Soils Investigation

Land adjacent to Stanford-in-the-Vale former Landfill Site

March 2015

Approval Sheet

Customer:	*Oxfordshire County Council*
Site:	*Stanford in the Vale Landfill Site*
Project title:	*Trial Pitting and Soils investigation – land adjacent to Stanford in the Vale former landfill*
Project Manager:	*Amanda Moreby*
Project Staff:	*Graham Watson*
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Issue	Status	Prepared By	Signature	Date
		G.Watson		*25/3*
		Approved By	**Signature**	**Date**
		A. Chell		

Foreword

enitial has used its best endeavours, experience and expertise to provide a report that will deliver a cost-effective, meaningful, accurate and relevant representation of the conditions present at the site. The works were based upon a defined programme and scope of works agreed with the Client and subject to enitial's terms and conditions of contract as previously agreed with the Client.

The report has been prepared to reflect our understanding of the Clients' requirement and relates to information provided by the Client, by the Parish Council and pursuant to investigation conducted on site. Our works programme was formulated to reflect these needs and to ensure appropriate and representative sampling and investigation (as described in BS 10175). It was recognized by the client that the overall objective of the report is for surveillance and information rather than to confirm any expectation of contamination.

No attempt has been made to validate any data or information provided to enitial and it is acknowledged that certain aspects may be superseded or rendered irrelevant by information in documentation to which we have not accessed. Where third party services have been engaged for analysis of samples, this has followed written procedures and is traceable to sample submission via chain of custody. Laboratory services were selected so as to ensure accreditation to quality and performance standards traceable to British Standards or UKAS.

enitial cannot accept responsibility to any parties whatsoever, for the issue or distribution of this report to third parties or for any matters arising which may be alleged or inferred from the described 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.

Objective of the Study

The works were designed to identify the presence (or otherwise) of typical soils contaminants via trial excavations and where appropriate, by the collection of representative cluster samples for laboratory analysis.

The site has been the subject of a pre-assessment (by reference to prior reports produced by enitial for the client), the potential for contaminant transport has been considered in these reports. It was considered unlikely that any direct sub-surface transport pathways exist in the unsaturated soils above groundwater, but there was a theoretical potential pathway via fall-out contamination from airborne dusts, gases and litter, which although highly unlikely, cannot be discounted.

The investigation considered the overall geological setting, the site topography and the potential after-use and identified 6 trial excavations sites at strategic and representative locations.

The excavations were supervised by enitial and were recorded in accordance with BS 5930 and BS 10175 as applicable, the field records are included as Appendix 3. Representative samples of soils were sent for laboratory analysis to determine the presence of substances likely to impact upon the potential for safe use of the land as public amenity. The substances were selected to be representative of the likely persistent inorganic and organic species and toxic metals likely to be present as soils contaminants and which might require remediation or other intervention.

In particular the sampling reflected the native soils, and deeper strata that might be exposed by levelling or grading works as is understood might be required in future, to a target depth of 2.5m.

The samples were collected in bespoke containers in accordance with good practice, and were submitted to a UKAS accredited laboratory. In particular the samples were taken as 'cluster samples' in accordance with BS10175 where a series of discreet samples were taken at regular intervals of a particular horizon, before being combined and placed into appropriate containers.

The samples were analysed for a routine profile of substances as described hereafter, and the results, plus the subjective field assessments are detailed in this descriptive factual report. The results of the fieldwork and analysis are considered and are summarised to reflect the professional opinion of enitial as to the condition of the land based at the time of this investigation.

Drawing 1- Location of Trial Pits

Overview of Methodology

The investigation was commenced on March 2nd with the preparation works to assess the likely presence of services, utilities and underground structures on the land.
The trial pit locations were set out and the immediate area around them surveyed using C.A.T scan and remote signal generator. A trained and competent enitial technician conducted the setting out and was confident that no sub-surface services were present that would compromise the excavations.
Sample containers had been organised in advance and were present on site for the works. 4 containers were required for each sample (1 500g tub, 1 250g glass jar and 2 x 60g VOC container). These were each filled to brimful, sealed and stored in cool-boxes for delivery to the lab.

Trial pits were pegged and geo-located and as was originally proposed, one pit was located so as to directly assist with assessing conditions at the site proposed for the construction of a changing room / pavilion. The remainder were distributed so as to reflect boundary conditions, control points at the site centre and to assess conditions at the site of proposed allotments and hence consider the risk of potential uptake of contaminants by cultivated plants.

An enitial technician was on site throughout to provide direction and supervision to the excavator operator, take measurements and record observations in accordance with site investigation good practice.
A field log with photographs was maintained, and the depth of any samples taken, their unique references and the observation giving rise to the sampling need was recorded.

The technician took all the samples in accordance with a defined method statement hence taking all reasonable steps to maintain the condition and integrity of the material.
Cluster sampling was specified as the most representative means of taking a sample representative of a defined soils horizon, and the composite sample was taken prior to being sealed in containers appropriate for the analytical technique to be adopted - all in accordance with Laboratory instructions.

The pits were to terminate at 3m or otherwise where water was encountered, or structural collapse of the pit wall precluded further deepening. The pits were reinstated immediately at the direction of the technician and the soils replaced to a condition and stratification replicating as closely as possible the original state.

On completion of the field investigation, the samples were collected together and taken for safe storage pending transport to the laboratory. A chain of custody was prepared that reflects the instruction to the laboratory for the analysis and their acknowledgement of receipt and understanding. The unique references applied to the samples followed through to the analytical report.

Laboratory Analysis

Conventional investigations into soils quality at potentially contaminated land requires the selection of analytical suites that cover a range of potential determinants, many of which could in theory be present near to a landfill source.

The samples recovered on site were analysed for the following sets of determinants

Metals *(including Arsenic, Chromium, Copper, Mercury, Lead, Nickel, Selenium, Vanadium, Cadmium, Cobalt, Iron, Potassium, Manganese, Antimony, Tin, Zinc)*

Speciated and Total PAH *(Polycyclic Aromatic Hydrocarbons)*

Carbon banded TPH *(Total Petroleum Hydrocarbons)*[1]
(TPH C_{10} – C_{40})
(TPH C_5 – C_{35})
(TPH C_6 – C_{35})

Speciated BTex[2]

Phenols, Ammonia, Cyanide

Speciated aromatic and halogenated VOC's (volatile organic compounds)

enitial has a long-established working relationship with Alcontrol Laboratories, and a costed programme of analysis was secured for the samples to be recovered which reflected Alcontrol's QA/QC processes, method accreditations and reporting limits.

The results of the soils analysis were supplied to enitial on 20th March.
The laboratory report in full is included as Appendix 1.

[1] **TPH** *is a term used to describe hydrocarbon compounds derived from Petroleum Sources. Common fuels such as Petrol, Diesel and Kerosene and Lubricating Oils/Greases all fall within the TPH banner.*
[2] **BTEX** *is an acronym that stands for benzene, toluene, ethylbenzene, and xylenes. These compounds are some of the volatile organic compounds (VOCs) found in petroleum derivatives such as petrol.*

Summary Reporting

The aim of this report is to compare the analytical data to scientifically- based generic assessment criteria that can be used to simplify the quantification of human health risks arising from long-term and on-site exposure to chemical contamination in soil. The analytical data and field observations have been collated, examined and considered as to the implications for future site usage as follows.

The results have been screened initially by considering the determinants where analysis has positively identified the presence of species in excess of the limit of detection for the technique applied. 1038 of a total of 1194 results were reported as being less than the limit of detection.

The remaining 152 results have been compared to published reference standards available in guidance and in particular against any limit values. This is a highly complex area and selection of criteria for comparison is not straightforward. The following section briefly describes the reference levels being used and their application in this case. A fuller more complex overview of the applicability of various standards and reference levels included as Appendix 2.
The majority of the positive detections have been compared to the Dutch Intervention Values for soils (as published in the Soil Remediation Circular 2009). The soil remediation intervention values indicate when the functional properties of the soil for humans, plants and animals is seriously impaired or threatened. They are representative of the level of contamination above which a serious case of soil contamination is deemed to exist. Their selection for use in this report is primarily on the basis that the list of determinants with threshold values is more extensive than those published for use in the UK.

Where possible, the UK Soils Guidance Values "SGV's" (as published by the Environment Agency) have been used for comparison, noting that these are generally used within CLEA assessment models and reflect the intended land use. However, given that SGVs have been derived for only a limited number of contaminants and with little prospect of further SGVs being published, other references were needed, and two separate professional groupings have produced Generic Assessment Criteria ("GACs") in accordance with the CLEA model for a large number of additional contaminants. See table 1 Appendix 2.

Additionally, in December 2013, Defra issued the findings of a research project undertaken by CL:AIRE to set out the framework by which potential Category 4 Screening Levels (pC4SL) were derived. These provisional threshold levels considered toxicological factors in conjunction with exposure settings and have in some instances led to the withdrawal of previous SGV's - for example in the case of lead. The pC4SL's are published in a format where the potential land-use dictates the stringency of the thresholds. The most stringent is for 'Residential with home-grown produce' and this has been used in this report so as to give the most conservative comparator for the analytical results.

Data Interpretation and comparison to thresholds

The full data report is included as Appendix 1. The laboratory has also provided their report in spreadsheet form and much of the analysis and interpretation derives from these spreadsheets.
The data results have been filtered to remove those where determinants were not recorded above the limit of detection, sorted to arrange the data according to the sample location and then tabulated with the reference threshold values.

Summary tables for each sample location are appended to the text below.

Pit 1 and Pit 2 are located along the eastern boundary of the landfill

Sample Point	Variable	Value	Dutch IV	pC4SL's	% of limit
PIT 1	Arsenic (Total) mg/kg	13.2	76	37	36%
0.5-1.0m	Cadmium (Total) mg/kg	0.294	13	26	
	Chromium (Total) mg/kg	5.7	-	-	
	Copper, total, as Cu mg/kg	2.47	190	-	1%
	Lead (Total) mg/kg	4.27	530	86-210	1%
	Nickel (Total) mg/kg	11.5	100	-	12%
	Zinc (Total) mg/kg	42.9	720	-	6%
	Cobalt mg/kg	2.65	190	-	1%
	Iron (Total) mg/kg	8950	-	-	
	Manganese mg/kg	305	-	-	
	Vanadium mg/kg	17.2	250	-	7%
	Potassium mg/kg	677	-	-	

Sample Point	Variable	Value	Dutch IV	pC4SL's	% of limit
PIT 2	Arsenic (Total) mg/kg	11	76	37	30%
0.4-1.0m	Cadmium (Total) mg/kg	0.191	13	26	1%
	Chromium (Total) mg/kg	8.63	-	-	
	Copper, total, as Cu mg/kg	4.4	190	-	2%
	Lead (Total) mg/kg	6.31	530	86-210	7%
	Nickel (Total) mg/kg	14.3	100	-	14%
	Zinc (Total) mg/kg	23.8	720	-	3%
	Cobalt mg/kg	4.53	190	-	2%
	Iron (Total) mg/kg	8960	-	-	
	Manganese mg/kg	400	-	-	
	Vanadium mg/kg	23.5	250	-	9%
	Potassium mg/kg	1150	-	-	

Notes – a column '% of limit' has been added to the table for illustrative purposes, this simply compares the analytical result 'value' to the most stringent of the reference thresholds. The relative significance of the analytical result to a level that would indicate contamination can be derived.

