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Contaminated Land Phase One Desk Study & II Intrusive Investigation for proposed residential development at Land Off Chapel Street, Manchester, M19 3QB.

Prepared for

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Summary

This report consists of a phase one contaminated land desk study and Phase II Intrusive Investigation produced in support of a planning application for the redevelopment of the site to residential accommodation at 7-9 Chapel Street, Manchester, M19 3QB.

Following the site walkover and review of the available information it has been concluded that there is a slim chance of contamination existing on site from presumed made ground which requires either further investigation or mitigation measures to be taken to prevent any significant risk of significant harm to the identified receptors either and to ensure the site is safe and suitable for the intended use.

The report further recommends that a watching brief is maintained throughout the construction of the new dwellings and any signs of potential contamination found are fully investigated, with appropriate remedial action taken as necessary.

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Introduction

Martin Environmental Solutions has been commissioned, to carry out a phase one contaminated land desk study and Phase II Intrusive investigation in relation to a proposed residential development at 7-9 Chapel Street, Manchester, M19 3QB.

Aims and Objectives of the report

The aims and objectives of this report are as follows:

- Assess the likelihood of contamination affecting the site,
- Identify any likely receptors to be affected by the potential contamination,
- Identify the pathways by which the receptors will be exposed to any potential contamination,
- Identify any areas where further investigation will be required.

Scope of works

This report has been written in line with the 'BS 10175: 2011+A2: 2017 Investigation of potentially contaminated sites – Code of Practice' and Land Contamination Risk Management (LCRM).

The scope of this report covers the phase one desk study only. It will look at relevant information on: -

- the history of the site and surrounding area,
- the current use of the site and surrounding area,
- the geology and hydrogeology of the area,

A site walk-over survey has been undertaken in addition to consultations with the existing site owner, to identify any potential contamination issues.

Evaluation of the above information will be used to construct an initial conceptual model as appropriate, with the identification of any additional investigations that may be required.

An intrusive investigation of the site has been undertaken to determine the presence of any contamination and to advise on the any required remediation.

The Site:

Site Address: 7-9 Chapel Street, Manchester, M19 3QB.

Grid reference: 387486; 394216

An aerial photograph of the site is included in Figure 1.

Current Site use:

The site currently consists of an engineering works with buildings to each side of the site, to the rear and through the centre. Two yards are present between the buildings. The surrounding area is residential accommodation with Chapel Road to the front and south of the site. An alleyway runs around the rest of the perimeter.

Phase 1 – Desk Study Research

Details of Research

This report has been based on information gathered from a number of reputable sources, covering details:

- on the historic and current use of the site,
- any known waste disposal activities in the area,
- any regulated industrial activities within the vicinity of the site including recorded industrial accidents,
- on the geology, hydrogeology, hydrology of the area,
- identification of any environmentally sensitive sites,
- any natural hazards.

Principle sources of this information have been:

- environmental data from Groundsure Limited
- the Local Planning Authority,
- historic maps (Groundsure Ltd),
- site walk-over survey and discussion with the current owners.

Site History

Information on the historic uses of the site has been obtained from historic mapping information (Appendix 2), and environmental data from Groundsure Limited.

Mapping Year	Changes on Site	Changes off Site
1849	The site forms part of a larger field, a watercourse is shown running through across the site along the southern boundary.	The surrounding area is largely agricultural. A dye works is located ~200m to the northeast, with a reservoir beyond. A cotton mill is present to the southeast on the opposite side of the road, with a chapel and school opposite. A railway line is shown ~200m to the west, running north/south.
1892-93	A building has been erected in the centre of the site, identified as a “Mission Room”.	The area has been developed, the cotton mill is identified as a wire mattress works and carpet mill with a reservoir between them. A brick works is shown 450m to the east. Another railway line is present 500m south of the site this one running east-west. A tramline is present along Stockport Road 100m to the west. A pond is present to he southeast formed from the above identified “Fallowfield Brook”.
1905-11	The site has been redeveloped with a number of buildings present, the far western building identified as a smithy.	Further development in the area, with residential development expanding from Stockport road in the west in both directions. The Dye works are no long present, the site having been redeveloped to residential accommodation. The works opposite are now tools works. An electricity Substation is sown opposite at the “mill” site. The pond by the brook is shown with trees growing across it. Residential dwellings are present over the reservoir to the northeast.
1922-23	No change	More housing in the area. The “mill” site opposite has been expanded and now includes an engineering works and laundry.

1933-34	Slight change shown in the building configuration in the centre of the site.	No significant changes
1938	No change	No significant changes, the tramline is no longer present.
1956-58	The site is identified as an engineering works.	The carpet mill is no longer present, a saw-mill is shown on site, the reservoirs have been filled.
1968	No change	No significant changes
1981-87	The western side fo the site has been redeveloped into one large building.	The saw-mill site is now a church. The other industrial sites are identified as “works”
1991-95	No change	No significant changes
2001-03	No change	No significant changes
2010	No change	No significant changes
2023	No change	The mill site to the south has been redeveloped into housing.
Aerial photos	The building in the centre is partial demolished between 2013-16 linking the two sides of the site together.	The properties over the mill site to the south were built in 2019.

Regulatory Information

Relevant information obtained from the Groundsure report (Appendix 1) is summarised below.

Two permitted activities that has been identified within 500m of the site as defined in the Environmental Permitting (England and Wales) Regulations 2016 or previous legislation. |these are both historic permits, the first for a dry cleaners, 196m southwest and the second a cement batching process, 411m northeast.

No pollution incidents have been identified in the surrounding area located.

Two discharge consents are also reported. The first a historic discharge located 415m southeast into Fallowfield brook from the Joseph Holt development at Broom Lane, and the second sewer storm overflow at Victoria Road 492m west of the site. in April 1992se are all related to the same site at Hagg Lane Midland terrace for sewer storm water overflow located 240m northeast of the site.

The above identified sites are unlikely to impact on the development site.

No active landfill site records have been found in the area. A historic landfill is recorded 479m southeast of the site between 1974-79 accepting inert, industrial, commercial and household waste.

Two waste exemptions have been identified, both onsite and relating to the screening and blending of waste and use of waste in construction, no further details are held.

37 current potentially contaminative sites are identified in the area. Those within 250m of the site include:

The onsite tools engineering & welding works

A blacksmiths 39m northeast of the site on Cromwell Road, this is a shop.

Electrical sub-station located 46m southwest, 212m northwest

MOT Station 48m southwest of the site

A generic tank located 54m southeast of the site, there is no evidence of a tank and the area is a new housing estate, the tank if it exists is possibly linked to a SUDS system.

A vehicle repair and hire centre 55m west, 114m west, 118m southeast

A publisher 64m west & 220m south, 240msouthwest

Vehicle parts 87m, retail sales

A bakery 95m southwest

Unspecified works 110m southeast, 164m north, 179m, 185m southeast

Electrical equipment repairs 142m northeast

A window sales company 158m north

A phone shop 166m south

Railway station 179m southeast

Scrap metal merchants 181m east

Historical potentially contaminative land uses have been identified within 250m of the site from the purchased information; most of these have been identified from the historical mapping and include:

Works 16m southwest

Tool works 28m southeast

Cotton mill 31m southeast, 83m south

Sawmill 32m south

Railway station 149m west,

Railway buildings 176m & 224m west, along with sidings

Dye works 150m northeast

Geology and Hydrogeology

Information from the British Geology Survey 1:50,000 mapping identifies the bedrock in the area as Chester Pebble Beds Formation – Sandstone overlaid with Till, Devensian - Diamicton. Nearby boreholes confirm the presence of sandy clay.

