loam	
136651	WS405 1.20	15/05/2018	21/05/2018	Silty clayey loam	
136652	WS406 0.20 - 0.50	15/05/2018	21/05/2018	Silty loam	
136653	WS406 1.60 - 1.90	15/05/2018	21/05/2018	Silty loam	
136654	WS406 3.10 - 3.50	15/05/2018	21/05/2018	Silty loam	
136655	WS407 0.30 - 0.50	15/05/2018	21/05/2018	Sandy silty loam	
136656	WS407 1.00 - 2.00	15/05/2018	21/05/2018	Silty loam	
136657	WS407 3.00 - 4.00	15/05/2018	21/05/2018	Silty loam	
136658	TP301 0.25	16/05/2018	21/05/2018	Silty loam	
136659	TP301 0.40	16/05/2018	21/05/2018	Silty loam	
136660	TP301 1.40	16/05/2018	21/05/2018	Silty loam	
136661	TP302 0.20	16/05/2018	21/05/2018	Silty loam	
136662	TP302 0.50	16/05/2018	21/05/2018	Silty clayey loam	
136663	TP302 1.30	16/05/2018	21/05/2018	Silty loam	
136664	TP302 2.70	16/05/2018	21/05/2018	Silty loam	
136665	TP303 0.30	16/05/2018	21/05/2018	Silty loam	
136666	TP303 0.70	16/05/2018	21/05/2018	Silty clayey loam	
136667	TP303 1.90	16/05/2018	21/05/2018	chalk	
136668	TP304 0.30	16/05/2018	21/05/2018	Silty loam	
136669	TP304 1.20	16/05/2018	21/05/2018	Silty clayey loam	
136670	TP305 0.80	16/05/2018	21/05/2018	Clayey loam	
136671	TP305 1.10	16/05/2018	21/05/2018	Clayey loam	
136672	TP306 0.20	15/05/2018	21/05/2018	Silty loam	
136673	TP306 0.40	15/05/2018	21/05/2018	Silty loam	
136674	TP306 0.80	15/05/2018	21/05/2018	Sandy silty loam	
136675	TP307 0.30	15/05/2018	21/05/2018	Silty loam	
136676	TP307 0.80	15/05/2018	21/05/2018	Silty clayey loam	
136677	TP307 1.20	15/05/2018	21/05/2018	Sand	
136678	TP308 0.10	15/05/2018	21/05/2018	Silty loam	
136679	TP308 0.30	15/05/2018	21/05/2018	Sandy silty loam	
136680	TP308 0.70	15/05/2018	21/05/2018	Silty clayey loam	
136681	TP309 0.25	15/05/2018	21/05/2018	Silty loam	
136682	TP309 0.50	15/05/2018	21/05/2018	Silty loam	
136683	TP309 0.65	15/05/2018	21/05/2018	Silty clayey loam	
136684	TP310 0.20	15/05/2018	21/05/2018	Silty loam	
136685	TP310 0.50	15/05/2018	21/05/2018	Silty loam	
136686	TP310 1.50	15/05/2018	21/05/2018	chalk	
136687	TP311 0.20	15/05/2018	21/05/2018	Silty loam	
136688	TP311 0.40	15/05/2018	21/05/2018	Silty loam	
136689	TP311 0.80	15/05/2018	21/05/2018	Silty loam	
136690	TP312 0.20	17/05/2018	21/05/2018	Silty loam	
136691	TP312 0.90	17/05/2018	21/05/2018	Silty loam	
136692	TP312 1.45	17/05/2018	21/05/2018	Silty clayey loam	
136693	TP313 0.25	17/05/2018	21/05/2018	Silty loam + chalk	
136694	TP313 0.50	17/05/2018	21/05/2018	Sandy silty loam	
136695	TP313 1.55	17/05/2018	21/05/2018	Loamy sand	
136696	TP314 0.30	17/05/2018	21/05/2018	Clayey loam	
136697	TP314 0.70	17/05/2018	21/05/2018	Silty loam	
136698	TP314 1.60	17/05/2018	21/05/2018	Silty clayey loam	
136699	TP315 0.20	17/05/2018	21/05/2018	Silty loam	
136700	TP315 0.60	17/05/2018	21/05/2018	Silty loam	

Sample Summary

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Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
136701	TP315 2.30	17/05/2018	21/05/2018	Clayey loam	
136702	TP316 0.20	17/05/2018	21/05/2018	Sandy silty loam	
136703	TP316 0.90	17/05/2018	21/05/2018	Silty clayey loam	
136704	TP316 1.90	17/05/2018	21/05/2018	Clayey loam	
136705	TP317 0.15	17/05/2018	21/05/2018	Silty loam	
136706	TP317 0.65	17/05/2018	21/05/2018	Clayey loam	
136707	TP317 1.40	17/05/2018	21/05/2018	Sandy loam	
136708	TP318 0.15	17/05/2018	21/05/2018	Silty loam	
136709	TP318 0.70	17/05/2018	21/05/2018	Silty clayey loam	
136710	TP319 1.80	17/05/2018	21/05/2018	Clayey loam	

Results Summary

Report No.: 18-17643

			ELAB Reference	136637	136638	136639	136640	136641	136642
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS401	WS401	WS401	WS402	WS402	WS402
			Sample Depth (m)	0.60 - 0.80	1.40 - 1.70	2.30 - 2.60	0.50	1.50	2.50
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Barium	U	mg/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Beryllium	U	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Cadmium	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Chromium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Copper	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Lead	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Mercury	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Nickel	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Selenium	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Vanadium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Zinc	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Anions									
Water Soluble Chloride	M	mg/kg	40	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Sulphate	M	g/l	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Inorganics									
Elemental Sulphur	M	mg/kg	20	n/t	n/t	n/t	n/t	n/t	n/t
Hexavalent Chromium	N	mg/kg	0.8	n/t	n/t	n/t	n/t	n/t	n/t
Total Sulphide	N	mg/kg	2	n/t	n/t	n/t	n/t	n/t	n/t
Total Cyanide	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Acid Soluble Sulphate (SO4)	U	%	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Boron	N	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Miscellaneous									
pH	M	pH units	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total Organic Carbon	N	%	0.01	0.51	1.9	2.2	0.47	1.4	0.49
Phenols									
Total Phenols	N	mg/kg	6	n/t	n/t	n/t	n/t	n/t	n/t
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluorene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Phenanthrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(a)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Chrysene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (b) fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(k)fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (a) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Dibenzo(a,h)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo[g,h,i]perylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total PAH(16)	M	mg/kg	0.4	n/t	n/t	n/t	n/t	n/t	n/t
BTEX									
Benzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Toluene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Ethylbenzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Xylenes	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136637	136638	136639	136640	136641	136642
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS401	WS401	WS401	WS402	WS402	WS402
			Sample Depth (m)	0.60 - 0.80	1.40 - 1.70	2.30 - 2.60	0.50	1.50	2.50
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C6-C8 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C5-C7 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C7-C8 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Total (>C5-C40) Ali/Aro	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

	ELAB Reference	136643	136644	136645	136646	136647	136648
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	WS402	WS403	WS403	WS403	WS404	WS404
	Sample Depth (m)	3.70 - 4.00	0.30 - 0.50	1.50 - 1.60	2.40 - 2.60	0.20 - 0.40	1.10 - 1.30
	Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Barium	U	mg/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Beryllium	U	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Cadmium	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Chromium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Copper	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Lead	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Mercury	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Nickel	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Selenium	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Vanadium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Zinc	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Anions									
Water Soluble Chloride	M	mg/kg	40	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Sulphate	M	g/l	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Inorganics									
Elemental Sulphur	M	mg/kg	20	n/t	n/t	n/t	n/t	n/t	n/t
Hexavalent Chromium	N	mg/kg	0.8	n/t	n/t	n/t	n/t	n/t	n/t
Total Sulphide	N	mg/kg	2	n/t	n/t	n/t	n/t	n/t	n/t
Total Cyanide	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Acid Soluble Sulphate (SO4)	U	%	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Boron	N	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Miscellaneous									
pH	M	pH units	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total Organic Carbon	N	%	0.01	0.68	0.61	0.69	0.19	2.5	0.20
Phenols									
Total Phenols	N	mg/kg	6	n/t	n/t	n/t	n/t	n/t	n/t
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluorene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Phenanthrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(a)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Chrysene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (b) fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(k)fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (a) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Dibenzo(a,h)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo[g,h,i]perylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total PAH(16)	M	mg/kg	0.4	n/t	n/t	n/t	n/t	n/t	n/t
BTEX									
Benzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Toluene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Ethylbenzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Xylenes	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136643	136644	136645	136646	136647	136648
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS402	WS403	WS403	WS403	WS404	WS404
			Sample Depth (m)	3.70 - 4.00	0.30 - 0.50	1.50 - 1.60	2.40 - 2.60	0.20 - 0.40	1.10 - 1.30
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C6-C8 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C5-C7 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C7-C8 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Total (>C5-C40) Ali/Aro	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136649	136650	136651	136652	136653	136654
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS405	WS405	WS405	WS406	WS406	WS406
			Sample Depth (m)	0.00 - 0.20	0.40 - 0.60	1.20	0.20 - 0.50	1.60 - 1.90	3.10 - 3.50
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Barium	U	mg/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Beryllium	U	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Cadmium	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Chromium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Copper	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Lead	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Mercury	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Nickel	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Selenium	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Vanadium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Zinc	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Anions									
Water Soluble Chloride	M	mg/kg	40	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Sulphate	M	g/l	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Inorganics									
Elemental Sulphur	M	mg/kg	20	n/t	n/t	n/t	n/t	n/t	n/t
Hexavalent Chromium	N	mg/kg	0.8	n/t	n/t	n/t	n/t	n/t	n/t
Total Sulphide	N	mg/kg	2	n/t	n/t	n/t	n/t	n/t	n/t
Total Cyanide	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Acid Soluble Sulphate (SO4)	U	%	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Boron	N	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Miscellaneous									
pH	M	pH units	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total Organic Carbon	N	%	0.01	1.6	1.0	0.87	0.98	1.4	3.8
Phenols									
Total Phenols	N	mg/kg	6	n/t	n/t	n/t	n/t	n/t	n/t
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluorene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Phenanthrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(a)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Chrysene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (b) fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(k)fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (a) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Dibenzo(a,h)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo[g,h,i]perylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total PAH(16)	M	mg/kg	0.4	n/t	n/t	n/t	n/t	n/t	n/t
BTEX									
Benzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Toluene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Ethylbenzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Xylenes	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136649	136650	136651	136652	136653	136654
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS405	WS405	WS405	WS406	WS406	WS406
			Sample Depth (m)	0.00 - 0.20	0.40 - 0.60	1.20	0.20 - 0.50	1.60 - 1.90	3.10 - 3.50
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C6-C8 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C5-C7 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C7-C8 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Total (>C5-C40) Ali/Aro	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136655	136656	136657	136658	136659	136660
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS407	WS407	WS407	TP301	TP301	TP301
			Sample Depth (m)	0.30 - 0.50	1.00 - 2.00	3.00 - 4.00	0.25	0.40	1.40
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	16/05/2018	16/05/2018	16/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Barium	U	mg/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Beryllium	U	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Cadmium	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Chromium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Copper	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Lead	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Mercury	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Nickel	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Selenium	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Vanadium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Zinc	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Anions									
Water Soluble Chloride	M	mg/kg	40	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Sulphate	M	g/l	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Inorganics									
Elemental Sulphur	M	mg/kg	20	n/t	n/t	n/t	n/t	n/t	n/t
Hexavalent Chromium	N	mg/kg	0.8	n/t	n/t	n/t	n/t	n/t	n/t
Total Sulphide	N	mg/kg	2	n/t	n/t	n/t	n/t	n/t	n/t
Total Cyanide	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Acid Soluble Sulphate (SO4)	U	%	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Boron	N	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Miscellaneous									
pH	M	pH units	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total Organic Carbon	N	%	0.01	0.72	1.2	2.1	1.7	0.80	2.3
Phenols									
Total Phenols	N	mg/kg	6	n/t	n/t	n/t	n/t	n/t	n/t
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluorene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Phenanthrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(a)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Chrysene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (b) fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(k)fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (a) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Dibenzo(a,h)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo[g,h,i]perylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total PAH(16)	M	mg/kg	0.4	n/t	n/t	n/t	n/t	n/t	n/t
BTEX									
Benzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Toluene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Ethylbenzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Xylenes	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136655	136656	136657	136658	136659	136660
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS407	WS407	WS407	TP301	TP301	TP301
			Sample Depth (m)	0.30 - 0.50	1.00 - 2.00	3.00 - 4.00	0.25	0.40	1.40
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	16/05/2018	16/05/2018	16/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C6-C8 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C5-C7 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C7-C8 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Total (>C5-C40) Ali/Aro	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136661	136662	136663	136664	136665	136666
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP302	TP302	TP302	TP302	TP303	TP303
			Sample Depth (m)	0.20	0.50	1.30	2.70	0.30	0.70
			Sampling Date	16/05/2018	16/05/2018	16/05/2018	16/05/2018	16/05/2018	16/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Barium	U	mg/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Beryllium	U	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Cadmium	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Chromium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Copper	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Lead	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Mercury	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Nickel	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Selenium	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Vanadium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Zinc	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	n/t
Anions									
Water Soluble Chloride	M	mg/kg	40	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Sulphate	M	g/l	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Inorganics									
Elemental Sulphur	M	mg/kg	20	n/t	n/t	n/t	n/t	n/t	n/t
Hexavalent Chromium	N	mg/kg	0.8	n/t	n/t	n/t	n/t	n/t	n/t
Total Sulphide	N	mg/kg	2	n/t	n/t	n/t	n/t	n/t	n/t
Total Cyanide	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t
Acid Soluble Sulphate (SO4)	U	%	0.02	n/t	n/t	n/t	n/t	n/t	n/t
Water Soluble Boron	N	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	n/t
Miscellaneous									
pH	M	pH units	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total Organic Carbon	N	%	0.01	0.48	0.77	0.64	1.3	2.1	0.21
Phenols									
Total Phenols	N	mg/kg	6	n/t	n/t	n/t	n/t	n/t	n/t
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Acenaphthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluorene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Phenanthrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(a)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Chrysene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (b) fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo(k)fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo (a) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Dibenzo(a,h)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Benzo[g,h,i]perylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	n/t
Total PAH(16)	M	mg/kg	0.4	n/t	n/t	n/t	n/t	n/t	n/t
BTEX									
Benzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Toluene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Ethylbenzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Xylenes	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

	ELAB Reference	136661	136662	136663	136664	136665	136666
	Customer Reference						
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP302	TP302	TP302	TP302	TP303	TP303
	Sample Depth (m)	0.20	0.50	1.30	2.70	0.30	0.70
	Sampling Date	16/05/2018	16/05/2018	16/05/2018	16/05/2018	16/05/2018	16/05/2018
Determinand	**Codes** / **Units** / **LOD**						
TPH CWG							
>C5-C6 Aliphatic	N / mg/kg / 0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C6-C8 Aliphatic	N / mg/kg / 0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aliphatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aliphatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aliphatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aliphatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aliphatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aliphatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C5-C7 Aromatic	N / mg/kg / 0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C7-C8 Aromatic	N / mg/kg / 0.01	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aromatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aromatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aromatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aromatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aromatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aromatic	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t
Total (>C5-C40) Ali/Aro	N / mg/kg / 1	n/t	n/t	n/t	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136667	136668	136669	136670	136671	136672
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP303	TP304	TP304	TP305	TP305	TP306
			Sample Depth (m)	1.90	0.30	1.20	0.80	1.10	0.20
			Sampling Date	16/05/2018	16/05/2018	16/05/2018	16/05/2018	16/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	9.2
Barium	U	mg/kg	10	n/t	n/t	n/t	n/t	n/t	51.3
Beryllium	U	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
Cadmium	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	< 0.5
Chromium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	23.1
Copper	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	7.9
Lead	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	18.6
Mercury	M	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	< 0.5
Nickel	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	15.7
Selenium	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
Vanadium	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	34.7
Zinc	M	mg/kg	5	n/t	n/t	n/t	n/t	n/t	55.8
Anions									
Water Soluble Chloride	M	mg/kg	40	n/t	n/t	n/t	n/t	n/t	< 40
Water Soluble Sulphate	M	g/l	0.02	n/t	n/t	n/t	n/t	n/t	< 0.02
Inorganics									
Elemental Sulphur	M	mg/kg	20	n/t	n/t	n/t	n/t	n/t	< 20
Hexavalent Chromium	N	mg/kg	0.8	n/t	n/t	n/t	n/t	n/t	< 0.8
Total Sulphide	N	mg/kg	2	n/t	n/t	n/t	n/t	n/t	< 2
Total Cyanide	M	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	n/t	n/t	n/t	n/t	n/t	0.07
Water Soluble Boron	N	mg/kg	0.5	n/t	n/t	n/t	n/t	n/t	0.7
Miscellaneous									
pH	M	pH units	0.1	n/t	n/t	n/t	n/t	n/t	6.1
Total Organic Carbon	N	%	0.01	0.05	2.7	0.20	0.74	1.2	0.48
Phenols									
Total Phenols	N	mg/kg	6	n/t	n/t	n/t	n/t	n/t	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Acenaphthylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Acenaphthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Fluorene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Phenanthrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Chrysene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Benzo (b) fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Benzo (a) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	n/t	n/t	n/t	n/t	n/t	< 0.1
Total PAH(16)	M	mg/kg	0.4	n/t	n/t	n/t	n/t	n/t	< 0.4
BTEX									
Benzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	< 10.0
Toluene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	< 10.0
Ethylbenzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	< 10.0
Xylenes	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	< 10.0

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136667	136668	136669	136670	136671	136672
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP303	TP304	TP304	TP305	TP305	TP306
			Sample Depth (m)	1.90	0.30	1.20	0.80	1.10	0.20
			Sampling Date	16/05/2018	16/05/2018	16/05/2018	16/05/2018	16/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	< 1.0

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136673	136674	136675	136676	136677	136678
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP306	TP306	TP307	TP307	TP307	TP308
			Sample Depth (m)	0.40	0.80	0.30	0.80	1.20	0.10
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	19.0	30.7	14.6	19.6	76.9	15.6
Barium	U	mg/kg	10	82.6	63.1	52.6	71.7	36.8	35.7
Beryllium	U	mg/kg	1	1.2	2.0	1.6	6.4	2.9	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5	0.6	0.5	2.4	1.4	< 0.5
Chromium	M	mg/kg	5	43.5	39.1	32.0	47.0	37.8	20.4
Copper	M	mg/kg	5	18.2	18.0	11.9	14.6	21.1	7.8
Lead	M	mg/kg	5	17.7	17.2	17.5	16.2	20.4	15.7
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	29.5	27.7	34.2	174	69.3	15.0
Selenium	M	mg/kg	1	< 1.0	1.4	1.1	4.1	1.8	< 1.0
Vanadium	M	mg/kg	5	59.9	80.9	50.9	59.3	188	42.2
Zinc	M	mg/kg	5	58.6	55.8	73.5	91.5	56.6	40.6
Anions									
Water Soluble Chloride	M	mg/kg	40	< 40	< 40	< 40	< 40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.03
Inorganics									
Elemental Sulphur	M	mg/kg	20	< 20	< 20	< 20	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.06	0.05	0.06	0.06	0.05	0.05
Water Soluble Boron	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Miscellaneous									
pH	M	pH units	0.1	6.8	7.0	6.5	7.6	7.4	6.9
Total Organic Carbon	N	%	0.01	0.14	0.11	0.31	0.21	0.05	0.43
Phenols									
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo (b) fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	0.1
Benzo (a) pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0

