Norfolk Partnership Laboratory
Part of the Norse Group

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Site Investigation including Quantitative Risk Assessment
Wolsey House Motors
Millway Lane
Diss
Norfolk
104056
March 2023

Client:
Mr D Pearcey
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Wortham
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IP22 1SL

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Mr D Pearcey	1 copy
Norfolk Partnership Laboratory	1 copy

1.0 Introduction

1.1 General

This site investigation was carried out Wolsey House Motors in the parish of Wortham, Diss, Suffolk (OSGR 609453,278604). The area under consideration is a former garage workshop which is presently used for storage. Mr D Pearcey instructed Norfolk Partnership Laboratory (NPL) to carry out the work, on an email dated 27 February 2023 after acceptance of Norfolk Partnership Laboratory's quotation. NPL provides a service within Norse Eastern Ltd.

This report should be read in conjunction with the following report:

1) Desk Study and Risk Assessment, Wolsey House Wortham, Diss, Norfolk ref: 101220 dated November 2020 by Norfolk Partnership Laboratory.

This investigation and risk assessment has been carried out to the requirements of The Environmental Protection Act Part IIA. This report also considers the health and safety of construction workers and subsequent site users that may be affected due to any soil contamination.

It is proposed to convert the existing building to a detached single storey residential dwelling with associated garden and parking area.

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

Although every effort has been made to give a true assessment of the condition of the site, it is possible that different ground conditions may exist in parts of the site that is neither recorded nor visible.

1.2 Report objectives

The objectives of these works are to assess contamination sources, pathways, and receptors, and to determine whether any contamination may be present either within the site boundaries or just outside the site. The report also assesses the extent to which human health, buildings and services and controlled waters may be affected. If contamination is thought likely to be present, recommendations will be made to ascertain the level of contamination and if these levels are within allowable limits.

1.3 Site location

The site is located to the south of Millway Lane in Wortham, Suffolk. (OSGR 609453,278604). The site is located approximately 2.60 kilometres to the southwest of Diss town centre.

A site location plan is in Appendix A.

1.4 Site layout

The development area is roughly rectangular in shape, relatively level, and approximately 0.04 hectare in area. A spot height of 34.1 metres is shown on the Ordnance Survey close to the site.

1.5 Planning application

The site is subject to the planning conditions of Babergh and Mid Suffolk Council planning ref: DC/20/03389.

2.0 Review and Summary of Previous Reports

2.1 Desk Study and Risk Assessment, Wolsey House Wortham, Diss, Norfolk ref: 101220 dated November 2020.

A walkover survey was undertaken by Mr I Brown of NPL on 23 October 2020.

The site is accessed from Millway Lane on to a gravel drive. A piped surface water ditch runs parallel to the northern boundary through the site at the front. The building to be converted is constructed from timber and blockwork with a pan tiled roof. Four vehicles are parked on the land in front of the building which is the garden area of the proposed development. A number of vehicles are also located to the east which is the shared access drive to the proposed development. Adjacent to the south of the former garage workshop is a timber shed which will be demolished, the area will be used for vehicle parking. Adjacent to the south is a brick and steel clad more recent workshop building which has been occupied since 2004. A number of vehicles are parked close to the western boundary which is outside of the proposals. Inside the former garage workshop building is a stored vehicle and a number of tyres and general related tools etc. The workshop has no inspection pit. No fuel was sold from the site consequently no underground tanks are present.

Historic Mapping

No Enclosure or Tithe Map exists for the site area.

On the 1886 OS Map the site appears to be occupied by a number of small buildings although this is unclear. A building is present to the east with a pond to the south. Although unnamed it resembles Wolsey House which occupies the site presently. Low Water Lane and Union Lane are annotated to the north. Hartsmere School (workhouse) is also present to the north. The surrounding land is predominantly agricultural. Ling Farm and Wortham Hall are both annotated to the west.

The 1904 OS Map is clearer and shows two rectangular buildings present on the site. One is at the front of the site on the western side and the other is smaller and located centrally to the rear. Allotment land is present to the north west.

No significant changes are shown on the 1927 OS Map. Wortham House to the north has been renamed The Homestead.

No changes of significance are shown on the 1936 or 1953 1:10560 OS Map or the 1958 1:10000 OS Map.

On the 1977 OS Map the site resembles how it appears presently with three small rectangular buildings present on the site. Off site to the south a larger rectangular structure is shown. Wolsey House is present to the east with the pond shown to the south. A duck farm is present to the north.

On the 1988 aerial photograph the site remains as described above. The gravel drive is visible in the north as is the workshop building. The image is not detailed but it is clear a number of vehicles are present off site to the south. Wolsey House can be seen to the east.

No further changes of significance to the site are shown on the 1995, 2000 or 2020 OS Maps.

2.1.1 Potential sources of contamination

Historical land use indicates that the site has had a potentially contaminative past use as a garage workshop from 1984 to 2004. A number of potential pollutants are identified in the Department of the Environment Industry profiles. The profile for road vehicle fuelling service and repair, garages and filling stations was considered partially relevant to the site. After visual examination of the site and reviewing information from the desk study the following have been identified as potential pollution sources.

a) Historical use as a garage workshop.

b) Spillages and leaks from onsite parked vehicles.

c) Spillages and leaks from offsite parked vehicles.

d) Offsite garage and workshop to the south.

These have a variety of potential pollution linkages.

2.1.2 Conclusions

The study area has had a potentially contaminative past use as a garage for vehicle servicing, however, more recently the site has been used for the storing of classic cars and tools and equipment. The workshop building has an intact concrete floor and no inspection pit and once cleared of equipment should be a low risk to the construction worker and residential end user. The proposals are to convert the structure using the existing footprint reducing greatly the necessity to break ground.

It was noted that four vehicles were parked on the site in the area designated as the garden as well as a number of vehicles were parked offsite close to the western boundary. From this, there is a possibility that these vehicles or others which have been parked there historically have leaked oil or related fluids into the surface and near surface soils.

The business was moved to the workshop in 2004 and a minor oil storage is present within the building.

The risk level associated with the above risks were deemed as Low Risk – (considered conceivable but unlikely).

2.1.3 Recommendations

NPL recommend that in the proposed front garden area where vehicles are currently parked the existing soil is removed and disposed of to a suitably licensed facility.

The excavated area should be to a depth of 600mm below the proposed finished ground level. At this point a representative of NPL should inspect the formation soils to ensure that no visible or olfactory signs of contamination are present. Sampling will be undertaken for contamination testing if required.

The garden area should then be replenished with either 600mm of certified clean topsoil or 300mm of certified clean subsoil and 300mm of clean certified topsoil.

All imported topsoil and subsoil should be certified free from contaminants and be transported under a conveyance note system.

2.2 Further works undertaken within the site

No further work has been undertaken since the issue of the previous Desk Study and Risk Assessment.

2.3 Intended future use of the site

It is proposed to convert the existing building to a detached single storey residential dwelling.

2.4 Planning applications or permissions at the site

The site is subject to the planning conditions of Babergh and Mid Suffolk Council planning ref: DC/20/03389.

2.5 Geology

The geology of the region may be summarised as follows:

Pleistocene	:	Lowestoft Formation
	:	Ingham Sand and Gravel formation
Cretaceous	:	Upper Chalk

Upper Chalk is a soft white or off white limestone that contains flints. Chalk was deposited in a warm sea close to a low lying landmass that remained free from the deposition of detritus for a long period of time. The chalk dips at a very shallow angle to the east. The surface of the chalk is thought to be 30 metres above ordnance survey datum in the area of the site.

Ingham Sand and Gravel Formation encompasses fluvial, lacustrine and organic deposits of the pre-glacial Bytham River. Deposits of four separate terrace levels are recognized as members of the formation. Commonly a basal fine to coarse-grained sandy gravel is overlain by fine- to coarse-grained pebbly sands, with few clay and silt beds. The gravels contain a high proportion of rounded pebbles of grey and purple quartzite, vein quartz, flint derived from the local chalk. There are traces of chalk and of igneous and metamorphic rocks. Recognised over a wide area of central East Anglia, from the Lark Valley in the west, to Knettishall in the valley of the Little Ouse, and along the valley of the Waveney to the North Sea coast at Pakefield and Kessingland. Thicknesses can be up to 13 metres.

The Lowestoft Formation forms an extensive sheet of chalky till, together with outwash sands and gravels, silts and clays. The till is characterised by its chalk and flint content. The deposit overlies a large range of Mesozoic, Palaeogene, Neogene and early Pleistocene bedrock formations, and in eastern East Anglia also overlies the older glacigenic Happisburgh Formation. The tills within the Lowestoft Formation typically contain a significantly higher percentage of chalk than the underlying tills. Thickness of the deposit is extremely variable, thickest in buried valleys where locally up to 60 metres may be present. Thick accumulations are also more generally present beneath much of northern Essex and south Suffolk.

