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investigate design resolve

PHASE 1 – DESK STUDY AND PRELIMINARY RISK ASSESSMENT

FOR A PROPOSED MIXED USE DEVELOPMENT

AT

MARRIOTT'S PARK, TAVERHAM, NORFOLK, NR8 6HL

Prepared For

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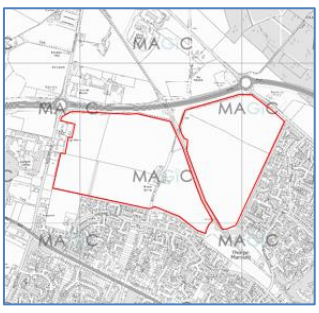
Report Reference Number:	3551,EC,AR,DS/DESK/LT,GF/28-11-18/V1
Project Number:	3551,EC,AR,DS
Issue Number:	1
Issue Date:	28 November 2018





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DOCUMENT ISSUED RECORD

Report Number:	3551,EC,AR,DS/DESK/LT,GF/28-11-18/V1
Client:	M Scott Properties Ltd
Project:	Marriott's Park, Taverham, Norfolk, NR8 6HL
Project Number:	3551,EC,AR,DS
Report Type:	Phase 1 – Desk Study and Preliminary Risk Assessment
Date of Report:	28 November 2018

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REVISION RECORD

Revision	Date	Document	Prepared By:	Admin

AMENDMENT RECORD

Revision	Date	Amendments

EXECUTIVE SUMMARY

Project Details	Geosphere Environmental Ltd was commissioned by M Scott Properties Ltd, to undertake a Phase 1 Preliminary Risk Assessment at the Marriott's Park, Taverham, Norfolk, NR8 6HL. It was understood that the site is to be developed into residential neighbourhoods with a new primary school, a sports site and associated infrastructure.
Site Location / Description	The subject site was situated in Taverham approximately 8km to the north west of Norwich and may be located by National Grid Reference (NGR) 615950 315110. At the time this report was prepared, the site was agricultural land with associated farm buildings.
Geology	The geological map indicated the site to be underlain predominantly by superficial deposits of the Sheringham Cliffs Formation which comprises of sand and gravel. A small proportion of the site is underlain by Alluvium superficial deposits. The superficial deposits were underlain by Chalk Bedrock Formations. Although not indicated as present upon the site, the possibility that Made Ground was present, could not be discounted.
Hydrogeology	The hydrogeological data provided within the Envirocheck Report indicate both Secondary Aquifer Type A and Type B overlying a bedrock Principal Aquifer. The site was located within a 'Zone III' (Total Catchment) groundwater source protection zone i.e. it was within the total area required to support the discharge from a protected groundwater source.
Hydrology	The Envirocheck reported an unidentified surface watercourse on site, this is likely to be the former pond located within a cluster of trees at Breck Farm which was found to be dry upon inspection. The site was not located within a river or tidal flood area and was not likely to be subject to flood warnings.
History	The information about the former uses of the site, indicated that the site has remained agricultural with some minor changes to the buildings associated with Breck Farm. One pond which was detailed on site is no longer present, having potentially been infilled.
Conceptual Model	Based upon the findings of the preliminary risk assessment and walkover, it has been assessed that the former and present uses of the site may result in potential contamination likely to pose risks to human health and/or Controlled Waters.
Recommendations	It is recommended that the following works are undertaken: Ground investigation, including ground gas/groundwater monitoring; a geotechnical investigation for foundation design of any proposed structures; a demolition and refurbishment asbestos survey of the existing structures due for any structural alterations.

This Executive Summary only provides a summary of the site data and its assessment. It does not provide a definitive engineering analysis and is for guidance only. It is recommended that the reader reviews the report in its entirety and any material referenced therein.

CONTENTS

CONTENTS

APPENDICES

TABLES

Page No.

1. INTRODUCTION

Geosphere Environmental Ltd was commissioned by M Scott Properties Limited, to undertake a Phase 1 Desk Study and Preliminary Risk Assessment for a proposed mixed-use development at Marriott's Park, Taverham, Norfolk, NR8 6HL.

