



Site Investigation Report

LOCATION	City Football Academy, Clayton Lane, Manchester, M11 4TS
ISSUE DATE	28 th June 2023
FOR	Manchester City Football Club Ltd.
CLIENT REF.	PO: MCFC1111546
OUR REF.	G23195

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1. Introduction

In accordance with your instruction Geoinvestigate Ltd. has carried out a limited site investigation at the City Football Academy site located off Clayton Lane, Manchester.

It was requested that five (5) locations be investigated where it is proposed to construct either new dugouts or toilet blocks alongside the existing sports pitches. Information regarding the geotechnical properties of the various locations was requested with a view to informing foundation design, together with waste acceptance criteria (WAC) testing to assist in classification and disposal of waste soils.

Investigation of only four of the five locations was possible due to the large number of buried services at the first attempted location in the northeast of the academy site. It was not safe to excavate in this area despite all attempts being made (using ground penetrating radar etc.) to find a safe location where damage to buried services could be avoided.

Prior to the investigation, the history of the site was not known but Geoinvestigate Ltd. were made aware of some of the site history during the day of the site works. It is understood that the site previously comprised a chemical works and that remedial works were undertaken when the site was redeveloped for the football club including, but perhaps not limited to, installation of a clean capping layer of uncontaminated soils across most or all of the site.

Geology:

- BGS records show the west of the academy site to be underlain by mudstone, siltstone and sandstone of the Pennine Upper Coal Measures, with the east underlain by the Chester Formation (sandstone).
- Superficial deposits are recorded as Devensian Till.
- BGS borehole records within the academy site generally show between 1m and 4m of made ground followed by boulder clay with occasional sand horizons. The made ground is often not described but in other records it is described as brick/concrete rubble, clayey ash fill, or a mix of the two.
- <https://www.ukradon.org/information/ukmaps> suggests that the site is not within a radon affected area.
- The Coal Authority shows the west of the site (where coal measures geology is recorded) to be in a development high risk area (DHRA) with recorded and probable mine workings present together with a number of mine entries and outcrops.

Historical land uses (identified from published historical mapping):

- The site appears to have been an aniline works with numerous tanks etc., and other features within or very close to the site including an engineering works (which included a tar still), an alkali works and a motor works, together with other chemical works.
- Numerous groundworks and rail links also appear to be present.

General contamination investigation and investigation of the coal mine risk (ground stability and gas risks) are beyond the scope of this exercise but it is assumed that these risks were fully investigated at the time of the redevelopment of the whole site, and that any risks were appropriately mitigated at that time.

Earlier site investigation and remediation reports have subsequently been provided to Geoinvestigate for review for another investigation running concurrently with this exercise. These have not yet been reviewed in detail but it appears as though the majority of remedial works comprised the capping of the site with a 'clean' (uncontaminated) cover layer and the burying/confining/encapsulation of large amounts of excavated material in certain areas, primarily in the areas which are now raised and planted in the east and northeast of the site.

This investigation is limited only to investigating four (4) specific locations and determining ground conditions at those sites, together with soil sampling for WAC testing.

2. Scope of Investigation

2.1 Scope of Works

Given the above, the following investigation was carried out:

- The investigation of ground conditions at the four (4) identified locations via the sinking of one (1) windowless sampling borehole at each (ref. BH1-BH4) to depths of 2.50m or 4.00m using a Dando Terrier mini drilling rig with logging, sampling and supervision of the works by a qualified and experienced geo-environmental engineer. Standard penetration tests (SPTs) and hand-vane shear strength tests were undertaken to determine ground strength.
- Waste acceptance criteria (WAC) testing on four (4) representative samples of soil from the boreholes to assist in waste classification of waste materials to be removed from the site during the proposed development works.
- Geotechnical testing on samples recovered from the site including three (3) moisture contents and three (3) Atterberg limits tests where natural cohesive soils were present, and a number of water soluble sulphate concentrations and pH tests to allow suitable foundations and concrete design advice.
- Provision of a factual and interpretative report including site plan, borehole logs, geotechnical test results, WAC analysis results, and advice on the foundation situation at the site. Final decisions regarding waste classification are left to the waste carrier receiver but some comment on the WAC results is included.

The borehole positions are shown on the plan provided in Appendix 1. The excavations were sampled and logged at site by a geo-environmental engineer and the ground conditions encountered are described on the boreholes logs also provided in Appendix 1.

Some photographs of the site and the recovered borehole cores are presented in Appendix 2, together with geotechnical test results.

The results of the WAC testing and water soluble sulphate and pH analyses are presented in Chemtech Environmental Report ref. 123338 which is included in Appendix 3.

2.2 Sampling Rationale

The borehole positions were chosen by the client to best represent the ground conditions at the four (4) locations of the proposed small structures. As noted earlier, no investigation was possible at one of the five original proposed positions.

3. Investigation Findings

3.1 Encountered Ground Conditions

Surface materials

The upper soils at boreholes BH1 to BH3 are inferred to belong to the capping layer installed during the redevelopment of the site as the academy. It is assumed these were sampled and proven uncontaminated at that time before installation at the site.

These comprised turf underlain by topsoil to 0.20m below ground level (bgl) followed by a red-brown fine sand horizon (often clayey) to between 0.30m and 0.45m bgl, possibly installed to assist in drainage. This was underlain by grey-brown or brown sandy gravelly clay horizons to depths of 0.75m (BH1), 1.20m (BH2) and 0.90m (BH3). This clay fill contained gravel constituents of sandstone, brick and coal with mudstone also noted at BH2.

A fairly similar clay fill was found below 0.30m of turf/topsoil at BH4, extending to 1.60m bgl. It was unclear whether this might comprise the capping material because it extended considerably deeper than would normally be expected for a cover system. This comprised gravelly borderline sand/clay fill.

Made Ground

Below the strata inferred to comprise more recently placed fill materials, older made ground was encountered to the full depths of boreholes BH1-BH3. This comprised a stiff brown-grey or grey-brown sandy very gravelly clay fill containing gravel constituents of sandstone, brick, coal and concrete, with occasional glass, slag and limestone noted in places.

Occasional sandy gravel or dark grey clay inclusions were noted, and the clay was noted to soften (to a 'firm' condition) below 3.30m in BH2. This fill was also initially weaker at BH2 (see figure 1 on following page), suggesting there are likely to be local variations in strength.

Additionally, different materials were found at the base of BH3. A firm blue-grey clay horizon extended from 3.40m to 3.95m followed by black gravelly sand from 3.95m to 4.00m (containing gravel of coal), though this may have been a small inclusion as opposed to a significant deposit (unclear).

A faint "creosote-like" odour was noted at the base of BH1 (2.50m bgl) and at around 3.00m bgl in BH2. This can sometimes be indicative of PAH (polycyclic aromatic hydrocarbon) contamination.

