wsp

[redacted]
North Lanarkshire Council
via email

Our Ref: 70062270/004
14 November 2019
CONFIDENTIAL

Dear [redacted]

Supplemental PCB Investigation Works at St Ambrose

BACKGROUND

WSP UK Ltd has been provided ongoing support to North Lanarkshire Council for the Buchanan and St Ambrose Campus site following the Scottish Government's independent review as published in their report titled *"Buchanan And St Ambrose High School Campus Independent Review"* dated 9th August 2019. As part of these works, RSK carried out ground investigations at the site. Both RSK and the Scottish Government recommended remediation of local soils at a hand pit location (HP50) due to the recorded concentrations of polychlorinated biphenyl (PCB) compounds. It was noted these works should be done *"on a purely precautionary basis so as to restore confidence in the site"*.

WSP prepared a remedial strategy document (memorandum dated 09 August 2019) to support the rapid remediation of this area prior to schools re-opening in August 2019. This involved removal of surficial soils over a 6m x 6m area centred on HP50, placement of a geotextile membrane, surfacing with paving slabs, and validation testing of both removed and residual soils. RSK attended during these remedial works, obtained duplicate samples, and produced validation reporting for the remedial works, as reported in their 29 August 2019 report titled *'Buchanan and St. Ambrose Schools, Coatbridge Remedial Measures Verification Report'* (ref. 355247-R1(00)).

WSP's validation samples did not detect PCBs in the soil validation samples, this is consistent with RSK's duplicate samples, though one RSK sample (VHP2) detected one PCB species (PCB28) at the limit of detection (0.002 mg/kg). RSK additionally analysed dioxins and furans in their validation samples. RSK reported that all dioxin and furan concentrations and the detected PCB species were below screening criteria, and that the mitigation measures were suitable to prevent exposure.

RSK concluded *"Whilst the works have addressed the isolated location of HP50 where PCBs had been previously identified, it is recommended that further soil sampling be completed on a grid spacing in this part of the site to confirm the absence of PCBs. This will inform the need for any supplementary remediation works, if any."* Following this, they have provided NLC with a proposal dated 19 September 2019 (ref. T355247-TL02(00)) with a proposed scope of works. NLC requested that WSP review this proposal and provide an alternate scope of works for NLC's

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consideration. In our memorandum dated 25th September 2019, WSP proposed to complete the proposed supplemental investigation coverage recommended by RSK, but provided detailed commentary to justify the exclusion of dioxin and furan testing (as scoped by RSK in all samples).

WSP were subsequently commissioned by NLC to carry out the works proposed in our memorandum dated 25th September 2019. This letter summarises the findings and provides a supplemental risk assessment of PCBs at the site.

SCOPE OF WORKS

Rationale

Due to the unexpected detection of PCBs at HP50 in previous ground investigations (which were completed on an average 50m grid), RSK recommended 15 no. hand pits on a refined 20m grid surrounding HP50, extending to previous exploratory hole locations where PCBs were not detected.

As previously noted, WSP considered that the remediation works recently completed at the site, whilst not considered necessary on the basis of the completed assessments, assisted in the overall process by demonstrating that any areas of even low potential risk have been subject to further assessment and remediation. In this context therefore, WSP does not consider that further works were strictly required based on an interpretation of the results from all phases of investigation and remediation. Notwithstanding this, however, it is recognised that any such further works can assist in demonstrating the level of conservatism adopted in the treatment of the site (particularly given the ongoing community engagement). Within this context, RSK's proposed coverage and hand pit locations is considered reasonable.

WSP observes that previous testing was completed on a 50m grid, equivalent to an 'exploratory' investigation given in BS10175. This guidance supports progression to a 'main' investigation (20-25m grid) where uncertainty or sensitivity is noted. Following the unexpected detection of PCBs in HP50 in previous investigations, the proposal to move to main investigation coverage is considered suitable to further reduce uncertainty regarding potential PCB impacts in the vicinity of HP50.

Following on the above, RSK's proposed targeted and coverage was incorporated into WSP's scope of works.

Delivered Scope of Works

The following investigation scope has been completed:

- Hand pitting at 15 locations, completed by Amey (directly appointed to NLC);
- Logging and soil sampling of hand pits by WSP staff;
- Analysis of 30 No. samples for PCB EC7 and WHO12 (two depths per hand pit); and
- Analysis of 8 No. samples for Soil Organic Matter.

Deviations from Proposed Scope of Works

The following previously-proposed works were not completed. A discussion regarding the deviations is given below.

- Duplicate analysis of three selected soil samples for Quality Control (QC) purposes: Subsequent to our proposal, intermediate arrangements were made for RSK to attend site and collect the QC samples. However, following additional discussions between NLC and RSK prior to the works, it was decided that RSK would not attend for this purpose.. However, due to the generally non-detect nature of PCBs recorded in supplemental works, and those detections

being significantly and consistently below assessment criteria (discussed later in this letter), then the absence of QC samples by RSK or WSP is not considered to have a significant impact on the assessment of results.
- Analysis of Dioxins and Furans on samples where PCBs are detected. The rationale for excluding these analyses are given in the risk assessments below.

INVESTIGATION FINDINGS

Hand pitting works were carried out on 12th October 2019. An exploratory hole plan and hand pit logs are appended to this letter. No visual/olfactory evidence of chemical contamination was noted. The ground conditions encountered are consistent with previous investigations, with grass and topsoil overlying made ground comprising predominately re-worked natural materials (sands, gravels, and clays) with inclusions of anthropogenic materials including brick, concrete, plastic, timber, coal, clinker, and glass.

Soil organic matter concentrations ranged from 6.24 to 18.8%, reflecting the higher organic content of the topsoil and made ground.

PCBs were detected in the following locations:

- SHP02 0.4-0.5m: PCB congener 180 – 0.0066 mg/kg
- SHP03 0.1-0.3m: PCB congener 180 – 0.0123 mg/kg
- SHP11 0.1-0.3m: three PCB7 species as follows:
  - PCB congener 138 - 0.0256 mg/kg
  - PCB congener 153 - 0.0462 mg/kg
  - PCB congener 180 - 0.1030 mg/kg

The remaining 27 samples did not detect PCB compounds above laboratory detection limits.

The detected PCB species in supplemental investigations all fall within PCB7 congeners, which is a group of PCB species indicative of a transformer oil source. However, the actual source is not known; no electrical substations were observed in historical mapping in this area. PCB impacts at HP50 0.0-0.1m were previously found to be limited in extent by delineation, and this exploratory hole recorded the highest concentration of total PCB7 (5.52 mg/kg) in site investigations to date. The total PCB7 detections in supplemental works ranged from 0.0066 mg/kg to 0.175 mg/kg, the highest being 30 times lower in concentration than recorded at HP50. In review of the concentrations and distribution of PCB detections, a widespread source is not considered present, as soil samples with PCB detections are separated from other locations by exploratory holes where PCBs were not detected. Therefore, the low PCB concentrations (i.e. significantly below the screening criteria adopted as discussed below) in this area are considered infrequent and sporadic. These may have been introduced during groundworks during site development, but as previously noted, the source is unknown.

The risks associated with the PCB detections are assessed in the following section.

SUPPLEMENTAL PCB RISK ASSESSMENT

PCB7 Congeners

PCB risks associated with HP50 were previously mitigated at site by source removal, which has been documented in WSP memorandum dated 30 September 2019. As such, no further assessment is required for the historical impacts at this location.

WSP has derived a site-specific assessment criteria (SSAC) of 5.81 mg/kg for total PCB7 congeners, the details of which are provided in our Contamination Risk Assessment report dated

August 2018 (ref. 70062270/001). The total PCB7 detections in supplemental works ranged from 0.0066 mg/kg to 0.175 mg/kg, notably below WSP's SSAC, indicating low risks and no need for remedial intervention.

PCB WHO12 Congeners

These were not detected in supplemental soil samples, indicating low risks.

Dioxins and Furans

Dioxins and dioxin-like PCBs cause toxic effects in similar ways and therefore should be assessed using a Toxic Equivalency Factor (TEF) approach. This TEF expresses the toxicity of dioxins, furans, and dioxin-like PCBs in terms of relative toxicity to the most toxic form of dioxin (2,3,7,8-TCDD). Eleven of the twelve dioxin-like PCBs are WHO12 species, which were not detected in supplemental samples, and the single PCB7 species used in the TEF calculations (PCB 118) was similarly not detected in supplemental samples. As such, there are no detected PCB species detected to combine with dioxins and furans in the TEF approach, so these calculations have not been carried out.