A geology report is included in Appendix B of this report.

2.6 Hydrogeology and Hydrology

According to the Regional Hydrogeology Map of Southern East Anglia, the Chalk is the principal aquifer for the area. The estimated minimum hydrostatic level of the Chalk water table in the vicinity of the site is approximately 30 metres above Ordnance Survey Datum.

The site is approximately 34 metres above Ordnance Survey Datum therefore the groundwater is approximately 4.00 metres below the site.

The site falls within the Environment Agency total catchment Zone 3 for groundwater source protection. An outer Zone 2 is present approximately 1 kilometre to the west with an inner Zone 1 approximately 1.50 kilometres to the west.

The site is not within the Environment Agency Flood Zones.

According to the BGS Flood map the site is within an area with the potential for groundwater flooding to occur at the surface.

The superficial Lowestoft Formation is secondary undifferentiated in terms of aquifer designation.

The bedrock Chalk is designated a principal aquifer.

A surface water ditch is present at the front of the site (piped).

3.0 Risk Assessment

3.1 Conceptual Model

The known or perceived sources of contamination and pollution linkages are assessed in this section. The conceptual model is realised here in tabulated form.

3.2 Sources of contamination

Historical land use indicates that the site has had a potentially contaminative past use as a garage workshop from 1984 to 2004. A number of potential pollutants are identified in the Department of the Environment Industry profiles. The profile for road vehicle fuelling service and repair, garages and filling stations was considered partially relevant to the site. After visual examination of the site and reviewing information from the desk study the following have been identified as potential pollution sources.

a) Historical use as a garage workshop.

b) Spillages and leaks from onsite parked vehicles.

c) Spillages and leaks from offsite parked vehicles.

d) Offsite garage and workshop to the south.

These have a variety of potential pollution linkages.

3.3 Pollution Linkages

Each of the potential contaminants may have a number of pollution linkages. Each of these linkage types has a number of potential pathways.

i) Surface soil linkages
   a) Direct contact ingestion or absorption
   b) Indirect contact ingestion or absorption
   c) Leaching to groundwater

ii) Subsurface soil linkages
   a) Direct contact ingestion or absorption
   b) Indirect contact ingestion or absorption
   c) Leaching to groundwater

iii) Surface water linkages
   a) Direct contact ingestion or absorption
   b) Indirect contact ingestion or absorption
   c) Percolation to groundwater

iv) Groundwater linkages
   a) Direct contact ingestion or absorption
   b) Indirect contact ingestion or absorption

v) Airborne linkages
   a) Vapour intrusion into confined / indoor spaces
   b) Inhalation or absorption of particulates
   c) Inhalation or absorption of volatile compounds

3.4 Receptors

Several potential receptors exist. These can be broadly grouped as:

i) Construction Worker
ii) Future Resident
iii) Trespasser
iv) Local population
v) Flora and fauna
vi) Buildings
vii) Surface Water
viii) Groundwater

For each source, the linkage type, pathway and potential receptors can be identified. A level of risk if no action is taken can then be assigned to each of these linkages. The level of risk has been divided into six categories as follows

Very Low Risk – Considered very unlikely or impossible
Low Risk – Considered conceivable but unlikely
Medium Risk – Considered possible but unusual
High Risk – Considered probable i.e. about 50% chance
Very High Risk – Considered that it is to be expected to happen
Certainty – Considered that it will happen

Note: These risks are related to the probability of an event happening. They do not relate to the severity of the effects on human health or flora and fauna nor the financial consequences if the event should happen.

3.4.1 Historical use as a garage workshop

Linkage type	Pathway	Receptor	Risk
Surface soil linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Resident	Low
		Trespasser	Low
		Flora and fauna	Low
	Direct contact	Surface water	Low
	Indirect contact ingestion or absorption	Resident	Low
Subsurface soil linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Resident	Low
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
	Indirect contact ingestion or absorption	Resident	Low
	Leaching to groundwater	Local population	Low
		Flora and fauna	Low
		Construction Worker	Low
		Groundwater	Low
Surface water linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Resident	Low
		Trespasser	Low
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
		Surface water	Low
	Percolation to groundwater	Local population	Low
		Flora and fauna	Low
		Groundwater	Low
Groundwater linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Local population	Low
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
		Groundwater	Low
	Indirect contact ingestion or absorption	Local population	Low
		Flora and fauna	Low
Airborne linkage	Inhalation of particulates	Construction Worker	Low
		Resident	Low
		Trespasser	Low
		Flora and fauna	Low
		Local population	Low
	Inhalation of volatile compounds	Construction Worker	Low
		Resident	Low
		Trespasser	Low
		Flora and fauna	Low
		Local population	Low
	Vapour intrusion into indoor spaces	Resident	Low
		Local population	Low

3.4.2 Spillages and leaks from onsite parked vehicles

Linkage type	Pathway	Receptor	Risk
Surface soil linkage	Direct contact ingestion or absorption	Construction Worker	Medium
		Resident	Medium
		Trespasser	Low
		Flora and fauna	Low
	Direct contact	Surface water	Medium
	Indirect contact ingestion or absorption	Resident	Medium
Subsurface soil linkage	Direct contact ingestion or absorption	Construction Worker	Medium
		Resident	Medium
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
	Indirect contact ingestion or absorption	Resident	Low
	Leaching to groundwater	Local population	Low
		Flora and fauna	Low
		Construction Worker	Low
		Groundwater	Low
Surface water linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Resident	Low
		Trespasser	Low
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
		Surface water	Low
	Percolation to groundwater	Local population	Low
		Flora and fauna	Low
		Groundwater	Low
Groundwater linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Local population	Low
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
		Groundwater	Low
	Indirect contact ingestion or absorption	Local population	Low
		Flora and fauna	Low
Airborne linkage	Inhalation of particulates	Construction Worker	Low
		Resident	Low
		Trespasser	Low
		Flora and fauna	Low
		Local population	Low
	Inhalation of volatile compounds	Construction Worker	Low
		Resident	Low
		Trespasser	Low
		Flora and fauna	Low
		Local population	Low
	Vapour intrusion into indoor spaces	Resident	Low
		Local population	Low

3.4.3 Spillages and leaks from offsite parked vehicles

Linkage type	Pathway	Receptor	Risk
Surface soil linkage	Direct contact ingestion or absorption	Construction Worker	Medium
		Resident	Medium
		Trespasser	Low
		Flora and fauna	Low
	Direct contact	Surface water	Medium
	Indirect contact ingestion or absorption	Resident	Medium
Subsurface soil linkage	Direct contact ingestion or absorption	Construction Worker	Medium
		Resident	Medium
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
	Indirect contact ingestion or absorption	Resident	Low
	Leaching to groundwater	Local population	Low
		Flora and fauna	Low
		Construction Worker	Low
		Groundwater	Low
Surface water linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Resident	Low
		Trespasser	Low
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
		Surface water	Low
	Percolation to groundwater	Local population	Low
		Flora and fauna	Low
		Groundwater	Low
Groundwater linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Local population	Low
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
		Groundwater	Low
	Indirect contact ingestion or absorption	Local population	Low
		Flora and fauna	Low
Airborne linkage	Inhalation of particulates	Construction Worker	Low
		Resident	Low
		Trespasser	Low
		Flora and fauna	Low
		Local population	Low
	Inhalation of volatile compounds	Construction Worker	Low
		Resident	Low
		Trespasser	Low
		Flora and fauna	Low
		Local population	Low
	Vapour intrusion into indoor spaces	Resident	Low
		Local population	Low

3.4.4 Offsite garage and workshop to the south

Linkage type	Pathway	Receptor	Risk
Surface soil linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Resident	Low
		Trespasser	Low
		Flora and fauna	Low
	Direct contact	Surface water	Low
	Indirect contact ingestion or absorption	Resident	Low
Subsurface soil linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Resident	Low
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
	Indirect contact ingestion or absorption	Resident	Low
	Leaching to groundwater	Local population	Low
		Flora and fauna	Low
		Construction Worker	Low
		Groundwater	Low
Surface water linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Resident	Low
		Trespasser	Low
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
		Surface water	Low
	Percolation to groundwater	Local population	Low
		Flora and fauna	Low
		Groundwater	Low
Groundwater linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Local population	Low
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
		Groundwater	Low
	Indirect contact ingestion or absorption	Local population	Low
		Flora and fauna	Low
Airborne linkage	Inhalation of particulates	Construction Worker	Low
		Resident	Low
		Trespasser	Low
		Flora and fauna	Low
		Local population	Low
	Inhalation of volatile compounds	Construction Worker	Low
		Resident	Low
		Trespasser	Low
		Flora and fauna	Low
		Local population	Low
	Vapour intrusion into indoor spaces	Resident	Low
		Local population	Low

4.0 Recommendations for Site Investigation

4.1 Stage I Conclusion

Based upon the information contained herein it is recommended no intrusive investigation is required for the development.