The locations of the pits are shown on drawing 1, the site records are shown in Appendix 3

Pit 3 is the northernmost point of the site and furthest from the A417

Sample Point	Variable	Value	Dutch IV	pC4SL's	% of limit
PIT 3	Arsenic (Total) mg/kg	9.99	76	37	27%
0.4-0.9m	Cadmium (Total) mg/kg	0.301	13	26	2%
	Chromium (Total) mg/kg	7.17	-	-	
	Copper, total, as Cu mg/kg	3.86	190	-	2%
	Lead (Total) mg/kg	5.77	530	86-210	7%
	Nickel (Total) mg/kg	10.2	100	-	10%
	EPH Range >C10 - C40 mg/kg	39.4	-	-	
	Zinc (Total) mg/kg	38.6	720	-	5%
	Cobalt mg/kg	3.87	190	-	
	Iron (Total) mg/kg	9980	-	-	
	Manganese mg/kg	500	-	-	
	Phenol mg/kg	0.0113	14	-	0.1%
	Vanadium mg/kg	18.8	250	-	8%
	Potassium mg/kg	992	-	-	

Pit 4 is halfway along the eastern boundary of the site

Sample Point	Variable	Value	Dutch IV	pC4SL's	% of limit
PIT 4	Arsenic (Total) mg/kg	19	76	37	51%
0.3-1.0m	Cadmium (Total) mg/kg	0.509	13	26	4%
	Chromium (Total) mg/kg	20	-	-	
	Copper, total, as Cu mg/kg	9.36	190	-	5%
	Lead (Total) mg/kg	18.7	530	86-210	22%
	Nickel (Total) mg/kg	19.8	100	-	20%
	Zinc (Total) mg/kg	76.3	720	-	11%
	Toluene ug/kg	4.68	32000	-	0%
	EPH Range >C10 - C40	57.9	-	-	
	Cobalt mg/kg	8.84	190	-	5%
	Iron (Total) mg/kg	24200	-	-	
	Manganese mg/kg	714	-	-	
	Tin mg/kg	0.541	900	-	0%
	Vanadium mg/kg	56.8	250	-	23%
	Potassium mg/kg	1870	-	-	

Pit5 is located to be representative of the soils conditions at the approximate location of the pavilion / changing rooms. It is the closest location to Cottage Road.

Sample Point	Variable	Value	Dutch IV	pC4SL's	% of limit
PIT 5	Toluene mg/kg	8.35	32	-	26%
0.3-0.9m	Fluoranthene ug/kg	25.7	-	-	
	Pyrene ug/kg	22.1	-	-	
	Chrysene ug/kg	16.9	-	-	
	Benzo(b)fluoranthene ug/kg	26.1	-	-	
	Benzo(a)pyrene ug/kg	19.7	-	5000	0.4%
	Arsenic (Total) mg/kg	15.9	76	37	43.0%
	Cadmium (Total) mg/kg	0.328	13	26	3%
	Chromium (Total) mg/kg	13	-	-	
	Copper, total, as Cu mg/kg	6.86	190	-	4%
	Lead (Total) mg/kg	14	530	86-210	16%
	Nickel (Total) mg/kg	13.1	100	-	13.1%
	Zinc (Total) mg/kg	55	720	-	8%
	Toluene ug/kg	4.6	32000	-	0%
	EPH Range >C10 - C40	55	-	-	
	Cobalt mg/kg	4.83	190	-	3%
	Iron (Total) mg/kg	16100	-	-	
	Manganese mg/kg	338	-	-	
	Tin mg/kg	0.409	900	-	0%
	Vanadium mg/kg	36.5	250	-	15%
	Potassium mg/kg	1780	-	-	

Pit 6 is approximately central to the site

Sample Point	Variable	Value	Dutch IV	pC4SL's	% of limit
PIT6	Fluoranthene ug/kg	40.7	-	-	
0.3-0.9m	Pyrene ug/kg	34.5	-	-	
	Benz(a)anthracene ug/kg	27.6	-	-	
	Chrysene ug/kg	21.3	-	-	
	Benzo(b)fluoranthene ug/kg	26.7	-	-	
	Benzo(a)pyrene ug/kg	25	-	5000	0.5%
	PAH, Total Detected USEPA 16	176	40000	-	0.4%
	Arsenic (Total) mg/kg	17.5	76	37	47%
	Cadmium (Total) mg/kg	0.467	13	26	4%
	Chromium (Total) mg/kg	18	-	-	
	Copper, total, as Cu mg/kg	7.24	-	-	
	Lead (Total) mg/kg	14.5	530	86-210	16.9%
	Nickel (Total) mg/kg	18.7	100	-	19%
	Zinc (Total) mg/kg	60.9	720	-	8%
	Toluene ug/kg	2.28	32000	-	0.0%
	EPH Range >C10 - C40	40.8	-	-	
	Cobalt mg/kg	7.38	190	-	3.9%
	Iron (Total) mg/kg	23000	-	-	
	Manganese mg/kg	571	-	-	
	Tin mg/kg	0.3	900	-	0%
	Vanadium mg/kg	52.2	250	-	21%
	Potassium mg/kg	1740	-	-	

Conclusions

A range of analyses were selected that were consistent with guidance for the assessment of soils for contamination. The majority of these analyses failed to detect contaminants above the limit of detection.

Where substances were detected, none of these determinants approached threshold values so as to indicate levels of contamination that would require either any form of intervention, or preclude the intended use of the site as public open space.

Note that -as previously mentioned- the '% of limit' relates to the most stringent of the pC4SL's i.e. to that for "Residential property with home grown produce". This applies a broader factor of safety to the conclusion that none of the analyses preclude the use of the land as Public Open Space, or as allotments. The determinant coming closest to the threshold is arsenic at upto 51% of the limit value. The result does not imply that arsenic is a likely threat and its occurrence across all of the pits suggests that is most likely geologically derived from the mineralogy of the local sands; very likely in association with iron and potassium.

Geological Interpretation

The excavation of the pits very rapidly removed a thin layer of topsoil overlying mineralised silty sand containing nodules and fragments of crystalline material.
This was occasionally a quite hard cemented layer passing into looser medium to coarse grained sand. It is presumed that this sand reflects the mineral previously exploited by the adjacent former quarry. Given the location of the site, is almost certainly the transition between the lower layers of the Stanford formation (probably the lower pebble bed of the Faringdon member) and the upper layer of the Shellingford facies – (part of the Kingston formation, Highworth Grit member).
The transition between the rock types is probably reflected by the site topography and there is a gradual drop in levels of around 2-3m towards the south of the site along a curving linear feature.

The mineralogy of the sands may in part influence the soil chemistry, but such assessment is outside the scope of this report.

Risk Assessment

The context of this report is to assess the potential for any contaminants present in the former landfill to be transported and to be present in the soils overlying the adjacent site. While presently rough pasture, the site is being considered for public open space / leisure use and the likelihood of public exposure either directly to the soils during levelling works, or thereafter during use as allotments or recreational space is to be assessed.

The potential theoretical pathways identified are via airborne dusts, or gaseous release, then fallout deposition, via underground gas transport in the unsaturated zone or via subsurface groundwater movement.

It has been established that the site redevelopment will not expose saturated ground and data held by OCC confirms that groundwater quality is not compromised by hazardous substances.

The site is routinely monitored for the presence of landfill gas and there is active abstraction and flaring of gas from the emplaced waste. Such measures would be considered appropriate to remove gas phase contaminants from the local environment and to prevent underground lateral migration.

In order to examine the extent to which any contaminants are present at site, the conditions at the potential receptor i.e. the site soils have been sampled and analysed. These indicate that the soils contaminant levels are comfortably within the thresholds that might require intervention for bespoke activities, and in particular the use of the land as public open space.

It should of course be noted that the conclusions can only apply to the locations that were actually sampled, however it was noted that there was a broad range of locations selected with very little variability between the soils quality detected at each.

It is concluded that there is little merit in conducting a formal quantitative risk assessment as without any evidence of contamination at the potential receptor, there is no need to consider pathways or source term contamination.

It is stated in guidance, that "if applied appropriately, SGVs can be used to identify sites where there is unlikely to be a possibility of significant harm" (Defra, 2008b)[3] and further that "where representative soil concentrations of contaminants on a site are at or below the SGV (and the generic land use scenario used to derive the SGV is sufficiently representative of, or conservative for, the site under evaluation), it can be assumed that it is very unlikely that a significant possibility of significant harm exists". (Defra, 2008b).

[3] DEFRA, 2008b. *Guidance on the legal definition of contaminated land*. London:Department for Environment, Food and Rural Affairs.

This circumstance appears to be the case at the surveyed site. As none of the substances that were detected, approached threshold values so as to indicate levels of contamination that would require any form of intervention, we can see no reason why the soil quality at this site would preclude the intended use of the land as public open space.

Appendix 1 – Laboratory Analytical Report

ALcontrol Laboratories

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Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: mkt@alcontrol.com
Website: www.alcontrol.com

Enitial
Enterprise Drive
Four Ashes
Wolverhampton
West Midlands
WV10 7DE

Attention: Graham Watson

CERTIFICATE OF ANALYSIS

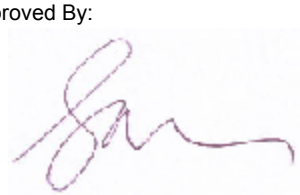
Date:	18 March 2015
Customer:	H_ENITIAL_WLV
Sample Delivery Group (SDG):	150305-39
Your Reference:	Q42572
Location:	Stanford soils
Report No:	305884

We received 6 samples on Thursday March 05, 2015 and 6 of these samples were scheduled for analysis which was completed on Wednesday March 18, 2015. 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:	150305-39	**Location:**	Stanford soils	**Order Number:**	
Job:	H_ENITIAL_WLV-127	**Customer:**	Enitial	**Report Number:**	305884
Client Reference:	Q42572	**Attention:**	Graham Watson	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
10949688	PIT1		0.50 - 1.00	03/03/2015
10949689	PIT2		0.40 - 1.00	03/03/2015
10949690	PIT3		0.40 - 0.90	03/03/2015
10949692	PIT4		0.30 - 1.00	03/03/2015
10949693	PIT5		0.30 - 0.90	03/03/2015
10949694	PIT6		0.30 - 0.90	03/03/2015

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

CERTIFICATE OF ANALYSIS

SDG:	150305-39	**Location:**	Stanford soils	**Order Number:**	
Job:	H_ENITIAL_WLV-127	**Customer:**	Enitial	**Report Number:**	305884
Client Reference:	Q42572	**Attention:**	Graham Watson	**Superseded Report:**	

SOLID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			10949688	PIT1		0.50 - 1.00	250g Amber Jar (AL)
							400g Tub (ALE214)
							60g VOC (ALE215)
			10949689	PIT2		0.40 - 1.00	250g Amber Jar (AL)
							400g Tub (ALE214)
							60g VOC (ALE215)
			10949690	PIT3		0.40 - 0.90	250g Amber Jar (AL)
							400g Tub (ALE214)
							60g VOC (ALE215)
			10949692	PIT4		0.30 - 1.00	250g Amber Jar (AL)
							400g Tub (ALE214)
							60g VOC (ALE215)
			10949693	PIT5		0.30 - 0.90	250g Amber Jar (AL)
							400g Tub (ALE214)
							60g VOC (ALE215)
			10949694	PIT6		0.30 - 0.90	250g Amber Jar (AL)
							400g Tub (ALE214)
							60g VOC (ALE215)
Alkali Metals by iCap-OES (Soil)	All	NDPs: 0 Tests: 6	X		X		X		X		X		X		X	
Ammonium Soil by Titration	All	NDPs: 0 Tests: 6		X		X		X		X		X		X		X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 6		X		X		X		X		X		X		X
EPH	All	NDPs: 0 Tests: 6	X		X		X		X		X		X		X	
EPH by FID	All	NDPs: 0 Tests: 6	X		X		X		X		X		X		X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 6		X		X		X		X		X		X		X
Metals in solid samples by OES	All	NDPs: 0 Tests: 6	X		X		X		X		X		X		X	
PAH by GCMS	All	NDPs: 0 Tests: 6	X		X		X		X		X		X		X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 6		X		X		X		X		X		X		X
Sample description	All	NDPs: 0 Tests: 6	X		X		X		X		X		X		X	
Semi Volatile Organic Compounds	All	NDPs: 0 Tests: 6	X		X		X		X		X		X		X	
VOC MS (S)	All	NDPs: 0 Tests: 6		X		X		X		X		X		X		X

