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25th August 2021

Jelson Homes Limited,
370 Loughborough Road
Leicester,
LE4 5PR

For the attention of Elliott Green

Dear Elliott,

Residential Development at Littleworth Drove, Deeping St Nicholas – Remediation and Validation of Elevated PAHs.

Background

Following the initial intrusive ground investigation works undertaken at the site in July 2019 and submission by Jelson Homes Limited of ground investigation report no. G19102-IR (dated August 2019) to South Holland District Council a response confirmed general agreement with the report's findings but declined to remove a planning condition relating to localised elevated levels of PAH's. In order to provide additional information relating to the south western corner of the site additional trial pitting and subsequent laboratory testing was undertaken. Our further findings and recommendations were provided in a letter dated 15th November 2019.

The area of the site was covered in topsoil mixed with ash and locally contained elevated levels of PAH'S. This was confirmed to cover a localised area of approximately 20m x 20m. Notification was received from South Holland District Council Environmental Protection Officer that planning condition 11 of H03-0331-16 could not be discharged until a remediation method statement had been provided. Nicholls Colton Group provided the remediation method statement for the site as outlined below.

Remediation Method Statement for Treatment of Elevated PAH's 'Hotspot'

The area of the site containing topsoil contaminated with elevated PAH's (identified within trial pits TP5, TP17B, TP18 and TP24) was to be set out and clearly identified. A copy of the exploratory hole location plan identifying the trial pit locations is attached.

In order to protect the site from groundwater flooding it is understood that the developer proposes to increase the ground level across the entire site area by approximately 1.00m utilising either inert imported soils or, in terms of proposed access roads, approved carriageway construction materials.

Given that the soils within the delineated 'hotspot' containing elevated levels of PAH (ranging in depth from 0.30m to 0.60m) are predominantly topsoil based and contain organic matter it is recommended that they should be stripped (and not buried within the garden areas) to reveal the underlying natural granular and cohesive soils prior to covering with imported inert cohesive soils.

Of note, with the exception of a single sample recovered at a depth of 0.20m within trial pit TP17B, all of the remaining test results which exceed the '*residential with plant uptake*' trigger levels comply with the '*public open space residenti*al' trigger levels.

It was agreed by South Holland District Council that on the basis of the above the excavated material may be utilised as fill to raise the ground level within an area of public open space. No encapsulation of the excavated soils was considered necessary.

On the basis of the above the proposed remediation methodology is as follows:

- Excavation of contaminated topsoil from area identified by previous trial pitting.
- Placement of excavated soils within areas of public open space.
- Validation of the sides and base of the excavation.
- Reporting

Nicholls Colton will attend site during the removal of the known area of contamination in order to collect soil samples to establish the condition of the site, and specifically the remaining soils. The locations of these samples will be determined on site in order to give a representative coverage of the excavation area and enable characterisation of the soil remaining in situ, as far as practicable.

Soil samples will be collected from around the excavation sides and from the base of the excavation with an absolute minimum of 4 no. samples suggested. The number of soil samples taken may increase or decrease depending on the size of the excavation and the variation in soils within the remaining faces/base. Additional samples may be taken at the discretion of the site engineer based on visual observations made during the remediation work.

The Engineer will obtain soil samples from the sides and base of excavations once the contaminated soils have been removed. Given the shallow depth of the excavation and the known soil sequence and anticipated size of the excavation, samples are to be taken directly from the excavation by the Engineer.

Soil sample descriptions will be recorded and soil samples will be assessed for potential contamination based on visual and olfactory evidence.

Photographs will be taken to support the visual observations.

Samples will be immediately packed into appropriate sample jars and stored in a cool box with a target temperature of 4°C.

Soil samples collected on site will be submitted to a UKAS accredited laboratory for analysis of potential contaminants. Contaminants to be tested will include:

- Polycyclic Aromatic Hydrocarbons (PAH's) USEPA 16

A watching brief should be maintained throughout the redevelopment works for any further previously unidentified areas of contamination.

Documentation including photographic records, dates of inspection and laboratory test results will be collected. This information will be collated and provided as a validation report on completion of the remedial works.

Validation of hotspot removal

On 21st September a Nicholls Colton Group Geo-Environmental Engineer attended the site to oversee the remedial works being undertaken at the site and to obtain confirmatory samples to validate the removal of the hotspot.

The area of the hotspot was set out in accordance with the recommendations of our letter dated 2nd January 2020 based upon the locations of the trial pits undertaken and subsequent laboratory testing. The surface materials were excavated across the entire area of the hotspot to a depth where the underlying natural strata were exposed (typically 0.40-0.60m below existing ground level). A former farm drainage channel was noted during the remedial works and the full depth of this was also excavated.

The material removed was placed in an area of public open space adjacent to the western site boundary to a level that will allow a suitable depth of imported material to be placed as capping. It should be remembered that this material is only marginally exceeded the S4UL for PAH in a single location.

