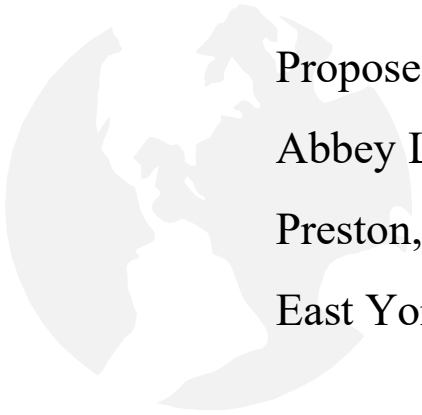


T. L. P. Ground Investigations.

Phase 1 Desk Study



Proposed New Residential Development,
Abbey Lane,
Preston,
East Yorkshire.

25th November 2016.

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Proposed New Residential Development, Abbey Lane, Preston, East Yorkshire.

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T. L. P. Ground Investigations Ltd.

Phase 1 Desk Study

Site: Proposed New Residential Development, Abbey Lane, Preston, East Yorkshire.
Client: Garry Hurd.
Date: 25th November 2016.

1.0 INTRODUCTION

1.1 General

Following the instructions of Garry Hurd, an environmental assessment was carried out in connection with a proposed new residential development which is being considered on 'land off' Abbey Lane, Preston, East Yorkshire. The brief for the investigation was to undertake a preliminary 'Phase 1 Desk Study' in general accordance with CLR3, CLR11, and the requirements of BS 10175 (2011) – Code of Practice for the Investigation of Potentially Contaminated Sites'. This environmental assessment follows a geo-environmental assessment of the site carried out by TLP Ground Investigations Ltd in November 2016 and which included environmental screening of a number of near surface soil samples in order to assess the existing contamination status of the near surface soils at the site.

The objective of the study was to:-

- Provide information on the past and current uses of the site and land in the immediate surrounding area which may have impacted on its contamination status.
- Identify potential sources of contamination, likely pathways and receptors of such contamination and any other features which may have constraints on the proposed development.
- Provide information on the geology, hydrogeology and hydrology of the site.
- To develop an initial conceptual site model of the nature and extent of any potential contamination.
- To provide recommendations for any further Phase 2 intrusive site investigation, if it was considered appropriate.

The **Desk Study** involved: -

- A walkover inspection and general visual appraisal of the site.
- An examination of archive TLP sources and contemporary / historical Ordnance Survey Maps.
- A review of a geo-environmental investigation recently undertaken at the site together with data published by the British Geological Survey.
- A review of the sites, hydrology and hydrogeology.
- An environmental data search, using information held in databases of the Environment Agency, British Geological Survey, Ordnance Survey, English Nature and The Coal Authority etc.

1.2 **Current and Proposed Site Use**

The site of the proposed new residential development currently comprises an open area of grassed paddock situated to the south of Abbey Lane in Preston, East Yorkshire. The proposed new residential development will entail the construction of 9 No. dwellings, each with individual private garden areas. The development will also include for the provision of new access and parking areas together with the usual infrastructure associated with a residential development of this nature.

2.0 **SITE DESCRIPTION**

The proposed new residential development is to be situated on land to the south of Abbey Lane in the north western outskirts of the village of Preston in the East Riding of Yorkshire. The elongated site has an approximate area of 0.75Ha and is centred at National Grid Reference 518574,430675.

The site can presently be accessed from Abbey Lane via a timber gate set within a post and barbed wire fence which extends along the northern boundary of the site. The site, itself, comprises an elongated grassed paddock which extends southwards from Abbey Lane. Although generally level, the surface of the site undulates slightly with a slight rise in level beyond the eastern boundary. The site boundaries are secured with either timber fences or post and wire fences and an electrified post and wire fence also extends through the centre of the site creating two individual paddocks. A number of mature and semi-mature tree specimens are present around the edges of the site; the majority of which are located along the south-eastern and north-western boundaries. Although the site was generally soft underfoot, no areas of standing water were identified during the walkover survey.

The site is located in the north-western outskirts of the village of Preston in a rural residential setting in the East Riding of Yorkshire. Beyond the eastern site boundary, the land use is predominantly residential whilst open fields and paddocks extend beyond the northern, southern and part of the western boundary. A small holding or farm is situated beyond the western boundary comprising a main farm house with a number of out buildings and large timber storage shed with a pitched roof of corrugated cement asbestos sheeting. Slightly further to the west is a large abattoir specialising in the processing of pork meat and products.

During the walkover inspection of the site, no sources or visual evidence of ground contamination were identified within the confines of the site or in the immediate surrounding areas.

3.0 SITE HISTORY

In order to help establish whether any previous uses of the site or activities in the surrounding area may have impacted on the contamination status of the site, historical and contemporary Ordnance Survey Maps of the area have been consulted ranging from circa 1855 to 2014.