It is recommended that in the proposed front garden area where vehicles are currently parked the existing soil is removed and disposed of to a suitably licensed facility.

The excavated area should be to a depth of 600mm below the proposed finished ground level. At this point a representative of NPL should inspect the formation soils to ensure that no visible or olfactory signs of contamination are present. Sampling will be undertaken for contamination testing if required.

The garden area should then be replenished with either 600mm of certified clean topsoil or 300mm of certified clean subsoil and 300mm of clean certified topsoil.

All imported topsoil and subsoil should be certified free from contaminants and be transported under a conveyance note system.

4.2 Consultation with Local authority

Following the review of the Stage I desk study and contamination risk assessment report, Environmental Protection at Babergh and Mid Suffolk Council responded under reference EP Reference : 283583 requesting that further investigation was required to justify the proposed remediation strategy.

5.0 Site Investigation

5.1 Investigation Objectives

The aim of this investigation is to determine whether any contamination exists on the site by targeting the potential sources areas documented in the Desk Study. In the event of contamination being found then it should be quantified as far as possible.

5.2 Preparatory Enabling Works

No preparatory enabling works were required on the site.

5.3 Works undertaken

On 8 March 2023, eight window sample holes were drilled to a maximum depth of 3.00 metres.

The locations of these excavations are shown on the plan in Appendix B.

5.4 Site Sampling Strategy

Disturbed samples were taken from the window sample holes in accordance with BS 5930:2015. The number and depths of these samples encountered are set out in Appendix C of this report.

5.5 In-situ and Geotechnical Testing

The following test was undertaken at the laboratory to assist classification of the soils and to determine their physical properties. Norfolk Partnership Laboratory is a UKAS testing laboratory No. 0920.

Location	Depth (m)	Test
WS08	1.50	Determination of liquid limit to BS 1377:PT 2: 1990 Cone Penetrometer (definitive method) (withdrawn) and determination of Plasticity Index to BS137-2:1990 (withdrawn)

5.6 Pollution prevention measures

No pollution prevention measures were required on this site. No material was removed except for samples for testing. Due diligence was employed to prevent any possible cross contamination of material. Window Sample holes were backfilled with bentonite.

6.0 Analytical Strategy

The following samples were tested for the parameters shown. The samples were sent to Envirolab, Cheshire for analysis. Envirolab is a UKAS accredited laboratory, No.1247.

6.1 *Soil*

	Depth (m)	Tests
WS01	0.10	Asbestos Screen, Speciated TPH to WGC UK
WS02	0.05	Asbestos screen
WS03	0.20	Speciated TPH to WGC UK
WS04	0.30	Suite SB
WS05	0.30	Suite SB
WS06	0.30	Speciated TPH to WGC UK, Suite SB
WS07	0.30	Speciated TPH to WGC UK
WS08	0.30	Speciated TPH to WGC UK

Suite SB = General contamination suite including testing for: Total Sulphate, Boron, Water Soluble, Arsenic, Cadmium, Chromium III, Chromium VI, Copper, Lead, Mercury, Nickel, Selenium, Zinc, Acid Soluble Sulphide, Phenols (Monohydric), Total Cyanide, Elemental Sulphur, pH Value, PAH Total, Speciated PAH, Soil Organic Matter (SOM).

6.2 *Water*

No groundwater was encountered during this investigation.

7.0 Investigation Results

7.1 Ground conditions

7.1.1 Made Ground

Made Ground was recorded as the surface deposit in all the window sample holes. The deposit comprised predominantly of gravelly, fine to coarse sand. The gravel content was fine to coarse chalk, flint, brick, concrete, and mortar. Colours recorded included light greyish brown, greyish brown and dark greyish brown. The thickness of the Made Ground deposit varied from 0.15 metre in WS04, 05, 06 and 08 up to 0.55 metre in WS03.

More detail can be found on the window sample logs in Appendix C.

7.1.2 Head

Head deposits were encountered in all window sample locations below the Made Ground. The deposit comprised mainly of silty, fine to medium sand. Colours included greyish brown, dark greyish brown, and greenish grey. The thickness of the deposit ranged from 0.50 metre in WS03 up to 1.05 metres in WS08. The base of this deposit was proven at a maximum depth of 1.20 metres.

More detail can be found on the window sample logs in Appendix C.

7.1.3 Lowestoft Till

The Lowestoft Till was identified below the Head deposits in all the window sample holes. The deposit generally comprised a firm silty, gravelly, clay and silty clay. Colours recorded included light grey, light greyish brown, light brown, and orangey brown. Clast content ranged from none to gravelly fine to coarse, sub-angular to sub-rounded flint and chalk. The thickness of the deposit ranged from 1.80 metres in WS08 to 2.00 metres in WS02. The base of this deposit was not proven in all the window sample holes at a maximum depth of 3.00 metres.

More detail can be found on the window sample logs in Appendix C.

According to NHBC Standards Chapter 4.3, Table 2 the Lowestoft Till can generally be treated as type of ground 3 and 4. Due to the variable nature strip footings would require examination after excavation to ensure an appropriate footing was used.

The minimum width (mm) of the strip footing in relation to total load should be according to the table shown below. Problems could possibly occur with the excavation of pipe runs or manholes in these materials.

NHBC Standards Chapter 4.3 Table 2

	Type of ground (including engineered fill)	Condition of ground	Field test applicable	Total load of load-bearing walling not more than (kN/linear metre)					
				20	30	40	50	60	70
				Minimum width of strip foundation (mm)					
1	**Rock**	Not inferior to sandstone, limestone or firm chalk	Requires at least a pneumatic or other mechanically operated pick for excavation.	Equal to the width of the wall plus 50mm each side.					
2	**Gravel Sand**	Medium dense	Requires pick for excavation. Wooden peg 50mm square in cross-section is hard to drive beyond 150mm.	250	300	400	500	600	650
3	**Clay Sandy clay**	Stiff	Can be indented slightly by thumb.	250	300	400	500	600	650
4	**Clay Sandy clay**	Firm	Thumb makes impression easily.	300	350	450	600	750	850
5	**Sand Silty sand Clayey sand**	Loose	Can be excavated with a spade. Wooden peg 50mm square in cross-section can be easily driven.	400	600	Does not fall within the provisions of this guidance where the total load exceeds 30 kN/linear m.			
6	**Silt Clay Sandy clay Clay or silt**	Soft	Finger can be pushed in up to 10mm.	450	650				
7	**Silt Clay Sandy clay Clay or silt**	Very soft	Finger can be easily pushed in up to 25mm.	Refer to specialist advice.					

The determination of Liquid Limit to BS1377-2 1990 Cone Penetrometer and determination of Plasticity Index to BS1377-2 1990 was undertaken at the laboratory on one sample. The results are tabulated below.

Hole ID	Depth (mbgl)	Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Modified PI (%)
WS08	1.50	13	33	13	20	18

The sample from WS08 at 1.50 metres was classified as a clay of low plasticity in accordance with BS1377. NHBC Standards Chapter 4.2 table 4B (where planting is outside the zone of influence) classifies the material as having a low volume change potential. This depth may need to be increased in the vicinity of any proposed planting and in areas where trees are present adjacent the site. Depths should be increased in line with NHBC Standards Chapter 4.2.

7.1.4 Lewes Nodular Chalk Formation

No Lewes Nodular Chalk Formation was identified during this investigation.

7.2 Groundwater conditions

No groundwater strikes were recorded during the drilling of the window sample holes.

7.3 Geoenvironmental test results summary

The samples indicated in Section 6.0 were sent to Envirolab, Cheshire for analysis. Envirolab is a UKAS accredited laboratory, No.1247.

These samples were tested for the contaminants of concern noted in sections 6.1. The test results are included in Appendix D.

7.4 Contamination

7.4.1 Soil

All the results were found to below the C4SL's, Atkins ATRISK and LQM/CIEH S4UL's threshold values for residential with the consumption of home grown produce land use, with 1% soil organic matter with the exception of one speciated TPH result.

The result for Aromatic C8-C10 of 17 mg/kg in WS01 at 0.10 metre is over the Atkins ATRISK threshold value of 14.8 mg/kg.

8.0 Quantitative Risk Assessment

8.1 Risk Assessment Objectives

The objective of the quantitative risk assessment is to revisit the preliminary risk assessment in the light of information obtained during the site investigation and thus reassess the validity of the model.

8.2 Proposed Development

It is proposed to convert the existing building to a detached single storey residential dwelling with associated garden and parking area.

8.3 Revised Conceptual Model

Referring to the original risk assessment in Section 3.0 the following potentially contaminative linkages were present.

a) Historical use as a garage workshop.

b) Spillages and leaks from onsite parked vehicles.

c) Spillages and leaks from offsite parked vehicles.

d) Offsite garage and workshop to the south.