Photographic records of the excavation have been taken and selected photos are attached.

Samples were obtained from the base of the excavation and submitted to the laboratory for analysis. The results of the laboratory testing are attached. The results confirm that all of the samples of the material remaining below the area of the hotspot are below the relevant S4UL values.

On the basis of the works carried out at the site and the laboratory test results above it is considered that no further remedial works are required with regards to the protection of future occupiers at the site.

We can confirm that the material removed from the excavation (approximately 250m^3) was moved during the remedial works and immediately placed within and area of public open space between the proposed gas storage tanks and proposed pumping station.

Following the placement of this material further clean fill has been imported to the site to raise ground levels with this placed as across all areas of public space. This effectively encapsulates this material which it should be remembered was deemed suitable for use within areas of public open space.

A review of the material import tickets indicates 74 loads of material have been imported totalling an imported quantity of soil of approximately 1,368 tonnes equivalent to approximately 912m^3.All imported materials were certificated at source to confirm the suitability of the materials for use as fill at the site.

We can confirm that the materials imported to the site are suitable for ‘residential with plant uptake’ end use. A copy of the laboratory test results for the imported materials is attached (testing undertaken by others).

The laboratory test results have been compared against the S4UL values (and C4SL value in the case of lead) to confirm the suitability for placement in the soft landscaped areas.

All of the results fall below the relevant assessment criteria values for the residential with plant uptake land use.

We trust the contents of this letter are satisfactory and if so should be forwarded to the South Holland District Council Environmental Protection Officer to allow discharge of the outstanding condition. Please do not hesitate to contact the writer should you wish to discuss the findings or require any further information.

Yours faithfully,



P.I. Plumpton
Senior Geo-Environmental Engineer
NICHOLLS COLTON GROUP

Enc.
Exploratory Hole Location Plan
Laboratory Test Results
Photographic Records

VALIDATION PHOTOGRAPHS

Excavation looking west:



Excavation looking north west:



VALIDATION PHOTOGRAPHS

Excavation looking East: Note deeper excavation of former drainage channel.



Excavation looking north east:



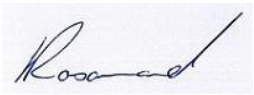
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Analytical Test Report: G19102-D/001

Your Project Reference:	**Land Off Littleworth Drove, Deeping St Nicholas**	Samples Received on:	22/09/2020
Your Order Number:	G19102-D	Testing Instruction Received:	22/09/2020
Report Issue Number:	1	Sample Tested:	22/09 to 06/10/2020
Samples Analysed:	4 soil samples	Report issued:	08/10/2020

Signed



Hollis Rosamond
Asbestos & Sample Registration Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies tab for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report with the exception of the asbestos test portion which is held for 6 months unless otherwise requested.

Moisture Content was determined in accordance with NC method statement MS - CL - Sample Prep, oven dried at <30˚C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with NC method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

Concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve. As received samples have been corrected for moisture content but not stone content.

Samples were supplied by customer, results apply to the samples as received.

Deviating Samples

Samples were received in suitable containers	**Yes**
A date and time of sampling was provided	**Yes**
Sample holding times were exceeded prior to analysis of determinants	**No**

Where samples do not meet one or more of the above criteria they will be classed as deviating, this means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue 24.01.2017
Owned by Emily Blissett - Customer Services Supervisor
Authorised by James Gane - Commercial Manager
J:\Public\Projects\2020\LE3 - Geotechnical\G19\G19102-D\[G19102-D-001.XLSX]Cover Sheet

Nicholls Colton Group
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G19102-D/001
Project Reference - Land Off Littleworth Drove, Deeping St Nicholas
Analytical Test Results - Soil

NC Reference			112088	112089	112090	112091
Client Sample ID			-	-	-	-
Client Sample Location			VAL	VAL	VAL	VAL
Client Sample Type			E	E	E	E
Client Sample Number			1	2	3	4
Depth - Top (m)			0.20	0.30	0.20	0.50
Depth - Bottom (m)			0.20	0.30	0.20	0.50
Date of Sampling			21/09/2020	21/09/2020	21/09/2020	21/09/2020
Time of Sampling			AM	AM	AM	AM
Sample Matrix			Sand	Sand	Sand	Clay
Determinant	**Units**	**Accreditation**				
Acenaphthene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Acenaphthylene	(mg/kg)	UKAS	< 0.02	< 0.02	< 0.02	< 0.02
Anthracene	(mg/kg)	UKAS	< 0.02	< 0.02	< 0.02	< 0.02
Benzo (a) anthracene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	0.03
Benzo (a) pyrene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Benzo (b) fluoranthene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	0.06
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	0.04
Benzo (k) fluoranthene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Chrysene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	0.05
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Fluoranthene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	0.06
Fluorene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	0.03
Naphthalene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Phenanthrene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Pyrene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	0.05
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	< 0.32	< 0.32	< 0.32	0.54