Results Summary

Report No.: 18-17643

			ELAB Reference	136673	136674	136675	136676	136677	136678
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP306	TP306	TP307	TP307	TP307	TP308
			Sample Depth (m)	0.40	0.80	0.30	0.80	1.20	0.10
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results Summary

Report No.: 18-17643

			ELAB Reference	136679	136680	136681	136682	136683	136684
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP308	TP308	TP309	TP309	TP309	TP310
			Sample Depth (m)	0.30	0.70	0.25	0.50	0.65	0.20
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	95.8	68.0	23.1	65.6	20.9	15.6
Barium	U	mg/kg	10	48.9	65.2	56.4	83.1	17.6	46.7
Beryllium	U	mg/kg	1	1.4	1.8	1.4	5.1	1.2	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	0.5	1.0	< 0.5	< 0.5
Chromium	M	mg/kg	5	43.5	59.2	29.6	62.4	11.9	21.1
Copper	M	mg/kg	5	17.2	22.1	13.3	18.3	< 5.0	10.0
Lead	M	mg/kg	5	23.5	26.2	27.1	22.2	6.3	24.2
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	22.0	80.3	45.2	190	35.3	24.4
Selenium	M	mg/kg	1	1.9	2.0	1.2	1.6	< 1.0	< 1.0
Vanadium	M	mg/kg	5	127	168	51.0	103	16.8	43.8
Zinc	M	mg/kg	5	58.6	71.0	80.7	143	27.6	60.5
Anions									
Water Soluble Chloride	M	mg/kg	40	< 40	< 40	< 40	< 40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02	< 0.02	0.02	0.11	0.06	0.03	0.03
Inorganics									
Elemental Sulphur	M	mg/kg	20	< 20	< 20	38	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.05	0.06	0.11	0.07	0.03	0.07
Water Soluble Boron	N	mg/kg	0.5	< 0.5	< 0.5	1.6	< 0.5	< 0.5	0.6
Miscellaneous									
pH	M	pH units	0.1	6.9	7.3	6.6	7.3	8.0	6.7
Total Organic Carbon	N	%	0.01	0.12	0.12	1.7	0.44	0.05	0.03
Phenols									
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo (b) fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo (a) pyrene	M	mg/kg	0.1	0.3	< 0.1	< 0.1	0.3	< 0.1	< 0.1
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4	0.4	< 0.4	< 0.4	0.4	< 0.4	< 0.4
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136679	136680	136681	136682	136683	136684
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP308	TP308	TP309	TP309	TP309	TP310
			Sample Depth (m)	0.30	0.70	0.25	0.50	0.65	0.20
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results Summary

Report No.: 18-17643

			ELAB Reference	136685	136686	136687	136688	136689	136690
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP310	TP310	TP311	TP311	TP311	TP312
			Sample Depth (m)	0.50	1.50	0.20	0.40	0.80	0.20
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	22.7	^ 4.7	15.3	22.7	27.4	5.0
Barium	U	mg/kg	10	73.8	17.9	51.7	60.6	61.9	120
Beryllium	U	mg/kg	1	1.3	< 1.0	1.0	2.3	2.6	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5	^ 1.0	< 0.5	< 0.5	1.4	0.7
Chromium	M	mg/kg	5	44.2	^ 6.9	23.3	45.9	54.0	11.3
Copper	M	mg/kg	5	19.2	^ < 5.0	11.3	18.1	24.7	9.9
Lead	M	mg/kg	5	21.8	^ < 5.0	27.6	22.1	17.2	16.0
Mercury	M	mg/kg	0.5	< 0.5	^ < 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	32.0	^ 13.9	29.3	66.7	200	14.3
Selenium	M	mg/kg	1	1.0	^ < 1.0	< 1.0	1.1	2.1	< 1.0
Vanadium	M	mg/kg	5	80.9	^ 9.8	46.8	75.9	66.1	16.3
Zinc	M	mg/kg	5	68.7	^ 21.5	64.1	104	97.9	45.8
Anions									
Water Soluble Chloride	M	mg/kg	40	< 40	^ < 40	< 40	< 40	< 40	103
Water Soluble Sulphate	M	g/l	0.02	0.02	^ < 0.02	0.04	0.05	0.02	0.10
Inorganics									
Elemental Sulphur	M	mg/kg	20	< 20	^ < 20	< 20	22	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	^ < 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.08	0.09	0.08	0.07	0.07	0.07
Water Soluble Boron	N	mg/kg	0.5	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5
Miscellaneous									
pH	M	pH units	0.1	6.7	^ 8.6	7.0	7.2	7.3	8.2
Total Organic Carbon	N	%	0.01	0.15	0.03	0.75	0.27	0.22	0.56
Phenols									
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	0.4
Anthracene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	0.2
Fluoranthene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	1.4
Pyrene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	1.4
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	1.3
Chrysene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	1.3
Benzo (b) fluoranthene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	1.7
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	^ < 0.1	0.2	< 0.1	< 0.1	2.1
Benzo (a) pyrene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	0.2	< 0.1	1.8
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	1.4
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	0.3
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1	2.1
Total PAH(16)	M	mg/kg	0.4	< 0.4	^ < 0.4	< 0.4	< 0.4	< 0.4	15.5
BTEX									
Benzene	M	ug/kg	10	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136685	136686	136687	136688	136689	136690
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP310	TP310	TP311	TP311	TP311	TP312
			Sample Depth (m)	0.50	1.50	0.20	0.40	0.80	0.20
			Sampling Date	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	3.1
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	135
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	9.3
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	4.2
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	136
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	17.1
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	304

Results Summary

Report No.: 18-17643

				ELAB Reference	136691	136692	136693	136694	136695	136696
				Customer Reference						
				Sample ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Location	TP312	TP312	TP313	TP313	TP313	TP314
				Sample Depth (m)	0.90	1.45	0.25	0.50	1.55	0.30
				Sampling Date	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**							
Metals										
Arsenic	M	mg/kg	1		11.2	20.3	^ 5.1	17.1	34.2	11.5
Barium	U	mg/kg	10		66.4	54.9	28.0	19.2	38.9	40.8
Beryllium	U	mg/kg	1		< 1.0	2.9	< 1.0	< 1.0	1.5	< 1.0
Cadmium	M	mg/kg	0.5		0.6	0.7	^ 0.6	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5		21.4	39.6	^ 10.2	14.5	20.4	34.0
Copper	M	mg/kg	5		18.5	23.8	^ 8.8	7.9	15.2	13.5
Lead	M	mg/kg	5		61.9	25.3	^ 12.3	14.1	20.5	17.3
Mercury	M	mg/kg	0.5		< 0.5	< 0.5	^ < 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5		29.3	93.1	^ 10.7	15.1	26.9	13.7
Selenium	M	mg/kg	1		1.1	1.8	^ < 1.0	< 1.0	< 1.0	< 1.0
Vanadium	M	mg/kg	5		39.2	64.6	^ 17.0	35.1	43.5	54.1
Zinc	M	mg/kg	5		129	136	^ 32.0	28.5	37.6	31.2
Anions										
Water Soluble Chloride	M	mg/kg	40		124	131	^ < 40	< 40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02		0.05	0.04	^ < 0.02	< 0.02	< 0.02	< 0.02
Inorganics										
Elemental Sulphur	M	mg/kg	20		< 20	< 20	^ < 20	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8		< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2		< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1		1.1	< 1.0	^ 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02		0.09	0.09	0.06	0.03	0.06	0.06
Water Soluble Boron	N	mg/kg	0.5		2.8	0.5	< 0.5	< 0.5	< 0.5	0.8
Miscellaneous										
pH	M	pH units	0.1		8.3	7.8	^ 8.3	8.1	8.1	7.7
Total Organic Carbon	N	%	0.01		2.6	0.42	0.28	0.12	0.08	0.24
Phenols										
Total Phenols	N	mg/kg	6		< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons										
Naphthalene	M	mg/kg	0.1		< 0.1	< 0.1	^ < 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1		< 0.1	< 0.1	^ 0.2	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1		< 0.1	< 0.1	^ < 0.1	0.2	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1		< 0.1	< 0.1	^ < 0.1	0.2	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1		< 0.1	< 0.1	^ < 0.1	1.8	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1		< 0.1	< 0.1	^ 0.1	0.6	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1		0.1	< 0.1	^ 0.6	1.8	< 0.1	< 0.1
Pyrene	M	mg/kg	0.1		0.1	< 0.1	^ 0.6	1.5	< 0.1	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1		< 0.1	< 0.1	^ 0.9	0.8	< 0.1	< 0.1
Chrysene	M	mg/kg	0.1		< 0.1	< 0.1	^ 0.8	0.8	< 0.1	< 0.1
Benzo (b) fluoranthene	M	mg/kg	0.1		0.2	< 0.1	^ 1.1	0.5	< 0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1		0.3	0.3	^ 1.5	0.8	< 0.1	< 0.1
Benzo (a) pyrene	M	mg/kg	0.1		0.1	< 0.1	^ 1.2	0.7	< 0.1	0.2
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1		< 0.1	< 0.1	^ 1.2	0.4	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1		< 0.1	< 0.1	^ 0.3	0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1		< 0.1	0.1	^ 1.3	0.3	< 0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4		0.9	0.4	^ 9.9	10.5	< 0.4	< 0.4
BTEX										
Benzene	M	ug/kg	10		< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10		< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10		< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10		< 10.0	< 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0

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Results Summary

Report No.: 18-17643

			ELAB Reference	136691	136692	136693	136694	136695	136696
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP312	TP312	TP313	TP313	TP313	TP314
			Sample Depth (m)	0.90	1.45	0.25	0.50	1.55	0.30
			Sampling Date	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	1.7	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	7.1	< 1.0	< 1.0	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	1.6	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	10.3	< 1.0	< 1.0	< 1.0

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Results Summary

Report No.: 18-17643

			ELAB Reference	136697	136698	136699	136700	136701	136702
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP314	TP314	TP315	TP315	TP315	TP316
			Sample Depth (m)	0.70	1.60	0.20	0.60	2.30	0.20
			Sampling Date	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	10.6	243	15.5	11.0	8.7	11.1
Barium	U	mg/kg	10	38.3	90.8	359	85.8	305	257
Beryllium	U	mg/kg	1	< 1.0	3.7	< 1.0	< 1.0	2.1	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5	3.5	0.7	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	19.3	37.4	15.5	30.8	59.1	23.7
Copper	M	mg/kg	5	7.8	24.4	30.2	13.3	25.7	23.2
Lead	M	mg/kg	5	14.8	28.5	220	64.6	27.2	146
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	11.9	271	16.1	15.0	25.3	15.5
Selenium	M	mg/kg	1	< 1.0	1.1	< 1.0	< 1.0	1.1	< 1.0
Vanadium	M	mg/kg	5	35.8	69.2	23.7	52.0	101	38.4
Zinc	M	mg/kg	5	36.9	139	91.1	58.2	62.5	107
Anions									
Water Soluble Chloride	M	mg/kg	40	< 40	< 40	< 40	< 40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02	< 0.02	0.05	0.03	0.06	< 0.02	0.05
Inorganics									
Elemental Sulphur	M	mg/kg	20	< 20	< 20	< 20	188	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.05	0.07	0.08	0.09	0.07	0.11
Water Soluble Boron	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	1.1	0.6	0.7
Miscellaneous									
pH	M	pH units	0.1	7.4	7.5	9.1	7.9	6.2	9.3
Total Organic Carbon	N	%	0.01	0.21	0.11	0.88	1.1	0.35	0.70
Phenols									
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	0.3	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1	1.9	< 0.1	< 0.1	0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	0.7	< 0.1	< 0.1	0.3
Fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	3.6	< 0.1	< 0.1	0.7
Pyrene	M	mg/kg	0.1	< 0.1	< 0.1	3.3	< 0.1	< 0.1	0.6
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	2.1	< 0.1	< 0.1	0.4
Chrysene	M	mg/kg	0.1	< 0.1	< 0.1	2.3	< 0.1	0.1	0.4
Benzo (b) fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	3.1	0.3	0.1	0.6
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	2.5	< 0.1	< 0.1	0.4
Benzo (a) pyrene	M	mg/kg	0.1	0.1	0.1	2.7	< 0.1	0.3	0.3
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	< 0.1	2.3	< 0.1	< 0.1	0.3
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	0.5	< 0.1	< 0.1	0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	< 0.1	3.0	0.1	< 0.1	0.4
Total PAH(16)	M	mg/kg	0.4	< 0.4	< 0.4	28.7	0.6	0.6	4.7
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136697	136698	136699	136700	136701	136702
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP314	TP314	TP315	TP315	TP315	TP316
			Sample Depth (m)	0.70	1.60	0.20	0.60	2.30	0.20
			Sampling Date	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	2.7	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	39.7	< 1.0	< 1.0	8.1
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	9.3	< 1.0	< 1.0	1.4
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	2.3	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	14.8	< 1.0	< 1.0	1.3
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	131	1.3	< 1.0	15.1
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	41.1	< 1.0	< 1.0	6.5
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	241	1.3	< 1.0	32.4

Results Summary

Report No.: 18-17643

			ELAB Reference	136703	136704	136705	136706	136707	136708
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP316	TP316	TP317	TP317	TP317	TP318
			Sample Depth (m)	0.90	1.90	0.15	0.65	1.40	0.15
			Sampling Date	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	10.1	4.8	16.3	11.4	5.7	9.7
Barium	U	mg/kg	10	75.6	76.8	180	36.7	28.2	169
Beryllium	U	mg/kg	1	< 1.0	1.7	1.4	6.9	1.4	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	0.6	5.2	< 0.5	0.7
Chromium	M	mg/kg	5	35.8	28.4	28.9	35.0	24.1	20.3
Copper	M	mg/kg	5	14.8	11.3	60.8	21.3	17.7	30.0
Lead	M	mg/kg	5	36.7	13.4	165	22.3	15.7	104
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	12.8	20.2	27.2	33.1	26.1	15.5
Selenium	M	mg/kg	1	< 1.0	< 1.0	1.4	1.1	< 1.0	< 1.0
Vanadium	M	mg/kg	5	64.1	47.5	49.0	49.9	39.1	34.5
Zinc	M	mg/kg	5	47.4	27.1	235	59.5	48.0	159
Anions									
Water Soluble Chloride	M	mg/kg	40	< 40	< 40	< 40	< 40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02	0.05	0.08	< 0.02	< 0.02	< 0.02	0.03
Inorganics									
Elemental Sulphur	M	mg/kg	20	< 20	< 20	< 20	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	1.2	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.08	0.07	0.08	0.05	0.06	0.07
Water Soluble Boron	N	mg/kg	0.5	0.8	0.7	1.3	0.7	< 0.5	0.7
Miscellaneous									
pH	M	pH units	0.1	8.1	5.5	7.6	7.9	7.4	8.5
Total Organic Carbon	N	%	0.01	0.60	0.06	2.9	0.32	0.08	1.9
Phenols									
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1
Chrysene	M	mg/kg	0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	0.2
Benzo (b) fluoranthene	M	mg/kg	0.1	0.1	0.1	0.1	< 0.1	< 0.1	0.4
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	0.3
Benzo (a) pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Total PAH(16)	M	mg/kg	0.4	< 0.4	< 0.4	0.7	< 0.4	< 0.4	2.1
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0

Results Summary

Report No.: 18-17643

			ELAB Reference	136703	136704	136705	136706	136707	136708
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP316	TP316	TP317	TP317	TP317	TP318
			Sample Depth (m)	0.90	1.90	0.15	0.65	1.40	0.15
			Sampling Date	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**						
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.7
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	3.7
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.6
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	7.0

Results Summary

Report No.: 18-17643

			ELAB Reference	136709	136710
			Customer Reference		
			Sample ID		
			Sample Type	SOIL	SOIL
			Sample Location	TP318	TP319
			Sample Depth (m)	0.70	1.80
			Sampling Date	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**		
Metals					
Arsenic	M	mg/kg	1	10.5	17.2
Barium	U	mg/kg	10	35.0	49.9
Beryllium	U	mg/kg	1	< 1.0	1.5
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	34.6	58.1
Copper	M	mg/kg	5	16.1	32.6
Lead	M	mg/kg	5	15.1	27.9
Mercury	M	mg/kg	0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	11.9	15.9
Selenium	M	mg/kg	1	< 1.0	1.2
Vanadium	M	mg/kg	5	55.4	106
Zinc	M	mg/kg	5	37.5	37.5
Anions					
Water Soluble Chloride	M	mg/kg	40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02	0.02	0.07
Inorganics					
Elemental Sulphur	M	mg/kg	20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.05	0.07
Water Soluble Boron	N	mg/kg	0.5	< 0.5	0.8
Miscellaneous					
pH	M	pH units	0.1	8.1	7.3
Total Organic Carbon	N	%	0.01	0.13	0.22
Phenols					
Total Phenols	N	mg/kg	6	< 6	< 6
Polyaromatic hydrocarbons					
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1
Pyrene	M	mg/kg	0.1	< 0.1	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	< 0.1
Chrysene	M	mg/kg	0.1	< 0.1	< 0.1
Benzo (b) fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1
Benzo (a) pyrene	M	mg/kg	0.1	< 0.1	< 0.1
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4	< 0.4	< 0.4
BTEX					
Benzene	M	ug/kg	10	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 18-17643

			ELAB Reference	136709	136710
			Customer Reference		
			Sample ID		
			Sample Type	SOIL	SOIL
			Sample Location	TP318	TP319
			Sample Depth (m)	0.70	1.80
			Sampling Date	17/05/2018	17/05/2018
Determinand	**Codes**	**Units**	**LOD**		
TPH CWG					
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonards on Sea, East Sussex, TN38 9BY
Tel: +44 (0)1424 718618, Email: info@elab-uk.co.uk, Web: www.elab-uk.co.uk

