Chartered Consulting Engineers

ARP Geotechnical Ltd 5 & 6 Northwest Business Park, Servia Hill, Leeds, LS6 2QH
☎ 0113 245 8498 ✉ leeds@arpgeotechnical.co.uk 🌐 www.arpconsultingengineers.co.uk

Mr Lee Stafford
Arncliffe Homes Ltd
Arncliffe House Bramley Grange
Skeltons Lane
Thorner
Leeds LS14 3DW

BY E-MAIL

Our Ref: ACF/31/AMJnml3

20th May 2021

Dear Lee

Halifax Road, Thurgoland
Validation of Required Remediation Measures

In accordance with your instruction, we visited the above site on 19th April and 6th May 2021, to validate the required remediation measures detailed for the site. The findings of these visits are presented below.

Background

The ARP Geotechnical Ltd (ARP) Contamination Remediation Method Statement (under reference ACF/31rem1), dated July 2019, recommended the removal off site of topsoil around position TP13, and further testing and movement of the topsoil around position TP4 onto Public Open Space (POS). The Remediation Plan (dated July 2019) from the method statement which shows this is attached to this letter.

Position TP13 identified elevated Poly Aromatic Hydrocarbons (PAH) above the screening values for both residential gardens and POS. Therefore, this topsoil could not remain on site and had to be removed (up to the position of the next clean sample). The method statement required that this removal be witnessed by an independent third party geo-environmental engineer (such as ARP).

Position TP4 identified elevated levels of lead (only) above residential, but not POS, screening criteria and therefore it was recommended that either the entire affected area of topsoil was removed (i.e. up to the next clean sample) and placed on POS or further sampling was undertaken to further identify the extent of the lead contaminated topsoil.

Apart from these two requirements, except if unexpected contamination was identified or imported topsoil was required (both of which were considered unlikely), then no other remediation works were considered necessary.

Managing Director: Andrew Radcliffe BEng (Hons) CEngMIStructE
Directors: John Race BSc (Hons) CGeol FGS EurGeol • Andy Hawkin BSc (Hons) IEngAMIStructE • Martin Ingram MCIHT
Associate Directors: Jessie Davey BSc (Hons) PhD RPGeo • Ngoc Phan Miller BA (Hons)
Company Registered No. 3771811

Site Work

19th April Visit – Removal of Topsoil Around TP13 and Testing of Topsoil Around TP4

We visited the site on 19th April 2021 to carry out these works. The topsoil in the area around TP13 (as shown on the Remediation Plan attached) had mostly already been removed and stockpiled on a plastic membrane when we first arrived at site. The area was then inspected, and some small areas of remnant topsoil were identified, which were subsequently removed into the stockpile. Topsoil was not present originally in a good proportion of this area, as relic structures, relic foundations, and some hardstandings, were also present. This material was removed separately from site.

The inspection identified that all of the topsoil in the area around TP13 had been excavated and stockpiled. We were informed the stockpile was due to be removed off site in the next few days and in the end, it was removed on 23rd April 2021. The stockpile totaled approximately 30m^3 and the Waste Transfer Notes (WTN's) are attached to this letter.

Photographs of the above works are also attached to this letter.

During this visit, samples were taken of the topsoil around TP4 to further identify and confirm the extent of the elevated lead. A small area of topsoil had been disturbed and formed a small stockpile.

Upon receipt and assessment of the results, a smaller area of topsoil around TP4 was identified to contain elevated lead (above residential screening values only) and it was confirmed that this topsoil was still suitable for POS. Therefore, a smaller area of topsoil was required to be removed to the adjacent POS area.

The plan showing the locations of the samples, the smaller area of topsoil identified to be removed to POS, and the final location of the topsoil stockpile on the POS, is shown on the drawing attached. The laboratory results for the lead testing are also enclosed. The small stockpile of topsoil mentioned above was close to sample location P.

The validation of the actual removal and placement works is detailed below.

6th May Visit – Excavation of Topsoil Around TP4 and Placement on POS

As discussed above, the area of topsoil around TP4, to be removed to POS, was reduced slightly in size from the original Remediation Plan.

These works still required independent validation, and the site was visited on the 6th May 2021 to witness and validate the excavation and removal of the topsoil onto the adjacent POS area.

The topsoil was stripped using a large tracked excavator and loaded onto a front loader dump truck, which moved the topsoil onto the POS for stockpiling and subsequent spreading. This process took approximately 3 hours.

