

Mineral Resource Assessment

For Land South of Chiswell Green Lane, St. Albans, Hertfordshire

On behalf of: CALA Homes (Chilterns) Limited and Redington Capital Limited



Date of Report: 15th August 2022

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- 2 Hertfordshire Mineral and Waste Local Plan 2040: Draft 2022: Appendix 3
- 3 Phase 2 Geo-Environmental Site Investigation (BRD) – Trial Pit and Borehole Location Plan
- 4 Phase 2 Geo-Environmental Site Investigation (BRD) – Carter Jonas Borehole Review

1 Introduction

1.1 Background

1.1.1 This report has been prepared in accordance with the joint instructions from CALA Homes (Chilterns) Limited and Redington Capital Limited (the 'Client'), to prepare a Minerals Resource Assessment (MRA) in support of an outline planning application for residential development on Land South of Chiswell Green Lane, Chiswell Green, planning application reference (PA ref:) 5/2022/0927.

1.1.2 The MRA seeks to address comments raised by Hertfordshire County Council (HCC) in their capacity as the Mineral Planning Authority (MPA):

The Minerals Planning Authority..... object to the proposed development and request a site investigation and evaluation by way of a Minerals Resource Assessment (MRA) to be undertaken in order to assess the potential for workable mineral deposits underlain at the site and to avoid the possibility of mineral sterilisation (please refer to Section 5(a) of the adopted Minerals Consultation Areas SPD).¹

1.2 Scope of Report

1.2.1 This Mineral Resource Assessment (MRA) has been prepared in accordance with the 'Mineral Safeguarding Practice Guidance' (April 2019) produced by the Mineral Products Association and the Planning Officers' Society. The guidance sets out that developers should provide sufficient information to enable the mineral planning authority (MPA) and local planning authority (LPA) to consider the potential effect of non-exempt development in Mineral Safeguarding areas/Mineral Consultation Areas (MSAs/MCAs) on mineral safeguarding, and the viability of prior extraction of mineral ahead, or in conjunction with, the non-mineral development. This information should be in the form of an MRA and Annex 1 to the guidance sets out matters to be addressed.

1.2.2 The report also has due regard to the relevant national and local mineral safeguarding policies including the Hertfordshire County Council (HCC) Supplementary Planning Document: 'Minerals Consultation Areas in Hertfordshire' and Policy 5 of the Adopted Minerals Local Plan, together with the emerging Minerals and Waste Local Plan (MWLP).

1.2.3 Appendix 3² of the emerging MWLP outlines the purpose of an MRA as being:

- *to identify whether the mineral resource is viable for mineral extraction, and*
- *if the mineral resource is viable, for the applicant to demonstrate whether the prior extraction of minerals would be practically and environmentally acceptable, prior to non-mineral development taking place, in order to prevent sterilisation*

¹ Consultee Response letter from Hertfordshire County Council, dated 5th July 2022

² Para 3.7

1.2.4 This report is a desk-based assessment and includes:

- a review of minerals supply and safeguarding planning policies in Hertfordshire;
- an appraisal of key planning and environmental designations on the Site and adjoining land, including constraints which may affect the prior extraction of mineral resources;
- a review of any nearby planning applications for non-mineral development which were accompanied by a Mineral Resource Assessment;
- the mineral potential associated with the proposed Site (e.g. an initial view on the quantity and quality based on available published geological data and results of any site investigation already undertaken) and consideration of mineral resources in the vicinity of the MSA; and
- need for the safeguarded mineral resources (based on the existing landbank) albeit that of itself this should not preclude the need to consider the scope for some prior extraction.

1.2.5 At this stage no mineral investigations have been undertaken. However, due regard has been given to the Phase 2 Geo-Environmental Site Investigation which was undertaken by BRD Environmental Ltd for PA ref: 5/2022/0927. Further details are provided in section 5 of this MRA.

1.2.6 The report has been prepared Tamsyn Luggar and Alexander Heath, peer reviewed by Huw Richards and peer reviewed and approved by Karen Hearnshaw.

Karen Hearnshaw is a Chartered Town Planner, Partner at Carter Jonas and the Minerals and Waste Planning lead. Karen has over 20 years' experience working in local government, as a consultant and in the minerals industry. Karen has provided evidence at Local Plan Examination and acted as an Expert Witness at Public Inquiries to address matters of mineral safeguarding.

Huw Richards is also a Partner in Carter Jonas' Minerals and Waste Management Team. Huw is a Chartered Minerals Surveyor and Member of the Institute of Quarrying with over 20' years' experience in the UK and International minerals sector. Huw has undertaken multiple Mineral Resource Assessments and mineral feasibility appraisals for submission to a range of Mineral Planning Authorities across the UK. Huw holds the appropriate qualifications and professional experience and is competent for the purpose of this instruction.

Tamsyn Luggar is an Associate in Carter Jonas' Minerals and Waste Management Team. Tamsyn is a Chartered Mineral Surveyor with over 10 years' experience in the UK and International Mineral Sector.

Alexander Heath is a Surveyor in Carter Jonas' Minerals and Waste Management Team. Alex is a Chartered Mineral Surveyor with 3 years' experience in the UK mineral sector.

2 The Site

2.1 Location

2.1.1 Land South of Chiswell Green Lane, Chiswell Green (the Site) is located at the western outskirts of the village of Chiswell Green, approximately 1.1km southeast of St Albans City Centre, within the administrative area of St Albans City and District Council in the County of Hertfordshire. The Site location is illustrated in Figure 1 and a Location Plan is attached at Appendix 1.

Figure 1 – Site Location



Source: Google Earth

2.2 Site Description

- 2.2.1 The Site is delineated by Chiswell Green Lane along its northern boundary, and along its western boundary by Miriam Lane and a car park screened by trees and hedges which form part of the former 'Butterfly World' located approximately 25 metres (m) to the west of the Site. Residential developments align the eastern and southern boundary along Forge End, Long Fallow and Hammers Gate. There is a small woodland area to the east of the Site situated between the Site and the residential area of Chiswell Green. The extent of the Site is illustrated below.

Figure 2 – The Site



Source: Google Earth

- 2.2.2 The Site extends to approximately 14 hectares (ha) of land comprising agricultural land, Chiswell Green Livery Yard and Riding School and stables, horse grazing fields and a derelict farmhouse and outbuildings. The Site is divided into four distinct fields separated by mature trees. There is a small woodland area (protected by a Tree Preservation Order (TPO)) to the east of the Site which is not included within the Site boundary and sits between the Site and the adjoining residential area.

2.2.3 Topographical maps of the area indicate that the Site slopes in a southerly direction from approximately 100m AOD in the north to approximately 85m AOD at the south.

2.3 The Proposed Development

2.3.1 A planning application has been submitted on the Site (PA ref: 5/2022/0927), described as:

Outline application (access sought) for the demolition of existing structures and construction of up to 391 dwellings (Use Class C3); the provision of land for a new 2FE Primary School; open space provision and associated landscaping; internal highways, parking, footpaths, cycleways, drainage, utilities and service infrastructure; new access arrangements.

2.3.2 The figure below shows an indicative layout for the Site.

Figure 4 – Indicative Development Layout



Source: Illustrative Masterplan, PA ref: 5/2022/0927

3 Planning Policy – Mineral Safeguarding

3.1 National Policy and Guidance

3.1.1 The National Planning Policy Framework (NPPF)³ sets out the requirements for the safeguarding of both mineral resources and infrastructure.

