

# **BRACKNELL DATA CENTRE**

Ground Conditions 20305B-RPS-XX-XX-RP-P-9734



#### **Approval for issue**

Clare Russell

1 March 2021

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### 1 INTRODUCTION

- 1.1.1 This Ground Conditions document accompanies and supports a planning application for the development of land at Cain Road, Amen Corner, Bracknell, Berks.
- 1.1.2 The purpose of this report is to reference the ground contamination and ground gas assessments that have been previously produced in relation to the Application Site, in order to support the planning application associated with Bracknell Data Centre in accordance with the requirements of the National Planning Policy Framework (NPPF).
- 1.1.3 This report also identifies any outstanding work requirements in relation to ground contamination and ground gas that will likely be required prior to occupation of the completed development.
- 1.1.4 A Master Site Plan (Reference 20305B-RPS-00-XX-DR-A-9501 P01) which illustrates the proposed development is presented as Figure 1.
- 1.1.5 A pre-application submission dated 14<sup>th</sup> December 2020 and associated response reference PRE/20/00220 are acknowledged. The pre-application response states that a 'full Phase 1 Contaminated Land Report' would be required to accompany any application. It states an updated 'Land Gas report' would also be required.
- 1.1.6 In the interests of avoiding pre-commencement planning conditions, the applicant has taken the decision to go beyond the requirements set out on the pre-application response and supplement the initial submission of a Phase 1 Preliminary Risk Assessment with a Phase 2 Site Investigation report (including a ground gas risk assessment) and a document which expands on this by providing a strategy for the implementation of remediation measures required to mitigate the post-development risk associated with ground gas.
- 1.1.7 It is acknowledged that a pre-occupation condition relating to the submission of a Remediation Verification/Validation report will be required. It is also acknowledged that a condition will be included to ensure that any previously uncharacterised contamination encountered during the redevelopment process is managed appropriately and documented within the Validation report.

### 2 PREVIOUS REPORTS

### 2.1 **Previous Reports Prepared for the Application Site**

- 2.1.1 The previous reports available in relation to the Application Site and used in the preparation of this report are as follows:
  - Phase 1 Environmental Assessment, CBRE, Hewlett Packard, Cain Road, Bracknell, CBRE, Reference 50BCD0262442/P1, dated June 2018.
  - Phase 2 Geo-Environmental Assessment, CBRE, Hewlett Packard, Cain Road, Bracknell, Reference 50BCD0262442/PII, dated October 2018.
  - Supplementary Gas Risk Assessment and Specification of Gas Protection Measures, Ramboll, Reference L1620009337\_04, dated 16 July 2020.
  - Site Due Diligence Report, Arcadis, reference 10040272-SDD-RG12-001, July 2020
- 2.1.2 The documents listed above are publicly available (with the exception of the Site Due Diligence Report which was not written for the purposes of planning support). On the basis of the content and findings of these documents, RPS does not foresee the requirement for any precommencement planning conditions.

### 2.2 Summary of Previous Reports

2.2.1 The findings of the three reports are briefly summarised as follows;

#### 2.2.2 CBRE Phase 1 Environmental Assessment

- 2.2.1 The Phase 1 Report includes a description of the environmental setting, a historical map review, an account of a site inspection and a conceptual site model with conclusions and recommendations for further work including a Phase 2 Site Investigation. Whilst the report was written based on a residential end-use the findings and recommendations are unlikely to have been significantly different if it was written for a less sensitive commercial land use such as that proposed by the applicant.
- 2.2.2 The report identifies that published sources indicate the site is underlain by Made Ground overlying the London Clay Formation (classified as Unproductive Stratum) with the Claygate Member (a Secondary A Aquifer) being present in the northwest corner of the site.
- 2.2.3 The report indicates that the site has a history of agricultural land use, and the eastern area of the site was used as a clay pit and subsequently infilled (c.1988) when the local brick works ceased to operate. The site later became a Hewlett Packard facility from c.1989. An electrical substation is indicated to be present onsite.
- 2.2.4 It is understood that the clay pit was infilled as part of the Beehive Landfill (industrial and commercial waste) which extends off-site to the south and east.
- 2.2.5 The report concludes that the site is situated in an area of low sensitivity with respect to groundwater and surface water resources.
- 2.2.6 The risk assessment identified the potential for active source pathway receptor pollutant linkages relating to potential ground contamination and ground gas and recommended a Phase 2 Site Investigation.