It was understood that the site is to be developed into residential neighbourhoods with a new primary school, a sports site and associated infrastructure.

The primary objectives of the preliminary risk assessment are to:

- Provide an assessment of environmental sensitivity at the site and the surrounding area in relation to any suspected or known contamination which may significantly affect the site and the proposed development; and
- Indicate whether further works are required, and the nature of the works, to enable a more complete assessment of the site.

These are to be achieved by:

- Undertaking a walkover of the site;
- Researching and assessing the available information regarding the current site status, recorded geology, hydrogeology and hydrology of the site and surrounding area, and details of the history of the site; and
- Develop a Conceptual Site Model.

There was no development plan available at the time of writing this report.

2. SITE SETTINGS

2.1 Site Description

The subject site was situated in Taverham, approximately 8km to the north west of Norwich and may be located by National Grid Reference (NGR) 615950 315110.

A Site Location Plan, is shown in Figure 1 below:

Figure 1 – Site Location Plan

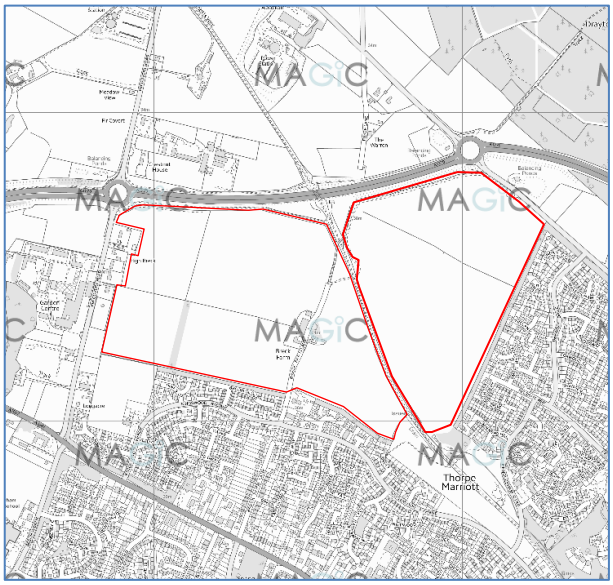


Figure 2 – Site Plan

The site is approximately 80 ha (hectares) and predominantly comprised of arable land separated into two parcels by Marriott's Way road. The land was split into seven arable and grazing fields separated by hedgerows, two of these were horse paddocks and the other five were being used for crop production.

In the centre of the development site was Breck Farm, located along Breck Farm Lane, which comprised of two residential properties and several outbuildings and barns. Two of the barns within the farm comprised of corrugated asbestos, the other buildings consisted of stone and brick. Towards the north of the farm there was a padlocked metal well structure likely to be used for irrigation purposes.

In addition to Breck Farm Lane, there were two hardstanding gravel tracks on site. One was located in the north west adjacent to the site boundary and the other linked the eastern and western site parcels, cutting through Marriott's Way.

The wider area comprised of residential developments to the south and the east. A row of residential properties bordered the west of the site, beyond which was a commercial business area. The A1270 road was located adjacent to the north of the site.

Phase 1 Walkover Plan with site photographs, Drawing ref. 3551,CE,AR,DS/007/Rev 0 detailing the locations of the findings from the site walkover is included in Appendix 7.

2.2 Site Walkover

A walkover survey of the site was carried out on 14 November 2018. The site walkover was conducted in accordance with CLR 2, (ref. **R.6**).

Relevant information from the site walkover has been described in subsection 2.1 above and in addition to the information already detailed, the following observations are considered relevant to this study:

- There is a potential for Made Ground indicated by concrete hardstanding on site; and
- Potentially Asbestos Containing Materials within several of the barns associated with Breck Farm.

2.3 Geological Setting

Details of the geology underlying the site have been obtained from the British Geological Survey (BGS) map at a scale of 1:50,000, which is provided within the Envirocheck Report.