3.1.2 Paragraph 210 requires that planning policies should:

c) safeguard mineral resources by defining Mineral Safeguarding Areas and Mineral Consultation Areas⁴; and adopt appropriate policies so that known locations of specific minerals resources of local and national importance are not sterilised by non-mineral development where this should be avoided (whilst not creating a presumption that the resources defined will be worked).

3.1.3 Paragraph 212 makes it clear that:

Local planning authorities should not normally permit other development proposals in Mineral Safeguarding Areas if it might constrain potential future use for mineral working.

3.1.4 Further guidance on safeguarding is set out in Planning Practice Guidance (PPG)⁵, which includes the purposes of safeguarding, the steps that should be taken by MPAs to define appropriate MSAs and the responsibilities for safeguarding.

3.2 Local Policy and Guidance

3.2.1 The Site is located within the administrative boundary of St Albans City and District Council (SACDC). HCC is the Mineral and Waste Planning Authority.

3.2.2 For the purposes of this MRA, the Development Plan documents comprise:

- Hertfordshire Minerals Local Plan 2002-2016 (Adopted March 2007)
- Waste Core Strategy & Development Management Policies DPD (Adopted November 2012)
- The City and District of St. Albans District Local Plan Review 1994, Saved Policies (2007 Direction)

The 'Mineral Consultation Areas in Hertfordshire' Supplementary Planning Document (SPD), adopted November 2007, sits alongside the Development Plan and is a material consideration in planning decisions.

³ July 2021

⁴ Primarily in two tier areas as stated in Annex 2 of the NPPF: Glossary

⁵ <https://www.gov.uk/guidance/minerals#minerals-safeguarding>

Adopted Minerals Local Plan

3.2.3 The Minerals Local Plan (MLP) was adopted in 2007 and covers the period to 2016. It does not include up to date policies with respect to mineral safeguarding and does not define MSAs or MCAs.

3.2.4 However, Minerals Policy 5 seeks to ensure that appropriate weight is accorded to the prior extraction of minerals which would otherwise be sterilised by non-mineral development. It also seeks to ensure that such areas are accorded priority ahead of extraction outside the identified areas in the Plan to ensure timely working of the mineral in coordination with other development.

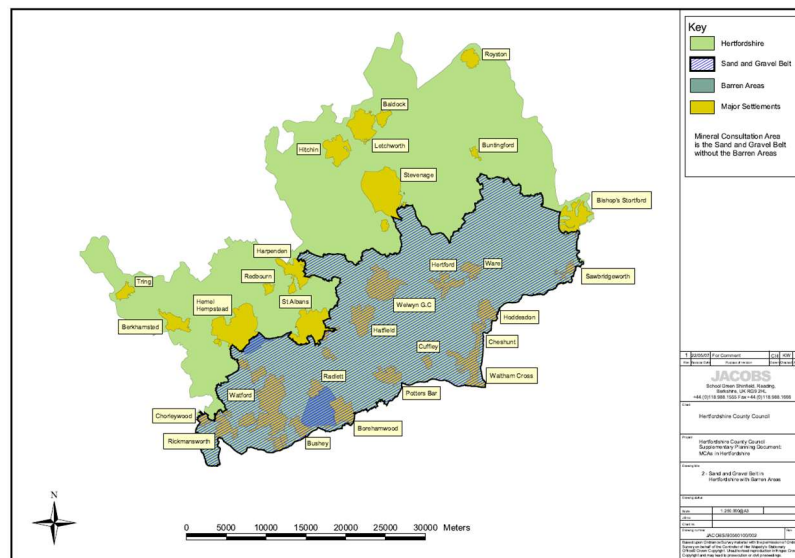
3.2.5 To assist with the implementation of this policy, and as an interim measure until such time as Development Plan Documents are prepared, HCC has adopted an SPD - Mineral Consultation Areas in Hertfordshire⁶, which sits alongside the MLP. The SPD illustrates a broad ‘sand and gravel’ belt where:

particular care is needed to prevent the unnecessary sterilisation of sand and gravel resources.

3.2.6 The sand and gravel belt covers most of the southern half of the County and is referred to in the SPD as an MCA. The extent of the MCA is illustrated on Drawing number MCA 2, the “Sand and Gravel Belt (without Barren Areas)”.

3.2.7 The Site lies within this Sand and Gravel Belt/MCA.

Figure 5: MLP MCA 2, the “Sand and Gravel Belt (without Barren Areas)”.



Source: MLP

3.2.8 The inclusion of land within the MCA does not give any presumption that mineral working will be permitted.

⁶ Adopted in November 2007

- 3.2.9 The purpose of the MCA is to define land within which planning applications for non-minerals development submitted to the district/borough councils may not be determined until the county council has been given the opportunity to comment on whether the proposal would unacceptably sterilise mineral resources. This MRA provides evidence to inform their view with respect to criteria i) and iii) of adopted MLP Policy 5: Minerals Sterilisation, which states:

Mineral extraction will be encouraged prior to other development taking place where any significant mineral resource would otherwise be sterilised, or where despoiled land would be improved following restoration.

The County Council will object to any development proposals within, or adjacent to areas of potential mineral resource, which would prevent, or prejudice potential future mineral extraction unless it is clearly demonstrated that:

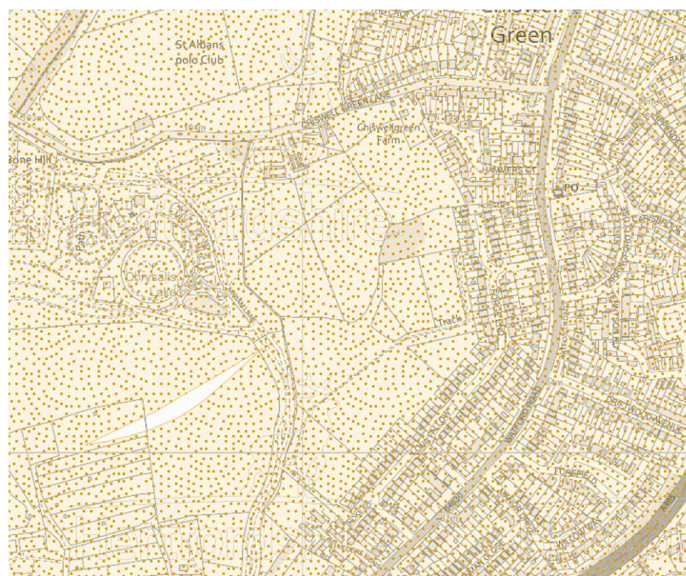
- i) the land affected does not contain potentially workable mineral deposits; and/or*
- ii) there is an overriding need for the development; and*
- iii) the mineral cannot practically be extracted in advance.*

- 3.2.10 The MLP and SPD do not define 'prior extraction' or provide any guidance on the extent of prior extraction that would be appropriate or anticipated.

Emerging Minerals and Waste Local Plan

- 3.2.11 HCC are currently reviewing their Mineral and Waste Local Plan documents.
- 3.2.12 In December 2021, HCC formally withdrew their emerging Minerals Local Plan and all associated documents, including background documents relating to safeguarding, consultation areas and incidental mineral extraction, making the decision to pursue a joint Minerals and Waste Local Plan.
- 3.2.13 In July 2022 they published the Hertfordshire Minerals and Waste Local Plan 2040 Deposit Draft (MWLP). The consultation period for this plan runs until 30 September 2022. The MWLP will cover the period to 2040 and once adopted will replace the MLP and the SPD.
- 3.2.14 The MWLP is at an early stage and so only limited weight can be afforded to the emerging policies.
- 3.2.15 Appendix 3 of the MWLP includes guidance on the production of an MRA.
- 3.2.16 In accordance with the NPPF and PPG, the MWLP proposes to define MSAs, the boundary of which will be contiguous with MCAs.
- 3.2.17 The Site falls wholly within the proposed MSA (and therefore MCA) which broadly aligns with the currently defined 'sand and gravel belt' MCA.