CERTIFICATE OF ANALYSIS

SDG:	150305-39	**Location:**	Stanford soils	**Order Number:**	
Job:	H_ENITIAL_WLV-127	**Customer:**	Enitial	**Report Number:**	305884
Client Reference:	Q42572	**Attention:**	Graham Watson	**Superseded Report:**	

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
10949688	PIT1	0.50 - 1.00	Light Brown	Sand	0.1 - 2 mm	Stones	None
10949689	PIT2	0.40 - 1.00	Light Brown	Sand	0.1 - 2 mm	Stones	Vegetation
10949690	PIT3	0.40 - 0.90	Light Brown	Sand	0.1 - 2 mm	Stones	Vegetation
10949692	PIT4	0.30 - 1.00	Dark Brown	Sandy Loam	0.1 - 2 mm	Stones	Vegetation
10949693	PIT5	0.30 - 0.90	Light Brown	Sandy Clay Loam	0.1 - 2 mm	Vegetation	Stones
10949694	PIT6	0.30 - 0.90	Dark Brown	Sand	0.1 - 2 mm	Stones	None

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:	150305-39	**Location:**	Stanford soils	**Order Number:**	
Job:	H_ENITIAL_WLV-127	**Customer:**	Enitial	**Report Number:**	305884
Client Reference:	Q42572	**Attention:**	Graham Watson	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	PIT1	PIT2	PIT3	PIT4	PIT5	PIT6
			Depth (m)	0.50 - 1.00	0.40 - 1.00	0.40 - 0.90	0.30 - 1.00	0.30 - 0.90	0.30 - 0.90
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	03/03/2015	03/03/2015	03/03/2015	03/03/2015	03/03/2015	03/03/2015
			Sample Time	.	.	.	.	.	.
			Date Received	05/03/2015	05/03/2015	05/03/2015	05/03/2015	05/03/2015	05/03/2015
			SDG Ref	150305-39	150305-39	150305-39	150305-39	150305-39	150305-39
			Lab Sample No.(s)	10949688	10949689	10949690	10949692	10949693	10949694
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		6.6	9.8	11	14	13	12
Exchangeable Ammonia as N	<15 mg/kg	TM024		<15	<15	<15	<15	<15	<15
EPH (C7-C36)	<35 mg/kg	TM061		<35	<35	<35	<35	<35	<35
EPH Surrogate % recovery**	%	TM061		108 M	114 M	94.2 M	112 M	88.8 M	114 M
EPH Band >C10-C12	<35 mg/kg	TM061		<35	<35	<35	<35	<35	<35
EPH Band >C12-C16	<35 mg/kg	TM061		<35	<35	<35	<35	<35	<35
EPH Band >C16-C21	<35 mg/kg	TM061		<35	<35	<35	<35	<35	<35
EPH Band >C21-C28	<35 mg/kg	TM061		<35	<35	<35	<35	<35	<35
EPH Band >C28-C35	<35 mg/kg	TM061		<35	<35	<35	<35	<35	<35
EPH Band >C35-C40	<35 mg/kg	TM061		<35	<35	<35	<35	<35	<35
EPH Range >C10 - C40	<35 mg/kg	TM061		<35 ♦ M	<35 ♦ M	39.4 M	57.9 ♦ M	55 M	40.8 ♦ M
Catechol	<0.01 mg/kg	TM062 (S)		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenol	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	0.0113 M	<0.01 M	<0.01 M	<0.01 M
Cresols	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Resorcinol	<0.05 mg/kg	TM062 (S)		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylenols	<0.015 mg/kg	TM062 (S)		<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M
1-Naphthol	<0.01 mg/kg	TM062 (S)		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)		<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)		<0.06 M	<0.06 M	<0.06 M	<0.06 M	<0.06 M	<0.06 M
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)		<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Cyanide (Total) mg/kg	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M	<1 M
Antimony (Total) mg/kg	<0.6 mg/kg	TM181		<0.6 #	<0.6 #	<0.6 #	<0.6 #	<0.6 #	<0.6 #
Arsenic (Total) mg/kg	<0.6 mg/kg	TM181		13.2 M	11 M	9.99 M	19 M	15.9 M	17.5 M
Cadmium (Total) mg/kg	<0.02 mg/kg	TM181		0.294 M	0.191 M	0.301 M	0.509 M	0.328 M	0.467 M
Chromium (Total) mg/kg	<0.9 mg/kg	TM181		5.7 M	8.63 M	7.17 M	20 M	13 M	18 M
Cobalt	<0.1 mg/kg	TM181		2.65 M	4.53 M	3.87 M	8.84 M	4.83 M	7.38 M
Copper, total, as Cu mg/kg	<1.4 mg/kg	TM181		2.47 M	4.4 M	3.86 M	9.36 M	6.86 M	7.24 M
Iron (Total) mg/kg	<1000 mg/kg	TM181		8950 #	8960 #	9980 #	24200 #	16100 #	23000 #
Lead (Total) mg/kg	<0.7 mg/kg	TM181		4.27 M	6.31 M	5.77 M	18.7 M	14 M	14.5 M
Manganese	<0.13 mg/kg	TM181		305 M	400 M	500 M	714 M	338 M	571 M
Mercury (Total) mg/kg	<0.14 mg/kg	TM181		<0.14 M	<0.14 M	<0.14 M	<0.14 M	<0.14 M	<0.14 M

CERTIFICATE OF ANALYSIS

SDG:	150305-39	**Location:**	Stanford soils	**Order Number:**	
Job:	H_ENITIAL_WLV-127	**Customer:**	Enitial	**Report Number:**	305884
Client Reference:	Q42572	**Attention:**	Graham Watson	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	PIT1	PIT2	PIT3	PIT4	PIT5	PIT6
			Depth (m)	0.50 - 1.00	0.40 - 1.00	0.40 - 0.90	0.30 - 1.00	0.30 - 0.90	0.30 - 0.90
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	03/03/2015	03/03/2015	03/03/2015	03/03/2015	03/03/2015	03/03/2015
			Sample Time	.	.	.	.	.	.
			Date Received	05/03/2015	05/03/2015	05/03/2015	05/03/2015	05/03/2015	05/03/2015
			SDG Ref	150305-39	150305-39	150305-39	150305-39	150305-39	150305-39
			Lab Sample No.(s)	10949688	10949689	10949690	10949692	10949693	10949694
			AGS Reference						
Nickel (Total) mg/kg	<0.2 mg/kg	TM181		11.5 M	14.3 M	10.2 M	19.8 M	13.1 M	18.7 M
Selenium (Total) mg/kg	<1 mg/kg	TM181		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Tin	<0.24 mg/kg	TM181		<0.24 #	<0.24 #	<0.24 #	0.541 #	0.409 #	0.3 #
Vanadium	<0.2 mg/kg	TM181		17.2 #	23.5 #	18.8 #	56.8 #	36.5 #	52.2 #
Zinc (Total) mg/kg	<1.9 mg/kg	TM181		42.9 M	23.8 M	38.6 M	76.3 M	55 M	60.9 M
Potassium	<16 mg/kg	TM224		677	1150	992	1870	1780	1740

CERTIFICATE OF ANALYSIS

SDG:	150305-39	**Location:**	Stanford soils	**Order Number:**	
Job:	H_ENITIAL_WLV-127	**Customer:**	Enitial	**Report Number:**	305884
Client Reference:	Q42572	**Attention:**	Graham Watson	**Superseded Report:**	

GRO by GC-FID (S)

Results Legend	
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*	Subcontracted test.
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1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	PIT1	PIT2	PIT3	PIT4	PIT5	PIT6
			Depth (m)	0.50 - 1.00	0.40 - 1.00	0.40 - 0.90	0.30 - 1.00	0.30 - 0.90	0.30 - 0.90
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	03/03/2015	03/03/2015	03/03/2015	03/03/2015	03/03/2015	03/03/2015
			Sample Time	.	.	.	.	.	.
			Date Received	05/03/2015	05/03/2015	05/03/2015	05/03/2015	05/03/2015	05/03/2015
			SDG Ref	150305-39	150305-39	150305-39	150305-39	150305-39	150305-39
			Lab Sample No.(s)	10949688	10949689	10949690	10949692	10949693	10949694
			AGS Reference						
GRO TOT (Moisture Corrected)	<44 µg/kg	TM089		<44 M	<44 M	<44 M	<44 M	<44 M	<44 M
Methyl tertiary butyl ether (MTBE)	<5 µg/kg	TM089		<5 M	<5 M	<5 M	<5 M	<5 M	<5 M
Benzene	<10 µg/kg	TM089		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
Toluene	<2 µg/kg	TM089		<2 M	<2 M	<2 M	4.68 M	4.6 M	2.28 M
Ethylbenzene	<3 µg/kg	TM089		<3 M	<3 M	<3 M	<3 M	<3 M	<3 M
m,p-Xylene	<6 µg/kg	TM089		<6 M	<6 M	<6 M	<6 M	<6 M	<6 M
o-Xylene	<3 µg/kg	TM089		<3 M	<3 M	<3 M	<3 M	<3 M	<3 M
sum of detected mpo xylene by GC	<9 µg/kg	TM089		<9	<9	<9	<9	<9	<9
sum of detected BTEX by GC	<24 µg/kg	TM089		<24	<24	<24	<24	<24	<24
GRO >C5-C6	<10 µg/kg	TM089		<10	<10	<10	<10	<10	<10
GRO >C6-C7	<10 µg/kg	TM089		<10	<10	<10	<10	<10	<10
GRO >C7-C8	<10 µg/kg	TM089		<10	<10	<10	<10	<10	<10
GRO >C8-C10	<10 µg/kg	TM089		<10	<10	<10	<10	<10	<10
GRO >C10-C12	<10 µg/kg	TM089		<10	<10	<10	<10	<10	<10

CERTIFICATE OF ANALYSIS

SDG:	150305-39	**Location:**	Stanford soils	**Order Number:**	
Job:	H_ENITIAL_WLV-127	**Customer:**	Enitial	**Report Number:**	305884
Client Reference:	Q42572	**Attention:**	Graham Watson	**Superseded Report:**	