8.4 Risk assessment rationale

Where available levels of potential contaminants were compared to C4SL's, Atkins ATRISK and LQM/CIEH S4UL's threshold values to assess human health risk.

To assess the risk to buildings and services the WRAS documentation and BRE Special Digest 1 were used. These are specialist documents that focus on a particular target.

8.5 Exposure scenario

8.5.1 Historical use as a garage workshop

Linkage type	Pathway	Receptor	Risk
Surface soil linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Future Resident	Low
		Trespasser	Low
		Flora and fauna	Low
	Direct contact	Surface water	Low
	Indirect contact ingestion or absorption	Future Resident	Low
Subsurface soil linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Future Resident	Low
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
	Indirect contact ingestion or absorption	Future Resident	Low
	Leaching to groundwater	Local population	Low
		Flora and fauna	Low
		Construction Worker	Low
		Groundwater	Low
Surface water linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Future Resident	Low
		Trespasser	Low
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
		Surface water	Low
	Percolation to groundwater	Local population	Low
		Flora and fauna	Low
		Groundwater	Low
Groundwater linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Local population	Low
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
		Groundwater	Low
	Indirect contact ingestion or absorption	Local population	Low
		Flora and fauna	Low
Airborne linkage	Inhalation of particulates	Construction Worker	Low
		Future Resident	Low
		Trespasser	Low
		Flora and fauna	Low
		Local population	Low
	Inhalation of volatile compounds	Construction Worker	Low
		Future Resident	Low
		Trespasser	Low
		Flora and fauna	Low
		Local population	Low
	Vapour intrusion into indoor spaces	Future Resident	Low
		Local population	Low

8.5.2 Spillages and leaks from onsite parked vehicles

Linkage type	Pathway	Receptor	Risk
Surface soil linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Future Resident	Low
		Trespasser	Low
		Flora and fauna	Low
	Direct contact	Surface water	Low
	Indirect contact ingestion or absorption	Future Resident	Low
Subsurface soil linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Future Resident	Low
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
	Indirect contact ingestion or absorption	Future Resident	Low
	Leaching to groundwater	Local population	Low
		Flora and fauna	Low
		Construction Worker	Low
		Groundwater	Low
Surface water linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Future Resident	Low
		Trespasser	Low
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
		Surface water	Low
	Percolation to groundwater	Local population	Low
		Flora and fauna	Low
		Groundwater	Low
Groundwater linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Local population	Low
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
		Groundwater	Low
	Indirect contact ingestion or absorption	Local population	Low
		Flora and fauna	Low
Airborne linkage	Inhalation of particulates	Construction Worker	Low
		Future Resident	Low
		Trespasser	Low
		Flora and fauna	Low
		Local population	Low
	Inhalation of volatile compounds	Construction Worker	Low
		Future Resident	Low
		Trespasser	Low
		Flora and fauna	Low
		Local population	Low
	Vapour intrusion into indoor spaces	Future Resident	Low
		Local population	Low

8.5.3 Spillages and leaks from offsite parked vehicles

Linkage type	Pathway	Receptor	Risk
Surface soil linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Future Resident	Low
		Trespasser	Low
		Flora and fauna	Low
	Direct contact	Surface water	Low
	Indirect contact ingestion or absorption	Future Resident	Low
Subsurface soil linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Future Resident	Low
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
	Indirect contact ingestion or absorption	Future Resident	Low
	Leaching to groundwater	Local population	Low
		Flora and fauna	Low
		Construction Worker	Low
		Groundwater	Low
Surface water linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Future Resident	Low
		Trespasser	Low
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
		Surface water	Low
	Percolation to groundwater	Local population	Low
		Flora and fauna	Low
		Groundwater	Low
Groundwater linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Local population	Low
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
		Groundwater	Low
	Indirect contact ingestion or absorption	Local population	Low
		Flora and fauna	Low
Airborne linkage	Inhalation of particulates	Construction Worker	Low
		Future Resident	Low
		Trespasser	Low
		Flora and fauna	Low
		Local population	Low
	Inhalation of volatile compounds	Construction Worker	Low
		Future Resident	Low
		Trespasser	Low
		Flora and fauna	Low
		Local population	Low
	Vapour intrusion into indoor spaces	Future Resident	Low
		Local population	Low

8.5.4 Offsite garage and workshop to the south

Linkage type	Pathway	Receptor	Risk
Surface soil linkage	Direct contact ingestion or absorption	Construction Worker	Medium
		Future Resident	Low
		Trespasser	Low
		Flora and fauna	Low
	Direct contact	Surface water	Low
	Indirect contact ingestion or absorption	Future Resident	Low
Subsurface soil linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Future Resident	Low
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
	Indirect contact ingestion or absorption	Future Resident	Low
	Leaching to groundwater	Local population	Low
		Flora and fauna	Low
		Construction Worker	Low
		Groundwater	Low
Surface water linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Future Resident	Low
		Trespasser	Low
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
		Surface water	Low
	Percolation to groundwater	Local population	Low
		Flora and fauna	Low
		Groundwater	Low
Groundwater linkage	Direct contact ingestion or absorption	Construction Worker	Low
		Local population	Low
		Flora and fauna	Low
	Direct contact	Buildings and services	Low
		Groundwater	Low
	Indirect contact ingestion or absorption	Local population	Low
		Flora and fauna	Low
Airborne linkage	Inhalation of particulates	Construction Worker	Low
		Future Resident	Low
		Trespasser	Low
		Flora and fauna	Low
		Local population	Low
	Inhalation of volatile compounds	Construction Worker	Low
		Future Resident	Low
		Trespasser	Low
		Flora and fauna	Low
		Local population	Low
	Vapour intrusion into indoor spaces	Future Resident	Low
		Local population	Low

8.6 Assessment criteria

The assessment criterion used is for residential with the consumption of homegrown produce land use using 1% SOM.

CLEA v1.06, C4SL's, Atkins ATRISK and LQM/CIEH S4ULs models were used to assess human health risk and determine allowable values for any contaminants present.

To assess the risk to buildings and services the WRAS documentation and BRE Special Digest 1 were used. These are specialist documents that focus on a particular target.

8.7 Constraints and limitations

The CLEA model is limited to published data. These assessing criteria only apply to human health and do not assess risk to groundwater.

Atkins AT**RISK**^{soil} SSV data was derived to use where CLEA guidance was not available. AT**RISK**^{soil} SSV was derived using toxicological data inputted into BP RISC 4.0.

The WRAS, CIRIA and BRE documents are specific to the target receptor.

8.8 Risk to controlled waters

According to the Regional Hydrogeology Map of Southern East Anglia, the Chalk is the principal aquifer for the area. The estimated minimum hydrostatic level of the Chalk water table in the vicinity of the site is approximately 30 metres above Ordnance Survey Datum.

The site is approximately 34 metres above Ordnance Survey Datum therefore the groundwater is approximately 4.00 metres below the site.

The site is thought to represent a Low Risk – (considered conceivable but unlikely) to the groundwater beneath the site.

8.9 Effects on Human Health

The testing undertaken during this investigation has indicated that the site generally poses a low risk. If the works discussed in Section 9.0 are undertaken the site will be suitable for the proposed end use and the site will pose an insignificant risk to the end user.

8.10 Effects on buildings and services

The site poses a low risk to buildings and services.

The Sulphate (water sol 2:1) levels was <0.01 g/l for all samples tested.

The pH values ranged from 7.77 to 7.99.

8.11 Uncertainties

There is a risk that contamination may exist in areas not investigated.

8.12 Risk Evaluation

With current knowledge this site represents a low risk to human health, buildings, and services and to controlled waters.

9.0 Recommendations

It is concluded that no further investigation works are required within the site.

With respect to the marginally elevated Aromatic C8-C10 at a depth of 0.10 metre in WS01 highlighted in Section 7.4.1. This area is proposed to be parking spaces. This area will be excavated and removed from site as part of the construction process which will see the new parking area created with a minimum of 300mm of construction material.

It is recommended the garden area is reduced by a minimum of 300mm below the existing site levels to ensure the removal of all the Made Ground. The Made Ground ranges in depth from 0.15 metre in WS05 and WS06 up to 0.25 metre in WS07. The garden area should then be reconstructed with a minimum depth of 300mm of certified contaminant free Topsoil and be transported under a conveyance note system.

It should also be stressed that if any possibly contaminated material is discovered during the development, then Babergh and Mid Suffolk Council, and Norfolk Partnership Laboratory should be informed immediately.

10.0 References

DEFRA: Contaminated Land exposure assessment “CLEA Version 1.04:2009"

Environment Agency: R&D Publication 20; Methodology for the derivation of remedial targets for soil and groundwater to protect water resources: 1999.