The information obtained on the hydrogeology of the area identifies the site as having a Principal aquifer in the bedrock usually providing a high level of water storage and may support water supply/river base flow on a strategic scale, with a Secondary Undifferentiated aquifer in the superficial layer.

13 groundwater abstraction licenses have been identified, all of which are historical and the nearest 1086m northeast of the site. No surface water abstraction licenses are identified.

The site is not located within a Source Protection Zone.

The Groundwater vulnerability is described as low in all geological layers.

Hydrology

There are no nearby watercourses and the site is not within a floodplain, and the risk of surface and ground water flooding is considered to be high.

Environmental Sensitivity

The only Environmental sensitive site in the area is a Local Nature Reserve (LNR) located 613m southeast at Highfield Country Park. The development site is unlikely to impact on this LNR.

The property is in an area identified as having less than 1% of properties above the action level of 200 Becquerel's per cubic metre, based on specific property search. Radon protection measures are not required in line with BR211.

No additional natural hazards have been identified & the site has low/very low risk of shrink swell, running sand, and compressible ground.

There are no mining activities identified in the immediate area.

Site Walkover

A site walkover was undertaken on the 7th April 2023 and confirmed much of what had already been identified from the information obtained on the site. The photographs in Appendix 3 provide some indication of the current layout and condition of the site.

The site is accessed from Chapel Street to the south, running around the site on the other three sides and separating it from the adjacent residential properties is a cobbled alleyway.

The site spilt into different sections by the buildings currently present. To the west a a large two storey workshop, constructed with a solid concrete floor, brick walls with corrugated Cementous sheeting to the top half of the wall and the roof. The building contains offices, welfare facilities and an engineering workshop. No evidence of fuel or chemical storage was present at the time of the walkover and the site was still in use.

To the front of this building and running around to the eastern side is a concrete apron, gas cylinders were seen at the front and the yard to the east was also used for the storage of metal beams. The concrete was in a reasonable condition, but cracks were seen in places.

To the rear of this yard was a small single storey brick building , access was not available at the time but the building was being used for the storage. To the far east of this building on the flat roof was an old fuel tank.

Running along the centre of the site was an old dilapidated single storey brick building. Removed in the middle to allow access across the full site. What was left of the roof was slate. The building had a concrete floor.

To the east of this building was a further storage yard. Originally having a concrete base this has been significantly broken up in places and consists of mud and puddles along the main travel path through the site.

Finally on the far east of the site is another old single storey brick-built building with a slate roof and concrete base. A metal lean-to is located at the southern end. An old toilet block at the far northern end. The building contains metal cutting equipment.

Nearby Investigations

Research has identified that previous investigations have been undertaken for the redevelopment of sites in the vicinity of the proposed development. Most notably for the mill/engineering site located to the south of the development, which is now housing. Submitted as part of planning application 113618/FO/2016 & CDN/17/0092. A contaminated land site investigation report was provided undertaken by e3p in July 2016.

This report identified the presence of made ground on site and the presence of heavy metal, asbestos, Polyaromatic Hydrocarbons and Total petroleum hydrocarbon contamination which was later remediated as part of the development. Ground gas monitoring on site did not identify any ground gas and as such a site characteristic situation 1 / Green was identified.

Conclusions

Potential Contaminants

Following a review of the information gathered on the history of the site and the surrounding area and following the site walk-over survey there exists a potential for contaminants to be present on site from the current and historic use of the site. Based on the surrounding land use and recent development there are no off-site sources that are considered likely to represent a significant risk of significant harm to the proposed development.

On site there exists a potential for made ground to be present below the concrete apron and given the current and historic use a potential for heavy metal, total petroleum hydrocarbon and polyaromatic hydrocarbons to be present. The age of the buildings on site, industrial nature and the Cementous material identified during the walkover indicates a potential for asbestos contamination to be present.

Receptors and Pathways

Potential receptors which may be affected by any unknown contamination on site will include:

- Construction workers who are likely to be affected by any potential contamination as they will initially be working in the ground and are likely to be the ones who unearth any potential contaminants.
- Future users of the site, including residents, staff and visitors to the site. For the purpose of evaluating any effects from any contamination found during any intrusive investigation future users/visitors to the site should be regarded as the 0-6-year-old female child.
- Any building on site e.g., foundations which may be attacked by any contaminants in the ground or services.
- The underlying groundwater which may be contaminated by migrating pollutants present on the site. There is also the potential for further pollution of the groundwater or the watercourse from disturbing any potential contaminants on site.

The pathways by which these receptors may be exposed to any unforeseen potential contamination will include:

Construction workers

- Inhalation, of gases or vapours released during ground work or fine particles.
- Ingestion of the contaminants, principally from cross contamination with contaminated soil and inadequate hand washing before smoking and eating.
- Absorption through the skin following contact with contaminated soil.

Future users and visitors

- Inhalations of gas/vapours or fibres, particularly if these are allowed to enter the new structures through the ground and build up in an enclosed area.
- Ingestion of contaminants, through the ingestion of contaminated soil from the garden area via direct contact, e.g., playing in the garden.
- Absorption of contaminants from dermal contact with contaminated soil.

Buildings

Contaminants on site have the potential to affect the foundations to the new building or the services supplying it.

Watercourses

As discussed above, if they exist on site, there is a potential for any contaminants to migrate through the ground into the groundwater and aquifer or via run-off into the watercourse.

Neighbouring sites

If present on site contaminates have the potential to migrate to neighbouring sites through ground water or air blown transfer.

Conceptual Model

The table represents a basic conceptual model. It highlights the potential sources of pollutants identified from the gathered information, and potential pathways in which any contaminants could reach the identified receptors.

Pathway	Description	Identified sources	Receptor at risk	Likelihood
1	Run off and seepage into groundwater from any spillages	Made ground, site use as an engineering works	Watercourse/ Environment	Medium
2	Migration of gases into the building.	Nearby infilled ground	Future users	Low,
3	Inhalation of gases/ vapours outside	Nearby infilled ground	Construction workers/future users	Low
4	Inhalation of fine particles	Made ground, historic & current site use, cementous sheeting	Construction workers/future users	Medium
5	Direct ingestion of contaminated soil	Made ground, historic & current site use	Construction workers	Medium
6	In-direct ingestion of contaminated soil	Made ground, historic & current site use	Future users	Medium
7	Absorption via direct dermal contact with contaminated soil	Made ground, historic & current site use	Construction workers/future users	Medium

Recommendations from Phase I

As a result of the investigation into the historical use of the site and surrounding area the site has been identified being potentially affected by contamination from historic and current site uses and as such a further intrusive investigation is recommended.

It is further recommended that a watching brief is maintained throughout the construction of the new building and any signs of potential contamination found are fully investigated, with appropriate remedial action taken as necessary and the local planning authority informed of the findings.

Phase II Intrusive Investigation

Following the outcome of the phase I Desk Study a Phase II intrusive investigation was undertaken on site on the 7th April 2023. The site was still in use at the time of the investigation, limiting the ability to sample inside buildings .

A total of eight trial pits were dug on site, the locations of these are shown on the plan in Figure 2. Two samples were taken from trail pits 1-5 & 7 and one from trail pit 6 & 8. The shallow sample from approx. 300mm bgl and the deeper one at 600mm bgl.

The samples were sent to Chemtech environmental a UKAS and MCERTs laboratory and each analysed for heavy metals, Total Petroleum Hydrocarbons and Polyaromatic Hydrocarbons, and Asbestos.

Details of each trail pit, including photographs are shown in Appendix 4.

A layer of concrete was found at the surface for all trail pit apart from

Trail pit one, adjacent to the main building to the rear of the site had a 100mm concrete apron at the surface followed by made ground of stone, sand, and gravel to 600mm, below which irm stiff sandy clay was identified and the water table reached at 850mm.