On the earliest small scale extract from 1855, the site is depicted as an open undeveloped field / paddock in the north western outskirts of the village of Preston. At this time the northern boundary is defined by Town End Lane and the southern boundary by Nun Lane. The extract shows the village of Preston situated to the east of the site including a Church and Methodist Chapel. A number of properties / small holdings with pumps indicated within the grounds are situated to the west of the site with open fields extending to the north and south. A number of small ponds are noted within the fields in the areas surrounding the site.

On the larger scale extract from 1891, the site remains undeveloped and is noted to contain occasional trees. A medium sized irregular shaped pond is now depicted in the north eastern corner of the site possibly created as a water supply for grazing livestock. A number of new structures are depicted to the east of the site within the village of Preston. Amongst these a Church Institute is depicted some distance to the east and a small 'smithy' and post office to the southeast. The extract also depicts what appears to be a narrow water course extending along the eastern boundary of the site. The nearest structure to the site is Abbey House which appears as a residential property or small holding immediately to the west of the site.

On the extract from 1910 the site remains undeveloped, however, trees are no longer indicated on the site. On land just beyond the north-eastern corner of the site is a collection of glass houses possibly indicating the presence of a plant nursery. The 'smithy' is no longer depicted to the southeast of the site.

In the extract from 1927 / 1928 the site remains undeveloped, however, the pond is no longer indicated in the north eastern corner of the site suggesting that it may have been in-filled. Further development is noted within the village of Preston to the east and southeast of the site with additional structures also noted at Blundell's Farm a short distance to the west. Additional glasshouses are now present in the area just beyond the northeast corner of the site.

In the small scale extract from 1938 and 1948, no significant changes are noted at the site or in the surrounding areas.

In the extract from 1952, the site remains unchanged. A public house is now depicted in the vicinity of the glasshouses just beyond the north eastern boundary of the site. Curiously, this is only noted on subsequent small scale extracts up to 1967 and never appears on the large scale extracts from similar years.

In the large scale extract from 1967, the site remains undeveloped and occasional trees are once again noted on the site. Just beyond the northeast corner of the site the collection of glass houses has been extended onto the opposite side of Abbey Lane. Just beyond the south eastern corner of the site is a collection of buildings designated as an abattoir. An abattoir and transport depot are also depicted on land approximately 100m to the west of the site just beyond Abbey Farm. Slightly further to the west, an abattoir is also depicted at Blundell's Farm approximately 250m to the west.

In the extract from 1979, no significant changes are noted at the site. A new collection of small structures, possibly animal 'lock-ups' are now depicted on land just beyond the southern boundary. The abattoir once situated just beyond Abbey Farm to the west of the site is no longer indicated, however, expansion is noted to the transport depot. Further to the west extensions are noted at Blundell's Farm and abattoir. A new structure is indicated within Abbey House adjacent to the western site boundary

In the extract from 1985, the site remains unchanged. Further expansion is noted to the Blundell's Farm abattoir.

On the extract from 1988, no significant changes are noted within the site boundaries. Just beyond the north eastern corner of the site a small residential development known as Chapel Mews has been constructed together with a small pumping station. The small abattoir once situated just beyond the south eastern corner of the site is no longer designated as such. The row of small 'lock-ups' once situated to the south of the site are no longer depicted. Slight modifications are noted at Abbey House just beyond the western site boundary. Further to the west further expansion of the Blundell's farm abattoir has taken place.

In the extract from 1994, no significant changes are noted on the site. The removal of one of the structures is noted at Abbey House beyond the western boundary. Slight modifications are also indicated at the depot beyond Abbey Farm slightly further to the west where a tank is now depicted. Slightly further to the west, significant expansion of the Blundell's Farm abattoir is noted including the appearance of two large circular tanks.

On the remaining extracts from 2002 to 2014, the site remains undeveloped. Continued expansion is noted at Abbey Farm and the adjacent Depot, together with significant expansion of the former Blundell's Farm abattoir which is now designated as a factory (Cranswick Country Foods meat processing works).

In recent years the site has been used as a paddock for small number of horses and ponies.

4.0 GEOLOGY HYDROLOGY AND HYDROGEOLOGY

Maps published by British Geological Survey indicate that the superficial deposits underlying the site are represented by Glacial Till comprising Diamicton (unsorted deposits). A recent geo-environmental assessment undertaken by TLP at the site, has confirmed that this is correct. The underlying solid geology is represented by the Flamborough Chalk Formation which is of Campanian / Santonian age. The maximum permeability of the superficial deposits is described as 'high' and that of underlying bedrock as 'very high'. The Emapsite report highlights a small circular area of in-filled ground situated 436m north of the study site and a the recent borehole investigation identified the presence of an historic pond in-filled with reworked glacial soils to a depth of approximately 1.48m beneath the surface.

