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Desk Study Report

**Land at Cottage Farm / James Copse
Lovedean Lane
Lovedean
Hampshire**

Client:

Bargate Homes Limited

J19042

January 2020

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- Ground Sure Geological and Environmental Summary Report
- Selected Historical Maps

EXECUTIVE SUMMARY

This executive summary contains an overview of the key findings and conclusions. No reliance should be placed on any part of the executive summary until the whole of the report has been read. Other sections of the report may contain information that puts into context the findings that are summarised in the executive summary.

BRIEF

This report describes the findings of a desk study carried out by Wilson Bailey Partnership Limited on the instructions of Bargate Homes Limited to carry out an assessment of the anticipated ground conditions and the potential for contamination with regard to the proposed residential development of this land parcel. Whilst details have not yet been finalised, it is anticipated that the development may comprise predominantly two storey housing together with a network of access roads, areas of hardstanding for car parking and areas of private domestic gardens and ancillary managed soft landscaping and planting areas.

DESK STUDY FINDINGS

Desk study research has been carried out with reference of publicly available historical mapping and environmental database records together with a site walkover survey.

The desk study research has indicated that the site is a predominantly greenfield site having not been developed previously other than the formation of what is recorded as being an old chalk pit within the central part of the site with a further old chalk pit located directly to the south of the site. Historical mapping indicates that the field boundaries were significantly modified in the early 1940s, and that since the mid 1960s, the area surrounding the site to the east and south has become increasingly developed through the construction of predominantly new housing. The field to the north has also been developed more recently for housing by Bargate Homes Limited.

The environmental searches have not indicated the presence of any particularly significant issues of concern with regard to land contamination, although these searches have indicated the site to be located within a Groundwater Source Protection Zone Class 1, which demonstrates a significant sensitivity.

The site is indicated to be underlain by junction between the clay and sand soils of the Lambeth Group overlying the chalk soils of the Tarrant Chalk, with a tract of alluvium to the west. This geological setting is a characteristic risk setting of chalk dissolution and the database searches have indicated numerous chalk dissolution features within the vicinity of the site and within the site itself. It is also important to note that mapping features identified as old chalk pits can sometimes be natural chalk dissolution features that may have been historically mis-identified.

It is understood that in recent years the site has been used for grazing but that during the 1970s, the site was used for growing turf and has been progressively stripped of much of the natural topsoil depth during those works.

CONTAMINATION RISK ASSESSMENT AND CONCLUSIONS

The historical use of the majority of the site as open agricultural land is not considered to be potentially contaminative, although the site is in a particularly sensitive setting with regards to groundwater risks.

Whilst the site is not considered to pose a significant risk at present and whilst the proposed residential development will not introduce significant additional sources of contamination, the proposed development will need to take account of the anticipated geologically compromised ground conditions. The design of the development will need to incorporate a strong engineering based philosophy to mitigate any ground related risks of subsidence and settlement in addition to incorporating design measures to mitigate the risk of any physical or chemical contamination of the groundwater during and after the construction period.

Following on from this desk study a site wide geophysics assessment should be carried out in order to aid the design of a suitably robust and considered physical investigation of the ground in order to determine the ground conditions and their variation across this site, determine the presence of chalk dissolution features, the extent of any historical ground workings and the depth to groundwater.

1.0 INTRODUCTION

Wilson Bailey Partnership has been commissioned by Bargate Homes Limited to carry out a desk study of the site which comprises an open area of land that is currently used for grazing at Cottage Farm / James Copse, Lovedean Lane, Lovedean.

1.1 Proposed Development

It is understood that proposals are being formulated for the residential development of this site through the construction of a range of predominantly two storey houses together with access roads and areas of hardstanding for car parking, areas of managed soft landscaping and planting and areas of private domestic gardens.

1.2 Purpose of Work

The principal technical objectives of the work carried out were as follows.