When considering dioxins and furans in isolation, both WSP and RSK have concluded that concentrations recorded at site are low risk for these compounds. WSP observed the concentration trends were, on average, lower than published background levels for urban soils, and RSK in their recent validation report found the dioxin and furan concentrations surrounding HP50 to be "considerably less" than their adopted assessment criteria. An assessment of suitable population (26 samples) of dioxin and furans analysis supports that these compounds are low risk at site. Further, the total dioxin and furan concentration in HP50 was 584 ng/kg, not notably higher than the average concentration of 520 ng/kg. As such, the detection of PCBs conforming to the transformer oil (PCB EC7) profile in HP50 does not give cause to suspect that elevated dioxin and furans would be present in the area surrounding HP50.

Consequently, WSP has not carried out supplemental dioxin and furan testing as:

- No PCB species used in TEF calculations were detected in the supplemental investigation; and
- Previous investigations and associated assessments by both WSP and RSK have reasonably demonstrated that dioxins and furans are low risk at site.

CLOSING

Supplemental PCB investigations have been completed in the area surrounding HP50 following RSK's previous recommendations. PCBs have been demonstrated to be largely absent from soils in this area, and assessed as low risk in isolated soils where PCBs were detected. As such, no further works are deemed necessary with regards to PCB impacts at the St. Ambrose site.

Yours sincerely

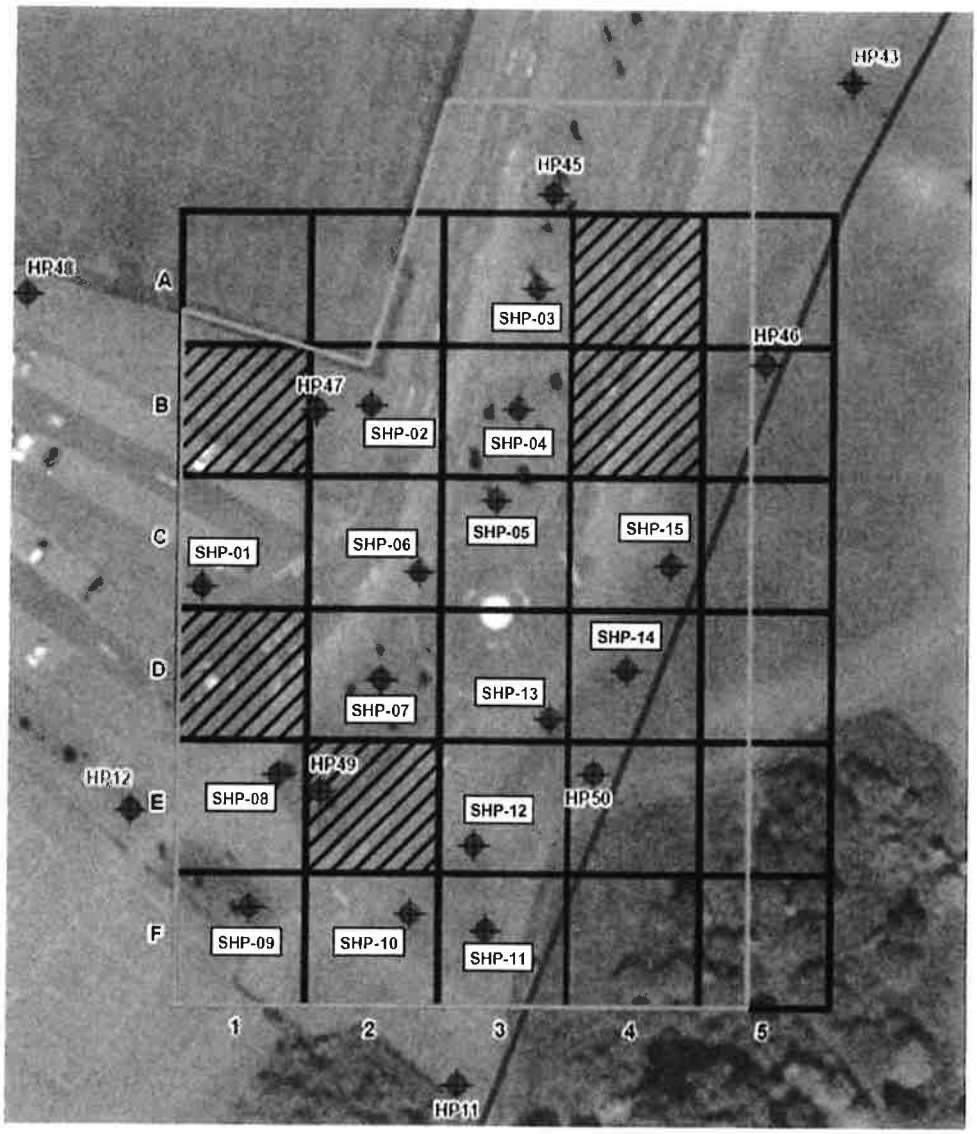
[redacted] 2019.11.14 11:13:46 Z

[redacted]
Associate

Encl. Exploratory Hole Location Plan; Hand Pit Logs; Laboratory Reports

Figure 1 – Exploratory Hole Location Plan

WSP locations overlain on extract from RSK figure titled *Alternative Areas 20m Grid*, Rev 01, dated 19/09/2019



Legend

- Site Boundary
- Site Area
- 20m grid square
- Previously tested area
- Existing Hand Pit Location (RSK, July 2019)
- WSP Hand Pit Location (October 2019)

Location	Easting	Northing
SHP-01	271745.2	665795.9
SHP-02	271770.2	665826.0
SHP-03	271799.2	665844.0
SHP-04	271792.3	665822.8
SHP-05	271788.3	665808.5
SHP-06	271847.7	665839.3
SHP-07	271772.9	665780.2
SHP-08	271755.6	665765.6
SHP-09	271761.5	665749.6
SHP-10	271776.4	665743.6
SHP-11	271790.0	665736.4
SHP-12	271787.6	665756.5
SHP-13	271795.1	665770.2
SHP-14	271805.2	665777.6
SHP-15	271813.8	665797.1

SHP-01 Strata depth and description

Depth (m)	Description
0 – 0.2	MADE GROUND: Grass over dark brown slightly gravelly slightly clayey fine to medium SAND with frequent rootlets. Gravel is angular fine to medium of mixed lithologies including occasional fragments of brick and mudstone (TOPSOIL).
0.20 – 0.5	MADE GROUND: Black slightly gravelly slightly clayey fine to medium SAND of mixed lithologies including black ash with occasional fragments of glass. Gravel is angular to sub-angular fine to medium of mixed lithologies including brick. Rare angular cobbles of concrete and brick.

SHP-02 Strata depth and description

Depth (m)	Description
0 – 0.2	MADE GROUND: Grass over dark brown slightly gravelly slightly clayey fine to medium SAND with frequent rootlets. Gravel is angular fine to medium of mixed lithologies including occasional fragments of brick and mudstone (TOPSOIL).
0.20 – 0.5	MADE GROUND: Black slightly gravelly slightly clayey fine to medium SAND of mixed lithologies including black ash with occasional fragments of glass. Gravel is angular to sub-angular fine to medium of mixed lithologies including brick.

SHP-03 Strata depth and description

Depth (m)	Description
0 – 0.2	MADE GROUND: Grass over dark brown slightly gravelly slightly clayey fine to medium SAND with frequent rootlets. Gravel is angular fine to medium of mixed lithologies including occasional fragments of brick and mudstone (TOPSOIL).
0.20 – 0.5	MADE GROUND: Black slightly gravelly slightly clayey fine to medium SAND of mixed lithologies including black ash with occasional fragments of glass. Gravel is angular to sub-angular fine to medium of mixed lithologies including brick.

SHP-04 Strata depth and description

Depth (m)	Description
0 – 0.2	MADE GROUND: Grass over dark brown slightly gravelly slightly clayey fine to medium SAND with frequent rootlets. Gravel is angular fine to medium of mixed lithologies including occasional fragments of brick and mudstone (TOPSOIL).
0.20 – 0.5	MADE GROUND: Black slightly gravelly slightly clayey fine to medium SAND of mixed lithologies including black ash with occasional fragments of glass. Gravel is angular to sub-angular fine to medium of mixed lithologies including brick.

SHP-05 Strata depth and description

Depth (m)	Description
0 – 0.2	MADE GROUND: Grass over dark brown slightly gravelly slightly clayey fine to medium SAND with frequent rootlets. Gravel is angular fine to medium of mixed lithologies including occasional fragments of brick and mudstone (TOPSOIL).
0.20 – 0.5	MADE GROUND: Black slightly gravelly slightly clayey fine to medium SAND of mixed lithologies including black ash with occasional fragments of glass. Gravel is angular to sub-angular fine to medium of mixed lithologies including brick.