White or occasionally blue-grey chalky inclusions were noted at BH2 and BH3 below 3.00m and 3.40m respectively. Following a brief review of the earlier site investigation / remediation reports, it is considered possible that this substance may have comprised "galligu", a (mostly) calcium sulphide solid waste product of the Leblanc Process used historically in alkali works. The earlier investigation and remediation reports discuss occurrences of what was believed to be galligu, and this would not be unusual given the presence of an alkali works within or adjacent to the west of the site.

Natural subsoils

Natural subsoil was only encountered in BH4 in the south of the site. This comprised dark brown mottled grey sandy gravelly clay from 1.60m to 2.00m bgl followed by very stiff brown slightly silty clay with occasional gravel from 2.00m to termination at 4.00m bgl.

General Information

All of the boreholes remained open and dry on completion of drilling.

Standard penetration test (SPT) results for the fill materials were highly variable with N values ranging from N=4 to N=49. The results are presented in Figure 1 below, colour coded to the type of material they represent.

Hand vane shear tests were carried out where the gravel content of the clay soils allowed. These returned values of between 27 kPa and 68 kPa in the upper capping materials, increasing to 100 kPa at BH4 (though this may not have been the capping material at BH4). The grey brown fill generally had too great a gravel content for hand vane tests to be carried out. Tests in the natural subsoils at BH4 yielded 73 kPa at 2.00m and >130 kPa in the stiff slightly silty clay below that.

Figure 1: SPT Results

BH1		BH2		BH3		BH4	
Test Commencing from (mBGL)	N Value	Test Commencing from (mBGL)	N Value	Test Commencing from (mBGL)	N Value	Test Commencing from (mBGL)	N Value
1.00	26	1.00	4	1.00	49	1.00	13
2.00	47	2.00	11	2.00	24	2.00	18
		3.00	19	3.00	15		
		4.00	8	4.00	13		

Grey-brown very gravelly clay fill
Brown to black gravelly sand fill
Brown clay fill (capping?)
Natural Subsoils

3.2 Soil Plasticity and Vegetation Influence

While made ground at the site is predominantly cohesive/clay in nature, its high gravel content might be expected to result in a lower shrinkage potential regardless. However, given the history of contamination and artificial nature of the deposits, no geotechnical testing was undertaken. It is Geoinvestigate's policy to not carry out geotechnical testing on potentially contaminated materials for health and safety reasons.

Regardless, no significant vegetation or roots were noted at the locations of boreholes BH1 to BH3, and at the location in the northeast of the academy site which could not be drilled. As such, soil shrinkage/swelling due to vegetation influence is not expected to be a concern for these four locations.

Where natural clay soils were encountered at BH4 in the southeast of the academy site, trees and hedges were also present, and roots were noted in the borehole core to a depth of 1.00m. Three (3) Plasticity Tests were undertaken on samples from depths of 2.00m, 3.00m and 4.00m from BH4. These returned quite consistent plasticity indices of between 23.8% and 25.9% classifying the soils as Clay of Intermediate Plasticity according to BS 5930, or medium shrinkage potential according to NHBC (building near trees guidance).

As such, precautions will be required with regard to potential vegetation influence in the foundation design of any new structure(s) at the location of BH4. No such precautions are expected to be necessary at any of the other four proposed building locations.

4. Contamination Testing

Representative samples of most of the various 'types' of fill material were selected for analysis to provide the best possible overview of the soils at the site within the limits of the investigation.

Samples were submitted for either waste acceptance criteria (WAC) testing to assist in waste classification, or for pH and water soluble sulphate testing to assist in concrete design.

1. Capping materials.

- Brown sandy gravelly clay fill was submitted for WAC analysis from a depth of 1.00m in BH2.
- Additional samples of this material from 0.50m in BH1 and BH3 were also submitted for pH and water soluble sulphate testing.

2. Grey-brown clay fill.

- This was the most common material encountered in the boreholes. A sample from 1.50m bgl in BH1 was submitted for WAC analysis. This sample also showed some dark staining.
- Additional samples of this material from 2.00m in BH2 and 1.50m in BH3 were also submitted for pH and water soluble sulphate testing.

3. Blue-grey clay fill.

- This material was found at BH3 and was roughly comparable to the common grey-brown fill discussed above, though with a slightly different colour. A sample of this fill was submitted for WAC analysis from a depth of 3.50m in BH3. This stratum also included the white chalky inclusions which may have comprised galligu.

4. Possible clay capping material.

- Brown gravelly borderline clay/sand fill from BH4 (where this extended to 1.60m bgl) was submitted for WAC analysis from a depth of 1.00m. It was not clear whether this comprised part of the capping layer or perhaps older fill material.
- This sample was also submitted for pH and water soluble sulphate testing.

All four samples submitted for WAC testing were also inspected for asbestos. No asbestos was detected in any of the four samples.

As discussed in section 1, this exercise was not intended to comprise a general contamination assessment (including human-health risk assessment for example) but was undertaken for waste classification and geotechnical guidance for the proposed development works. The above was considered sufficient to classify the soils encountered in the boreholes for those purposes.

The full results of the analyses are included in Appendix 3 of this report (Chemtech Environmental Ltd. report 123338).

5. Conclusions

5.1 WAC Testing

WAC test results sheets for the four samples are presented in Appendix 3.

Final decisions regarding classification of waste are left to the waste carrier/receiver but a brief summary of the results is as follows:

1. **Capping materials.**

The sample of new (clay) capping materials from a depth of 1.00m in BH2 returned results within the limits for **inert waste**.

2. **Grey-brown clay fill.**

The sample from 1.50m bgl in BH1 returned arsenic and total organic carbon (TOC) levels which exceed the limits for both the inert and non-reactive hazardous waste categories. This material might therefore comprise **hazardous waste**. Exceedances of inert limits were also noted for antimony, selenium, sulphate, total dissolved solids (TDS), and mineral oils.

3. **Blue-grey clay fill.**

The sample from a depth of 3.50m in BH3 returned TOC and sulphate levels in excess of the limits for inert landfill, and a loss on ignition in excess of the limit for hazardous waste (at 21.7%).

Further advice should be sought regarding the consequence of the higher loss on ignition result. Some prior treatment may be required to safely dispose of this material. However, given the depth of this fill, there may be no requirement to remove any of it from the site, assuming none is found at shallower depth during groundworks.

This stratum also included the white chalky inclusions which may have comprised galligu. A presence of galligu might account for the higher sulphate levels and generally alkaline pH of this sample and other soils at the site*.

*Weathering of galligu can result in production of calcium sulphate (among other chemicals) and a change from lower to higher pH. Ref.: <https://www.envchemgroup.com/galligu-an-environmental-legacy-of-the-leblanc-alkali-industry-1814-1920.html>

4. **Possible clay capping material.**

The sample from a depth of 1.00m in BH4 returned an antimony level marginally in excess of the limit for inert landfill. While this material will not be suitable for inert landfill, it may qualify as general non-hazardous waste – further advice should be sought from the waste carrier/receiver.