Results Summary

Report No.: 18-17643

Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #)
in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric	Gravimetric Analysis by ACM Type	Free Fibre	Total
136637	0.60 - 0.80	WS401	Brown clay, stones, clinker	No asbestos detected	n/t	n/t	n/t	n/t
136640	0.50	WS402	Brown clay, stones	No asbestos detected	n/t	n/t	n/t	n/t
136645	1.50 - 1.60	WS403	Brown sandy soil, stones, concrete, brick, clinker, organics	No asbestos detected	n/t	n/t	n/t	n/t
136650	0.40 - 0.60	WS405	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
136651	1.20	WS405	Brown sandy soil, stones, concrete, brick, wood	No asbestos detected	n/t	n/t	n/t	n/t
136653	1.60 - 1.90	WS406	Brown sandy soil, stones, concrete, brick, clinker, glass	No asbestos detected	n/t	n/t	n/t	n/t
136655	0.30 - 0.50	WS407	Brown sandy soil, stones, clinker	No asbestos detected	n/t	n/t	n/t	n/t
136657	3.00 - 4.00	WS407	Brown sandy soil, stones, concrete, brick, clinker, chalk, organics	Chrysotile (asbestos cement)	0.729	Asbestos cement (0.729%)	< 0.001	0.729
136658	0.25	TP301	Brown sandy soil, stones, concrete, brick, clinker, organics	No asbestos detected	n/t	n/t	n/t	n/t
136659	0.40	TP301	Brown sandy soil, stones, clinker, wood	No asbestos detected	n/t	n/t	n/t	n/t
136660	1.40	TP301	Brown sandy soil, stones, brick, clinker, organics	No asbestos detected	n/t	n/t	n/t	n/t
136661	0.20	TP302	Brown sandy soil, stones, chalk, clinker, organics	Chrysotile (asbestos cement)	0.147	Asbestos cement (0.147%)	< 0.001	0.147
136662	0.50	TP302	Brown sandy soil, stones, clinker, organics	No asbestos detected	n/t	n/t	n/t	n/t
136664	2.70	TP302	Brown sandy soil, stones, concrete, clinker	No asbestos detected	n/t	n/t	n/t	n/t
136666	0.70	TP303	Brown sandy soil, stones, concrete, clinker	No asbestos detected	n/t	n/t	n/t	n/t
136669	1.20	TP304	Brown sandy clay, stones, clinker	No asbestos detected	n/t	n/t	n/t	n/t
136670	0.80	TP305	Brown sandy clay, stones, clinker	No asbestos detected	n/t	n/t	n/t	n/t
136672	0.20	TP306	Brown sandy soil, stones, organics	No asbestos detected	n/t	n/t	n/t	n/t
136673	0.40	TP306	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
136674	0.80	TP306	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
136675	0.30	TP307	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136676	0.80	TP307	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136677	1.20	TP307	Brown sandy soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136678	0.10	TP308	Brown sandy soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136679	0.30	TP308	Brown sandy soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136680	0.70	TP308	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136681	0.25	TP309	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136682	0.50	TP309	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136683	0.65	TP309	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136684	0.20	TP310	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136685	0.50	TP310	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136686	1.50	TP310	Chalk	No asbestos detected	n/t	n/t	n/t	n/t
136687	0.20	TP311	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136688	0.40	TP311	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136689	0.80	TP311	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
136690	0.20	TP312	Brown chalky soil with stones and brick	No asbestos detected	n/t	n/t	n/t	n/t
136691	0.90	TP312	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136692	1.45	TP312	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136693	0.25	TP313	Brown chalky soil with stones and clinker	No asbestos detected	n/t	n/t	n/t	n/t
136694	0.50	TP313	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
136695	1.55	TP313	Sand	No asbestos detected	n/t	n/t	n/t	n/t
136696	0.30	TP314	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
136697	0.70	TP314	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
136698	1.60	TP314	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
136699	0.20	TP315	Brown sandy soil,Stones,concrete,brick	Chrysotile (fibre bundle)	< 0.001	Fibre bundle (<0.001)	< 0.001	< 0.001
136700	0.60	TP315	Brown sandy soil	No asbestos detected	n/t	n/t	n/t	n/t
136701	2.30	TP315	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
136702	0.20	TP316	Brown sandy soil,Stones,brick,clinker	No asbestos detected	n/t	n/t	n/t	n/t
136703	0.90	TP316	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
136704	1.90	TP316	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
136705	0.15	TP317	Brown sandy soil,Stones,glass,clinker	No asbestos detected	n/t	n/t	n/t	n/t
136706	0.65	TP317	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t
136707	1.40	TP317	Brown sandy soil,stones	No asbestos detected	n/t	n/t	n/t	n/t
136708	0.15	TP318	Brown sandy soil,Stones,brick	No asbestos detected	n/t	n/t	n/t	n/t
136709	0.70	TP318	Brown soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
136710	1.80	TP319	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 18-17643

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Sulphide	N	As submitted sample	23/05/2018	109	Colorimetry
Hexavalent chromium	N	As submitted sample	23/05/2018	110	Colorimetry
pH	M	Air dried sample	24/05/2018	113	Electromeric
Acid Soluble Sulphate	U	Air dried sample	24/05/2018	115	Ion Chromatography
Aqua regia extractable metals	M	Air dried sample	23/05/2018	118	ICPMS
Phenols in solids	N	As submitted sample	23/05/2018	121	HPLC
Elemental Sulphur	M	Air dried sample	23/05/2018	122	HPLC
PAH (GC-FID)	M	As submitted sample	23/05/2018	133	GC-FID
Water soluble anions	M	Air dried sample	23/05/2018	172	Ion Chromatography
Low range Aliphatic hydrocarbons soil	N	As submitted sample	24/05/2018	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	24/05/2018	181	GC-MS
BTEX in solids	M	As submitted sample	24/05/2018	181A	GC-MS
Water soluble boron	N	Air dried sample	23/05/2018	202	Colorimetry
Total cyanide	M	As submitted sample	23/05/2018	204	Colorimetry
Total organic carbon/Total sulphur	N	Air dried sample	24/05/2018	210	IR
Aliphatic hydrocarbons in soil	N	As submitted sample	23/05/2018	214	GC-FID
Aliphatic/Aromatic hydrocarbons in soil	N	As submitted sample	25/05/2018	214	GC-FID
Aromatic hydrocarbons in soil	N	As submitted sample	23/05/2018	214	GC-FID
Asbestos identification	U	Air dried sample	23/05/2018	260	Microscopy

Tests marked N are not UKAS accredited

Report Information

Report No.: 18-17643

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis (dried at < 30°C)
Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage

CLEA Software Version 1.071

Report generated 21/06/2018

Report title Woodcroft Farm, Lovedean

Created by FG at GESL

BASIC SETTINGS

Land Use Residential with produce (C4SL)

Building Small terraced house
Receptor Female (res C4SL) Start age class 1 End age class 6 Exposure Duration 6 years
Soil Sandy loam

Exposure Pathways

Direct soil and dust ingestion	✓	Dermal contact with indoor dust	✓	Inhalation of indoor dust	✓
Consumption of homegrown produce	✓	Dermal contact with soil	✓	Inhalation of soil dust	✓
Soil attached to homegrown produce	✓			Inhalation of indoor vapour	✓
				Inhalation of outdoor vapour	✓

Land Use Residential with produce (C4SL) **Receptor** Female (res C4SL)

Age Class	Exposure Frequencies (days yr^{-1})						Occupation Periods (hr day^{-1})		Soil to skin adherence factors (mg cm^{2})		Direct soil ingestion rate (g day^{-1})	Body weight (kg)	Body height (m)	Inhalation rate (m^{3} day^{-1})	Max exposed skin factor		Total skin area (m^{2})
	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with indoor dust	Dermal contact with soil	Inhalation of dust and vapour, indoor	Inhalation of dust and vapour, outdoor	Indoors	Outdoors	Indoor	Outdoor					Indoor (m^{2} m^{-2})	Outdoor (m^{2} m^{-2})	
1	180	180	180	170	365	365	23.0	1.0	0.06	0.10	0.10	5.60	0.7	5.4	0.32	0.26	3.43E-01
2	365	365	365	170	365	365	23.0	1.0	0.06	0.10	0.10	9.80	0.8	8.0	0.33	0.26	4.84E-01
3	365	365	365	170	365	365	23.0	1.0	0.06	0.10	0.10	12.70	0.9	8.9	0.32	0.25	5.82E-01
4	365	365	365	170	365	365	23.0	1.0	0.06	0.10	0.10	15.10	0.9	10.1	0.35	0.28	6.36E-01
5	365	365	365	170	365	365	19.0	1.0	0.06	0.10	0.10	16.90	1.0	10.1	0.35	0.28	7.04E-01
6	365	365	365	170	365	365	19.0	1.0	0.06	0.10	0.10	19.70	1.1	10.1	0.33	0.26	7.94E-01
7	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	22.10	1.2	12.0	0.22	0.15	8.73E-01
8	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	25.30	1.2	12.0	0.22	0.15	9.36E-01
9	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	27.50	1.3	12.0	0.22	0.15	1.01E+00
10	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	31.40	1.3	12.0	0.22	0.15	1.08E+00
11	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	35.70	1.4	12.0	0.22	0.14	1.19E+00
12	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	41.30	1.4	15.2	0.22	0.14	1.29E+00
13	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	47.20	1.5	15.2	0.22	0.14	1.42E+00
14	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	51.20	1.6	15.2	0.22	0.14	1.52E+00
15	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	56.70	1.6	15.2	0.21	0.14	1.60E+00
16	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	59.00	1.6	15.2	0.21	0.14	1.63E+00
17	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.00	1.6	15.7	0.33	0.27	1.78E+00
18	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.90	1.6	13.6	0.33	0.27	1.80E+00

Consumption Rates

Environment Agency

Consumption rates (g FW kg^{-1} bodyweight day^{-1}) by Produce Group

Age Class	MEAN RATES						90TH PERCENTILE RATES					
	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit
1	3.47E+00	5.22E+00	9.22E+00	8.90E-01	1.07E+00	1.87E+00	7.12E+00	1.07E+01	1.60E+01	1.83E+00	2.23E+00	3.82E+00
2	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
3	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
4	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
5	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
6	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
7	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
8	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
9	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
10	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
11	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
12	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
13	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
14	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
15	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
16	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
17	1.26E+00	6.00E-01	1.18E+00	6.90E-01	9.00E-02	1.27E+00	2.36E+00	1.12E+00	2.35E+00	1.29E+00	1.80E-01	2.38E+00
18	1.35E+00	6.40E-01	1.25E+00	7.40E-01	1.00E-01	1.36E+00	2.34E+00	1.12E+00	2.36E+00	1.28E+00	1.80E-01	2.37E+00

Top 2 applied? Yes

Where top 2 method is applied, two produce categories use 90th percentile rates, while the remainder use the mean. Produce categories vary on a chemical-by-chemical basis. Where top 2 method is not used, all produce categories for all chemicals assume 90th percentile rates.

Building Small terraced house

Soil Sandy loam

Building footprint (m^2)	2.80E+01
Living space air exchange rate (hr^{-1})	5.00E-01
Living space height (above ground, m)	4.80E+00
Living space height (below ground, m)	0.00E+00
Pressure difference (soil to enclosed space, Pa)	3.10E+00
Foundation thickness (m)	1.50E-01
Floor crack area (cm^2)	4.23E+02
Dust loading factor ($\mu g\ m^{-3}$)	5.00E+01

Porosity, Total ($cm^3\ cm^{-3}$)	5.30E-01
Porosity, Air-Filled ($cm^3\ cm^{-3}$)	2.00E-01
Porosity, Water-Filled ($cm^3\ cm^{-3}$)	3.30E-01
Residual soil water content ($cm^3\ cm^{-3}$)	1.20E-01
Saturated hydraulic conductivity ($cm\ s^{-1}$)	3.56E-03
van Genuchten shape parameter *m* (dimensionless)	3.20E-01
Bulk density ($g\ cm^{-3}$)	1.21E+00
Threshold value of wind speed at 10m ($m\ s^{-1}$)	7.20E+00
Empirical function (F_x) for dust model (dimensionless)	1.22E+00
Ambient soil temperature (K)	2.83E+02
Soil pH	7.40E+00
Soil Organic Matter content (%)	8.60E-01
Fraction of organic carbon ($g\ g^{-1}$)	4.99E-03
Effective total fluid saturation (unitless)	5.12E-01
Intrinsic soil permeability (cm^2)	4.75E-08
Relative soil air permeability (unitless)	6.42E-01
Effective air permeability (cm^2)	3.05E-08

Soil - Vapour Model

Depth to top of source (no building) (cm)	0
Depth to top of source (beneath building) (cm)	65
Default soil gas ingress rate?	Yes
Soil gas ingress rate ($cm^3\ s^{-1}$)	2.50E+01
Building ventilation rate ($cm^3\ s^{-1}$)	1.87E+04
Averaging time surface emissions (yr)	6
Finite vapour source model?	No
Thickness of contaminated layer (cm)	200

Air Dispersion Model

Mean annual windspeed at 10m ($m\ s^{-1}$)		5.00
Air dispersion factor at height of 0.8m *		2400.00
Air dispersion factor at height of 1.6m *		0.00
Fraction of site cover ($m^2\ m^{-2}$)		0.75

* Air dispersion factor in $g\ m^{-2}\ s^{-1}$ per $kg\ m^{-3}$

Soil - Plant Model

	Dry weight conversion factor	Homegrown fraction		Soil loading factor	Preparation correction factor
		Average	High		
	g DW g^{-1} FW	dimensionless		g g^{-1} DW	dimensionless
Green vegetables	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	0.103	0.06	0.40	1.00E-03	1.00E+00
Tuber vegetables	0.210	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	0.058	0.06	0.40	1.00E-03	6.00E-01
Shrub fruit	0.166	0.09	0.60	1.00E-03	6.00E-01
Tree fruit	0.157	0.04	0.27	1.00E-03	6.00E-01

Gardener type Average

CLEA Software Version 1.071

Report generated	21-Jun-18
Report title	Woodcroft Farm, Lovedean
Created by	FG at GESL

RESULTS

Environment Agency

		Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?		Top Two applied?	Apply Top 2 Approach to Produce Group					
		oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal		Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
1	Arsenic	3.80E+01	1.21E+02	NR	1.00	0.31	NR	NR	No	No	Yes	No	No	No	No	No	No
2	Beryllium	1.29E+02	1.72E+00	NR	0.01	1.00	NR	NR	Yes	Yes	Yes	No	No	No	No	No	No
3	Benzo(a)pyrene	3.93E+00	1.57E+01	NR	1.00	0.25	NR	7.83E-01 (vap)	No	No	Yes	No	No	No	No	No	No
4	Dibenz(ah)anthracene	3.93E-01	1.40E+00	NR	1.00	0.28	NR	3.38E-03 (vap)	No	No	Yes	No	No	No	No	No	No
5	Nickel	1.49E+02	1.81E+02	NR	1.00	0.70	NR	NR	Yes	Yes	Yes	No	No	No	No	No	No
6	Lead (C4SL adult)	9.04E+01	NR	NR	1.00	NR	NR	NR	No	No	Yes	Yes	No	Yes	No	No	No
7	Benzo(b)fluoranthene	4.94E+00	1.89E+01	NR	1.00	0.26	NR	1.05E+00 (sol)	No	No	Yes	No	No	No	No	No	No
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	

Environment Agency

	Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?		Top Two applied?	Apply Top 2 Approach to Produce Group					
	oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal		Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
21																
22																
23																
24																
25																
26																
27																
28																
29																
30																

Environment Agency

		Soil Distribution				Media Concentrations													
		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
		%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
1	Arsenic	99.9	0.1	0.0	100.0	3.80E+01	NR	1.90E+01	1.62E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.64E-02	1.52E-02	8.75E-03	1.26E-02	7.61E-03	4.18E-02
2	Beryllium	100.0	0.0	0.0	100.0	1.72E+00	NR	8.62E-01	7.34E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.21E-02	2.07E-03	2.07E-03	2.07E-03	2.07E-03	2.07E-03
3	Benzo(a)pyrene	100.0	0.0	0.0	100.0	3.93E+00	1.08E-05	1.96E+00	1.67E-09	0.00E+00	1.42E-08	3.33E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4	Dibenz(ah)anthracene	100.0	0.0	0.0	100.0	3.93E-01	2.28E-06	1.96E-01	1.67E-10	0.00E+00	2.83E-09	2.68E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5	Nickel	99.9	0.1	0.0	100.0	1.49E+02	NR	7.45E+01	6.34E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.66E-01	6.41E-01	2.83E-01	3.73E-01	3.73E-01	5.07E-01
6	Lead (C4SL adult)	100.0	0.0	0.0	100.0	9.04E+01	NR	4.52E+01	3.85E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.79E-01	3.63E-01	6.61E-01	6.77E-02	1.85E-02	2.07E-02
7	Benzo(b)fluoranthene	99.9	0.1	0.0	100.0	4.94E+00	1.94E-05	2.47E+00	2.10E-09	0.00E+00	2.53E-08	4.62E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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Environment Agency

	Soil Distribution				Media Concentrations													
	Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
	%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
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Environment Agency

		Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
		Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
1	Arsenic	2.82E-04	1.42E-05	3.77E-06	6.29E-07	0.00E+00	0.00E+00	0.00E+00	94.03	4.72	1.26	0.00	0.00	0.00	0.00	0.00
2	Beryllium	1.28E-05	2.67E-06	0.00E+00	2.85E-08	0.00E+00	8.44E-04	9.09E-08	0.00	0.00	0.00	50.00	0.00	0.00	0.00	50.00
3	Benzo(a)pyrene	2.91E-05	1.84E-07	1.69E-06	6.49E-08	1.02E-08	6.19E-06	3.64E-07	93.96	0.59	5.45	0.00	0.00	0.00	0.00	0.00
4	Dibenz(ah)anthracene	2.91E-06	1.84E-08	1.69E-07	6.49E-09	1.92E-09	2.25E-06	2.00E-06	93.96	0.59	5.45	0.00	0.00	0.00	0.00	0.00
5	Nickel	1.11E-03	2.90E-04	2.46E-06	2.46E-06	0.00E+00	7.54E-03	1.57E-05	39.46	10.36	0.09	0.09	0.00	0.00	49.90	0.10
6	Lead (C4SL adult)	4.02E-04	2.27E-04	0.00E+00	9.56E-07	0.00E+00	0.00E+00	0.00E+00	63.85	35.99	0.00	0.15	0.00	0.00	0.00	0.00
7	Benzo(b)fluoranthene	3.66E-05	2.31E-07	2.12E-06	8.17E-08	1.78E-08	6.19E-06	7.88E-07	93.96	0.59	5.45	0.00	0.00	0.00	0.00	0.00
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Environment Agency

	Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
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Environment Agency

		Oral Health Criteria Value (µg kg^{-1} BW day^{-1})		Inhalation Health Criteria Value (µg kg^{-1} BW day^{-1})		Oral Mean Daily Intake (µg day^{-1})	Inhalation Mean Daily Intake (µg day^{-1})	Air-water partition coefficient (K_{aw}) (cm^3 cm^{-3})	Coefficient of Diffusion in Air (m^2 s^{-1})	Coefficient of Diffusion in Water (m^2 s^{-1})	log K_{oc} (cm^3 g^{-1})	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor (g g^{-1} DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
1	Arsenic	ID	0.3	ID	0.002	NR	NR	NR	NR	NR	NR	NR	0.03	0.5	1	1	1
2	Beryllium	TDI	2	TDI	0.000057	15	0.0015	NR	NR	NR	NR	NR	0	0.5	1	1	1
3	Benzo(a)pyrene	ID	0.031	ID	0.0003	0.11	0.006	1.76E-06	4.38E-06	3.67E-10	5.11	6.18	0.13	0.5	1	1	1
4	Dibenz(ah)anthracene	ID	0.0031	ID	0.00003	0.04	0.033	5.40E-06	4.08E-06	3.40E-10	5.27	6.38	0.13	0.5	1	1	1
5	Nickel	TDI	2.8	TDI	0.006	134	0.259	NR	NR	NR	NR	NR	0.005	0.5	1	1	1
6	Lead (C4SL adult)	ID	0.63	NR	0	NR	NR	NR	NR	NR	NR	NR	0	0.5	1	0.6	0.64
7	Benzo(b)fluoranthene	ID	0.039	ID	0.00038	0.11	0.013	2.05E-06	4.36E-06	3.62E-10	5.02	6.08	0.13	0.5	1	1	1
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	Oral Health Criteria Value (µg kg^{-1} BW day^{-1})		Inhalation Health Criteria Value (µg kg^{-1} BW day^{-1})		Oral Mean Daily Intake (µg day^{-1})	Inhalation Mean Daily Intake (µg day^{-1})	Air-water partition coefficient (K_{aw}) (cm^3 cm^{-3})	Coefficient of Diffusion in Air (m^2 s^{-1})	Coefficient of Diffusion in Water (m^2 s^{-1})	log K_{oc} (cm^3 g^{-1})	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor (g g^{-1} DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
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Environment Agency