SHP-06 Strata depth and description

Depth (m)	Description
0 – 0.2	MADE GROUND: Grass over dark brown slightly gravelly slightly clayey fine to medium SAND with frequent rootlets. Gravel is angular fine to medium of mixed lithologies including occasional fragments of brick and mudstone (TOPSOIL).
0.20 – 0.5	MADE GROUND: Black slightly gravelly slightly clayey fine to medium SAND of mixed lithologies including black ash with occasional fragments of glass. Gravel is angular to sub-angular fine to medium of mixed lithologies including brick. Rare angular cobbles of concrete and brick.

SHP-07 Strata depth and description

Depth (m)	Description
0 – 0.2	MADE GROUND: Grass over dark brown slightly gravelly slightly clayey fine to medium SAND with frequent rootlets. Gravel is angular fine to medium of mixed lithologies including occasional fragments of brick and mudstone (TOPSOIL).

0.20 – 0.5	MADE GROUND: Black slightly gravelly slightly clayey fine to medium SAND of mixed lithologies including black ash with occasional fragments of glass. Gravel is angular to sub-angular fine to medium of mixed lithologies including brick.

SHP-08 Strata depth and description

Depth (m)	Description
0 – 0.2	MADE GROUND: Grass over dark brown slightly gravelly slightly clayey fine to medium SAND with frequent rootlets. Gravel is angular fine to medium of mixed lithologies including occasional fragments of brick and mudstone (TOPSOIL).
0.20 – 0.5	MADE GROUND: Black slightly gravelly slightly clayey fine to medium SAND of mixed lithologies including black ash with occasional fragments of glass. Gravel is angular to sub-angular fine to medium of mixed lithologies including brick. Rare angular cobbles of concrete and brick.

SHP-09 Strata depth and description

Depth (m)	Description
0 – 0.2	MADE GROUND: Grass over dark brown slightly gravelly slightly clayey fine to medium SAND with frequent rootlets. Gravel is angular fine to medium of mixed lithologies including occasional fragments of brick and mudstone (TOPSOIL).
0.20 – 0.5	MADE GROUND: Black slightly gravelly slightly clayey fine to medium SAND of mixed lithologies including black ash with occasional fragments of glass. Gravel is angular to sub-angular fine to medium of mixed lithologies including brick. Rare angular cobbles of concrete and brick.

SHP-10 Strata depth and description

Depth (m)	Description
0 – 0.2	MADE GROUND: Grass over dark brown slightly gravelly slightly clayey fine to medium SAND with frequent rootlets. Gravel is angular fine to medium of mixed lithologies including occasional fragments of brick and mudstone (TOPSOIL).
0.20 – 0.5	MADE GROUND: Black slightly gravelly slightly clayey fine to medium SAND of mixed lithologies including black ash with occasional fragments of glass. Gravel is angular to sub-angular fine to medium of mixed lithologies including brick. Rare angular cobbles of concrete and brick.

SHP-11 Strata depth and description

Depth (m)	Description
0 – 0.2	MADE GROUND: Grass over dark brown slightly gravelly slightly clayey fine to medium SAND with frequent rootlets. Gravel is angular fine to medium of mixed lithologies including occasional fragments of brick and mudstone (TOPSOIL).
0.20 – 0.5	MADE GROUND: Black slightly gravelly slightly clayey fine to medium SAND of mixed lithologies including black ash with occasional fragments of glass. Gravel is angular to sub-angular fine to medium of mixed lithologies including brick, coal and occasional clinker. Rare angular cobbles of concrete and brick.

SHP-12 Strata depth and description

Depth (m)	Description
0 – 0.2	MADE GROUND: Grass over dark brown slightly gravelly slightly clayey fine to medium SAND with frequent rootlets. Gravel is angular fine to medium of mixed lithologies including occasional fragments of brick and mudstone (TOPSOIL).
0.20 – 0.5	MADE GROUND: Black slightly gravelly slightly clayey fine to medium SAND of mixed lithologies including black ash with occasional fragments of glass. Gravel is angular to sub-angular fine to medium of mixed lithologies including brick, coal and occasional clinker.

SHP-13 Strata depth and description

Depth (m)	Description
0 – 0.2	MADE GROUND: Grass over dark brown slightly gravelly slightly clayey fine to medium SAND with frequent rootlets. Gravel is angular fine to medium of mixed lithologies including occasional fragments of brick and mudstone (TOPSOIL).
0.20 – 0.5	MADE GROUND: Black slightly gravelly slightly clayey fine to medium SAND of mixed lithologies including black ash with occasional fragments of glass. Gravel is angular to sub-angular fine to medium of mixed lithologies including brick, coal and occasional clinker.

SHP-14 Strata depth and description

Depth (m)	Description
0 – 0.2	MADE GROUND: Grass over dark brown slightly gravelly slightly clayey fine to medium SAND with frequent rootlets. Gravel is angular fine to medium of mixed lithologies including occasional fragments of brick and mudstone (TOPSOIL).
0.20 – 0.5	MADE GROUND: Black slightly gravelly slightly clayey fine to medium SAND of mixed lithologies including black ash with occasional fragments of glass. Gravel is angular to sub-angular fine to medium of mixed lithologies including brick, coal and occasional clinker.

SHP-15 Strata depth and description

Depth (m)	Description
0 – 0.2	MADE GROUND: Grass over dark brown slightly gravelly slightly clayey fine to medium SAND with frequent rootlets. Gravel is angular fine to medium of mixed lithologies including occasional fragments of brick and mudstone (TOPSOIL).
0.20 – 0.5	MADE GROUND: Black slightly gravelly slightly clayey fine to medium SAND of mixed lithologies including black ash with occasional fragments of glass. Gravel is angular to sub-angular fine to medium of mixed lithologies including brick, coal and occasional clinker.

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WSP PB SCOTLAND
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Attention: [redacted]

CERTIFICATE OF ANALYSIS

Date of report Generation:	23 October 2019
Customer:	WSP PB SCOTLAND
Sample Delivery Group (SDG):	191015-79
Your Reference:	70062270- st ambrose
Location:	St Ambrose
Report No:	526681

This report has been revised and directly supersedes 526352 in its entirety.

We received 37 samples on Tuesday October 15, 2019 and 37 of these samples were scheduled for analysis which was completed on Wednesday October 23, 2019. 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.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

[redacted]

Operations Manager

Validated

CERTIFICATE OF ANALYSIS

SDG:	191015-79	Client Reference:	70062270- st ambrose	Report Number:	526681
Location:	St Ambrose	Order Number:	70062270-07S	Superseded Report:	526352

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
20941939	SD01	ES	0.00 - 0.00	12/10/2019
20941825	SHP-01	ES	0.10 - 0.30	12/10/2019
20941851	SHP-01	ES	0.40 - 0.50	12/10/2019
20941904	SHP-02	ES	0.10 - 0.30	12/10/2019
20941963	SHP-02	ES	0.40 - 0.50	12/10/2019
20941968	SHP-03	ES	0.10 - 0.30	12/10/2019
20941973	SHP-03	ES	0.40 - 0.50	12/10/2019
20941980	SHP-04	ES	0.10 - 0.30	12/10/2019
20941985	SHP-04	ES	0.40 - 0.50	12/10/2019
20941990	SHP-05	ES	0.10 - 0.30	12/10/2019
20941828	SHP-05	ES	0.40 - 0.50	12/10/2019
20941830	SHP-06	ES	0.10 - 0.30	12/10/2019
20941832	SHP-06	ES	0.40 - 0.50	12/10/2019
20941834	SHP-07	ES	0.10 - 0.30	12/10/2019
20941837	SHP-07	ES	0.40 - 0.50	12/10/2019
20941839	SHP-08	ES	0.10 - 0.30	12/10/2019
20941841	SHP-08	ES	0.40 - 0.50	12/10/2019
20941843	SHP-09	ES	0.10 - 0.30	12/10/2019
20941845	SHP-09	ES	0.40 - 0.50	12/10/2019
20941848	SHP-10	ES	0.10 - 0.30	12/10/2019
20941856	SHP-10	ES	0.40 - 0.50	12/10/2019
20941861	SHP-11	ES	0.10 - 0.30	12/10/2019
20941866	SHP-11	ES	0.40 - 0.50	12/10/2019
20941871	SHP-12	ES	0.10 - 0.30	12/10/2019
20941875	SHP-12	ES	0.40 - 0.50	12/10/2019
20941882	SHP-13	ES	0.10 - 0.30	12/10/2019
20941887	SHP-13	ES	0.40 - 0.50	12/10/2019
20941892	SHP-14	ES	0.10 - 0.30	12/10/2019
20941894	SHP-14	ES	0.40 - 0.50	12/10/2019
20941898	SHP-15	ES	0.10 - 0.30	12/10/2019
20941908	SHP-15	ES	0.40 - 0.50	12/10/2019
20941913	TP10-VAL01	ES	0.20 - 0.30	12/10/2019
20941919	TP10-VAL02	ES	0.20 - 0.30	12/10/2019
20941925	TP10-VAL03	ES	0.20 - 0.30	12/10/2019
20941930	TP10-VAL04	ES	0.20 - 0.30	12/10/2019
20941934	TP10-VAL05	ES	0.50	12/10/2019
20941950	TS01	ES	0.00 - 0.00	12/10/2019