All four samples submitted for WAC testing were also inspected for asbestos. No asbestos was detected in any of the four samples.

5.2 Foundations

Made ground has been confirmed to be up to and in excess of 4.00m deep at the site with natural subsoils only being encountered at BH4.

The fill materials were fairly variable in nature but mostly fairly competent in terms of strength, with some exceptions.

The capping materials are unlikely to have been compacted on installation and have been noted to be quite soft in places (such as at BH3). These materials will not provide suitable bearing strata.

The underlying grey-brown fill materials found at boreholes BH1 to BH3 inclusive was generally competent though was notably weaker in places, such as at 1.00m in BH2. Figure 1 is reproduced below to present the SPT results for reference.

Figure 1: SPT Results

BH1		BH2		BH3		BH4	
Test Commencing from (mBGL)	N Value	Test Commencing from (mBGL)	N Value	Test Commencing from (mBGL)	N Value	Test Commencing from (mBGL)	N Value
1.00	26	1.00	4	1.00	49	1.00	13
2.00	47	2.00	11	2.00	24	2.00	18
		3.00	19	3.00	15		
		4.00	8	4.00	13		

Grey-brown very gravelly clay fill
Brown to black gravelly sand fill
Brown clay fill (capping?)
Natural Subsoils

Given the potential localised variability of the fill material, a raft foundation is considered to be the most feasible solution for most of the proposed building locations. The relatively small/light nature of the proposed structures should allow for this and this method should minimise excavation into the underlying contaminated soils, thus hopefully reducing waste disposal costs.

A fully reinforced edge-stiffened raft foundation may be designed to a net bearing pressure of 40kPa, seated below the base of the brown clay capping materials (present to depths of 0.75m, 1.20m and 0.90m at BH1 to BH3 respectively).

It is considered fairly likely that similar ground conditions will be found at the location in the northeast of the site which could not be drilled. However, it would be prudent to have a geotechnical engineer attend site to assess the ground conditions in that area on commencement of groundworks, particularly if differing ground conditions are discovered.

BH4

Ground conditions at BH4 differed somewhat, with 1.6m of borderline clay/sand fill being underlain by very stiff natural silty clay, with roots also confirmed to at least 1.00m.

As such, given the competent clay at depth and potential for vegetation induced soil shrinkage/swelling, a traditional reinforced strip foundation with suspended beam and block floor is recommended for this location in the southeast of the site. Seated at a depth of at least 1.60m or 600mm below the deepest roots (whichever is greater), a bearing capacity of 150kPa can be expected in the initial natural clay or at least 200kPa in the deeper very stiff clay below 2.00m.

5.3 Concrete Design

The results of chemical analyses of the fill (including the results included in the WAC testing) returned 2:1 water soluble sulphate levels of between 113mg l^{-1} and 3178mg l^{-1} and pH levels of between 8.6 and 10.0.

A higher sulphate level of 4236mg l^{-1} was returned for the deeper sample at 3.50m in BH3 though this soil might not be in contact with foundations.

On this basis, and assuming no mobile groundwater (at the depth of the foundations), concrete in contact with the ground may be designed to ACEC Class DS-3 AC-3s (DC3) of "BRE Special Digest 1 – Concrete in aggressive ground".

BH4

The sample of fill material from BH4 returned a water soluble sulphate level of 98mg l^{-1} and a pH of 10.7.

Ground conditions at this location are considered sufficiently different to allow less resistant concrete to be used. Again, assuming no mobile groundwater (at the depth of the foundations), concrete in contact with the ground in this location may be designed to ACEC Class DS-1 AC-1s of "BRE Special Digest 1 – Concrete in aggressive ground".

END OF REPORT

The findings and contents of this (intrusive) Site Investigation Report pertain solely to the study area(s) outlined herein and are based solely on the findings of the excavations undertaken as part of the current exercise unless otherwise stated. The findings and/or recommendations of this report do not take into account any ground conditions that may be present but have hitherto not been encountered and as such further investigation and/or a reconsideration of the findings of this report should be undertaken if such conditions are subsequently encountered or an alternative development plan or land use is subsequently proposed.

This report considers various environmental and/or geological risks posed to the site and/or proposed development and offers advice accordingly as guidance only. The findings of this report will remain valid provided no change of ground or groundwater conditions, either natural or anthropogenic, take place and no warrantee is offered or implied.

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APPENDIX 1
Site Plan
and
Borehole Logs

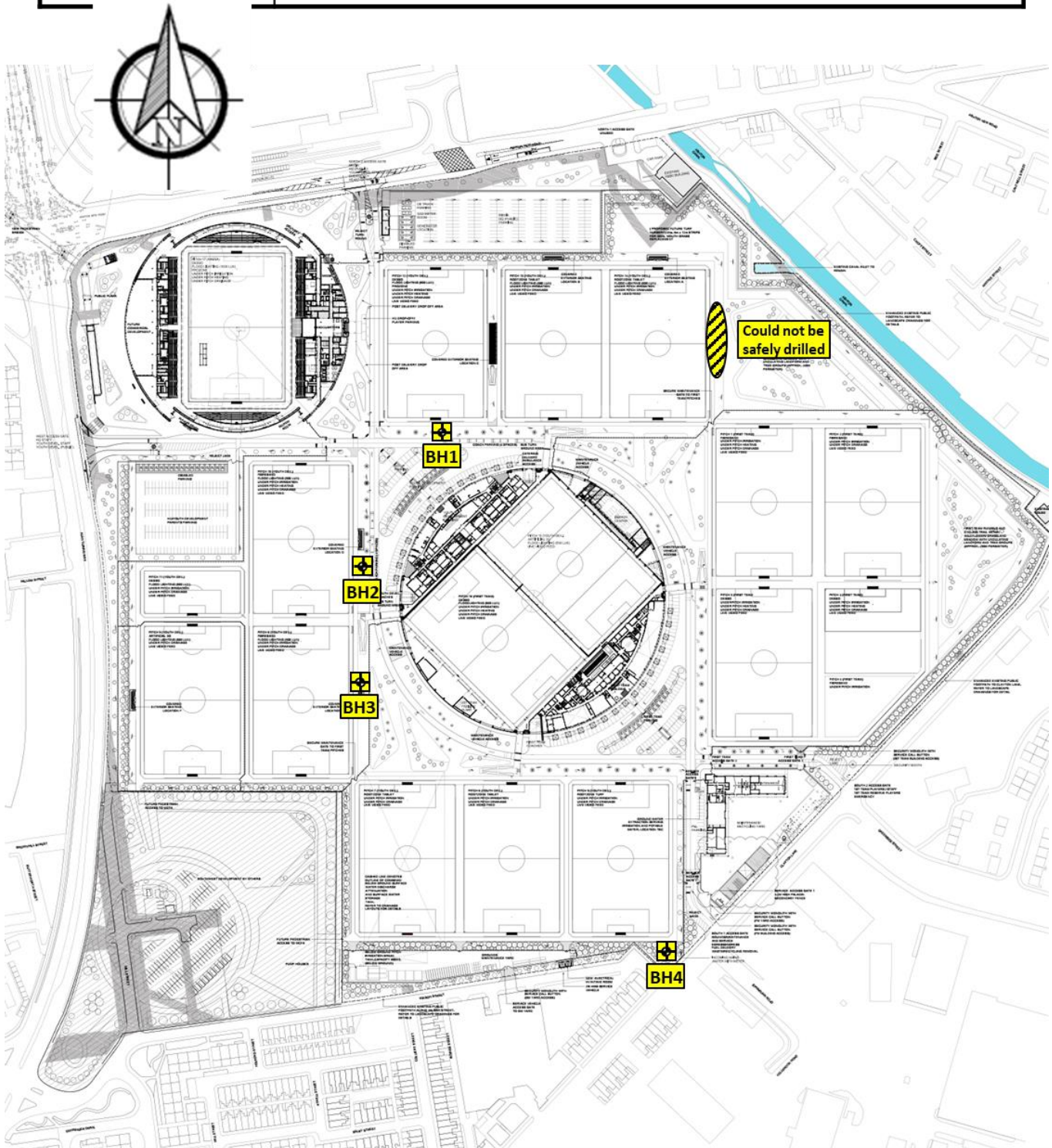
GEOINVESTIGATE Ltd.