		Soil-to-water partition coefficient ($cm^3\ g^{-1}$)	Vapour pressure (Pa)	Water solubility ($mg\ L^{-1}$)	Soil-to-plant concentration factor for green vegetables ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for root vegetables ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for tuber vegetables ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for herbaceous fruit ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for shrub fruit ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for tree fruit ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)
1	Arsenic	5.00E+02	NR	1.25E+06	0.00043 fw	0.0004 fw	0.00023 fw	0.00033 fw	0.0002 fw	0.0011 fw
2	Beryllium	1.70E+03	NR	1.66E+06	0.007 fw	0.0012 fw	0.0012 fw	0.0012 fw	0.0012 fw	0.0012 fw
3	Benzo(a)pyrene	6.43E+02	2.00E-08	3.80E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4	Dibenz(ah)anthracene	9.29E+02	1.66E-10	6.00E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5	Nickel	5.00E+02	NR	2.50E+06	0.0038 fw	0.0043 fw	0.0019 fw	0.0025 fw	0.0025 fw	0.0034 fw
6	Lead (C4SL adult)	1.00E+03	NR	2.96E+05	0.00419 fw	0.00402 fw	0.00731 fw	0.00074 fw	0.00020 fw	0.00022 fw
7	Benzo(b)fluoranthene	5.22E+02	6.34E-08	2.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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Environment Agency

	Soil-to-water partition coefficient (cm^3 g^{-1})	Vapour pressure (Pa)	Water solubility (mg L^{-1})	Soil-to-plant concentration factor for green vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for root vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for herbaceous fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for shrub fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tree fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)
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Client/client ref: Grainger PLC
Project ref: GE16943
Site ref: Woodcroft Farm - Horse Arena
Data description:
Contaminant(s): Metals
Test scenario: Planning
Date: 11 June 2018
User details: FG

	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)	Hexavalent Chromium (mg/kg)	Total Cyanide (mg/kg)
Critical concentration, C_c	**38.03**	**1330**	**1.72**	**11**	**910**	**2400**	**200**	**40**	**180**	**250**	**410**	**3700**	~~6~~	~~2~~
Notes														
Full dataset size	33	33	33	33	33	33	33	33	33	33	33	33	0	0
Outliers present?	Yes	No	Yes	Yes	#REF!	Yes	No	No	Yes	Yes	Yes	Yes		
Number of outliers temporarily excluded	0													
Number removed by filter	0	0	0	0	2	0	0	0	0	0	0	0	0	0
Sample size, n	**33**	**33**	**33**	**33**	**31**	**33**	**33**	**33**	**33**	**33**	**33**	**33**	**0**	**0**
Sample mean, $\bar{x}$	24.6666667	47.9636364	1.42121212	0.45606061	#REF!	16.1515152	19.4212121	0.25	41.9060606	0.93636364	63.3878788	58.1757576	No Data	No Data
Standard deviation, s	21.8105288	20.6339498	1.34065226	0.47561762	#REF!	7.14016462	5.96525133	0	50.3206527	0.77007231	39.9900437	27.5875202		
Number of non-detects	0	0	**15**	**25**	0	**2**	**1**	**33**	0	**21**	0	0	0	0
Set non-detect values to:	Detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Distribution	Non-normal	Normal	Non-normal	Non-normal	#REF!	Normal	Normal	Single value	Non-normal	Non-normal	Non-normal	Normal		
Statistical approach	Auto: Chebychev	Auto: One-sample t-	Auto: Chebychev	Auto: Chebychev	#REF!	Auto: One-sample t-	Auto: One-sample t-	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: One-sample t-	Auto	Auto
Test scenario:	Planning: is true mean lower than critical concentration (μ < Cc)?				**Evidence level required:**		**95%**	Use Normal distribution to test for outliers						
t statistic, t_0 (or k_0)	-3.519699416	-356.9233356	-1.280276577	-127.3508755	#REF!	-1917.906336	-173.898148	N/A	-15.76468594	-1857.957548	-49.79076935	-758.3388207		
Upper confidence limit (on true mean concentration, μ)	41.2162104	54.0479317	2.43848151	0.81695303	#REF!	18.2569225	21.1801749	0.25	80.0887132	1.52068443	93.7318005	66.3104395		
Evidence level	**93%**	**100%**	**62%**	**100%**	**#REF!**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**		
Base decision on:	evidence level	evidence level	evidence level	evidence level	lower bound	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level		
Result	**μ ≈≥ Cc**	**μ < Cc**	**μ ≈≥ Cc**	**μ < Cc**	**#REF!**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**		
Select dataset	●	○	○	○	○	○	○	○	○	○	○	○	○	○

Back to data | **Go to outlier test** | **Go to normality test** | **Show individual summary**

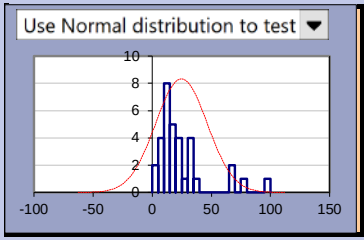
Test Results

Arsenic (mg/kg)

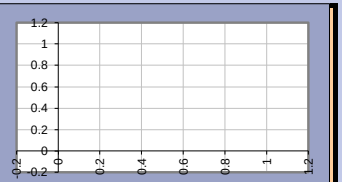
Client/client ref: Grainger PLC | Site ref: Woodcroft Farm - Horse Arena | Date: 11-Jun-2018

Project ref: GE16943 | Data description: | User details: FG

Dataset: Arsenic (mg/kg)	
Sample mean (mg/kg), $\overline{x}$	24.667
Sample standard deviation, s	21.811
Sample size, n	33
Critical concentration, Cc (mg/kg)	38.03



Outliers & non-detects	
Outliers present?	Yes
Significance level	5%
Outliers excluded	0
Non-detects	0

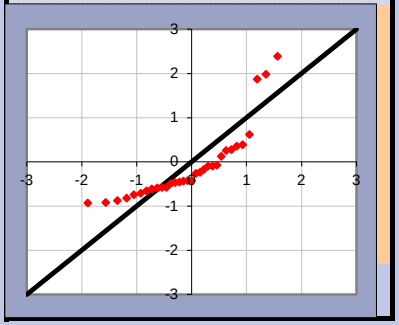


Normality test

Significance le: 5%

Non-normal distribution

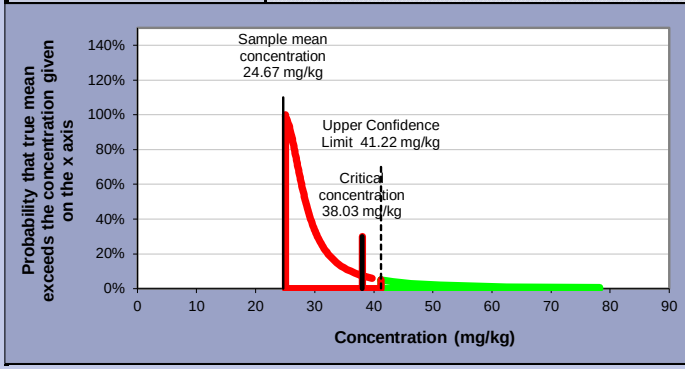
Use: Auto: Chebychev



Test scenario:

Planning: is true mean lower than critical concentration (μ < Cc)?

Null hypothesis:	The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc
Alternative hypothesis:	The true mean concentration is less than the critical concentration: μ < Cc

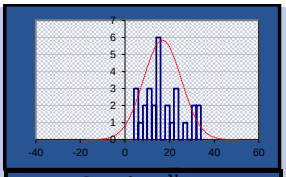


Evidence against Null hypothesis:	**93%**
Base decision on:	evidence level
Evidence level required:	**95%**
Balance of probability?	N/A
Reject Null Hypothesis?	No

Not enough evidence

Back to data | Back to summary | Go to outlier test | Go to normality test

Sample ID	Include?	Arsenic		Outliers
TP229	N			38.2
TP306	Y	9.2		
TP306	Y	19		
TP306	Y	30.7		
TP307	Y	14.6		
TP307	Y	19.6		
TP307	N			76.9
TP308	Y	15.6		
TP308	N			95.8
TP308	N			68
TP309	Y	23.1		
TP309	N			65.6
TP309	Y	20.9		
TP310	Y	15.6		
TP310	Y	22.7		
TP310	Y	4.7		
TP311	Y	15.3		
TP311	Y	22.7		
TP311	Y	27.4		
TP205	Y	12.1		
TP206	Y	4.5		
TP207	Y	11.8		
TP217	Y	32.6		
TP221	Y	8.6		
TP222	Y	12.1		
TP226	Y	11.5		
TP228	Y	10.4		
TP231	Y	33.1		
TP232	Y	5.6		
TP234	Y	6.9		
TP235	Y	14.7		
TP236	Y	30.4		
TP237	Y	14.1		
	Y			
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	Y			
	Y			
	Y			
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	Y			
	Y			
	Y			
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	Y			
	Y			
	Y			



Sample mean, $\bar{x}$
16.768

Standard deviation, s
8.500

Sample size, n
28

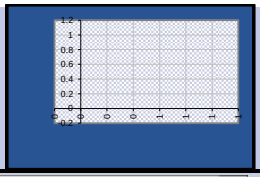
Maxiumum
33.100

Outlier Test Applicability
Applicable

Level of Significance, α
5%

Tn = 1.921
Tcrit = 2.714

Outliers?
No
(5 selected)



Dataset: Arsenic (mg/kg) O/T:28/33

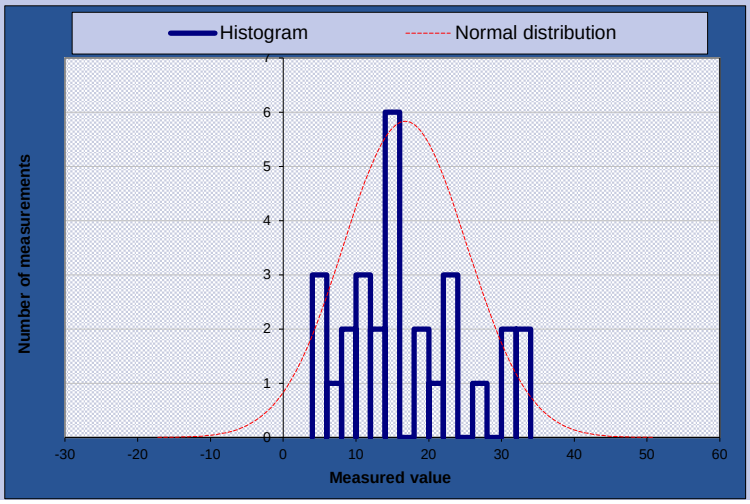
Use Normal distribution to test for outliers

Exclude identified outliers

Show individual summary

Back to summary

Back to data



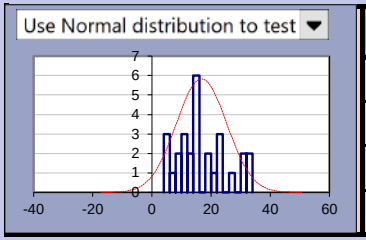
Test Results

Arsenic (mg/kg) O/T:28/33

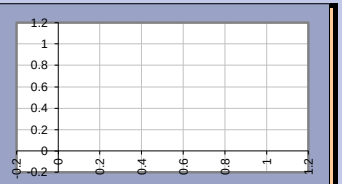
Client/client ref: Grainger PLC | Site ref: Woodcroft Farm - Horse Arena | Date: 11-Jun-2018

Project ref: GE16943 | Data description: | User details: FG

Dataset: Arsenic (mg/kg) O/T:28/33	
Sample mean (mg/kg), $\overline{x}$	16.768
Sample standard deviation, s	8.4998
Sample size, n	28
Critical concentration, Cc (mg/kg)	38.03



Outliers & non-detects	
Outliers present?	No
Significance level	5%
Outliers excluded	5
Non-detects	#NAME?

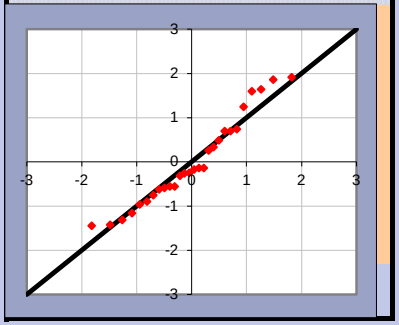


Normality test

Significance le: 5%

Normal distribution

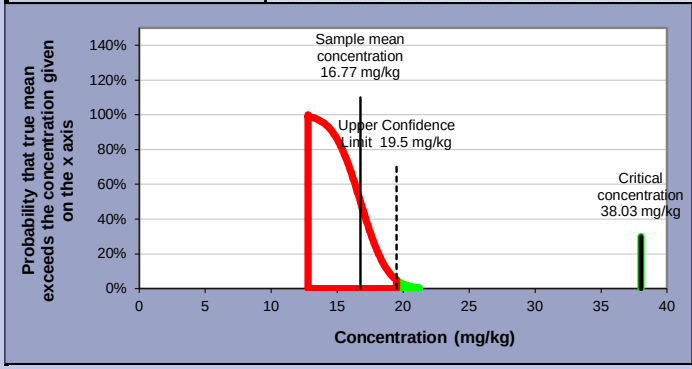
Use: Auto: One-sample



Test scenario:

Planning: is true mean lower than critical concentration (μ < Cc)?

Null hypothesis:	The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc
Alternative hypothesis:	The true mean concentration is less than the critical concentration: μ < Cc



Evidence against Null hypothesis:	**100%**
Base decision on:	evidence level
Evidence level required:	**95%**
Balance of probability?	N/A
Reject Null Hypothesis?	Yes

μ < Cc (re this dataset)

Back to data | Back to summary | Go to outlier test | Go to normality test

Test Results

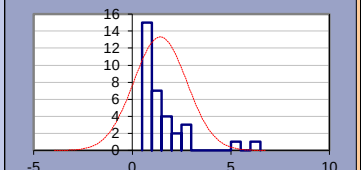
Beryllium (mg/kg)

Client/client ref: Grainger PLC | Site ref: Woodcroft Farm - Horse Arena | Date: 11-Jun-2018

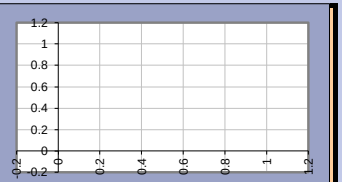
Project ref: GE16943 | Data description: | User details: FG

Dataset: Beryllium (mg/kg)	
Sample mean (mg/kg), $\overline{x}$	1.4212
Sample standard deviation, s	1.3407
Sample size, n	33
Critical concentration, Cc (mg/kg)	1.72

Use Normal distribution to test



Outliers & non-detects	
Outliers present?	Yes
Significance level	5%
Outliers excluded	0
Non-detects	#NAME?

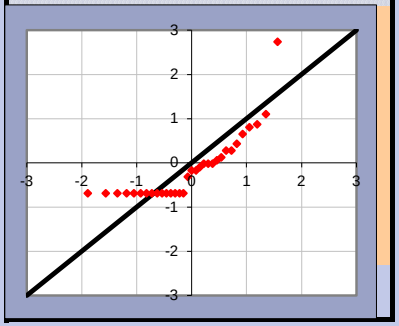


Normality test

Significance le: 5%

Non-normal distribution

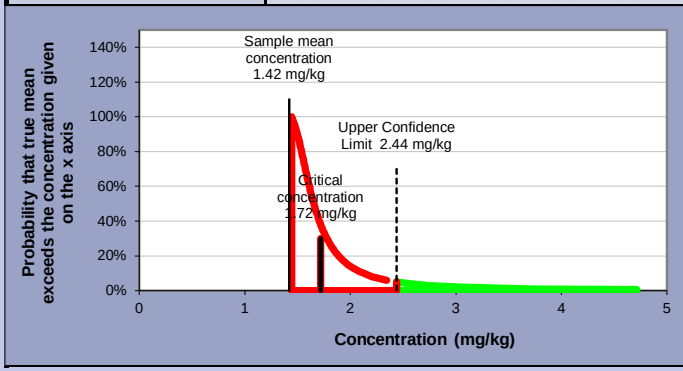
Use: Auto: Chebychev



Test scenario:

Planning: is true mean lower than critical concentration (μ < Cc)?

Null hypothesis:	The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc
Alternative hypothesis:	The true mean concentration is less than the critical concentration: μ < Cc

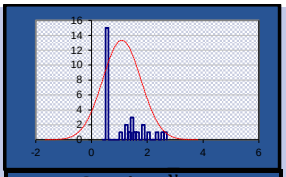


Evidence against Null hypothesis:	**62%**
Base decision on:	evidence level
Evidence level required:	**95%**
Balance of probability?	N/A
Reject Null Hypothesis?	No

Not enough evidence

Back to data | Back to summary | Go to outlier test | Go to normality test

Sample ID	Include?	Beryllium		Outliers
TP229	Y	1.8		
TP306	Y	0.5		
TP306	Y	1.2		
TP306	Y	2		
TP307	Y	1.6		
TP307	N			6.4
TP307	N			2.9
TP308	Y	0.5		
TP308	Y	1.4		
TP308	Y	1.8		
TP309	Y	1.4		
TP309	N			5.1
TP309	Y	1.2		
TP310	Y	0.5		
TP310	Y	1.3		
TP310	Y	0.5		
TP311	Y	1		
TP311	Y	2.3		
TP311	Y	2.6		
TP205	Y	0.5		
TP206	Y	0.5		
TP207	Y	0.5		
TP217	Y	2.5		
TP221	Y	0.5		
TP222	Y	0.5		
TP226	Y	0.5		
TP228	Y	0.5		
TP231	Y	0.5		
TP232	Y	0.5		
TP234	Y	0.5		
TP235	Y	0.5		
TP236	Y	1.5		
TP237	Y	1.4		
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			
	Y			



Sample mean, $\bar{x}$
1.083

Standard deviation, s
0.684

Sample size, n
30

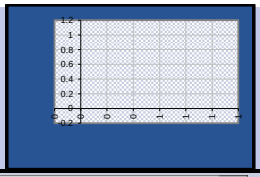
Maxiumum
2.600

Outlier Test Applicability
Not Applicable

Level of Significance,
5%

Tn = 2.216
Tcrit = 2.745

Outliers?
No
(3 selected)



Dataset: Beryllium (mg/kg) O/T:30/33

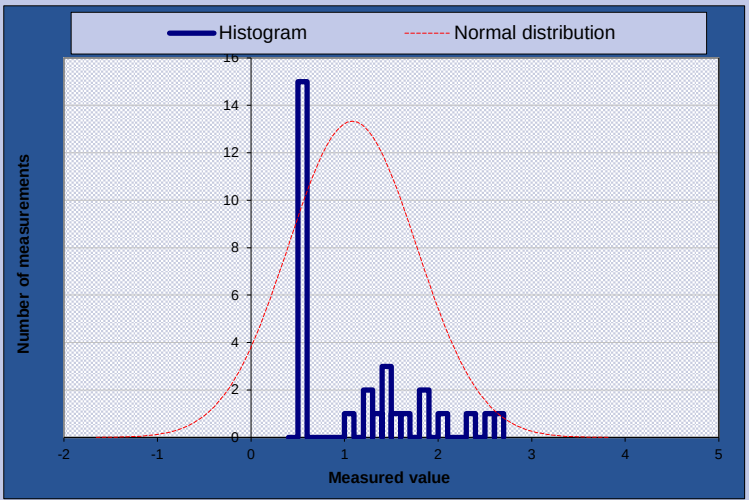
Use Normal distribution to test for outliers

Exclude identified outliers

Show individual summary

Back to summary

Back to data



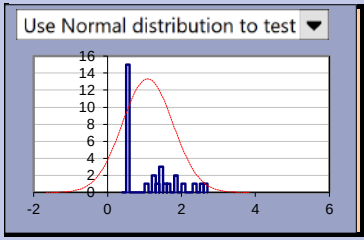
Test Results

Beryllium (mg/kg) O/T:30/33

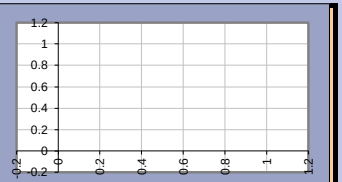
Client/client ref: Grainger PLC | Site ref: Woodcroft Farm - Horse Arena | Date: 11-Jun-2018

Project ref: GE16943 | Data description: | User details: FG

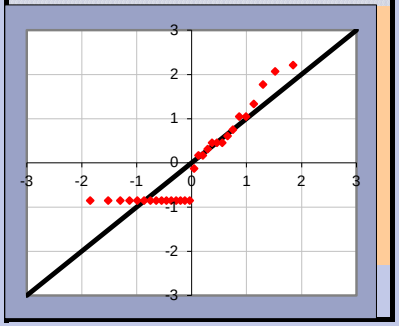
Dataset: Beryllium (mg/kg) O/T:30/33	
Sample mean (mg/kg), $\overline{x}$	1.0833
Sample standard deviation, s	0.6843
Sample size, n	30
Critical concentration, Cc (mg/kg)	1.72



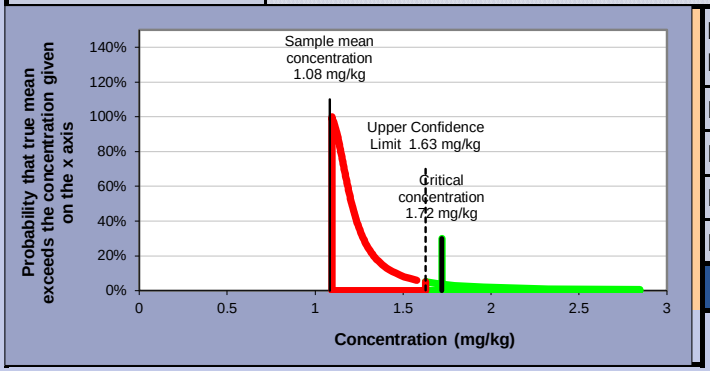
Outliers & non-detects	
Outliers present?	No
Significance level	5%
Outliers excluded	3
Non-detects	#NAME?