All of the topsoil in the designated area was removed to the stockpile on the POS area. Photographs are provided as evidence attached to this letter.

Conclusion

In the light of the above, it is concluded that the topsoil around TP13 was successfully removed off site and the topsoil around TP4, which was only suitable for use within POS, was successfully moved and stockpiled in the POS area for subsequent spreading.

The site strip for the entire site has been undertaken and no unexpected contamination was found. The site won topsoil volume for the site is adequate for the proposed development and, therefore, no topsoil will be required to be imported to site. As such, it is considered that all contamination remediation measures for this site are now complete.

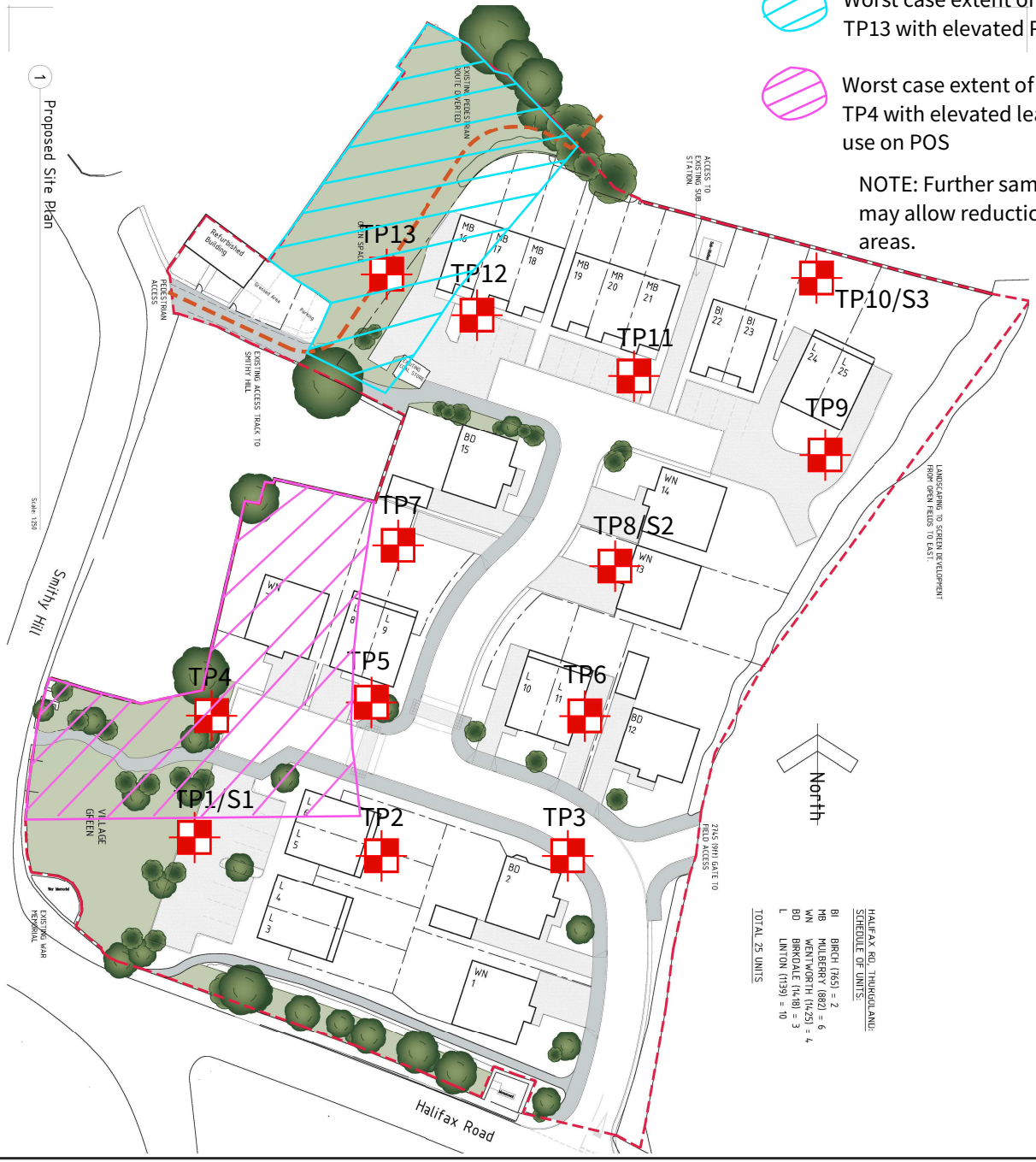
The photographs included in this letter are a small selection of the ones taken. Further photographic evidence can be requested if required.