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G19102-D/001

Project Reference - Land Off Littleworth Drove, Deeping St Nicholas

Sample Descriptions

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)
112088	-	VAL	E	1	Brown slightly clayey silty sand with rare organic matter	18	0.1
112089	-	VAL	E	2	Greyish brown slightly clayey silty sand with rare organic matter	25	0.0
112090	-	VAL	E	3	Greyish brown slightly clayey silty sand with rare organic matter	23	0.0
112091	-	VAL	E	4	Dark brown slightly silty sandy clay with rare rootlets	31	0.0

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G19102-D/001

Project Reference - Land Off Littleworth Drove, Deeping St Nicholas

Analysis Methodologies

Matrix	Determinant	Sample condition for analysis	Test Method used
Soil	PAH	As Received	In house method statement - MS - CL - PAH (As received)

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GRM Development Solutions
Laurus House
First Avenue
Centrum 100
Burton Upon Trent
DE14 2WH

Analytical Test Report: L21/0300/GRM/001

Your Project Reference:	**Melton Road, Barrow-Upon-**	Samples Received on:	02/02/2021
Your Order Number:	P9608	Testing Instruction Received:	02/02/2021
Report Issue Number:	1	Sample Tested:	02/02 to 22/02/2021
Samples Analysed:	10 soil samples	Report issued:	22/02/2021

Signed



Peter Swanston
Environmental Laboratories Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies tab for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report with the exception of the asbestos test portion which is held for 6 months unless otherwise requested.

Moisture Content was determined in accordance with NC method statement MS - CL - Sample Prep, oven dried at <30˚C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with NC method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

With the exception of Sulphate and LoI which are crushed over the 2mm test sieve, concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve. As received samples have been corrected for moisture content but not stone content.

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Asbestos

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

Deviating Samples

Samples were received in suitable containers	**Yes**
A date and time of sampling was provided	**Yes**
Sample holding times were exceeded prior to analysis of determinants	**No**

Where samples do not meet one or more of the above criteria they will be classed as deviating, this means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

WAC Testing

Samples were leached in accordance with BS EN 12457-2: 2002.

Eluate Results are reported as L/S 10. These results have been calculated in accordance with BS EN 12457-2:2002.

Comparative values are taken from the Council Decision Annex - CRITERIA AND PROCEDURES FOR THE ACCEPTANCE OF WASTE AT LANDFILLS, (2003/33/EC).

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue 10/12/2020
Owned by Emily Blissett - Customer Services Supervisor
Authorised by James Gane - Commercial Manager
J:\Public\Projects\2021\L21\GRM - GRM\L21-0300-GRM\[L21-0300-GRM-001.XLSX]GRM Suite