Normality test	
Significance le	5%
Non-normal distribution	
Use:	Auto: Chebychev



Test scenario:	Planning: is true mean lower than critical concentration (μ < Cc)?
Null hypothesis:	The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc
Alternative hypothesis:	The true mean concentration is less than the critical concentration: μ < Cc



Evidence against Null hypothesis:	**96%**
Base decision on:	evidence level
Evidence level required:	**95%**
Balance of probability?	N/A
Reject Null Hypothesis?	Yes

μ < Cc (re this dataset)

Back to data | Back to summary | Go to outlier test | Go to normality test

Test Results

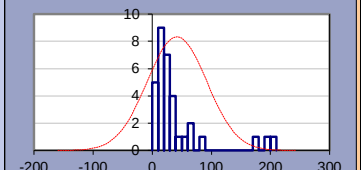
Nickel (mg/kg)

Client/client ref: Grainger PLC | Site ref: Woodcroft Farm - Horse Arena | Date: 11-Jun-2018

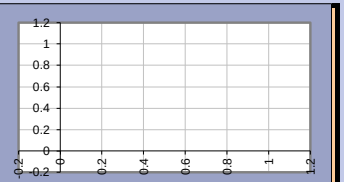
Project ref: GE16943 | Data description: | User details: FG

Dataset: Nickel (mg/kg)	
Sample mean (mg/kg), $\overline{x}$	41.906
Sample standard deviation, s	50.321
Sample size, n	33
Critical concentration, Cc (mg/kg)	180

Use Normal distribution to test



Outliers & non-detects	
Outliers present?	Yes
Significance level	5%
Outliers excluded	0
Non-detects	#NAME?

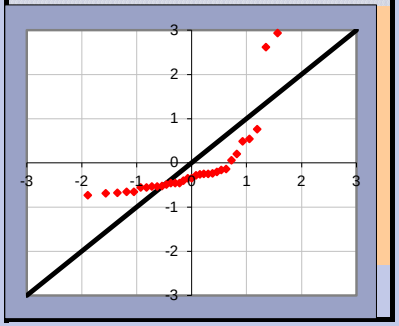


Normality test

Significance le: 5%

Non-normal distribution

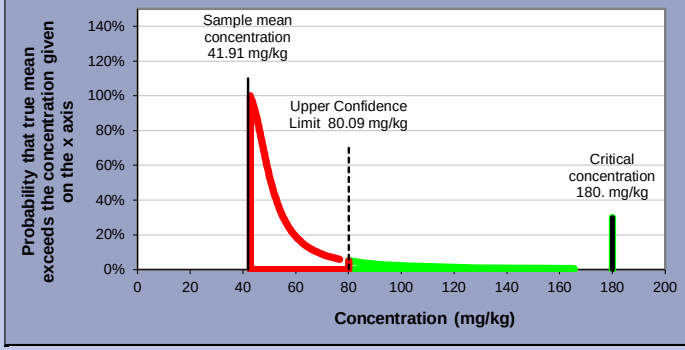
Use: Auto: Chebychev



Test scenario:

Planning: is true mean lower than critical concentration (μ < Cc)?

Null hypothesis:	The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc
Alternative hypothesis:	The true mean concentration is less than the critical concentration: μ < Cc



Evidence against Null hypothesis:	**100%**
Base decision on:	evidence level
Evidence level required:	**95%**
Balance of probability?	N/A
Reject Null Hypothesis?	Yes

μ < Cc (re this dataset)

Back to data | Back to summary | Go to outlier test | Go to normality test

Geo-Environmental

APPENDIX C

BRE Cover System Calculation Sheet



Calculations based on mixed zone (M)	600	mm

Contaminant	Site Data				Expressed as a Factor of Target Guideline Value				Cover Thickness Required for Compliance to Specified Target Guideline Value	
	Contamination of Ground (Cg)	Contamination of Cover (Cc)	Target Guideline Value 1	Target Guideline Value 2	Soil / Target Guideline Value 1	Cover / Target Guideline Value 1	Soil / Target Guideline Value 2	Cover / Target Guideline Value 2	Target Guideline Value 1	Target Guideline Value 2
	Units		Units		Fraction				(mm)	
Arsenic	95	16	38	38	2.5	0.4	2.5	0.4	433	433
Cadmium (Soil pH8)										
Chromium										
Chromium (VI)										
Mercury										
Selenium										
Copper										
Nickel										
Zinc										
Lead										
Boron (Water sol)										
Sulphate (total)										
Phenols										
Sulphide										
Cyanide										
Solvent Extractable Matter										
Benzo(a)pyrene										

Summary		
	Target Guideline Value 1	Target Guideline Value 2
Number of contaminants	17	17
Number of contaminants **with no** thickness calculation	16	16
Breakdown - Number for which no TV specfied	16	16
Breakdown - Number for which no soil specified	16	16
Breakdown - Number for which no cover specified	16	16
Breakdown - Number for which cover > TV	0	0
Number of contaminants **with** thickness calculation	1	1
Breakdown - Number for which no cover required	0	0
Breakdown - Number for which cover required	1	1

Overall thickness of cover required	**433**	**433**

APPENDIX D

Imported Soils Criteria



Geo-Environmental

IMPORTED SOIL SPECIFICATION

for the site at

WOODCROFT FARM, WOODCROFT LANE,

LOVEDEAN, HAMPSHIRE, PO8 9QA

on behalf of

GRAINGER PLC



Report:	**IMPORTED SOIL SPECIFICATION**
Site:	**WOODCROFT FARM, WOODCROFT LANE, LOVEDEAN, HAMPSHIRE, PO8 9QA**
Client:	**GRAINGER PLC**
Date:	**28-06-2018**
Reference:	**GE16943-ISS-180628**
Revision:	**1.0**
Prepared by:	
	FIONA GOODE BSc (Hons), MSc, FGS, MIEnvSc, RSoBRA **SENIOR CONSULTING ENGINEER**
Reviewed by:	
	GAVIN ROBERTS CGeol, BEng (Hons), MSc, FGS **TECHNICAL DIRECTOR**

Geo-Environmental Services Limited
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+44(0)1273 832972 www.gesl.net

AMENDMENT RECORD

Revision ref.	Date	Reasons for amendment	Author's initials
1.0	28/06/2018	First issue	FG

CONTENTS

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2.0	Chemical Composition	1
3.0	Nutritional Composition	5
4.0	Physical Composition	5
5.0	Source Requirements	6
6.0	Testing Rates and Compliance	6

1.0 Introduction

This document sets out the requirements for imported subsoil and Topsoil materials for any project undergoing redevelopment or other works where capping work is required.

Within the specification reference has been made to topsoil and subsoil. Topsoil relates to the top layer of natural soil that can support healthy vegetation growth. Subsoil relates to the layer of soil immediately below the topsoil to the depth of the underlying broken rock or geological parent material.

The specification considers the chemical, nutritional and physical properties of soils that are to be imported onto site in order to ensure materials used are suitable for their intended use and do not introduce any new hazard or pollutant linkage on to the site.

Where there is any discrepancy between this specification and BS3882:2015 or BS8601:2013, the latter documents shall take precedence unless otherwise formally confirmed by the relevant regulator.

2.0 Chemical Composition

The chemical criteria listed below are based on the published Category 4 Screening Levels (C4SLs) by DEFRA and/or the relevant Suitable for Use Levels (S4ULs) published by LQM, for a residential end use with plant uptake. From time to time these values may change in line with regulatory or UK policy changes. Such changes will require revision and re-issue of this document.

Where C4SLs or S4ULs are published for a range of Soil Organic Matter (SOM) values, these ranges and their respective SOM values have been presented and would be considered when assessing compliance with this Specification.

2.1 Method of Analysis

Samples should be analysed using UKAS or MCERTS accredited laboratories. For TPH analysis sample preparation must not include air drying.

2.1.1 Poly Aromatic Hydrocarbon (PAH)

The PAH analysis must include the EPA priority 16.

2.1.2 Total Petroleum Hydrocarbons (TPH)

The analysis for TPH should be undertaken on the ‘as received’ sample and not be subject to any pre-treatment and shall include aliphatic and aromatic carbon banding split.

2.2 Topsoil (0-300mm depth)

Tables 1, 1a, 1b and 1c provide a list of the maximum acceptable concentrations for a range of determinants for imported topsoil.

Determinant	Maximum concentration (mg/kg)
Inorganic	**SOM 6%**
Arsenic (total)	37
Boron (water soluble)	290
Cadmium (total)	11
Chromium (total)	130
Copper (total)	2400
Cyanide (total)	250
Lead (total)	200
Mercury (total inorganic)	40
Nickel (total)	180
pH	5.5 – 7.8
Selenium (total)	250
Sulphate (total)	2000
Zinc (total)	3700
Asbestos	Absent
Organic	
Phenols (total)	110
Poly Aromatic Hydrocarbon (speciated)	See Table 1a
Total Petroleum Hydrocarbon (speciated)	See Table 1b

Table 1 Chemical Specification for Topsoil

Determinant	Maximum Concentration (mg/kg)		
	1% SOM	2.5% SOM	6% SOM
Acenaphthene	210	510	1100
Acenaphthylene	170	420	920
Anthracene	2400	5400	11000
Benz(a)anthracene	7.2	11	13
Benzo(a)pyrene	2.2	2.7	3.0
Benzo(b)fluoranthene	2.6	3.3	3.7
Benzo(ghi)perylene	320	340	350
Benzo(k)fluoranthene	77	93	100
Chrysene	15	22	27
Dibenz(ah)anthracene	0.24	0.28	0.30
Fluoranthene	280	560	890
Fluorene	170	400	860
Indeno(1,2,3CD)pyrene	27	36	41
Naphthalene	2.3	5.6	13.0
Phenanthrene	95	220	440
Pyrene	620	1200	2000

Table 1a Topsoil Specification for Speciated PAH

Determinant	Maximum Concentration (mg/kg)		
	1% SOM	2.5% SOM	6% SOM
Aliphatic			
EC 5-6	42	78	160
EC >6-8	100	230	530
EC >8-10	27	65	150
EC >10-12	130	330	760

Determinant	Maximum Concentration (mg/kg)		
	1% SOM	2.5% SOM	6% SOM
EC >12-16	1100	2400	4300
EC >16-35	65000	92000	110000
EC >35-44	65000	92000	110000
Aromatic			
EC 5-7 (benzene)	70	140	300
EC >7-8 (toluene)	130	290	660
EC >8-10	34	83	190
EC >10-12	74	180	380
EC >12-16	140	330	660
EC >16-21	260	540	930
EC >21-35	1100	1500	1700
EC >35-44	1100	1500	1700
Aliphatic and Aromatic			
EC >44-70	1600	1800	1900

Table 1b Topsoil Specification for Speciated TPH

Determinant	Phytotoxicity GAC (mg/kg)		
	pH <6.0	pH 6.0-7.0	pH >7.0
Zinc	200	200	300
Copper	100	135	200
Nickel	60	75	110

Table 1c Topsoil Specification for phytotoxicity

2.3 Subsoil (300-1000mm depth)

Tables 2, 2a, 2b and 2c provide a list of the maximum acceptable concentrations for a range of determinants for imported subsoil.

Determinant	Maximum concentration (mg/kg)
Inorganic	SOM 6%
Arsenic (total)	37
Boron (water soluble)	290
Cadmium (total)	11
Chromium (total)	130
Copper (total)	2400
Cyanide (total)	250
Lead (total)	200
Mercury (total inorganic)	40
Nickel (total)	180
pH	5.5 – 7.8
Selenium (total)	250
Sulphate (total)	2000
Zinc (total)	3700
Asbestos	Absent
Organic	
Phenols (total)	110
Poly Aromatic Hydrocarbon (speciated)	See Table 2a

Determinant	Maximum concentration (mg/kg)
Inorganic	**SOM 6%**
Total Petroleum Hydrocarbon (speciated)	See Table 2b

Table 2 Chemical Specification for Subsoil

Determinant	Maximum Concentration (mg/kg)		
	1% SOM	2.5% SOM	6% SOM
Acenaphthene	210	510	1100
Acenaphthylene	170	420	920
Anthracene	2400	5400	11000
Benz(a)anthracene	7.2	11	13
Benzo(a)pyrene	2.2	2.7	3.0
Benzo(b)fluoranthene	2.6	3.3	3.7
Benzo(ghi)perylene	320	340	350
Benzo(k)fluoranthene	77	93	100
Chrysene	15	22	27
Dibenz(ah)anthracene	0.24	0.28	0.30
Fluoranthene	280	560	890
Fluorene	170	400	860
Indeno(1,2,3CD)pyrene	27	36	41
Naphthalene	2.3	5.6	13.0
Phenanthrene	95	220	440
Pyrene	620	1200	2000

Table 2a Subsoil Specification for Speciated PAH

Determinant	Maximum Concentration (mg/kg)		
	1% SOM	2.5% SOM	6% SOM
Aliphatic			
EC 5-6	42	78	160
EC >6-8	100	230	530
EC >8-10	27	65	150
EC >10-12	130	330	760
EC >12-16	1100	2400	4300
EC >16-35	65000	92000	110000
EC >35-44	65000	92000	110000
Aromatic			
EC 5-7 (benzene)	70	140	300
EC >7-8 (toluene)	130	290	660
EC >8-10	34	83	190
EC >10-12	74	180	380
EC >12-16	140	330	660
EC >16-21	260	540	930
EC >21-35	1100	1500	1700
EC >35-44	1100	1500	1700
Aliphatic and Aromatic			
EC >44-70	1600	1800	1900

Table 2b Subsoil Specification for Speciated TPH

Determinant	Phytotoxicity GAC (mg/kg)		
	pH <6.0	pH 6.0-7.0	pH >7.0
Zinc	200	200	300
Copper	100	135	200
Nickel	60	75	110

Table 2c Subsoil Specification for phytotoxicity

3.0 Nutritional Composition

The nutritional criteria listed below are based on BS3882:2015 for topsoil and BS8601:2013 for subsoil. In the absence of published criteria, current guidance and best practice has been applied to derive appropriate criteria.

3.1 Topsoil & Subsoil

Table 3 details the minimum acceptable concentrations for imported topsoil and subsoil. The nutrient concentrations set out in Table 3 for Topsoil are based on those set out in BS3882:2015 which states *"Multipurpose topsoil is the grade suited to most situations where topsoil is required; however, there can be situations where specific purpose topsoil is required"*. In the event that an alternative specific Topsoil grade is required, i.e. acidic; calcareous; low fertility; low fertility acidic; or low fertility calcareous, the compliance criteria set out in BS3882:2015 shall be applicable in place of those set out in Table 3 below.

Topsoil/Subsoil	Parameter	Concentration
Topsoil (multipurpose grade only)	Phosphorous	16 – 140 mg/l
	Potassium	121 – 1500 mg/l
	Magnesium	51 – 600 mg/l
	Nitrogen	0.15 % m/m
	Carbon:nitrogen ratio	<20:1
Subsoil	Phosphorous	16 mg/l
	Potassium	121 mg/l
	Magnesium	51 mg/l
	Nitrogen	0.15 %
	Carbon:nitrogen ratio	<20:1

Table 3 Nutritional Specification for Topsoil and Subsoil

4.0 Physical Composition

The physical criteria listed below are based on BS3882:2015 Specification for Topsoil. In the absence of published criteria, current guidance and best practice has been applied to derive appropriate criteria.

4.1 Topsoil

Table 4 details the physical suitability requirements for imported topsoil and subsoil. Table 4 sets out acceptability criteria from BS3882:2015 for multipurpose Topsoil. In the event that an alternative specific Topsoil grade is required, i.e. acidic; calcareous; low fertility; low fertility acidic; or low fertility calcareous, the compliance criteria set out in BS3882:2015 shall be applicable in place of those set out in Table 4 below.

Topsoil/Subsoil	Parameter	Specification requirements
Topsoil (multipurpose Topsoil only)	Textural Classification	Sandy clay loam, sandy loam, loamy sand, sandy silt loam (as defined in BS3882:2015, Figure 1)
	Loss on Ignition	3 - 20% (for 5-20% clay soil) 5 - 20% (for 20-35% clay soil)
	Maximum Stone content:	>2mm = 30% >20mm = 10% >50mm = 0%
Subsoil	Textural Classification	Refer to BS8601:2013 Figure 1
	Loss on Ignition	2%
	Maximum Stone content:	>2mm = 40% >20mm = 20% >75mm = 0%

NB: Topsoil and Subsoil must be free from glass, brick fragments, plastic, metal, asbestos and other deleterious materials.

Table 4 Physical Specification for Topsoil & Subsoil

5.0 Source Requirements

5.1 Topsoil and Subsoil

The following will be provided with all soils imported to site:

- A site plan detailing the location and address of the source site, including grid reference.
- Location description of source material, including historic and current site uses.
- Sample analysis results of material at source, including details of laboratory, date of sampling, date samples received by laboratory etc.