Environment Agency: Technical advice to third parties on the pollution of controlled waters for part IIA: 2002.

Environment Agency: Guidance on Requirements for Land Contamination Reports; July 2005.

Environment Agency website.

RAIS website.

WRAS Information and Guidance Note No 9-04-03, Issue 1: The Selection of Materials for Water Supply Pipes to be Laid in Contaminated Land: October 2002.

CIRIA Report 149: Protecting Development from Methane: 1995.

CIRIA C665 Assessing risks posed by hazardous ground gases to buildings, 2007.

BRE Special Digest 1: Concrete in aggressive ground, 3rd Edition: 2005.

Atkins ATRISK SSV's derived using CLEA Version 1.06.

NHBC Standards January 2019.

NHBC Technical Extra October 2014, Issue 15.

BS 1377: 1990; Soils for Civil Engineering Purposes.

BS 5930:2015 incorporating amendment A1:2020; Code of practice for Site Investigations.

BS 10175: 2011; Investigation of potentially contaminated sites – Code of practice.

LQM/CIEH S4ULs for Human Health Risk Assessment.

Norfolk Partnership Laboratory

Site Investigation Section

This report was prepared under the direction of

Head of Laboratory Services

I D Brown

Author of report

Assistant Engineer

J Price

Date: 31/03/2023

Appendix A

Wortham Ling

Norfolk County Council

Tom McCabe
Executive Director of
Community and Environmental Services
Norfolk County Council
County Hall, Martineau Lane
Norwich NR1 2SG

DRAWING TITLE
104056 Wortham, Wolsey House Motors
Site Investigation
Site Location Plan

REV.	DESCRIPTION	DRAWN BY	CHECKED	DATE

	INITIALS	DATE
SURVEYED BY	OS	03/23
DESIGNED BY	JP	03/23
DRAWN BY	JP	03/23
CHECKED BY	IDB	03/23

DRAWING No. 104056-001
PROJECT TITLE Wortham, Wolsey House Motors Site Investigation
SCALE 1: 2500 @A3
FILE No. 104056

ORIGINAL SIZE: A3

IG 12/10/16

Appendix B

Norfolk County Council

Tom McCabe
Executive Director of
Community and Environmental Services
Norfolk County Council
County Hall, Martineau Lane
Norwich NR1 2SG

DRAWING TITLE
104056 Wortham, Wolsey House Motors
Site Investigation
WS Location Plan

REV.	DESCRIPTION	DRAWN BY	CHECKED	DATE

	INITIALS	DATE
SURVEYED BY	OS	03/23
DESIGNED BY	JP	03/23
DRAWN BY	JP	03/23
CHECKED BY	IDB	03/23

DRAWING No. 104056-002
PROJECT TITLE Wortham, Wolsey House Motors Site Investigation
SCALE 1: 250 @A3
FILE No. 104056

ORIGINAL SIZE: A3
IG 12/10/16

Appendix C

NORFOLK PARTNERSHIP LABORATORY

Window Sampler Log

Sheet 1 of 1

Scheme	Wortham Wolsey House Motors	Job No.	104056	WS No.	WS01
Carried out for	Wolsey House Motors	Date Started	08/03/2023	Date Finished	08/03/2023
Remarks:		Type of Rig	Premier 110	Logged by	DJ
		Depth (m)	3.00	Ground Level (m AOD)	Drawn by	JP
		Co-ords	609447 - 278604		Checked by	IDB

Backfill	Water	Casing	Description	Legend	Depth (m)	Scale	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	LL	PL	MPI	Org.	CBR
			MADE GROUND; comprising of dark greyish brown, silty, gravelly, fine to medium sand. Gravel is fine to coarse, sub-angular to sub-rounded chalk and flint. MADE GROUND												
			Dark greyish brown silty, fine SAND. HEAD		0.30			1							
			Greyish brown silty, fine to medium SAND with rare fine to medium, sub-angular to sub-rounded flint. HEAD		0.60										
			Firm light greyish brown silty CLAY. LOWESTOFT TILL		1.05	1.00									
			Firm light greyish brown and light brown gravelly, silty CLAY. Gravel is fine to coarse, sub-angular to sub-rounded chalk and flint. LOWESTOFT TILL		1.35			2							
						2.00									
								3							
					3.00	3.00									
						4.00									

NORFOLK PARTNERSHIP LABORATORY

Window Sampler Log

Sheet 1 of 1

Scheme	Wortham Wolsey House Motors	Job No.	104056	WS No.	WS02
Carried out for	Wolsey House Motors	Date Started	08/03/2023	Date Finished	08/03/2023
Remarks:		Type of Rig	Premier 110	Logged by	DJ
		Depth (m)	3.00	Ground Level (m AOD)	Drawn by	JP
		Co-ords	69443 - 278611		Checked by	IDB

Backfill	Water	Casing	Description	Legend	Depth (m)	Scale	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	LL	PL	MPI	Org.	CBR
			MADE GROUND; comprising of dark greyish brown, gravelly, fine to coarse sand. Gravel is fine to coarse, sub-angular to sub-rounded asphalt, flint, brick and concrete. MADE GROUND												
			Dark greyish brown silty, fine SAND. HEAD		0.25			1							
			Greyish brown silty, fine to medium SAND with rare fine to medium, sub-angular to sub-rounded flint. HEAD		0.80										
			Firm light greyish brown and light brown gravelly, silty CLAY. Gravel is fine to coarse, sub-angular to sub-rounded chalk and flint. LOWESTOFT TILL		1.00	1.00		2							
						2.00		3							
					3.00	3.00									
						4.00									

NORFOLK PARTNERSHIP LABORATORY

Window Sampler Log

Sheet 1 of 1

Scheme	Wortham Wolsey House Motors	Job No.	104056	WS No.	WS03
Carried out for	Wolsey House Motors	Date Started	08/03/2023	Date Finished	08/03/2023
Remarks:		Type of Rig	Premier 110	Logged by	DJ
		Depth (m)	3.00	Ground Level (m AOD)	Drawn by	JP
		Co-ords	609445 - 278622		Checked by	IDB

Backfill	Water	Casing	Description	Legend	Depth (m)	Scale	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	LL	PL	MPI	Org.	CBR
			MADE GROUND; comprising of dark greyish brown, silty, gravelly, sand. Gravel is fine to coarse, sub-angular to sub-rounded brick, flint and concrete. MADE GROUND												
			MADE GROUND; comprising of firm mottled light grey and greyish brown, gravelly, silty clay. Gravel is up to cobble sized brick, flint and mortar. MADE GROUND		0.25			1							
			Greenish grey soft, very sandy, silty CLAY. HEAD		0.55										
			Greyish brown silty, fine to medium SAND. HEAD		0.90										
			Firm mottled light greyish brown and orangey brown, silty CLAY. LOWESTOFT TILL		1.05	1.00									
			Firm becoming stiff, mottled light grey and light brown, gravelly, silty CLAY. Gravel is fine to coarse, sub-angular to sub-rounded chalk and flint. LOWESTOFT TILL		1.35			2							
						2.00									
								3							
					3.00	3.00									
						4.00									

NORFOLK PARTNERSHIP LABORATORY

Window Sampler Log

Sheet 1 of 1

Scheme	Wortham Wolsey House Motors	Job No.	104056	WS No.	WS04
Carried out for	Wolsey House Motors	Date Started	08/03/2023	Date Finished	08/03/2023
Remarks:		Type of Rig	Premier 110	Logged by	DJ
		Depth (m)	3.00	Ground Level (m AOD)	Drawn by	JP
		Co-ords	609448 - 278615		Checked by	IDB

Backfill	Water	Casing	Description	Legend	Depth (m)	Scale	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	LL	PL	MPI	Org.	CBR
			MADE GROUND; comprising of greyish brown, gravelly, fine to coarse sand. Gravel is fine to coarse, sub-angular to sub-rounded flint and concrete. MADE GROUND		0.15										
			Greyish brown silty, fine to medium SAND with rare fine to coarse, sub-angular to sub-rounded flint. HEAD					1							
			Greyish brown very clayey, silty, fine to medium SAND. HEAD		0.65										
			Bedded firm light greyish brown, silty CLAY, and light greyish brown sandy, silty CLAY. LOWESTOFT TILL *Lenses of fine to medium sand between 1.45 - 1.60 metres.*		1.05	1.00		2							
			Firm to stiff mottled light greyish brown and light brown, gravelly, silty CLAY. Gravel is fine to medium, sub-angular to sub-rounded chalk and flint. LOWESTOFT TILL		1.90	2.00		3							
					3.00	3.00									
						4.00									

NORFOLK PARTNERSHIP LABORATORY

Window Sampler Log

Sheet 1 of 1

Scheme	Wortham Wolsey House Motors	Job No.	104056	WS No.	WS05
Carried out for	Wolsey House Motors	Date Started	08/03/2023	Date Finished	08/03/2023
Remarks:		Type of Rig	Premier 110	Logged by	DJ
		Depth (m)	3.00	Ground Level (m AOD)	Drawn by	JP
		Co-ords	609451 - 278619		Checked by	IDB