OUR REF: G23195

SITE PLAN (NOT TO SCALE)

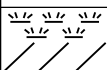
DATE: 20/05/22

City Football Academy, Clayton Lane, Manchester, M11 4TS

**Key**

Windowless Sampling
Borehole location
(approximate)

GEOINVESTIGATE Ltd.**Your Ref.** PO MCFC1111546**Our Ref.** G23195**BH No.1 Sheet No. 1 of 1****Location:** City Football Academy, Clayton Lane, Manchester, M11 4TS**DATE:** 30/05/23

Depth (m)	Description of Strata	Thickness	Legend	Gas Well	Sample	Test Type Result	SPT N Value (Depth)	Depth to Water	Depth (m)
0.20	TURF and TOPSOIL. Soft dark brown silty gravelly sand. Gravel is fine to coarse of sandstone, brick and coal.	200				Cv kN/m ²			0.25
0.40	MADE GROUND. Medium dense brown-red fine sand.	200			O				0.50
0.75	MADE GROUND. Very stiff grey-brown sandy gravelly clay. Gravel is fine to coarse of sandstone, brick and coal.	350			O		1.00m-1.45m 8,6,5,7,7,7 N = 26		0.75
1.10	MADE GROUND. Dense brown-grey slightly silty slightly clayey gravelly sand. Gravel is fine to coarse of sandstone, brick and coal.	350			O				1.00
	MADE GROUND. Stiff dark grey-brown sandy very gravelly clay. Gravel is fine to coarse of sandstone, brick, coal, concrete and occasional glass. Silty dark grey inclusion 1.50m to 1.60m.	1400					2.00m-2.45m 3,5,4,16,18,9 N = 47		1.25
	Clayey gravelly sand inclusion 1.90m to 2.00m								1.50
	Very slight odour at base of borehole akin to creosote.				O				1.75
2.50	Borehole terminated at 2.50m due to refusal								2.00
									2.25
									2.50

Remarks:

Casing to 1.00m

Dynamic windowless sampling by Terrier Rig to 2.50m

Borehole remained open and dry on completion

Key:

Slotted Pipe
Plain Pipe
Bentonite
Gravel Filter

O Disturbed sample

Cv Shear vane

W Water sample

S Standard Penetration Test using solid cone

BH1

GEOINVESTIGATE Ltd.**Your Ref.** PO MCFC1111546**Our Ref.** G23195**BH No.2 Sheet No. 1 of 1****Location:** City Football Academy, Clayton Lane, Manchester, M11 4TS**DATE:** 30/05/23

Depth (m)	Description of Strata	Thickness	Legend	Gas Well	Sample	Test Type Result	SPT N Value (Depth)	Depth to Water	Depth (m)
0.20	TURF and TOPSOIL. Compact brown silty gravelly sand. Gravel is fine to medium of sandstone and occasional brick & concrete.	200				Cv kN/m ²			0.25
0.30	MADE GROUND. Compact red-brown clayey gravelly sand. Gravel is fine to medium of sandstone.	100							0.50
0.50	MADE GROUND. Very stiff grey-brown sandy gravelly clay. Gravel is fine to coarse of sandstone, brick and coal.	200			O	68	1.00m-1.45m 0,0,1,1,1,1 N = 4		0.75
1.20	MADE GROUND. Firm to stiff brown sandy gravelly clay. Gravel is fine to coarse sandstone and mudstone with occasional brick and coal.	700			O	68			1.00
	MADE GROUND. Stiff dark grey-brown sandy very gravelly clay. Gravel is fine to coarse of sandstone, brick, coal, concrete and occasional glass.								1.25
					O		2.00m-2.45m 2,2,2,3,3,3 N = 11		1.50
									1.75
									2.00
									2.25
									2.50
	Sandstone and brick cobbles at 2.80m	2800					3.00m-3.45m 5,5,7,6,6,6 N = 19		2.75
	Some white chalky inclusions below 3.00m, occasionally slightly blue-grey.								3.00
	Very slight odour around 3.00m akin to creosote.								3.25
	Becoming firm with brown inclusions below 3.30m				O				3.50
4.00					O		4.00m-4.45m 2,2,2,2,2,2 N = 8		3.75
									4.00
	Borehole terminated at 4.00m								

Remarks:

Casing to 1.00m

Dynamic windowless sampling by Terrier Rig to 4.00m

Borehole remained open and dry on completion

Key:
 Slotted Pipe
 Plain Pipe
 Bentonite
 Gravel Filter
O Disturbed sample**Cv** Shear vane**W** Water sample**S** Standard Penetration Test using solid cone**BH2**

GEOINVESTIGATE Ltd.**Your Ref.** PO MCFC1111546**Our Ref.** G23195**BH No.3 Sheet No. 1 of 1****Location:** City Football Academy, Clayton Lane, Manchester, M11 4TS**DATE:** 30/05/23