The geological map indicated the site to be underlain predominantly by superficial deposits of the Sheringham Cliffs Formation which comprises of sand and gravel. A small proportion of the site is underlain by Alluvium superficial deposits, comprising of clay, silt, sand and gravel.

The superficial deposits were underlain by Chalk Bedrock Formations.

Table 1 below, summarises the factors that may have a potential impact upon the engineering of the proposed development:

Table 1 – Geohazards and Ground Workings

Potential Hazard	Recorded Risk [m] / [Direction]			Comments
	On-site	Within 250m	Within 500m	
Shrink Swell Clay	Very Low	-	-	-
Ground Dissolution	Low	-	-	-
Compressible Deposits	-	-	-	-
Collapsible Deposits	Very Low	-	-	-
Landslides	Very Low	-	-	-
Running Sands	Very Low	-	-	-
Ground Dissolution	Low	-	-	-

2.4 Hydrogeological Setting

The hydrogeological data provided within the Envirocheck Report indicate both Secondary Aquifer Type A and Type B overlying a bedrock Principal Aquifer.

The Environment Agency (ref. **R.17**) defines Principal Aquifer as 'these layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale'.

A Secondary Aquifer Type A is defined as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.

A Secondary Aquifer Type B is defined as predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.

The groundwater vulnerability map and Envirocheck Report, indicates the soil to be of high leaching potential. Soils of high leaching potential are soils that readily transmit liquid discharges because they are either shallow or susceptible to rapid by-pass flow directly to rock, gravel or groundwater.

The site was located within a 'Zone III' (Total Catchment) groundwater source protection zone i.e. it was within the total area required to support the discharge from a protected groundwater source.

There was one groundwater abstraction well located on site, used for agricultural and domestic purposes, this is likely to be the well identified during the walkover. There were numerous groundwater abstraction wells within 1km of the site. The closest of which was situated approximately 96m to the north of the site and was used for general farming and domestic use.

2.5 Hydrological Setting

The Envirocheck reported an unidentified surface watercourse on site, this is likely to be the former pond located within a cluster of trees at Breck Farm which was found to be dry upon inspection.

The nearest river is the River Wensum located 1.5km to the south of the site. There was no available river quality classification data for this watercourse.

The site was not located within a river or tidal flood area and was not likely to be subject to flood warnings.

2.6 Radon

The HPA 'Indicative Atlas of Radon' 2007 (ref**. R.3**), indicates the site to lie within an area where there is a probability of <1% of present or future homes being above the action level of 200Bq/m^3. As such, the site is not classified as a Radon Affected Area. This is confirmed by the Building Research Establishment, Report 211, 2007, (ref. **R.4**).

3. ENVIRONMENTAL SEARCHES

3.1 Environmental Searches Summary

The environmental searches are detailed fully within the Envirocheck Report presented within Appendix 4. Table 2 shown below, summarises the most relevant findings:

Table 2 - Environmental Searches Summary

Activity	Distance From The Site			Comments [m]/[direction]
	On-site	Within 250m	250m to 500m	
1. Incidents and Registers				
Red List Discharge Consents	-	-	-	
Dangerous Substances Inventory Sites – List 1	-	-	-	
Dangerous Substances Inventory Sites – List 2	-	-	-	
Radioactive Substances	-	-	-	
COMAH and NIHHS sites	-	-	-	
Environment Agency Recorded Pollution Incidents	-	1	-	68m/SW – Category 3 Inert Suspended Solids
IPPC	-	-	-	
Discharge Consents	-	3	1	29m/N - Unknown 103m/W – Sewage and Trade 115m/W – Sewage and Trade 345m/SE - Unknown
Sites Determined as Contaminated Land under Part IIA EPA1990	-	-	-	
2. Landfills and Waste Treatment / Disposal Sites				
Registered Landfill Site	-	-	-	
Historical Landfills	-	-	-	
Non-operational Landfills	-	-	-	
BGS - Landfill	-	-	-	
3. Contemporary Trade Entries of Concern				
Industrial Sites	-	3	4	46m/N – Active Motor Engineers 61m/N – Active Garage Services 138m/W – Inactive Garage Services 307m/SE – Inactive Coal Merchants 321m/SE – Inactive Oil & Gas Exploration Services 399m/S – Inactive Agricultural Machinery Sales and Service 475m/SE – Active Garage Services
Fuel Sites	-	-	2	467m/S - Inactive 492m/SE - Active