- to determine the history of the site and surrounding area, particularly with respect to any previous or present potentially contaminative uses;
- to research the geology and hydrogeology of the site;
- to check records of data on ground water, surface water and other publicly available environmental data; and
- to use the information obtained in the above searches to produce a preliminary conceptual model and carry out a preliminary contaminated land risk assessment based upon the proposed more sensitive residential land use.

1.3 Scope of Work

In order to meet the above objectives, a desk study was carried out, comprising, in summary, the following activities:

- a review of readily available geological maps;
- a review of publicly available environmental data sourced from the GroundSure database;
- a review of Ordnance Survey (OS) supplied by GroundSure;
- a review of publically available information supplied by the Environment Agency; and
- provision of a report presenting and interpreting the above data, together with our advice and recommendations with respect to the proposed change of use of the existing building.

1.4 Limitations

The conclusions and recommendations made in this report are limited to those that can be made on the basis of the research carried out. The results of the research should be viewed in the context of the work that has been carried out and no liability can be accepted for matters outside the stated scope of the research. Any comments made on the basis of information obtained from third parties are given in good faith on the assumption that the information is accurate. No independent validation of third party information has been made by the Wilson Bailey Partnership.

2.0 THE SITE

2.1 Site Description

The site is an approximately rectangular shaped area of land with approximate maximum dimensions of 240 m by 160 m, the western boundary of which is formed by a line of post and rail fencing that segregates the site from further adjoining areas of open land used for grazing horses. The eastern boundary is variable but predominantly formed by the extent of fences and hedges that define the extent of the adjoining rear gardens to the various houses that front onto Lovedean Lane to the east. Within the northern part of the eastern site boundary there is a narrow access track that provides access to the site directly from Lovedean Lane, with an ongoing new residential development currently underway on the former Cottage Farm site itself directly to the north of this access track.

The northern boundary to the site is formed by a mature hedge, beyond which is a recently completed residential development by Bargate Homes. The southern boundary to the site is formed by the houses and gardens to James Copes, with a small field gate also providing access from this road onto the site.

The site is located within the western side slope of a north to south trending dry valley within which Lovedean Lane is situated. The site has a variable topography and includes a number of areas of relatively steep slopes down towards the east, which are consistent with the local topography, but the site also slopes locally to the west, north and south. This variable topography is considered to be indicative of either natural ground variation as a result of chalk dissolution, man-made localised earthworks, or more likely a combination of both.

No indications of any distressed vegetation were noted and no indications of invasive plant species were identified during our site walkover, although it should be noted that our site visit was carried out during the winter, when evidence of invasive plant species and distressed vegetation can be seasonally absent.

There are also a series of above ground high voltage electricity cables supported on wooden that bisect the northern part of the site before dropping to ground level and passing below the site in ducts and then along through the central eastern part of the site and down the track to Lovedean Lane.

Beyond the site boundaries to the northwest and south west are areas of dense woodland that include a number of further variations in the topography with a series of dells and possible earthworks, although a full inspection of these off-site areas was not carried out.

2.2 Site History

Desk study research has been carried out with reference of publically available historical mapping and environmental database records together with a site walkover survey.

The desk study research has indicated that the site is a predominantly greenfield site having not been developed previously other than the formation of what is recorded as being an old chalk pit within the central part of the site with a further old chalk pit located directly to the south of the site. Historical mapping indicates that the field boundaries were significantly modified in the early 1940s, and that since the mid 1960s, the area surrounding the site to the east and south has become increasingly developed through the construction of predominantly new housing. The field to the north has also been developed more recently for housing by Bargate Homes Limited.

2.3 Other Information

It is understood that in recent years the site has been used for grazing but that during the 1970s, the site was used for growing turf and has been progressively stripped of much of the natural topsoil depth during those works.

The environmental searches have not indicated the presence of any particularly significant issues of concern with regard to land contamination, although these searches have indicated the site to be located within a Groundwater Source Protection Zone Class 1, which demonstrates a significant sensitivity.