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
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*	Subcontracted test.
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1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	PIT1	PIT2	PIT3	PIT4	PIT5	PIT6
			Depth (m)	0.50 - 1.00	0.40 - 1.00	0.40 - 0.90	0.30 - 1.00	0.30 - 0.90	0.30 - 0.90
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	03/03/2015	03/03/2015	03/03/2015	03/03/2015	03/03/2015	03/03/2015
			Sample Time	.	.	.	.	.	.
			Date Received	05/03/2015	05/03/2015	05/03/2015	05/03/2015	05/03/2015	05/03/2015
			SDG Ref	150305-39	150305-39	150305-39	150305-39	150305-39	150305-39
			Lab Sample No.(s)	10949688	10949689	10949690	10949692	10949693	10949694
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		100	98.5	94.4	104	91.8	95.8
Acenaphthene-d10 % recovery**	%	TM218		100	99.7	96.3	104	93.9	96.3
Phenanthrene-d10 % recovery**	%	TM218		97.5	96.8	94.2	102	90.5	94.3
Chrysene-d12 % recovery**	%	TM218		92.2	91.3	88.5	96.1	88.8	89.6
Perylene-d12 % recovery**	%	TM218		103	102	97.9	108	101	99.5
Naphthalene	<9 µg/kg	TM218		<9 M	<9 M	<9 M	<9 M	<9 M	<9 M
Acenaphthylene	<12 µg/kg	TM218		<12 M	<12 M	<12 M	<12 M	<12 M	<12 M
Acenaphthene	<8 µg/kg	TM218		<8 M	<8 M	<8 M	<8 M	<8 M	<8 M
Fluorene	<10 µg/kg	TM218		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
Phenanthrene	<15 µg/kg	TM218		<15 M	<15 M	<15 M	<15 M	<15 M	<15 M
Anthracene	<16 µg/kg	TM218		<16 M	<16 M	<16 M	<16 M	<16 M	<16 M
Fluoranthene	<17 µg/kg	TM218		<17 M	<17 M	<17 M	<17 M	25.7 M	40.7 M
Pyrene	<15 µg/kg	TM218		<15 M	<15 M	<15 M	<15 M	22.1 M	34.5 M
Benz(a)anthracene	<14 µg/kg	TM218		<14 M	<14 M	<14 M	<14 M	<14 M	27.6 M
Chrysene	<10 µg/kg	TM218		<10 M	<10 M	<10 M	<10 M	16.9 M	21.3 M
Benzo(b)fluoranthene	<15 µg/kg	TM218		<15 M	<15 M	<15 M	<15 M	26.1 M	26.7 M
Benzo(k)fluoranthene	<14 µg/kg	TM218		<14 M	<14 M	<14 M	<14 M	<14 M	<14 M
Benzo(a)pyrene	<15 µg/kg	TM218		<15 M	<15 M	<15 M	<15 M	19.7 M	25 M
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218		<18 M	<18 M	<18 M	<18 M	<18 M	<18 M
Dibenzo(a,h)anthracene	<23 µg/kg	TM218		<23 M	<23 M	<23 M	<23 M	<23 M	<23 M
Benzo(g,h,i)perylene	<24 µg/kg	TM218		<24 M	<24 M	<24 M	<24 M	<24 M	<24 M
PAH, Total Detected USEPA 16	<118 µg/kg	TM218		<118	<118	<118	<118	<118	176

CERTIFICATE OF ANALYSIS

SDG:	150305-39	**Location:**	Stanford soils	**Order Number:**	
Job:	H_ENITIAL_WLV-127	**Customer:**	Enitial	**Report Number:**	305884
Client Reference:	Q42572	**Attention:**	Graham Watson	**Superseded Report:**	

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	PIT1	PIT2	PIT3	PIT4	PIT5	PIT6
			Depth (m)	0.50 - 1.00	0.40 - 1.00	0.40 - 0.90	0.30 - 1.00	0.30 - 0.90	0.30 - 0.90
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	03/03/2015	03/03/2015	03/03/2015	03/03/2015	03/03/2015	03/03/2015
			Sample Time	.	.	.	.	.	.
			Date Received	05/03/2015	05/03/2015	05/03/2015	05/03/2015	05/03/2015	05/03/2015
			SDG Ref	150305-39	150305-39	150305-39	150305-39	150305-39	150305-39
			Lab Sample No.(s)	10949688	10949689	10949690	10949692	10949693	10949694
			AGS Reference						
Phenol	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Pentachlorophenol	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
n-Nitroso-n-dipropylamine	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Nitrobenzene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Isophorone	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Hexachloroethane	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Hexachlorocyclopentadiene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Hexachlorobutadiene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Hexachlorobenzene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
n-Dioctyl phthalate	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Dimethyl phthalate	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Diethyl phthalate	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
n-Dibutyl phthalate	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Dibenzofuran	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Carbazole	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Butylbenzyl phthalate	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
bis(2-Ethylhexyl) phthalate	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
bis(2-Chloroethoxy)methane	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
bis(2-Chloroethyl)ether	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Azobenzene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
4-Nitrophenol	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
4-Nitroaniline	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
4-Methylphenol	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
4-Chlorophenylphenylether	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
4-Chloroaniline	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
4-Chloro-3-methylphenol	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
4-Bromophenylphenylether	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
3-Nitroaniline	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
2-Nitrophenol	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
2-Nitroaniline	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
2-Methylphenol	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
1,2,4-Trichlorobenzene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100

CERTIFICATE OF ANALYSIS

SDG:	150305-39	**Location:**	Stanford soils	**Order Number:**	
Job:	H_ENITIAL_WLV-127	**Customer:**	Enitial	**Report Number:**	305884
Client Reference:	Q42572	**Attention:**	Graham Watson	**Superseded Report:**	

Semi Volatile Organic Compounds

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			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	03/03/2015	03/03/2015	03/03/2015	03/03/2015	03/03/2015	03/03/2015
			Sample Time	.	.	.	.	.	.
			Date Received	05/03/2015	05/03/2015	05/03/2015	05/03/2015	05/03/2015	05/03/2015
			SDG Ref	150305-39	150305-39	150305-39	150305-39	150305-39	150305-39
			Lab Sample No.(s)	10949688	10949689	10949690	10949692	10949693	10949694
			AGS Reference						
2-Chlorophenol	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
2,6-Dinitrotoluene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
2,4-Dinitrotoluene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
2,4-Dimethylphenol	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
2,4-Dichlorophenol	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
2,4,6-Trichlorophenol	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
2,4,5-Trichlorophenol	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
1,4-Dichlorobenzene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
1,3-Dichlorobenzene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
1,2-Dichlorobenzene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
2-Chloronaphthalene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
2-Methylnaphthalene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Acenaphthylene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Acenaphthene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Anthracene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Benzo(a)anthracene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Benzo(b)fluoranthene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Benzo(k)fluoranthene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Benzo(a)pyrene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Benzo(g,h,i)perylene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Chrysene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Fluoranthene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Fluorene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Indeno(1,2,3-cd)pyrene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Phenanthrene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Pyrene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Naphthalene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100
Dibenzo(a,h)anthracene	<100 µg/kg	TM157		<100	<100	<100	<100	<100	<100

CERTIFICATE OF ANALYSIS

SDG:	150305-39	**Location:**	Stanford soils	**Order Number:**	
Job:	H_ENITIAL_WLV-127	**Customer:**	Enitial	**Report Number:**	305884
Client Reference:	Q42572	**Attention:**	Graham Watson	**Superseded Report:**	

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	PIT1	PIT2	PIT3	PIT4	PIT5	PIT6
			Depth (m)	0.50 - 1.00	0.40 - 1.00	0.40 - 0.90	0.30 - 1.00	0.30 - 0.90	0.30 - 0.90
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	03/03/2015	03/03/2015	03/03/2015	03/03/2015	03/03/2015	03/03/2015
			Sample Time	.	.	.	.	.	.
			Date Received	05/03/2015	05/03/2015	05/03/2015	05/03/2015	05/03/2015	05/03/2015
			SDG Ref	150305-39	150305-39	150305-39	150305-39	150305-39	150305-39
			Lab Sample No.(s)	10949688	10949689	10949690	10949692	10949693	10949694
			AGS Reference						
Dibromofluoromethane**	%	TM116		116	110	112	113	106	110
Toluene-d8**	%	TM116		104	101	101	102	101	103
4-Bromofluorobenzene**	%	TM116		96.7	85.9	85.2	87.8	80.2	84.2
Dichlorodifluoromethane mg/kg	<6 µg/kg	TM116		<6 M	<6 M	<6 M	<6 M	<6 M	<6 M
Chloromethane mg/kg	<7 µg/kg	TM116		<7 #	<7 #	<7 #	<7 #	<7 #	<7 #
Vinyl Chloride mg/kg	<6 µg/kg	TM116		<6 M	<6 M	<6 M	<6 M	<6 M	<6 M
Bromomethane mg/kg	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
Chloroethane mg/kg	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
Trichlorofluoromethane mg/kg	<6 µg/kg	TM116		<6 M	<6 M	<6 M	<6 M	<6 M	<6 M
1,1-Dichloroethene mg/kg	<10 µg/kg	TM116		<10 #	<10 #	<10 #	<10 #	<10 #	<10 #
Carbon Disulphide	<7 µg/kg	TM116		<7 M	<7 M	<7 M	<7 M	<7 M	<7 M
Dichloromethane mg/kg	<10 µg/kg	TM116		<10 #	<10 #	<10 #	<10 #	<10 #	<10 #
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
Trans-1,2-Dichloroethene mg/kg	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
1,1-Dichloroethane mg/kg	<8 µg/kg	TM116		<8 M	<8 M	<8 M	<8 M	<8 M	<8 M
Cis-1,2-Dichloroethene mg/kg	<6 µg/kg	TM116		<6 M	<6 M	<6 M	<6 M	<6 M	<6 M
2,2-Dichloropropane	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
Bromochloromethane mg/kg	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
Chloroform mg/kg	<8 µg/kg	TM116		<8 M	<8 M	<8 M	<8 M	<8 M	<8 M
1,1,1-Trichloroethane mg/kg	<7 µg/kg	TM116		<7 M	<7 M	<7 M	<7 M	<7 M	<7 M
1,1-Dichloropropene mg/kg	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
Carbontetrachloride	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
1,2-Dichloroethane mg/kg	<5 µg/kg	TM116		<5 M	<5 M	<5 M	<5 M	<5 M	<5 M
Benzene mg/kg	<9 µg/kg	TM116		<9 M	<9 M	<9 M	<9 M	<9 M	<9 M
Trichloroethene mg/kg	<9 µg/kg	TM116		<9 #	<9 #	<9 #	<9 #	<9 #	<9 #
1,2-Dichloropropane mg/kg	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
Dibromomethane mg/kg	<9 µg/kg	TM116		<9 M	<9 M	<9 M	<9 M	<9 M	<9 M
Bromodichloromethane mg/kg	<7 µg/kg	TM116		<7 M	<7 M	<7 M	<7 M	<7 M	<7 M
Cis-1,3-Dichloropropene mg/kg	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
Toluene mg/kg	<7 µg/kg	TM116		<7 M	<7 M	<7 M	<7 M	8.35 M	<7 M
Trans-1,3-Dichloropropene mg/kg	<10 µg/kg	TM116		<10	<10	<10	<10	<10	<10
1,1,2-Trichloroethane mg/kg	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M

CERTIFICATE OF ANALYSIS

SDG:	150305-39	**Location:**	Stanford soils	**Order Number:**	
Job:	H_ENITIAL_WLV-127	**Customer:**	Enitial	**Report Number:**	305884
Client Reference:	Q42572	**Attention:**	Graham Watson	**Superseded Report:**	