Depth (m)	Description of Strata	Thickness	Legend	Gas Well	Sample	Test Type Result	SPT N Value (Depth)	Depth to Water	Depth (m)
0.20	TURF and TOPSOIL. Compact brown silty gravelly sand. Gravel is fine to medium of sandstone and occasional brick & concrete.	200				Cv kN/m ²			0.25
0.45	MADE GROUND. Compact red-brown clayey gravelly sand. Gravel is fine to medium of sandstone.	250			O	27			0.50
0.90	MADE GROUND. Soft to firm brown sandy gravelly clay. Gravel is fine to coarse of sandstone, brick and coal.	450					1.00m-1.45m 5,9,8,12,14,15 N = 49		0.75
1.10	MADE GROUND. Loose grey sandy gravel. Gravel is fine to coarse of sandstone and brick.	200							1.00
2.00	MADE GROUND. Stiff grey-brown sandy very gravelly CLAY. Gravel is fine to coarse of sandstone, limestone, brick and coal. Dark grey inclusion with a cobble of slag from 1.50m to 1.70m	900			O		2.00m-2.45m 2,3,9,6,5,4 N = 24		1.25
3.40	MADE GROUND. Stiff dark grey-brown sandy very gravelly clay. Gravel is fine to coarse of sandstone, brick, coal, concrete and occasional glass.	1400			O		3.00m-3.45m 3,4,4,3,4,4 N = 15		1.50
3.95	MADE GROUND. Firm blue-grey sandy very gravelly clay. Gravel is fine to medium of sandstone and mudstone. Some white chalky inclusions.	550			O		4.00m-4.45m 3,4,3,3,4,3 N = 13		1.75
4.00	MADE GROUND. Loose dark brown to black gravelly sand. Gravel is fine to coarse of coal.	50							2.00
	Borehole terminated at 4.00m								2.25
									2.50
									2.75
									3.00
									3.25
									3.50
									3.75
									4.00

Remarks:

Casing to 1.00m

Dynamic windowless sampling by Terrier Rig to 4.00m

Borehole remained open and dry on completion

Key:
 Slotted Pipe
 Plain Pipe
 Bentonite
 Gravel Filter
O Disturbed sample**Cv** Shear vane**W** Water sample**S** Standard Penetration Test using solid cone**BH3**

GEOINVESTIGATE Ltd.

Your Ref. PO MCFC1111546

Our Ref. G23195

BH No.4 Sheet No. 1 of 1

Location: City Football Academy, Clayton Lane, Manchester, M11 4TS

DATE: 30/05/23

Depth (m)	Description of Strata	Thickness	Legend	Gas Well	Sample	Test Type Result	SPT N Value (Depth)	Depth to Water	Depth (m)
0.30	TURF and TOPSOIL. Loose brown silty slightly clayey gravelly sand. Gravel is fine to coarse of sandstone, limestone, brick and coal.	300				Cv kN/m ²			0.25
	MADE GROUND. Stiff / medium dense brown very sandy gravelly clay / very clayey gravelly sand. Gravel is fine to coarse of sandstone, brick and coal.	1300			O		1.00m-1.45m 4,4,3,3,3,4 N = 13		0.50
	Becoming sandy gravelly clay below 1.10m								0.75
									1.00
									1.25
1.60	Small dark grey gravelly sand inclusion at 1.60m					100			1.50
2.00	Firm dark brown mottled grey sandy gravelly CLAY. Gravel is fine to medium of sandstone and coal. Dark grey silty sandy inclusions noted.	400			O	73	2.00m-2.45m 2,2,3,4,5,6 N = 18		1.75
	Possibly made ground - unclear.								2.00
	Very stiff brown mottled grey slightly silty CLAY. Occasional fine to medium gravel of sandstone and coal.					>130			2.25
									2.50
									2.75
					O	>130			3.00
									3.25
									3.50
									3.75
4.00					O	>130			4.00
	Borehole terminated at 4.00m								

Remarks:

Casing to 1.00m

Dynamic windowless sampling by Terrier Rig to 4.00m

Borehole remained open and dry on completion

Key:

 Slotted Pipe
 Plain Pipe
 Bentonite
 Gravel Filter

O Disturbed sample

Cv Shear vane

W Water sample

S Standard Penetration Test using solid cone

BH4

APPENDIX 2
Geotechnical Test Results
and
Site Photographs

GEOINVESTIGATE Ltd.

Atterberg Limit Test Results

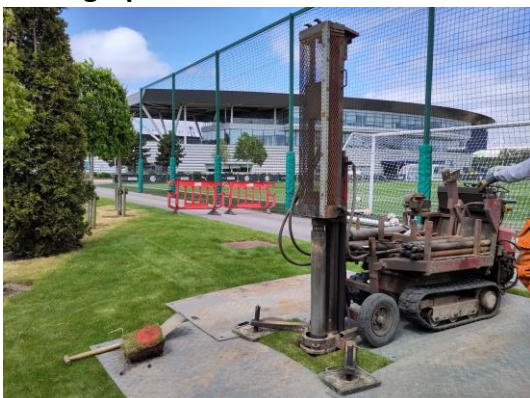
Our ref. G23195

Your ref. PO MCFC1111546

Table 1

Location: City Football Academy, Clayton Lane, Manchester, M11 4TS

TP / BH No.	Sample Depth (m)	Insitu Moisture Content (%)	% Passing BS 425 Micron Sieve	Corrected Moisture Content (%)	Plastic Limit (%)	Liquid Limit (%)	Plasticity Index (%)	Soil Classification
4	2.00	24.4	>95	24.4	21.7	47.6	25.9	CI
	3.00	18.2	>95	18.2	23.0	46.8	23.8	CI
	4.00	17.2	94.6	18.2	21.3	45.8	24.5	CI

Photograph 1: Cores recovered from BH1.**Photograph 2: Cores recovered from BH2.****Photograph 3: Cores recovered from BH3.****Photograph 4: Cores recovered from BH4.****Photograph 5: close up of blue-grey material with possible gillu inclusions below 3.00m at BH3.****Photograph 6: Vegetation at BH4 location.****Photograph 7: Borehole BH1 location.**

APPENDIX 3

Chemtech Analytical Test Report



ANALYTICAL TEST REPORT

Contract no: 123338

Contract name: Manchester City Academy, Manchester, M11 4TQ

Client reference: G23195

Clients name: Geo Investigate

Clients address: Units 3a & 4 Terry Dicken Industrial Estate
Ellerbeck Way, Stokesley
North Yorkshire
TS9 7AE

Samples received: 01 June 2023

Analysis started: 01 June 2023

Analysis completed: 21 June 2023

Report issued: 21 June 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:

Samantha Rogerson
Reporting Manager

Chemtech Environmental Limited

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
123338-1	BH1	0.50	Sandy Loamy Clay with Gravel	-	-	13.3
123338-2	BH1	1.50	Sandy Loamy Clay with Gravel	-	-	20.5
123338-3	BH2	1.00	Sandy Loamy Clay with Gravel	-	-	15.5
123338-4	BH2	2.00	Sandy Loamy Clay with Gravel	-	-	16.8
123338-5	BH3	0.50	Sandy Loamy Clay with Gravel	-	-	15.7
123338-6	BH3	1.50	Sandy Loamy Clay with Gravel	-	-	19.8
123338-7	BH3	3.50	Sandy Clay with Gravel	-	-	16.7
123338-8	BH4	1.00	Sandy Loamy Clay with Gravel	-	-	18.9