The searches have also indicated the site to be located in an area where less than 1% of homes may be affected by radon emissions, which is the lowest risk category such that radon protection measures are not required as part of the redevelopment of this site.

The site is indicated to be underlain by junction between the clay and sand soils of the Lambeth Group overlying the chalk soils of the Tarrant Chalk, with a tract of alluvium to the west. This geological setting is a characteristic risk setting of chalk dissolution and the database searches have indicated numerous chalk dissolution features within the vicinity of the site and within the site itself.

Details of the locations and descriptions of the chalk dissolution features identified within the site and immediate surroundings are included within the appendix to this report and include sink-holes and swallow holes. It is also important to note that mapping features identified as old chalk pits can sometimes be natural chalk dissolution features that may have been historically mis-identified or where natural features have been exploited and adapted to create man made extraction points for chalk.

3.0 ANTICIPATED GROUND CONDITIONS

3.1 Soil Conditions

The site is indicated to be underlain by junction between the clay and sand soils of the Lambeth Group overlying the chalk soils of the Tarrant Chalk, with a tract of alluvium to the west.

As noted above, this geological setting is a characteristic risk setting of chalk dissolution.

3.2 Ground Water Conditions

Information provided by the Environment Agency indicates the Tarrant Chalk to be classed as a Principal Aquifer and that the site is located within a Groundwater Source Protection Zone 1 associated with a public drinking water abstraction owned and operated by Portsmouth Water.

Preliminary discussions have been held with Portsmouth Water to discuss the site, the potential for development and the implications with regards to groundwater protection.

4.0 PRELIMINARY CONCEPTUAL MODEL

The determination of contaminated sites is based on a “suitable for use” approach which involves investigating the risks posed by contaminated land by making risk-based decisions. This risk assessment is carried out on the basis of establishing one or more “pollution linkages”; a pollution linkage requires a source of contamination, a sensitive target or receptor that is at risk from the contamination and a pathway by which the contamination can travel from the source to the target.

Current guidance to Local Planning Authorities also indicates the need for a conceptual model and risk assessment. Where development is proposed on land that may be affected by contamination, a risk assessment should be carried out for consideration by the LPA before the planning application is determined. Where unacceptable risks are identified proposals need to be made to address these risks as part of the development process.

The guidance recognises the benefits of a phased approach and the desk study is the first phase in the process of investigating and identifying contamination to assist in the determination of a planning application.

The long term historical use of the site and its current use are not considered to be potentially contaminative. The proposed residential development will introduce the potential for future contamination, although by its nature a residential development is not considered to present a significant risk of ground contamination. The development process of construction will present an increased risk of ground contamination associated with the operation of plant, storage and use of a range of fuels, oils and greases and the opening of excavations into the ground.

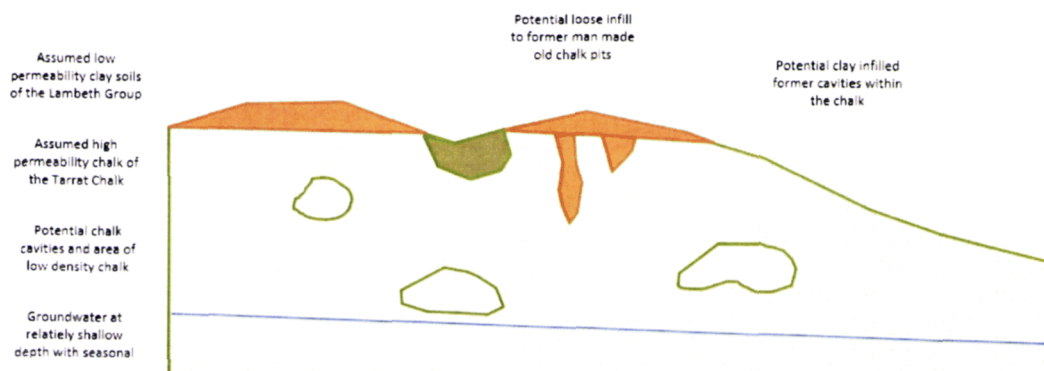
The significance of the hydrogeological and geological setting of the site will necessitate a precautionary approach to the proposed development of this site with the proposed development and the construction process designed to mitigate the identified risks associated with the setting of the site.