Figure 6: Extract from the Draft Minerals and Waste Plan 2022 Online Map



Source: Emerging MWLP

3.2.18 MWLP draft Policy 5 requires:

..Following consultation with the MPA, the submission of a Mineral Resource Assessment (MRA), undertaken by a suitably qualified professional and including geological survey data, may be required to establish the existence or otherwise of a viable mineral resource.....

...The MPA will object to proposals for non-mineral development within MSAs based on the findings of the MRA unless it is clearly demonstrated that:

- g. prior extraction of mineral will take place and the mineral extracted will be put to sustainable use; or*
- h. mineral extraction is not environmentally acceptable; or*
- i. the mineral is not of current or future economic value; or*
- j. the need for the non-mineral development demonstrably outweighs the sterilisation of the mineral resource; or*
- k. the proposed development would not constrain present and/or potential future mineral development.....*

Where mineral cannot practicably be extracted in advance of the proposed development, full consideration must be given to the use of material on site through opportunistic extraction, in order to reduce the need for material to be imported.

3.2.19 Depending on the nature of the Site and underlying mineral, the MWLP proposes a hierarchy of options:

Prior extraction – where this can be phased to coincide with the phasing of the non-mineral development. This may require a separate mineral planning application.

Opportunistic extraction – the use of sand and gravel on-site during construction to reduce the need to import material. A separate mineral planning application may not be required.

4. Sand and Gravel Supply and Need

- 4.0.1 Paragraph 207 of the NPPF requires MPAs to ensure a steady and adequate supply of minerals. Safeguarding minerals will assist with enabling future supply, by requiring due consideration to be given to the potential for unnecessary sterilisation of resources within MSAs.
- 4.0.2 The NPPF requires MPAs to maintain a landbank of at least seven years for sand and gravel. The size of the landbank or impact of prior extraction on the landbank is not listed in the adopted and emerging criteria based mineral safeguarding policies. For example, it is considered unlikely that the effect of increasing the landbank beyond 7 years would preclude prior extraction. However, it could have a bearing on a decision regarding the extent and timescales for any prior extraction. A brief review of the current Hertfordshire landbank for sand and gravel, and the sites currently, or proposed to be, allocated for minerals extraction is provided below.

4.1 Landbank for Sand and Gravel

- 4.1.1 The latest Local Aggregates Assessment (LAA) for Hertfordshire was published in November 2021 and details the recent (as at 31 December 2020) and predicted situation in Hertfordshire with respect to all aspects of aggregate supply. The LAA provides details of the landbank for sand and gravel across the County. This data has been used to inform the approach to future mineral supply and site allocation requirements in the MWLP.
- 4.1.2 As at end 2020, the total permitted reserve of sand and gravel was 7.68Mt. Based on the current provision rate of 1.31Mtpa the landbank for sand and gravel supplies within Hertfordshire is 5.9 years, and therefore below the 7-year landbank requirement. The reserves will have decreased further since then.
- 4.1.3 At the end of 2020 there were 8 permitted sand and gravel sites within the County, only three of which were actively extracting sand and gravel, with a further one yet to commence extraction.
- Tyttenhanger Quarry, Colney Heath.
 - Hatfield Quarry, linked with Symondshyde extraction site.
 - Thorley Hall Farm.
 - Furze Field, Hatfield Quarry, was reported as being: “*Not yet active. Extraction yet to commence*”, but with development, excluding aftercare due “*to be completed by 31/12/2023*”.
- 4.1.4 The remaining 4 sites have exhausted their mineral reserves and are being restored/landfilled.
- 4.1.5 MWLP Policy 2: Meeting the Sand and Gravel Needs, seeks to address the current shortfall in the Landbank through the identification of Mineral Allocation Sites (MAS). Three sites are proposed in the Deposit Draft, which together could yield an additional 20.35Mt of sand and gravel:
- MAS01: The Briggens Estate (8.80Mt)
 - MAS02: Hatfield Aerodrome (8.00Mt)
 - MAS03: Land adjoining Coopers Green Lane (3.52Mt)

4.2 Recent Mineral Planning Applications and Permissions

- 4.2.1 In October 2020 resolution to grant planning permission, subject to a section 106 agreement (s106) was obtained for Land adjoining Coopers Green Lane, Hatfield Quarry (PP ref: PL\0963\18). Until the legal agreement is signed and the decision notice is issued, the 3.52Mt of mineral in this site cannot be counted in the landbank figure. However, once consented this will address the predicted short fall in the landbank.
- 4.2.2 The land at Hatfield Aerodrome (MAS02) had a resolution to grant planning permission, subject to a s106 (PP ref: 5/0394-16). However, the s106 was not signed in time and when the application returned to committee in September 2020 it was rejected. In January 2022, an inspector dismissed an appeal (APP/M1900/W/21/3278097).

4.3 Future Supply

- 4.3.1 The Site has not been identified in the MLP as a “specific site for sand and gravel extraction” or a “preferred area”, or as a proposed MAS in the MWLP.
- 4.3.2 Adopted and emerging minerals policies make provision for applications for aggregate extraction outside preferred areas where:

MLP Policy 4

iii) the sterilisation of resources will otherwise occur.

MWLP Policy 2:

...Proposals for sand and gravel extraction in other areas will only be supported where they:

- a) are required to maintain a shortfall in the council's landbank;*
- b) do not compromise the ability of allocated sites to meet that need;*
- c) conform to the overall spatial strategy for minerals for the area; and*
- d) maximise the recovery of the identified reserve.*

- 4.3.3 It is considered unlikely that MWLP Policy 2 would take precedence over the adopted and emerging minerals safeguarding policies which do not list ‘need’ as a criterion to be met. On the contrary, MLP Policy 5 seeks to ensure that prior extraction from areas which would otherwise be sterilised by non-mineral development are accorded priority ahead of extraction outside the identified areas in the Plan, to ensure timely working of the mineral in coordination with other development.

5 Mineral Assessment

5.1 Geology

5.1.1 Regional Geology

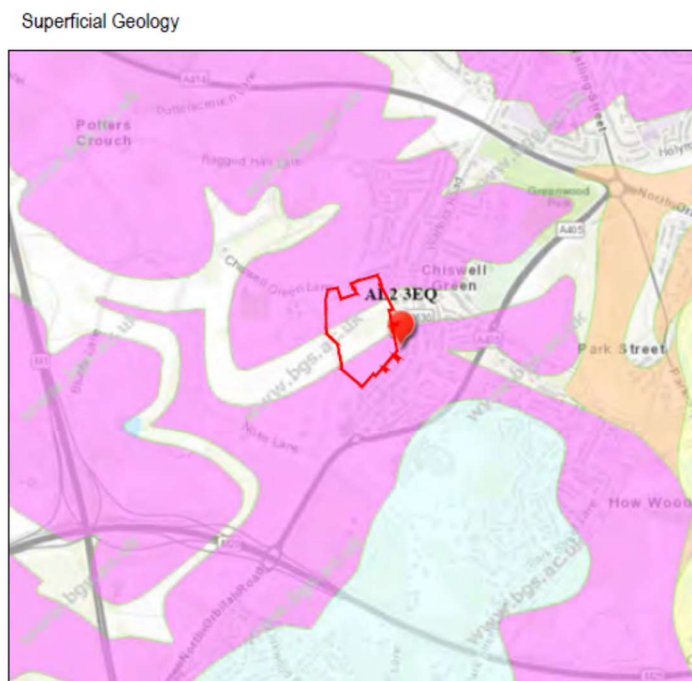
5.1.1.1 Our review of publicly available geological data provides an overview of the geology in the vicinity of the Site. Geologically, a distinction is made between ‘*superficial deposits*’ and ‘*solid geology*’. Superficial deposits such as sand and gravel are found at, or close to, the surface. The solid bedrock beneath the superficial deposits is called the ‘solid’ or ‘bedrock’ geology.