#### 2.2.3 CBRE Phase 2 Geo-Environmental Assessment

2.2.1 The Phase 2 Site Investigation identified the Made Ground was thickest in the south-eastern portion of the site (6.5-6.8m thick), within the area of the infilled former clay pit, with the thickness decreasing towards the northwest from 2-3m in the centre to 0.5m in the north.

- 2.2.2 A continuous shallow groundwater body was not identified during the investigation. Localised perched groundwater was encountered at depths of between 0.4m and 6.6mbgl during the monitoring programme.
- 2.2.3 Widespread, gross or potentially mobile contamination impacts were not identified at the site. The report concluded that based on the measured contaminant concentrations, site soils and groundwater concentrations do not present a significant risk to human health under a commercial development scenario.
- 2.2.4 Asbestos was not recorded in soil samples analysed; however asbestos cement was recorded in one location during the investigation in the area of the historical clay pit. It concluded that considering the number of samples analysed during investigation, this was not considered to be indicative of a problem requiring site wide mitigation measures.
- 2.2.5 CBRE noted that no putrescible waste material was identified during the site investigation.
- 2.2.6 Several contaminants were identified in exceedance of assessment criteria protective of controlled waters (groundwater and surface water), however, it was concluded that the risk to controlled waters was not indicated to be significant, given the low sensitivity of the water environment at the site and the highly conservative nature of the assessment criteria (which do not consider the effects of dilution and attenuation). Therefore, the risk to controlled waters was considered low and no further work was likely to be warranted in this respect.
- 2.2.7 CBRE carried out six rounds of ground gas monitoring in 2018 as part of this site investigation. The gas assessment concluded that the site would fall into CIRIA 'Characteristic Gas Situation 2', i.e. 'low' risk and basic gas protection measures would be required within any proposed buildings on site.
- 2.2.8 The overall conclusion stated that the site was of low risk with respect to ground contamination issues. The report recommended that no remediation was considered necessary, with the exception of the inclusion of basic gas protection measures into new structures in accordance with the requirements for a Characteristic Situation 2 setting.

#### 2.2.4 Ramboll Supplementary Gas Risk Assessment

- 2.2.1 Ramboll was commissioned to undertake confirmatory gas monitoring following the monitoring and risk assessment undertaken by CBRE. The report notes that the existing Hewlett Packard site was developed during the 1980's with gas protection measures incorporated into the office buildings.
- 2.2.2 Ramboll supplemented the previous six rounds of gas monitoring with a further four rounds of monitoring. They reported that the data was similar to that provided by CBRE and the elevated gas concentrations were similarly limited to a number of isolated wells as opposed to being site wide with flow rates being low, typically less than 1.0l/hr.
- 2.2.3 Ramboll assessed the data from all ten sets of gas monitoring data and concluded that the gas risk was in line with Characteristic Situation 2.
- 2.2.4 The Ramboll report goes on to specify gas protection requirements in accordance with BS8485. It recommends that the protection measures include a cast in-situ monolithic reinforced ground bearing raft floor slab with minimal penetrations and a gas resistant membrane which must be sufficiently impervious and strong and verified in accordance with CIRIA C735. It suggests that this should be supplemented with passive ventilation measures.
- 2.2.5 As well as setting out ground gas protection requirements the report also sets out mitigation measures relating to material management, a capping system for landscaped areas, protection of water supply pipes, a watching brief during groundworks and a strategy for reacting to unexpected contamination.

