PHASE 1 GEO-ENVIRONMENTAL GROUND INVESTIGATION AT THE GARAGE OUTBUILDINGS, THE FORGE, FAUVEL PLACE, GLOSSOP, DERBYSHIRE FOR MR A FOSTER

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APPENDICES

1.0 EXECUTIVE SUMMARY

1.1 Integra Consulting Engineers Ltd has been instructed by Mr A Foster to undertake a Phase 1 geo-environmental ground investigation at The Forge, Fauvel Place, Glossop, Derbyshire. The Ordnance Survey national grid reference at the site is E403370 N394310.

1.2 The objectives of the report were to assess the probable geological and contaminated land conditions on and beneath the surface and to identify potential contaminants present at the site. A preliminary conceptual model was then to be developed to define the scope and extent of any further investigations deemed necessary.

1.3 The site comprises a two storey masonry garage outbuilding used as a storage space for the neighbouring property known as The Forge. The redevelopment of the property from its current use as storage to two residential properties does not require the demolition or extension of the existing structure nor the provision of gardens / soft landscaping.

1.4 The site is underlain by low permeability boulder clay which in turn is underlain by the Kinderscout Grit stone formation comprising sandstone, shale and grit stone and is classed as a minor aquifer with low permeability by the Environment Agency.

1.5 Historically the site was used as open / rural fields until 1898 when the current structure was recorded on the historical OS maps.

1.6 The site is unaffected by hazardous installations, landfill or made ground and has not been used for the significant storage of fuel or fuel oils. The site is unaffected by coal mining, brine extraction or radon. The site is unaffected by flooding.

1.7 A human health conceptual model has not been included on the basis that there are no on site contamination sources, no significant off site contamination sources and the redevelopment of the site does not involve any demolition or extension of the existing structure.

1.8 A controlled waters conceptual model has not been included on the basis there is no contamination source on the site, no significant off site contamination source and the minor aquifer beneath the site is covered by low permeability clay deposits. In addition there are no on site watercourses or features and the nearest off site surface water feature is approximately 300m north east of the site.

1.9 In summary, neither an intrusive Phase 2 environmental ground investigation nor geotechnical testing is deemed necessary at the site. The Integra Consulting Structural Survey dated March 2010 should be referred to in relation to the redevelopment of the site from garage outbuildings into two residential properties.

2.0 INTRODUCTION

2.1 General

This Phase 1 geo-environmental ground investigation and report has been prepared at the request of Mr A Foster.

Instructions to proceed were received on 2 June 2010. Desk study work was undertaken between 21 June and 30 June 2010. The walk over survey was carried out on Friday 25 June 2010.

This Phase 1 report is to be used for submission to the Local Authority as part of the planning application as it is the Client's intention to undertake a conversion of the existing site building. The proposed development will consist of a conversion of an existing two storey garage outbuilding into two residential units with car parking.

This report specifically covers geotechnical and environmental (contaminated land) aspects of the site and hence does not include an appraisal of the structural integrity of the existing building. This information is contained within a separate structural report produced by Integra Consulting Engineers Limited dated March 2010.

3.0 BRIEF

The brief was to carry out a Phase 1 geo-environmental ground investigation of the site at The Forge, Fauvel Place, Glossop, Derbyshire. The extent of the site is shown on the aerial photograph and site plans contained in Appendix 1. The investigation was to include for the following studies:

a) A desk study involving examination of available geological maps, BGS borehole logs, historical Ordnance Survey maps, environmental maps, Coal Authority report, Coal Authority mining abandonment plans and accessible historical records to assess the probable geological and contaminated land conditions on and below the site.

b) A walk over study of the site to ascertain any evidence of previous and current site uses that may have caused contamination of the ground and surface waters at the site. During the walk over survey the topography of the site was to be noted along with any land features that could give an indication of probable sub- surface features and formations.

c) Identify probable contaminants that may be present at the site using current contaminated land guidance and identify potential receptors which could be at risk from potential contaminants.

d) Develop a conceptual model for the site to assess the potential risks of contamination and to undertake a preliminary risk assessment.

e) Determine whether further investigation and assessment is required.

f) Define the scope and extent of further investigations.