We trust the above details are acceptable. However, if you have any comments or queries, please do not hesitate to contact us at your convenience.

Yours sincerely
for ARP GEOTECHNICAL LTD

A M Jones

Encs



Worst case extent of topsoil at/around TP13 with elevated PAHs. Take off site

Worst case extent of topsoil at/around TP4 with elevated lead. Take off site or use on POS

NOTE: Further sampling and testing may allow reductions of the affected areas.

0m 30m

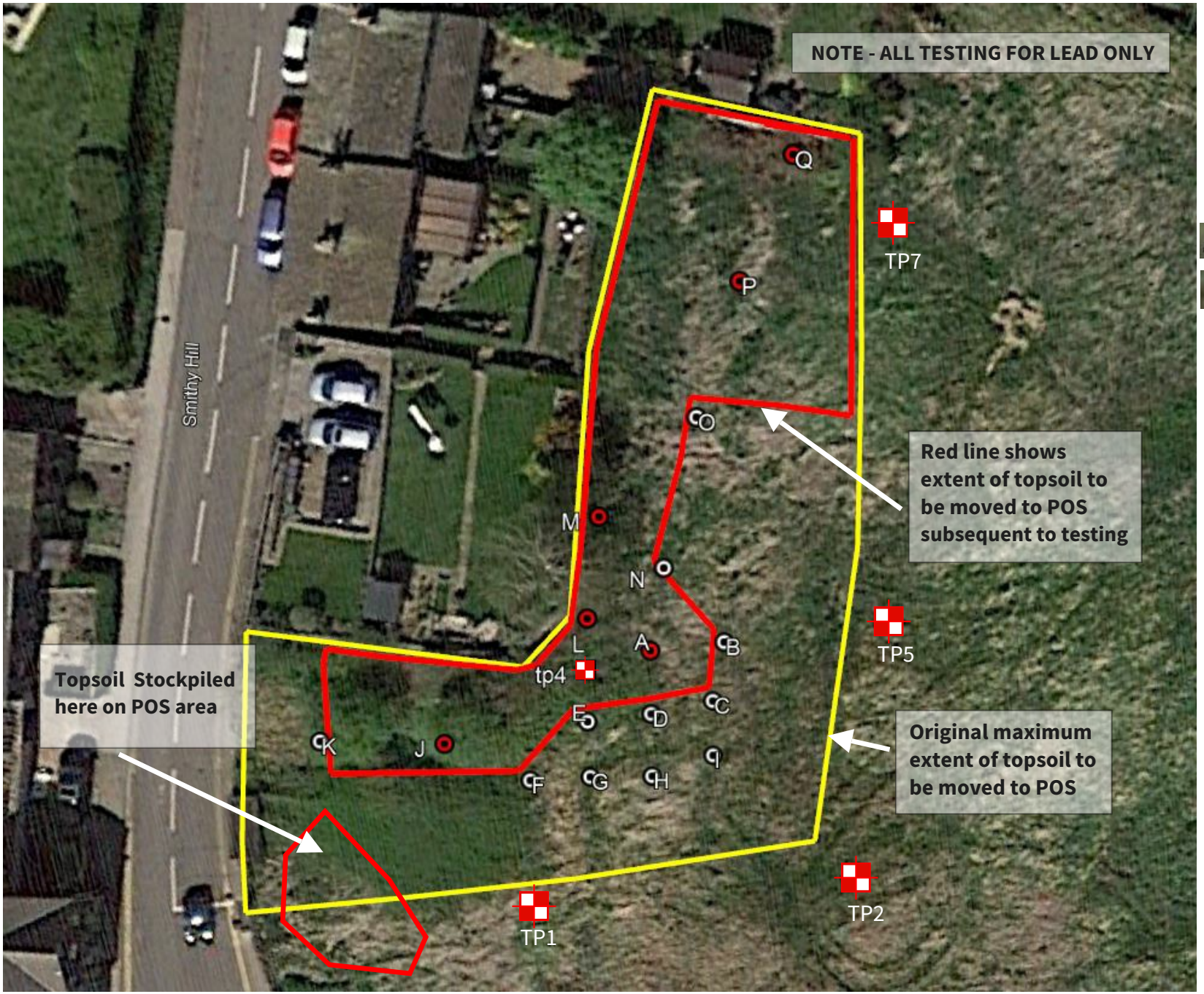
Approximate Scale

Key

Trial Pit Location

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS
Northwest House 5-6 Northwest Business Park Servia Hill · Leeds LS6 2QH
Telephone : 0113 245 8498 Fax : 0113 244 3864 E-Mail : leeds@arpassociates.co.uk