There are no records of fault lines within 500m of the site. There are no records of current or historical surface or underground workings within 500m of the study site. There are no records of any other forms of mining, extractions or natural cavities within 1000m of the site. All forms of opencast mineral workings within 1000m of the study site for chalk, sand, gravel, clay and shale have now ceased.

In terms of their aquifer potential, the superficial deposits overlying the site are designated as a Secondary (undifferentiated) Aquifer. A Secondary A aquifer is situated 10m east of the site. The underlying solid / bedrock geology is designated as a Principal Aquifer i.e. geology of high inter-granular and / or high fracture permeability usually providing a high level of water storage and may support water supply / base flow to rivers on a strategic scale.

According to EA database information, there appears to be a single current groundwater abstractions within 1000m of the study site. This relates to an historical permit issued 07/11/2011 at a location 191m west of the site which allows Cranswick Country Foods Ltd. to obtain groundwater from a borehole point source for general washing and process washing. The expiry of this permit is dated 31/03/2025. There are no other surface water abstraction points situated within 1000m of the study site. There are no records of potable water abstraction points situated within 2000m of the study site. The site is not situated within 500m of a groundwater source protection zone (SPZ).

The Emapsite report records four river network entries situated within 500m of the study site. The nearest of these is a drain situated 139m north of the site which is classed as a tertiary river. The EA does not hold any biological or chemical quality records for any water course within 1500m

of the study site. The Emapsite report also indicates a record of a surface water feature 1m to the northwest of the site however it is unclear what this relates to.

According to the EA RoFRas database, the site is situated within an area with a ‘very low’ risk of flooding from rivers and the sea. There are no flood defences situated within 250m of the site however, the site is located within 250m of an area benefiting from flood defences. The site is not located within 250m of an area used for flood storage.

According to the BGS, the site has limited potential for ‘Clearwater flooding’ to occur below the surface (i.e. flooding within unconfined aquifers). The level of confidence in this assumption is ‘High’.

5.0 ENVIRONMENTAL SEARCHES

Information gathered from environmental searches is contained within the enclosed Groundsure ‘Enviroinsight’ report produced by Emapsite, Report No EMS-391251_523640. The salient details of the report are as follows: -

5.1 Environmental Permits, Incidents and Registers

There are seven records of Part A(1) and IPPC Authorised Activities situated within 500m of the study site. All of the records are located at Preston Abattoir operated by Cranswick Country Foods Plc. at a point 282m south of the site. A number of the permits have now been superseded but two remain active for the slaughtering of animals and the treating of animal raw materials for food.

There is a record of a Part B activity situated 217m south of the study site. This relates to a current permit at Wrights Garage for the use of a waste oil burner. No enforcements have been notified on the permit.

There are six licensed discharge consents situated within 500m of the study site. The nearest current permit is situated 48m west of the site at the Preston SPS, allowing a water company to release sewage discharges from a pumping station. The receiving water is designated as a ‘nearby ditch’.

There are two recorded pollution incidents recorded within 500m of the study site. The nearest of these relates to an incident situated 228m south of the site, which took place on the 30.12.2002. The incident involved the release of crude sewage. The incident is recorded as having had no minor impact to air and minor impact to land and water.

5.2 Landfill and other Waste Sites

There are no current or historical landfill sites situated within 1000m of the study site. There are no other waste sites, such as treatment, transfer or disposal sites situated within 500m of the site.

5.3 Historical & Current Land Uses

There are 26 records of historical potentially contaminative land uses, tanks and energy features within 500m of the study site. Within 100m of the site these include plant nurseries once situated 12m north of the site and 30m northeast of the site. Apart from the in-filled historic pond which has been identified on the site, no other areas of potentially in-filled land have been identified within 500m of the site.

There are ten records of current potentially contaminative land uses within 250m of the study site. The nearest of these is a water pumping station designated as being situated ‘on site’. Within 150m, the remaining entries include a transport depot, a generic tank, a gas compound and a container storage depot. The nearest petrol / fuel site was once situated 384m south of the site at Wrights Car Care Centre, however this is now designated as obsolete. There are no records of underground high voltage electricity cables or high pressure gas pipelines within 500m of the site.

5.4 Designated Environmentally Sensitive Areas

There are no environmentally sensitive areas situated within 2000m of the study site. According to DEFRA, the site is recorded as being situated within an 'existing' nitrate vulnerable zone.

5.5 Natural Hazards Findings

The site lies within an area with a very low hazard rating from subsidence caused by shrink / swell clay, landslides, collapsible rocks and running sand and a negligible hazard rating is indicated for subsidence caused by soluble rocks and compressible ground.