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L21/0300/GRM/001

Project Reference - Melton Road, Barrow-Upon-Soar

Analytical Test Results - GRM Soil Suite

NC Reference			138290	138291	138292	138293	138294	138295	138296
Client Sample ID			SP01	SP01	SP01	SP02	SP02	SP03	SP03
Client Sample Location			SP01	SP01	SP01	SP02	SP02	SP03	SP03
Client Sample Type			ES1	ES2	ES3	ES1	ES2	ES1	ES2
Depth - Top (m)			0.30	0.30	0.30	0.30	0.30	0.30	0.30
Depth - Bottom (m)			0.30	0.30	0.30	0.30	0.30	0.30	0.30
Date of Sampling			01/02/2021	01/02/2021	01/02/2021	01/02/2021	01/02/2021	01/02/2021	01/02/2021
Time of Sampling			Not provided	Not provided	Not provided	Not provided	Not provided	Not provided	Not provided
Sample Matrix			Clay	Clay	Clay	Clay	Clay	Clay	Clay
Determinant	**Units**	**Accreditation**							
Arsenic	(mg/kg)	MCERTS	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Cadmium	(mg/kg)	MCERTS	1.1	1.1	1.1	1.2	1.2	0.6	0.8
Chromium (Total)	(mg/kg)	UKAS	9.3	6.5	8.8	11	10	17	14
Copper	(mg/kg)	MCERTS	46	44	45	44	47	29	36
Lead	(mg/kg)	MCERTS	23	18	19	23	23	15	25
Mercury	(mg/kg)	UKAS	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5
Nickel	(mg/kg)	MCERTS	30	29	32	35	35	30	25
Selenium	(mg/kg)	u	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
Zinc	(mg/kg)	MCERTS	63	56	54	67	65	47	67
Total Phenols	(mg/kg)	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cyanide (Total)	(mg/kg)	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chromium (Hexavalent)	(mg/kg)	u	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
pH	pH Units	MCERTS	8.3	8.4	8.2	8.4	8.4	8.8	9.4
SOM	(%)	UKAS	3.3	3.3	3.5	3.7	3.8	< 1.7	< 1.7
Sulphate	(mg/l)	u	38	38	260	140	190	550	880
Acenaphthene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	0.04	< 0.02	< 0.02	< 0.02
Acenaphthylene	(mg/kg)	UKAS	< 0.02	< 0.02	< 0.02	< 0.02	0.06	< 0.02	< 0.02
Anthracene	(mg/kg)	UKAS	< 0.02	< 0.02	< 0.02	0.12	0.37	< 0.02	< 0.02
Benzo (a) anthracene	(mg/kg)	MCERTS	< 0.02	0.08	< 0.02	0.69	0.61	< 0.02	< 0.02
Benzo (a) pyrene	(mg/kg)	MCERTS	< 0.02	0.05	< 0.02	0.51	0.31	< 0.02	< 0.02
Benzo (b) fluoranthene	(mg/kg)	MCERTS	0.03	0.11	0.03	0.88	0.55	< 0.02	< 0.02
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	< 0.02	0.05	< 0.02	0.33	0.16	< 0.02	< 0.02
Benzo (k) fluoranthene	(mg/kg)	MCERTS	< 0.02	0.04	< 0.02	0.30	0.20	< 0.02	< 0.02
Chrysene	(mg/kg)	MCERTS	0.03	0.08	< 0.02	0.62	0.53	< 0.02	< 0.02
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	0.06	0.04	< 0.02	< 0.02
Fluoranthene	(mg/kg)	MCERTS	0.04	0.14	< 0.02	1.1	0.99	< 0.02	0.02
Fluorene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	0.04	0.05	< 0.02	< 0.02
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	MCERTS	< 0.02	0.05	< 0.02	0.38	0.20	< 0.02	< 0.02
Naphthalene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phenanthrene	(mg/kg)	MCERTS	0.04	0.08	< 0.02	0.42	0.26	< 0.02	< 0.02
Pyrene	(mg/kg)	MCERTS	0.03	0.13	< 0.02	0.97	0.83	< 0.02	< 0.02
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	0.44	0.97	0.41	6.5	5.2	< 0.32	0.37
Asbestos	-	UKAS	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

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L21/0300/GRM/001

Project Reference - Melton Road, Barrow-Upon-Soar

Analytical Test Results - GRM Soil Suite

NC Reference			138297	138298	138299
Client Sample ID			SP04	SP04	SP04
Client Sample Location			SP04	SP04	SP04
Client Sample Type			ES1	ES2	ES3
Depth - Top (m)			0.30	0.30	0.30
Depth - Bottom (m)			0.30	0.30	0.30
Date of Sampling			01/02/2021	01/02/2021	01/02/2021
Time of Sampling			Not provided	Not provided	Not provided
Sample Matrix			Clay	Clay	Clay
Determinant	**Units**	**Accreditation**			
Arsenic	(mg/kg)	MCERTS	< 10	< 10	< 10
Cadmium	(mg/kg)	MCERTS	0.8	0.8	0.7
Chromium (Total)	(mg/kg)	UKAS	17	19	16
Copper	(mg/kg)	MCERTS	33	33	30
Lead	(mg/kg)	MCERTS	27	28	22
Mercury	(mg/kg)	UKAS	< 2.5	< 2.5	< 2.5
Nickel	(mg/kg)	MCERTS	30	30	27
Selenium	(mg/kg)	u	< 8.0	< 8.0	< 8.0
Zinc	(mg/kg)	MCERTS	71	71	58
Total Phenols	(mg/kg)	MCERTS	< 1.0	< 1.0	< 1.0
Cyanide (Total)	(mg/kg)	MCERTS	< 1.0	< 1.0	< 1.0
Chromium (Hexavalent)	(mg/kg)	u	< 1.0	< 1.0	< 1.0
pH	pH Units	MCERTS	8.4	8.2	8.9
SOM	(%)	UKAS	< 1.7	1.8	< 1.7
Sulphate	(mg/l)	u	740	760	200
Acenaphthene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02
Acenaphthylene	(mg/kg)	UKAS	< 0.02	< 0.02	< 0.02
Anthracene	(mg/kg)	UKAS	< 0.02	< 0.02	< 0.02
Benzo (a) anthracene	(mg/kg)	MCERTS	0.04	< 0.02	< 0.02
Benzo (a) pyrene	(mg/kg)	MCERTS	0.04	< 0.02	< 0.02
Benzo (b) fluoranthene	(mg/kg)	MCERTS	0.07	0.03	< 0.02
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	0.04	< 0.02	< 0.02
Benzo (k) fluoranthene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02
Chrysene	(mg/kg)	MCERTS	0.05	< 0.02	< 0.02
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02
Fluoranthene	(mg/kg)	MCERTS	0.06	0.03	< 0.02
Fluorene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	MCERTS	0.04	< 0.02	< 0.02
Naphthalene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02
Phenanthrene	(mg/kg)	MCERTS	0.03	0.02	< 0.02
Pyrene	(mg/kg)	MCERTS	0.06	0.03	< 0.02
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	0.60	0.38	< 0.32
Asbestos	-	UKAS	No asbestos detected	No asbestos detected	No asbestos detected