Trail pit 2, had a similar concrete apron below which sandy, gravel was encountered to 600mm where a clay layer was found.

Trail pit 3, a similar concrete apron, sand, and gravel with clay at 600mm

Trail pit 5 located in the centre left of the eastern yard, immediately below a layer of asphalt cobbles were found with smaller stone down to 220mm gravel, sand and sandstone was found down to 600mm bgl

Trail pit 6 located at the front corner of the main building had a 100mm layer of concrete followed by gravel, sand and stone and a strong odour of diesel. At 300mm a further concrete layer was uncovered. This was left to avoid further contamination below the layer.

Trail pit 7 located tot eh front of the main building in the southwest corner of the site. The surface consisted of broken concrete/stone, with sandy loam, gravel in the shallow layer. A further concrete base was uncovered at 400-450mm with sandy clay found below this.

Trail pit 8 was located inside the main warehouse building to the west, below the layer of concrete made ground consisting of stone, bricks, and cobbles.

Results

The full sampling results are contained within Appendix 4, and the sampling locations in Figure 2. The sampling locations were chosen to represent the garden amenity areas of the development. The results were compared against the LQM/CIEH S4UL's for residential with homegrown produce scenario & the C4SL value for Lead. Soil organic matter ranged across the site ranged from 1.5-18, a figure of 1% has been used within the analysis as the most conservative figure available.

Details of each trail pit, including photographs are shown in Appendix 5.

Elevated levels of Polyaromatic Hydrocarbons were identified in TP 1b, 3a, 5a & 6a, along with elevated levels of Total petroleum hydrocarbons in TP6a (strong diesel odour identified). Heavy metal contaminated of lead was also encountered in TP1b, 3a, 5b, 6a, & 8a, along with arsenic in 5b and 8a. Asbestos fibres from lagging were also identified in TP1b, & 6a.

The JIWG Asbestos Risk Assessment tool has been used and identified a medium risk from the identified asbestos fibres, given the current location on site and the proposed development. This risk falls to very low if a suitable 600mm capping layer is consider within Stage 3 of the assessment.

Conclusions and Recommendations from The Phase II Intrusive Investigation

Contaminants which have a potential to resulting significant harm of future occupants of the site have been identified at various locations and within proposed garden amenity areas. The source of these contaminants is likely to be the historical use of the site.

As a result further works are required to ensure the site will be safe for the intended use as residential accommodation.

The site contains a number of buildings with additional made ground and foundations identified across it. These will need to be grubbed out prior to the commencement of building works. It is recommended that as part of this work areas of identified contamination are removed, including the Polyaromatic Hydrocarbons and Total Petroleum Hydrocarbon contamination

identified in Trail pits 1b, 3a, 5a and 6a, with further validation of the removal undertaken. This will also remove the heavy metal and asbestos contamination in these areas. Trail pit 8a also contained heavy metal contamination and this should also be removed. A clean cover system of 600mm in all garden amenity areas and 450mm in landscaped areas is then recommended.

Figure 1 – Aerial Photograph

Figure 2 – Intrusive Investigation Trail Pits Locations

Lawn
Unit 4
Bins
Permeable Paving
Unit 3
Lawn
Bins
Permeable Paving
Low level planting
Bins
Lawn
Unit 2
Permeable Paving
Low level planting
Lawn
Unit 1
Bins
Permeable Paving
R6.0m
Bins
Permeable Paving
Unit 5
Lawn
Permeable Paving
Unit 6
Lawn
Bins
Bins
Permeable Paving
Unit 7
Lawn
Bins
Permeable Paving
Unit 8
Lawn

Appendix 1 – Groundsure Data

Appendix 2 – Historical Mapping

Appendix 3 – Site Walkover Photographs

The alleyway around the site, eastern boundary looking north.

Northern boundary looking west.

Eastern boundary looking north.

Southern boundary of the site

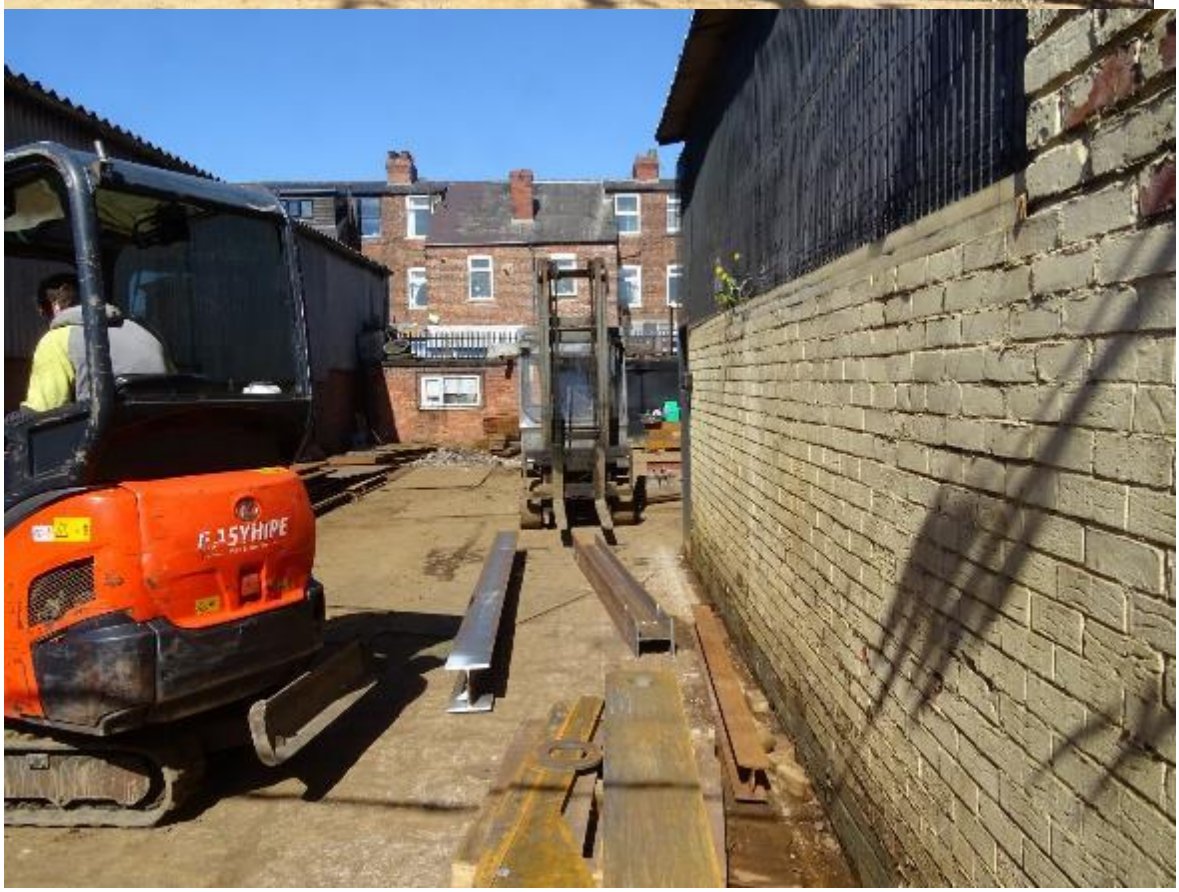
Nearby public open space (historic watercourse/pond)

The building to the East of the site

The eastern yard

The building to the north of the site

The building to the west of the site and western yard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EMPTY

Appendix 4 – Intrusive Investigation Soil Sample results.