According to the Coal Authority, the site is not located within the specific distance (75m) of an identified mining area. The site is also not situated within 50m of any non-coal mining activities.

The HPA indicates that the site is not located in a Radon Affected Area with less than 1% of properties within the defined search area, recorded above the Action Level. The Groundsure GeoInsight Report indicates that no radon protective measures are necessary for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment.

More detailed information on environmental issues and contemporary trade directory entries can be obtained by consulting the enclosed **Emapsite** Groundsure Reports.

5.6 Land Use Summary

- According to historical mapping, from the middle of the nineteenth century the site remained as an undeveloped area of land in the north western outskirts of the village of Preston. Towards the end of the nineteenth century, a medium sized pond was excavated in the north eastern corner of the site however, by 1927 this had been in-filled. Historical records extracts do not indicate any activities at the site other than those associated with agricultural purposes or the grazing of livestock.
- From the middle of the nineteenth century the areas surrounding the site were sporadically developed with residential properties, farms and small holdings together with a number of churches and other public buildings within the village of Preston a short distance to the east of the site. For a short period, towards the end of the nineteenth century, a small 'smithy' was situated a short distance to the southeast. Throughout the early part of the twentieth century the areas surrounding the site were gradually developed with additional housing and public buildings predominantly in Preston village. From the early part of the twentieth century, a plant nursery was in existence just beyond the north eastern corner of the site. During the mid-nineteen sixties, three abattoirs were operational in the areas surrounding the site, the closest of which was situated on Nun Lane adjacent to the south eastern corner of the site. By the nineteen seventies a row of small 'lock-ups' had been constructed just beyond the southern boundary which may have been associated with abattoir to the southeast. During the late nineteen eighties the lock ups disappeared when the abattoir was decommissioned. Two further abattoirs were also situated some distance to the west of the site and during the mid-nineteen eighties one of these was converted into a transport depot. The other expanded into a large abattoir which later became the Cranswick Country Foods meat processing works. Also during the late nineteen eighties, a small housing development appeared just beyond the north eastern corner of the site which necessitated the installation of a small pumping station which is still present.

6.0 PRELIMINARY CONCEPTUAL SITE MODEL

Guidance published by the Department of the Environment, Transport and Regions (DETR Circular 02/2000) indicates that before the Local Authority can make a judgement that any land appears to be 'contaminated land', on the basis 'that significant harm is being caused, or there is a significant possibility of such harm being caused', the authority must identify a significant pollution linkage. This means that each of the following has been identified:-

- a contaminant (Source)
- a relevant receptor and
- a pathway

Regarding this relationship (source-pathway-receptor SPR), if any of the three elements are not present, there is no risk and therefore land cannot be classified as statutory 'contaminated land'.

With respect to 'controlled waters', before determining that pollution of controlled waters is being, or is likely to be, caused, the Local Authority should be satisfied that a substance is continuing to enter controlled waters or is likely to enter controlled waters.

6.1 Potential Sources of Contamination

From the information gathered in this preliminary desk study and walkover survey it would appear that the possible pollution linkages are limited to those outlined below.

- From an examination of the sites history, potential 'on site' sources of ground contamination would appear to be limited since the site has never been developed for any purpose other than for use as arable farmland / paddock.
- There is the possibility that burning processes may have taken place at the site such as bonfires although this is unlikely to be of any major significance.
- In the areas surrounding the site farm and residential developments have taken place and during the construction of these areas there is the possibility that some pollutants may migrated on to the site. There is also the possibility the site could have been associated with the abattoir which was, for a time, situated just beyond the south eastern corner of the site.
- Weathering of the natural geological stratum can occasionally cause enrichment of certain metals in the near surface strata.
- The historical extracts indicate the presence of a narrow water course that once extended along part of the eastern boundary. Although unlikely this may have provided a conduit via which potential mobile contamination could have migrated onto the site.
- Although no actual landfill sites are recorded within 1000m of the study site, the desk study has revealed the existence of a former pond once situated in the north eastern corner of the site which has subsequently been infilled. A recent geo-environmental survey undertaken at the site has revealed that the materials infilling the pond comprise reworked deposits of natural glacial clays of low organic content, which would not be considered to represent a credible source of significant ground gas generation.