#### 2.2.5 Arcadis Site Due Diligence Report

2.2.1 The Site Due Diligence report covers many environmental topics including the potential risk associated with ground contamination and ground gas from a property due diligence perspective. As it was not written from a planning support perspective it has not been submitted in support of

the planning application but salient findings are summarised below. The report included a Phase 1 Assessment and a Phase 2 Site investigation which references the aforementioned third party reports and incorporated the previous findings into the risk assessment process.

- 2.2.2 The Phase 1 Assessment identified a low to moderate risk rating in relation to ground gas and a low to moderate risk rating to controlled water receptors in relation to potential ground contamination.
- 2.2.3 The Phase 2 Investigation was undertaken during June 2020 and comprised a total of six boreholes to depths between 10.5 and 18.95m bgl; with groundwater monitoring wells in three of the boreholes. Soil and groundwater sampling and analysis was undertaken and the data was subject to quantitative risk assessment.
- 2.2.4 A total of thirty soil samples were analysed for a range of potential contaminants and compared to commercial generic assessment criteria (GAC). Nine samples were screened for asbestos; none was identified other than a fragment of asbestos cement identified by the previous CBRE investigation. Three groundwater samples were analysed and compared to drinking water standards (DWS).
- 2.2.5 The reports indicates that no soil or groundwater contamination was identified at concentrations considered to represent risk to human health receptors.
- 2.2.6 The report indicates that some metals were identified in groundwater above the DWS and hydrocarbons were present at a low concentration at one location but PAHs, VOCs, SVOCs, PCBs, pesticides and herbicides were all below the laboratory limit of detection. The report concluded that the sensitivity of the water environment was low and the risk to controlled waters from identified contamination was low and unlikely to warrant further investigation.

## 3 **RPS OPINION**

- 3.1.1 THE CBRE Phase 1 report includes the necessary information and meets the general requirements of a Preliminary Risk Assessment. The CBRE Phase 2 Site Investigation provided comprehensive coverage of the site (a total of 70 soil samples and eight perched groundwater samples). Six rounds of ground gas monitoring were also completed.
- 3.1.2 The generic risk assessment identified concentrations of hydrocarbons at levels exceeding assessment criteria protective of future residential users (being considered at the time). However, it would be anticipated that no exceedances of the commercial criteria would be encountered given the reduction in sensitivity of the land use now proposed. The risk assessments produced by Arcadis as part of the subsequent due diligence assessments corroborated these conclusions.
- 3.1.3 CBRE provided recommendation of CS2 ground gas protection measures which was also corroborated by Ramboll following further monitoring and risk assessment and RPS concur with this concussion based on the available data.
- 3.1.4 Elevated TPH concentrations that may pose a potential risk to new water supply pipes were recorded to the northeast of the site during the 2018 CBRE investigation. Requirements should be sought from the service provider prior to installation of any water supply pipes in impacted areas of the site.
- 3.1.5 On the basis of the above, RPS does not consider any further Phase 2 Site Investigation to be required from a geo-environmental perspective and the remediation/mitigation measures set out within the Ramboll report are considered to be appropriate based on the findings of the site investigations and risk assessments.

### 4 VALIDATION PLAN

4.1.1 To support the discharge of pre-occupation planning conditions relating to verification/validation, a verification report containing the following information will be submitted by the applicant on completion of the relevant site development works:

#### 4.2 Surface Cover System

- 4.2.1 The surface cover system will primarily consist of hardstanding and building cover that are part of the finished site and soft landscaping with an imported soil cover system where necessary.
- 4.2.2 New areas of soft landscaping will be provided with a growth medium generally comprising of 150mm subsoil and 150mm topsoil (or similar) or alternatively 300mm of granular material in areas of the site found to be impacted by shallow soil contamination.
- 4.2.3 As part of the development proposals areas of the site will be established as wildflower grassland as part of the ecological mitigation (refer to the Landscape Management Plan document ref 20305B-RPS-XX-XX-RP-P-9723) and in these areas a reduced topsoil cover is necessary. Enhanced management systems will therefore be implemented as part of the site's health and safety file to control soil disturbance and to prevent the Made Ground becoming exposed at the surface in these areas. Details will be presented within the site's health and safety files and a permit to work procedure will be implemented to minimise unnecessary soil disturbance and ensure control measures are in places for tasks where soils need to be disturbed.
- 4.2.4 Information submitted to verify the surface cover system would include:
  - Analysis of samples of the cover system (topsoil, subsoils or granular materials) to ensure that the materials is suitable for use. The samples would be subject to analysis for the following determinands:
    - o pH;
    - Metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Se, Zn);
    - Cyanide, phenols and sulphate;
    - Petroleum hydrocarbons (TPHCWG);
    - Polycyclic aromatic hydrocarbons (PAH 16 Speciated); and,
    - Asbestos screen.
- 4.2.5 The laboratory data would be compared to the S4UL screening values derived for commercial land use. If a positive identification for asbestos is identified in any of the samples the corresponding sample would be subject to quantification. If the quantification result exceeds the laboratory limit of detection of <0.001% wt the sample would be considered unsuitable for use. Samples will be collected and analysed at a rate of one sample per 250m<sup>3</sup> and a minimum of three samples from each source of material.
- 4.2.6 The verification report will also include:
  - Photographic evidence of the depth of the surface cover.
  - Conformation of the presence of hardstanding across other areas of the site.

#### 4.3 **Ground Gas Protection Measures**

- 4.3.1 The ground gas protection measures will be installed by a suitably experienced specialist contractor in accordance with a design produced by a suitably experienced engineer.
- 4.3.2 Membranes will be independently verified in accordance with CIRIA C735 Good practice on the testing and verification of protection systems for buildings against hazardous ground gases (C735).
- 4.3.3 Information submitted to verify the gas/vapour protection measures would include:
  - Design drawings;

- The specification of the selected membrane(s);
- An installation record provided by the specialist contactor (including photographic documentation of the completed installation and joint sealing process; and,
- A verification document provided by an independent party that confirms that verification has been successful and undertaken in accordance with CIRIA C735.

### 4.4 Water Supply Pipe Protection

- 4.4.1 UKWIR Guidance for the selection of Water Supply Pipes to be used in Brownfield Sites, provide guidance for supply pipes. Confirmation of the required supply pipes should be sought with the water supply company if any such infrastructure is required in the area of the site affected by hydrocarbon contamination.
- 4.4.2 Information contained within the Validation Report would include:
  - The specification for the selected water supply pipe; and,
  - A photographic record of installation.

#### 4.5 Discovery Strategy

- 4.5.1 A discovery strategy for any previously un-encountered contamination would be implemented as part of the redevelopment process. The discover strategy should consist of the following procedures.
- 4.5.2 RPS or another suitably qualified environmental consultant should be contacted, where any significant visual or olfactory evidence of contamination, not previously encountered, is identified by construction workers during the development works. The following shall be considered indicative of soil contamination that may require remediation:
  - The presence of free phase contamination (liquid oils);
  - Fibrous or cement bound materials (potentially asbestos containing materials);
  - Significant staining and discolouration of exposed soils;
  - Evidence of Japanese Knotweed; and / or
  - Olfactory evidence of hydrocarbon contamination.
- 4.5.3 Any construction activities in the area of this material would cease until an appropriate plan for dealing with the contamination has been put in place. A written statement would be provided by the principal contractor on behalf of the applicant where no significant evidence of contamination is encountered.
- 4.5.4 The Validation report would include an account of any previously uncharacterised contamination that is encountered during the redevelopment process and an account of the assessment and remediation/ mitigation measures adopted.