Maximum Sample/Coolbox Temperature (°C) : **16.6**

ISO5667-3 Water quality - Sampling - Part3 -
During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs

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

Validated

CERTIFICATE OF ANALYSIS

SDG:	191015-79	**Client Reference:**	70062270- st ambrose	**Report Number:**	526681
Location:	St Ambrose	**Order Number:**	70062270-07S	**Superseded Report:**	526352

Results Legend

X Test

No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			20941939	20941825	20941851	20941904	20941963	20941968	20941973	20941980	20941985	20941990	20941828	20941830	20941832	20941834	20941837	20941839	20941841
Customer Sample Reference			SD01	SHP-01	SHP-01	SHP-02	SHP-02	SHP-03	SHP-03	SHP-04	SHP-04	SHP-05	SHP-05	SHP-06	SHP-06	SHP-07	SHP-07	SHP-08	SHP-08
AGS Reference			ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
Depth (m)			0.00 - 0.00	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50
Container			1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	250g Amber Jar (ALE210)	250g Amber Jar (ALE210)	250g Amber Jar (ALE210)	250g Amber Jar (ALE210)	250g Amber Jar (ALE210)	250g Amber Jar (ALE210)	250g Amber Jar (ALE210)	250g Amber Jar (ALE210)	250g Amber Jar (ALE210)	250g Amber Jar (ALE210)	250g Amber Jar (ALE210)	250g Amber Jar (ALE210)	250g Amber Jar (ALE210)
Sample Type			S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2	X																
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2		X															
EPH CWG GC (S)	All	NDPs: 0 Tests: 2		X															
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2			X														
Metals in solid samples by OES	All	NDPs: 0 Tests: 7		X															
PAH by GCMS	All	NDPs: 0 Tests: 2		X															
PCBs by GCMS	All	NDPs: 0 Tests: 32		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
pH	All	NDPs: 0 Tests: 2		X															
Sample description	All	NDPs: 0 Tests: 37		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Total Organic Carbon	All	NDPs: 0 Tests: 10		X			X			X			X	X					X				
TPH CWG GC (S)	All	NDPs: 0 Tests: 2		X															
VOC MS (S)	All	NDPs: 0 Tests: 2			X														

20941950	TS01	ES	0.00 - 0.00	250g Amber Jar (ALE210) 1kg TUB	S												
20941934	TP10-VAL05	ES	0.50	250g Amber Jar (ALE210)	S	X				X				X			
20941930	TP10-VAL04	ES	0.20 - 0.30	250g Amber Jar (ALE210)	S		X							X	X		
20941925	TP10-VAL03	ES	0.20 - 0.30	250g Amber Jar (ALE210)	S									X	X		
20941919	TP10-VAL02	ES	0.20 - 0.30	250g Amber Jar (ALE210)	S									X	X		
20941913	TP10-VAL01	ES	0.20 - 0.30	250g Amber Jar (ALE210)	S									X	X		
20941908	SHP-15	ES	0.40 - 0.50	250g Amber Jar (ALE210)	S									X	X		
20941898	SHP-15	ES	0.10 - 0.30	250g Amber Jar (ALE210)	S									X	X	X	
20941894	SHP-14	ES	0.40 - 0.50	250g Amber Jar (ALE210)	S									X	X		
20941892	SHP-14	ES	0.10 - 0.30	250g Amber Jar (ALE210)	S									X	X		
20941887	SHP-13	ES	0.40 - 0.50	250g Amber Jar (ALE210)	S									X	X	X	
20941882	SHP-13	ES	0.10 - 0.30	250g Amber Jar (ALE210)	S									X	X		
20941875	SHP-12	ES	0.40 - 0.50	250g Amber Jar (ALE210)	S									X	X		
20941871	SHP-12	ES	0.10 - 0.30	250g Amber Jar (ALE210)	S									X	X		
20941866	SHP-11	ES	0.40 - 0.50	250g Amber Jar (ALE210)	S									X	X		
20941861	SHP-11	ES	0.10 - 0.30	250g Amber Jar (ALE210)	S									X	X		
20941856	SHP-10	ES	0.40 - 0.50	250g Amber Jar (ALE210)	S									X	X		
20941848	SHP-10	ES	0.10 - 0.30	250g Amber Jar (ALE210)	S									X	X	X	
20941845	SHP-09	ES	0.40 - 0.50	250g Amber Jar (ALE210)	S									X	X		
20941843	SHP-09	ES	0.10 - 0.30	250g Amber Jar (ALE210)	S									X	X		

Validated

CERTIFICATE OF ANALYSIS

SDG:	191015-79	**Client Reference:**	70062270- st ambrose	**Report Number:**	526681
Location:	St Ambrose	**Order Number:**	70062270-07S	**Superseded Report:**	526352

Results Legend

X **Test**

No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
			20941950	TS01	ES	0.00 - 0.00	60g VOC (ALE215)	S
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2						X
VOC MS (S)	All	NDPs: 0 Tests: 2						X

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	Inclusions	Inclusions 2
20941939	SD01	0.00 - 0.00	Dark Brown	Loamy Sand	Crushed Brick	Stones
20941825	SHP-01	0.10 - 0.30	Dark Brown	Sandy Silt Loam	Vegetation	Stones
20941851	SHP-01	0.40 - 0.50	Dark Brown	Silty Clay Loam	Crushed Brick	Stones
20941904	SHP-02	0.10 - 0.30	Dark Brown	Sandy Silt Loam	Stones	Vegetation
20941963	SHP-02	0.40 - 0.50	Dark Brown	Sandy Silt Loam	Stones	Vegetation
20941968	SHP-03	0.10 - 0.30	Dark Brown	Silty Clay Loam	Brick	Stones
20941973	SHP-03	0.40 - 0.50	Dark Brown	Sandy Silt Loam	Stones	Vegetation
20941980	SHP-04	0.10 - 0.30	Dark Brown	Sandy Silt Loam	Stones	Vegetation
20941985	SHP-04	0.40 - 0.50	Dark Brown	Silty Clay Loam	Crushed Brick	Plastic
20941828	SHP-05	0.40 - 0.50	Dark Brown	Silty Clay Loam	Crushed Brick	Glass
20941990	SHP-05	0.10 - 0.30	Dark Brown	Sandy Silt Loam	Stones	Vegetation
20941830	SHP-06	0.10 - 0.30	Dark Brown	Silt Loam	Stones	Vegetation
20941832	SHP-06	0.40 - 0.50	Dark Brown	Silt Loam	Crushed Brick	Stones
20941834	SHP-07	0.10 - 0.30	Dark Brown	Silt Loam	Brick	Vegetation
20941837	SHP-07	0.40 - 0.50	Dark Brown	Silty Clay Loam	Crushed Brick	Glass
20941839	SHP-08	0.10 - 0.30	Dark Brown	Sandy Silt Loam	Crushed Brick	Vegetation
20941841	SHP-08	0.40 - 0.50	Dark Brown	Silty Clay Loam	Glass	Crushed Brick
20941843	SHP-09	0.10 - 0.30	Dark Brown	Silty Clay Loam	Stones	Vegetation
20941845	SHP-09	0.40 - 0.50	Dark Brown	Silty Clay Loam	Crushed Brick	Glass
20941848	SHP-10	0.10 - 0.30	Dark Brown	Silty Clay Loam	Crushed Brick	Stones
20941856	SHP-10	0.40 - 0.50	Dark Brown	Sandy Silt Loam	Stones	Vegetation
20941861	SHP-11	0.10 - 0.30	Dark Brown	Sandy Silt Loam	Stones	Vegetation
20941866	SHP-11	0.40 - 0.50	Dark Brown	Sandy Silt Loam	Stones	Vegetation
20941871	SHP-12	0.10 - 0.30	Dark Brown	Sandy Silt Loam	Stones	None
20941875	SHP-12	0.40 - 0.50	Dark Brown	Sandy Silt Loam	Stones	Vegetation
20941882	SHP-13	0.10 - 0.30	Dark Brown	Sandy Silt Loam	Stones	Vegetation
20941887	SHP-13	0.40 - 0.50	Dark Brown	Sandy Silt Loam	Stones	Vegetation
20941892	SHP-14	0.10 - 0.30	Dark Brown	Sandy Silt Loam	Stones	Vegetation
20941894	SHP-14	0.40 - 0.50	Dark Brown	Sandy Silt Loam	Stones	Vegetation
20941898	SHP-15	0.10 - 0.30	Dark Brown	Sandy Silt Loam	Stones	None
20941908	SHP-15	0.40 - 0.50	Dark Brown	Sandy Silt Loam	Stones	Vegetation
20941913	TP10-VAL01	0.20 - 0.30	Dark Brown	Silty Clay Loam	Stones	Crushed Brick
20941919	TP10-VAL02	0.20 - 0.30	Dark Brown	Silty Clay Loam	Stones	Vegetation
20941925	TP10-VAL03	0.20 - 0.30	Black	Silty Clay Loam	Crushed Brick	Vegetation
20941930	TP10-VAL04	0.20 - 0.30	Black	Silty Clay Loam	Crushed Brick	Concrete/Aggregate
20941934	TP10-VAL05	0.50	Black	Sandy Clay Loam	Crushed Brick	Glass
20941950	TS01	0.00 - 0.00	Dark Brown	Loamy Sand	Vegetation	Stones

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.