Backfill	Water	Casing	Description	Legend	Depth (m)	Scale	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	LL	PL	MPI	Org.	CBR
			MADE GROUND; comprising of greyish brown gravelly, fine to coarse sand. Gravel is fine to coarse, sub-angular to sub-rounded flint and concrete.												
			MADE GROUND		0.15										
			Greyish brown silty, fine to medium SAND with rare fine to coarse, sub-angular to sub-rounded flint. HEAD					1							
			Soft to firm light greyish brown sandy, silty CLAY with rare fine to coarse, sub-angular to sub-rounded flint. LOWESTOFT TILL		1.05	1.00									
			Firm light greyish brown gravelly, silty CLAY. Gravel is fine to medium, sub-angular to sub-rounded chalk and flint. LOWESTOFT TILL		1.40			2							
			Becoming gravelly and very stiff between 2.40 - 3.00 metres.			2.00									
								3							
					3.00	3.00									
						4.00									

NORFOLK PARTNERSHIP LABORATORY

Window Sampler Log

Sheet 1 of 1

Scheme	Wortham Wolsey House Motors	Job No.	104056	WS No.	WS06
Carried out for	Wolsey House Motors	Date Started	08/03/2023	Date Finished	08/03/2023
Remarks:		Type of Rig	Premier 110	Logged by	DJ
		Depth (m)	3.00	Ground Level (m AOD)	Drawn by	JP
		Co-ords	609454 - 278622		Checked by	IDB

Backfill	Water	Casing	Description	Legend	Depth (m)	Scale	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	LL	PL	MPI	Org.	CBR
			MADE GROUND; comprising of greyish brown gravelly, fine to coarse sand. Gravel is fine to coarse, sub-angular to sub-rounded flint and concrete.												
			MADE GROUND		0.15										
			Greyish brown silty, fine to medium SAND with rare fine to coarse, sub-angular to sub-rounded flint. HEAD					1							
			Firm greyish brown slightly gravelly, sandy, silty CLAY. Gravel is fine to coarse, sub-angular to sub-rounded flint. LOWESTOFT TILL		1.05	1.00									
			Firm becoming light greyish brown, gravelly, silty CLAY. Gravel is fine to medium, sub-angular to sub-rounded chalk and flint. LOWESTOFT TILL		1.35			2							
						2.00									
								3							
					3.00	3.00									
						4.00									

NORFOLK PARTNERSHIP LABORATORY

Window Sampler Log

Sheet 1 of 1

Scheme	Wortham Wolsey House Motors	Job No.	104056	WS No.	WS07
Carried out for	Wolsey House Motors	Date Started	08/03/2023	Date Finished	08/03/2023
Remarks:		Type of Rig	Premier 110	Logged by	DJ
		Depth (m)	3.00	Ground Level (m AOD)	Drawn by	JP
		Co-ords	609454 - 278615		Checked by	IDB

Backfill	Water	Casing	Description	Legend	Depth (m)	Scale	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	LL	PL	MPI	Org.	CBR
			MADE GROUND; comprising of dark greyish brown, gravelly, clayey, silty, fine to coarse sand. Gravel is fine to coarse, sub-angular to sub-rounded brick, flint, coal and concrete. MADE GROUND												
			Light greyish brown clayey, silty, fine to coarse SAND with occasional fine to coarse, sub-angular to sub-rounded flint. HEAD		0.25			1							
			Firm light greyish brown, silty CLAY. LOWESTOFT TILL		1.10	1.00									
			Firm becoming stiff light greyish brown, gravelly, silty CLAY. Gravel is fine to medium, sub-angular to sub-rounded chalk and flint. LOWESTOFT TILL		1.30			2							
						2.00									
					3.00	3.00		3							
						4.00									

NORFOLK PARTNERSHIP LABORATORY

Window Sampler Log

Sheet 1 of 1

Scheme	Wortham Wolsey House Motors	Job No.	104056	WS No.	WS08
Carried out for	Wolsey House Motors	Date Started	08/03/2023	Date Finished	08/03/2023
Remarks:		Type of Rig	Premier 110	Logged by	DJ
		Depth (m)	3.00	Ground Level (m AOD)	Drawn by	JP
		Co-ords	609458 - 278613		Checked by	IDB

Backfill	Water	Casing	Description	Legend	Depth (m)	Scale	Sample Type	Sample No.	Field Tests	Laboratory Tests MC%	LL	PL	MPI	Org.	CBR
			MADE GROUND; comprising of light greyish brown, gravelly, silty, fine to medium sand. Gravel is fine to coarse, sub-angular to sub-rounded with flint with occasional brick fragments.												
			MADE GROUND		0.15										
			Light greyish brown clayey, silty, fine to coarse SAND with occasional fine to coarse, sub-angular to sub-rounded flint. HEAD					1							
						1.00									
			Firm light greyish brown silty CLAY. LOWESTOFT TILL		1.20										
			Firm becoming stiff light greyish brown, gravelly, silty CLAY. Gravel is fine to medium, sub-angular to sub-rounded chalk and flint. LOWESTOFT TILL		1.50			2							
						2.00									
								3							
					3.00	3.00									
						4.00									

Appendix D

envirolab
Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 23/02346
Issue Number: 1 **Date:** 21 March, 2023

Client: Norse Eastern Ltd t/a Norse Highways
280 Fifers Lane
Norwich
Norfolk
NR6 6EQ

Project Manager: Josh Thompson/Sharon Woods; Simon Holden
Project Name: Wortham, Wolsey House Motors
Project Ref: 104056
Order No: PN05056615
Date Samples Received: 14/03/23
Date Instructions Received: 14/03/23
Date Analysis Completed: 21/03/23

Approved by:

Richard Wong
Client Manager

Envirolab Job Number: 23/02346

Client Project Name: Wortham, Wolsey House Motors

Client Project Ref: 104056

Lab Sample ID	23/02346/1	23/02346/2	23/02346/3	23/02346/4	23/02346/5	23/02346/6	23/02346/7	Units	Limit of Detection	Method ref
Client Sample No	03135	03136	03137	03138	03139	031310	031311			
Client Sample ID	WS01	WS02	WS03	WS04	WS05	WS06	WS07			
Depth to Top	0.10	0.05	0.20	0.30	0.30	0.30	0.30			
Depth To Bottom										
Date Sampled	13-Mar-23	13-Mar-23	13-Mar-23	13-Mar-23	13-Mar-23	13-Mar-23	13-Mar-23			
Sample Type	Soil - D	Soil - D	Soil - D	Soil - D	Soil - D	Soil - D	Soil - D			
Sample Matrix Code	4AB	4AB	4A	1A	4	1	1			
% Stones >10mm$_A$	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	% w/w	0.1	A-T-044
pH$_D$[M#]	-	-	-	7.77	7.99	7.94	-	pH	0.01	A-T-031s
Sulphate (water sol 2:1)$_D$[M#]	-	-	-	<0.01	<0.01	<0.01	-	g/l	0.01	A-T-026s
Sulphate (acid soluble)$_D$[M#]	-	-	-	<200	<200	<200	-	mg/kg	200	A-T-028s
Cyanide (total)$_A$[M#]	-	-	-	<1	<1	<1	-	mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC$_A$	-	-	-	<0.2	<0.2	<0.2	-	mg/kg	0.2	A-T-050s
Sulphide$_A$	-	-	-	<5	<5	<5	-	mg/kg	5	A-T-043-s
Sulphur (elemental)$_D$[M#]	-	-	-	<5	<5	<5	-	mg/kg	5	A-T-029s
Organic Matter$_D$[M#]	-	-	-	0.7	0.5	0.4	-	% w/w	0.1	A-T-032s
Arsenic$_D$[M#]	-	-	-	4	6	3	-	mg/kg	1	A-T-024s
Boron (water soluble)$_D$[M#]	-	-	-	<1.0	2.8	<1.0	-	mg/kg	1	A-T-027s
Cadmium$_D$[M#]	-	-	-	<0.5	<0.5	<0.5	-	mg/kg	0.5	A-T-024s
Copper$_D$[M#]	-	-	-	6	7	6	-	mg/kg	1	A-T-024s
Chromium$_D$[M#]	-	-	-	10	13	11	-	mg/kg	1	A-T-024s
Chromium (hexavalent)$_D$	-	-	-	<1	<1	<1	-	mg/kg	1	A-T-040s
Lead$_D$[M#]	-	-	-	9	9	7	-	mg/kg	1	A-T-024s
Mercury$_D$	-	-	-	<0.17	<0.17	0.26	-	mg/kg	0.17	A-T-024s
Nickel$_D$[M#]	-	-	-	7	9	8	-	mg/kg	1	A-T-024s
Selenium$_D$[M#]	-	-	-	<1	<1	<1	-	mg/kg	1	A-T-024s
Zinc$_D$[M#]	-	-	-	39	33	29	-	mg/kg	5	A-T-024s