5.2 Manufactured soils

Where natural soils are unavailable manufactured soils may be utilised, and the following should be provided:

- Details of the soil manufacturing process, including criteria for received soils, quality control procedure and validation protocol.
- Soils should be tested at a minimum ratio of one sample per 50m^3.

6.0 Testing Rates and Compliance

Sampling shall be undertaken in accordance with BS3882:2015 and BS8601:2013.

6.1 Topsoil

Where natural sourcing is proposed, the provenance of the material shall be determined by analysis of the soils at a minimum rate of 3No. samples per source site (up to 250m^3) and 1 sample per 250m^3 thereafter. Imported soils should be sampled once it has been laid on the site to support the analysis provided by the source supplier.

Where Topsoil is derived from a manufactured source, testing would be undertaken at a rate of 1 sample per 50m^3, with a minimum of 3No. tests for any given potential source material (or production batch).

6.2 Subsoil

Where the source of the material is known validation sampling should be undertaken at a minimum rate of 3 samples per source (up to 250m³) and 1 sample per 250m³ thereafter. Imported soils should be sampled once it has been laid on the site to support the analysis provided by the source supplier.

Where subsoil is derived from a manufactured source, testing would be undertaken at a rate of 1 sample per 50m³, with a minimum of 3No. tests for any given potential source material (or production batch)

Where the source of the material is not known the validation sampling should be undertaken in-line with the testing rates as set out for cover systems to ensure the materials are suitable for their intended use. Further guidance on minimum testing under this scenario is presented in Section 6.3 below.

6.3 Cover Systems

Where a cover system/ capping layer is proposed as part of the required remedial measures, sampling frequency will follow the guidance set out by the NHBC in their guidance for clean cover systems (2010) and supplemented within NHBC Technical Extra Guidance Issue 8, November 2012, outlined below:

- Sites with more than 30 plots testing should be conducted at a rate of one plot in four, with a minimum of 10 tests across the site;
- Sites with between 20 – 30 plots testing should be conducted at a rate of one plot in three, with a minimum of 7 tests across the site;
- Sites with between 5 -20 plots testing should be conducted at a rate of one plot in two with a minimum of 5 tests across the site;
- Sites with fewer than 5 plots testing should be conducted in every plot with a minimum of 3 tests across the site.

6.4 Sample failure

In the event that a sample fails to meet the specified criteria for any parameter the Environmental Consultant should be contacted for advice on the suitability of the materials.

Further testing may be required to provide reassurance that the exceedances are not representative of the soil and to provide clarification whether the soil is suitable for importation and/or proposed use.

6.5 Timing

Sampling and analysis undertaken by a manufactured topsoil supplier shall be no earlier than two weeks from the date of import, any results which are older than two weeks will be deemed not to be representative of the soils to be imported and rejected. Results showing consistency of batching may be requested to demonstrate consistency of the physical, chemical and nutritional composition of the material.

Imported soil suppliers and groundwork contractors are required to take reasonably practicable measures to ensure that compliance with this Specification does not hinder formal completion of individual plots or developments.

6.6 General Compliance

All analytical suites shall correspond with the chemical, nutritional and physical compliance criteria (as set out in Tables 1 to 4). The soil supplier shall ensure that the analytical limits of detection are equal or lower than the compliance values presented within this Specification. Where either testing suites or limits of detection do not comply with this Specification, the entire set of results shall be rejected.

Geo-Environmental

ASBESTOS MANAGEMENT PLAN

for the land at

WOODCROFT FARM PHASES 2B & 3,

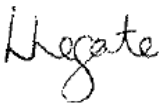
WOODCROFT LANE, LOVEDEAN,

HAMPSHIRE, PO8 9QA

on behalf of

VISTRY HOMES SOUTHERN



Report:	**ASBESTOS MANAGEMENT PLAN**
Site:	**WOODCROFT FARM PHASES 2B & 3, WOODCROFT LANE, LOVEDEAN, HAMPSHIRE, PO8 9QA**
Client:	**VISTRY HOMES SOUTHERN**
Date:	**28/08/2020**
Reference:	**GE18761-AMP-AUG20**
Version:	**1.0**
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FIGURES

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FIGURE 7	Soil Contamination Exceedances - Farmyard Area
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APPENDICES

APPENDIX A	CAR-SOIL2012 Decision Support Tool

AMENDMENT RECORD

Revision ref.	Date	Reasons for amendment	Prepared by	Reviewed by	Approved by
1.0	28/08/2020	Initial issue	FG	LL	GE

1.0 INTRODUCTION

1.1 General

Geo-Environmental Services Limited (Geo-Environmental) was appointed by Vistry Homes Southern, to compile an Asbestos Management Plan (AMP) in relation to the proposed residential development on land at Woodcroft Farm Phases 2B and 3, Woodcroft Lane, Lovedean, Hampshire, PO8 9QA herein referred to as 'the site' (Figure 1). The AMP has been developed in conjunction with the Remediation Strategy and Verification Plans, and the Materials Management Plan also developed for the site as detailed below:

- Remediation Strategy and Verification Plan – Chalk Pit, ref: GE16943 – RSVP-CP-V5.0 - AUG20, dated August 2020
- Remediation Strategy and Verification – Farmyard, ref: GE16943 – RSVP-FY-V5.0 - AUG20, dated August 2020
- Remediation Strategy and Verification – Horse Arena, ref: GE16943 – RSVP-HA-V4.0 - AUG20, dated August 2020
- Materials Management Plan, ref: GE18761-MMP-AUG20, dated August 2020

1.2 Objectives

The Asbestos Management Plan (AMP) sets out the proposed methodology and best practice for works to be undertaken on the subject site to support its development for a residential end use to ensure that adequate protection is in place to mitigate potential risks to human health.

2.0 BACKGROUND

This AMP has been developed for the site from the findings of the various phases of assessment undertaken across the site. The presence of asbestos has been identified on the site within the farmyard area and the chalk pit area, both as ACMs and as loose fibres within the soil. As such it was considered than an Asbestos Management Plan (AMP) was required to support the ongoing works and development of the site.

The following reports detail the phases of site investigation works undertaken at the site:

- Geoenvironmental and Geotechnical Ground Investigation Report, undertaken by Peter Brett Associates LLP on behalf of Grainger PLC, Project ref: 21834/030, Doc ref: R02/rev01, Dated July 2013.
- Intrusive Site Investigation Letter Report ref: GE16662/FG02/170929 undertaken on behalf of Grainger PLC and Linden Homes South, Dated 29th September 2017
- Remediation Strategy and Verification Plan – Chalk Pit, ref: GE16943 – RSVP-CP-V5.0 - AUG20, dated August 2020
- Remediation Strategy and Verification – Farmyard, ref: GE16943 – RSVP-FY-V5.0 - AUG20, dated August 2020
- Remediation Strategy and Verification – Horse Arena, ref: GE16943 – RSVP-HA-V4.0 - AUG20, dated August 2020

A brief overview of salient findings of the reports is presented below. For further information, the individual reports (listed above) should be referred to directly.

2.1 Overview

The wider site's previous uses included use as a farm with associated barns and buildings, scrapyard, horse arena and a former chalk pit which was infilled as an inert landfill.

During the Geo-Environmental, August 2017, Ref: GE16662/FG02/170929 intrusive investigation, the farm complex area, shown in Figure 2, comprised a farm house located in the south east of the complex area, with private gardens to the front and rear of the property. To the north and west of the farm house were a number of stable blocks that at the time of the site investigation works were occupied by a number of horses. The stable blocks were constructed on hard standing, generally concrete, and comprised a mixture of wooden stables and stables constructed within breeze block barns. These barns were noted to have corrugated roofs that have the potential to contain asbestos.

In the central area and west of the farm complex area was an area utilised for parking, and the storage of scrap type items. This included engines, vehicles (in varying states of repair), a skip of metal, and other assorted metal items. There was also evidence of recent burning activities being undertaken within this area, piles of ash and blackened patches were noted. A manure heap was also located with the central northern part of this area.

This farmyard area was subsequently demolished with all buildings and areas of hardstanding being removed.

The Peter Brett, 2013 investigation, Ref: 21834/030 reported that Made Ground was encountered within all the locations investigated at the infilled pit where landfill materials were placed during the 1970s. The Made Ground (Landfill) was found to be variable in composition and comprised brown grey and black clay with variable proportions of sand and gravel. Some timber and organic matter were encountered within the Made Ground. Some of the clay materials within the landfill were noted to have organic odour. The Made Ground within the infilled pit locally contained fragments of concrete and brick sections up to 1.20m long and 0.20m thick. The Made Ground was encountered to between 0.60m (TP04) to a maximum depth of 5.80m below ground level (WS02) in the infilled pit. A fragment of cement bound tile suspected to contain asbestos that was detected in TP02 within the infilled pit.

Asbestos screening identified detectable asbestos fibres within the Made Ground from one location. Asbestos fibres were identified within the Made Ground in the landfill area and the horse arena. It was also considered likely that asbestos would be identified within the Made Ground in the vicinity of the farm buildings.

A supplementary geotechnical and geo-environmental investigation was undertaken by Geo-Environmental Services Limited in August 2017, Ref: GE GE16662/FG02/170929. Encountered ground conditions were found to comprise a mantle of Topsoil and/or Made Ground overlying, clay, gravelly clay and sandy clay, with bands of flint cobbles and bands of sandy clay in certain locations. Chalk was encountered within boreholes BH301 and BH303 at depths of 12.90m bgl and 1.90m bgl respectively. Made Ground was encountered within all the trial pits located within the farmyard complex area and was also encountered in TP211, TP213 and TP214. The Made Ground was found to comprise bricks, brick fragments, chalk of cobble and gravel size, ashy deposits, plastic, wood, possible asbestos (tiles and sheets), concrete, tarmac, and charcoal. Made Ground was encountered to a maximum depth of 2.30m bgl, although TP225 was terminated within the Made Ground at 0.60m bgl so the full depth of Made Ground in this location was not established. Due to the use of the farm buildings as stables, and horses being present at the time of the investigation, it was not possible to investigate beneath these existing farm/stable buildings.

Soil samples collected during this investigation were submitted for asbestos screening and where asbestos

was identified quantification testing was carried out. Asbestos was identified within 3No. locations within the farmyard area. Given the age of the buildings still present on site at the time of the intrusive investigation works it was considered that there was the potential for asbestos to be present within the building fabric. Previous investigations undertaken by third parties also identified the presence of asbestos within soils within the farmyard complex area.

Due to the restriction in access to some areas of the farmyard complex during the initial investigation works, it was recommend that following demolition of the buildings on site, further intrusive investigations were carried out to identify and delineate the location of asbestos within the Made Ground within the farmyard area.

Subsequent investigations undertaken by Geo-Environmental in May 2018 (investigation findings reported in reports, GE16943 – RSVP-CP-V5.0 - AUG20, GE16943 – RSVP-FY-V5.0 - AUG20 and GE16943 – RSVP-HA-V4.0 - AUG20) were to carry out additional targeted investigation works within specific areas of the site including, but not exclusive to, the farmyard area (following demolition of the buildings), the chalk pit/ landfill area and the horse arena.

Intrusive investigation works undertaken with the farmyard area were undertaken following the demolition of the existing farm buildings. Soil samples were submitted for asbestos screening and where asbestos was identified quantification testing was carried out. Three samples within the farmyard area identified the presence of asbestos. The asbestos identified within TP230 was in the form of asbestos tiling. The tile fragments discovered were relatively intact within the ground. During the additional delineation investigation work carried out in May 2018, potential asbestos containing materials (ACM) were observed within stockpile demolition material associated with the demolition of the farmyard buildings. In addition, sporadic ACM's were observed within the surface soils across the farmyard area.

Additional intrusive investigation works were also undertaken within the chalk pit/ former landfill area of the site. Soil samples collected during this phase of investigation works were submitted for asbestos screening and where asbestos was identified quantification testing was undertaken. Three samples identified the presence of asbestos, in addition due to the extent and variation of the Made Ground/ landfill materials encountered within this area of the site it was considered prudent to assume the potential for sporadic presence of ACM within the Made Ground across the chalk pit/ former landfill area.

Asbestos was not identified elsewhere across the site.

2.2 Proposed Site Use

The proposed development comprises a development of up to 288No. homes with, a new access road from Eagle Avenue, internal access roads, associated car parking, open space and landscaping (private gardens and communal). Should the proposed development proposals change the Asbestos Management Plan (AMP) would remain valid for construction works undertaken on the site, subject to a review of the risk assessment.

2.3 Conceptual Site model

Remediation works are proposed to break the identified plausible pollutant linkages associated with respect to the presence of asbestos within specific areas of the site.

This would be undertaken as several phases of works on site and only within the specific areas identified:

1) Reduced dig to the minimum depths indicated on Figure 9 within the Farmyard area only to achieve the required formation level to accommodate the required soil cover thickness, or the full extent of the Made Ground where Made Ground is shallower.
2) It is proposed to retain and re-use the excavated soils (without treatment) within garden plots (at depth beneath the soil cover system) where levels require raising to achieve development levels and hence the requirement for the volume of excavated soil being generated from the reduced dig. These works would be undertaken inline within the Materials Management Plan (MMP) ref: GE18761-MMP-AUG20.
3) If excavated soils are to be stored on site prior to their removal they will need to be placed on and covered with sheeting to prevent the spread of any asbestos or asbestos containing material. It is preferable for excavated soils from the reduced dig to be relocate directly to the final re-use location without stockpiling so as to avoid double handling, stockpile controls and the like.
4) Material re-use is subject to the requirements of this and associated remedial strategies which apply to the development within the overall site boundary and no materials are to be excavated or moved until a Materials Management Plan is in place and the required QP Declaration has been submitted to CLAIRE as required under the DOWCOP. This will include agreement in principal for the proposed re-use and agreement of the RSVPs for the site with the regulators (Local Authority and Environment Agency. Movement of materials outside of these protocols would be considered an illegal waste process and subject to legal action and financial penalties applied by the regulators to the developer and/or groundworks contractor.

Farmyard Area (FY) – Phase 2B and 3:

5) Installation of a soil cover system in garden areas and areas of soft landscaping to break the pollutant linkage for the contaminants identified within the Made Ground soils in the farmyard area, and to also provide suitable growing media. Where the reduced dig does not remove all of the Made Ground and hence the cover system is to be laid over Made Ground, it shall incorporate a 150mm thick break layer formed of stone or crushed concrete with a geotextile membrane laid above and beneath, and overlain by a deter to dig geofabric to act as a visible deterrent overlain by a minimum 300mm thickness of subsoil and a minimum of 300mm of Topsoil. Where the reduced dig removes all Made Ground and exposes uncontaminated natural strata and is validated as such, the soil cover system shall comprise clean subsoil and a minimum 300mm of suitable Topsoil, the thickness of subsoil in this scenario will defined by the difference between the finished garden level (minus 300mm Topsoil) and the reduced dig level. The cover system is likely to be completed with Topsoil placement towards the end of plot specific development with the placement of Topsoil.

Chalk Pit/ Former Landfill Area (CP)- Phase 3:

6) Installation of a soil cover system in private garden areas and areas of soft landscaping to break the source, pathway receptor pollutant linkage for the contaminants identified within the chalk pit and landfill area, and to also provide suitable growing media. The cover system is to comprise a 150mm thick break layer formed of stone and crushed concrete with a geotextile membrane laid above and beneath, overlain by a deter-to-dig membrane, such as an Alert Geofabric to act as a visible barrier to excavation, 600mm thickness of subsoil and Topsoil to include a minimum of 300mm of Topsoil. The cover system is likely to be completed with Topsoil placement towards the end of plot specific development with the placement of Topsoil on given plots.

The proposed capping system would be achieved by undertaking a reduced dig within identified specific Plots within the farmyard area only and the installation of a capping system within all Plots in the identified

Farmyard and Chalk Pit areas. These works would be monitored through observations and records providing a documentary evidence trail of the materials if removed from site. Validation works would be undertaken upon completion of the remediation works to demonstrate the depth of reduced dig and the thicknesses and composition of the capping layer installed.

The aim of the remediation is not to remove all contamination identified on site but to reduce the identified risk to an acceptable level with respect to human health in terms of asbestos.

3.0 ASBESTOS

Asbestos is a naturally occurring mineral which was used as a building material up until 2000 and is commonly found as either free fibres or as part of asbestos-containing material (ACMs) in the ground during site development.

Three main types of asbestos are commonly used in the UK:

1) Crocidolite – commonly known as blue asbestos;
2) Amosite – commonly known as brown asbestos and
3) Chrysotile – commonly known as white asbestos.

Asbestos is responsible for over 5000 deaths every year. Younger people, if routinely exposed to asbestos fibres over time, are at greater risk of developing asbestos-related disease than older workers. This is due to the time it takes for the body to develop symptoms after exposure to asbestos (latency). Exposure to asbestos can cause four main diseases:

- Mesothelioma (a cancer of the lining of the lungs; it is always fatal and is almost exclusively caused by exposure to asbestos)
- Asbestos-related lung cancer (which is almost always fatal)
- Asbestosis (a scarring of the lungs which is not always fatal but can be a very debilitating disease, greatly affecting quality of life)
- Diffuse pleural thickening (a thickening of the membrane surrounding the lungs which can restrict lung expansion leading to breathlessness.)

Hodgeson and Darton (2000) epidemiological studies reported:

> "At exposure levels seen in occupational cohorts it is concluded that the exposure specific risk of mesothelioma from the three principal commercial asbestos types is broadly in the ratio 1:100:500[1] for chrysotile, amosite and crocidolite, respectively". Amosite or crocidolite (amphipoles) pose a greater risk than that from the same level of exposure to chrysotile"

([1] 1:100:500 relates to the risk rating, a factor of 1 for chrysotile, 100 for amosite, 500 for crocidolite. In essence at exposure to the same fibre levels you are 500 more times likely to get mesothelioma from exposure to crocidolite than to chrysotile.)

3.1 Control of Asbestos Regulations

The Control of Asbestos Regulations 2012 came into force on 6th April 2012. The following section summarises the main requirements of the regulations, reference to the regulations is needed to understand the detailed requirements.

"Control measure" means a measure taken to prevent or reduce exposure to asbestos (including the provision of systems of work and supervision, the cleaning of workplaces, premises, plant and equipment, and the provision and use of engineering controls and personal protective equipment).

The "control limit" refers to the concentration of asbestos fibres in any localised atmosphere, measured and averaged over a continuous period of four hours, in accordance with the 1997 World Health Organisation's recommended method. At the moment, the control limit is 0.1 asbestos fibres per cubic

centimetre of air (0.1 f/cm^3). The control limit is not a 'safe' level and work activities involving asbestos should be designed to be as far below the control limit as possible. HSE has progressively tightened the control limit since 1987.

The Control of Asbestos Regulations 2012 identifies two scenarios for consideration and where control is necessary:

Designated Asbestos Areas – Any area where work with asbestos is being carried out and should be isolated with suitable barriers and warning notices identifying the area as an asbestos area. However, this requirement does not apply to non-licensable work where asbestos fibres will be much lower than the asbestos in an air control limit.

A Respirator Zone – is an area within an asbestos area where exposure may exceed the asbestos control limit. Typically a respirator zone will be a designated area within an enclosure. Only employees who have been suitably trained in the use of RPE (Respiratory Protective Equipment) and have other relevant health and safety training can enter the respirator zone. This includes not only employees engaged in the asbestos work but also personnel carrying out other activities such as air monitoring, emergency services etc.