Lab number			121585-1	121585-2	121585-3	121585-4	121585-5	121585-6	121585-7	121585-8	121585-9	121585-10	121585-11	121585-12	121585-13	121585-14
Sample id			1	1b	2a	2b	3a	3b	3a	4b	5a	5b	6a	7a	7b	8a
Depth (m)			0.30	0.60	0.30	0.60	0.30	0.60	0.30	0.60	0.30	0.60	0.30	0.30	0.60	0.60
Date sampled			07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023
Test	**Method**	**Units**														
Total Organic Carbon (TOC)	CE197	% w/w C	0.9	6.8	3.3	1.3	10.4	4.0	3.2	5.8	1.2	8.1	4.8	4.3	1.4	17.5
Estimate of OMC (calculated from TOC)	CE197	% w/w	1.5	11.8	5.7	2.2	18.0	6.8	5.6	10.0	2.1	14.0	8.3	7.4	2.3	30.1
PAH																
Naphthalene	CE087 M	mg/kg	<0.02	0.31	0.03	<0.02	0.10	<0.02	0.02	0.08	0.59	<0.02	7.23	<0.02	<0.02	0.09
Acenaphthylene	CE087 M	mg/kg	<0.02	0.82	0.03	<0.02	0.05	<0.02	<0.02	0.09	0.07	<0.02	6.28	0.02	<0.02	0.03
Acenaphthene	CE087 M	mg/kg	<0.02	0.46	0.04	<0.02	0.30	<0.02	0.03	0.40	0.93	<0.02	7.18	<0.02	<0.02	0.05
Fluorene	CE087 U	mg/kg	<0.02	0.37	0.03	<0.02	0.18	<0.02	<0.02	0.46	0.66	<0.02	13.09	<0.02	<0.02	0.04
Phenanthrene	CE087 M	mg/kg	0.06	7.02	0.47	<0.02	2.82	0.09	0.16	0.36	6.80	0.02	66.18	0.10	0.06	0.46
Anthracene	CE087 U	mg/kg	0.02	2.63	0.14	<0.02	0.69	<0.02	0.04	0.11	2.09	0.03	22.73	0.05	<0.02	0.10
Fluoranthene	CE087 M	mg/kg	0.11	9.23	1.13	<0.02	4.65	0.13	0.22	0.37	10.15	<0.02	89.37	0.21	0.04	0.67
Pyrene	CE087 M	mg/kg	0.11	8.19	1.15	<0.02	4.61	0.14	0.23	0.39	11.20	<0.02	83.77	0.21	0.04	0.70
Benzo(a)anthracene	CE087 U	mg/kg	0.05	4.68	0.61	<0.02	1.60	0.08	0.12	0.21	4.98	<0.02	30.92	0.14	0.02	0.34
Chrysene	CE087 M	mg/kg	0.05	4.88	0.62	<0.03	1.91	0.07	0.13	0.24	4.64	<0.03	33.37	0.15	<0.03	0.41
Benzo(b)fluoranthene	CE087 M	mg/kg	0.11	8.41	0.67	<0.02	2.58	0.09	0.14	0.25	6.16	<0.02	31.81	0.21	0.03	0.41
Benzo(k)fluoranthene	CE087 M	mg/kg	0.04	3.47	0.24	<0.03	1.00	0.03	0.05	0.11	2.31	<0.03	13.14	0.07	<0.03	0.14
Benzo(a)pyrene	CE087 U	mg/kg	0.07	7.86	0.62	<0.02	2.41	0.08	0.12	0.22	6.03	<0.02	33.94	0.18	<0.02	0.37
Indeno(123cd)pyrene	CE087 M	mg/kg	0.08	6.48	0.37	<0.02	1.73	<0.02	<0.02	0.05	4.26	<0.02	25.30	0.18	<0.02	0.21
Dibenz(ah)anthracene	CE087 M	mg/kg	<0.02	1.34	0.03	<0.02	0.33	<0.02	<0.02	<0.02	0.82	<0.02	6.07	<0.02	<0.02	<0.02
Benzo(ghi)perylene	CE087 M	mg/kg	0.12	6.25	0.31	<0.02	1.65	<0.02	<0.02	0.06	4.05	<0.02	22.86	0.28	<0.02	0.24
PAH (total of USEPA 16)	CE087	mg/kg	0.81	72.4	6.49	<0.34	26.6	0.71	1.26	3.39	65.7	<0.34	493	1.79	<0.34	4.25

Depth (m)			0.30	0.60	0.30	0.60	0.30	0.60	0.30	0.60	0.30	0.60	0.30	0.30	0.60	0.60
Date sampled			07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023
Test	**Method**	**Units**														
Total Organic Carbon (TOC)	CE197	% w/w C	0.9	6.8	3.3	1.3	10.4	4.0	3.2	5.8	1.2	8.1	4.8	4.3	1.4	17.5
Estimate of OMC (calculated from TOC)	CE197	% w/w	1.5	11.8	5.7	2.2	18.0	6.8	5.6	10.0	2.1	14.0	8.3	7.4	2.3	30.1
TPH																
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
EPH Aromatic (>EC10-EC12)	CE250	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	92	<10	<10	<10
EPH Aromatic (>EC12-EC16)	CE250	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	326	<10	<10	<10
EPH Aromatic (>EC16-EC21)	CE250	mg/kg	<1	<1	<1	<1	14	<1	<1	<1	147	<1	1445	<1	<1	96
EPH Aromatic (>EC21-EC35)	CE250	mg/kg	52	<1	<1	<1	40	<1	<1	<1	397	<1	3195	25	<1	697
EPH Aromatic (>EC35-EC44)	CE250	mg/kg	50	<1	<1	<1	11	<1	<1	<1	114	<1	823	12	<1	332
VPH Aliphatic (>C5-C6)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
VPH Aliphatic (>C6-C8)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
VPH Aliphatic (>C8-C10)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
EPH Aliphatic (>C10-C12)	CE250	mg/kg	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	72	<6	<6	<6
EPH Aliphatic (>C12-C16)	CE250	mg/kg	<6	11	<6	<6	<6	<6	<6	<6	<6	<6	153	<6	<6	10
EPH Aliphatic (>C16-C35)	CE250	mg/kg	89	<15	<15	<15	<15	<15	106	<15	186	<15	5970	27	<15	1083
EPH Aliphatic (>C35-C44)	CE250	mg/kg	21	<10	<10	<10	<10	<10	<10	<10	27	<10	1024	<10	<10	40

Lab number			121585-1	121585-2	121585-3	121585-4	121585-5	121585-6	121585-7	121585-8	121585-9	121585-10	121585-11	121585-12	121585-13	121585-14
Sample id			1	1b	2a	2b	3a	3b	3a	4b	5a	5b	6a	7a	7b	8a
Depth (m)			0.30	0.60	0.30	0.60	0.30	0.60	0.30	0.60	0.30	0.60	0.30	0.30	0.60	0.60
Date sampled			07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023
Test	**Method**	**Units**														
Total Organic Carbon (TOC)	CE197	% w/w C	0.9	6.8	3.3	1.3	10.4	4.0	3.2	5.8	1.2	8.1	4.8	4.3	1.4	17.5
Estimate of OMC (calculated from TOC)	CE197	% w/w	1.5	11.8	5.7	2.2	18.0	6.8	5.6	10.0	2.1	14.0	8.3	7.4	2.3	30.1
Subcontracted analysis																
Asbestos (qualitative)	$	-	NAD	Chrysotile	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	Chrysotile	NAD	NAD	NAD
Arsenic	$ M	mg/kg	3.5	18	13	12	23	16	12	9.4	9.1	55	16	7.9	6.7	98
Cadmium	$ M	mg/kg	< 0.2	3.1	0.3	< 0.2	0.4	< 0.2	< 0.2	< 0.2	< 0.2	0.6	4.0	0.5	< 0.2	1.5
Chromium	$ M	mg/kg	30	42	31	30	32	30	27	26	32	68	71	66	29	57
Copper	$ M	mg/kg	16	294	91	23	108	35	34	29	31	243	157	82	25	619
Lead	$ M	mg/kg	27	935	125	41	204	96	70	55	33	331	222	133	21	1170
Mercury	$ M	mg/kg	0.1	2.9	0.4	< 0.1	0.2	0.2	0.1	0.3	0.5	0.3	0.7	0.1	< 0.1	3.1
Nickel	$ M	mg/kg	17	75	32	17	83	22	24	19	22	83	59	42	30	97
Selenium	$ M	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	$ M	mg/kg	86	608	135	89	167	65	49	49	52	210	412	109	59	551
Form of Asbestos	$	-	-	Lagging	-	-	-	-	-	-	-	-	Lagging	-	-	-
Asbestos (quantitative)	$	% w/w	-	0.173	-	-	-	-	-	-	-	-	0.337	-	-	-