Envirolab Job Number: 23/02346

Client Project Name: Wortham, Wolsey House Motors

Client Project Ref: 104056

Lab Sample ID	23/02346/1	23/02346/2	23/02346/3	23/02346/4	23/02346/5	23/02346/6	23/02346/7	Units	Limit of Detection	Method ref
Client Sample No	03135	03136	03137	03138	03139	031310	031311			
Client Sample ID	WS01	WS02	WS03	WS04	WS05	WS06	WS07			
Depth to Top	0.10	0.05	0.20	0.30	0.30	0.30	0.30			
Depth To Bottom										
Date Sampled	13-Mar-23	13-Mar-23	13-Mar-23	13-Mar-23	13-Mar-23	13-Mar-23	13-Mar-23			
Sample Type	Soil - D	Soil - D	Soil - D	Soil - D	Soil - D	Soil - D	Soil - D			
Sample Matrix Code	4AB	4AB	4A	1A	4	1	1			
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_{D}^{\#}$	NAD	NAD	-	-	-	-	-			A-T-045
Asbestos Matrix (visual)$_{D}$	-	-	-	-	-	-	-			A-T-045
Asbestos Matrix (microscope)$_{D}$	-	-	-	-	-	-	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_{D}$	N/A	N/A	-	-	-	-	-			A-T-045

Envirolab Job Number: 23/02346

Client Project Name: Wortham, Wolsey House Motors

Client Project Ref: 104056

Lab Sample ID	23/02346/1	23/02346/2	23/02346/3	23/02346/4	23/02346/5	23/02346/6	23/02346/7	Units	Limit of Detection	Method ref
Client Sample No	03135	03136	03137	03138	03139	031310	031311			
Client Sample ID	WS01	WS02	WS03	WS04	WS05	WS06	WS07			
Depth to Top	0.10	0.05	0.20	0.30	0.30	0.30	0.30			
Depth To Bottom										
Date Sampled	13-Mar-23	13-Mar-23	13-Mar-23	13-Mar-23	13-Mar-23	13-Mar-23	13-Mar-23			
Sample Type	Soil - D	Soil - D	Soil - D	Soil - D	Soil - D	Soil - D	Soil - D			
Sample Matrix Code	4AB	4AB	4A	1A	4	1	1			
PAH-16MS										
Acenaphthene$_A^{M\#}$	-	-	-	<0.01	<0.01	<0.01	-	mg/kg	0.01	A-T-019s
Acenaphthylene$_A^{M\#}$	-	-	-	<0.01	<0.01	<0.01	-	mg/kg	0.01	A-T-019s
Anthracene$_A^{M\#}$	-	-	-	<0.02	<0.02	<0.02	-	mg/kg	0.02	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	-	-	-	<0.04	<0.04	<0.04	-	mg/kg	0.04	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	-	-	-	<0.04	<0.04	<0.04	-	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	-	-	-	<0.05	<0.05	<0.05	-	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	-	-	-	<0.05	<0.05	<0.05	-	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	-	-	-	<0.07	<0.07	<0.07	-	mg/kg	0.07	A-T-019s
Chrysene$_A^{M\#}$	-	-	-	<0.06	<0.06	<0.06	-	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	-	-	-	*<0.04*	*<0.04*	*<0.04*	-	mg/kg	0.04	A-T-019s
Fluoranthene$_A^{M\#}$	-	-	-	<0.08	<0.08	<0.08	-	mg/kg	0.08	A-T-019s
Fluorene$_A^{M\#}$	-	-	-	<0.01	<0.01	<0.01	-	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	-	-	-	<0.03	<0.03	<0.03	-	mg/kg	0.03	A-T-019s
Naphthalene $_A^{M\#}$	-	-	-	<0.03	<0.03	<0.03	-	mg/kg	0.03	A-T-019s
Phenanthrene$_A^{M\#}$	-	-	-	<0.03	<0.03	<0.03	-	mg/kg	0.03	A-T-019s
Pyrene$_A^{M\#}$	-	-	-	<0.07	<0.07	<0.07	-	mg/kg	0.07	A-T-019s
Total PAH-16MS$_A^{M\#}$	-	-	-	<0.08	<0.08	<0.08	-	mg/kg	0.01	A-T-019s

Envirolab Job Number: 23/02346

Client Project Name: Wortham, Wolsey House Motors

Client Project Ref: 104056

Lab Sample ID	23/02346/1	23/02346/2	23/02346/3	23/02346/4	23/02346/5	23/02346/6	23/02346/7	Units	Limit of Detection	Method ref
Client Sample No	03135	03136	03137	03138	03139	031310	031311			
Client Sample ID	WS01	WS02	WS03	WS04	WS05	WS06	WS07			
Depth to Top	0.10	0.05	0.20	0.30	0.30	0.30	0.30			
Depth To Bottom										
Date Sampled	13-Mar-23	13-Mar-23	13-Mar-23	13-Mar-23	13-Mar-23	13-Mar-23	13-Mar-23			
Sample Type	Soil - D	Soil - D	Soil - D	Soil - D	Soil - D	Soil - D	Soil - D			
Sample Matrix Code	4AB	4AB	4A	1A	4	1	1			
TPH UKCWG with Clean Up										
Ali >C5-C6$_A^{\#}$	<0.01	-	<0.01	-	-	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C6-C8$_A^{\#}$	<0.01	-	<0.01	-	-	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C8-C10$_A$	<10	-	<1	-	-	<1	<1	mg/kg	1	A-T-055s
Ali >C10-C12$_A^{M\#}$	<10	-	<1	-	-	<1	<1	mg/kg	1	A-T-055s
Ali >C12-C16$_A^{M\#}$	<10	-	<1	-	-	<1	<1	mg/kg	1	A-T-055s
Ali >C16-C21$_A^{M\#}$	<10	-	2	-	-	<1	<1	mg/kg	1	A-T-055s
Ali >C21-C35$_A^{M\#}$	369	-	44	-	-	<1	<1	mg/kg	1	A-T-055s
Ali >C35-C44$_A$	142	-	21	-	-	<1	<1	mg/kg	1	A-T-055s
Total Aliphatics$_A$	511	-	68	-	-	<1	<1	mg/kg	1	Calc-As Recd
Aro >C5-C7$_A^{\#}$	<0.01	-	<0.01	-	-	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C7-C8$_A^{\#}$	<0.01	-	<0.01	-	-	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C8-C10$_A$	17	-	2	-	-	<1	<1	mg/kg	1	A-T-055s
Aro >C10-C12$_A$	20	-	1	-	-	<1	<1	mg/kg	1	A-T-055s
Aro >C12-C16$_A$	40	-	2	-	-	<1	<1	mg/kg	1	A-T-055s
Aro >C16-C21$_A^{M\#}$	155	-	14	-	-	<1	<1	mg/kg	1	A-T-055s
Aro >C21-C35$_A^{M\#}$	553	-	139	-	-	<1	<1	mg/kg	1	A-T-055s
Aro >C35-C44$_A$	39	-	3	-	-	<1	<1	mg/kg	1	A-T-055s
Total Aromatics$_A$	824	-	162	-	-	<1	<1	mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C44)$_A$	1340	-	229	-	-	<1	<1	mg/kg	1	Calc-As Recd
BTEX - Benzene$_A^{\#}$	<0.01	-	<0.01	-	-	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Toluene$_A^{\#}$	<0.01	-	<0.01	-	-	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene$_A^{\#}$	<0.01	-	<0.01	-	-	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene$_A^{\#}$	<0.01	-	<0.01	-	-	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - o Xylene$_A^{\#}$	<0.01	-	<0.01	-	-	<0.01	<0.01	mg/kg	0.01	A-T-022s
MTBE$_A^{\#}$	<0.01	-	<0.01	-	-	<0.01	<0.01	mg/kg	0.01	A-T-022s

Envirolab Job Number: 23/02346

Client Project Name: Wortham, Wolsey House Motors

Client Project Ref: 104056

Lab Sample ID	**23/02346/8**							**Units**	**Limit of Detection**	**Method ref**
Client Sample No	**031312**									
Client Sample ID	**WS08**									
Depth to Top	**0.30**									
Depth To Bottom										
Date Sampled	**13-Mar-23**									
Sample Type	**Soil - D**									
Sample Matrix Code	**1**									
% Stones >10mm$_A$	**<0.1**							**% w/w**	**0.1**	**A-T-044**