Neither of these descriptions are considered to apply to this site, however, should conditions change with the release of excessive fibres these scenarios may become relevant.

Work involving some lower risk asbestos-containing materials (e.g. asbestos cement products and textured decorative coatings, among others) can be carried out if a risk assessment demonstrates that the control limit will not be exceeded and that any exposure to asbestos is expected to be 'sporadic and of low intensity'. The control limit for this type of non-licensed work is 0.6 asbestos fibres per cubic centimetre of air (0.6 f/cm^3), measured over a ten-minute period. Any work which is likely to result in exposures at or above this level cannot be considered to be sporadic and of low intensity and should therefore only be carried out by a licensed contractor.

For the purposes of the Regulations, work with asbestos is not “short duration work” if, in any seven day period

- work, including any ancillary work liable to disturb asbestos, takes more than two hours; or
- any person carries out that work for more than one hour.

The Regulations state no exposure to asbestos will be “sporadic and of low intensity” if the concentration of asbestos in the atmosphere exceeds the control limit.

Notification of work with asbestos, establishment of “designated areas” and creation of health records and medical surveillance do not apply where the exposure to asbestos of employees is sporadic and of low intensity; and it is clear from the risk assessment that the exposure to asbestos of any employee will not exceed the control limit.

A Risk Assessment of the proposed work which potentially exposes employees to asbestos must be carried out by the employer and identify the steps needed to protect the workers from the identified type(s) of asbestos, determine the nature and degree of exposure which may occur and consider the effects of control measures which have been or will be taken.

The employer must consider the results of monitoring of exposure, set out the steps to be taken to prevent that exposure or reduce it to the lowest level reasonably practicable. The employer must consider the results of any medical surveillance that is relevant; and include such additional information needed in order to complete the risk assessment.

The risk assessment must be reviewed regularly, and immediately if:

- There is reason to suspect that the existing risk assessment is no longer valid;
- There is a significant change in the work to which the risk assessment relates; or
- The results of any monitoring carried out show it to be necessary, and where, as a result of the review, changes to the risk assessment are required, those changes must be made and, where they relate to the significant findings of the risk assessment or are themselves significant they must be recorded.

A written plan of work must be produced that details the work to be carried out and a copy of the plan of work must be kept at those premises where the work is being carried out and must set out the methods to be applied where the work involves the handling of asbestos or materials containing asbestos, relating to the equipment to be used for:

i. Protection and decontamination of those carrying out the work, and
ii. Protection of other persons on or near the worksite.

The employer must prevent as is reasonably practicable or reduce exposure to asbestos where it is not reasonably practicable to prevent such exposure and take the measures necessary to reduce exposure to asbestos of any such employee to the lowest level reasonably practicable by measures other than the use of respiratory protective equipment, and ensure that the number of any such employees exposed to asbestos at any one time is as low as is reasonably practicable.

Where it is not reasonably practicable to prevent the exposure to asbestos in order of priority employers must:

- Design and use appropriate work processes, systems and engineering controls and provide and use of suitable work equipment and materials in order to avoid or minimise the release of asbestos, and
- Control exposure at source, including adequate ventilation systems and appropriate organisational measures, and the employer must so far as is reasonably practicable provide any employee concerned with suitable respiratory protective equipment

Where it is not reasonably practicable for the employer to reduce the exposure to asbestos to below the control limit by the measures referred to above then, in addition to taking those measures, the employer must provide that employee with suitable respiratory protective equipment which will reduce the concentration of asbestos in the air inhaled by that employee (after taking account of the effect of that respiratory protective equipment) to a concentration which is:

- below the control limit; and
- as low as is reasonably practicable.

Personal protective equipment provided must be suitable for its purpose and comply with any provision of the Personal Protective Equipment Regulations 2002; or in the case of respiratory protective equipment be of a type approved, or must conform to a standard, approved by the HSE. In this case the Health and Safety Executive Equipment and Method sheet EM6 "Asbestos Essential – Non Licensed tasks" is appropriate and can be found at:

http://www.hse.gov.uk/pubns/guidance/em6.pdf

Employers must ensure that no employee is exposed to asbestos in a concentration in the air inhaled which exceeds the control limit. If the control limit is exceeded employers must immediately inform any employees concerned and their representatives and ensure that work does not continue in the affected area until adequate measures have been taken to reduce exposure to asbestos below the control limit, and ensure a very clean working environment.

Employers must ensure, so far as is reasonably practicable, that the plan is carried out in accordance with that plan and any subsequent written changes to it.

Employees must be given the appropriate level of information, instruction and training, and use any control measures provided and maintain safety equipment, including PPE and PRE in a clean condition.

The regulations impose a duty that asbestos is not spread (i.e. uncontrolled spreading/release, rather than controlled relocation of Made Ground as proposed for this site)

The area of working has to be designated and if respiratory equipment is to be used, that area has to be specifically designated.

If the control limit is likely to be exceeded air monitoring is required. In relation to work carried out indoors, or enclosed spaced, a "certificate of reoccupation" is required, prior to any persons entering without the use of control measures. The person carrying out such monitoring has to be appropriately qualified.

For licensed and notifiable non-licensed work with asbestos, health records and medical surveillance is required for any persons undertaking that work.

Adequate washing and changing facilities must be provided for employees who are exposed to asbestos. When protective clothing is issued relating to asbestos adequate facilities for the storage of that protective clothing, and personal clothing not worn during working hours must be provided where an employer is required to provide respiratory protective equipment, adequate facilities for the storage of that equipment must be provided. The facilities for the storage of personal protective clothing, personal clothing not worn during working hours and respiratory protective equipment must be separate from each other.

3.2 CAR-SOIL

The Control of Asbestos Regulations 2012 applies to all work with asbestos but focuses on exposure to asbestos from ACM within buildings. CAR-SOIL ('Control of Asbestos Regulations 2012 - Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials: Industry guidance') published in 2016 provides guidance to assist employers with compliance with CAR2012 when undertaking work on soils and construction and demolition materials which contain or may contain asbestos. (see https://www.claire.co.uk/component/phocadownload/category/36-asbestos-in-soil?download=545:jiwg-car-

soil-guidance)

This guidance includes advice for ascertaining whether the proposed work with asbestos containing soils is non-licensed work, notifiable non-licensed work or licensed work. CAR-SOIL also provides useful guidance for the interpretation of asbestos quantification testing results with regard to ascertaining whether asbestos is present in large, moderate, low or very low quantities in terms of the regulations.

Given the site investigation findings detailed earlier, it is considered that the work with the asbestos containing soils at the site would be non-licensed work. This decision has been reached with reference to Figure 2 on page 42 of CAR-SOIL as follows:

- The work on asbestos contaminated soil is 'Ground Remediation Works'
- The work with asbestos will be unlikely to generate fibre release which will exceed the control limit
- The work is not with 'clearly identifiable' insulation or AIB ('clearly identifiable' in this context means the ACM form could be identified *in situ* by a competent and trained person, the insulation/lagging encountered by the previous investigations was identified as such by laboratory testing)
- The work is with fibrous 'debris' and all other ACMs (i.e. asbestos cement)
- The asbestos material is degraded at the outset of the work
- The asbestos is present in low levels (maximum asbestos quantification result of 0.018% w/w)

This decision has also been considered within the Joint Industry Working Group's 'Decision Support Tool for the Categorisation of Work Activities Involving Asbestos in Soil and Construction & Demolition Materials in accordance with the Control of Asbestos Regulations 2012: v2.1 March 2017'. This spreadsheet tool provides a decision support platform to aid the categorisation of work under CAR2012 and supports the CAR-SOIL guidance.

The decision support tool indicated that the work with the Made Ground soils at this site would be non-licensed work. A copy of this decision support tool and its results for the site is included in Appendix A.

3.3 Site Investigation Findings

The ground conditions on site have been established through several phases of intrusive investigation. Encountered soils comprised a mantle of Topsoil and/ or Made Ground overlying Head Deposits and/ or soils of the Lambeth Group which in turn in some locations overlay the Tarrant Chalk.

The ground conditions were observed to vary over relatively short distances, i.e. within the extent of some of the trial pits/trenches excavated. In addition, the depth to the Chalk was observed to vary significantly such that whilst Chalk was encountered at relatively shallow depth in some of the exploratory holes, it was not encountered in others.

Representative environmental soil testing was carried out based on the land use assessment for the site. It was considered that remedial action would be warranted in specific areas of the site; the farmyard, the chalk pit/ former land and the horse arena. Remedial action was not considered necessary for the majority of the site.

Based on the soil analysis undertaken and the presence/quantification of asbestos. The results show only a small percentage of samples were recorded as containing asbestos, these samples were located within the Farmyard and Chalk Pit areas only. However given that ACMs were potentially noted to be present within stockpiles in the farmyard area and the nature of the fill/ Made Ground material encountered within the chalk

pit area, it was considered that there was the potential for further asbestos to be present within the Made Ground across both the farmyard area and the chalk pit area of the site. Chrysotile was positively identified in six locations on site, three within the farmyard area and three within the chalk pit area, in TP225 at 0.25m bgl (August 2017), TP239 at 0.50m bgl (August 2017), TP315 at 0.20m bgl (May 2018), TP213 at 1.00m bgl (August 2017), TP302 at 0.20m bgl (May 2018) and WS407 at 3.00-4.00m bgl (May 2018) and Crocidolite in TP213 at 1.00m bgl (August 2017).

Quantification testing for asbestos was not undertaken during both the August 2017 and May 2018 investigations undertaken for the site. The results are summarised in Table 1.

From a risk assessment point of view it has to be assumed that the results reported are representative of the levels present within the Made Ground across the site (that is unless further quantification was to be carried out. However, further quantification may not be appropriate if the chosen control method is clean capping or off-site disposal. It may be appropriate if selective hot spot removal was considered, but this is considered inappropriate for this site).

Above concentrations of 0.1% w/w asbestos in soil these materials are considered to be hazardous waste and would have to be treated as such if disposed of off-site. The quantification result from TP225, TP239, TP213 and WS407 shows the materials identified within these locations to be above this level.

Location	Depth (m bgl)	Type	Free Fibres (%)	Total (%)
TP225	0.25	Chrysotile	<0.001	3.54
TP239	0.50	Chrysotile	<0.001	25.0
TP315	0.20	Chrysotile (fibre bundle)	<0.001	<0.001
TP213	1.00	Chrysotile and Crocidolite	<0.001	2.66
TP302	0.20	Chrysotile	<0.001	0.726
WS407	3.00-4.00	Chrysotile	<0.001	0.147

Table 1 Asbestos Results Reported for the site.

3.4 Conceptual Site Model - For Asbestos Only

For a human health risk to exist there needs to be one or more contaminant- pathway-receptor linkages i.e. a “pollutant linkage”, by which a relevant receptor might be affected by the contaminants in question. In other words, for a risk to exist there must be contaminants present in, on or under the land in a form and quantity that pose a hazard, and one or more pathways by which they might pollute controlled waters or harm human health.

Defra (2012) in Environmental Protection Act Part: 2a – Contaminated Land Statutory Guidance provides the following definitions:

a) “contaminant” is a substance which is in, on or under the land and which has the potential to cause significant harm to a relevant receptor, or to cause significant pollution of controlled waters.
b) A “receptor” is something that could be adversely affected by a contaminant, for example a person, an organism, an ecosystem, property, or controlled waters.

c) A “pathway” is a route by which a receptor is or might be affected by a contaminant.

The term “pollutant linkage” means the relationship between a contaminant, a pathway and a receptor. All three elements of a contaminant linkage must exist for there to be a risk to the identified receptor.

The conceptual site model summarises what is known about the ground conditions at the site, then goes on to describe potential sources, pathways and receptors and identify viable pollutant linkages.

Asbestos has been identified to be the source of contamination on the site. The plausible pathways are summarised in Table 2. These pathways are based on the proposed end use to comprise a residential land use, including communal gardens and soft landscaping.

Pathway	Description
Inhalation	Inhalation of asbestos fibres by site worker(s)
	Inhalation of asbestos fibres by off-site receptors e.g. adjacent land owners/users
	Inhalation of asbestos fibres by site users/residents
Windblown fibres	Offsite receptors exposed to windblown asbestos fibres

Table 2 Contaminant Pathways for Asbestos post development

Asbestos does not have an adverse effect on surface water, ground water, vegetation or building materials, therefore these receptors can be discounted from this assessment (but please note the Geo-Environmental report identified other chemical contaminants, but they are not repeated here being outside the scope of this report).

4.0 ASBESTOS RISK ASSESSMENT

The risk assessment has been undertaken in general accordance with Defra / Environment Agency's guidance Model Procedures for the Management of Land Contamination (2004).

There are currently no UK Soil Guideline Values relating to asbestos. The Control of Asbestos Regulations 2012 specify a limit for worker exposure to all types of asbestos of 100 000 fibres per m^3 averaged over four hours. This "control limit" is described as not a "safe" level, and exposure from work activities involving asbestos should be reduced to as low as reasonably practicable.

Furthermore, it should be noted that industry experts have stated:

"Currently there is neither a standard method for determining the amount of asbestos present in soil or even an agreed minimal risk level or generic assessment criterion for asbestos in soil. This means that the legal and practical position is unclear on what steps should be taken and to what extent to remove the asbestos. (Asbestos: The hidden hazard on brownfield sites" (Evolution Magazine CIRIA - Joane Kwan, Paula Whitell and Paul Nathanial 2012)

The distribution of asbestos is considered to be wide spread throughout the Made Ground within the farmyard and chalk pit areas of the site only, and quantified at a level that merits control measures being employed to remove the ACMs identified at ground level and where the ground is to be disturbed.

The quantification test undertaken on site identified total levels of between <0.001% and 25% and free fibre levels of <0.001% with both chrysotile and Crocidolite being identified on the site.

Given that asbestos fibres and ACMs have been identified within the shallows soils within the farmyard and chalk pits areas of the site from ground level to 4.0m below ground level it is considered that there is a potential risk to on site users and people off site, given that the asbestos could potentially be entrained in the wind. At these shallow depths it is considered that the material could be exposed by rutting if the site is traversed in wet weather (followed by subsequent drying out) by demolition and constructions vehicles. As such vehicle movements should be limited and undertaken across designated paths on site, where clean materials have been lain to cover the Made Ground and prevent the spread of fibres.

In addition, a hand pick exercise should be undertaken to remove the visible ACM materials evident within the shallow soils on site, in order to prevent them being broken up and further fibres released during demolition and construction traffic around the site.

4.1 Options Appraisal - Risks to End Users Following Construction

There are limited options associated with the remediation of land affected by contamination hence the brevity of this section.

Hot spot removal

This is not considered practical given the distribution of the asbestos identified visually and through analysis on the site.

Remove all Made Ground from site

This would not be economically viable and not necessarily required by the regulatory authorities. Given the proposed development and depth of Made Ground identified across parts of the site, together with the subsequent requirement for disposal this is not considered to be the most cost effective or viable option for the site.

Barrier / cover layers

1) Geomembranes – these are expensive and likely to be damaged during construction phases, thereby limiting the protection provided. This area also unsuitable in areas of proposed gardens and soft landscaping where digging in the garden or root zones of trees and vegetation's could penetrate through the geomembrane.

2) Soil cover system - Comprising a crushed concrete capillary break layer sandwiched between two geotextiles, overlain by a suitable thickness of subsoil and Topsoil. This represents the most practical and robust solution ensuring that the source, pathway, receptor linkage is broken and Asbestos is isolated from end uses. This forms the most common approach in the UK for management of asbestos and contaminated soil/material that are to remain on site.

4.2 Options Appraisal – Risks to Human Health During Construction

Proposed Control Measures

The primary objective of the proposed control measures is to mitigate the potential for airborne release of asbestos at the point of excavation, in transit, stockpiling and during final deposition.

- Site specific asbestos training/briefing for all workers involved in the project.
- Establishing areas where the work with asbestos containing soils is taking place and excluding other personnel and plant from this area to avoid the spread of asbestos (any site compound/cabins should be separated from these areas). These areas would include the area where excavation is taking place, the stockpiling area and the area where deposition is taking place.
- Dust suppression with sprayed water of all disturbed and exposed Made Ground soils – to prevent asbestos fibre release from soils. This includes the excavation area, exposed soils on stockpiles and the area of deposition.
- Where asbestos containing soils are stockpiled, exposed soils should be covered immediately with sheeting that is adequately anchored so it is not blown off – to prevent the spread of asbestos fibres. Any temporary stockpile location will be on an hardstanding where possible and this will mitigate the potential for stockpiled soils impacting the ground in the stockpile location. Nonetheless, subject to an inspection of the stockpile location prior to stockpiling commencing, the Contractor should also make provision for placing a polythene membrane across the proposed stockpile area.
- Once stockpiling is completed, including the placement of sheeting, the stockpile should be fenced off with Heras-type fencing (or other fencing which is not easily removed, plastic mesh or Chapter 8 pedestrian barriers are not acceptable). Signage should be placed at regular intervals indicating that the stockpile contains asbestos and entry is prohibited. This is to prevent inadvertent reuse of the soils.

- Regular inspection of the stockpile should take place to ensure the sheeting, fencing and signage remains in place. Any repairs to damaged sheeting should be made using the control measures and PPE listed in this section.
- When sheeting is removed from the stockpile prior to the transportation and final placement of the soils, dust suppression should recommence, and the sheeting should be disposed of as asbestos waste.
- Use of washable boots, without laces, and provision of boot washing facilities at exit of the working area – to prevent mud being tracked into site cabins, vehicles etc. where it could dry and generate inhalable dust.
- Use of disposable coveralls with elasticated cuffs and collars within the working area only – to protect workers clothes from asbestos fibres or asbestos containing soil which could then be transferred to locations off the site.
- Provision for washing plant prior to removal from the excavation area site paying special attention to tracks, wheels, buckets, cab floors, steps and footplates – to prevent the transfer of asbestos containing soils off the site and around the site.
- Provision for avoiding the spread of asbestos containing soils during transportation between the area of excavation, the stockpile and the area of proposed re-use particularly. Measures should include:
    - not overloading transportation plant to prevent spillage of soils
    - sheeting all loads prior to them departing the excavation area
    - washing wheels of transportation plant on leaving the excavation area
    - careful management of the cleanliness of the stockpiling and deposition area to ensure that transportation plant is not tracking asbestos containing soils across the site on leaving these areas.

Rejected Control Measures

Respiratory protective equipment (RPE) has been considered to protect groundworkers. However, the measures set out above represent the primary control measures to mitigate release of asbestos to the air thereby protecting the site workforce and occupants/residents of properties and land around the development. The control measures detailed above are considered sufficient to control asbestos fibre release such that RPE is not required as a mandatory, or primary control. In addition, groundworkers may not be accustomed to wearing masks and there is an increased health and safety risk associated with the use (or ineffective use) of unfamiliar masks and heavy plant. However, this should be revised if further ACM is discovered during the works or reassurance air monitoring indicates the control limit has been exceeded.

Notwithstanding the above, the Contractor should utilise PPE (including RPE and eye protection) additional to that listed in this section for additional precautionary protection. However, the use of PPE additional to that listed in the control measures would not replace any control measure. For example, the use of RPE would not remove the requirement for dust suppression as it would not mitigate the risk to adjacent land users and thus cannot be a primary control measure. The contractor should also utilise PPE for non-asbestos hazards such as hard hats and gloves in line with the relevant health and safety legislation.