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	PIT1	PIT2	PIT3	PIT4	PIT5	PIT6
			Depth (m)	0.50 - 1.00	0.40 - 1.00	0.40 - 0.90	0.30 - 1.00	0.30 - 0.90	0.30 - 0.90
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	03/03/2015	03/03/2015	03/03/2015	03/03/2015	03/03/2015	03/03/2015
			Sample Time	.	.	.	.	.	.
			Date Received	05/03/2015	05/03/2015	05/03/2015	05/03/2015	05/03/2015	05/03/2015
			SDG Ref	150305-39	150305-39	150305-39	150305-39	150305-39	150305-39
			Lab Sample No.(s)	10949688	10949689	10949690	10949692	10949693	10949694
			AGS Reference						
1,3-Dichloropropane mg/kg	<7 µg/kg	TM116		<7 M	<7 M	<7 M	<7 M	<7 M	<7 M
Tetrachloroethene mg/kg	<5 µg/kg	TM116		<5 M	<5 M	<5 M	<5 M	<5 M	<5 M
Dibromochloromethane mg/kg	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
1,2-Dibromoethane mg/kg	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
Chlorobenzene mg/kg	<5 µg/kg	TM116		<5 M	<5 M	<5 M	<5 M	<5 M	<5 M
1,1,1,2-Tetrachloroethane mg/kg	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
Ethylbenzene mg/kg	<4 µg/kg	TM116		<4 M	<4 M	<4 M	<4 M	<4 M	<4 M
p/m-Xylene	<10 µg/kg	TM116		<10 #	<10 #	<10 #	<10 #	<10 #	<10 #
o-Xylene mg/kg	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
Styrene mg/kg	<10 µg/kg	TM116		<10 #	<10 #	<10 #	<10 #	<10 #	<10 #
Bromoform mg/kg	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
Isopropylbenzene mg/kg	<5 µg/kg	TM116		<5 #	<5 #	<5 #	<5 #	<5 #	<5 #
1,1,2,2-Tetrachloroethane mg/kg	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
1,2,3-Trichloropropane mg/kg	<16 µg/kg	TM116		<16 M	<16 M	<16 M	<16 M	<16 M	<16 M
Bromobenzene mg/kg	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
Propylbenzene	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
2-Chlorotoluene mg/kg	<9 µg/kg	TM116		<9 M	<9 M	<9 M	<9 M	<9 M	<9 M
1,3,5-Trimethylbenzene mg/kg	<8 µg/kg	TM116		<8 M	<8 M	<8 M	<8 M	<8 M	<8 M
4-Chlorotoluene mg/kg	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
Tert-Butylbenzene mg/kg	<14 µg/kg	TM116		<14 M	<14 M	<14 M	<14 M	<14 M	<14 M
1,2,4-Trimethylbenzene mg/kg	<9 µg/kg	TM116		<9 #	<9 #	<9 #	<9 #	<9 #	<9 #
sec-Butylbenzene mg/kg	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
4-Isopropyltoluene	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
1,3-Dichlorobenzene mg/kg	<8 µg/kg	TM116		<8 M	<8 M	<8 M	<8 M	<8 M	<8 M
1,4-Dichlorobenzene mg/kg	<5 µg/kg	TM116		<5 M	<5 M	<5 M	<5 M	<5 M	<5 M
n-Butylbenzene mg/kg	<11 µg/kg	TM116		<11	<11	<11	<11	<11	<11
1,2-Dichlorobenzene mg/kg	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
1,2-Dibromo-3-Chloropropane mg/kg	<14 µg/kg	TM116		<14 M	<14 M	<14 M	<14 M	<14 M	<14 M
Tert-amyl methyl ether	<10 µg/kg	TM116		<10 #	<10 #	<10 #	<10 #	<10 #	<10 #
1,2,4-Trichlorobenzene	<20 µg/kg	TM116		<20	<20	<20	<20	<20	<20
Hexachlorobutadiene	<20 µg/kg	TM116		<20	<20	<20	<20	<20	<20
Naphthalene	<13 µg/kg	TM116		<13 M	<13 M	<13 M	<13 M	<13 M	<13 M

CERTIFICATE OF ANALYSIS

SDG:	150305-39	**Location:**	Stanford soils	**Order Number:**	
Job:	H_ENITIAL_WLV-127	**Customer:**	Enitial	**Report Number:**	305884
Client Reference:	Q42572	**Attention:**	Graham Watson	**Superseded Report:**	

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	PIT1	PIT2	PIT3	PIT4	PIT5	PIT6
			Depth (m)	0.50 - 1.00	0.40 - 1.00	0.40 - 0.90	0.30 - 1.00	0.30 - 0.90	0.30 - 0.90
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	03/03/2015	03/03/2015	03/03/2015	03/03/2015	03/03/2015	03/03/2015
			Sample Time	.	.	.	.	.	.
			Date Received	05/03/2015	05/03/2015	05/03/2015	05/03/2015	05/03/2015	05/03/2015
			SDG Ref	150305-39	150305-39	150305-39	150305-39	150305-39	150305-39
			Lab Sample No.(s)	10949688	10949689	10949690	10949692	10949693	10949694
			AGS Reference						
1,2,3-Trichlorobenzene	<20 µg/kg	TM116		<20 #	<20 #	<20 #	<20 #	<20 #	<20 #

CERTIFICATE OF ANALYSIS

SDG:	150305-39	**Location:**	Stanford soils	**Order Number:**	
Job:	H_ENITIAL_WLV-127	**Customer:**	Enitial	**Report Number:**	305884
Client Reference:	Q42572	**Attention:**	Graham Watson	**Superseded Report:**	

Extractable Petroleum Hydrocarbons (EPH) By GC-FID

EPH (DRO) (C10-C40)

Sample No	Customer Sample Ref.	Depth	Matrix (mg/kg)	EPH	Interpretation
10994433	PIT1	0.50 - 1.00	SOLID	<35.0	No interpretation possible
10994430	PIT2	0.40 - 1.00	SOLID	<35.0	No interpretation possible
10994417	PIT3	0.40 - 0.90	SOLID	39.4	No interpretation possible
10994423	PIT4	0.30 - 1.00	SOLID	57.9	No interpretation possible
10994411	PIT5	0.30 - 0.90	SOLID	55.0	No interpretation possible
10994428	PIT6	0.30 - 0.90	SOLID	40.8	No interpretation possible

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:	150305-39	**Location:**	Stanford soils	**Order Number:**	
Job:	H_ENITIAL_WLV-127	**Customer:**	Enitial	**Report Number:**	305884
Client Reference:	Q42572	**Attention:**	Graham Watson	**Superseded Report:**	

Table of Results - Appendix

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		
TM024	Method 4500A & B, AWWA/APHA, 20th Ed., 1999	Determination of Exchangeable Ammonium and Ammoniacal Nitrogen as N by titration on solids		
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC		
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		
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser		
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		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM218	Microwave extraction – EPA method 3546	Microwave extraction - EPA method 3546		
TM224	US EPA Method 6010B	Determination of Alkaline Metals by iCap 6500 Duo ICP-OES		

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

CERTIFICATE OF ANALYSIS

SDG:	150305-39	**Location:**	Stanford soils	**Order Number:**	
Job:	H_ENITIAL_WLV-127	**Customer:**	Enitial	**Report Number:**	305884
Client Reference:	Q42572	**Attention:**	Graham Watson	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	10949688	10949689	10949690	10949692	10949693	10949694
Customer Sample Ref.	PIT1	PIT2	PIT3	PIT4	PIT5	PIT6
AGS Ref.						
Depth	0.50 - 1.00	0.40 - 1.00	0.40 - 0.90	0.30 - 1.00	0.30 - 0.90	0.30 - 0.90
Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Alkali Metals by iCap-OES (Soil)	16-Mar-2015	16-Mar-2015	16-Mar-2015	16-Mar-2015	16-Mar-2015	16-Mar-2015
Ammonium Soil by Titration	09-Mar-2015	09-Mar-2015	09-Mar-2015	09-Mar-2015	09-Mar-2015	09-Mar-2015
Cyanide Comp/Free/Total/Thiocyanate	18-Mar-2015	18-Mar-2015	18-Mar-2015	18-Mar-2015	18-Mar-2015	18-Mar-2015
EPH	18-Mar-2015	18-Mar-2015	18-Mar-2015	18-Mar-2015	18-Mar-2015	18-Mar-2015
EPH by FID	18-Mar-2015	18-Mar-2015	17-Mar-2015	18-Mar-2015	17-Mar-2015	18-Mar-2015
GRO by GC-FID (S)	16-Mar-2015	16-Mar-2015	16-Mar-2015	16-Mar-2015	16-Mar-2015	16-Mar-2015
Metals in solid samples by OES	13-Mar-2015	13-Mar-2015	13-Mar-2015	17-Mar-2015	13-Mar-2015	17-Mar-2015
PAH by GCMS	13-Mar-2015	13-Mar-2015	13-Mar-2015	13-Mar-2015	17-Mar-2015	13-Mar-2015
Phenols by HPLC (S)	18-Mar-2015	18-Mar-2015	18-Mar-2015	18-Mar-2015	18-Mar-2015	18-Mar-2015
Sample description	06-Mar-2015	06-Mar-2015	06-Mar-2015	06-Mar-2015	06-Mar-2015	06-Mar-2015
Semi Volatile Organic Compounds	12-Mar-2015	12-Mar-2015	12-Mar-2015	12-Mar-2015	12-Mar-2015	12-Mar-2015
VOC MS (S)	15-Mar-2015	15-Mar-2015	15-Mar-2015	15-Mar-2015	15-Mar-2015	15-Mar-2015

SDG:	150305-39	**Location:**	Stanford soils	**Order Number:**	
Job:	H_ENITIAL_WLV-127	**Customer:**	Enitial	**Report Number:**	305884
Client Reference:	Q42572	**Attention:**	Graham Watson	**Superseded Report:**	

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC 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 all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples 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 analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

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 the major 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 C5-C12 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.

Sample Deviations

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
5	**Samples exceeded holding time before presevation was performed**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials 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.

Appendix 2 – overview of current guidance on Interpretation of chemical contamination of soils

Appendix 2

Current Guidance on Interpretation of Chemical Contamination of Soils

Contaminated land is defined in law through Part IIA of the Environmental Protection Act 1990, implemented through Section 57 of the Environment Act 1995. This supports a 'suitable for use' based approach to the risk assessment of contaminated land.
Site specific risk assessment is based upon an assessment of plausible contaminant linkages, referred to as a "contaminant-pathway-receptor" model, based upon the current or proposed use of the site.
Before undertaking a risk assessment a conceptual site model is devised in order to identify the potential contaminants, pathways and receptors. The individual contaminants, pathways and receptors then need to be further investigated in order to refine the initial assessment and risk assessment undertaken.

In March 2002, the Department for Environment, Food and Rural Affairs (Defra) and the Environment Agency (EA) published the Contaminated Land Exposure Assessment (CLEA) Model and a series of related reports. These were designed to provide a scientifically based framework for the assessment of chronic risks to human health from contaminated land.

These reports (CLR7-10) together with associated "SGV" documents were withdrawn and further documents have been published as listed below as revised guidance to the CLEA assessment:

- *Environment Agency. 2008. Using Soil Guideline Values SC050021/SGV Introduction, March 2008.*
- *Environment Agency. 2008. Science Report SC050021/SR2: Human health toxicological assessment of contaminants in soil.*
- *Environment Agency. 2008. Science Report SC050021/SR3: Updated technical*
- *background to the CLEA model.*
- *Environment Agency. 2008. Compilation of Data for Priority Organic Contaminants for Derivation of Soil Guideline Values Science report SC050021/SR7*
- *Science Report SC050021/SR4: CLEA Software (Version) Handbook.*

Additional guidance on statistical assessment replacing CLR 7 is partly provided in:

- *CL:AIRE :2009: Guidance on Comparing Data With a Critical Concentration*

A different approach to the statistical appraisal of data is required depending on whether the assessment of risk is to determine whether land is Contaminated Land in accordance with regulations, or whether the assessment is to determine whether the site is suitable for new development in according with planning guidance. This is discussed further in CL:AIRE :2009 "Guidance on Comparing Data With a Critical Concentration".

The introduction of the Contaminated Land (England) (Amendment) Regulations 2012 and Contaminated Land Statutory Guidance (Defra, 2012) re-assessed the CLEA Model and the derived SGVs (and associated GACs calculated using the model). This re-assessment concluded that the SGVs/GACs were conservative screening criteria for determining the suitability of soil with regard to the risk to human health under the planning regime and defined a new upper limit for planning purposes which is the boundary between the new Category 3 and 4. In March 2014, Defra issued preliminary guidance on these new Category 4 Screening Levels (C4SL) and these are discussed further hereafter.