Table 2 - Environmental Searches Summary				
Activity	Distance From The Site			Comments [m]/[direction]
	On-site	Within 250m	250m to 500m	
Electrical Substations	-	-	-	
Other	-	-	-	
4. Designed Environmentally Sensitive Sites				
Sites of Special Scientific Interest (SSSI)	-	-	-	
National Nature Reserves (NNR)	-	-	-	
Local Nature Reserves (LNR)	-	-	-	
Areas of Outstanding Natural Beauty and Scenic Areas	-	-	-	
Green Belt Areas	-	-	-	
Special Areas of Conservation	-	-	-	
Special Protection Areas	-	-	-	
Environmentally Sensitive Areas (DEFRA)	-	-	-	

3.2 Nitrate Vulnerable Zone

The site was located within an area designated as a nitrate vulnerable zone. The Nitrates Directive, (ref. **R.7**) defines a nitrate vulnerable zone as:

- Surface freshwater which contains or could contain, if preventative action is not taken, nitrate concentrations greater than 50mg/l;
- Groundwater which contains or could contain, if preventative action is not taken, nitrate concentrations greater than 50mg/l; and
- Natural freshwater lakes or other freshwater bodies, estuaries, coastal waters and marine waters, which are eutrophic or may become so in the near future if protective action is not taken.

4. SITE HISTORY

4.1 Historical Maps

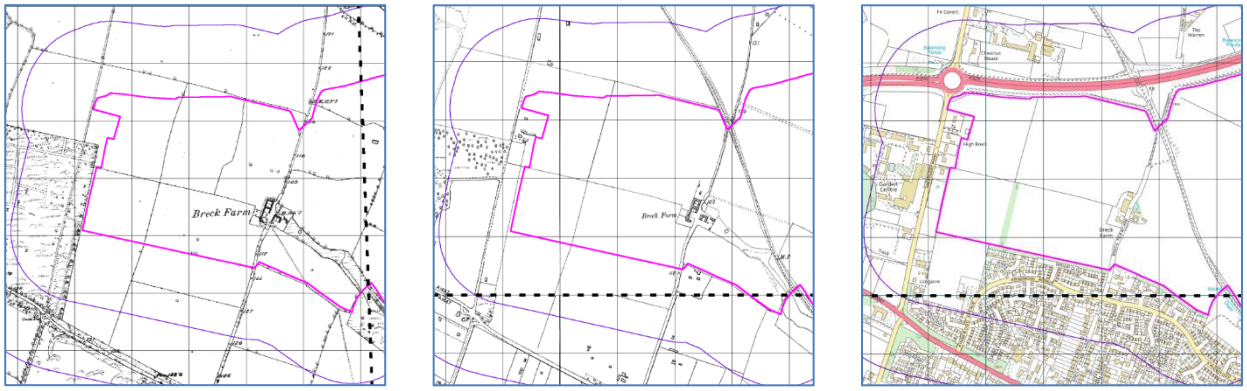
A review of the history of the site has been conducted based upon readily available large scale (1:1056 / 1:2500) historical maps provided by Landmark Information Group. The most significant changes are detailed in Table 3 below and the historical ordnance survey maps are included in Appendix 5:

Table 3 - Historical Summary

Date	Potentially Contaminative Land Uses / Significant Changes	
	On-site [Direction]	Off-site [Distance/Direction]
1882 - 1884	○ The site appeared to be largely consistent with its current configuration with Breck Farm located in the centre of the site alongside Breck farm Lane and the surrounding area being arable land ○ There was an area of rough pasture stretching east from Breck Farm and extending off-site. There was a pond depicted on site within this area.	○ The surrounding area was predominantly arable land and woodland plantations. ○ Eastern and Midlands Railway depicted as running along the gap which separates the two parcels of the site ○ 430m/NW, 770m/SE, 900m/W, 920m/SW, 1km/S – Pits ○ 1.3km/S – Taverham Mill
1906 - 1908	○ A new pond was noted adjacent to Breck Farm Lane	○ 557m/W, 718m/SE, 872m/SE – Wells noted ○ The previous railway became the Midland and Great Northern Joint Railway ○
1938	○ No significant changes of note	○ No significant changes of note
1957	○ Two new structures noted just north of Breck Farm	○ Four buildings depicted adjacent to the western site boundary ○ Three buildings noted adjacent to the southern site boundary ○ Three buildings noted adjacent to the eastern site boundary ○ 5m/W – Road ○ 100m/N – Three new buildings
1965 - 1971	○ No significant changes of note	○ Three buildings and a drive extending from Breck Farm Lane noted
1973 - 1976	○ Two structures now depicted as one larger rectangular building ○ Rough pasture area and pond no longer present	○ Railway noted as dismantled ○ Three buildings adjacent to the eastern site boundary now noted as a Dairy Farm, four more buildings depicted ○ Buildings adjacent to the western site boundary noted as a Poultry Farm with an additional six buildings ○ 150m/S – Residential area noted ○ 740m/W – Poultry houses ○ 1.4km/SE – Electrical substation

Table 3 - Historical Summary		
Date	**Potentially Contaminative Land Uses / Significant Changes**	
	On-site [Direction]	**Off-site [Distance/Direction]**
1994 - 1995	○ Map not available for the site	○ Large residential area noted adjacent to the eastern site boundary ○ Expansion of residential area to the south of the site ○ Old railway now depicted as Mariott's Way
2000	○ Largest building associated with Breck Farm depicted as two buildings ○ Hedgerow noted in south west of the site	○ Properties noted adjacent to the west of the site ○ 80m/W – Garden centre noted with numerous outbuildings
2006	○ No significant changes of note	○ Expansion of garden centre to the west, likely to have become a commercial area at this point
2018	○ Track noted from Breck Farm Lane leading off site to north	○ A1270 dual carriageway noted 15m to the north of the site ○ Expansion of the commercial area to the west ○ 170m/N – Farm expansion
Notes: *It should be noted that the dates of the maps do not always correspond with the time of the surveys.*		

The review of historical maps provided information about changes to the site and its surroundings between 1884 and 2008.



1884 - 1885 1957 2018

Figure 3 – Extracts from Historical Ordnance Survey Maps between 1884 and 2018

4.2 Planning Applications

The review of the planning records available on Norfolk County Council planning portal indicated no applications that are considered relevant to the subject site.

4.3 History of the Site – Summary

The review of historical maps provided information about changes to the site and its surroundings between 1882 and 2018. Based upon the historical information it has been concluded that the site usage does not change significantly throughout the years from the earliest available map until the present time. The information about the former uses of the site, indicated that the site has remained agricultural with some minor changes to the buildings associated with Breck Farm. One pond which was detailed on site is no longer present, having potentially been infilled.

The surrounding area has been subject to an increase in residential development since 1973, particularly to the south and the west of the development site. The land separating the two site parcels was originally depicted as the Eastern and Midlands Railway, which then became the Midland and Great Northern Joint Railway from 1906. The railway was then depicted as dismantled before being noted as Mariott's Way from 1994. The A1270 was first detailed adjacent to the north of the site in 2018.

5. CONCEPTUAL MODEL

The risk assessment methodology is based upon current guidelines (refs. **R.8**, **R.9** and **R.10**), and legislation (refs**. R.12** and **R.13**).

The current guidance requires that a conceptual model be formulated, based upon the findings of the research. The conceptual model is limited at this stage to the identification and assessment of potential 'hazards', identified or suspected from the results of the research; the potential 'receptors' that may be affected and the anticipated 'pathways' to those receptors. The findings are summarised in the following subsections.