5.0 REMEDIATION STRATEGY

5.1 Risk Mitigation Activities

The following risk mitigation activities are proposed at the site on the basis that the Made Ground within the farmyard and chalk pit areas is to remain as the preferred option:

Soft landscaping and gardens

- Hand pick exercise to remove the visible ACM materials evident within the shallow soils on site.
- Within specifically identified Plots within the farmyard area only a reduced level dig, depths as specified in Figure 9, is required in order to allow for the installation of a soil cover system so as to be inline within proposed final site levels.
- A cover system comprising a crushed concrete capillary break layer sandwiched between two geotextiles, overlain by a suitable thickness of subsoil and Topsoil. In total a placement of 600mm of clean soils as cover to limit exposure to asbestos from the Made Ground (The thickness proposed would also serve to be protective of other chemical contaminants identified within the Made Ground and Shallow soils on the site), This thickness should be agreed with the Local Authority specific to asbestos.
- Locally thickened for tree roots

Building footprint

The base of the building itself can act as a barrier to asbestos release. The difficulty of relying on this is that the owners may build extensions and penetrate below the building base. This is less likely for proposed higher rise buildings. However, documentation of the presence of asbestos within the Made Ground and shallow soils beneath building footprints and areas of hard standing should be recorded in case of future proposals. Whilst there is no specific requirement to remove asbestos containing materials where located beneath areas of hard standing and building footprint, the NHBC will not permit the re-use of soils containing asbestos beneath building footprints due to the potential ongoing maintenance issued associated with building which may subsequently expose the asbestos.

Piled Foundations

Should piling be proposed the piling mechanism should be one that results in the lowest level of disturbance to the Made Ground. Any pile arising should be segregated in terms of Made Ground and natural material to minimise the spread of asbestos to the natural arisings. Alternatively, continuous helical displacement piles (CHD) could be utilised to minimise arising's.

Excavations through Made Ground

Provided suitable precautions (i.e. damping down) are taken in excavating and placing material to prevent windblown fibres there is unlikely to be a risk to human health on or off site during these works.

Entry into excavations within Made Ground e.g. retaining walls with shallow foundations

Workers should be prevented from entering into excavations in the Made Ground. Excavations should be left open for as short a time period as possible. Therefore, work should be planned to minimise the length of open trenches for the installation of services. All services should be backfilled with clean gravel, or similar. Where Made Ground is to remain in the base of trenches, a marker plastic sheet should be placed at the base of the trenches. Where trenches are excavated through the whole depth of Made Ground a marker sheet is not required.

With regards to workers on the site, suitable Health and Safety precautions should be employed to minimise exposure to free fibres. Where this is not possible it is assumed that suitable PPE would need to be employed. As a minimum workers should be briefed on the risks associated with asbestos inhalation, suitable gloves should be worn and consideration should be given to the wearing of one piece overalls with elasticated sleeves and respiratory protective equipment, with a facility also provided to wash exposed areas of skin.

5.2 Refined Conceptual Model

Potential Source/media	Potential Receptors	Potential Pathways	Likelihood	Consequence	Mitigation and Risk
Construction Phase (Asbestos)	Site Workers	Air (indirect)	Likely	Medium	**Moderate** Site works are likely to come into contact with soils via direct contact during development and construction works. Utilising mitigation measures to include: • Damping Down with water. • Facilities for washing and drying. • No smoking, drinking, eating on the site. Would serve to reduce the risk. As such the consequence would be reduced to low to moderate.
	Neighbouring Land (residents)	Air (indirect)	Likely	mild	**Moderate to Low** The surrounding land uses comprise a mixture of woodland, agricultural land and residential development. As such whilst there is a potential for materials to be mobilised by the wind the number of potential residents that may be affected is limited. In addition, appropriate controls on the site would serve to reduce the potential for fibre mobilisation. As such the consequence with appropriate mitigation would be low.
	Residents	Air (indirect)	Unlikely	Medium	**Low** It is proposed to cap all areas of gardens and soft landscaping with a

Potential Source/media	Potential Receptors	Potential Pathways	Likelihood	Consequence	Mitigation and Risk
Post Construction Phase (Asbestos)					suitable capping system to break the source pathway receptor linkage from the site. In addition, it is proposed to undertaken a hand picking exercise across the site to remove visible ACMs within the shallow soils on the site. As such the consequence following the proposed remediation measures on site would be very low.
	Maintenance workers	Air (indirect)	Low	Medium	**Moderate to Low** Services installed onsite would be constructed within clean backfill and covered with a clean capping layer. Where it is unavoidable to install services within Made Ground these should be backfilled with clean gravel or similar with marker warnings. As such with appropriate good practice construction methods the risk for ongoing maintenance workers on the site would be low.

Table 3 Refined Conceptual Model

During excavation or loading of vehicles and if necessary, placing the material back on the ground/ unloading, the material should be damped down to prevent windblown release. Covering of vehicles transporting material around the site should be considered. Any vehicles leaving the site and using the public highway should be sheeted. In addition, the storage of Made Ground materials within stockpiles on site should be covered.

6.0 ASBESTOS MANAGEMENT PLAN

The excavation and placement of Made Ground contaminated with asbestos is not considered a licensable activity, nor is the removal of the Made Ground from site.

Most higher-risk work with asbestos must only be done by a licensed contractor. Licensable work with asbestos is work defined by the Health and Safety Executive as:

- where worker exposure to asbestos is not sporadic and of low intensity; or
- where the risk assessment cannot clearly demonstrate that the control limit will not be exceeded i.e. 0.1 asbestos fibres per cubic centimetre of air (0.1 f/cm^3) (averaged over a four hour period); or
- on asbestos coating; or
- on asbestos insulation or asbestos insulating board where the risk assessment demonstrates that the work is not short duration work, e.g. when work with these materials will take no more than two hours in any seven day period, and no one person works for more than one hour in that two hour period.

As identified earlier in this document general earthworks onsite are not considered to be licensable and hence not an asbestos designated area or a respirator zone. As such, the Health and Safety Executive will not require notification of the work before it begins. The employer should, however, ensure that all workers on the site have received site specific asbestos training/briefing.

Stripping of asbestos, if present, from the former buildings is likely to be a licensable activity as above. The consultant carrying out the asbestos survey prior to demolition should be asked to advise on this on the basis of the nature of the asbestos present (e.g. fibrous compared with ACM ceiling tiles).

A handpicking exercise to remove visible ACMs within the Made Ground and shallow soils on site, may be licensable subject to the type of materials and length of time required to complete the works. Confirmation should be obtained of this as part of the quote obtained for undertaking these works.

All work is to be carried out in external areas. Therefore, it is unlikely that the "control limit" will be exceeded. The work that could potentially release fibres is excavation and placement of the Made Ground, with this work being of a limited duration. Therefore, normal earthworks PPE should be sufficient. RPE should not be required, however the use of a type P3 disposable respirator by workers would be good practice. See:

http://www.hse.gov.uk/pubns/guidance/em6.pdf

Any stockpiling of Made Ground should be kept to a minimum and any stockpile should be covered immediately with clean soil or sheeting that is adequately anchored so it is not blown off to prevent the spread of asbestos fibres.

Services should be laid in the clean capping layer wherever possible. Backfill should be with clean gravel or similar. Trenches in Made Ground should be closed over as quickly as possible. Where man entry is necessary then the contractor should carry out their own risk assessment, the control measures are likely to include the wearing of hooded disposable one piece suits with elasticated apertures, disposable respirator (Type P3) and non-laced foot wear.

Personal exposure monitoring for workers should be carried out to confirm fibre concentrations in the air, analysis should be carried out by an UKAS accredited laboratory for fibres and the analyst should have successfully completed P403: "Asbestos Fibre Counting (PCM)". In addition, there may still be circumstances where samples need to be taken, for instance where quantities of ACM's are discovered, previously not identified. Bulk analysis should be carried out by an UKAS accredited laboratory and the analyst should have successfully completed P401: "Identification of Asbestos in Bulk Samples (PLM)".

Dust suppression and management techniques should include:

- Only working on manageable small areas during each working day.
- Management of dust levels via careful excavation and deposit.
- Use of aqueous direct suppression methods using sprayed water or water/PVA mixtures, if deemed necessary at the time.

Proof of control should be demonstrated by workers wearing personal monitoring equipment (a single test each day should be sufficient as long as the excavation area is limited as above).

In addition to this "reassurance" air testing should be carried out along the site boundaries. This should be carried out at two locations per day and at the same time as the personal monitors are worn by workers. At least one round of this particular type of monitoring should be carried out before excavation works commence in order to identify "baseline" and the ideal sampling interval. It is suggested this is done on a dry day. The air monitoring shall have a minimum limit of detection of 0.001f/ml and be undertaken in accordance with the protocols contained within CIRIA C733 "Asbestos in soil and made ground: a guide to understanding and managing risks"

Management data should include a plan and records of daily excavations, use of suppression techniques and personal and reassurance air testing results will need to be included in a management report at the end of the project.

It is recommended that a groundworks contractor with appropriate experience and prepared procedures that can be reviewed by the client prior to the further works on site, are used at the site.

It is recommended that the Environment Health Department of the Local Authority are consulted to confirm they are content with the proposed clean capping approach and the risk mitigation measures discussed above.

The H&S file for the site should document the presence of asbestos.

6.1 Re-use of on-site Material and Importation of Clean Capping Material

The Environment Agency classifies excavated contaminated soils as waste. As such its reuse on the site has to be carried out under an Environmental Permit or waste exemption. That is unless the reuse is carried out under the Definition of Waste: Development Industry Code of Practice (CL:AIRE 2011) where it can be demonstrated that there is a need or requirement for use, that the risk is acceptable, the quantities for re-use are no more than required and the use is guaranteed. It is recommended that the reuse of excavated material will be undertaken via the Site of Origin scenario where Made Ground is excavated and reused. A

number of sites with asbestos contamination have been successfully remediated via this route.

In addition, the Environment Agency classifies clean soil as waste upon leaving the site of excavation i.e. where it is surplus to requirements at that site. Hence the reuse of imported clean soil needs to be carried out under an Environmental Permit or exemption. That is unless the material is used under the Definition of Waste: Development Industry Code of Practice. It is recommended that such material is brought to the site and reused under the Direct Transfer scenario. Both the Direct Transfer and Site of Origin reuses need to be covered by one Materials Management Plan, but subject to two separate Declarations completed by a registered independent Qualified Person.

If Made Ground is to be removed from site it will be classified as waste and will need to be taken to an appropriately authorised facility. Once materials for disposal have been identified further WAC and asbestos testing should be undertaken to classify the material for the purpose of disposal. Materials containing asbestos would only be classified as Hazardous where the concentration of asbestos within a sample of ACM material is less than 0.1% the material. In terms of the percentage total asbestos identified in the soils these have been shown to be at a level of between <0.001% and 25%, and therefore it is likely that some Made Ground material will need to be disposed of as hazardous waste, in addition visually evident ACM removed (handpicked) from the soil would also need to be disposed of as Hazardous waste.

Figures



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Site Location Plan
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE18761	**Revision:**	0		
Drawn:	FG	**Date:**	11/05/2018		
Figure:	1	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Location of Farmyard Area
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE18761	**Revision:**	0		
Drawn:	FG	**Date:**	25/06/2018		
Figure:	2	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Location of Former Chalk Pit and Landfill Area
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE18761	**Revision:**	0		
Drawn:	FG	**Date:**	25/06/2018		
Figure:	3	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Exploratory Hole Locations - Farmyard Area
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE18761	**Revision:**	0		
Drawn:	FG	**Date:**	11/05/2018		
Figure:	4	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Exploratory Hole Locations - Trial Pit and Trenches - Landfill Area
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE18761	**Revision:**	0		
Drawn:	FG	**Date:**	22/06/2018		
Figure:	5	**Scale:**	Not To Scale		



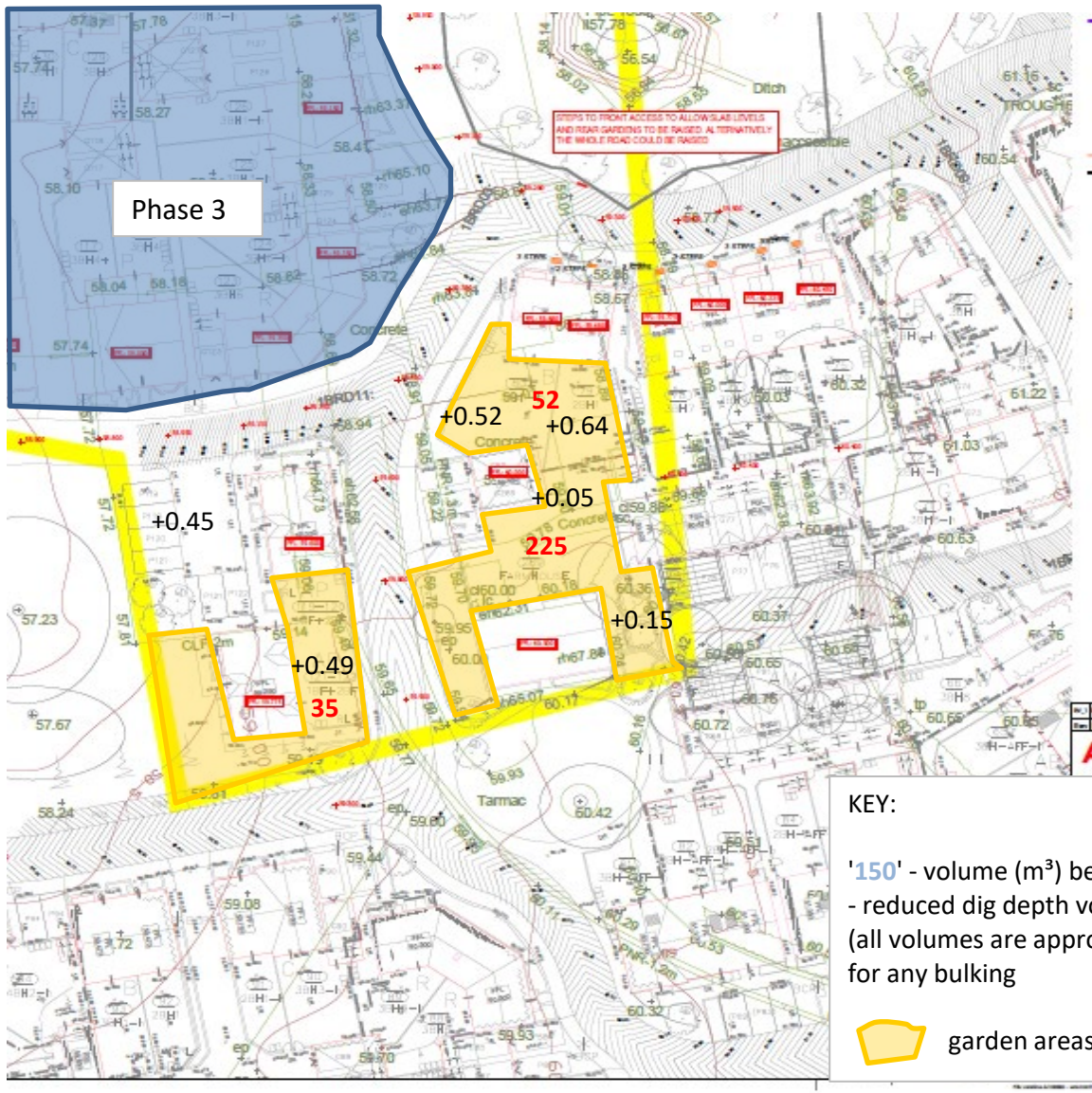
Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Extent of Made Ground - Window Sampler Boreholes - Landfill Area
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE18761	**Revision:**	0		
Drawn:	FG	**Date:**	22/06/2018		
Figure:	6	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Soil Contamination Exceedances - Farmyard Area
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE18761	**Revision:**	0		
Drawn:	FG	**Date:**	11/05/2018		
Figure:	7	**Scale:**	Not To Scale		



Project:	Woodcroft Farm, Lovedean, PO8 9QA			**Title**	Soil Contamination Exceedances - Landfill Area
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE18761	**Revision:**	0		
Drawn:	FG	**Date:**	25/06/2018		
Figure:	8	**Scale:**	Not To Scale		



Project:	Woodcroft Farm Lovedean PO8 9QA			**Title**	Remediation Strategy Plan - Phase 2B Farmyard Volumes
Client:	Vistry Homes Southern			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE18761	**Revision:**	0		
Drawn:	FG	**Date:**	21/08/2020		
Figure:	9	**Scale:**	Not To Scale		

Geo-Environmental

APPENDIX A

CAR-SOIL2012 Decision Support Tool



JIWG

Joint Industry Working Group

Asbestos in Soil and Construction & Demolition Materials

Project Reference	GE18761
Site Name	Woodcroft Farm (Phases 2B and 3)
Client	Vistry Homes Southern
Run by	FG
Date	28-Aug-20
Scenario details	

Decision Support Tool for CAR2012 Work Categories

Stage 1

Hazard Factors

		Score
Select ACM type (run model for each type to generate 'Worst Case' output)	Loose fibrous asbestos debris	3
Extent of degradation of ACMs at outset of work	Disaggregated (dominated by loose fibrous material; extreme degradation in ACM and/or free asbestos fibres/fibre bundles)	4
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Friable ACM or ACM with fibres not firmly linked in a matrix	2
Distribution of Visible Asbestos Across Affected Area	Occasional/random occurrences of visible contamination by ACMs	1
Amount of asbestos fibre in selected ACM/fibre type as % of host material	Trace quantities - <0.0001 to 0.001 %wt/wt	0
Sub-total		**0**

Note: the asbestos licensing regime is unaffected by the type of asbestos fibre present in ACMs

Hazard ranking **Negligible**

No warranty, expressed or implied, or reliance, is provided in relation to the use of this tool.
It is contingent on users to satisfy themselves that the output from the tool is relevant and appropriate to the assessment being made.

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Stage 2

Exposure Factors		Score
Anticipated airborne fibre concentration - Control Limit or SALI?	<0.001 fibres/ml	0
Anticipated duration of exposure to asbestos	< 1 hour for any one person in any week (e.g. Short Duration Work)	1
Activity type and effect on deterioration of ACMs during work	Sampling, manual or mechanical (no or minimal deterioration expected)	0
Best description of primary host material matrix (soil/made ground)	Fine Silt and/or Clay	1
Respirable fibre index for ACM - RIVM report 711701034 (2003)	Medium	3
Sub-total		**5**
Exposure ranking		Very low
Combined hazard and exposure ranking	**5**	Very Low

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Stage 3

Risk Assessment Outputs

Probable Licensing Status	CAR do not apply
RPE*	None
Dust Suppression**	None
Hygiene/Decontamination***	None

*Where RPE has to be worn continuously for long periods (e.g. more than 1-hour), then powered RPE may be necessary.
**Reduction in control measures possible if natural mitigation factors are present (e.g. raining, wet ground)
***Guide only; suitability of selected personal hygiene measures may be reviewed on a site/contamination-specific basis

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Material Tracking Form

Geo-Environmental

Site:	Glenvale, Plot R8 (R8A & R8B), North Wellingborough NNP 5YP
Client:	Keepmoat Homes
Job No:	GE19175

Daily Controller:	
Date:	
Signature:	

Excavation /Stockpile Reference	Type of Materials	Volume (M^3)	Summary of Testing	Further Testing Required (Specify)	Approved for Reuse in Area	Quantity used (M^3)	Approximate Quantity Remaining	For removal off site (specify reason)	Additional Comments