Plumley Wood Quarry, Harbridge, Ringwood, Hampshire

Archaeological Watching Brief and assessment of Pleistocene gravel deposits

by Will Attard

Site Code: PWH10/99
(SU 1230 0970)
Plumley Wood Quarry, Harbridge, Ringwood, Hampshire

An Archaeological Watching Brief and assessment of Pleistocene gravel deposits Phases 1-3

For Tarmac Ltd

by Will Attard
Thames Valley Archaeological Services Ltd

Site Code PWH 10/99

September 2017
Summary

Site name: Plumley Wood Quarry, Harbridge, Ringwood, Hampshire

Grid reference: SU 1230 0970

Site activity: Watching Brief for Pleistocene Deposits.

Date and duration of project: April to May 2017

Project manager: Steve Ford

Site supervisor: Will Attard

Site code: PWH10/99

Summary of results: The fieldwork, including detailed sedimentological assessment, for the third area of extraction, revealed a single handaxe of Palaeolithic date but did not reveal any deposits which may have contained in-situ Palaeolithic remains.

Location and reference of archive: The archive is presently held at Thames Valley Archaeological Services, Reading and will be deposited with Hampshire Cultural Trust in due course.

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Report edited/checked by:  

Steve Ford ✓ 12.09.17

Steve Preston ✓ 12.09.17
Introduction

This report documents the results of an archaeological watching brief carried out at Plumley Wood Quarry, Harbridge, Ringwood, Hampshire (SU 1230 0970) (Fig. 1). The work was commissioned by Mr Andrew Cadell of Tarmac Ltd, Stancombe Quarry, Stancombe Lane, Flaxbourton, Bristol, BS48 3QD.

Planning permission (app 08/91952) has been gained from Hampshire County Council for sand and gravel extraction on the site. The consent is subject to a condition relating to archaeology as guided by PPG16 (1990) (now superseded) and the County Council’s Mineral Policies. The application was supported by a cultural heritage desk-based assessment (Entec 2008) which detailed the archaeological potential of the site and the likely requirements to satisfy the expected planning conditions. There were to be two components to the archaeological study of the site: archaeology of late or post-glacial date; that is, stratigraphically, located on top of the gravel, typically just beneath the topsoil ('upper' archaeology); and Lower or Middle Palaeolithic archaeology, which could lie within or beneath the gravel on the site ('lower' archaeology). It is the purpose of this document to report on the 'lower' aspects of the archaeology. Several phases of work relating to the post-glacial archaeology on the site have been carried out with interim statements presented (Fig. 2): these aspects of the site will form the basis for separate reports.

The field investigation was carried out to a specification approved by the Mineral planning authority as advised by Dr Hannah Fluck (former) archaeological officer for Hampshire. The fieldwork for the ‘lower archaeology’ was undertaken by Will Attard in April and May 2017 within an overall programme of work that began in 2011, with the site code PWH10/99. The archive is presently held at Thames Valley Archaeological Services, Reading and will be deposited with Hampshire Cultural Trust in due course.

Location, topography and geology

The site lies within the Lower Avon Valley of the Hampshire Basin and to the north of the existing Nea Farm Quarry (Somerley). It is located within the eastern edge of Ringwood Forest and around Plumley Farm (Fig. 1). The underlying geology consists of ‘Plateau Gravel’ and Bagshot Sands (BGS 1990). However, specialist geological interpretation (Kubala 1980; Clarke 1980) has identified two principal gravel terraces: a higher,
western terrace and a lower, eastern terrace. The higher, older, terrace has been attributed as terrace 7 or 8. The lower younger terrace which has been attributed as terrace 6 or 7. Both terraces represent fluvial deposition by the proto Avon between c. 400,000 and 250,000 years BP. At least 15 terraces have been identified for the Lower Avon Valley in total. These terraces overlie the Bagshot Beds (or locally the Poole Formation) which are fine grained Eocene sands, silts and clays.

Palaeolithic background
The higher gravel terraces of the Avon Valley are moderately noteworthy for the presence of lower Palaeolithic remains, though curiously, most findspots are recorded on the eastern side of the valley (Wymer 1999, fig. 30). However, the gravel terraces along the south coast formed by the proto Solent river (of which the Avon Valley was once a part) are sometimes found to be prolific in Palaeolithic findspots. The near total absence of findspots in the middle reaches of the Avon Valley may be more to do with the lack of systematic investigation than genuine absence. Fieldwork at Nea Farm revealed a rare Upper Palaeolithic site though stratigraphically this lies on top of the gravel deposits subject to investigation here (Barton et al. 2009).

Objectives and methodology
The research aims of the project were:

- to establish the character of geological deposits to define topographic areas where in-situ or near in-situ Palaeolithic occupation remains might be encountered;
- to sample excavate and record occurrences of Palaeolithic artefacts to determine their nature and significance (that is in terms of whether they are redeposited stray finds, in-situ stray finds or in-situ occupation/activity sites);
- to determine locations which merit formal excavation; and
- to produce information on the local palaeoenvironment linked to the chronological development of the gravel formation and any Palaeolithic archaeological deposits.