ANALYTICAL TEST REPORT

Contract no:	121585
Contract name:	Standard Soil Suite
Client reference:	Chapel St
Clients name:	Martin Environmental Solutions
Clients address:	14 Hermitage Way Lytham St Annes FY8 4FX
Samples received:	14 April 2023
Analysis started:	14 April 2023
Analysis completed:	21 April 2023
Report issued:	21 April 2023

Key

U	UKAS accredited test
M	MCERTS & UKAS accredited test
$	Test carried out by an approved subcontractor
I/S	Insufficient sample to carry out test
N/S	Sample not suitable for testing
NAD	No Asbestos Detected

Approved by:

Abbie Neasham-Bourn
Senior Reporting Administrator

Unit 6 Parkhead, Greencroft Industrial Park, Stanley, County Durham, DH9 7YB
Tel 01207 528578 Email customerservices@chemtech-env.co.uk
Vat Reg No. 772 5703 18 Registered in England number 4284013

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SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Lab ref	Sample id	Depth (m)	Sample description	Material removed	% Removed	% Moisture
121585-1	1	0.30	Sand with Gravel	-	-	12.0
121585-2	1b	0.60	Sandy Loam with Gravel	-	-	19.7
121585-3	2a	0.30	Loamy Clay with Gravel	-	-	15.8
121585-4	2b	0.60	Sandy Clay	-	-	22.5
121585-5	3a	0.30	Sandy Loam with Gravel	-	-	20.2
121585-6	3b	0.60	Sandy Clay with Gravel	-	-	25.5
121585-7	3a	0.30	Sandy Loamy Clay with Gravel	-	-	18.8
121585-8	4b	0.60	Sandy Loamy Clay with Gravel	-	-	15.6
121585-9	5a	0.30	Sandy Clay with Gravel	-	-	17.8
121585-10	5b	0.60	Sandy Loam with Gravel	-	-	14.4
121585-11	6a	0.30	Sandy Loam with Gravel	-	-	9.7
121585-12	7a	0.30	Sandy Loam with Gravel	-	-	8.6
121585-13	7b	0.60	Sandy Clay	-	-	12.5
121585-14	8a	0.60	Sandy Loam with Gravel	-	-	20.3

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SOILS

Lab number			121585-1	121585-2	121585-3	121585-4	121585-5	121585-6
Sample id			1	1b	2a	2b	3a	3b
Depth (m)			0.30	0.60	0.30	0.60	0.30	0.60
Date sampled			07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023
Test	**Method**	**Units**						
Total Organic Carbon (TOC)	CE197	% w/w C	0.9	6.8	3.3	1.3	10.4	4.0
Estimate of OMC (calculated from TOC)	CE197	% w/w	1.5	11.8	5.7	2.2	18.0	6.8
PAH								
Naphthalene	CE087 M	mg/kg	<0.02	0.31	0.03	<0.02	0.10	<0.02
Acenaphthylene	CE087 M	mg/kg	<0.02	0.82	0.03	<0.02	0.05	<0.02
Acenaphthene	CE087 M	mg/kg	<0.02	0.46	0.04	<0.02	0.30	<0.02
Fluorene	CE087 U	mg/kg	<0.02	0.37	0.03	<0.02	0.18	<0.02
Phenanthrene	CE087 M	mg/kg	0.06	7.02	0.47	<0.02	2.82	0.09
Anthracene	CE087 U	mg/kg	0.02	2.63	0.14	<0.02	0.69	<0.02
Fluoranthene	CE087 M	mg/kg	0.11	9.23	1.13	<0.02	4.65	0.13
Pyrene	CE087 M	mg/kg	0.11	8.19	1.15	<0.02	4.61	0.14
Benzo(a)anthracene	CE087 U	mg/kg	0.05	4.68	0.61	<0.02	1.60	0.08
Chrysene	CE087 M	mg/kg	0.05	4.88	0.62	<0.03	1.91	0.07
Benzo(b)fluoranthene	CE087 M	mg/kg	0.11	8.41	0.67	<0.02	2.58	0.09
Benzo(k)fluoranthene	CE087 M	mg/kg	0.04	3.47	0.24	<0.03	1.00	0.03
Benzo(a)pyrene	CE087 U	mg/kg	0.07	7.86	0.62	<0.02	2.41	0.08
Indeno(123cd)pyrene	CE087 M	mg/kg	0.08	6.48	0.37	<0.02	1.73	<0.02
Dibenz(ah)anthracene	CE087 M	mg/kg	<0.02	1.34	0.03	<0.02	0.33	<0.02
Benzo(ghi)perylene	CE087 M	mg/kg	0.12	6.25	0.31	<0.02	1.65	<0.02
PAH (total of USEPA 16)	CE087	mg/kg	0.81	72.4	6.49	<0.34	26.6	0.71
TPH								
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
EPH Aromatic (>EC10-EC12)	CE250	mg/kg	<10	<10	<10	<10	<10	<10
EPH Aromatic (>EC12-EC16)	CE250	mg/kg	<10	<10	<10	<10	<10	<10
EPH Aromatic (>EC16-EC21)	CE250	mg/kg	<1	<1	<1	<1	14	<1
EPH Aromatic (>EC21-EC35)	CE250	mg/kg	52	<1	<1	<1	40	<1
EPH Aromatic (>EC35-EC44)	CE250	mg/kg	50	<1	<1	<1	11	<1
VPH Aliphatic (>C5-C6)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
VPH Aliphatic (>C6-C8)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
VPH Aliphatic (>C8-C10)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
EPH Aliphatic (>C10-C12)	CE250	mg/kg	<6	<6	<6	<6	<6	<6
EPH Aliphatic (>C12-C16)	CE250	mg/kg	<6	11	<6	<6	<6	<6
EPH Aliphatic (>C16-C35)	CE250	mg/kg	89	<15	<15	<15	<15	<15
EPH Aliphatic (>C35-C44)	CE250	mg/kg	21	<10	<10	<10	<10	<10
Subcontracted analysis								
Asbestos (qualitative)	$	-	NAD	Chrysotile	NAD	NAD	NAD	NAD
Arsenic	$ M	mg/kg	3.5	18	13	12	23	16
Cadmium	$ M	mg/kg	< 0.2	3.1	0.3	< 0.2	0.4	< 0.2
Chromium	$ M	mg/kg	30	42	31	30	32	30