Superficial deposits

5.1.1.2 British Geological Survey (BGS) Onshore GeolIndex indicates that at the 1:50,000 scale the superficial geology across the northern and southern thirds of the Site comprises “Kesgrave Catchment Subgroup – Sand and Gravel”, identified in pink on Figure 7. These superficial deposits are defined by the BGS as “*bodies of cross-bedded and massive, moderately sorted sand and gravel*”. The Kesgrave Catchment Subgroup is typically characterised by interbedded quartz and quartzite rich sand and sandy gravels deposited in a fluvial environment up to 3 million years ago.

5.1.1.3 Based on BGS data, there does not appear to be any superficial deposits located across the central portion of the Site.

Figure 7: BGS Superficial Geology of the Site

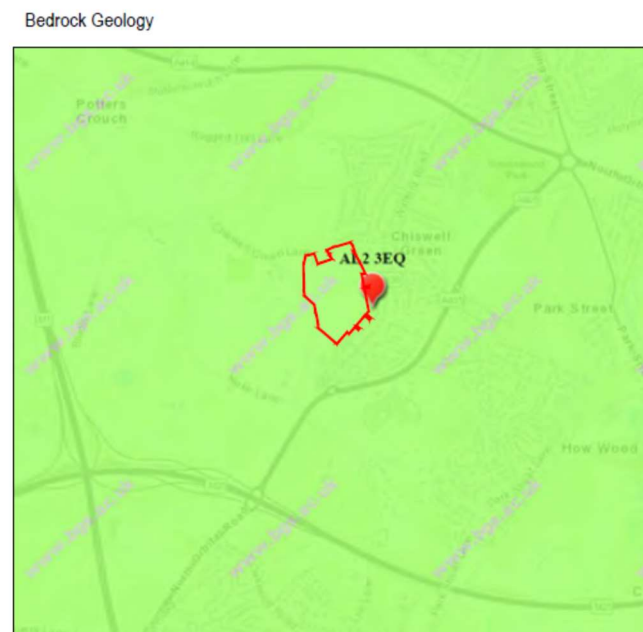


Source: BGS/Flood Risk Assessment

Solid geology

5.1.1.4 BGS Onshore GeoIndex shows that at the 1:50,000 scale the bedrock geology at the Site comprises the “Lewes Nodular Chalk Formation and Seaford Chalk Formation (Undifferentiated) – Chalk”. The BGS describes the Lewes Nodular Chalk Formation as “*hard to very hard nodular chalks and hardgourds with interbedded soft to medium hard chalks and marls*” and the Seaford Chalk Formation as “*firm white chalk with conspicuous semi-continuous nodular and tabular flint seams*”. The chalks formed during the Cretaceous Period approximately 84 to 94 million years ago. Both formations comprise part of the White Chalk Supergroup.

Figure 8: BGS Bedrock Geology of the Site



Source: BGS/Flood Risk Assessment

5.1.1.5 Both the Lewes Nodular Chalk Formation and Seaford Chalk Formation are known to be present “*throughout the Southern Province, within the Chilterns and northward into East Anglia in the Transitional Province*”. The chalk deposits are not considered to be of economic worth.

5.1.1.6 Based on the review of BGS data, the economic geology of the Site comprises the superficial sand and gravel deposits of the Kesgrave Catchment Subgroup.

5.1.2 Local Mineral

Historical BGS Borehole Records

5.1.2.1 Research of online BGS data has identified that borehole records are available the nearest of which is located approximately 340m to the west of the Site (BGS BH ref: TL100SW22). The borehole records are summarised in Table 1.

Table 1: Borehole records in the vicinity of the Site boundary.

BGS Borehole Reference	Record Type	Ground Level (mAOD)	Description
TL10SW22	Shell and auger, 6in diameter.	112.4	0.4m SOIL; 2.7m brown sandy CLAY; 3.0m very clayey GRAVEL (gravel: mainly coarse with some fine, subangular to well-rounded flint with some quartz and quartzite. Sand: mainly fine to medium with some coarse; brown); 0.5m brown and black mottled stiff CLAY; 0.1m brown, pebbly sandy CLAY with rounded flint pebbles; 1.3mbrown and black mottled stiff CLAY with angular flint cobbles; 0.2m + soft white chalk.
TL10SW301	Percussion Drilling		2.50m HOGGIN, 1.50m brown CLAY and FLINTS; 53.0m plus hard CHALK and FLINTS.
TL10SW23	Shell and Auger, 6in diameter.	80.8	0.3m SOIL; 5.7m 'very clayey' sandy GRAVEL (gravel – fine and coarse, subangular to rounded flint; sand – medium with some fine and coarse, brown); 2.3m soft brown and grey mottled sandy CLAY; 0.7m chalky CLAY with flint pebbles; 0.2m + soft white chalk.

5.1.2.2 The records attached to borehole reference TL10SW22 include a grading analysis. This indicates that between the depths of 3.1m and 6.1m within the granular portion of the soil profile the mean particle distribution is:

- Gravel = 40%
- Sand = 32%
- Fines = 28%

St Stephens Green Farm Minerals Resource Assessment

5.1.2.3 An MRA was prepared by RSK in April 2022 in connection with PA ref: 5/2021/3194. The boundary of St. Stephen's Green Farm lies less than 30m to the north of the Site, with their Borehole 3c. 235m from the Site boundary and 450m from the potential extraction area on the Site.

5.1.2.4 The MRA indicated that St. Stephens Green Farm was underlain by the Kesgrave Catchment Subgroup (Sand and Gravel) over bedrock of the Lewes Nodular Chalk Formation and Seaford Chalk Formation (undifferentiated). This is consistent with the BGS data analysed for the Site.

5.1.2.5 The intrusive site investigations undertaken at St. Stephens Green Farm reported geological conditions similar to those initially recorded by historical IMAU (BGS) mineral assessment borehole TL10SW22 (advanced to the south of the Site in 1972).

5.1.2.6 The investigations revealed a soil overburden layer comprising; topsoil, extending to a maximum depth of 0.60m. Beneath this were the mineral resources comprising; a discontinuous 1.50m thick cohesive unit of gravelly sandy clay, with the gravel described as rounded fine and medium flint. Granular deposits found to be of variable composition and thickness, ranging from 1.00 to 4.00m interbedded with sandy gravel and gravelly sand with a variable proportion of a fine secondary fraction. The gravel was found to be predominantly flint. A horizon of cohesive deposits (interburden) was encountered at the base of the granular deposits in some boreholes, ranging in

depth from 1.00 to 2.50 metres, comprising flint and chalk. The underlying chalk was encountered at depths ranging from 3.50 m to 8.50 metres.

5.1.2.7 The assessment of the quality of the potential mineral resource at St. Stephen Green noted:

The particle size distribution analysis confirmed that with the exception of the soils recorded within borehole BH1 the majority of the samples tested from the mineral resource contained a fines content below the minimum threshold criteria of 25%.

With the exception of BH01, where no viable resource was encountered (based on grading), the calculated ratios are below the adopted 3:1 acceptance threshold in all the remaining boreholes.