A detailed report was to be provided to summarise findings and recommendations.

4.0 LIMITATIONS OF INVESTIGATION WORK AND REPORT

Desk Study References

The desk study has been produced using historical Ordnance Survey maps and environmental maps available at the time the report has been produced. The environmental information used was the current information available at the time of writing but there is no absolute guarantee of accuracy.

Historical Ordnance Survey maps do no provide a comprehensive description of a site's history. They provide details of the site from a date prior to the publication of the map (i.e. a snapshot in time). The period between map editions can be substantial (i.e. several decades). Not all map series are available for every date range in many areas of the UK and therefore there will be gaps in this mapped record for some sites. Potentially contaminative land uses could have been present and removed during such periods and may therefore not form a part of this particular record. In addition, there will be potentially contaminative land uses which are not identified on the map records such as small scale storage / use of hazardous materials, illegal / unlicenced waste disposal activities etc.

Different map series identify different features utilising different symbols which can result in features that remain on site being removed from maps. Some features are also not mapped for security reasons i.e. airfields and other military installations. These areas are mostly shown as blank areas on historical maps.

Boreholes / Trial Pits

Where the spacing of trial pits or boreholes for future intrusive investigation work has been presented as part of this report, the spacing has been determined to provide a reasonable indication of the general ground conditions and extent of land / groundwater contamination on the site but the number has ultimately been limited by commercial constraints. The ground conditions at the proposed borehole / trial pit locations are no absolute guarantee of the ground conditions between such locations. Due allowance should be made for the possibility of variation in conditions between borehole / trial pit locations when preparing any assessments of the final foundation and land / groundwater remediation proposals.

Extent of Contamination Studies

This report is strictly limited to the nature of contamination contained within the ground and groundwater at the site. The report does not cover environmental aspects such as air or noise pollution and ground vibrations and the like. In addition, ecological matters relating to wildlife, flora and fauna have not been investigated as part of this report. In particular, the site has not been inspected for the presence or otherwise of Japanese Knotweed. It is recommended that the Client appoints a specialist in this subject to carry out a detailed inspection of the site if its presence is suspected.

Flooding

Flooding in this report is defined as flooding caused by the sea, ditches, rivers, streams, ponds, lakes, reservoirs and the like. It does not extend to flooding caused by surcharged piped drainage systems and investigations into flooding of this nature are excluded from this report.

5.0 THIRD PARTIES

This report has been prepared for the sole use of Mr A Foster. It must not be copied or passed onto any third party or used for any purpose other than which it was prepared without the permission of the author. This report is copyright.

6.0 SCOPE OF INVESTIGATION WORK

6.1 Walk Over Survey

The site was visited during dry, bright weather conditions and the objectives of the site walkover were, where applicable:

- to identify and assess visual and olfactory evidence of contmation e.g. staining of concrete / soils, odours, presence of gas protection measures etc.;
- to identify locations of potential sources of contamination and assess their conditions i.e. tank location, presence / condition of secondary containment / bunds, location of fill points, process areas.;
- to identify surrounding land uses and any potentially contaminating activities;
- to identify / verify the presence of potential receptors (on and off site) which may be affected by identified sources;
- to obtain information on activities / procedures and standards of housekeeping etc.
- to assess site access and potential investigation locations and constraints.
- to assess any visual subsurface geotechnical features / anomalies e.g. foundations, made ground , subsidence etc

Photographs were taken of the site during the walkover survey and these photographs are contained in Appendix 2.