Project	HALIFAX ROAD, THURGOLAND
Client	ARNCLIFFE HOMES LTD
Title	REMEDIATION PLAN
Date	JULY 2019
Drawn	AH
Scale	AS SHOWN
Job No.	ACF/31



0m 15m

Approximate Scale

Key

Trial Pit Location Original SI

Sample over residential value but acceptable for POS

Sample below residential value

ARP GEOTECHNICAL LTD
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Telephone : 0113 245 8498 Fax : 0113 244 3864• E-Mail : leeds@arpassociates.co.uk

Project
HALIFAX ROAD, THURGOLAND

Client
ARNCLIFFE HOMES LTD

Title
TOPSOIL AROUND TP4 FURTHER TESTING AND DELINEATION

Date
MAY 2021

Drawn
AMJ

Scale
AS SHOWN

Job No.
ACF/31



Photograph 1: 19/04/2021 - Stockpile of topsoil from the area around TP13 placed on plastic membrane



Photograph 2: 19/04/2021 - Stockpile of topsoil from the area around TP13 placed on plastic membrane



Photograph 3: 19/04/2021 - Topsoil stripped from surveyed in area around TP13 (looking east from close to the western boundary of the site)



Photograph 4: 19/04/2021 -Topsoil stripped from surveyed in area around TP13 (looking south)



Photograph 5: 19/04/2021 - Topsoil stripped from surveyed in area around TP13 (looking north)



Photograph 6: 19/04/2021 - Another view of the topsoil stockpile to be removed off site



Photograph 7: 19/04/2021 - Additional sampling around TP4



Photograph 8: 19/04/2021 - Additional sampling around TP4



Photograph 9: 06/05/2021 – Stripping of the topsoil area around TP4



Photograph 10: 06/05/2021 – Stripping of the topsoil around TP4



Photograph 11: 06/05/2021 – Stripping of the topsoil around TP4. Large obstructions and concrete to be disposed of off site separately.



Photograph 12: 06/05/2021 – Stockpile of topsoil excavated from around TP4. Placed onto Public Open Space for subsequent spreading.

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	21-12896-1
Initial Date of Issue:	27-Apr-2021
Client	ARP Geotechnical Ltd
Client Address:	5/6 Northwest Business Park Servia Hill Leeds Yorkshire LS6 2QH
Contact(s):	Andy Jones
Project	ACF/31 Halifax Road

Quotation No.:		**Date Received:**	21-Apr-2021
Order No.:	ACF/31	**Date Instructed:**	22-Apr-2021
No. of Samples:	18		
Turnaround (Wkdays):	5	**Results Due:**	28-Apr-2021
Date Approved:	27-Apr-2021		

Approved By:



Details: Glynn Harvey, Technical Manager

Results - Soil

Project: ACF/31 Halifax Road

Client: ARP Geotechnical Ltd				**Chemtest Job No.:**	21-12896	21-12896	21-12896	21-12896	21-12896	21-12896	21-12896	21-12896	21-12896	21-12896	21-12896	21-12896
Quotation No.:				**Chemtest Sample ID.:**	1183851	1183852	1183853	1183854	1183855	1183856	1183857	1183858	1183859	1183860	1183861	1183862
				Client Sample ID.:	A	B	C	D	E	F	G	H	I	J	K	L
				Sample Location:	ACF/31	ACF/31	ACF/31	ACF/31	ACF/31	ACF/31	ACF/31	ACF/31	ACF/31	ACF/31	ACF/31	ACF/31
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Determinand	**Accred.**	**SOP**	**Units**	**LOD**												
Moisture	N	2030	%	0.020	47	47	44	41	41	38	41	44	49	37	28	44
Lead	U	2450	mg/kg	0.50	230	170	110	110	85	170	180	200	150	220	190	510

Results - Soil

Project: ACF/31 Halifax Road

Client: ARP Geotechnical Ltd		**Chemtest Job No.:**			21-12896	21-12896	21-12896	21-12896	21-12896	21-12896
Quotation No.:		**Chemtest Sample ID.:**			1183863	1183864	1183865	1183866	1183867	1183868
		Client Sample ID.:			M	N	O	P	Q	Stockpile
		Sample Location:			ACF/31	ACF/31	ACF/31	ACF/31	ACF/31	ACF/31
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
Moisture	N	2030	%	0.020	39	39	16	22	21	24
Lead	U	2450	mg/kg	0.50	240	170	75	240	270	280