5.1.2.8 The report concluded:

*Based upon these factors, the area of the site underlain by potential extractable resource is 6.43 Hectares, using an average thickness of resource deposits of 3.65m, a total volume of **234,695 m³** potentially extractable mineral resource (sand & gravel) has been calculated to be present beneath the site. This equates to **387,246 tonnes (0.39Mt)** of sand and gravel (calculated assuming a bulk density of 1650kg/m³ (for naturally occurring dry sand and gravel). It is noted that this figure does not take into consideration the potential for further reduction due to the calculated average fines content of 12.8%.*

5.1.3 Site Specific Mineral Investigation

5.1.3.1 We are not aware of any site-specific mineral investigations that have been undertaken at the Site.

5.1.3.2 Carter Jonas has been provided with a Phase 1 Geo-Environmental Desk Study completed by BRD Environmental Limited (BRD) in relation to the whole Site. The Phase 1 report prepared by BRD is a desk study report that considers the potential for contamination at the Site, with no ground investigations completed.

5.1.3.3 The Phase 1 Geo-Environmental Desk Study prepared by BRD confirms the same findings as our desk study investigation in respect of geology, identifying superficial deposits of the Kesgrave Catchment Subgroup and bedrock geology deposits of the Lewes Nodular Chalk Formation and Seaford Chalk Formation.

5.1.3.4 In addition to the Phase 1 Geo-Environmental Desk Study, BRD undertook a Phase 2 Site Investigation (SI) within the southern part of the Site. The SI results are included at Appendix E to the Flood Risk Assessment⁷ (FRA). A summary of the results is provided in paragraphs 2.11 to 2.16 of the FRA. The intrusive investigations involved a combination of trial pits and windowless sample boreholes undertaken between March and July 2020. The BRD trial pit and borehole location plan is included at Appendix 3 of this MRA, albeit that the plan quality is poor. The summary

⁷ Prepared by Glanville, dated 31st March 2022

records for 41No. trial pits and 32No. boreholes are included at Appendix E. The trial pits varied in depth from 3 to 3.3 metres and the windowless boreholes 2.8 to 7.45 metres.

- 5.1.3.5 Superficial deposits were recorded in all the exploratory holes (except for TP116, TP117 and TP119 that were terminated at the base of the Topsoil). The geology encountered from the intrusive investigations generally accorded with the geology indicated on BGS maps, albeit the superficial deposits of the Kesgrave Catchment Group were more laterally extensive than indicated. Underlying the superficial deposits, the bedrock geology was found in 6No. windowless sample boreholes and 4No. trial pit locations in two different areas of the Site.
- 5.1.3.6 Generally, a layer of Topsoil or Made Ground Topsoil was found overlying the superficial deposits of the Kesgrave Catchment subgroup, which in turn were found overlying the identified bedrock identified as the Lewes Nodular Chalk Formation and Seaford Chalk Formation (Undifferentiated).
- 5.1.3.7 The depth to the Chalk bedrock varies, being identified as shallow as 1.70 metres below ground level, but in other areas of the Site not being proven in some of the windowless sample boreholes (maximum 7.45 metre depth below ground level) across the Site. This implies that the superficial deposits across the site vary in thickness with the chalk beneath having an irregular undulating surface.
- 5.1.3.8 The Kesgrave Catchment Subgroup was encountered in all the exploratory holes across the investigation area (bar those which terminated at the base of the Topsoil). The thickness of these deposits is greater than 5.45 metre in some of the site comprising either gravely, sandy or clay rich deposits. The borehole logs and trial pits have not been subject to a grading analysis, and we are therefore unable to comment on the quality of the sand and gravel deposits. There is also no comment on the fines content of the drilled superficial deposits.
- 5.1.3.9 The range of thickness of the superficial deposits identified from the intrusive investigations across the southern portion of the Site, varying from 1.7m in thickness to in excess of 5.45m, generally accords with average mineral (sand and gravel) thickness adopted in the St. Stephens Green Farm MRA of 3.65m.

5.1.4 High Level Resource Estimate

- 5.1.4.1 Carter Jonas has undertaken a high-level resource assessment at the Site using the publicly available and site-specific data referred to above.
- 5.1.4.2 Adopting the average mineral depth of 3.65m across the total site area of 14.02ha provides for a maximum estimated mineral resource volume of 511,730m³. Applying an estimated bulk density of 1.65t per cubic metre equates to a gross resource of 844,355t prior to any deduction for appropriate “buffer zones” from adjoining properties and other Site constraints and any processing losses.
- 5.1.4.3 The information available indicates an average overburden depth of 0.60m. For this high level estimate we have assumed this average overburden depth applies across the full Site area which provides for an estimated overburden to mineral ratio of 16.4%.

5.2 Hydrogeology

- 5.2.1 On the basis of the published geological data of the area, the hydrogeology beneath the Site is understood to comprise an unconfined shallow aquifer associated with the superficial deposits. The Environment Agency has classified the aquifer as a Secondary 'A' Aquifer with respect to groundwater sensitivity. The Chalk bedrock identified to underlie the superficial Kesgrave Sand and Gravel Deposits is classified as a Principal Aquifer.
- 5.2.2 Given the unconfined nature of the shallow aquifer underlying the Site, and the anticipated permeability of the Kesgrave Sand and Gravel Deposits, the groundwater beneath the Site is expected to be in hydraulic continuity. Borehole reference TL10SW22 and TK10SW23, sourced from BGS GeoIndex, drilled to 8.2 and 9.2m below ground level respectively did not encounter groundwater.
- 5.2.3 Natural England's MAGIC website indicates that the Site is situated within a Source Protection Zone II and III. Two groundwater abstractions sites are situated within 1km of the Site.

5.3 Site Constraints

- 5.3.1 Carter Jonas has undertaken a review of potential constraints to mineral extraction at the Site. This comprises a review of physical constraints in the form of built development and adjoining property boundaries, services (underground and overground), environmental designations and site-specific constraints identified during the initial assessment work. These constraints could reduce the potential area of the Site available for prior extraction of the mineral resource.
- 5.3.2 An assessment of the site-specific constraints has been undertaken in the context of the sequential approach outlined by the policies of the Local Plan, MWLP and SPD that seek to ensure maximisation of the quantities of minerals recovered.
- 5.3.3 At this stage potential environmental constraints, such as noise, air quality and transport, have not been assessed. A buffer zone has been proposed (see Section 5.3.10 below) which would help to mitigate some of these impacts.

Site infrastructure/ utilities

- 5.3.4 We have been provided with a copy of a Foul Drainage and Utility Assessment completed at the Site by Glanville Associates. This indicates that there is a public foul water sewer, 150mm in diameter, along Chiswell Green Lane. A short section of the sewer is indicated to lie within the site boundary, but would fall within the unworked margin adjacent to the Lane.

Planning and environmental designations

- 5.3.5 The Site is located within the Metropolitan Green Belt and lies within a Landscape Development Area. Neither of these designations need constrain extraction of a potential mineral resource.

5.3.6 There are no nationally designated sites (e.g., National Park or Area of Outstanding Natural Beauty (AONB), Special Area of Conservation SAC)) on or within close to the Site, nor is it within an Area of High Landscape Value.

5.3.7 There are 21 non-statutory designated sites located within 2km of the Site, the closest of these being How Wood Local Wildlife Site 545m to the south-east. Adjacent to the eastern boundary of the Site are the priority habitats of 'Lowland Mixed Deciduous Woodland' and 'Traditional Orchard'.