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SOILS

Lab number			121585-1	121585-2	121585-3	121585-4	121585-5	121585-6
Sample id			1	1b	2a	2b	3a	3b
Depth (m)			0.30	0.60	0.30	0.60	0.30	0.60
Date sampled			07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023
Test	**Method**	**Units**						
Copper	$ M	mg/kg	16	294	91	23	108	35
Lead	$ M	mg/kg	27	935	125	41	204	96
Mercury	$ M	mg/kg	0.1	2.9	0.4	< 0.1	0.2	0.2
Nickel	$ M	mg/kg	17	75	32	17	83	22
Selenium	$ M	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	$ M	mg/kg	86	608	135	89	167	65
Form of Asbestos	$	-	-	Lagging	-	-	-	-
Asbestos (quantitative)	$	% w/w	-	0.173	-	-	-	-

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SOILS

Lab number			121585-7	121585-8	121585-9	121585-10	121585-11	121585-12
Sample id			3a	4b	5a	5b	6a	7a
Depth (m)			0.30	0.60	0.30	0.60	0.30	0.30
Date sampled			07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023
Test	**Method**	**Units**						
Total Organic Carbon (TOC)	CE197	% w/w C	3.2	5.8	1.2	8.1	4.8	4.3
Estimate of OMC (calculated from TOC)	CE197	% w/w	5.6	10.0	2.1	14.0	8.3	7.4
PAH								
Naphthalene	CE087 M	mg/kg	0.02	0.08	0.59	<0.02	7.23	<0.02
Acenaphthylene	CE087 M	mg/kg	<0.02	0.09	0.07	<0.02	6.28	0.02
Acenaphthene	CE087 M	mg/kg	0.03	0.40	0.93	<0.02	7.18	<0.02
Fluorene	CE087 U	mg/kg	<0.02	0.46	0.66	<0.02	13.09	<0.02
Phenanthrene	CE087 M	mg/kg	0.16	0.36	6.80	0.02	66.18	0.10
Anthracene	CE087 U	mg/kg	0.04	0.11	2.09	0.03	22.73	0.05
Fluoranthene	CE087 M	mg/kg	0.22	0.37	10.15	<0.02	89.37	0.21
Pyrene	CE087 M	mg/kg	0.23	0.39	11.20	<0.02	83.77	0.21
Benzo(a)anthracene	CE087 U	mg/kg	0.12	0.21	4.98	<0.02	30.92	0.14
Chrysene	CE087 M	mg/kg	0.13	0.24	4.64	<0.03	33.37	0.15
Benzo(b)fluoranthene	CE087 M	mg/kg	0.14	0.25	6.16	<0.02	31.81	0.21
Benzo(k)fluoranthene	CE087 M	mg/kg	0.05	0.11	2.31	<0.03	13.14	0.07
Benzo(a)pyrene	CE087 U	mg/kg	0.12	0.22	6.03	<0.02	33.94	0.18
Indeno(123cd)pyrene	CE087 M	mg/kg	<0.02	0.05	4.26	<0.02	25.30	0.18
Dibenz(ah)anthracene	CE087 M	mg/kg	<0.02	<0.02	0.82	<0.02	6.07	<0.02
Benzo(ghi)perylene	CE087 M	mg/kg	<0.02	0.06	4.05	<0.02	22.86	0.28
PAH (total of USEPA 16)	CE087	mg/kg	1.26	3.39	65.7	<0.34	493	1.79
TPH								
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
EPH Aromatic (>EC10-EC12)	CE250	mg/kg	<10	<10	<10	<10	92	<10
EPH Aromatic (>EC12-EC16)	CE250	mg/kg	<10	<10	<10	<10	326	<10
EPH Aromatic (>EC16-EC21)	CE250	mg/kg	<1	<1	147	<1	1445	<1
EPH Aromatic (>EC21-EC35)	CE250	mg/kg	<1	<1	397	<1	3195	25
EPH Aromatic (>EC35-EC44)	CE250	mg/kg	<1	<1	114	<1	823	12
VPH Aliphatic (>C5-C6)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
VPH Aliphatic (>C6-C8)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
VPH Aliphatic (>C8-C10)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
EPH Aliphatic (>C10-C12)	CE250	mg/kg	<6	<6	<6	<6	72	<6
EPH Aliphatic (>C12-C16)	CE250	mg/kg	<6	<6	<6	<6	153	<6
EPH Aliphatic (>C16-C35)	CE250	mg/kg	106	<15	186	<15	5970	27
EPH Aliphatic (>C35-C44)	CE250	mg/kg	<10	<10	27	<10	1024	<10
Subcontracted analysis								
Asbestos (qualitative)	$	-	NAD	NAD	NAD	NAD	Chrysotile	NAD
Arsenic	$ M	mg/kg	12	9.4	9.1	55	16	7.9
Cadmium	$ M	mg/kg	< 0.2	< 0.2	< 0.2	0.6	4.0	0.5
Chromium	$ M	mg/kg	27	26	32	68	71	66

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SOILS

Lab number			121585-7	121585-8	121585-9	121585-10	121585-11	121585-12
Sample id			3a	4b	5a	5b	6a	7a
Depth (m)			0.30	0.60	0.30	0.60	0.30	0.30
Date sampled			07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023
Test	**Method**	**Units**						
Copper	$ ᴹ	mg/kg	34	29	31	243	157	82
Lead	$ ᴹ	mg/kg	70	55	33	331	222	133
Mercury	$ ᴹ	mg/kg	0.1	0.3	0.5	0.3	0.7	0.1
Nickel	$ ᴹ	mg/kg	24	19	22	83	59	42
Selenium	$ ᴹ	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	$ ᴹ	mg/kg	49	49	52	210	412	109
Form of Asbestos	$	-	-	-	-	-	Lagging	-
Asbestos (quantitative)	$	% w/w	-	-	-	-	0.337	-

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SOILS

Lab number			121585-13	121585-14
Sample id			7b	8a
Depth (m)			0.60	0.60
Date sampled			07/04/2023	07/04/2023
Test	**Method**	**Units**		
Total Organic Carbon (TOC)	CE197	% w/w C	1.4	17.5
Estimate of OMC (calculated from TOC)	CE197	% w/w	2.3	30.1
PAH				
Naphthalene	CE087 M	mg/kg	<0.02	0.09
Acenaphthylene	CE087 M	mg/kg	<0.02	0.03
Acenaphthene	CE087 M	mg/kg	<0.02	0.05
Fluorene	CE087 U	mg/kg	<0.02	0.04
Phenanthrene	CE087 M	mg/kg	0.06	0.46
Anthracene	CE087 U	mg/kg	<0.02	0.10
Fluoranthene	CE087 M	mg/kg	0.04	0.67
Pyrene	CE087 M	mg/kg	0.04	0.70
Benzo(a)anthracene	CE087 U	mg/kg	0.02	0.34
Chrysene	CE087 M	mg/kg	<0.03	0.41
Benzo(b)fluoranthene	CE087 M	mg/kg	0.03	0.41
Benzo(k)fluoranthene	CE087 M	mg/kg	<0.03	0.14
Benzo(a)pyrene	CE087 U	mg/kg	<0.02	0.37
Indeno(123cd)pyrene	CE087 M	mg/kg	<0.02	0.21
Dibenz(ah)anthracene	CE087 M	mg/kg	<0.02	<0.02
Benzo(ghi)perylene	CE087 M	mg/kg	<0.02	0.24
PAH (total of USEPA 16)	CE087	mg/kg	<0.34	4.25
TPH				
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	<0.01	<0.01
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	<0.01	<0.01
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	<0.01	<0.01
EPH Aromatic (>EC10-EC12)	CE250	mg/kg	<10	<10
EPH Aromatic (>EC12-EC16)	CE250	mg/kg	<10	<10
EPH Aromatic (>EC16-EC21)	CE250	mg/kg	<1	96
EPH Aromatic (>EC21-EC35)	CE250	mg/kg	<1	697
EPH Aromatic (>EC35-EC44)	CE250	mg/kg	<1	332
VPH Aliphatic (>C5-C6)	CE067	mg/kg	<0.1	<0.1
VPH Aliphatic (>C6-C8)	CE067	mg/kg	<0.1	<0.1
VPH Aliphatic (>C8-C10)	CE067	mg/kg	<0.1	<0.1
EPH Aliphatic (>C10-C12)	CE250	mg/kg	<6	<6
EPH Aliphatic (>C12-C16)	CE250	mg/kg	<6	10
EPH Aliphatic (>C16-C35)	CE250	mg/kg	<15	1083
EPH Aliphatic (>C35-C44)	CE250	mg/kg	<10	40
Subcontracted analysis				
Asbestos (qualitative)	$	-	NAD	NAD
Arsenic	$ M	mg/kg	6.7	98
Cadmium	$ M	mg/kg	< 0.2	1.5
Chromium	$ M	mg/kg	29	57