Validated

CERTIFICATE OF ANALYSIS

SDG:	191015-79	**Client Reference:**	70062270- st ambrose	**Report Number:**	526681
Location:	St Ambrose	**Order Number:**	70062270-07S	**Superseded Report:**	526352

Results Legend		Customer Sample Ref	SD01	SHP-01	SHP-01	SHP-02	SHP-02	SHP-03
#	ISO17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample							
diss.filt	Dissolved / filtered sample	Depth (m)	0.00 - 0.00	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30
tot.unfilt	Total / unfiltered sample.	Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
**	Subcontracted - refer to subcontractor report for accreditation status	Date Sampled	12/10/2019	12/10/2019	12/10/2019	12/10/2019	12/10/2019	12/10/2019
**	% 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	Sample Time						
		Date Received	15/10/2019	15/10/2019	15/10/2019	15/10/2019	15/10/2019	15/10/2019
(F)	Trigger breach confirmed	SDG Ref	191015-79	191015-79	191015-79	191015-79	191015-79	191015-79
[-34.8]	Sample deviation (see appendix)	Lab Sample No (s)	20941939	20941825	20941851	20941904	20941983	20941968
		AGS Reference	ES	ES	ES	ES	ES	ES

Component	LOQ/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	4.1	19	21	18	18	24
Soil Organic Matter (SOM)	<0.35 %	TM132	<0.35 #		18.8 #			18.3 #
pH	1 pH Units	TM133	8.44 M					
Cyanide, Total	<1 mg/kg	TM153	<1 M					
Cyanide, Free	<1 mg/kg	TM153	<1 M					
PCB congener 28	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 52	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 101	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 118	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 138	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 153	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 180	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	0.00664 M	<0.003 M
Sum of detected PCB 7 Congeners	<0.021 mg/kg	TM168	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021
PCB congener 81	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 77	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 123	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 114	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 105	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 126	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 167	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 156	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 157	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 169	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 189	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
Sum of detected WHO 12 PCBs	<0.036 mg/kg	TM168	<0.036	<0.036	<0.036	<0.036	<0.036	<0.036
Arsenic	<0.6 mg/kg	TM181	3.11 M					
Cadmium	<0.02 mg/kg	TM181	<0.02 M					
Chromium	<0.9 mg/kg	TM181	10.3 M					
Copper	<1.4 mg/kg	TM181	5.7 M					
Lead	<0.7 mg/kg	TM181	9.24 M					
Mercury	<0.14 mg/kg	TM181	<0.14 M					
Nickel	<0.2 mg/kg	TM181	18.6 M					
Selenium	<1 mg/kg	TM181	<1 #					

Validated

CERTIFICATE OF ANALYSIS

SDG:	191015-79	**Client Reference:**	70062270- st ambrose	**Report Number:**	526681
Location:	St Ambrose	**Order Number:**	70062270-07S	**Superseded Report:**	526352

Results Legend			Customer Sample Ref.	SD01	SHP-01	SHP-01	SHP-02	SHP-02	SHP-03
#	ISO17025 accredited								
M	mCERTS accredited								
aq	Aqueous / settled sample								
diss.fil	Dissolved / filtered sample		Depth (m)	0.00 - 0.00	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30
tot.unfil	Total / unfiltered sample		Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
'	Subcontracted - refer to subcontractor report for accreditation status		Date Sampled	12/10/2019	12/10/2019	12/10/2019	12/10/2019	12/10/2019	12/10/2019
"	% 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		Sample Time						
			Date Received	15/10/2019	15/10/2019	15/10/2019	15/10/2019	15/10/2019	15/10/2019
(F)	Trigger breach confirmed		SDG Ref	191015-79	191015-79	191015-79	191015-79	191015-79	191015-79
1-3+[x]	Sample dilution (see appendix)		Lab Sample No (s)	20941939	20941825	20941851	20941904	20941963	20941958
			AGS Reference	ES	ES	ES	ES	ES	ES
Component	**LOD/Units**	**Method**							
Zinc	<1.9 mg/kg	TM181		42.9 M					

Validated

CERTIFICATE OF ANALYSIS

SDG:	191015-79	**Client Reference:**	70062270- st ambrose	**Report Number:**	526681
Location:	St Ambrose	**Order Number:**	70062270-07S	**Superseded Report:**	526352

Results Legend

#	ISO17025 accredited
M	mCERTS accredited
aq	Aqueous / settled sample
diss.filt	Dissolved / filtered sample
tot.unfilt	Total / unfiltered sample
*	Subcontracted - refer to subcontractor report for accreditation status
**	% 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
1-34[a]	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref	SHP-03	SHP-04	SHP-04	SHP-05	SHP-05	SHP-06
			Depth (m)	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	12/10/2019	12/10/2019	12/10/2019	12/10/2019	12/10/2019	12/10/2019
			Sample Time						
			Date Received	15/10/2019	15/10/2019	15/10/2019	15/10/2019	15/10/2019	15/10/2019
			SDG Ref	191015-79	191015-79	191015-79	191015-79	191015-79	191015-79
			Lab Sample No.(s)	20941973	20941980	20941985	20941990	20941828	20941830
			AGS Reference	ES	ES	ES	ES	ES	ES
Moisture Content Ratio (% of as received sample)	%	PM024		16	18	22	25	28	22
Soil Organic Matter (SOM)	<0.35 %	TM132				6.24 #	18.3 #		
PCB congener 28	<0.003 mg/kg	TM168		<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 52	<0.003 mg/kg	TM168		<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 101	<0.003 mg/kg	TM168		<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 118	<0.003 mg/kg	TM168		<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 138	<0.003 mg/kg	TM168		<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 153	<0.003 mg/kg	TM168		<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 180	<0.003 mg/kg	TM168		<0.003 M	<0.003 M	<0.003 M	0.0123 M	<0.003 M	<0.003 M
Sum of detected PCB 7 Congeners	<0.021 mg/kg	TM168		<0.021	<0.021	<0.021	<0.021	<0.021	<0.021
PCB congener 81	<0.003 mg/kg	TM168		<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 77	<0.003 mg/kg	TM168		<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 123	<0.003 mg/kg	TM168		<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 114	<0.003 mg/kg	TM168		<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 105	<0.003 mg/kg	TM168		<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 126	<0.003 mg/kg	TM168		<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 167	<0.003 mg/kg	TM168		<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 156	<0.003 mg/kg	TM168		<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 157	<0.003 mg/kg	TM168		<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 169	<0.003 mg/kg	TM168		<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 189	<0.003 mg/kg	TM168		<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
Sum of detected WHO 12 PCBs	<0.036 mg/kg	TM168		<0.036	<0.036	<0.036	<0.036	<0.036	<0.036

Validated

CERTIFICATE OF ANALYSIS

SDG:	191015-79	**Client Reference:**	70062270- st ambrose	**Report Number:**	526681
Location:	St Ambrose	**Order Number:**	70062270-07S	**Superseded Report:**	526352

Results Legend		Customer Sample Ref	SHP-06	SHP-07	SHP-07	SHP-08	SHP-08	SHP-09
#	ISO17025 accredited							
M	mCERTS accredited							
aq	Aqueous / settled sample							
diss.filt	Dissolved / filtered sample	Depth (m)	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30
tot. unfilt	Total / unfiltered sample	Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
*	Subcontracted - refer to subcontractor report for accreditation status	Date Sampled	12/10/2019	12/10/2019	12/10/2019	12/10/2019	12/10/2019	12/10/2019
~	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples are not corrected for the recovery	Sample Time						
		Date Received	15/10/2019	15/10/2019	15/10/2019	15/10/2019	15/10/2019	15/10/2019
(F)	Trigger breach confirmed	SDG Ref	191015-79	191015-79	191015-79	191015-79	191015-79	191015-79
1-3+[4]	Sample deviation (see appendix)	Lab Sample No.(s)	20941832	20941834	20941837	20941839	20941841	20941843
		AGS Reference	ES	ES	ES	ES	ES	ES

Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	15	20	25	23	26	33
Soil Organic Matter (SOM)	<0.35 %	TM132			15.5 #			
PCB congener 28	<0.003 mg/kg	TM168	<0.015 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 52	<0.003 mg/kg	TM168	<0.015 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 101	<0.003 mg/kg	TM168	<0.015 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 118	<0.003 mg/kg	TM168	<0.015 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 138	<0.003 mg/kg	TM168	<0.015 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 153	<0.003 mg/kg	TM168	<0.015 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 180	<0.003 mg/kg	TM168	<0.015 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
Sum of detected PCB 7 Congeners	<0.021 mg/kg	TM168	<0.105	<0.021	<0.021	<0.021	<0.021	<0.021
PCB congener 81	<0.003 mg/kg	TM168	<0.015 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 77	<0.003 mg/kg	TM168	<0.015 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 123	<0.003 mg/kg	TM168	<0.015 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 114	<0.003 mg/kg	TM168	<0.015 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 105	<0.003 mg/kg	TM168	<0.015 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 126	<0.003 mg/kg	TM168	<0.015 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 167	<0.003 mg/kg	TM168	<0.015 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 156	<0.003 mg/kg	TM168	<0.015 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 157	<0.003 mg/kg	TM168	<0.015 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 169	<0.003 mg/kg	TM168	<0.015 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 189	<0.003 mg/kg	TM168	<0.015 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
Sum of detected WHO 12 PCBs	<0.036 mg/kg	TM168	<0.18	<0.036	<0.036	<0.036	<0.036	<0.036

Validated

CERTIFICATE OF ANALYSIS

SDG:	191015-79	**Client Reference:**	70062270- st ambrose	**Report Number:**	526681
Location:	St Ambrose	**Order Number:**	70062270-07S	**Superseded Report:**	526352

Results Legend		Customer Sample Ref.	SHP-09	SHP-10	SHP-10	SHP-11	SHP-11	SHP-12
#	ISO17025 accredited							
M	mCERTS accredited							
aq	Aqueous / settled sample							
diss.filt	Dissolved / filtered sample							
tot.unfilt	Total / unfiltered sample							
*	Subcontracted - refer to subcontractor report for accreditation status							
**	% 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	Depth (m)	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30
		Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
		Date Sampled	12/10/2019	12/10/2019	12/10/2019	12/10/2019	12/10/2019	12/10/2019
		Sample Time						
		Date Received	15/10/2019	15/10/2019	15/10/2019	15/10/2019	15/10/2019	15/10/2019
		SDG Ref	191015-79	191015-79	191015-79	191015-79	191015-79	191015-79
(F)	Trigger breach confirmed	Lab Sample No.(s)	20941845	20941848	20941856	20941861	20941866	20941871
LOD/LOR	Sample deviation (see appendix)	AGS Reference	ES	ES	ES	ES	ES	ES

Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	19	20	19	27	28	24
Soil Organic Matter (SOM)	<0.35 %	TM132		13.8 #				
PCB congener 28	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 52	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 101	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 118	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 138	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	0.0256 M	<0.003 M	<0.003 M
PCB congener 153	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	0.0462 M	<0.003 M	<0.003 M
PCB congener 180	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	0.103 M	<0.003 M	<0.003 M
Sum of detected PCB 7 Congeners	<0.021 mg/kg	TM168	<0.021	<0.021	<0.021	0.175	<0.021	<0.021
PCB congener 81	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 77	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 123	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 114	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 105	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 126	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 167	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 156	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 157	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 169	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 189	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
Sum of detected WHO 12 PCBs	<0.036 mg/kg	TM168	<0.036	<0.036	<0.036	<0.036	<0.036	<0.036

Validated

CERTIFICATE OF ANALYSIS

SDG:	191015-79	**Client Reference:**	70062270- st ambrose	**Report Number:**	526681
Location:	St Ambrose	**Order Number:**	70062270-07S	**Superseded Report:**	526352

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / wetted sample
diss./filt	Dissolved / filtered sample.
tot./unfilt	Total / unfiltered sample
*	Subcontracted - refer to subcontractor report for accreditation status
**	% 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
I-Jx[g]	Sample deviation (see appendix)

Customer Sample Ref			SHP-12	SHP-13	SHP-13	SHP-14	SHP-14	SHP-15
		Depth (m)	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30
		Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
		Date Sampled	12/10/2019	12/10/2019	12/10/2019	12/10/2019	12/10/2019	12/10/2019
		Sample Time						
		Date Received	15/10/2019	15/10/2019	15/10/2019	15/10/2019	15/10/2019	15/10/2019
		SDG Ref	191015-79	191015-79	191015-79	191015-79	191015-79	191015-79
		Lab Sample No (s)	20941875	20941882	20941887	20941892	20941894	20941898
		AGS Reference	ES	ES	ES	ES	ES	ES
Component	**LOD/Units**	**Method**						
Moisture Content Ratio (% of as received sample)	%	PM024	23	19	17	29	25	26
Soil Organic Matter (SOM)	<0.35 %	TM132			11.5 #			15 #
PCB congener 28	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 52	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 101	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 118	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 138	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 153	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 180	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
Sum of detected PCB 7 Congeners	<0.021 mg/kg	TM168	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021
PCB congener 81	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 77	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 123	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 114	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 105	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 126	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 167	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 156	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 157	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 169	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
PCB congener 189	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M	<0.003 M
Sum of detected WHO 12 PCBs	<0.036 mg/kg	TM168	<0.036	<0.036	<0.036	<0.036	<0.036	<0.036

Validated

CERTIFICATE OF ANALYSIS

SDG:	191015-79	**Client Reference:**	70062270- st ambrose	**Report Number:**	526681
Location:	St Ambrose	**Order Number:**	70062270-07S	**Superseded Report:**	526352

Results Legend	
#	ISO17025 accredited
M	mCERTS accredited
aq	Aqueous / settled sample
diss.filt	Dissolved / filtered sample
tot.unfilt	Total / unfiltered sample
*	Subcontracted - refer to subcontractor report for accreditation status
~	% 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
1-3 [x2]	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref	SHP-15	TP10-VAL01	TP10-VAL02	TP10-VAL03	TP10-VAL04	TP10-VAL05
			Depth (m)	0.40 - 0.50	0.20 - 0.30	0.20 - 0.30	0.20 - 0.30	0.20 - 0.30	0.50
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	12/10/2019	12/10/2019	12/10/2019	12/10/2019	12/10/2019	12/10/2019
			Sample Time						
			Date Received	15/10/2019	15/10/2019	15/10/2019	15/10/2019	15/10/2019	15/10/2019
			SDG Ref	191015-79	191015-79	191015-79	191015-79	191015-79	191015-79
			Lab Sample No (s)	20941906	20941913	20941918	20941925	20941930	20941934
			AGS Reference	ES	ES	ES	ES	ES	ES
Moisture Content Ratio (% of as received sample)	%	PM024		28	37	32	26	35	21
PCB congener 28	<0.003 mg/kg	TM168		<0.003 M					
PCB congener 52	<0.003 mg/kg	TM168		<0.003 M					
PCB congener 101	<0.003 mg/kg	TM168		<0.003 M					
PCB congener 118	<0.003 mg/kg	TM168		<0.003 M					
PCB congener 138	<0.003 mg/kg	TM168		<0.003 M					
PCB congener 153	<0.003 mg/kg	TM168		<0.003 M					
PCB congener 180	<0.003 mg/kg	TM168		<0.003 M					
Sum of detected PCB 7 Congeners	<0.021 mg/kg	TM168		<0.021					
PCB congener 81	<0.003 mg/kg	TM168		<0.003 M					
PCB congener 77	<0.003 mg/kg	TM168		<0.003 M					
PCB congener 123	<0.003 mg/kg	TM168		<0.003 M					
PCB congener 114	<0.003 mg/kg	TM168		<0.003 M					
PCB congener 105	<0.003 mg/kg	TM168		<0.003 M					
PCB congener 126	<0.003 mg/kg	TM168		<0.003 M					
PCB congener 167	<0.003 mg/kg	TM168		<0.003 M					
PCB congener 156	<0.003 mg/kg	TM168		<0.003 M					
PCB congener 157	<0.003 mg/kg	TM168		<0.003 M					
PCB congener 169	<0.003 mg/kg	TM168		<0.003 M					
PCB congener 189	<0.003 mg/kg	TM168		<0.003 M					
Sum of detected WHO 12 PCBs	<0.036 mg/kg	TM168		<0.036					
Lead	<0.7 mg/kg	TM181			234 M	209 M	165 M	442 M	348 M