6.1.1 Potential Contaminants (Sources)

The potential contaminants that might be associated with the past activities at the site and the immediate surrounding area have been tabulated below:-

- Metals, metalloids and asbestos which could be associated with any imported deposits of ‘made ground’ that may have been placed on the site surface. Contamination could have also been deposited on the site during the construction of the residential / developments and farm buildings occupying the adjacent areas. Residual contamination from natural weathering of the underlying geological strata is also possible.
- Polycyclic Aromatic Hydrocarbons (PAH’s) derived from incomplete combustion of organic materials, i.e. from bonfires or burning processes that may have taken place at the site in the past.
- Total Petroleum Hydrocarbons (TPH) and Benzene, Toluene, Ethylbenzene, and Xylene (BTEX) contamination contained within deposits of made up or disturbed ground which may have been transported on to the site or through the use / parking of farming plant or machinery.
- If significant TPH contamination is present in the near surface soils then there may be a risk from TPH vapours.
- Possible pathogenic contaminants associated with the keeping of livestock and the adjacent abattoir.
- Following the recent geo-environmental investigation it has been established that the former pond once situated on the site has been in-filled with reworked natural soils of low organic content and would not be considered to represent a credible source of significant ground gas generation.

Table 1

Sources							
Sources Description	Contaminants Associated with Source						
	Metals	PAH	TPH/BTEX	Asbestos	Pathogenic contaminants	Landfill Gas	TPH Vapours
<u>On Site</u>							
The possible presence of deposits of imported made / disturbed ground which may contain harmful contaminants or ‘fall out’ from the construction of the adjacent developed areas.	✓	✓	✓	✓			✓
Burning processes that may have taken place within the site boundaries during its past history.	✓	✓					
The possible presence of TPH and BTEX compounds contained within any deposits of made / disturbed ground that may have been transported on to the site or created during the parking or use of of farming plant or machinery.			✓				✓
Possible pathogenic contaminants associated with the keeping of livestock and the adjacent abattoir.					✓		
Residual contamination from natural weathering of geological strata.	✓						
<u>Off Site</u>							
Construction of residential and farm buildings in the areas surrounding the site.	✓	✓		✓			

Table 1 - Summarises the potential contaminative land uses on and in the vicinity of the site showing potential sources with associated contaminants.

Key for Table 1

Metals

Includes - Metals and metalloids (Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Zinc, Arsenic, Boron, Selenium and inorganic chemicals such as Cyanide)

PAH

Includes – EA16 – Acenaphthene, Acenaphthylene, Anthracene, Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Chrysene, Dibenzo[a,h]anthracene, Fluoranthene, Fluorene, Indeno[1,2,3-cd]pyrene, Naphthalene, Phenanthrene, Pyrene.

6.2 Potential Receptors

Potential receptors for any contamination at the site have been identified as: -

- Any shallow groundwater within the superficial deposits overlying the site.
- The principal and secondary aquifers i.e. groundwater within the superficial deposits and underlying bedrock.
- Ground workers involved in the redevelopment of the site.
- Flora and Fauna.
- Future occupiers of the site.
- The properties located adjacent to the site boundaries.
- The fabric of the dwellings to be constructed at the site.

6.3 Potential Pathways

- Any groundwater underlying the site may represent a pathway via which water-soluble contamination may migrate laterally or vertically.
- Highly permeable strata at shallow depth, which has little ability to attenuate diffuse source pollutants.
- Any drainage ditches, service conduits or land drains and any permeable natural deposits beneath the site may represent pathways via which contamination, if present, may be able to migrate.
- The trafficking of plant and machinery across the site in the historical past or during construction of the development.
- Dermal absorption, ingestion and inhalation represent pathways via which ground workers during redevelopment works at the site and future occupiers, may become exposed to contaminated soil, groundwater, dust or vapours.

Table 2

<u>Pathways</u>		<u>Receptors</u>	
<u>Human Health</u>		<u>Human Health</u>	
Dermal Contact with soil	✓	End users and construction workers	✓
Ingestion of soil	✓	End users and construction workers	✓
Inhalation of Contaminated Dust and Harmful Vapours	✓	End users and construction workers	✓
Ingestion of site grown vegetables	✓	End users	✓
Ingestion of water from affected service pipes	✓	End users	✓
<u>Buildings</u>		<u>Buildings</u>	
Mobile water soluble sulphates	✓	Concrete foundations	✓
<u>Controlled Waters</u>		<u>Controlled Waters</u>	
Lateral and vertical migration	✓	Surface water receptors & shallow / deeper groundwater regime	✓
Infiltration	✓	Surface water receptors & shallow / deeper groundwater regime	✓

Table 2 - details the potential pathways with receptors identified for any contaminants that may be present in the ground at the site during and following the proposed development.

6.4 Previous Geo –Environmental Investigation.

A geo-environmental investigation recently undertaken at the site by TLP just prior to the preparation of this Phase 1 Desk Study included sampling and environmental screening of near surface samples from across the site. Assessment of the results has been provided in the report which is entitled - Preliminary Geo-Environmental Investigation - Proposed Residential Development, Abbey Lane, Preston, East Yorkshire. Dated 22/11/2016.