Proximity of other development

5.3.8 As detailed in Section 2.2 of this MRA, the eastern and south boundary of the Site immediately adjoin the rear gardens of the residential dwellings on Hammers Gate, Forge End and Long Fallow.

5.3.9 The northern boundary of the Site comprises a small number of residential properties with their gardens abutting the boundary of the Site and Chiswell Green Lane. Miriam Lane forms most of the western boundary of the Site.

5.3.10 Appropriate "buffer zones" would be required to protect the amenity of the residential buildings bordering the Site and the public highways to the north and west as well as providing lateral and super adjacent support to neighbouring properties.

Buffer Zones

5.3.11 Neither the MLP nor the MWLP provide guidance on the lateral extent of a Buffer Zone that should be applied when considering mineral extraction, the plans refer only to buffer zones for Safeguarded Mineral and Waste Management Infrastructure.

5.3.12 For the purposes of this MRA, a buffer zone of 100 m has been applied from the front elevation of neighbouring residential properties and a 30m buffer along the remaining boundaries. The block of woodland in the south-eastern corner of the Site has been excluded as it was proposed to maintain this as part of the residential development. On this basis, the potential maximum workable area is circa 4.9ha. The indicative mineral extraction area is shown overleaf in Figure 9.

5.3.13 The high-level Resource Assessment in section 5.1.3 has been adjusted using the parameters below to quantify the extent of the potential recoverable sand and gravel and consider the economic viability of the resource:

- A site area reflecting the 100m⁸ buffer to the front elevation of neighbouring residential properties and the livery yard and riding school and a 30m buffer along the remaining boundaries of 4.9ha;

⁸ For the purposes of mineral extraction, the extent of a buffer would be defined following technical assessments including for noise, dust and air quality and landscape and visual impacts. Such assessments have not been undertaken. However, given the concentration and proximity of existing residential properties which adjoin the eastern and southern boundaries of the Site and the sensitivity associated with the use of land to the north as livery yard and riding school, it is considered appropriate to apply a 100m buffer for the purposes of the high-level resource assessment. This is consistent with the MRA undertaken for land to the north (St. Stephens Green Farm,

- Average depth of sand and gravel of 3.65m;
- Average topsoil / overburden depth of 0.60m;
- A bulk density for Sand and Gravel of 1.65 tonnes per cubic m;
- Processing losses for Sand and Gravel of 15%.

Figure 9: Maximum extent of potential mineral extraction.



5.3.14 Adoption of the above parameters and assuming that the Site is capable of being extracted to its full extent with lateral side walls to the excavation would provide for a total potential mineral resource of approximately 250,000t.

Chiswell). It is also worth noting that unworked margins of at least 80m were proposed in connection with mineral development at the nearby 'Land adjoining Coopers Green Lane' (Hatfield Quarry).

Site Area (m²) reflecting buffer zone	Est. Mineral Depth (m)	Est. Mineral Volume	Est. Mineral Volume (Tonnes)	Potential Mineral Resource less processing loss (Tonnes)
49,075	3.65	179,124	295,554	251,221

5.3.15 We have also considered the mineral resource excluding the central portion of the Site where, as mentioned above in Section 5.1.1, it is indicated by BGS Maps that there is an absence of superficial deposits. This area is shown shaded green on Figure 10 below. The indicated potential mineral resource on this basis is approximately 210,000t.

Site Area (m²) reflecting buffer zone	Est. Mineral Depth (m)	Est. Mineral Volume	Est. Mineral Volume (Tonnes)	Potential Mineral Resource less processing loss (Tonnes)
41,262	3.65	150,606	248,500	211,225

Figure 10: Maximum extent of potential mineral extraction excluding indicated barren area.



5.3.16 The barren central portion indicated by the BGS maps is located to the north of the area where the Phase 2 Site Investigations have been undertaken. In the absence of further intrusive investigations in this area of the Site we are unable to verify if this area is barren as indicated by the mapped superficial geology.

6 Viability of Potential Mineral Resource

6.0 This section considers the viability of prior extraction and opportunistic extraction as outlined by the MLP policies and SPD and the MWLP that seek to ensure maximisation of the quantities of minerals recovered, and to reduce the volume of mineral which could potentially be sterilised by the proposed development.

6.1 Prior Extraction

6.1.1 This desktop assessment has identified the potential presence of sand and gravel underlying the Site. However, the shape of the Site, its proximity to residential properties and the potential nature of the underlying mineral is such that the potential saleable volume of mineral has been assessed as being approximately 250,000t. Discounting the area indicated to not contain superficial deposits on BGS Maps, reduced the volume of mineral to approximately 210,000t.

6.1.2 The potential nature of the mineral on the Site, is such that it would need processing before being sold. To be commercially viable, a minerals operator industry would normally require a reserve of at least 1Mt to offset the costs associated with the opening a new site (including planning and Environmental Impact Assessment, site preparation, infrastructure including processing facilities, operational costs, etc).

6.1.3 It is likely that mineral won from the Site would have to be sold “as raised” to a third-party operator, which attracts a far lower selling price per tonne than processed sand and gravel. However, the Site is c. 7km (straight line distance, longer by road) from the existing sand and gravel quarries, and associated processing plant at Tyttenhanger, and Hatfield. The income received may possibly “break even” with the cost of extraction but when the cost of haulage to a third-party processing plant is accounted for, the mineral would be loss making and uneconomic to extract on an as raised basis.

6.1.4 Surface working of the minerals would alter site levels and likely require imported fill post mineral extraction to facilitate the residential led development of the Site, with the consequential delay to its timely delivery.

6.1.5 In conclusion, due to the limited potential mineral reserve volume within the Site, it is not considered economically viable to undertake prior extraction.

6.2 Opportunistic Extraction

6.2.1 The depth of topsoil may be shallow enough in sections of the Site for it to be considered appropriate to extract underlying sand and gravel during the preparatory works required for the proposed development such as the foundations and footings or landscaping works associated with the development.

6.2.2 If this is appropriate, then this material could be recovered for re-use in the development, albeit that for usage in an aggregate, it would need to be of the right specification or capable of being processed to achieve this and the volumes available are likely to be minimal. Opportunistic

extraction could encourage a reduction of excavation waste removed from the Site as well as inbound materials for construction uses. The potential volume of mineral available from incidental extraction in the form of footings, trenches, landscaping, etc. cannot at this stage be quantified.

6.2.3 The Geotechnical Summary Report (FRA, Appendix E) states with respect to estimated footing depths that

the minimum footing depth required is 0.75m, but 1m where required to allow for restricted new tree planting. Foundations up to 2.45m depth will be required for some plots due to the tree influence.

7 Conclusion

- 7.1 An outline planning application for residential development has been submitted for land South of Chiswell Green.
- 7.2 The application area is located within the Mineral Consultation Area for a Sand and Gravel Belt as designated by Hertfordshire County Council.
- 7.3 The purpose of the Mineral Consultation Area is to define land within which planning applications for non-minerals development submitted to the district/borough Councils may not be determined until the county council has been given the opportunity to comment on whether the proposal would unacceptably sterilise mineral resources.
- 7.4 Hertfordshire County Council has requested a Mineral Resource Assessment be undertaken to “assess the potential for workable mineral deposits underlain at the site and to avoid the possibility of mineral sterilisation.”
- 7.5 This report fulfils that requirement with due consideration having been given to the adopted Mineral Local Plan Policy 5, the accompanying Supplementary Planning Document on Mineral Consultation Areas and the emerging Minerals and Waste Local Plan.
- 7.6 With respect to criteria (i) and (iii) of Policy 5, the conclusions are as follows:

i) the land affected does not contain potentially workable mineral deposits

This report demonstrates that the potential Sand and Gravel Resource within the Site has been rendered uneconomic by the characteristics of the Site including its size, shape and the constraining effect of residential dwellings in close proximity.