Validated

CERTIFICATE OF ANALYSIS

SDG:	191015-79	**Client Reference:**	70062270- st ambrose	**Report Number:**	526681
Location:	St Ambrose	**Order Number:**	70062270-07S	**Superseded Report:**	526352

Results Legend		Customer Sample Ref	TS01					
#	ISO17025 accredited							
M	mCERTS accredited							
aq	Aqueous / settled sample							
diss.filt	Dissolved / filtered sample	Depth (m)	0.00 - 0.00					
tot.unfilt	Total / unfiltered sample	Sample Type	Soil/Solid (S)					
^	Subcontracted - refer to subcontractor report for accreditation status.	Date Sampled	12/10/2019					
**	% 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.	Sample Time						
		Date Received	15/10/2019					
(F)	Trigger breach confirmed	SDG Ref	191015-79					
1-34 [a]	Sample deviation (see appendix)	Lab Sample No (s)	20941950					
		AGS Reference	ES					

Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	20					
Soil Organic Matter (SOM)	<0.35 %	TM132	6.91 #					
pH	1 pH Units	TM133	6.67 M					
Cyanide, Total	<1 mg/kg	TM153	<1 M					
Cyanide, Free	<1 mg/kg	TM153	<1 M					
PCB congener 28	<0.003 mg/kg	TM168	<0.003 M					
PCB congener 52	<0.003 mg/kg	TM168	<0.003 M					
PCB congener 101	<0.003 mg/kg	TM168	<0.003 M					
PCB congener 118	<0.003 mg/kg	TM168	<0.003 M					
PCB congener 138	<0.003 mg/kg	TM168	<0.003 M					
PCB congener 153	<0.003 mg/kg	TM168	<0.003 M					
PCB congener 180	<0.003 mg/kg	TM168	<0.003 M					
Sum of detected PCB 7 Congeners	<0.021 mg/kg	TM168	<0.021					
PCB congener 81	<0.003 mg/kg	TM168	<0.003 M					
PCB congener 77	<0.003 mg/kg	TM168	<0.003 M					
PCB congener 123	<0.003 mg/kg	TM168	<0.003 M					
PCB congener 114	<0.003 mg/kg	TM168	<0.003 M					
PCB congener 105	<0.003 mg/kg	TM168	<0.003 M					
PCB congener 126	<0.003 mg/kg	TM168	<0.003 M					
PCB congener 167	<0.003 mg/kg	TM168	<0.003 M					
PCB congener 156	<0.003 mg/kg	TM168	<0.003 M					
PCB congener 157	<0.003 mg/kg	TM168	<0.003 M					
PCB congener 169	<0.003 mg/kg	TM168	<0.003 M					
PCB congener 189	<0.003 mg/kg	TM168	<0.003 M					
Sum of detected WHO 12 PCBs	<0.036 mg/kg	TM168	<0.036					
Arsenic	<0.6 mg/kg	TM181	8.49 M					
Cadmium	<0.02 mg/kg	TM181	0.741 M					
Chromium	<0.9 mg/kg	TM181	14.3 M					
Copper	<1.4 mg/kg	TM181	43.5 M					
Lead	<0.7 mg/kg	TM181	104 M					
Mercury	<0.14 mg/kg	TM181	<0.14 M					
Nickel	<0.2 mg/kg	TM181	37.4 M					
Selenium	<1 mg/kg	TM181	1.26 #					

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Validated

CERTIFICATE OF ANALYSIS

SDG:	191015-79	**Client Reference:**	70062270- st ambrose	**Report Number:**	526681
Location:	St Ambrose	**Order Number:**	70062270-07S	**Superseded Report:**	526352

Results Legend		Customer Sample Ref	TS01
#	ISO17025 accredited		
M	mCERTS accredited		
aq	Aqueous / settled sample		
diss filt	Dissolved / filtered sample.	Depth (m)	0.00 - 0.00
tot unfilt	Total / unfiltered sample.	Sample Type	Soil/Solid (S)
*	Subcontracted - refer to subcontractor report for accreditation status.	Date Sampled	12/10/2019
**	% 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	Sample Time	
		Date Received	15/10/2019
(F)	Trigger breach confirmed	SDG Ref	191015-79
1-3+[4]	Sample deviation (see appendix)	Lab Sample No (s)	20941950
		AGS Reference	ES

Component	LOD/Units	Method						
Zinc	<1.9 mg/kg	TM181	233 M					

Validated

CERTIFICATE OF ANALYSIS

SDG:	191015-79	**Client Reference:**	70062270- st ambrose	**Report Number:**	526681
Location:	St Ambrose	**Order Number:**	70062270-07S	**Superseded Report:**	526352

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample
diss.filt	Dissolved / filtered sample
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status
**	% 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
1-34 [#]	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SD01	TS01				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Soil/Solid (S)	Soil/Solid (S)				
			Date Sampled	12/10/2019	12/10/2019				
			Sample Time						
			Date Received	15/10/2019	15/10/2019				
			SDG Ref	191015-79	191015-79				
			Lab Sample No (s)	20941939	20941950				
			AGS Reference	ES	ES				
Naphthalene-d8 % recovery**	%	TM218		88.2	86.5				
Acenaphthene-d10 % recovery**	%	TM218		91.1	91.1				
Phenanthrene-d10 % recovery**	%	TM218		90.3	90.2				
Chrysene-d12 % recovery**	%	TM218		85.4	85.3				
Perylene-d12 % recovery**	%	TM218		107	103				
Naphthalene	<0.009 mg/kg	TM218		<0.009 M	<0.009 M				
Acenaphthylene	<0.012 mg/kg	TM218		<0.012 M	<0.012 M				
Acenaphthene	<0.008 mg/kg	TM218		<0.008 M	0.0162 M				
Fluorene	<0.01 mg/kg	TM218		<0.01 M	0.0172 M				
Phenanthrene	<0.015 mg/kg	TM218		<0.015 M	0.209 M				
Anthracene	<0.016 mg/kg	TM218		<0.016 M	0.0518 M				
Fluoranthene	<0.017 mg/kg	TM218		<0.017 M	0.396 M				
Pyrene	<0.015 mg/kg	TM218		<0.015 M	0.372 M				
Benz(a)anthracene	<0.014 mg/kg	TM218		<0.014 M	0.224 M				
Chrysene	<0.01 mg/kg	TM218		<0.01 M	0.199 M				
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		<0.015 M	0.331 M				
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		<0.014 M	0.1 M				
Benzo(a)pyrene	<0.015 mg/kg	TM218		<0.015 M	0.244 M				
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		0.0201 M	0.172 M				
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		<0.023 M	0.03 M				
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		<0.024 M	0.19 M				
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		<0.118	2.55				

Validated

CERTIFICATE OF ANALYSIS

SDG:	191015-79	**Client Reference:**	70062270- st ambrose	**Report Number:**	526681
Location:	St Ambrose	**Order Number:**	70062270-07S	**Superseded Report:**	526352

TPH CWG (S)

Results Legend		Customer Sample Ref	SD01	TS01				
#	ISO17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample							
diss.fil	Dissolved / filtered sample	Depth (m)	0.00 - 0.00	0.00 - 0.00				
tot.unfil	Total / unfiltered sample.	Sample Type	Soil/Solid (S)	Soil/Solid (S)				
*	Subcontracted - refer to subcontractor report for accreditation status	Date Sampled	12/10/2019	12/10/2019				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples are not corrected for the recovery	Sample Time						
		Date Received	15/10/2019	15/10/2019				
(F)	Trigger breach confirmed	SDG Ref	191015-79	191015-79				
1.3+10	Sample deviation (see appendix)	Lab Sample No (s)	20941939	20941950				
		AGS Reference	ES	ES				