Soil Guideline Values

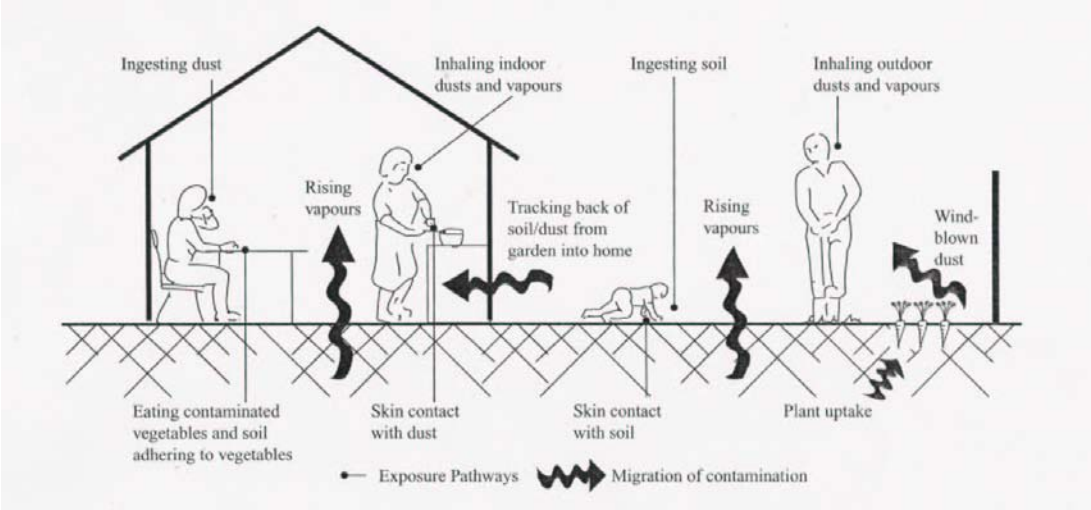
A programme for the derivation of SGVs based on the above guidance is provided by the Environment Agency and is entitled "CLEA Software Version 1.06". These reports, together with supporting toxicology reviews ("Tox" or Supplementary Information Reports for individual substances, Soil Guideline Value Reports and other guidance referred to in these), provide guidance and the scientific basis for assessing the risk to human health from potential contaminants.

Soil Guideline Value Reports (SGV Reports) have been published for a number of contaminants and these are published by the Environment Agency. It is planned that the reports will include SGVs for:

- *heavy metals and other inorganic compounds: arsenic, cadmium, chromium, cyanide, lead(now withdrawn), mercury nickel, and selenium;*
- *benzene, ethylbenzene, toluene and xylenes;*
- *phenol;*
- *dioxins and dioxin-like polychlorinated biphenyls (PCBs);*
- *polycyclic aromatic hydrocarbons (PAHs) – 11 substances.*

In addition, CIEH through LQM and the EIC, has published generic assessment criteria (GACs) for a variety of other parameters including metals, hydrocarbons, solvents, PAHs and explosive substances for three standard land uses. These have been produced to supplement the Environment Agency guidance and will be replaced by SGVs when or if the EA publishes these.

The CLEA model has been developed to calculate an estimated tolerable daily soil intake (TDSI) for site users given a set 'default' exposure pathways. Ten human exposure pathways are covered in the CLEA model as presented below:



Ingestion

- ingestion of outdoor soil;
- ingestion of indoor dust;
- ingestion of home grown vegetables;
- ingestion of soil attached to home grown vegetables.

Dermal Contact

- dermal contact with outdoor soil;
- dermal contact with indoor dust.

Inhalation

- inhalation of outdoor dust;
- inhalation of indoor dust;

- inhalation of outdoor soil vapour;
- inhalation of indoor soil vapour.

It should be noted that there are other potential exposure pathways on some sites not included in the CLEA model e.g. certain organic species can transfer through plastic water pipes into drinking water supply.
The presence and/or significance of each of the above exposure pathways are dependent on the type of land use being considered and the nature of the contaminant under scrutiny. Accordingly, the CLEA model considers for principle 'default' land use types and makes a series of 'default' assumptions with regard to human exposure frequency, duration and critical human target groups for each land use considered:

- *residential land use;*
- *allotments;*
- *commercial and industrial land use.*

The land use categories defined in the CLEA are detailed below.

Residential: *This land use category assumes that people live in a variety of dwellings including terraced, detached and semi detached houses up to two storeys high. The structure of buildings varies. Default parameters for building materials and building design are included in CLEA documents to calculate the relevant multi-layer diffusion coefficients for vapour intrusion and to model indoor vapour intrusion. The CLEA model assumes that regardless of the style of housing the residents will have access to either a private garden or community open space nearby, and that soil tracked into the home will form indoor dust. It allows for the ingestion pathways from home grown vegetables.*

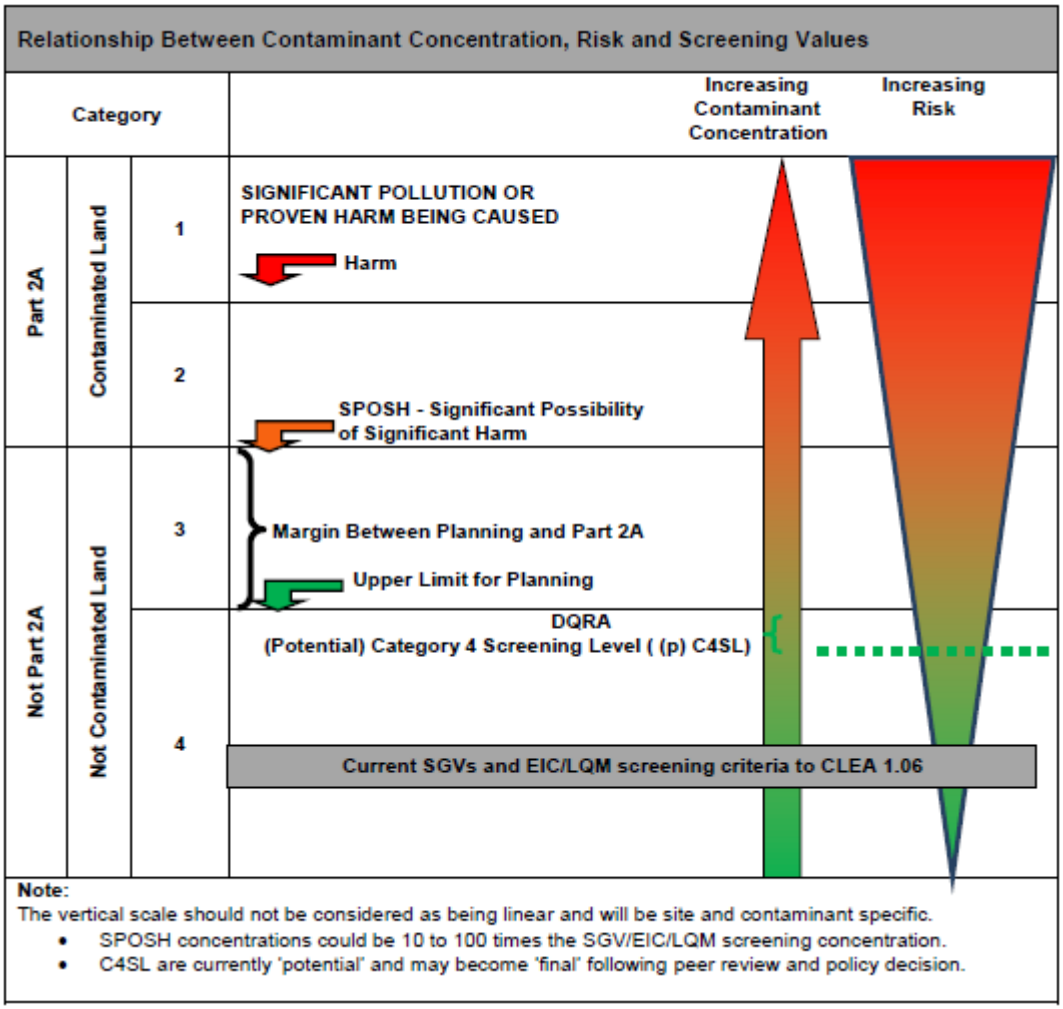
Allotments: *The CLEA model incorporates an assessment of land provided by local authorities specifically for people to grow fruit and vegetables for their own consumption. Consumption of such fruit and vegetables present several exposure pathways; plants absorb contaminants mainly via water uptake through roots, the contaminants move to edible portions of plants via translocation and contaminated soil particles become trapped in the skin and between leaves. At present the model fails to account for exposure through the consumption of animals, and their products (e.g. eggs), which have been reared on contaminated land.*

Commercial/Industrial: *Although there are a wide variety of workplaces and work-related activities, the CLEA assessment of this land-use assumes that work occurs in a permanent, three-storey structure, where employees spend most time indoors, conducting office-based or light physical work. The model assumes employees sit outside during breaks for most of the year. Limitations in applying this land-use to different industries are detailed in EA publication "Updated technical background to the CLEA model" (2011). The generic model assumes that the site would not be covered by hard standing. Risk of exposure to contaminants would be clearly less where commercial land is essentially all buildings and hard standing***.**

Based on the assumptions of each land use and the associated applicable exposure pathways, a 'Soil Guideline Value' (SGV) may be calculated for each contaminant under consideration for a particular land use in order to determine whether certain contaminant soil concentrations pose a significant risk to human health.

The primary purpose of the CLEA SGVs are as 'trigger values' – indicators to a risk assessor that soil concentrations below this level require no further assessment as it can be assumed

that the soil is suitable for the proposed use. Where soil concentrations occur above the SGV then further assessment of the results is required. The Contaminated Land (England) (Amendment) Regulations 2012 and Contaminated Land Statutory Guidance (Defra, 2012) effective since April 2012 provide clarity on the assessment of risk where soil concentrations exceed the SGV. The guidance introduces a four stage classification system relating to concentration of contaminants and the assessed risk which indicates appropriate actions. Category 1 and 2 sites are classified as "Contaminated Land" as defined in Part IIA of The Environmental Protection Act (1990).
Category 3 and 4 sites are not considered as "Contaminated Land" in accordance with the Act. This can be explained using the figure below.



There are also difficulties in establishing soil concentrations of contaminants beyond which risks from exposure to these contaminants would be 'unacceptable' and that they would lead to "significant possibility of significant harm" as defined in Part IIA of The Environmental Protection Act (1990) and determine that the land is "contaminated." This ultimately requires detailed 'toxicological' information of the health effects of individual contaminants and also a scientific judgement on what constitutes an 'unacceptable' risk. It is for local authorities or the Environment Agency to determine whether a particular site is contaminated land and it is for local Planning Authorities to determine whether land affected by contamination can be redeveloped.

Given the SGVs have been derived only for a limited number of contaminants and there was little prospect of further SGVs being published, two professional groupings have produced Generic Assessment Criteria (GACs) in accordance with the CLEA model for a large number

of additional contaminants. These GACs were recognised in the new Contaminated Land Statutory Guidance (DEFRA, 2012) and have been produced as follows:

> *LQM/CIEH : 2009 Nathaniel CP, McCaffrey C, Ashmore MH, Cheng NPS GROUP, Gillett A,Ogden R & Scott D : 2009 . The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment (2nd edition). Land Quality Press, Nottingham.*
>
> *CL:AIRE/EIC/AGS: 2009 : Soil Generic Assessment Criteria (GAC) for Human Health Risk Assessment. Contaminated Land: Applications in Real Environments, Environment Industries Commission & Association of Geotechnical and Environmental Specialists. December 2009.*

Category 4 Screening Levels

For new developments progressing through the planning regime, it is desirable that the soil concentrations are within Category 4 where there is a valid contaminant linkage. The upper boundary between Category 4 and 3 is not defined in the guidance. This boundary can also be better defined by carrying out a Detailed Quantified Risk Assessment (DQRA) and this is discussed later in this appendix.