In this investigation, **none of the samples submitted for testing recorded concentrations of contaminants above current screening values for a residential development.** This would suggest that no specific soil remediation is necessary in order for the proposed residential development to proceed as planned. As no significantly elevated concentrations of contaminants have been identified in the near surface soils, it is considered highly unlikely that significant quantities of contaminated leachate are being generated. Moreover, once the development is completed significant parts of the site will be covered with buildings and permanent hard paving. In these areas, direct contact with potentially contaminated soil by end users of the site would be largely eliminated and the potential for leachate production also reduced. Any minor risks posed to construction workers would be temporary and could be mitigated through the use of appropriate PPE.

In one of the samples submitted for testing, a concentration of >1500cfu/g of Clostridium Perfringens was identified. This is likely to be associated with manure which has been generated during the use of the site as a horse paddock. During the intrusive investigation horse manure was identified distributed randomly across all parts of the site and this is considered to be the most likely origin of the observed bacteria.

Using the information gathered within this Phase I Desk Study, coupled with the information obtained during the initial Geo-Environmental Investigation, the following Conceptual Site Model and Risk Assessment Matrix has been generated.

Preliminary Conceptual Site Model - CIRIA C552 Risk Assessment Matrix

The following risk assessment matrix is based on the findings of this Phase I Environmental Assessment and the results of the contamination tests performed on samples recently obtained from the above site as part of the former Preliminary Geo-Environmental Investigation - Proposed Residential Development, Abbey Lane, Preston, East Yorkshire. Dated 22/11/2016.

Potential Source	Potential Pathway	Potential Receptor	Probability	Consequence	Risk Classification
<p>The possible presence of deposits of imported made / disturbed ground which may contain harmful contaminants. Burning processes that may have taken place within the site boundaries during its past history. The possible presence of TPH and BTEX compounds contained within any deposits of made / disturbed ground that may have been transported on to the site or created during the parking or use of farming plant or machinery. Residual contamination from natural weathering of geological strata. Pathogenic contaminants associated with the keeping of livestock or the adjacent abattoir. Construction of residential and farming buildings in the areas surrounding the site.</p> <p>Potential Contaminants Include – PAH, TPH, BTEX, metals, semi-metals, pathogenic contaminants and asbestos.</p> <p>If significant TPH contamination is identified in the near surface soil then there could be a risk of TPH vapour emissions. Harmful ground gasses such as methane and carbon dioxide.</p>	<p>Ingestion, inhalation (dust) and dermal contact</p>	<p>Construction Workers</p>	<p>Unlikely</p>	<p>Medium</p>	<p>Low – Previous uses of site suggested that there was limited potential for contamination to be present at the study site. However, environmental screening of near surface samples has confirmed that concentrations of all contaminants are well within current guideline values for a residential end use with the consumption of home grown produce. Exposure to any contamination not identified in the previous survey would be temporary. Risks could be mitigated by the use of appropriate PPE and good hygiene practices. Dust suppression techniques and covered wagons during earth works would also reduce the potential for the release of potentially contaminated airborne particulates.</p>
		<p>End users</p>	<p>Unlikely</p>	<p>Medium</p>	<p>Low – Previous uses of site suggested that there was limited potential for contamination to be present at the study site. However, environmental screening of near surface samples has confirmed that concentrations of all contaminants are well within current guideline values for a residential end use with the consumption of home grown produce and no specific remediation is considered necessary. Made up or disturbed ground was present over many parts of the site and therefore intended garden / landscaped areas would benefit from the provision of a clean cover of nutrient rich topsoil to assist plant growth.</p>
	<p>Migration of gas / vapours through voids into confined spaces</p>	<p>Construction Workers During Excavation</p>	<p>Unlikely</p>	<p>Medium</p>	<p>Low – Although unlikely it was initially considered a possibility that the former in-filled pond in the north eastern part of the site could represent a potential source of harmful ground gas generation such as methane and carbon dioxide, especially if the area had been backfilled with soils of high organic content or biodegradable deposits. The recent intrusive geo-environmental investigation has however established that the former pond has been in-filled with deposits of re-worked boulder clay with a low organic content. These soils would not be considered a potential source of ground gas generation. The risk of ground gas being generated at the site is therefore considered to be low and no further assessment is considered necessary in this regard. The absence of any elevated TPH or B-TEX fractions within the soil samples submitted for testing suggests that construction workers working in excavations or confined spaces should not be at risk from significant hydrocarbon vapour</p>