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L21/0300/GRM/001

Project Reference - Melton Road, Barrow-Upon-Soar

Analytical Test Results - TPH CWG

NC Reference			138290	138291	138292	138293	138294	138295
Client Sample ID			SP01	SP01	SP01	SP02	SP02	SP03
Client Sample Location			SP01	SP01	SP01	SP02	SP02	SP03
Client Sample Type			ES1	ES2	ES3	ES1	ES2	ES1
Depth - Top (m)			0.30	0.30	0.30	0.30	0.30	0.30
Depth - Bottom (m)			0.30	0.30	0.30	0.30	0.30	0.30
Date of Sampling			01/02/2021	01/02/2021	01/02/2021	01/02/2021	01/02/2021	01/02/2021
Time of Sampling			Not provided	Not provided	Not provided	Not provided	Not provided	Not provided
Sample Matrix			Clay	Clay	Clay	Clay	Clay	Clay
Determinant	**Units**	**Accreditation**						
Aliphatics								
>C_5 to C_6 [HS_MS_1D_AL]	(mg/kg)	u	0.06	< 0.04	< 0.04	< 0.04	< 0.04	< 0.05
>C_6 to C_8 [HS_MS_1D_AL]	(mg/kg)	u	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.05
>C_8 to C_{10} [HS_MS_1D_AL]	(mg/kg)	u	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.05
>C_{10} to C_{12} [EH_CU_1D_AL]	(mg/kg)	u	< 10	< 10	< 10	< 10	< 10	< 10
>C_{12} to C_{16} [EH_CU_1D_AL]	(mg/kg)	u	< 10	< 10	< 10	< 10	< 10	< 10
>C_{16} to C_{21} [EH_CU_1D_AL]	(mg/kg)	u	< 10	< 10	< 10	< 10	< 10	< 10
>C_{21} to C_{35} [EH_CU_1D_AL]	(mg/kg)	u	22	17	26	23	19	< 10
Aromatics								
>C_5 to C_7 [HS_MS_1D_AR]	(mg/kg)	u	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.05
>C_7 to C_8 [HS_MS_1D_AR]	(mg/kg)	u	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.05
>C_8 to C_{10} [HS_MS_1D_AR]	(mg/kg)	u	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.05
>C_{10} to C_{12} [EH_CU_1D_AR]	(mg/kg)	u	< 10	< 10	< 10	< 10	< 10	< 10
>C_{12} to C_{16} [EH_CU_1D_AR]	(mg/kg)	u	< 10	< 10	< 10	< 10	< 10	< 10
>C_{16} to C_{21} [EH_CU_1D_AR]	(mg/kg)	u	< 10	< 10	< 10	< 10	< 10	< 10
>C_{21} to C_{35} [EH_CU_1D_AR]	(mg/kg)	u	19	16	34	25	20	< 10
Total								
>C_5 to C_{40} [EH_CU+HS_1D_Total]	(mg/kg)	u	< 50	< 50	60	< 50	< 50	< 50

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Project Reference - Melton Road, Barrow-Upon-Soar