6.2 Desk Study Documentation

The following documents were obtained and examined during the desk study:

a) An aerial photograph of the site dated circa 2010. The photograph is contained in Appendix 1.

b) Historical Ordnance Survey maps as follows:

- 1:2500 dated 1881
- 1:10560 dated 1882
- 1:10560 dated 1882
- 1:2500 dated 1898
- 1:10560 dated 1899
- 1:10560 dated 1899
- 1:10560 dated 1911
- 1:2500 dated 1921
- 1:10560 dated 1924
- 1:10560 dated 1938
- 1:10560 dated 1938
- 1:10560 dated 1938
- 1:10560 dated 1938 – 1948
- 1:10560 dated 1954
- 1:2500 dated 1968
- 1:10000 dated 1969
- 1:1250 dated 1974 – 1975
- 1:10000 dated 1981 – 1982
- 1:1250 dated 1984 – 1987
- 1:1250 dated 1987 – 1988
- 1:1250 dated 1989
- 1:10000 dated 1991
- 1:1250 dated 1992
- 1:1250 dated 1993 – 1994
- 1:1250 dated 1994
- 1:1250 dated 1995
- 1:10000 dated 1999
- 1:10000 dated 2006
- 1:10000 dated 2010

These maps are contained in Appendix 3.

c) Environmental maps obtained through Envirocheck as follows:

- Environment Agency and hydrological maps dated October 2008 to April 2010.
- Groundwater vulnerability map dated January 1999.
- Sensitive land uses map dated April 1997 to March 2010.
- Summary maps showing locations of recorded waste sites, industrial land use sites and hazardous substances sites in adjacent areas.

These maps are contained in Appendix 4.

d) An environmental report obtained from Landmark, the environmental database company, which provides a list of recorded past and present activities at or adjacent to the site which could have an impact on the levels of contamination in the soils and groundwater at the site.

This report is contained in Appendix 5.

e) The British Geological Society 1:10,000 solid and drift geological maps reference number SK 09 SW. A part extract of the maps covering the area under consideration along with borehole references is contained in Appendix 6. The extracts have been copied under licence from the British Geological Society. The BGS geology report obtained as part of the Landmark report is also contained in Appendix 6.

f) The Indicative Atlas of Radon in England and Wales published by the British Geological and the Health Protection Agency was examined to assess the probable presence or otherwise of radon gas in the ground. Extracts of the relevant maps are contained in Appendix 7.

g) Discussions with the following statutory authorities / regulatory bodies relevant to the site as follows:

- Mr Matthew Rhodes, Contaminated Land Officer at High Peak Borough Council.

7.0 FINDINGS

7.1 Description of the Site

The site is located in a mature mixed residential and commercial area of Glossop, to the north of the town centre. The location is shown on the site location plans in Appendix 1. The national Ordnance Survey grid reference for the centre of the site is E403370 and N394310. It is located at post code SK13 7DD and contains the current garage outbuilding for The Forge residential property approximately 20m north of the property. The site is bounded by residential properties to the north, south and west with Local Authority Social Services offices to the east. Fauvel Place lies directly adjacent to the northern external wall of the property and forms the main access route to the building. Howard Street runs approximately 15m south of the site in a north west to south east direction. An aerial photograph of the site prior to works commencing is also contained in Appendix 1.

The site consists of a two storey masonry building and is used as garages and domestic storage purposes. The site does not include any external areas such as garden / soft landscaping or car parking.

7.2 Walk Over Survey

During the walk over survey the following features were noted relating to geology and contaminated land matters:

Geology

There is no evidence of mine shafts, mining subsidence, outcropping rock, faults or slope instability on the land surrounding the property.

There are no retaining walls or bridges, made ground mounds, water courses or surface water features.

There are a number of mature trees approximately 10m north east of the north eastern corner of the property which are noted to lean slightly towards the property.

Due to the nature of the existing on site structure, the underlying geology could not be inspected.

Contaminated Land

The ground floor of the property is currently used for domestic storage purposes. The first floor of the property is empty and displays no evidence of any previous light industrial or commercial uses.

There are no rivers or water courses passing through or adjacent to the site.

There are no fuel pumps, fuel tanks, workshops, boiler houses or oil storage within the site boundary.