In December 2013 Defra issued the findings of a research project undertaken by CL:AIRE to set out the framework by which potential Category 4 Screening Levels (pC4SL) may be derived. The report was not designed to produce 'final' C4SL as the steering group producing the report believes that final C4SL should be set by a 'relevant authority' (e.g. Defra), the toxicological framework proposed has not been reviewed by the Committee on Toxicity and the document has yet to be subject to peer review. In March 2014, appendices to the main Defra report were published detailing the derivation of pC4SL for 6 contaminants and other appendices regarding a review of the CIEH/CL:AIRE statistics guidance and sensitivity analysis. For each contaminant, a range of pC4SLs have been produced relating to modifying toxicological parameters only, modifying exposure parameters only or by modifying both. It should be noted that the pC4SL produced for lead (the SGV was withdrawn in 2011) has undertaken a relatively large toxicological review in relation to modelling blood lead concentrations. pC4SL have been produced for:

- *Arsenic;*
- *Benzene;*
- *Benzo(a)pyrene (as a surrogate marker for PAHs);*
- *Cadmium;*
- *Chromium (VI); and*
- *Lead*

The values published are 'potential' C4SL and are included on Table 1 At present, it is considered that the pC4SL provide a simple test for deciding whether land is suitable for use without any remediation. The pC4SL represent a new set of screening levels that are more pragmatic (but highly precautionary) compared to the existing soil guideline values (SGVs and the other GACs calculated in accordance with the existing CLEA methodology). The pC4SL provide cautious estimates of contaminant concentrations in soil that are still considered to present an acceptable level of risk, within the context of Part 2A, by combining information on toxicology, exposure assessment and normal levels of exposure to these contaminants.

The threshold values are tabulated in Table 1 and annotated with either the matching SGV or GAC where applicable.

Table 1

Provisional C4SLs – *source - Contaminated Land in England- Update on guideline values – Defra -10th October 2013*

	pC4SL with changes to exposure parameters and LLTC (mg/kg) **(SGV or GAC shown in brackets for comparison)**					
Substance	**Residential** *With home grown produce.*	**Residential** *Without home grown produce*.	**Allotments**	**Commercial**	**POS resi**	**POS park**
Arsenic	*37 (32)*	*40*	*49 (43)*	*640 (640)*	*79*	*168*
Benzene	*0.87 (0.33)*	*3.3*	*0.18 (0.07)*	*98 (95)*	*140*	*230*
Benzo(a)pyrene (as a surrogate marker for genotoxic PAHs)	*5.0 (1.0)*	*5.3*	*5.7 (2.1)*	*76 (14)*	*10*	*21*
Cadmium	*26 (10)*	*149*	*4.9 (1.8)*	*410 (230)*	*220*	*880*
Chromium (VI)	*21 (4.3)*	*21*	*170 (2.1)*	*49 (35)*	*23*	*250*
Lead	*86 – 210 (450*)*	*130 - 330 (450*)*	*34 – 84 (450*)*	*1100 – 6000 (750*)*	*270 - 760*	*580-1400*

POS = public open space

GAC from Nathanail *et al*., 2009 shown blue * Former SGV now withdrawn shown red

Lead

The SGV for lead was withdrawn in 2011. The pC4SL for lead provides a technically robust and conservative assessment tool using significantly updated toxicological modelling in line with current scientific understanding of lead toxicology.

Public Open Space

The Defra report (December 2013) has also introduced exposure scenarios for two other commonly occurring land uses which require assessment (under the planning and Part 2A regimes) on a relatively frequent basis. These exposure scenarios are:

- *Public Open Space – Space Near Residential Housing (POS_{resi}); and*
- *Public Open Space – Public Park (POS_{park}).*

Potential use of pC4SL relating to Public Open Space (POS) require care due to the significant variability in exposure characteristics. For example, POS may include:

- *Children's play areas, public parks where children practise sport several times a week and teenagers only once a week;*
- *Grassed areas adjacent to residential properties which are rarely used;*
- *Dedicated sports grounds where exposure is only to players and ground-workers; and*
- *Nature reserves or open ground with low level activity (for example, dog walking).*

Within the Defra report (December 2013) the following exposure scenarios have been modelled as these are considered the most important for potential exposure for the critical receptor (young children):

- *Green open space close to housing, including tracking back of soil (POS_{resi}); and*

- *Park-type scenario where distance is considered sufficient to discount tracking back of soil (POSpark).*

Detailed Quantified Risk Assessment (DQRA)
SGVs, GACs and pC4SL are based on a number of basic assumptions. There are two main options for developing Site Specific Assessment Criteria (SSAC) by adjusting the CLEA model so that they have greater relevance to the site:
Simple adjustment of the generic SGV / C4SL model*. Such adjustment is restricted to the choice of exposure routes selected for the generic land use, building type, soil type and soil organic matter content within the CLEA software.*
Detailed adjustment. *It may be relevant to make greater modifications to the model due to the specific use of the land in question. This can include modification to any parameter value, including exposure assumptions, building parameters, and the choice and application of fate and transport models. This is equally relevant to site-specific modifications of existing generic land uses, the development of new land uses, and the inclusion of additional exposure pathways. Much of this can be undertaken using the CLEA software.*
Depending on the complexity of the detailed adjustments required, it may be necessary to use other tools either alone or in conjunction with the CLEA software. Both options should follow established protocols for DQRA and require sufficient justification and supporting information for the adjustments made. Detailed adjustments are likely to require substantially greater technical justification and supporting documentation, especially if modifications are based on information not contained within the SGV framework documents.

If the screening levels are exceeded then more sophisticated quantitative risk assessment can be undertaken or remedial action may be taken to break the contaminant linkages. The benefits of undertaking a quantitative risk assessment must be weighed against the likelihood that it will bring about cost savings in the proposed remediation.

Further information about the use of soil guideline values is provided in Environment Agency - Using Soil Guideline Values SC050021/SGV Introduction, March 2008.

A broader range of analytical species are considered in the most recent version of the Dutch Intervention Values, these have been partially updated and published in the Soil Remediation Circular 2009. The soil intervention values apply to dry soil.

The soil remediation intervention values indicate when the functional properties of the soil for humans, plants and animals is seriously impaired or threatened.
They are representative of the level of contamination above which a serious case of soil contamination is deemed to exist. New proposals were made for intervention values and these are included in RIVM report 711701023 (Feb 2001). The new proposed intervention values for a number of substances have been adjusted on the basis of EU policy-related considerations. The amended standards are described in the NOBO report: Ministry of Housing, Spatial Planning and the Environment, 2008, in print: NOBO: Normstelling en bodemkwaliteitsbeoordeling (report on standardisation and soil quality assessment).

Although not directly applicable to UK guidance, the intervention values are nonetheless a useful indication of the significance of species detected that fall outside of those species for which there are Soil Guideline Values.

Both the UK and Dutch standard threshold values have been used in the report to determine the potential significance of the analytical results.

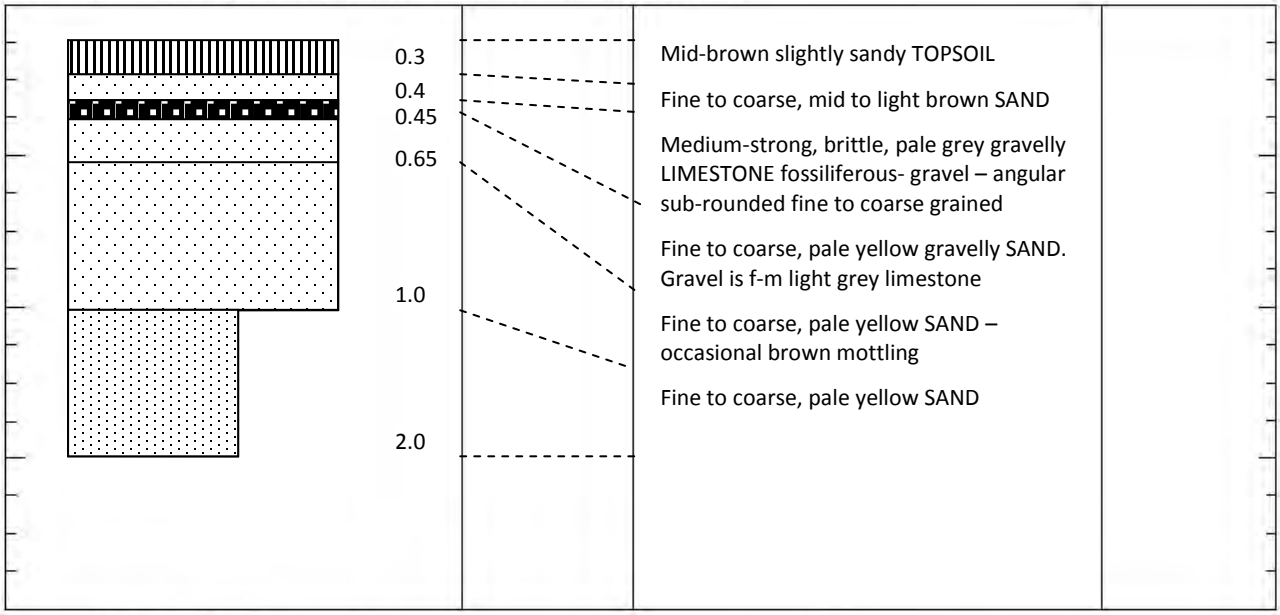
Appendix 3 – Site Records (Trial Pit Logs and Photographs)

enitial

Trial Pit Log

Project	Stanford in the Vale	Project No		Trial Pit No	1
Date		Described by		Sheet No	

Face Sketch (Indicate stratum boundaries and face(s) sketched, use additional sheets as required)

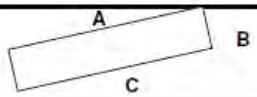


Samples and Tests			Strata	
Depth m	Type & No	Test results	Depth m	Description
			0 – 0.3m	
			0.3 – 0.4	
			0.4– 0.45	Composite sample from 0.5 – 1.0m
			0.45-0.65	
			0.65-1.0	
			1.0-2.0	

Groundwater Observations (level and rate of inflow)

No groundwater influx, sand increasingly moist from 1.2m

Strike of Face A		deg
Length of Face A		m
Width of Face B		m



Weather

Plant in use

Stability

Support in use

Record of photographs taken

Sample and test types

D	Small disturbed sample	TkW	Thick walled open sample
B	Large disturbed sample	TW	Thin walled open sample
Blk	Block sample	PS	Piston sample
V	Vane test	CS	Core sample
		Note sample diameter if not 100 mm	

Remarks

Standard in use: 5930 Amdt1: 5930 pre Amdt 1: Other

Trial Pit 1 face A

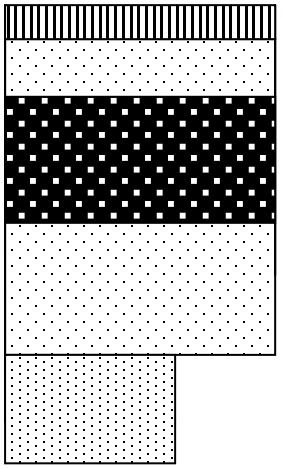
Trial Pit 1 face B

enitial

Trial Pit Log

Project	Stanford in the Vale	Project No		Trial Pit No	2
Date		Described by		Sheet No	