Chemtech Environmental Limited

SOILS

Lab number			123338-1	123338-2	123338-3	123338-4	123338-5	123338-6
Sample id			BH1	BH1	BH2	BH2	BH3	BH3
Depth (m)			0.50	1.50	1.00	2.00	0.50	1.50
Date sampled			30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023
Test	Method	Units						
Antimony	\$	mg/kg	-	11.6	0.8	-	-	-
Arsenic	\$ ^M	mg/kg	-	464.0	15.2	-	-	-
Barium	\$ ^U	mg/kg	-	247	156	-	-	-
Cadmium	\$ ^M	mg/kg	-	0.4	< 0.2	-	-	-
Chromium	\$ ^M	mg/kg	-	40.0	34.1	-	-	-
Copper	\$ ^M	mg/kg	-	128.0	29.1	-	-	-
Lead	\$ ^M	mg/kg	-	426.0	21.0	-	-	-
Mercury	\$ ^M	mg/kg	-	1.6	< 0.1	-	-	-
Molybdenum	\$ ^M	mg/kg	-	3.5	< 1.0	-	-	-
Nickel	\$ ^M	mg/kg	-	30.5	35.7	-	-	-
Selenium	\$ ^M	mg/kg	-	3.3	< 1.0	-	-	-
Zinc	\$ ^M	mg/kg	-	148.0	68.9	-	-	-
pH	CE004 ^M	units	10.0	-	-	9.3	8.6	9.4
Sulphate (2:1 water soluble)	CE061 ^U	mg/l SO ₄	813	-	-	837	113	2409
Subcontracted analysis								
Asbestos (qualitative)	\$	-	-	NAD	NAD	-	-	-

Chemtech Environmental Limited

SOILS

Lab number			123338-7	123338-8
Sample id			BH3	BH4
Depth (m)			3.50	1.00
Date sampled			30/05/2023	30/05/2023
Test	Method	Units		
Antimony	\$	mg/kg	3.2	8.7
Arsenic	\$ ^M	mg/kg	41.9	34.7
Barium	\$ ^U	mg/kg	114	223
Cadmium	\$ ^M	mg/kg	0.3	0.4
Chromium	\$ ^M	mg/kg	22.3	36.0
Copper	\$ ^M	mg/kg	65.1	68.4
Lead	\$ ^M	mg/kg	113.0	112.0
Mercury	\$ ^M	mg/kg	0.3	0.5
Molybdenum	\$ ^M	mg/kg	1.8	1.4
Nickel	\$ ^M	mg/kg	22.0	34.4
Selenium	\$ ^M	mg/kg	< 1.0	< 1.0
Zinc	\$ ^M	mg/kg	75.7	122.0
pH	CE004 ^M	units	-	10.7
Sulphate (2:1 water soluble)	CE061 ^U	mg/l SO ₄	-	
Subcontracted analysis				
Asbestos (qualitative)	\$	-	NAD	NAD

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
\$	Antimony	Aqua regia digest, ICP-MS	Dry		0.5	mg/kg
\$ ^M	Arsenic	Aqua regia digest, ICP-MS	Dry	M	0.5	mg/kg
\$ ^U	Barium	Aqua regia digest, ICP-MS	Dry	U	1.0	mg/kg
\$ ^M	Cadmium	Aqua regia digest, ICP-MS	Dry	M	0.2	mg/kg
\$ ^M	Chromium	Aqua regia digest, ICP-MS	Dry	M	1.0	mg/kg
\$ ^M	Copper	Aqua regia digest, ICP-MS	Dry	M	4.0	mg/kg
\$ ^M	Lead	Aqua regia digest, ICP-MS	Dry	M	1.0	mg/kg
\$ ^M	Mercury	Aqua regia digest, ICP-MS	Dry	M	0.1	mg/kg
\$ ^M	Molybdenum	Aqua regia digest, ICP-MS	Dry	M	1.0	mg/kg
\$ ^M	Nickel	Aqua regia digest, ICP-MS	Dry	M	1.0	mg/kg
\$ ^M	Selenium	Aqua regia digest, ICP-MS	Dry	M	1.0	mg/kg
\$ ^M	Zinc	Aqua regia digest, ICP-MS	Dry	M	4.5	mg/kg
CE004	pH	Based on BS 1377, pH Meter	As received	M	-	units
CE061	Sulphate (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry	U	10	mg/l SO ₄
\$	Asbestos (qualitative)	HSG 248, Microscopy	Dry	U	-	-

Chemtech Environmental Limited

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)
123338-1	BH1	0.50	N	
123338-2	BH1	1.50	N	
123338-3	BH2	1.00	N	
123338-4	BH2	2.00	N	
123338-5	BH3	0.50	N	
123338-6	BH3	1.50	N	
123338-7	BH3	3.50	N	
123338-8	BH4	1.00	N	

Chemtech Environmental Limited

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 6 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.

Waste Acceptance Criteria Testing BS EN 12457-Part 3, 2 Stage Process

Sample Details

Contract Name Manchester City Academy,
Manchester, M11 4TQ

Lab Number 123338-2

Sample ID BH1 1.50m

Date Sampled 30 May 2023

Date Received 1 June 2023

Particle Size (<4mm) -

Method of size reduction N/A

Non-crushable matter N/A

Test Values

Mass of Raw Test Portion (MW) kg 0.220

Mass of Dried Test Portion (MD) kg 0.175

Moisture Content Ratio (MC) % 25.73

Dry Matter Content Ratio (DR) % 79.53

Leachant Volume (1) (L2) Litre 0.305

Leachant Volume (2) (L8) Litre 1.400

Eluate Volume (1) (VE1) Litre 0.155

Eluate Volume (2) (VE2) Litre 1.280

Eluate Analysis	Conc in Eluate	
Liquid : Waste Ratio	2:1	8:1
pH (units)	7.1	6.5
Temperature (°C)	20	20
Conductivity (µS/cm)	2540	1003
Antimony (µg/l Sb)	44.9	31.2
Arsenic (µg/l As)	1380	817
Barium (µg/l Ba)	106	34
Cadmium (µg/l Cd)	< 0.5	< 0.5
Chromium (µg/l Cr)	1.7	2.3
Copper (µg/l Cu)	22.7	9.6
Lead (µg/l Pb)	0.6	< 0.5
Mercury (µg/l Hg)	< 0.05	< 0.05
Molybdenum (µg/l Mo)	95	16
Nickel (µg/l Ni)	9.9	1.8
Selenium (µg/l Se)	11	11
Zinc (µg/l Zn)	18.2	< 1.2
Chloride (mg/l Cl)	33	4.0
Fluoride (mg/l F)	<0.1	0.1
Sulphate (mg/l SO ₄)	1589	508
Total Dissolved Solids (mg/l TDS)	1930	762
Phenol Index (µg/l PhOH)	<10	<10
Dissolved Organic Carbon (mg/l C)	18	<5