Analytical Test Results - TPH CWG

NC Reference			138296	138297	138298	138299
Client Sample ID			SP03	SP04	SP04	SP04
Client Sample Location			SP03	SP04	SP04	SP04
Client Sample Type			ES2	ES1	ES2	ES3
Depth - Top (m)			0.30	0.30	0.30	0.30
Depth - Bottom (m)			0.30	0.30	0.30	0.30
Date of Sampling			01/02/2021	01/02/2021	01/02/2021	01/02/2021
Time of Sampling			Not provided	Not provided	Not provided	Not provided
Sample Matrix			Clay	Clay	Clay	Clay
Determinant	**Units**	**Accreditation**				
Aliphatics						
$>C_5$ to C_6 [HS_MS_1D_AL]	(mg/kg)	u	< 0.04	0.17	0.27	< 0.04
$>C_6$ to C_8 [HS_MS_1D_AL]	(mg/kg)	u	< 0.04	< 0.04	< 0.04	< 0.04
$>C_8$ to C_{10} [HS_MS_1D_AL]	(mg/kg)	u	< 0.04	0.06	0.15	0.09
$>C_{10}$ to C_{12} [EH_CU_1D_AL]	(mg/kg)	u	< 10	< 10	< 10	< 10
$>C_{12}$ to C_{16} [EH_CU_1D_AL]	(mg/kg)	u	< 10	< 10	< 10	< 10
$>C_{16}$ to C_{21} [EH_CU_1D_AL]	(mg/kg)	u	< 10	< 10	< 10	< 10
$>C_{21}$ to C_{35} [EH_CU_1D_AL]	(mg/kg)	u	< 10	17	< 10	< 10
Aromatics						
$>C_5$ to C_7 [HS_MS_1D_AR]	(mg/kg)	u	< 0.04	< 0.04	< 0.04	< 0.04
$>C_7$ to C_8 [HS_MS_1D_AR]	(mg/kg)	u	< 0.04	< 0.04	< 0.04	< 0.04
$>C_8$ to C_{10} [HS_MS_1D_AR]	(mg/kg)	u	< 0.04	< 0.04	< 0.04	< 0.04
$>C_{10}$ to C_{12} [EH_CU_1D_AR]	(mg/kg)	u	< 10	< 10	< 10	< 10
$>C_{12}$ to C_{16} [EH_CU_1D_AR]	(mg/kg)	u	< 10	< 10	< 10	< 10
$>C_{16}$ to C_{21} [EH_CU_1D_AR]	(mg/kg)	u	< 10	< 10	< 10	< 10
$>C_{21}$ to C_{35} [EH_CU_1D_AR]	(mg/kg)	u	< 10	27	< 10	< 10
Total						
$>C_5$ to C_{40} [EH_CU+HS_1D_Total]	(mg/kg)	u	< 50	< 50	< 50	< 50

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Project Reference - Melton Road, Barrow-Upon-Soar

Certificate Of Analysis - WAC Suite

NC Reference	138292
Client Sample ID	SP01
Client Sample Location	SP01
Client Sample Type	ES3
Depth - Top (m)	0.30
Depth - Bottom (m)	0.30
Date of Sampling	01/02/2021
Time of Sampling	Not provided
Sample Description	Brownish grey slightly sandy slightly gravelly silty clay
Sample Matrix	Clay
Moisture Content (%)	26
Stone content (%)	0

			Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
Solid Analysis						
Total Organic Carbon	%	MCERTS	2.0	3.0	5.0	6.0
Loss on Ignition	%	UKAS	7.2	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C_{10} to C_{40}) [EH_1D_Total]	mg/kg	u	164	500	-	-
PAH	mg/kg	u	0.4	100	-	-
pH	units	MCERTS	8.2	-	> 6	-
Eluate Analysis						
Arsenic	mg/kg	u	< 0.03	0.50	2	25
Barium	mg/kg	u	0.17	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	< 0.01	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	0.41	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.05	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.05	4	50	200
Chloride	mg/kg	u	29	800	15000	25000
Fluoride	mg/kg	u	3	10	150	500
Sulphate (as SO_4)	mg/kg	u	240	1000	20000	50000
Total Dissolved Solids	mg/kg	u	590	4000	60000	100000
Phenol Index	mg/kg	u	1.2	1	-	-
Dissolved Organic Carbon	mg/kg	u	22.0	500	800	1000

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Project Reference - Melton Road, Barrow-Upon-Soar

Certificate Of Analysis - WAC Suite

NC Reference	138294
Client Sample ID	SP02
Client Sample Location	SP02
Client Sample Type	ES2
Depth - Top (m)	0.30
Depth - Bottom (m)	0.30
Date of Sampling	01/02/2021
Time of Sampling	Not provided
Sample Description	Brownish grey slightly sandy slightly gravelly silty clay
Sample Matrix	Clay
Moisture Content (%)	27
Stone content (%)	0

			Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
Solid Analysis						
Total Organic Carbon	%	MCERTS	2.2	3.0	5.0	6.0
Loss on Ignition	%	UKAS	7.8	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C_{10} to C_{40}) [EH_1D_Total]	mg/kg	u	98	500	-	-
PAH	mg/kg	u	5.3	100	-	-
pH	units	MCERTS	8.4	-	> 6	-
Eluate Analysis						
Arsenic	mg/kg	u	< 0.03	0.50	2	25
Barium	mg/kg	u	0.09	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	0.01	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	0.29	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.05	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.05	4	50	200
Chloride	mg/kg	u	9	800	15000	25000
Fluoride	mg/kg	u	7	10	150	500
Sulphate (as SO_4)	mg/kg	u	290	1000	20000	50000
Total Dissolved Solids	mg/kg	u	470	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	55.0	500	800	1000

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Project Reference - Melton Road, Barrow-Upon-Soar

Certificate Of Analysis - WAC Suite

NC Reference	138299
Client Sample ID	SP04
Client Sample Location	SP04
Client Sample Type	ES3
Depth - Top (m)	0.30
Depth - Bottom (m)	0.30
Date of Sampling	01/02/2021
Time of Sampling	Not provided
Sample Description	Brownish grey slightly sandy slightly gravelly silty clay with rare brick fragments
Sample Matrix	Clay
Moisture Content (%)	22
Stone content (%)	17

			Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
Solid Analysis						
Total Organic Carbon	%	MCERTS	< 1.0	3.0	5.0	6.0
Loss on Ignition	%	UKAS	4.4	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C_{10} to C_{40}) [EH_1D_Total]	mg/kg	u	< 15	500	-	-
PAH	mg/kg	u	< 0.34	100	-	-
pH	units	MCERTS	8.9	-	> 6	-
Eluate Analysis						
Arsenic	mg/kg	u	< 0.03	0.50	2	25
Barium	mg/kg	u	0.09	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	< 0.01	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	0.06	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.05	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.05	4	50	200
Chloride	mg/kg	u	7	800	15000	25000
Fluoride	mg/kg	u	8	10	150	500
Sulphate (as SO_4)	mg/kg	u	120	1000	20000	50000
Total Dissolved Solids	mg/kg	u	300	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	69.0	500	800	1000

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Project Reference - Melton Road, Barrow-Upon-Soar

Sample Descriptions

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
138290	SP01	SP01	ES1	Brownish grey slightly sandy slightly gravelly silty clay	27	0.0	100
138291	SP01	SP01	ES2	Brownish grey slightly sandy slightly gravelly silty clay	26	2.3	100
138292	SP01	SP01	ES3	Brownish grey slightly sandy slightly gravelly silty clay	26	0.0	100
138293	SP02	SP02	ES1	Brownish grey slightly sandy slightly gravelly silty clay with rare brick fragments	19	37	100
138294	SP02	SP02	ES2	Brownish grey slightly sandy slightly gravelly silty clay	27	0.0	97
138295	SP03	SP03	ES1	Brownish grey slightly sandy slightly gravelly silty clay	28	5.9	72
138296	SP03	SP03	ES2	Brownish grey slightly sandy slightly gravelly silty clay	14	45	47
138297	SP04	SP04	ES1	Brownish grey slightly sandy slightly gravelly silty clay	19	0.0	71
138298	SP04	SP04	ES2	Brownish grey slightly sandy slightly gravelly silty clay	13	33	80
138299	SP04	SP04	ES3	Brownish grey slightly sandy slightly gravelly silty clay with rare brick fragments	22	17	65

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Analysis Methodologies

Matrix	Determinant	Sample condition for analysis	Test Method used
Soil	Metals	Air Dried	In house method statement - MS - CL - ICP metals
Soil	PAH	As Received	In house method statement - MS - CL - PAH (As received)
Soil	Phenols	As Received	In house method statement - MS - CL - Phenols by Skalar
Soil	Chromium (hexavalent)	As Received	In house method statement - MS - CL - Hexavalent Chromium by Skalar
Soil	Cyanide	As Received	In house method statement - MS - CL - Cyanide by Skalar
Soil	pH	As Received	In house method statement - MS - CL - pH in soils (using a 1:3 soil to water extraction)
Soil	SOM	Air Dried	In house method statement - MS - CL - TOC Eltra
Soil	Sulphate (w/s)	Oven Dried	In house method statement - MS - CL - Anions by Aquakem
Soil	CWG	As Received	In house method statements - MS - CL - EPH in soil and MS - CL - VPH
Soil	Asbestos	-	Fibre identification is in accordance with in house documented methods which are based on the procedure documented in the HSE Document HSG 248 "Asbestos: The analysts guide for sampling, analysis and clearance procedures"

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WAC Analysis Methodologies

Matrix	Determinant	Sample condition for analysis	Test Method used
Soil	TOC	Air Dried	In house method statement - MS - CL - TOC Eltra
Soil	LoI	Oven Dried	Testing was in accordance with BS 1377: Part 3: 1990 Clause 4. Determination of the mass loss on ignition. Some information required by BS1377: 2016: Part 1 has not been reported. This information is available on request.
Soil	BTEX	As Received	In house method statement - MS - CL - VOC and MBTEX
Soil	PCB	As Received	In house method statement - MS - CL - PCB
Soil	Mineral Oil	As Received	In house method statement - MS - CL - TPH (GC-FID)
Soil	PAH	As Received	In house method statement - MS - CL - PAH (As received)
Soil	pH	As Received	In house method statement - MS - CL - pH in soils (using a 1:3 soil to water extraction)
Eluate	Metals	Leached	In house method statement - MS - CL - ICP Waters
Eluate	Anions	Leached	In house method statement - MS - CL - Anions by Aquakem
Eluate	Phenol Index	Leached	In house method statement - MS - CL - Phenols (Skalar)
Eluate	DOC	Leached	In house method statement - MS - CL - DOC
Eluate	TDS	Leached	In house method statement - MS - CL - pH & Conductivity