Results
The watching brief comprised two components: episodic monitoring of the exposed gravel faces to evaluate the potential for preserved in-situ Pleistocene deposits within the gravels; and the monitoring of gravel on the reject pile at the processing plant.

The general investigations which took place episodically over several years, comprised visual assessment of exposed quarry faces within the active quarry (Pls 1 and 2) but recorded no artefacts nor horizons where in-situ preservation was likely (e.g., sand bars overlooking palaeochannels). Detailed sedimentological assessment has been carried out by Dr Simon Colcutt of Oxford Archaeological Associates for two locations within the
quarry (phases 1 and 3). His reports are presented as Appendices 1 and 2. To summarize the findings, the basal gravels of the fluvial sequence were accessible, as in places was the boundary with the underlying marine sand.

Whilst no in-situ or undisturbed Middle Pleistocene deposits were observed, the site still holds potential for such to be discovered in the future. The derived nature of the sand found in lenses across the site (Pl. 2) makes Optically Stimulated Luminescence dating unlikely to yield meaningful results.

A single handaxe was recovered from the reject pile for the phase 3 extraction area.

**Flint handaxe**

A single, heavily abraded, bifacially flaked stone tool was recovered from the oversize heap (at the quarry's processing compound (Blashford, Hampshire) on 14th March 2017. It has been established that material deposited on the oversize heap came from the active phase of quarrying at Plumley Wood Farm, and thus that it must have originated from deposits extracted from phase 3 (Fig. 2; Pl. 3). The gravel terraces currently being quarried are located on the western side of the lower Avon, making this handaxe the first from these deposits.

**Description**

The handaxe is worked on both faces, with one face being more invasively flaked (Pl. 4). Flake scars here travel across the entirety of the face. The less modified face is around 60% cortical, with the majority of flakes having been removed from one edge. This would originally have created a sharp worked edge. In total, 9 diagnostic flake scars are visible, with a further 3 possible flake scars that could also relate to post-depositional damage due to river rolling. One edge of the handaxe appears to be intact (if abraded), whilst the other appears to have been broken post-manufacture. This latter aspect is demonstrated by the absence of a point of origin on flake scars travelling from the direction of the missing portion. The implement measures 90mm x 68mm x 34mm (max. length x width x thickness). It is heavily abraded along the edges, the flake scar ridges and the broken edges, suggesting a significant amount of river-rolling. This is in line with other artefacts recovered from the fluvial gravel terraces of the Avon, and with river terrace-derived material in general.

The flint used to make the handaxe is heavily iron-stained, including the cortex, breaks and abraded portions. This suggests that whilst the damage occurred post-manufacture, it is not the result of aggregate extraction. Some of the possible flake scars at the proximal end of the piece are slightly less stained, suggesting a more recent date and a taphonomic rather than anthropogenic explanation for the removals.

Overall the handaxe does not appear to be a particularly elaborate form (quite the opposite), and is superficially more similar to examples from sites such as Swanscombe than Boxgrove or Harnham. A relatively
small number of flakes have been struck to create the implement, though this would not necessarily have affected functionality.

**Conclusion**

The fieldwork for the first three areas of extraction revealed only a single find of Palaeolithic date but no deposits which contained *in-situ* Palaeolithic remains nor any deposits likely to do so. No usable samples could be taken for Optically Stimulated Luminescence dating, but it is intended to re-consider this topic in subsequent monitoring visits.

**References**


Plumley Wood Quarry, Harbridge, Hampshire, Archaeological watching brief and assessment of Pleistocene gravel deposits

Figure 1. Location of site within the Avon Valley and Hampshire.
Plumley Wood Quarry, Harbridge, Ringwood, Hampshire
Archaeological watching brief and assessment of Pleistocene gravel deposits

Figure 2. Extraction areas.
Plate 1. Exposed gravel section, looking south Phase 3

Plate 2. Exposed gravel section with sand lense, looking south east. Phase 3
Plate 3. General view over phase 3 works, looking west.

Plate 4. Handaxe, front and lateral views, Scales: 0.1m. Phase 3 area
PLUMLEY WOOD QUARRY (TARMAC)
HARBRIDGE, RINGWOOD
HAMPSHIRE

PLEISTOCENE ISSUES
SITE INSPECTION 11 MAY 2011

Produced by Oxford Archaeological Associates Limited
under the direction of

S.N. Collcutt
MA(Hons) DEA DPhil FSA

Commissioned by
Thames Valley Archaeological Services Limited

May 2011
1. **Introduction**

1.1 In accordance with the Specification (20th September 2010) concerning Middle Pleistocene archaeology, Dr. Simon Collcutt (OAA) visited the initial workings at Plumley Wood Quarry on the 11th May 2011. Andy Taylor and Jacqui Pitt (TVAS) were present, both to explain fieldwork results to date and to consult over future watching techniques and priorities. The extraction contractors were also kind enough to provide useful information about the deep (Tertiary) deposits.