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SOILS

Lab number			121585-13	121585-14
Sample id			7b	8a
Depth (m)			0.60	0.60
Date sampled			07/04/2023	07/04/2023
Test	**Method**	**Units**		
Copper	$ ^M	mg/kg	25	619
Lead	$ ^M	mg/kg	21	1170
Mercury	$ ^M	mg/kg	< 0.1	3.1
Nickel	$ ^M	mg/kg	30	97
Selenium	$ ^M	mg/kg	< 1.0	< 1.0
Zinc	$ ^M	mg/kg	59	551
Form of Asbestos	$	-	-	-
Asbestos (quantitative)	$	% w/w	-	-

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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
CE197	Estimate of OMC (calculated from TOC)	Calculation from Total Organic Carbon	Dry		0.1	% w/w
CE087	Naphthalene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Fluorene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Phenanthrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(a)anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Chrysene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(b)fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(k)fluoranthene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(a)pyrene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Indeno(123cd)pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Dibenz(ah)anthracene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(ghi)perylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	PAH (total of USEPA 16)	Solvent extraction, GC-MS	As received		0.34	mg/kg
CE067	VPH Aromatic (>EC5-EC7)	Headspace GC-FID	As received		0.01	mg/kg
CE067	VPH Aromatic (>EC7-EC8)	Headspace GC-FID	As received		0.01	mg/kg
CE067	VPH Aromatic (>EC8-EC10)	Headspace GC-FID	As received		0.01	mg/kg
CE250	EPH Aromatic (>EC10-EC12)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC12-EC16)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC16-EC21)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC21-EC35)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC35-EC44)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE067	VPH Aliphatic (>C5-C6)	Headspace GC-FID	As received		0.1	mg/kg
CE067	VPH Aliphatic (>C6-C8)	Headspace GC-FID	As received		0.1	mg/kg
CE067	VPH Aliphatic (>C8-C10)	Headspace GC-FID	As received		0.1	mg/kg
CE250	EPH Aliphatic (>C10-C12)	Solvent extraction, GCxGC-FID	As received		6	mg/kg
CE250	EPH Aliphatic (>C12-C16)	Solvent extraction, GCxGC-FID	As received		6	mg/kg
CE250	EPH Aliphatic (>C16-C35)	Solvent extraction, GCxGC-FID	As received		15	mg/kg
CE250	EPH Aliphatic (>C35-C44)	Solvent extraction, GCxGC-FID	As received		10	mg/kg
$	Asbestos (qualitative)	HSG 248, Microscopy	Dry	U	-	-
$ M	Arsenic	Aqua regia digest, ICP-MS	Dry	M	0.5	mg/kg
$ M	Cadmium	Aqua regia digest, ICP-MS	Dry	M	0.2	mg/kg
$ M	Chromium	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg
$ M	Copper	Aqua regia digest, ICP-MS	Dry	M	4	mg/kg
$ M	Lead	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg
$ M	Mercury	Aqua regia digest, ICP-MS	Dry	M	0.1	mg/kg
$ M	Nickel	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg
$ M	Selenium	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg
$ M	Zinc	Aqua regia digest, ICP-MS	Dry	M	4.5	mg/kg

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DEVIATING SAMPLE INFORMATION

Comments
Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.
For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.
Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
121585-1	1	0.30	N	
121585-2	1b	0.60	N	
121585-3	2a	0.30	N	
121585-4	2b	0.60	N	
121585-5	3a	0.30	N	
121585-6	3b	0.60	N	
121585-7	3a	0.30	N	
121585-8	4b	0.60	N	
121585-9	5a	0.30	N	
121585-10	5b	0.60	N	
121585-11	6a	0.30	N	
121585-12	7a	0.30	N	
121585-13	7b	0.60	N	
121585-14	8a	0.60	N	

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ADDITIONAL INFORMATION

Notes

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

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

For soils and solids, analytical results are inclusive of stones, where applicable.

Moisture Content Calculated on a Wet Weight basis

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Appendix 5– Intrusive Investigation Photographs and Trail Pit records

Trail Pit 1 – Rear northwest western yard

Sample 1a –

Trail pit 1 –	north of western yard
0.00-0.10m	concrete
0.10-080m	stone, gravel, sand
Water found at 0.8m	

Trail Pit 2 – Rear northwest of eastern yard

Sample 2

Trail pit 2 –	north boundary east yard
0.00-0.08m	some soil and ~100mm of concrete
0.10-0.48m	gravel stone and clay,
0.40-0.65m	sandy clay

Trail Pit 3 – Rear northwest of eastern yard

Sample 3a –

Trail pit 3 –	north boundary east yard
0.00-0.08m	some soil and ~800mm of concrete
0.08-0.37m	sandy loam gravel.
0.10-0.87m	sandy clay and gravel

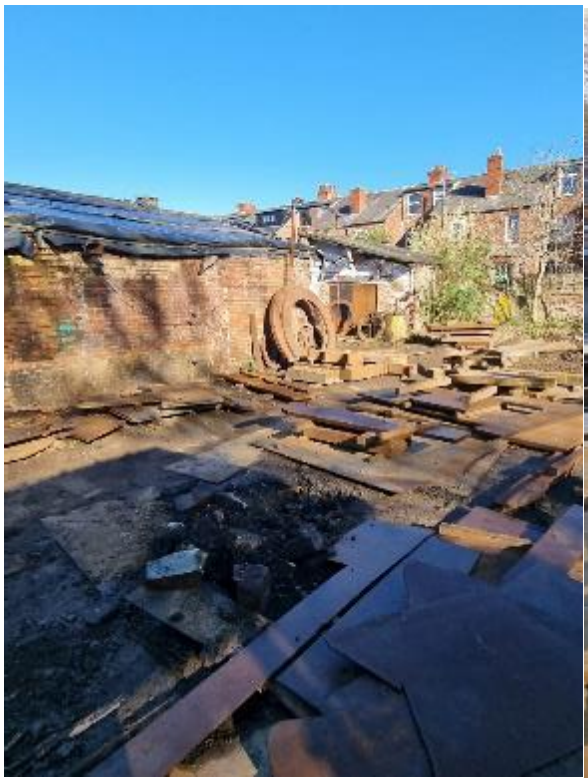
Trail Pit 4 – Front south-eastern corner

Sample 4

Trail pit 4–	southeast corner, under lean-to
0.00-0.06m	asphalt
0.06-0.45m	sandy loamy clay, gravel, small stones
0.45-0.65m	sandy loamy clay, gravel, stones

Trail Pit 5 – Eastern yard centre

Sample 5



Trail pit 5 –	centre of eastern yard
0.00-0.10m	asphalt
0.10-0.22m	cobbles, black gravel, stone
0.22-0.35m	sandstone fragments
0.35-0.60m	sandstone, gravel, sandy clay