					emissions.
		End users	Unlikely	Medium	Low – Although unlikely it was initially considered a possibility that the former in-filled pond in the north eastern part of the site could represent a potential source of harmful ground gas generation such as methane and carbon dioxide, especially if the area had been backfilled with soils of high organic content or biodegradable deposits. The recent intrusive geo-environmental investigation has however established that the former pond has been in-filled with deposits of re-worked boulder clay with a low organic content. These soils would not be considered a potential source of ground gas generation. The risk of ground gas being generated at the site is therefore considered to be low and no further assessment is considered necessary in this regard. The absence of any elevated TPH or B-TEX fractions within the soil samples submitted for testing suggests that the risk from TPH emissions is low and no protection measures are considered necessary in new properties in this regard.
	Migration of Radon into buildings	End users	Unlikely	Medium	Low – The site is not located within a radon affected area as less than 1% of properties within the specified search area were recorded above the action level. The Emapsite report indicates that no radon protection measures are required for new buildings or extensions to those already existing.
	Plant uptake	Landscaping Plants	Unlikely	Minor	Very Low – Previous uses of site suggest limited potential for contamination to be present. Grass, plants and vegetation growing on site and adjacent to the edges of the site do not appear to be exhibiting any signs of distress. Environmental screening of soil samples submitted for testing has demonstrated that concentrations of potential contaminants are well within acceptable guideline limits for a ‘residential with the consumption of home grown produce’ end use scenario. However, as made ground is present over many parts of the site, any intended garden / landscaped areas would benefit from a clean cover of nutrient rich topsoil to assist plant growth.
	Chemical Attack	Water Supply Pipes	Low likelihood	Mild	Low – Previous uses of site suggest limited potential for contamination to be present at this site. Environmental screening of soil samples submitted for testing has demonstrated that concentrations of potential contaminants are well within acceptable guideline limits. Nevertheless, the local Water Company will need to be contacted to ensure compliance. Guidance can be obtained from the UKWIR Publication 2010. Provided the correct procedures are implemented to protect water pipes then the risk class attributed to future site users would be Low.
	Chemical Attack	Underground Structures	Unlikely	Mild	Low – Water-soluble sulphate concentrations were found to lie within the design sulphate class DS-1 of the

					BRE Digest Special Digest 1 classification 'Concrete in Aggressive Ground'. In accordance with the guidelines contained in Part 1 of the Digest and taking into consideration the specific soil and groundwater conditions, the site can be assigned an ACEC Class AC-1.
	Vertical Migration	Groundwater in superficial deposits (Secondary Undifferentiated Aquifer)	Unlikely	Medium	Low – Previous uses of site suggest limited potential for contamination to be present at this site. The recent intrusive survey has revealed that the site is overlain by a covering of Glacial Till. Percolation trials undertaken as part of the recent intrusive survey have demonstrated that the near surface clays have a very low permeability. Although these superficial soils are designated as a Secondary (undifferentiated) aquifer, groundwater within these low permeability deposits is unlikely to be highly mobile. As such these low permeability deposits will be inhibiting the migration of any potentially contaminated leachate. The site is not situated within 500m of a groundwater SPZ, however the underlying Principal aquifer would still be considered highly sensitive. There appears to be a single current groundwater abstractions within 1000m of the study site. This relates to an historical permit issued 07/11/2011 at a location 191m west of the site which allows Cranswick Country Foods Ltd. to obtain groundwater from a borehole point source for general washing and process washing. The expiry of this permit is dated 31/03/2025. There are no other surface water abstraction points situated within 1000m of the study site. There are no records of potable water abstraction points situated within 2000m of the study site.
		Groundwater (Bedrock – Principal Aquifer)	Unlikely	Medium	Low - Previous uses of site suggest limited potential for contamination to be present at this site. The superficial deposits underlying the site have been found to comprise low permeability Boulder Clay and these soils are likely to have provided an effective barrier to the vertical or lateral migration of potentially contaminated leachate. The superficial deposits are underlain by the Flamborough Chalk Formation which is designated a Principal Aquifer. This receptor would be considered a highly sensitive if left exposed to any contamination that might ultimately be revealed. The site is not situated within 500m of a groundwater SPZ, however the underlying Principal aquifer would still be considered highly sensitive. There appears to be a single current groundwater abstractions within 1000m of the study site. This relates to an historical permit issued 07/11/2011 at a location 191m west of the site which allows Cranswick Country Foods Ltd. to obtain groundwater from a borehole point source for general washing and process washing. The expiry of this permit is dated 31/03/2025. There are no

					other surface water abstraction points situated within 1000m of the study site. There are no records of potable water abstraction points situated within 2000m of the study site.
	Lateral Migration in groundwater or surface water	Surface Water (Off Site Drainage)	Unlikely	Medium	Low – The nearest surface water feature to the site is a drain (tertiary river), situated approximately 139m north of the site. At such a distance, this water feature is unlikely to be vulnerable to contamination that may be being generated by the study site. It is therefore unlikely that the site could pose a significant risk to surface water receptors in the surrounding areas.