Face Sketch (Indicate stratum boundaries and face(s) sketched, use additional sheets as required)



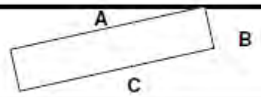
0.25	Dark brown slightly sandy TOPSOIL
0.4	Fine to coarse, mid grey angular to sub-rounded limestone gravel
0.8	Medium-strong, brittle, mid grey weathered LIMESTONE closely laminated fossiliferous- occ.pea shaped Calcite nodules
1.5	Fine to coarse, pale yellow gravelly SAND. Gravel is f-m light grey weathered limestone
2.0	Fine to coarse, light to mid yellow SAND –

Samples and Tests			Strata	
Depth m	Type & No	Test results	Depth m	Description
			0 – 0.25m	
			0.25– 0.4	
			0.4– 0.8	Composite sample from 0.4 – 1.0m
			0.8-1.5	
			1.5-2.0	

Groundwater Observations (level and rate of inflow)

No groundwater influx,

Strike of Face A		deg
Length of Face A		m
Width of Face B		m



Weather

Plant in use	Record of photographs taken
Stability	
Support in use	

Sample and test types

D	Small disturbed sample	TkW	Thick walled open sample
B	Large disturbed sample	TW	Thin walled open sample
Blk	Block sample	PS	Piston sample
V	Vane test	CS	Core sample

Note sample diameter if not 100 mm

Remarks

Standard in use: 5930 Amdt1: 5930 pre Amdt 1: Other

Trial Pit 2 face A

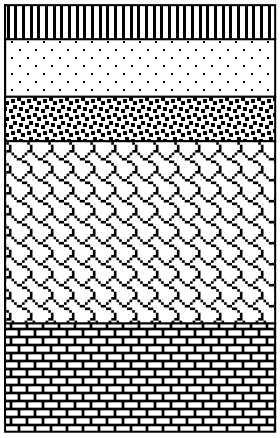
Trial Pit 2 face B

enitial

Trial Pit Log

Project	Stanford in the Vale	Project No		Trial Pit No	3
Date		Described by		Sheet No	

Face Sketch (Indicate stratum boundaries and face(s) sketched, use additional sheets as required)



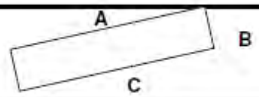
0.3	Dark brown slightly sandy TOPSOIL, some fine roots
0.55	Yellow-brown Fine to coarse, SANDY GRAVEL - gravel is fine to coarse weathered limestone
0.7	Mid-grey, fine to coarse limestone GRAVEL with occasional cobbles
	Mid-grey angular to sub-rounded gravelly limestone COBBLES
1.2	
	Mid-grey medium strong, thinly bedded fossiliferous LIMESTONE –
1.5	

Samples and Tests			Strata	
Depth m	Type & No	Test results	Depth m	Description
			0 – 0.3m	
			0.3– 0.55	
			0.55– 0.7	Composite sample from 0.4 – 0.9
			0.7-1.2	
			1.2 –1.5	

Groundwater Observations (level and rate of inflow)

No groundwater influx,

Strike of Face A		deg
Length of Face A		m
Width of Face B		m



Weather

Plant in use

Stability

Support in use

Record of photographs taken

Sample and test types

D	Small disturbed sample	TkW	Thick walled open sample
B	Large disturbed sample	TW	Thin walled open sample
Blk	Block sample	PS	Piston sample
V	Vane test	CS	Core sample
		Note sample diameter if not 100 mm	

Remarks

Unable to penetrate limestone layer with excavator used

Standard in use: 5930 Amdt1: 5930 pre Amdt 1: Other

Trial Pit 3 face A

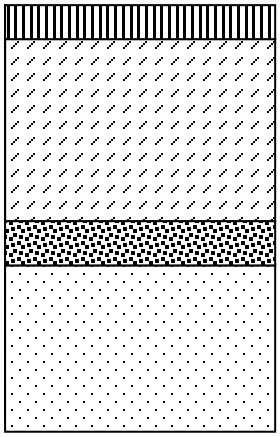
Trial Pit 3 – face B

enitial

Trial Pit Log

Project	Stanford in the Vale	Project No		Trial Pit No	4
Date		Described by		Sheet No	

Face Sketch (Indicate stratum boundaries and face(s) sketched, use additional sheets as required)



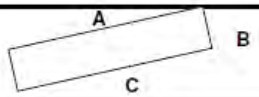
0.4	Mid -Dark brown sandy TOPSOIL, with occ. Fine to med GRAVEL
	Mid reddish-brown, clayey SILT, fairly dense and lightly cohesive
1.5	Brownish-yellow fine to coarse silty SAND
1.7	Mid to light yellow, fine to coarse SAND
2.0	

Samples and Tests			Strata	
Depth m	Type & No	Test results	Depth m	Description
			0 – 0.3m	
			0.3– 0.4	
			0.4– 1.5	Composite sample from 0.3 – 1.0
			1.5-1.7	
			1.7–2.0	

Groundwater Observations (level and rate of inflow)

No groundwater influx, topsoil was moiset

Strike of Face A		deg
Length of Face A		m
Width of Face B		m



Weather

Plant in use

Stability

Support in use

Record of photographs taken

Sample and test types

D	Small disturbed sample	TkW	Thick walled open sample
B	Large disturbed sample	TW	Thin walled open sample
Blk	Block sample	PS	Piston sample
V	Vane test	CS	Core sample

Note sample diameter if not 100 mm

Remarks

No limestone layer present, silt turns to sand layer very sharply, 2 discreet layers. Pit located in slight depression in field

Standard in use: 5930 Amdt1: 5930 pre Amdt 1: Other

Trial Pit 4 – face A

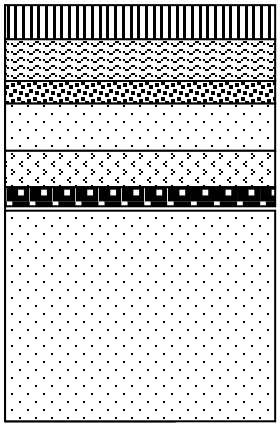
Trial Pit 4 face B

enitial

Trial Pit Log

Project	Stanford in the Vale	Project No		Trial Pit No	5
Date		Described by		Sheet No	

Face Sketch (Indicate stratum boundaries and face(s) sketched, use additional sheets as required)



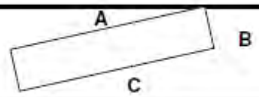
0.3	mid - brown sandy TOPSOIL with fine gravel at base
0.5	mid grey ,med strong brittle fossiliferous LIMESTONE
0.65	yellow brown, fine to coarse, gravelly SAND – limestone gravel fragments
0.8	yellow fine to coarse SAND
1.0	reddish-yellow, fine to coarse silty SAND
1.05	mid grey ,soft, silty CLAY
2.0	reddish yellow, fine to coarse SAND, with occ grey silty clay layers

Samples and Tests			Strata	
Depth m	Type & No	Test results	Depth m	Description
			0 – 0.3m	
			0.3– 0.5	
			0.5– 0.65	Composite sample from 0.3 -0.9
			0.65 -0.8	
			0.8-1.0	
			1.0 – 1.05	
			1.05 – 2.0	

Groundwater Observations (level and rate of inflow)

No groundwater influx,

Strike of Face A		deg
Length of Face A		m
Width of Face B		m



Weather

Plant in use	Record of photographs taken
Stability	
Support in use	

Sample and test types

D	Small disturbed sample	TkW	Thick walled open sample
B	Large disturbed sample	TW	Thin walled open sample
Blk	Block sample	PS	Piston sample
V	Vane test	CS	Core sample

Note sample diameter if not 100 mm

Remarks

On face C dark red brown sandy SILT from 0.5 to 1.10m, then reddish yellow fine to coarse silty sand to base

Standard in use: 5930 Amdt1: 5930 pre Amdt 1: Other

Pit 5 – face A

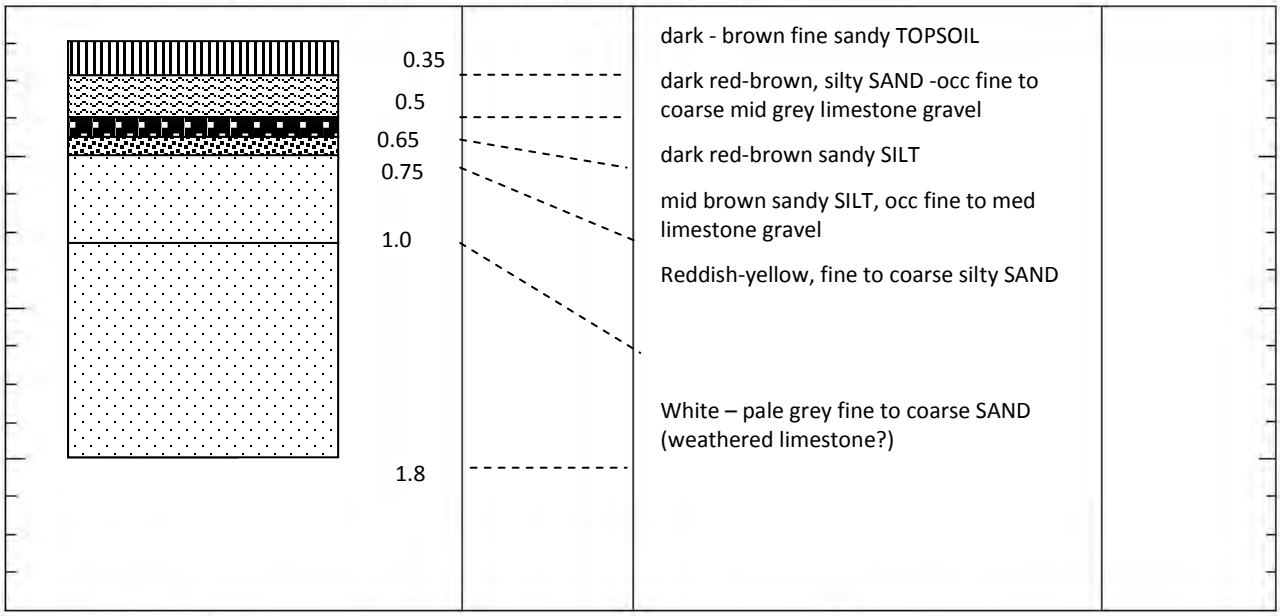
Pit 6 – Face C

enitial

Trial Pit Log

Project	Stanford in the Vale	Project No		Trial Pit No	6
Date		Described by		Sheet No	

Face Sketch (Indicate stratum boundaries and face(s) sketched, use additional sheets as required)

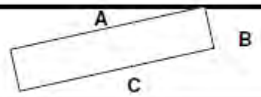


Samples and Tests			Strata	
Depth m	Type & No	Test results	Depth m	Description
			0 – 0.3m	
			0.3– 0.5	
			0.5– 0.65	Composite sample from 0.3 -0.9
			0.65 -0.8	
			0.8-1.0	
			1.0 – 1.05	

Groundwater Observations (level and rate of inflow)

No groundwater influx,

Strike of Face A		deg
Length of Face A		m
Width of Face B		m



Weather

Plant in use

Stability

Support in use

Record of photographs taken

Sample and test types

D	Small disturbed sample	TkW	Thick walled open sample
B	Large disturbed sample	TW	Thin walled open sample
Blk	Block sample	PS	Piston sample
V	Vane test	CS	Core sample

Note sample diameter if not 100 mm

Remarks

On face C dark red brown sandy SILT from 0.5 to 1.10m, then reddish yellow fine to coarse silty sand to base

Standard in use: 5930 Amdt1: 5930 pre Amdt 1: Other

Pit 6 face A

Pit 6 face B