Test Methods

SOP	Title	Parameters included	Method summary
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

ARP GEOTECHNICAL LIMITED
SOIL CONTAMINANT SCREENING VALUES
RESIDENTIAL WITH HOME-GROWN PRODUCE

Determinand	S4UL (mg/kg)			C4SL (mg/kg)		
Arsenic	37			37		
Cadmium	11			22		
Chromium (trivalent)	910					
Chromium (hexavalent)	6			21		
Copper	2400					
Lead				200		
Inorganic Mercury	40					
Nickel	180					
Selenium	250					
Zinc	3700					
Acidity (pH)	*Should be Greater Than 5			*Should be Greater Than 5		
	1% SOM	**2.5% SOM**	**6% SOM**	**1% SOM**	**2.5% SOM**	**6% SOM**
Naphthalene	2.3	5.6	13			
Acenaphthylene	170	420	920			
Acenaphthene	210	510	1,100			
Fluorene	170	400	860			
Phenanthrene	95	220	440			
Anthracene	2,400	5,400	11,000			
Fluoranthene	280	560	890			
Pyrene	620	1,200	2,000			
Benzo(a)anthracene	7.2	11	13			
Chrysene	15	22	27			
Benzo(b)fluoranthene	2.6	3.3	3.7			
Benzo(k)fluoranthene	77	93	100			
Benzo(a)pyrene	2.2	2.7	3			5
Indeno(1,2,3-cd)pyrene	27	36	41			
Dibenzo(a,h)anthracene [CLEA]	0.77	0.87	0.91			
Benzo(g,h,I)perylene	320	340	350			
Phenols	120	200	380			
Total TPH	*Above 500, speciate and compare with values below:					
C5 to C6 Aliphatic	42	78	160			
C6 to C8 Aliphatic	100	230	530			
C8 to C10 Aliphatic	27	65	150			
C10 to C12 Aliphatic	130	330	760			
C12 to C16 Aliphatic	1100	2,400	4,300			
C16 to C35 Aliphatic	65,000	92,000	110,000			
C35 TO C44 Aliphatic	65,000	92,000	110,000			
C5 to C7 Aromatic (Benzene)	70	140	300			
C7 to C8 Aromatic (Toluene)	130	290	660			
C8 to C10 Aromatic	34	83	190			
C10 to C12 Aromatic	74	180	380			
C12 to C16 Aromatic	140	330	660			
C16 to C21 Aromatic	260	540	930			
C21 TO C35 Aromatic	1100	1,500	1,700			
C35 TO C44 Aromatic	1100	1,500	1,700			
Asbestos	*Should be None Detected			*Should be None Detected		

* In House Value/Approach S4UL = Suitable 4 Use Level, CIEH/LQM 2014 C4SL = Cat 4 Screening Level, DEFRA, 2014

[CLEA] Assessment criteria derived using the CLEA tool (version 1.071) based on standard conceptual models that underpin soil guideline values

Blank cell indicates no published value or in-house value. Some values presented are above saturation limits.

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ARP GEOTECHNICAL LIMITED
SOIL CONTAMINANT SCREENING VALUES
PUBLIC OPEN SPACE NEAR RESIDENTIAL