The guidance proposes a four-stage approach for the assessment of contamination and the associated risks. The four stages are listed below:

- Hazard Identification;
- Hazard Assessment;
- Risk Estimation; and
- Risk Evaluation.

In accordance with the guidance, (ref. **R.9**), only the first two stages are addressed in a preliminary risk assessment; should hazards exist which are a potential risk then more intrusive investigation works are recommended.

5.1 Hazard Identification: On-Site

The desk based research and historical review identified the following potential hazards on the site:

- Potential Made Ground associated with the infilling of the former pond;
- Potential Made Ground associated with the hardstanding tracks and well; and
- PACM within the outbuildings associated with Breck Farm.

Subject to controlled removal by an appropriately qualified and licenced contractor, any potential risk of PACM fragments/fibres being released to air or entering the ground will be minimised.

5.2 Hazard Identification: Off-Site

The desk-based research and historical review identified Made Ground from the surrounding residential developments and the former railway as a potential hazard off-site which may impact upon the site.

5.3 Hazard Assessment

The preliminary risk assessment has identified potential sources of contamination that may pose risk to human health and the Controlled Waters. Potential pollutant linkages that require further consideration are presented in the Table 5 shown overleaf:

Table 4 – Conceptual Model

Sources	PATHWAYS: Root Uptake	Direct Contact	Ingestion	Respiration	Gas Accumulation	RECEPTORS: Plants	End Users	Structures (Concrete)	Services/Utilities	Construction Workers	Controlled Waters (GW)	Risk Rating	Comments
Made Ground	U	L	U	U	L	Mi	Mo	Mi	Mi	Mo	Mi	MR	A low to moderate risk is considered to exist from this source, further investigation is recommended targeting in particular the former pond,
Asbestos Containing material in structures	n/a	n/a	n/a	U	n/a	n/a	S	n/a	n/a	S	n/a	MR	The structures show some signs of deterioration of the PACM corrugated sheets. This may have led to asbestos fibres entering the soil adjacent to the structures.

Legend:-

See Comparison of Consequence Against Probability within Appendix 6 for Key to Legend.

Probability:

Negligible (N)	
Unlikely (U)	
Likely (L)	
Highly Likely (HL)	

Consequence (Severity):

Negligible (N)	
Mild (Mi)	
Moderate (Mo)	
Severe (S)	

Risk Rating:

Very High Risk	VH
High Risk	HR
Medium Risk	MR
Low Risk	LR
Negligible Risk	NR

Based upon the findings of the data search as well as the site walkover, it has been assessed that the former uses of the site are likely to result in potential contamination that could pose low to medium risks to human health/Controlled Waters.

5.4 Potential Constraints or Considerations for Development

The following constraints to the development should be taken into consideration during redevelopment of the site:

- ACMs and or PACMs within the existing structures – for survey, assessment and removal;
- The effect of trees, tree roots and associated factors that may be present within the soils and affect foundation design;
- Soil quality variation or potential contamination associated with the former uses of the site, and potentially backfilled ponds; and
- The presence of protected species and associated ecological constraints.

6. CONCLUSIONS AND RECOMMENDATIONS

Based upon the findings of the preliminary risk assessment data and site walkover, a number of potential contaminant sources and pathways to potential receptors have been identified.

It would be prudent to undertake a preliminary intrusive ground investigation to determine the extent of any potential contamination within the groundwater and soil strata. Any investigation should ensure a number of exploratory holes across the site. Where applicable, ground gas and/or groundwater monitoring installations should be constructed on site.

Any investigation should target the location of the former pond on site (to include soil gas monitoring) and shallow soil sampling around buildings with PACM. It would be prudent for the investigation to also comprise of a general spread of investigation points across the site due to the potential usage of chemicals related to agriculture and to assess soil quality across the site (principally for any proposed areas of residential development) and on the northern boundary closest to the active garages.

As part of the above investigation a geotechnical investigation of the site could be undertaken to enable a suitable foundation solution to be designed for the proposed structures. It would be prudent, where possible, to undertake this at the same time as the environmental investigations to minimise mobilisation and supervisory costs. Considerations such as soil infiltration parameters and potential for soil re-use may also need assessment at some stage during the design process.