Component	LOD/Units	Method						
GRO Surrogate % recovery**	%	TM089	110	74				
Aliphatics >C5-C6	<0.01 mg/kg	TM089	<0.01	<0.01				
Aliphatics >C6-C8	<0.01 mg/kg	TM089	<0.01	<0.01				
Aliphatics >C8-C10	<0.01 mg/kg	TM089	<0.01	<0.01				
Aliphatics >C10-C12	<1 mg/kg	TM414	<1	<1				
Aliphatics >C12-C16	<1 mg/kg	TM414	<1	2.32				
Aliphatics >C16-C35	<1 mg/kg	TM414	<1	35.2				
Aliphatics >C35-C44	<1 mg/kg	TM414	<1	6.48				
Total Aliphatics >C10-C44	<5 mg/kg	TM414	<5	44.5				
Total Aliphatics & Aromatics >C10-C44	<10 mg/kg	TM414	<10	91.1				
Aromatics >EC5-EC7	<0.01 mg/kg	TM089	<0.01	<0.01				
Aromatics >EC7-EC8	<0.01 mg/kg	TM089	<0.01	<0.01				
Aromatics >EC8-EC10	<0.01 mg/kg	TM089	<0.01	<0.01				
Aromatics > EC10-EC12	<1 mg/kg	TM414	<1	<1				
Aromatics > EC12-EC16	<1 mg/kg	TM414	<1	1.04				
Aromatics > EC16-EC21	<1 mg/kg	TM414	<1	7.4				
Aromatics > EC16-EC35	<1 mg/kg	TM414	<1	43.4				
Aromatics > EC21-EC35	<1 mg/kg	TM414	<1	36				
Aromatics >EC35-EC44	<1 mg/kg	TM414	<1	2.17				
Aromatics > EC40-EC44	<1 mg/kg	TM414	<1	<1				
Total Aromatics > EC10-EC44	<5 mg/kg	TM414	<5	46.6				
Total Aliphatics & Aromatics >C5-C44	<10 mg/kg	TM414	<10	91.1				
Total Aliphatics >C5-C10	<0.05 mg/kg	TM089	<0.05	<0.05				
Total Aromatics >EC5-EC10	<0.05 mg/kg	TM089	<0.05	<0.05				
GRO >C5-C10	<0.02 mg/kg	TM089	<0.02	<0.02				

Validated

CERTIFICATE OF ANALYSIS

SDG:	191015-79	**Client Reference:**	70062270- st ambrose	**Report Number:**	526681
Location:	St Ambrose	**Order Number:**	70062270-07S	**Superseded Report:**	526352

VOC MS (S)

Results Legend

#	ISO17025 accredited
M	mCERTS accredited
aq	Aqueous / settled sample
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample
*	Subcontracted - refer to subcontractor report for accreditation status
**	% 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
1-3+§@	Sample deviation (see appendix)

		Customer Sample Ref	SD01	TS01				
		Depth (m)	0.00 - 0.00	0.00 - 0.00				
		Sample Type	Soil/Solid (S)	Soil/Solid (S)				
		Date Sampled	12/10/2019	12/10/2019				
		Sample Time						
		Date Received	15/10/2019	15/10/2019				
		SDG Ref	191015-79	191015-79				
		Lab Sample No.(s)	20941939	20941950				
		AGS Reference	ES	ES				
Component	**LOD/Units**	**Method**						
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116	<0.1 M	<0.1 M				
Benzene	<0.009 mg/kg	TM116	<0.09 M	<0.09 M				
Toluene	<0.007 mg/kg	TM116	<0.07 M	<0.07 M				
Ethylbenzene	<0.004 mg/kg	TM116	<0.04 M	<0.04 M				
p/m-Xylene	<0.01 mg/kg	TM116	<0.1 #	<0.1 #				
o-Xylene	<0.01 mg/kg	TM116	<0.1 M	<0.1 M				
Tert-amyl methyl ether	<0.01 mg/kg	TM116	<0.1 #	<0.1 #				

12:38:56 23/10/2019

Validated

CERTIFICATE OF ANALYSIS

SDG:	191015-79	**Client Reference:**	70062270- st ambrose	**Report Number:**	526681
Location:	St Ambrose	**Order Number:**	70062270-07S	**Superseded Report:**	526352

Asbestos Identification - Solid Samples

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
*	Subcontracted test.
(F)	Trigger breach confirmed
1-55+[@]	Sample deviation (see appendix)

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	SD01ES 0.00 - 0.00 SOLID 12/10/2019 00:00:00 15/10/2019 19:04:00 191015-79 20941939 TM048	18/10/2019	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TS01ES 0.00 - 0.00 SOLID 12/10/2019 00:00:00 15/10/2019 19:04:00 191015-79 20941950 TM048	18/10/2019	Marcin Magdziarek	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Detected

Validated

CERTIFICATE OF ANALYSIS

SDG:	191015-79	**Client Reference:**	70062270- st ambrose	**Report Number:**	526681
Location:	St Ambrose	**Order Number:**	70062270-07S	**Superseded Report:**	526352

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
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
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S)

Validated

CERTIFICATE OF ANALYSIS

SDG:	191015-79	**Client Reference:**	70062270- st ambrose	**Report Number:**	526681
Location:	St Ambrose	**Order Number:**	70062270-07S	**Superseded Report:**	526352

Test Completion Dates

Lab Sample No(s)	20941939	20941825	20941851	20941904	20941963	20941968	20941973	20941980	20941985	20941828
Customer Sample Ref.	SC01	SHP 01	SHP 01	SHP 02	SHP 02	SHP 03	SHP 03	SHP 04	SHP 04	SHP 05
AGS Ref.	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
Depth	0.00 - 0.00	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.40 - 0.50
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Asbestos ID in Solid Samples	18-Oct-2019									
Cyanide Comp/Free/Total/Thiocyanate	18-Oct-2019									
EPH CWG GC (S)	17-Oct-2019									
GRO by GC-FID (S)	21-Oct-2019									
Metals in solid samples by OES	17-Oct-2019									
PAH by GCMS	21-Oct-2019									
PCBs by GCMS	22-Oct-2019	22-Oct-2019	23-Oct-2019	22-Oct-2019	22-Oct-2019	23-Oct-2019	22-Oct-2019	22-Oct-2019	22-Oct-2019	23-Oct-2019
pH	22-Oct-2019									
Sample description	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019
Total Organic Carbon	18-Oct-2019		21-Oct-2019			21-Oct-2019			21-Oct-2019	
TPH CWG GC (S)	21-Oct-2019									
VOC MS (S)	22-Oct-2019									

Lab Sample No(s)	20941990	20941830	20941832	20941834	20941837	20941839	20941841	20941843	20941845	20941848
Customer Sample Ref.	SHP 05	SHP 06	SHP 06	SHP 07	SHP 07	SHP 08	SHP 08	SHP 09	SHP 09	SHP 10
AGS Ref.	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
Depth	0.10 - 0.30	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
PCBs by GCMS	22-Oct-2019	22-Oct-2019	22-Oct-2019	23-Oct-2019	22-Oct-2019	22-Oct-2019	23-Oct-2019	23-Oct-2019	23-Oct-2019	23-Oct-2019
Sample description	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019
Total Organic Carbon	18-Oct-2019				21-Oct-2019					21-Oct-2019

Lab Sample No(s)	20941856	20941861	20941866	20941871	20941875	20941882	20941887	20941892	20941894	20941898
Customer Sample Ref.	SHP 10	SHP 11	SHP 11	SHP 12	SHP 12	SHP 13	SHP 13	SHP 14	SHP 14	SHP 15
AGS Ref.	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
Depth	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30	0.40 - 0.50	0.10 - 0.30
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
PCBs by GCMS	22-Oct-2019	22-Oct-2019	22-Oct-2019	22-Oct-2019	22-Oct-2019	22-Oct-2019	22-Oct-2019	22-Oct-2019	22-Oct-2019	22-Oct-2019
Sample description	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019
Total Organic Carbon							18-Oct-2019			16-Oct-2019

Lab Sample No(s)	20941908	20941913	20941919	20941925	20941930	20941934	20941950
Customer Sample Ref.	SHP 15	TP10 VAL01	TP10 VAL02	TP10 VAL03	TP10 VAL04	TP10 VAL05	FSM
AGS Ref.	ES	ES	ES	ES	ES	ES	ES
Depth	0.40 - 0.50	0.20 - 0.30	0.20 - 0.30	0.20 - 0.30	0.20 - 0.30	0.50	0.00 - 0.00
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Asbestos ID in Solid Samples							18-Oct-2019
Cyanide Comp/Free/Total/Thiocyanate							18-Oct-2019
EPH CWG GC (S)							18-Oct-2019
GRO by GC-FID (S)							21-Oct-2019
Metals in solid samples by OES		21-Oct-2019	21-Oct-2019	18-Oct-2019	18-Oct-2019	17-Oct-2019	21-Oct-2019
PAH by GCMS							21-Oct-2019
PCBs by GCMS	22-Oct-2019						22-Oct-2019
pH							22-Oct-2019
Sample description	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019	16-Oct-2019
Total Organic Carbon							21-Oct-2019
TPH CWG GC (S)							21-Oct-2019
VOC MS (S)							22-Oct-2019

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35°C) 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. 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. ALS reserve the right to charge for samples received and stored but not analysed.

3. 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.

4. 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.

5. 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.

6. NDP - No determination possible due to insufficient/unsuitable sample

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. 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.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. 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.

15. 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.

16. 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.

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. **Sample Deviations**

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**

19. **Asbestos**

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 (NDP). The quantity of

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 ALS (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 ALS (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

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.
Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2107)*

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.