The sketch conceptual cross section through the site is intended to aid the discussion of the site setting and risk assessment.

Conceptual Sketch Cross Section Through the Site

West

East



5.0 RISK ASSESSMENT

The site is proposed to be developed through construction of residential housing together with access roads and areas of hardstanding for car parking, areas of managed soft landscaping and planting and areas of private domestic gardens.

Whilst the current and historical site uses are not considered to have been contaminative and that proposed residential development is not considered to present a significant risk of contamination, the extremely sensitive geological and hydrogeological setting of the site warrants specific consideration and discussion.

5.1 Environmental Risks

The works that will be required to facilitate the construction of the proposed residential development will, by their nature, involve the operation of plant and equipment and necessitate the storage, use and dispensing of a wide range of fuels, oils, greases and solvents.

The design of the construction works and the necessary precautions required to mitigate the environmental risks associated with the spilled or leakage of any fuels oils, greases and solvents will need to be carefully considered as part of a Construction Management Plan that will need to be developed for this site.

In addition to the risks associated with chemical contamination of the chalk aquifer and the groundwater, consideration must also be given to the risks of physical contamination associated with silt run-off and surface water from areas of hardstanding during and after construction. Precautions will need to be taken during the construction works to mitigate the risk of silt and run-off and these may include provision of drainage to hardstanding from the outset, locating site compounds and car parking areas of drained areas of hardstanding and avoiding the use of crush concrete built temporary areas of hardstanding. In addition, an important consideration may be to carry out only limited areas of site topsoil stripping to mitigate risks associated with surface run-off and silt contamination of the aquifer.

Design precautions may also need to be considered for proposed drainage infrastructure for road and any areas of private drainage. The use of soakaways cannot be incorporated into the drainage design for this site.

5.2 Geotechnical Risks

The site is located within a geologically compromised setting that is prone to the risk of chalk dissolution.

The site walkover and desk study have indicated the presence of likely chalk dissolution features and man-made chalk extraction related features within the site boundary and the database searches have indicated the presence of numerous chalk dissolution features in the vicinity of the site.

The presence of any such features within the site does not necessarily preclude the potential for development, although it is important that the location of any below ground anomalies and the variation of the natural and man-made geology beneath the site is robustly and appropriately assessed. Once the ground and groundwater conditions have been fully assessed, the implications with regards to geotechnical stability of the ground can be determined.

Where development can be subsequently acceptable, the design of the proposed scheme will need to be carefully considered within the geotechnical parameters of the site and below ground structures may need to incorporate measures such as reinforcement and load spreading to mitigate the risks of geotechnical instability, settlement, subsidence and collapse.

It is considered that in addition to the environmental reasons noted above, for geotechnical reasons soakaways shall not form part of any development scheme at this site and precautions will be required with regards to surface drainage and infrastructure to mitigate the risks of surface water drainage further reducing the geotechnical stability of the ground at this site.

6.0 CONCLUSIONS

It is considered that the site in its current state does not present any unacceptable environmental risks and that with careful and considered design, it should be possible to mitigate the identified potential future risks associated with the construction and completed occupation of the proposed residential development of this site.

Extensive further works will be required to fully evaluate the site. These works should commence with a geophysical survey of the ground conditions that may be used to guide a subsequent physical investigation of the ground conditions by means of trial pits and boreholes.

As part of the physical investigation of the site it will be essential to determine the depth to groundwater and potentially investigate for seasonal fluctuations.

APPENDIX

GroundSure Geo-Insight Summary Report

GroundSure Enviro-Insight Summary Report

Historical Maps