Any ground investigation should be designed in general accordance with current CLR guidance and standards such as BS10175, (ref. **R.14**) and BS5930, (ref. **R.15**).

Due to the potential for soil contamination, PPE is advised to be worn during any groundworks until the soil quality/ ground conditions are confirmed to provide a low risk to receptors.

Furthermore, cohesive ground conditions and the presence of mature trees should be taken into consideration. Any excavation of foundations should be carried out in accordance with the NHBC standards (ref. **R.5**).

It is recommended that this report be submitted to the Local Authority as part of the planning submission for the site.

Should demolition or alteration of the buildings associated with Breck Farm be considered it would be necessary to undertake a Refurbishment and Demolition Survey (asbestos survey) of the buildings, in accordance with MDHS (and other) guidance (ref. **R.16**). Any asbestos removal must be undertaken in a controlled manner by suitably qualified and licenced contractors, disposed of in accordance with current legislation, and these works recorded.

APPENDICES

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APPENDIX 1 - ACRONYMS AND ABBREVIATIONS

Acronym / Abbreviation	Definition
ACM	Asbestos containing material
ADE	Average daily exposure
ASPT	Average score per Taxon
BAP	Biodiversity Action Plan
BOD	Biochemical oxygen demand
BH	Borehole
BRE	Building Research Establishment
BS	British Standard
BTEX	Benzene, Toluene, Ethyl benzene and Xylenes
CIRIA	Construction Industry Research and Information Association
CLEA	Contaminated Land Exposure Assessment
CLR	Contaminated Land Research reports
DEFRA	Department of the Environment, Food and Rural Affairs (formerly the DoE and DETR)
DETR	Department of the Environment, Transport and the Regions (formerly the DoE and now Defra)
DO	Dissolved oxygen
DoE	Department of the Environment (then DETR and later Defra)
DQRA	Detailed quantitative risk assessment (Tier 2)
EA	Environment Agency
EPH	Extractable petroleum hydrocarbons
EQI	Environmental Quality Index
EQS	Environmental Quality Standards
FRA	Flood Risk Assessment
GQRA	Generic quantitative risk assessment (Tier 1)
IPC	Integrated Pollution Control
IPPC	Integrated Pollution Prevention Control
m aOD	Metres above ordnance datum
mbgl	Metres below ground level
NGR	National grid reference
NHBC	National House Building Council
NRA	National Rivers Authority (now the Environment Agency)
PACM	Potentially asbestos containing material

APPENDIX 2 – REPORT LIMITATIONS AND CONDITIONS

This report refers, within the limitations stated, to the condition of the site at the time of the inspections. No warranty is given as to the possibility of future changes in the condition of the site.

The comments given in this report, and the opinions expressed herein, are based upon the readily available information collated for the report and an assessment based upon the current UK guidance, primarily the Contaminated Land Research (CLR) Reports, and most importantly CLR Report 3 (ref. R.1).

This report has been prepared for the sole use of the Client for the purposes described and no extended duty of care to any third party is implied or offered. Third parties using any information contained within this report do so at their own risk.

This report is prepared and written for the use stated herein; it should not be used for any other purposes without reference to Geosphere Environmental Limited. The report has been prepared in relation to the proposed end-use should another end-use been intended a further re-assessment may be required. It is likely that over time practises will improve and the relevant guidance and legislation be amended or superseded, which may necessitate a re-assessment of the site.

The report is limited to those aspects of land contamination specifically reported on and is necessarily qualified accordingly, no liability shall be accepted for other aspects which may be the result of gradual or sudden pollution incidents, past or present unrecorded land uses both on- and off-site and the potential for associated contaminant migration. The opinions expressed cannot be absolute due to the limitations of time and resources imposed by the agreed brief.

The accuracy of any map extracts cannot be guaranteed. It is possible that different conditions existed on site, between and subsequent to the various map surveys appended.