Amount Leached		Council Decision 2003/33/EC Limit Values mg/kg at L:S 10:1		
2:1	10:1	Inert Waste	Non-reactive Hazardous Waste	Hazardous Waste
mg/kg	mg/kg			
0.090	0.324	0.06	0.7	5
2.760	8.669	0.5	2	25
0.212	0.404	20	100	300
<0.0005	<0.0050	0.04	1	5
0.003	0.022	0.5	10	70
0.045	0.108	2	50	100
0.001	<0.005	0.5	10	50
<0.00005	<0.00050	0.01	0.2	2
0.190	0.230	0.5	10	30
0.020	0.025	0.4	10	40
0.022	0.110	0.1	0.5	7
0.036	<0.027	4	50	200
65	65	800	15000	25000
<0.2	<1.4	10	150	500
3178	6036	1000	20000	50000
3861	8657	4000	60000	100000
<0.02	<0.1	1		
36	<61	500	800	1000

Waste Analysis	Units	Result			
Total Organic Carbon	% w/w	6.0	3%	5%	6%
Loss on Ignition	% w/w	8.0			10%
BTEX	mg/kg	<0.06	6		
PCBs (7 congeners)	mg/kg	0.048	1		
Mineral Oil (C10 - C40)	mg/kg	1016	500		
PAH (total)	mg/kg	70.0	100		
pH	pH units	9.9		>6	
Acid Neutralisation Capacity (pH4)	mol/kg	0.50		To be evaluated	
Acid Neutralisation Capacity (pH7)	mol/kg	0.10		To be evaluated	

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Comments

Authorised by:



Name: Samantha Rogerson

Report date:

21 June 2023

Position: Reporting Manager

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

Waste Acceptance Criteria Testing BS EN 12457-Part 3, 2 Stage Process

Sample Details

Contract Name Manchester City Academy,
Manchester, M11 4TQ

Lab Number 123338-3

Sample ID BH2 1.00m

Date Sampled 30 May 2023

Date Received 1 June 2023

Particle Size (<4mm) -

Method of size reduction N/A

Non-crushable matter N/A

Test Values

Mass of Raw Test Portion (MW) kg 0.207

Mass of Dried Test Portion (MD) kg 0.175

Moisture Content Ratio (MC) % 18.39

Dry Matter Content Ratio (DR) % 84.47

Leachant Volume (1) (L2) Litre 0.318

Leachant Volume (2) (L8) Litre 1.400

Eluate Volume (1) (VE1) Litre 0.115

Eluate Volume (2) (VE2) Litre 1.150

Eluate Analysis	Conc in Eluate	
Liquid : Waste Ratio	2:1	8:1
pH (units)	7.9	6.6
Temperature (°C)	20	20
Conductivity (µS/cm)	438	180
Antimony (µg/l Sb)	1.8	0.8
Arsenic (µg/l As)	11.9	0.6
Barium (µg/l Ba)	54	19
Cadmium (µg/l Cd)	< 0.5	< 0.5
Chromium (µg/l Cr)	< 0.5	< 0.5
Copper (µg/l Cu)	1.2	0.6
Lead (µg/l Pb)	< 0.5	< 0.5
Mercury (µg/l Hg)	< 0.05	< 0.05
Molybdenum (µg/l Mo)	4	3
Nickel (µg/l Ni)	< 0.5	< 0.5
Selenium (µg/l Se)	< 1	< 1
Zinc (µg/l Zn)	< 1.2	< 1.2
Chloride (mg/l Cl)	4.9	0.9
Fluoride (mg/l F)	0.5	0.3
Sulphate (mg/l SO ₄)	95	12
Total Dissolved Solids (mg/l TDS)	333	137
Phenol Index (µg/l PhOH)	<10	41
Dissolved Organic Carbon (mg/l C)	<5	<5

Amount Leached		Council Decision 2003/33/EC Limit Values mg/kg at L:S 10:1		
		Inert Waste	Non-reactive Hazardous Waste	Hazardous Waste
2:1 mg/kg	10:1 mg/kg			
0.004	0.009	0.06	0.7	5
0.024	0.013	0.5	2	25
0.108	0.213	20	100	300
<0.0005	<0.0050	0.04	1	5
<0.0005	<0.005	0.5	10	70
0.002	0.006	2	50	100
<0.0005	<0.005	0.5	10	50
<0.00005	<0.00050	0.01	0.2	2
0.008	0.031	0.5	10	30
<0.0005	<0.005	0.4	10	40
<0.001	<0.0100	0.1	0.5	7
<0.0012	<0.012	4	50	200
9.8	11	800	15000	25000
1.0	3.4	10	150	500
190	178	1000	20000	50000
666	1497	4000	60000	100000
<0.02	<0.39	1		
<10	<50	500	800	1000

Waste Analysis	Units	Result			
Total Organic Carbon	% w/w	1.7	3%	5%	6%
Loss on Ignition	% w/w	2.8			10%
BTEX	mg/kg	<0.06	6		
PCBs (7 congeners)	mg/kg	<0.045	1		
Mineral Oil (C10 - C40)	mg/kg	44	500		
PAH (total)	mg/kg	0.80	100		
pH	pH units	8.7		>6	
Acid Neutralisation Capacity (pH4)	mol/kg	0.30		To be evaluated	
Acid Neutralisation Capacity (pH7)	mol/kg	0.06		To be evaluated	

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Comments

Authorised by:

Name: Samantha Rogerson

Report date:

21 June 2023

Position: Reporting Manager

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

Waste Acceptance Criteria Testing BS EN 12457-Part 3, 2 Stage Process

Sample Details

Contract Name Manchester City Academy,
Manchester, M11 4TQ

Lab Number 123338-7

Sample ID BH3 3.50m

Date Sampled 30 May 2023

Date Received 1 June 2023

Particle Size (<4mm) -

Method of size reduction N/A

Non-crushable matter N/A

Test Values

Mass of Raw Test Portion (MW) kg 0.210

Mass of Dried Test Portion (MD) kg 0.175

Moisture Content Ratio (MC) % 20.11

Dry Matter Content Ratio (DR) % 83.26

Leachant Volume (1) (L2) Litre 0.315

Leachant Volume (2) (L8) Litre 1.400

Eluate Volume (1) (VE1) Litre 0.110

Eluate Volume (2) (VE2) Litre 1.260

Eluate Analysis	Conc in Eluate	
Liquid : Waste Ratio	2:1	8:1
pH (units)	6.9	6.1
Temperature (°C)	20	20
Conductivity (µS/cm)	434	250
Antimony (µg/l Sb)	2.2	1.4
Arsenic (µg/l As)	4.8	1.6
Barium (µg/l Ba)	92	75
Cadmium (µg/l Cd)	0.6	< 0.5
Chromium (µg/l Cr)	< 0.5	< 0.5
Copper (µg/l Cu)	5.1	1.8
Lead (µg/l Pb)	0.6	< 0.5
Mercury (µg/l Hg)	< 0.05	< 0.05
Molybdenum (µg/l Mo)	144	34
Nickel (µg/l Ni)	3.9	1.3
Selenium (µg/l Se)	4	2
Zinc (µg/l Zn)	12.4	< 1.2
Chloride (mg/l Cl)	88	15
Fluoride (mg/l F)	0.6	<0.1
Sulphate (mg/l SO ₄)	2118	1554
Total Dissolved Solids (mg/l TDS)	330	190
Phenol Index (µg/l PhOH)	11	15
Dissolved Organic Carbon (mg/l C)	<5	<5