The report demonstrates that while the County landbank for sand and gravel is not currently at the requisite level, a planning application for mineral development, which has a resolution in favour of granting permission subject to the signing of a section 106 agreement, will address the situation and recharge the landbank to in excess of 7 years. The contribution that the potential mineral resource at the Site (even if it was capable of being extracted) would make to the annual provision rate in Hertfordshire equates to just 2 months' supply, which is not considered proportionate to the adverse effect and risk that prior extraction could have on the future re-use of the Site and the timeframe for its delivery.

iii) the mineral cannot practically be extracted in advance

Prior extraction of the mineral is considered unviable.

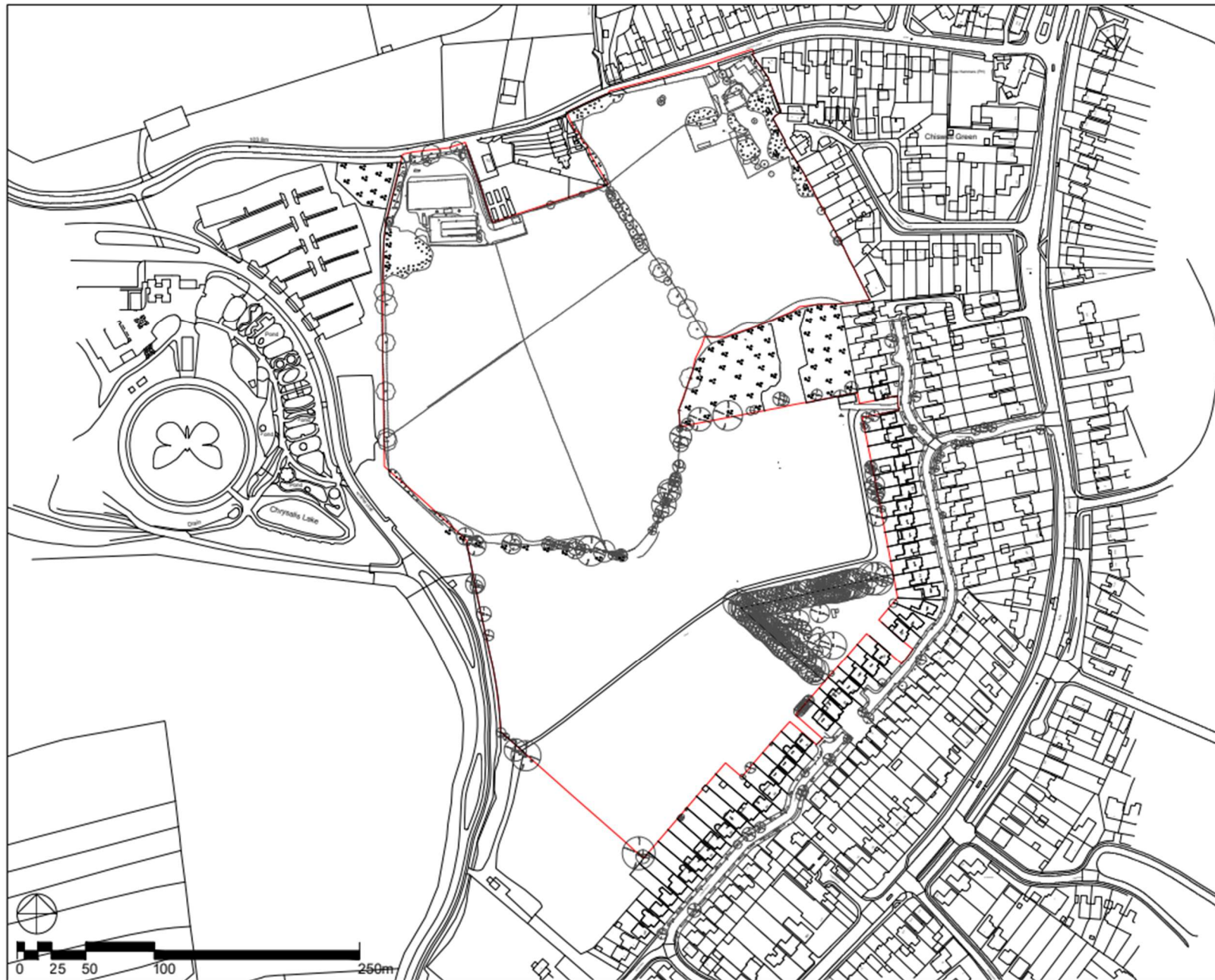
Potential to export off Site to a local established mineral operator for processing and therefore for use of the extracted material as an aggregate is considered unlikely.

Opportunistic extraction may be possible to a shallow depth during the preparatory works required for the proposed development such as the foundations and footings or landscaping works associated with the development. The most likely potential would be to re-use the

materials associated with the superficial deposits on-site for general fill and selected end uses such as Capping material. The logistics for undertaking the construction works to enable the beneficial re-use during the phased residential development of the Site could be set out in a Minerals Recovery Strategy to be agreed with Hertfordshire County Council as Mineral Planning Authority and secured by planning condition.

Appendix 1

Site Location Plan for Planning Application Reference 5/2022/0927



Notes:
The contractor must verify all dimensions on site before commencing any work on-site drawings, do not scale from this drawing.
McBains Ltd copyright

Site Transmittal Document
McBains Ltd makes no express or implied warranties with respect to the accuracy, location, or condition of the data contained in this drawing, incorporated within, or the suitability of the data for any particular purpose beyond those originally intended by McBains Ltd. Please refer to our standard terms and conditions for further details.

KEY:
— Planning Application Boundary

PS	issued for planning approval	08.03.2022
PLA	issued for comments	08.03.2022
PS	issued for comments	08.03.2022
PL	issued for comments	08.03.2022
PS	issued for comments	08.03.2022