Whilst the report may express an opinion on possible configurations of strata between or beyond exploratory holes discussed or on the possible presence of features based upon visual, verbal or published evidence, this is for guidance only and no liability can be accepted for its accuracy.

The conceptual model is based upon the information available at the time of conducting this assessment and is an interpretative assessment of the conditions at the site. It should be noted that the redevelopment and/or further investigation of the site may reveal additional information and therefore alter the conceptual model and the conclusion of this report.

APPENDIX 3 – REFERENCES

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R.2. CLR 8, 'Potential contaminants for the assessment of contaminated land'. Defra/EA, March 2002. (Withdrawn).

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R.5. National House-Building Council, Standards, Chapter 4.2, 2003 'Building Near Trees'.

R.6. CLR 2, 'Guidance on preliminary site inspection of contaminated land', Report by Applied Environmental, DoE 1994.

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R.9. CLR 11, 'Model procedures for the management of contaminated land: Risk assessment procedure', DoE 2011.

R.10. CLR 6, 'Prioritisation & categorisation procedure for sites which may be contaminated', Report by M J Carter Associates, DoE 1995.

R.11. CLR 4, 'Sampling strategies for contaminated land'. Report by The Centre for Research into the Built Environment, the Nottingham Trent University, DoE, 1994.

R.12. The Environmental Protection Act, Part IIA, Section 78, 1990.

R.13. Environment Act 1995, Section 57, DoE 1995.

R.14. British Standards Institute: BS 10175 'Code of practice for the investigation of potentially contaminated sites', BSI 2011.

R.15. British Standards Institute: BS 5930 'Code of practice for site investigations', BSi 2015.

R.16. Methods for the determination of hazardous substances (MDHS) "100 Surveying, sampling and assessment of asbestos-containing materials" HSE, July 2001.

R.17. http://www.environment-agency.gov.uk/homeandleisure/117020.aspx.

R.18. Planning portal website: (http://www.norfolk.gov.uk)

APPENDIX 4 – ENVIROCHECK DATA SEARCH REPORT

APPENDIX 5 – ENVIROCHECK HISTORICAL MAPS

Large scale Ordnance Survey Map Extracts at 1:2,500 and 1:1,250 scales

Small scale Ordnance Survey Map Extracts at 1:10,000 and 1:10,560 scales

APPENDIX 6 – COMPARISON OF CONSEQUENCES AGAINST PROBABILITY

		Consequence (Severity of Linkage)			
		Severe (S)	Moderate (Mo)	Mild (Mi)	Negligible (N)
Probability (Likelihood of linkage from)	Highly Likely (HL)	Very High Risk (VH)	High Risk (HR)	Moderate Risk (MR)	Moderate/Low Risk (MR-LR)
	Likely (L)	High Risk (HR)	Moderate Risk (MR)	Moderate/Low Risk (MR-LR)	Low Risk (LR)
	Unlikely (U)	Moderate Risk (MR)	Moderate/Low Risk (MR-LR)	Low Risk (LR)	Negligible Risk (NR)
	Negligible (N)	Moderate/Low Risk (MR-LR)	Low Risk (LR)	Negligible Risk (NR)	Negligible Risk (NR)

This Table is to provide reference information in conjunction with the GEL Conceptual Model attached within the Hazard Risk Assessment section of this report, Table 4 – Conceptual Model.

Very High Risk (VH)

- There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is happening currently.
- Urgent investigation and remediation are likely to be required and advised.

High Risk (HR)

- Harm is likely to arise to a designated receptor from an identified hazard.
- Urgent investigation is required and remedial works are likely necessary in both the short to long term.

Moderate Risk (MR)

- It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild.
- Investigation is required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.

Low Risk (LR)

- It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild. Limited investigation recommended.

Negligible Risk (NR)

- There is a minimal possibility that harm could arise to a receptor. In the event of such harm being realised it is high likely to not be severe. Investigation not deemed necessary.

APPENDIX 7 – DRAWINGS

Phase 1 Walkover Plan – Drawing ref. 3551,EC,AR,DS/007/Rev 0