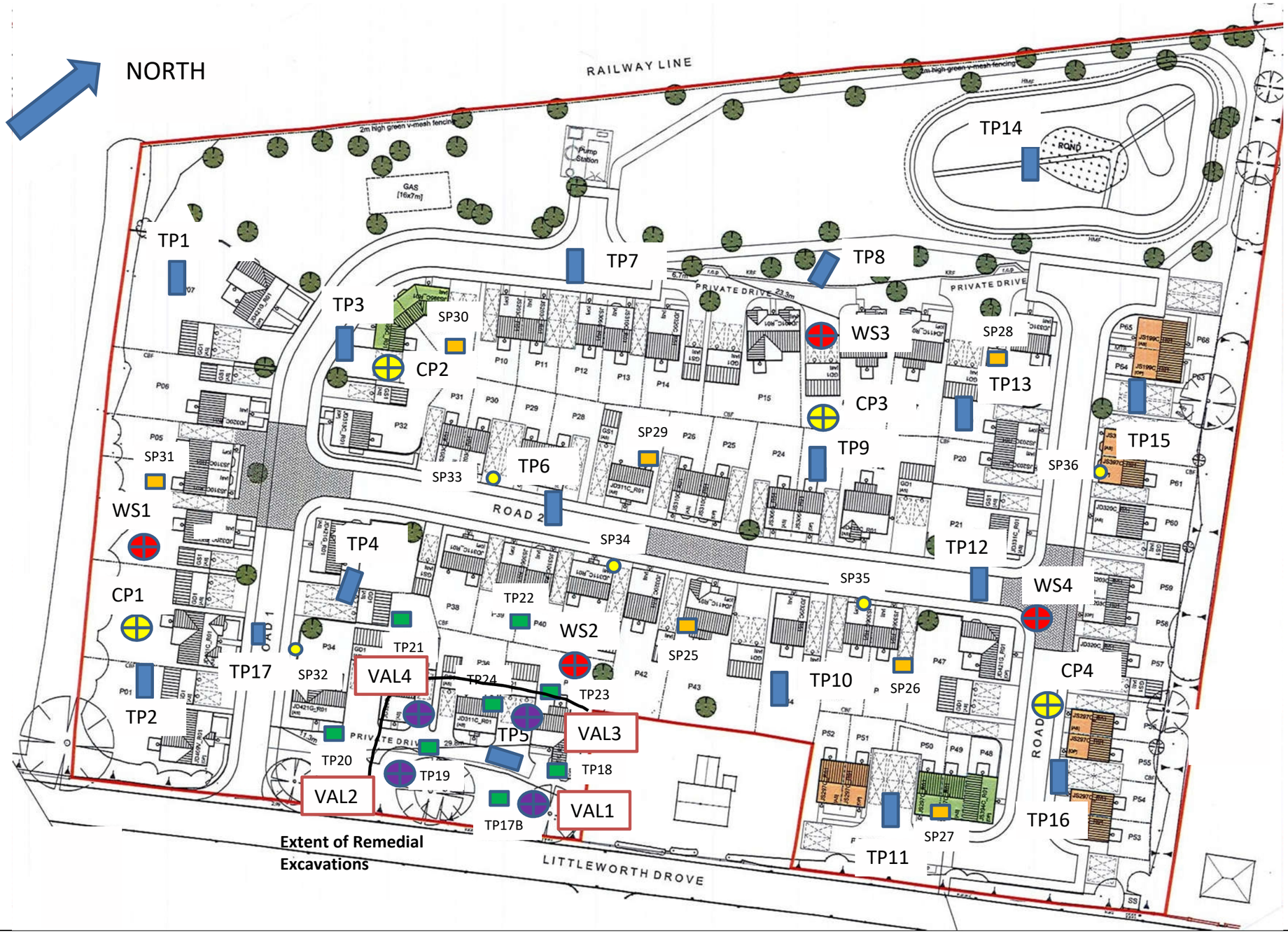
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HWOL TPH Acronym Index

Acronym	Description
HS	Headspace Analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics and Aromatics
AL	Aliphatics Only
AR	Aromatics Only
2D	GC-GC - Double Coil Gas Chromatography
#1	EH_Total but with humics extracted
2#	EH_Total but with fatty acids extracted
_	Operator - underscore to separate acronyms (except for +)
+	Operator to indicate cumlative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry



Key:

- Window Sample borehole with gas monitoring installation
- Cable Percussion borehole
- Trial Pit Location
- EHO planning condition trial pit Location
- Sulphate Investigation trial pit location
- Sample Location for imported fill Sulphate test Validation Sample Location

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Client:
Jelson Homes Limited

Project:
Land off Littleworth Drove, Deeping St Nicholas, Lincolnshire.

Title:
Plan showing extent of remediation.

Date:	Drawing No.
October 2020	G19102-IR/03