CA	EL	TC
6/18/22	08/22	1/23/22 @ A3

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Client:
CALA

Project:
Land South of Clowell Green Lane
St. Albans

Drawing Title:
SITE LOCATION PLAN

ARCHITECTURE

REDCN MCB 22 22 08 A 0201 05 PS

Appendix 2

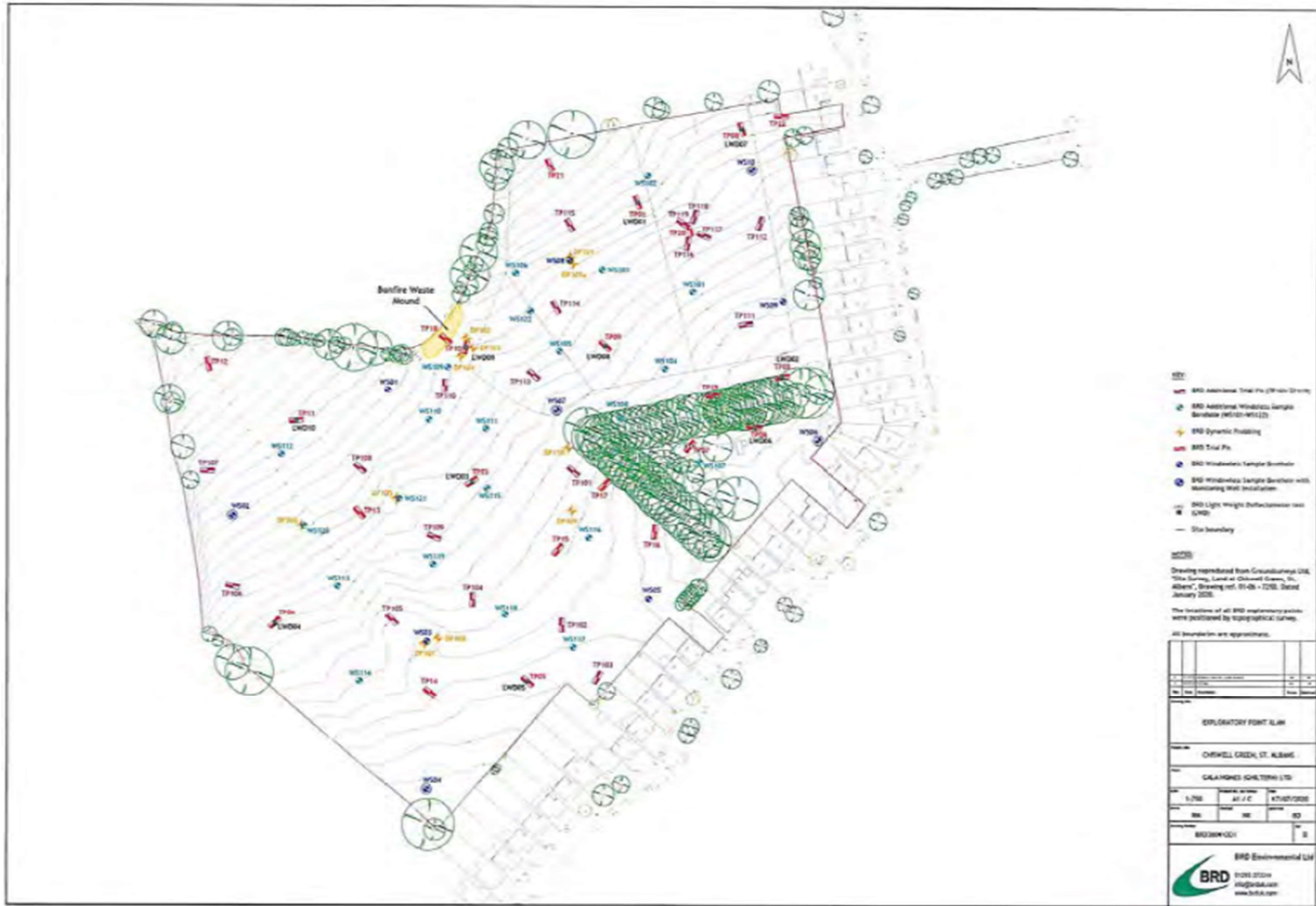
Hertfordshire Mineral and Waste Local Plan 2040
Draft Plan July 2022

The following table outlines how this report addresses the requirement for an MRA set out in Appendix 3: Safeguarding of Minerals and Waste Infrastructure and Resources

<p>Background Details</p> <ul style="list-style-type: none"> • Site Location Plan (red line boundary in relation to the MSA) • Site history, including previous land uses and planning history • Description of the proposed development (layout, scale, phasing, timescale etc) 	See Section 2
<p>Desk based study of available geological information</p> <ul style="list-style-type: none"> • Type of mineral present • Existing mineral data (e.g., previous mineral investigations in the area) • Details of any previous extraction at the site 	See Section 5
<p>Market evaluation</p> <ul style="list-style-type: none"> • Local demand for the resource. This could include an evaluation of nearby major construction or infrastructure projects that would require a supply of the mineral • Contributions of the resource to minerals supply within the county • Interested operators 	See Section 6
<p>Intrusive site investigation and analysis</p> <ul style="list-style-type: none"> • Borehole and trial pit plan • Results of the investigation • Extent of mineral • Depth of mineral • Overburden depth • Quality of the mineral (e.g., silt content) and processing needs • Estimated tonnage of the resource with the potential to be sterilised • Estimated market value of the resource with the potential to be sterilised 	A Geo-Environmental Intrusive Phase 2 site investigation has been undertaken across the southern portion of the Site. No intrusive investigations have been undertaken across the northern area.
<p>Opportunities for prior extraction</p> <ul style="list-style-type: none"> • Proximity to any existing minerals infrastructure (processing facilities, rail depots, bulk handling facilities) • Previous consideration of the site for mineral extraction • Wider context and value for extraction (nearby infrastructure projects, market supply benefits etc.) • Proximity to industrial transport links (sustainable haulage modes, Primary Road Network) • Potential benefits through restoration of the area (open space, enhancement of the natural environment) 	See Section 6
<p>Reasons against prior extraction</p> <ul style="list-style-type: none"> • Site location (sensitive receptors, SSAs, infrastructure, site accessibility etc.) • Natural and historic environment considerations (biodiversity, landscape, hydrology and heritage implications) • Effect on the viability of the proposed non-minerals development (excessive delays, landscape and landform changes etc.) 	See Section 6
<p>Conclusions</p> <ul style="list-style-type: none"> • The MRA should confirm whether there is any intention to recover the mineral resource. If a decision is taken to sterilise the mineral resource, adequate justification for this decision must be provided 	See Section 7

Appendix 3

Phase 2 Geo-Environmental Site Investigation (BRD) – Trial Pit and
Borehole Location Plan



Appendix 4

Phase 2 Geo-Environmental Site Investigation (BRD)

Carter Jonas Borehole Review

Borehole Analysis					
Borehole	Reference	Overburden Thickness (m)	Kesgrave Catchment Thickness (m)	Bedrock Depth (m)	Comment
BH	WS01	0.3	5.15	5.45	Not hit - terminated 5.45
BH	WS02	0.5	3	3.5	
BH	WS03	0.3	3.2	3.5	
BH	WS04	0.4	5.05	5.45	Not hit - terminated 5.45
BH	WS05	0.4	5.05	5.45	Not hit - terminated 5.45
BH	WS06	0.4	2.5	2.9	
BH	WS07	0.3	2	2.3	
BH	WS08	0.4	3.7	4.1	
BH	WS09	0.4	2.2	2.6	
BH	WS10	0.3	2.5	2.8	Not hit - terminated 2.8
BH	WS101	0.2	3.2	3.6	
BH	WS102	0.4	5.05	5.45	Not hit - terminated 5.45
BH	WS103	0.1	5.35	5.45	Not hit - terminated 5.45
BH	WS104	0.3	5.15	5.45	Not hit - terminated 5.45
BH	WS105	0.3	2.4	2.7	
BH	WS106	0.2	2.5	2.7	
BH	WS107	0.3	5.15	5.45	Not hit - terminated 5.45
BH	WS108	0.3	3.5	3.8	
BH	WS109	0.3	2.7	3	
BH	WS110	0.2	2.8	3	
BH	WS111	0.3	2.6	2.9	
BH	WS112	0.4	2.6	3	Not hit - terminated 3
BH	WS113	0.3	2.7	3	
BH	WS114	0.3	4.7	5	
BH	WS115	0.2	2.8	3	
BH	WS116	0.2	2.6	2.8	
BH	WS117	0.1	4.7	4.8	
BH	WS118	0.05	5.4	5.45	Not hit - terminated 5.45
BH	WS119	0.05	4.05	4.1	
BH	WS120	0.1	3.9	4	
BH	WS121	0.1	7.35	7.45	Not hit - terminated 7.45
BH	WS122	0.1	3.2	3.3	
Average		0.27	3.79	4.06	
*** Rows highlighted yellow have been discounted from the average (boreholes not drilled to sufficient depth).					
*** Mineral thickness would be greater than calculated - a number of boreholes drilled did not reach the chalk bedrock.					