A new above ground plastic oil tank is located approximately 5m south west of the property in the yard of the neighbouring residential property. The tank is in good condition and displays no visual or olfactory evidence of leakage or spills.

The north of the site is bounded by a residential property with gardens and car parking, referred to as 'The Forge', and appears to be of relatively new build.

There is no evidence of made ground or flytipping on or adjacent to the site.

Photographs taken during the walkover survey are contained in Appendix 2.

7.3 Geology

The 1:10,000 geological map of the area (ref: SK 09 SW) shows boulder clay till which in turn overlies the Kinderscout Grit (sandstones, shales and grit stones) of the carboniferous period. There are no coal deposits or mining activities in the proximity of the site.

A surface fault is recorded approximately 200m east and south east of the site with a north east to south west trend.

A British Geological Society (BGS) borehole record in close proximity to the site is as follows:

SK09SW BJ208

This shell and auger borehole was located at the site of the Esso petrol filling station located on High Street East and was constructed during March 1992. A total of 3.5m of made ground was recorded overlying 'medium dense, coarse sand and gravel' which in turn overlay 'firm to stiff, stony, gravely brown boulder clay'.

Extracts from the 1:10,000 geological map sheet and the BGS borehole log sheet are contained in Appendix 6.

7.4 Site History

The site development history has been researched by reference to historical maps and street plans. These are included in Appendix 3 to this report and the principal observations which are summarised into on site and off site history are summarised below.

On Site History

Date	Description
1881 - 1898	The site is shown as open land surrounded by roads and residential properties to the north west of the town centre.
1898 - present	The site buildings are visible and match the current building envelope.

Off Site History

Date	Description	Distance	Direction
1881 - present	Railway lines and a station.	50m	S
1881 - 1987	Gas works.	250m	SW
1898 - 1982	School	30m	E
1982 – 1991	Council Depot in place of the school	30m	E
1991 - present	Government offices in place of the Council Depot	30m	E
1993 - present	The Forge – residential property	15m	N

7.5 Waters and Flooding

Environmental data relevant to the site and its immediately surrounding area has been obtained from sources available in the public domain. In addition, an environmental report was obtained from Landmark, the commercial suppliers of environmental data. The Landmark report and associated maps that have been inspected are presented in Appendices 4 and 5, and the principal observations in relation to waters and flooding can be summarised as follows:

Flooding

- The site is located 249 metres north east of an area prone to extreme flooding from rivers or seas without defences.

Aquifer / Groundwater

- The site is underlain by the Kinderscout Grit which is classed as a minor aquifer with soils of a low leaching potential by the Environment Agency.
- The site is overlain by low permeability boulder clay.
- The site is not located on or near a Groundwater Protection Zone.
- The nearest groundwater abstraction is approximately 250 metres to the south east of the site and is described as being used for laundry use. There are eight other groundwater abstraction points within 1 km of the site, all of which are used for process water, boiler feed, general cooling or laundry use.

Surface Water Features

- There are no known surface water features crossing the site area. The nearest surface water feature is a small pond which is situated approximately 300 metres north east of the site.
- The nearest surface water abstraction point is located 460m south east of the site and is used in cooling and manufacturing processes. There are 15 No additional surface water abstractions within 1km of the site and are all described as being used for boiler feed, process water or general cooling.
- There is a river quality sampling point located 406m south west of the site along Glossop (Shelf) Brook, classified as River Quality B, and 686 metres north west of the site along Hurst Brook, classified as River Quality A.

Pollution Incidents

- A minor pollution incident to controlled waters occurred approximately 280 metres south west of the site on 28 May 1992 involving a release of inert suspended solids into Glossop Brook. There have been numerous additional minor incidents within 1km of the site mostly involving the release of sewage, chemicals or oils.
- A significant pollution incident to controlled waters occurred approximately 620m south west of the site along Shelf Brook on 9 March 1992 and involved the release of mud, clay and soil. A further miscellaneous significant incident is recorded 660m south east of the site during June 1996.
- A major pollution incident to controlled waters occurred approximately 940m south west of the site during June 1998 and is recorded as being an accidental spillage of inert suspended soils into Longclough Brook.