Envirolab Job Number: 23/02346

Client Project Name: Wortham, Wolsey House Motors

Client Project Ref: 104056

Lab Sample ID	23/02346/8							Units	Limit of Detection	Method ref
Client Sample No	031312									
Client Sample ID	WS08									
Depth to Top	0.30									
Depth To Bottom										
Date Sampled	13-Mar-23									
Sample Type	Soil - D									
Sample Matrix Code	1									
TPH UKCWG with Clean Up										
Ali >C5-C6$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s
Ali >C6-C8$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s
Ali >C8-C10$_A$	<1							mg/kg	1	A-T-055s
Ali >C10-C12$_A^{M\#}$	<1							mg/kg	1	A-T-055s
Ali >C12-C16$_A^{M\#}$	<1							mg/kg	1	A-T-055s
Ali >C16-C21$_A^{M\#}$	<1							mg/kg	1	A-T-055s
Ali >C21-C35$_A^{M\#}$	<1							mg/kg	1	A-T-055s
Ali >C35-C44$_A$	<1							mg/kg	1	A-T-055s
Total Aliphatics$_A$	<1							mg/kg	1	Calc-As Recd
Aro >C5-C7$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s
Aro >C7-C8$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s
Aro >C8-C10$_A$	<1							mg/kg	1	A-T-055s
Aro >C10-C12$_A$	<1							mg/kg	1	A-T-055s
Aro >C12-C16$_A$	<1							mg/kg	1	A-T-055s
Aro >C16-C21$_A^{M\#}$	<1							mg/kg	1	A-T-055s
Aro >C21-C35$_A^{M\#}$	<1							mg/kg	1	A-T-055s
Aro >C35-C44$_A$	<1							mg/kg	1	A-T-055s
Total Aromatics$_A$	<1							mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C44)$_A$	<1							mg/kg	1	Calc-As Recd
BTEX - Benzene$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s
BTEX - Toluene$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s
BTEX - m & p Xylene$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s
BTEX - o Xylene$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s
MTBE$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.
The results reported herein relate only to the material supplied to the laboratory.
The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and interpretations expressed are outside the scope of our accreditation.
If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.
A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis.
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample, 9 = INCINERATOR ASH.
Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,
E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.
US indicates Unsuitable Sample for analysis.
NDP indicates No Determination Possible.
NAD indicates No Asbestos Detected.
N/A indicates Not Applicable.
Superscript # indicates method accredited to ISO 17025.
Superscript "M" indicates method accredited to MCERTS.
Subscript "A" indicates analysis performed on the sample as received.
Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve
Subscript "^" indicates analysis has dependant options against results. Testing dependant on results appear in the comments area of your sample receipt.
EPH CWG results have humics mathematically subtracted through instrument calculation
TPH results "with Cleanup" indicates results cleaned up with Silica during extraction

EPH CWG GCxGC ID from TPH CWG

Where we have identified humic substances in any ID's from TPH CWG with Clean Up please note that the concentration of these humic substances is not included in the quantified results and are included in the ID for information.

Please contact us if you need any further information.

v2

Envirolab Analysis Dates

Lab Sample ID	23/02346/1	23/02346/2	23/02346/3	23/02346/4	23/02346/5	23/02346/6	23/02346/7	23/02346/8
Client Sample No	03135	03136	03137	03138	03139	031310	031311	031312
Client Sample ID/Depth	WS01 0.10m	WS02 0.05m	WS03 0.20m	WS04 0.30m	WS05 0.30m	WS06 0.30m	WS07 0.30m	WS08 0.30m
Date Sampled	13/03/23	13/03/23	13/03/23	13/03/23	13/03/23	13/03/23	13/03/23	13/03/23
A-T-019s				20/03/2023	20/03/2023	20/03/2023		
A-T-022s	17/03/2023		17/03/2023			17/03/2023	17/03/2023	17/03/2023
A-T-024s				17/03/2023	17/03/2023	17/03/2023		
A-T-026s				17/03/2023	17/03/2023	17/03/2023		
A-T-027s				17/03/2023	17/03/2023	17/03/2023		
A-T-028s				17/03/2023	17/03/2023	17/03/2023		
A-T-029s				20/03/2023	20/03/2023	20/03/2023		
A-T-031s				20/03/2023	20/03/2023	20/03/2023		
A-T-032s				20/03/2023	20/03/2023	20/03/2023		
A-T-040s				17/03/2023	17/03/2023	17/03/2023		
A-T-042sTCN				16/03/2023	16/03/2023	16/03/2023		
A-T-043-s				16/03/2023	16/03/2023	16/03/2023		
A-T-044	16/03/2023		16/03/2023	16/03/2023	16/03/2023	16/03/2023	16/03/2023	16/03/2023
A-T-045	15/03/2023	15/03/2023						
A-T-050s				20/03/2023	20/03/2023	20/03/2023		
A-T-055s	21/03/2023		21/03/2023			21/03/2023	21/03/2023	21/03/2023
Calc-As Recd	21/03/2023		21/03/2023			21/03/2023	21/03/2023	21/03/2023

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

Appendix E

Norfolk Partnership Laboratory
Part of the Norse Group

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Wolsey House Motors
FAO Danny Pearcey
Millway
Wortham
Diss
Norfolk
IP22 1SL

dan@wolseyhousemotors.co.uk

Our Reference No.	NNPL2023031313
Our Project No	104056
Your Sample Ref	D31313
Your Project or Order No.	Dan Pearcey 28/02/
Date Report Issued	29 Mar 2023

Determination of Liquid Limit to BS1377-2:1990 Cl 4.3 Cone Penetrometer (Definitive Method) (Withdrawn) and Determination of Plasticity Index to BS1377-2:1990 Cl 5 (Withdrawn)

Scheme	Wortham, Wolsey House Motors		
Location	WS08	**Depth**	1.5m
Date sampled	13 Mar 2023	**Date received**	13 Mar 2023
Sampled by	DJ (NPL Staff)	**Date tested**	20 Mar 2023
Sample type	Small disturbed sample	**Sample Mass (g)**	642

If a sample certificate was provided, it is available for inspection. The accuracy of any information provided by third parties cannot be guaranteed. These results only relate to the sample tested.

Material	Soil		
Description	Firm becoming stiff light greyish brown, gravelly, silty CLAY. Gravel is fine to medium, sub-angular to sub-rounded chalk and flint.		
Supplier	Not applicable	**Source**	Ex site

Test Specimen

Location	Not applicable
Orientation	Not applicable

Preparation Details

Method of Division	Quartering
Preparation Method	Wet sieving
Retained 425µm (%)	10.4

Natural MC (%)	13	
Drying Temp. (ºC)	105-110	
Liquid Limit (%)	33	
Plastic Limit (%)	13	
Plasticity Index (%)	20	
Modified PI *(%)	18	*BRE Digest 240:1993.
		This calculation is outside the scope of UKAS accreditation.
BS Soil Classification	**CL**	

Remarks NHBC Volume change potential classification is low.

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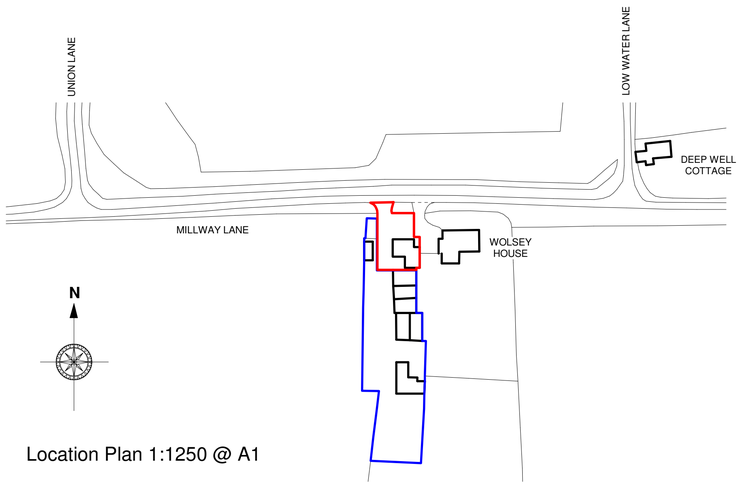
Please be aware that we only report compliance with specifications using 'simple acceptance' as a guide as the specifications for the material as well as the methodology for testing are well established and take into account uncertainty in their formulation.

Test Code =604

UKAS TESTING 0920

Jim Elliott (Lead Technical Support Tech.)

Appendix F



Location Plan 1:1250 @ A1

Proposed Site Plan 1:100 @ A1

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WOLSEY HOUSE MOTORS, MILLWAY LANE, WORTHAM, DISS, IP22 1SL.

PROPOSED SITE PLAN

Proposed Residential Conversion at Wolsey House Motors, Millway Lane, Wortham, Diss, Suffolk, IP22 1SL.
For Wolsey House Motors Ltd
Date: March 2020 Scale: 1:1250, 1:100 Dwg No. TL-4395-20-1
Proposed Site Plan

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