7.0 RISK OVERVIEW

The information compiled in this desk study, together with the findings of the recent initial geo-environmental assessment have led to the conclusion that the site poses a ‘Low’ environmental risk. Environmental screening of near surface samples did not identify any significant contamination and therefore it is concluded that the site is suitable for its proposed residential use without the need for any specific remediation. In such circumstances it is considered that no further investigation or assessment is required for the proposed residential development to proceed as planned. The concentration of clostridium perfringens that was recorded in the sample obtained from south eastern part of the site is likely to be associated with faeces produced by the small number horses that currently occupy the paddock. Once the livestock are no longer present on the site and the site prepared for building, the bacteria / spores within the near surface soils are likely to gradually reduce over time. A generous covering of certified clean, nutrient rich topsoil, over proposed garden / landscaped areas should reduce the risk of direct contact between the end users of the site and any areas where pathogenic bacteria may remain. This cover would also serve to provide a healthy media for plant growth.

8.0 PRECAUTIONARY MEASURES - CONTAMINATION

Precautionary measures are recommended and these are listed:-

- The disposal of any soils from site should be to an appropriate receiving facility. Any documentation relating to the export of soils from site should be retained for possible future inspection by the local authority Environmental Protection Officer. Changes in legislation concerning hazardous waste may have an effect on the disposal costs of any materials from the site. Compliance testing is likely to be required in order to classify materials within the Waste Acceptance Criteria (WAC). If materials excavated from the site are exported to landfill, certificates of the analysis should be made available to prospective receiving facilities to determine the most appropriate disposal route.
- If materials suspected of being significantly contaminated are revealed during site preparation, then it will be necessary to take representative samples and carry out additional analysis. All such occurrences should be photographed, carefully logged and the extent shown on a copy of the site plan. Remediation work should not take place until this potential ‘new’ contamination has been fully identified and a remediation strategy approved by the local authority. Any soils suspected of being contaminated, which are stockpiled, should be placed on sheeted areas and representative samples submitted for analysis. Upon receipt of the results, these materials will be either available for re-use or disposed of to an authorized landfill.
- All replacement fill materials to be used should be certified clean at source. Suitable fill materials may include but are not necessarily limited to natural sand, gravel or crushed stone. Prior to the import of any sub-soil fill or topsoil, appropriate documentation should

be obtained providing evidence that the materials are not contaminated and are fit for use. It is recommended that any such paperwork is inspected by TLP or similar consultancy to ensure compliance.

- The risk to site users, neighbouring occupants, the ‘general’ public and to construction workers from airborne pollution is considered to be generally ‘low’ nevertheless, basic dust suppression measures should be adopted for the duration of any earth works as a precaution. Haulage vehicles removing any soils should be provided with a cover to reduce the possibility of release of potentially contaminated airborne particulates during transportation.
- Ground workers involved in the development should be provided with appropriate personal protective equipment in order to mitigate the risk of temporary exposure to contamination.

Provided the measures detailed above in sections 8.0 are implemented then the long term risk to human health and other environmental receptors is considered to be generally Low.

8.1 **Other Considerations**

There are several other areas of research beyond the scope of this report that may or may not be applicable to the site. These factors are generally identified within specific planning conditions and can include:

- **Archaeology** – Should the site be situated on or within an area of archaeological sensitivity, the advisor to the relevant local authority should be consulted.
- **Ecology** – There may be a requirement for a detailed ecological report, dependent on the type or size of the development.
- **Underground Services** – These should be fully investigated prior to any redevelopment.

TLP Ground Investigations Ltd

Prepared by R.L. Trattles

Reviewed by S. P. Trattles

Approved by R.L. Trattles

Ref. RT/GH/CK/11/2016

Site Location Plan

Proposed Residential Development, Abbey Lane, Preston, East Yorkshire.



Site Location Plan

Proposed Residential Development, Abbey Lane, Preston, East Yorkshire.





EmapSite

Masdar House, 1 Reading Road,
Eversley, RG27 0RP

Groundsure EMS-391251_523640
Reference:

Your Reference: EMS_391251_523640

Report Date 4 Nov 2016

Report Delivery Email - pdf
Method:

Groundsure Enviro Insight

Address: Abbey Lane, Preston, East Yorkshire,

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Enviro Insight** as requested.

If you would like further assistance regarding this report then please contact the emapsite customer services team on 0118 9736883 quoting the above report reference number.

Yours faithfully,

emapsite customer services team

Enc.
Groundsure Enviroinsight

Groundsure Enviro Insight

Address: Abbey Lane, Preston, East Yorkshire,
Date: 4 Nov 2016
Reference: EMS-391251_523640
Client: EmapSite

NW

N

NE

W

E



SW

S

SE

Aerial Photograph Capture date: 15-Apr-2007
Grid Reference: 518574,430675
Site Size: 0.75ha

Report Reference: EMS-391251_523640
Client Reference: EMS_391251_523640

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