7.6 Hazardous Installations, Landfill and Waste

The following information relating to hazardous installations, landfill and waste obtained from the Landmark report, published information and the walkover survey can be summarised as follows:

- There are no active landfill sites within 1km of the site.
- An historical landfill site is recorded 750m south east of the site off Silk Street - no further information is provided.
- A closed Local Authority landfill site is recorded 880m south east of the site on Silk Street and is noted as being for the deposition of domestic waste.
- There are no Integrated Pollution Controls (IPC) within 250m of the site.
- There are 12 integrated pollution controls (IPC) within 1km of the site.
    - 2 IPC's were issued to Ferro Alloy and Metals Ltd (from 1995 to 1998) located approximately 375 metres north east of the site.
    - 10 IPC's were issued to Lancashire Chemical Works Ltd (from 1994 to 2006) located approximately 975m north west of the site.
- There are no Control Of Major Accident Hazards (COMAH) registered sites within 1km of the site.
- There is an active fuel station located on High Street East approximately 365m south east of the site.
- There are no pollution inventory sites on or near the site.
- There are no waste EP OPRA sites on or near the site.
- There are no Notifications of Installations Handling Hazardous Substances (NIHHS) on or near the site.

7.7 Mining

7.7.1 Coal Mining

The site is located outside a recognised coal production area and is therefore unaffected by coal mining activities. On this basis, a Coal Authority report has not been included in this report.

7.7.2 Brine Extraction

The site is located outside of the Cheshire Brine Compensation area and is therefore unaffected by brine extraction activities. On this basis, a Brine Extraction report has not been included in this report.

7.8 Radon

The Indicative Atlas of Radon in England and Wales produced by the Health Protection Agency, BRE 211 Radon; Guidance on Protective Measures for New Buildings and British Geological Survey indicates that the site does not lie in an area affected by radon.

Map 14 of the Indicative Atlas of Radon in England and Wales and map 14 of the BRE 211 Radon; Guidance on the Protective Measures for New Buildings contains information on the region in which the site is located and is presented in Appendix 7

8.0 CONCLUSIONS

8.1 General

As the site comprises a two storey brick building, there are no on site geological features evident. The land surrounding the property is at the same elevation as the site building and does not display any evidence of landslips or instability.

The walk over survey did not record any potentially contaminative on site sources and only one localised off site potential contamination source in the form of a small above ground plastic oil storage tank 5m to the south west of the property. The single track railway approximately 50m south of the property beyond Howard Street is not considered to pose a contamination risk.

8.2 Geology

The desk study carried out indicated that the upper drift deposits in the area were probably thin beds of sand or gravel overlying a boulder clay of glacial origin overlying Kinderscout Grit which is classed as a minor aquifer by the Environment Agency.

The site is not affected by either coal mining or brine extraction.

8.3 Contaminated Land Legislative Framework

The assessment of contaminated soils is carried out within the current legal framework, which is based upon the Environmental Protection Act Part 2A and current national planning guidelines. Under this framework, the potential contamination of a proposed development site is a material planning consideration. In addition, land that is deemed harmful to human health or has the potential to pollute waters can be designated as contaminated land and appropriate remediation can be enforced by the Local Authority.

Following the "Way Forward" report undertaken by Department for Environment, Food and Rural Affairs (DEFRA) a new approach to land contamination was issued by DEFRA and the Environment Agency (EA). Two documents have been produced which supersede the previous Contaminated Land Reports (CLR) 7 – 10. The two reports are 'Human health toxicological assessment of contaminants in soil' (formerly CLR 9) and 'Updated technical background to the CLEA model' (formerly CLR 10) and other supporting documentation including revised toxicological reports.

Broadly, the approach consists of preparation of conceptual models to illustrate how potential contamination (source) can reach (through a pathway) humans or receptors (targets).