Amount Leached		Council Decision 2003/33/EC Limit Values mg/kg at L:S 10:1		
		Inert Waste	Non-reactive Hazardous Waste	Hazardous Waste
2:1 mg/kg	10:1 mg/kg			
0.004	0.015	0.06	0.7	5
0.010	0.018	0.5	2	25
0.184	0.761	20	100	300
0.0012	<0.0051	0.04	1	5
<0.0005	<0.005	0.5	10	70
0.010	0.020	2	50	100
0.001	<0.005	0.5	10	50
<0.00005	<0.00050	0.01	0.2	2
0.288	0.409	0.5	10	30
0.008	0.015	0.4	10	40
0.008	0.021	0.1	0.5	7
0.025	<0.019	4	50	200
176	195	800	15000	25000
1.3	<1.3	10	150	500
4236	15892	1000	20000	50000
660	1988	4000	60000	100000
0.02	0.15	1		
<10	<50	500	800	1000

Waste Analysis	Units	Result			
Total Organic Carbon	% w/w	3.9	3%	5%	6%
Loss on Ignition	% w/w	21.7			10%
BTEX	mg/kg	<0.06	6		
PCBs (7 congeners)	mg/kg	<0.045	1		
Mineral Oil (C10 - C40)	mg/kg	32	500		
PAH (total)	mg/kg	0.98	100		
pH	pH units	9.1		>6	
Acid Neutralisation Capacity (pH4)	mol/kg	2.88		To be evaluated	
Acid Neutralisation Capacity (pH7)	mol/kg	0.44		To be evaluated	

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Comments

Authorised by:



Name: Samantha Rogerson

Report date:

21 June 2023

Position: Reporting Manager

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

Waste Acceptance Criteria Testing BS EN 12457-Part 3, 2 Stage Process

Sample Details

Contract Name Manchester City Academy,
Manchester, M11 4TQ

Lab Number 123338-8

Sample ID BH4 1.00m

Date Sampled 30 May 2023

Date Received 1 June 2023

Particle Size (<4mm) -

Method of size reduction N/A

Non-crushable matter N/A

Test Values

Mass of Raw Test Portion (MW) kg 0.216

Mass of Dried Test Portion (MD) kg 0.175

Moisture Content Ratio (MC) % 23.35

Dry Matter Content Ratio (DR) % 81.07

Leachant Volume (1) (L2) Litre 0.309

Leachant Volume (2) (L8) Litre 1.400

Eluate Volume (1) (VE1) Litre 0.170

Eluate Volume (2) (VE2) Litre 1.280

Eluate Analysis	Conc in Eluate	
Liquid : Waste Ratio	2:1	8:1
pH (units)	8.6	7.2
Temperature (°C)	20	20
Conductivity (µS/cm)	591	319
Antimony (µg/l Sb)	8.4	9.9
Arsenic (µg/l As)	11.1	3.8
Barium (µg/l Ba)	27	53
Cadmium (µg/l Cd)	< 0.5	< 0.5
Chromium (µg/l Cr)	3.8	1.8
Copper (µg/l Cu)	133	34.4
Lead (µg/l Pb)	< 0.5	< 0.5
Mercury (µg/l Hg)	< 0.05	< 0.05
Molybdenum (µg/l Mo)	49	9
Nickel (µg/l Ni)	30.0	7.2
Selenium (µg/l Se)	17	4
Zinc (µg/l Zn)	< 1.2	< 1.2
Chloride (mg/l Cl)	41	5.7
Fluoride (mg/l F)	0.5	0.3
Sulphate (mg/l SO ₄)	49	46
Total Dissolved Solids (mg/l TDS)	449	242
Phenol Index (µg/l PhOH)	18	<10
Dissolved Organic Carbon (mg/l C)	19	<5

Amount Leached		Council Decision 2003/33/EC Limit Values mg/kg at L:S 10:1		
		Inert Waste	Non-reactive Hazardous Waste	Hazardous Waste
2:1 mg/kg	10:1 mg/kg			
0.017	0.098	0.06	0.7	5
0.022	0.045	0.5	2	25
0.054	0.505	20	100	300
<0.0005	<0.0050	0.04	1	5
0.008	0.020	0.5	10	70
0.266	0.440	2	50	100
<0.0005	<0.005	0.5	10	50
<0.00005	<0.00050	0.01	0.2	2
0.098	0.129	0.5	10	30
0.060	0.094	0.4	10	40
0.034	0.053	0.1	0.5	7
<0.0012	<0.012	4	50	200
82	91	800	15000	25000
1.1	3.5	10	150	500
98	464	1000	20000	50000
898	2625	4000	60000	100000
0.04	<0.11	1		
37	<63	500	800	1000

Waste Analysis	Units	Result			
Total Organic Carbon	% w/w	2.0	3%	5%	6%
Loss on Ignition	% w/w	4.4			10%
BTEX	mg/kg	<0.06	6		
PCBs (7 congeners)	mg/kg	<0.045	1		
Mineral Oil (C10 - C40)	mg/kg	99	500		
PAH (total)	mg/kg	60.0	100		
pH	pH units	10.7		>6	
Acid Neutralisation Capacity (pH4)	mol/kg	1.50		To be evaluated	
Acid Neutralisation Capacity (pH7)	mol/kg	0.40		To be evaluated	

Disclaimer: The Landfill Waste Acceptance Criteria limits in this report are provided for guidance only and values are transcribed from the Council Decision annex 2003/33/EC. Chemtech Environmental Ltd does not take responsibility for any errors or omissions in the transcription, and all data should be verified by the end user. Results will be colour flagged to the lowest threshold value breached. Any assessments made are based on the published results from the Laboratory and make no assessment of uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. Method uncertainty levels can be provided. Waste Acceptance Criteria assessment is outside the scope of the laboratory's UKAS accreditation. Moisture Content Calculated on Wet Weight Basis

Comments

Authorised by:

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Report date:

21 June 2023

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Statement of Conformity

Where Chemtech reports a statement of conformity to a specification, the decision rules applied are derived from the Ilac document ILAC G8:09/2019.

Acceptance limits (AL), applied are derived from the tolerance limits (TL) by you the client or applicable standard (e.g. 2003.33.EC Council Decision, BS3882, BS8601)

Agreed and reported Decision Rule:

"PASS" if the result < TL, and the bias / precision values for the process meet the targets defined within the methodology and/or applied accreditation.

Reported Decisions:

Result < TL for determinands: PASS

Result > TL for determinands: FAIL

Definitions Used:

Acceptance limit (AL) Specified upper or lower bounds of permissible measured quantity values.

Tolerance limit (TL) Specified upper or lower bound of permissible values of a property.