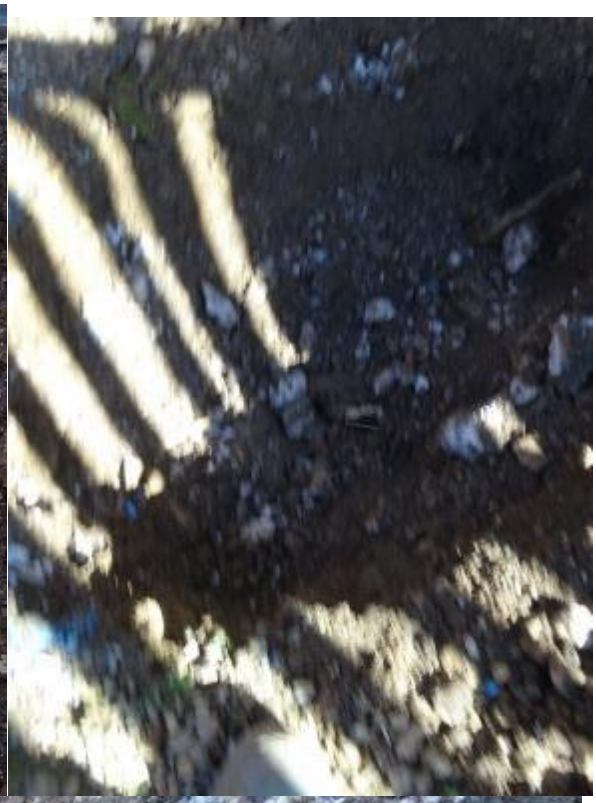
Trail Pit 6 – Front western yard, corner of western building

Sample 6

Trail pit 6 –	south of western yard
0.00-0.08m	concrete
0.080-0.30m	strong diesel odour, very dark gravel, sand.
At 300mm concrete base identified, no further excavation due to risk of contamination.	

Trail Pit 7 – Front southwestern corner

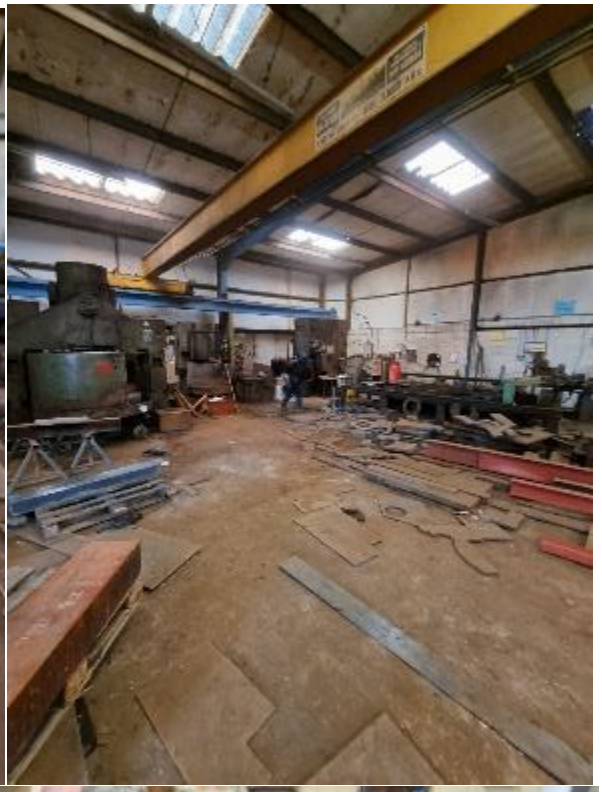
Sample 7



Trail pit 7 –	southwest boundary
0.00-0.10m	broken concrete and stone.
0.10-0.58m	sandy loam, gravel
0.40 – 0.45	concrete base
0.45-0.65	sandy clay, gravel

Trail Pit 8 – Rear northwest corner of main building.

Sample 8



Trail pit 8 –	western building
0.00-0.05m	concrete
0.05-0.35m	sandy loamy, gravel, stone, plastic sheeting, brick
0.35-0.6	brick fragments, gravel.

Appendix 6 Report limitations and exclusions

Basis of Risk Assessment

The methods used follow a risk-based approach with the potential risk assessed using the 'Source – pathway – receptor pollution linkage concept.

Limitations and Exceptions of this Report

This report was undertaken for at the request of Building Design Services and as such should not be entrusted to any third party without written permission of ***Martin Environmental Solutions***. No other third parties may rely upon or reproduce the contents of this report without the written permission of ***Martin Environmental Solutions***. If any unauthorised third party comes into possession of this report, they rely on it at their own risk and the authors do not owe them any duty of care or skill.

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The findings and opinions provided in this document are made in good faith and are based on data provided by third parties (Groundsure, Environment Agency, The Coal Authority, and Regulatory Bodies) and the report should be read in conjunction with the limitations on the document control form. The accuracy of map extracts cannot be guaranteed and it should be recognised that different conditions on /adjacent to the site may have existed between and subsequent to the various map surveys.

This report is prepared and written in the context of the purposes stated above and should not be used in a different context. Furthermore, new information, improved practices and legislation may necessitate an alteration to this report in whole or in part after its submission.

The conclusions and recommendations of this report are based on the development described, for any other development the report may require revision.

All of the comments and opinions contained in this report, including any conclusions, are based on the information obtained by ***Martin Environmental Solutions***. The conclusions

drawn by ***Martin Environmental Solutions*** could therefore differ if the information obtained is found to be misrepresentative, inaccurate, or misleading. ***Martin Environmental Solutions*** reserves the right to amend their conclusions and recommendations in the light of further information that may become available.

The report should be read in its entirety, including all associated drawings and appendices.

Martin Environmental Solutions cannot be held responsible for any misinterpretations arising from the use of extracts that are taken out of context.

This report does not comprise a geotechnical assessment of the strata underlying the site.

Any borehole data from the British Geological Survey sources is included on the following basis: 'The British Geological Survey accept no responsibility for omissions or misinterpretations of the data from their Data Bank as this may be old or obtained from non-BGS sources and may not represent current interpretation'.

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Any risks identified in a Phase I Desk Study Report are perceived risks. Actual risks can only be assessed following a physical investigation of the site.

The findings of this report are based on finite information obtained from research and consultations. Martin Environmental Solutions cannot guarantee the reliability of all such information and the searches should not be considered exhaustive. The findings of the report may need to be reviewed as any future exploratory investigations progress and in the event that additional archive information becomes available.

Notwithstanding the findings of this study (and any subsequent investigations), if any indication of contaminated soil (visual or olfactory) is encountered at any stage of the development further investigation may be required.

Arboricultural Survey and advice on arboricultural issues are considered to be outside the scope of this report except for their effect on the foundations to the proposed buildings.

Where identification of any species is made, especially invasive plants such as Japanese Knotweed, Himalayan Balsam or Giant Hogweed, this should only be considered as a preliminary assessment and subject to confirmation by a professional Arboriculturist. Martin Environmental Solutions takes no responsibility for failing to identify, or the incorrect identification of, any tree or plant species on site.

Our investigations exclude surveys to identify the presence or indeed absence of asbestos in buildings/infrastructure on site. If asbestos is suspected to be present, we recommend specialists in the identification and control / disposal of asbestos are appointed prior to commencement of any works on site or, if appropriate, purchase of the site. The presence of asbestos on site may have considerable effects on the cost / timescale in developing the site. There is good guidance in relation to Asbestos available on the Health and Safety Executive (HSE) web site.

Whilst a site walkover has been undertaken as part of this report, the survey does not constitute either an asbestos or structural survey and all areas of the site may not have been visited / inspected.