As a result of these conceptual models, each of which are site specific, a risk analysis can be carried out to determine the frequency of testing to establish levels of source contamination, possible mobility of those contaminants and the potential hazards those mobilised contaminants could cause to human receptors.

In addition to direct human receptors, water courses, aquifers and agricultural resources must be considered as these are potential indirect pathways to humans.

The government is part way through the publication of a number of updated toxicological reports and associated updated Soil Guideline Values which give guidance on acceptable soil contamination for a limited number of contaminants and further authoritative guidance on the toxicity of other contaminants for risk assessment purposes.

As of March 2009, updated toxicological reports and revised Soil Guideline Values have been published for the following determinands:

- Arsenic
- Nickel
- Selenium
- Benzene
- Toluene
- Ethylbenzene
- Mercury (elemental, methyl and inorganic)
- Xylene (O, M and P)
- Cadmium
- Phenol
- Dioxins, furans etc.

Where no updated toxicological reports or Soil Guideline Values are available, the existing toxicological reports and associated Soil Guideline Values will naturally be used to classify the risk and toxicity posed by the selected determinands.

In addition, where updated Soil Guideline Values and/or toxicological reports are not available, guidance is available from the Environment Agency on acceptable methods of assessing human health risks utilising recognised methodology developed in the UK and abroad. The means available to assess human health risks and to be utilised on this site are as follows:

Assessment	**Means**
Production of conceptual models	Human health toxicological assessment of contaminants in soil and Contaminated Land Report 11
Scope of contamination testing	Human health toxicological assessment of contaminants in soil (2009) and DEFRA Industry Profiles
Contamination sampling rates	Contaminated Land Report 4
Laboratory testing	MCERTS Accreditation
Acceptable contamination levels for Arsenic, Nickel, Mercury, Selenium, Ethylbenzene, Toluene, Benzene, Cadmium, Phenol and Xylenes	Updated Published Soil Guideline Value Reports (March 2009 onwards)
Acceptable contamination levels for Chromium and Lead.	Current Published Soil Guideline Value Reports (2002 – 2004)
Acceptable levels for other contaminants except cyanide and except where the conceptual model includes dermal absorption	SNIFFER Worksheets / LQM/CIEH (2nd Ed)
Acceptable contamination levels for cyanide and where the conceptual model includes dermal absorption	RISC v 4.02 and updated technical background to the CLEA model
Assessment of Total Petroleum Hydrocarbons within the above framework as adopted by the Environment Agency	Total Petroleum Hydrocarbon Criteria Working Group and updated technical background to the CLEA model

8.4 Sources of Contamination and Probable Contaminants

The historical Ordnance Survey maps, the Envirocheck report and other environmental information revealed that the site has historically only been occupied by open fields and the current site building and that there have been no adjacent land uses that could detrimentally affect the site redevelopment.

The neighbouring property named 'The Forge' suggests the property was once a blacksmiths or metal workers yard. However, the property was built in 1993 before which the land has been predominantly open space with the exception of a number of small unidentified buildings between 1968 and1974.

Details of the buildings on the historical plans indicate that there was no extensive use or storage of hydrocarbons for fuel or heating.

The desk study and walk over at the site have not identified any potentially contaminative on site sources.

A small plastic above ground oil storage tank was noted approximately 5 metres south west of the property. The tank is, however, in good condition, displayed no evidence of spillages or leaks and is set above an area of hardstanding. Consequently this is not regarded as a potential contaminative source.

The single track railway and station, located approximately 50m south of the site, are not regarded as having a significant contaminative impact at the development site.

In consideration of the above and the nature of the redevelopment plans, environmental testing is not deemed necessary.

8.5 Pathways for Contamination

Waters

Although there is a minor aquifer located in the Kinderscout Grits beneath the site, there is a thick impervious layer of boulder clay covering these beds. This will negate the vertical migration pathway from any potential contamination (if any were present).

There were no watercourses on or close to the site and waters at the site are positively drained through the existing drainage networks.