Determinand	S4UL (mg/kg)			C4SL (mg/kg)		
Arsenic	79			79		
Cadmium	120			220		
Chromium (trivalent)	1500					
Chromium (hexavalent)	7.7			21		
Copper	12000					
Lead				630		
Inorganic Mercury	120					
Nickel	230					
Selenium	1100					
Zinc	81000					
Acidity (pH)	*Should be Greater Than 5					
	1% SOM	**2.5% SOM**	**6% SOM**	**1% SOM**	**2.5% SOM**	**6% SOM**
Naphthalene	4900	4900	4900			
Acenaphthylene	15000	15000	15000			
Acenaphthene	15000	15000	15000			
Fluorene	9900	9900	9900			
Phenanthrene	3100	3100	3100			
Anthracene	74000	74000	74000			
Fluoranthene	3100	3100	3100			
Pyrene	7400	7400	7400			
Benzo(a)anthracene	29	29	29			
Chrysene	57	57	57			
Benzo(b)fluoranthene	7.1	7.2	7.2			
Benzo(k)fluoranthene	190	190	190			
Benzo(a)pyrene	5.7	5.7	5.7			10
Indeno(1,2,3-cd)pyrene	82	82	82			
Dibenzo(a,h)anthracene	0.57	0.57	0.57			
Benzo(g,h,I)perylene	640	640	640			
Phenols	440	690	1300			
Total TPH	*Above 3,800, speciate and compare with values below:					
C5 to C6 Aliphatic	570000	590000	600000			
C6 to C8 Aliphatic	600000	610000	620000			
C8 to C10 Aliphatic	13000	13000	13000			
C10 to C12 Aliphatic	13000	13000	13000			
C12 to C16 Aliphatic	13000	13000	13000			
C16 to C35 Aliphatic	250000	250000	250000			
C35 TO C44 Aliphatic	250000	250000	250000			
C5 to C7 Aromatic (Benzene)	56000	56000	56000			
C7 to C8 Aromatic (Toluene)	56000	56000	56000			
C8 to C10 Aromatic	5000	5000	5000			
C10 to C12 Aromatic	5000	5000	5000			
C12 to C16 Aromatic	5100	5100	5000			
C16 to C21 Aromatic	3800	3800	3800			
C21 TO C35 Aromatic	3800	3800	3800			
C35 TO C44 Aromatic	3800	3800	3800			
Asbestos	*Should be None Detected			*Should be None Detected		

* In House Value/Approach S4UL = Suitable 4 Use Level, CIEH/LQM 2014 C4SL = Cat 4 Screening Level, DEFRA, 2014

Blank cell indicates no published value or in-house value. Some values presented are above saturation limits.

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WASTE TRANSFER NOTE

The Environmental Protection (Duty of Care) Regulations 1991

FASTSOURCE LTD.
EXCAVATIONS / DEMOLITION & HAULAGE
Tel: (0113) 2701637 Fax: (0113) 2704366

THE WASTE

SECTION A - DESCRIPTION OF THE WASTE							
1. Describe the waste being transferred:	NON HAZ soil						
2. Describe how the waste is contained:	Loose: ☐	Sacks: ☐	Skip: ☐	Drum: ☐	Tanker: ☐	Bulk Lorry: ☑	
	Other:						
3. Give the appropriate waste code:	17 05 04	4. Multiple consignments: Yes / No					
5. Describe the quantity of waste:	upto 100T						

TRANSFEROR

SECTION B - PRODUCER/HOLDER OF THE WASTE		
1. Full name of Producer/Holder:	Arncliffe	
2. Address of Producer/Holder:	Bramley grange farm Leeds LS14 3PW	
3. Address of Transfer/Collection Point:	Smithy Lane Thurgoland S35 7EB	
4. Date of Transfer:	Individual waste collection date: 23-4-21	
	Multiple waste consignments- Date of first transfer: 23.4.21 Date of last transfer	
5. Signature on behalf of Producer/Holder:	Signature: C NORTON	SIC Code (2007): 4312
	Name:	Date: 23-4-21

TRANSFEREE

SECTION C - WASTE CARRIER		
1. Full name of Carrier:	Fastsource Limited	Fastsource Ltd The old Coal Yard Caldervale Road Wakefield WF1 5PH Permit: EPR/HB3336AU
2. Address of Carrier:	[redacted]	
3. Registered Waste Carrier No.:	CB/WN5277KC	4. Expiry Date: 16.3.22
5. Waste Carrier No. issued by:	E.A.: ☑ S.E.P.A.: ☐ Other: ☐	
6. Signature on behalf of the waste Carrier	Signature:	
	MARK.	Date: 23.4.21

DISPOSAL SITE

SECTION D - DISPOSAL SITE / TRANSFER STATION		
1. Full name of Site Operator:	Fastsource Limited	
2. Name of Disposal Site:	The Old Coal Yard	
3. Address of Disposal Site:	Caldervale Road, Wakefield West Yorkshire WF1 5PH	
4. Site Waste Management Licence No. & details / Waste Exemption Licence No. & details:	EPR/HB3336AU	
5. Licence / Exemption No. issued by:	E.A.: ☒ S.E.P.A.: ☐ Other: ☐	
6. Signature on behalf of the Recipient of the Waste:	Signature: R Evans	
	Name: R EVANS	Date: 23.4.21

I confirm that I have fulfilled my duty to apply the waste hierarchy as required by regulation 12 of the waste (England and Wales) Regulations 2011

White Copy: Retained by Carrier **Pink Copy:** Retained by Recipient **Yellow Copy:** Retained by Producer

Controlled Waste Transfer Notes must be retained for at least 2 years

No 1189