The nearest groundwater abstraction point is approximately 250m south east of the property and is described as being used for laundry use which is deemed as low sensitivity.

Site Occupants

The pathways along which contamination could potentially reach the targets on site during use and after completion of development works are detailed in 'Updated Technical Background to the CLEA Model' (Environment Agency 2009) but can be summarized as follows:

a) Ingestion of soil directly and indoor dust *
b) Consumption of home grown produce and attached soil
c) Inhalation of soil dust (indoor and outdoor)
d) Dermal contact with soil (indoor and outdoor)
e) Inhalation of soil vapours (indoor and outdoor)
f) Oral background
g) Inhalation background

** Treated as one pathway*

8.6 Targets of Contamination

Targets for these pathways include the following

a) Homeowners
b) Construction workers
c) The general public
d) Groundwater contained within aquifers; Kinderscout Grit
e) Surface water features e.g. rivers, streams, ponds and reservoirs
f) Subsurface plastic (e.g. potable plastic water pipe)
g) Building fabric (e.g. concrete foundations etc)

8.7 Conceptual Model for Human Health Risk Assessment

Although both a pathway (inhalation) and a receptor are present on site, a conceptual model for human health has not been prepared on the basis that there is no contamination source on or adjacent to the site which has potential to effect human health.

In addition, the existing structure is not being demolished or extended. All redevelopment work is scheduled to be undertaken on and within the existing structure and site soils will therefore not be disturbed or exposed. The redevelopment will have a small paved area to the front of each property to create separate entrances, but there will be no gardens or soft landscaped areas.

8.8 Conceptual Model For Waters Risk Assessment

The site is underlain by low permeability drift overlying a minor aquifer. Consequently, there is limited migration of leachable contaminants into the aquifer. There is potential for lateral perched water movement across the underlying drift. However, there is no site surface watercourse and the nearest off site watercourse is approximately 300m north east of the site on the far side of residential and commercial developments.

A site conceptual model has not been prepared on the basis that there is no contamination source on or adjacent to the site which has the potential to affect waters on or adjacent to the site.

We can therefore conclude that although there is a low risk receptor, there is no contamination source and, additionally, a layer of boulder clay covers the aquifer. On this basis, the risk to surface watercourses and underlying aquifers is considered insignificant.

8.9 Scope of Phase 2 Intrusive Geo - environmental Ground Investigation

As a result of the investigations undertaken, it is not considered necessary to undertake an intrusive environmental or geotechnical ground investigation of the site. This is on the basis that both the human health and controlled waters conceptual site models have not been included as there is no perceived risk to human health or waters at the site.

The redevelopment of the site is based on a refurbishment of the existing structure and therefore no additional geotechnical investigation is considered necessary at the site.

A separate structural survey report of the existing property was undertaken by Integra Consulting Engineers and should be reviewed in conjunction with the proposed redevelopment plan.

9.0 RECOMMENDATIONS

9.1 As a result of the risks identified, neither a geotechnical nor a Phase 2 intrusive environmental ground investigation is required on the basis of this Phase 1 report.

9.2 The structural survey undertaken by Integra Consulting Engineers should be consulted prior to redevelopment and conversion of the property commencing.

9.3 If any contamination is recorded / suspected during the conversion works then appropriate chemical testing and subsequent appraisal of the conceptual models will be undertaken.

APPENDIX 1

SITE LOCATION PLANS AND AERIAL PHOTOGRAPH

APPENDIX 2

WALK OVER SURVEY PHOTOGRAPHS

APPENDIX 3

HISTORICAL ORDNANCE SURVEY MAPS

APPENDIX 4

ENVIRONMENTAL MAPS

APPENDIX 5

LANDMARK ENVIRONMENTAL REPORT

APPENDIX 6

EXTRACTS OF GEOLOGICAL MAPS

APPENDIX 7

EXTRACTS OF RADON ATLAS FOR ENGLAND AND WALES

APPENDIX 8

PROPOSED REDEVELOPMENT PLAN