1.2 So far, Pleistocene deposits have only been exposed significantly within Phase 1A of the quarry, in the excavations for Silt Lagoons 1-2 (see Fig.1). Work for Lagoon 2 (the more southerly) has almost reached the intended base across about a half of the area (cf. the southwestwards view from SU 12590 09910 ± 5 m across SL-2 shown on the front cover of this report, in which the rightmost dumper is standing upon the boundary between the Pleistocene and Tertiary deposits). The zone which will contain Lagoon 1 has currently been excavated to the Pleistocene/Tertiary boundary in the western half of the area and to the top of cleaner Pleistocene gravels (i.e. it has been stripped of 'overburden', with recently sampled Holocene archaeological cut-features apparent) in the eastern half. Battered sections (unavoidably disturbed but exposed enough to rule out the presence of unusual material, such as larger late channel-forms with finer fills) were available all along the southern and western margins of Phase 1A; there are no significant Pleistocene deposits along the eastern margin, because the modern hillside drops to intersect with more or less the top of the Tertiary deposits. Reasonable access to the irregular Pleistocene/Tertiary boundary was possible right across the 'floor' of the western half of the SL-1 area, as well as in the various battered sections around SL-2. Excellent exposures of the full Pleistocene sequence were available, as a c.100 m transverse section (roughly E-W) at the north(east)ern limit of SL-2 and as the adjoining (at right angles) c.125 m longitudinal section (roughly N-S) half way across SL-1.

2. **Observations**

2.1 The Tertiary deposits in Phase 1A consist of a basal dense blue-grey clay (assumed to be Lower Eocene London Clay), overlain conformably by a relatively thick (c.7-8 m) sequence from the Poole Formation (part of the Bagshot Beds). The lower division of the Poole Formation here comprises strong alternations (possibly cycles) of grey clayey silts, clays (more or less identical to the material of the London Clay), generally poorly consolidated lignites (often with a felty texture but with some harder nodules and grains) and sand laminae, usually in extremely well bedded and quite laterally persistent sequence. The middle division comprises variously grey/yellow/ginger coarse-fine to medium laminated sands with red-brown silty clay partings and some load deformation; where these sands are accessible, the degree of bioturbate structure is notably low to very low. An uppermost division is sometimes present, comprising moderately dense silty clays (grey), with fine lignite lenses and reworked flecks, to purer soft clays (almost white towards the southern side of SL-2). All these Tertiary deposits are shallow-marine to estuarine in origin.

2.2 The (unconformable) boundary between the Tertiary deposits and the Middle Pleistocene deposits is irregular but, in this Phase, does not appear to involve sharper relief of over 1.5 m (commonly less); there are no obvious basal channel-forms in the Pleistocene, and there is no special basal deposit (in particular, no marked coarse lag). The absolute altitude of the boundary (which on average is c.42 m AOD) rises northwards, with Tertiary clays and sands obviously present at various points on the 'floor' of the current excavated
area on the western side of SL-1 and the Pleistocene sequence having lost about 1.5-2 m in thickness (rising base). Some large patches of exposed clay seem to be roughly oval in plan and may represent the top of diapirs (major up-domed structures caused by differential loading within the Pleistocene meta-channel); at SU 12425 09885 ± 4 m (near the northern edge of the SL-1 area), such clays seem to have affected slightly (penetrated and deformed) the lower part of the overlying Pleistocene stratigraphy.

2.3 The Pleistocene deposits are c.5 m thick at SU 12481 09889 ± 5 m (the ‘corner’ between the two main exposed sections) but they are gradually cut out eastwards by the falling surface slope. These sediments are nearly all gravels, dominated by flint (with only very small proportions of quartzite, sandstone and even rarer ironstone). Perhaps three-quarters of clasts are angular to sub-angular or are fragments of primary nodules, all derived more or less directly (within Pleistocene time) from the Chalk to the north. The remaining quarter is composed of very rounded and surface-chattered pebbles of flint; these are marine beach pebbles, eroded from coarser facies of the Tertiary, also outcropping further north.

2.4 The lower part of the Pleistocene deposits (some 2.9 m thick in the current maximum exposure) comprises clast-supported fine, medium and rarer fine-coarse gravels (most commonly 1-10 cm diameters, coarse tail up to 15 cm but very rarely any larger), with some coarse sands. The bedding is most commonly horizontal to gently undulating and laterally persistent. A typical set of beds in transverse section is shown in Fig.2 (detail in Fig.3), where well packed open-work structure (indicating sustained relatively strong current) alternates with more chaotic/massive, less well sorted sandy gravel (indicating rather faster ‘dumping’). Within individual tabular units, most structure remains parallel but there are sometimes some traces of lenticular or festoon bedding; larger-scale cross-bedding is very rare, the only significant example currently exposed being shown in Fig.4.

2.5 Sediments with principal modes finer than gravels are quite rare in this sequence. The tops of some or the gravel beds show post-depositional infiltrating (during later, low flow stage) of clays and silts. There are rare and restricted lenses of laminated (ripple cross-bedded) medium to coarse sand (cf. Fig.7). The even rarer occurrences of clay and/or silt are usually just drapes (no more than 1-2 mm thick), the most obvious ones being in grey clays probably derived from nearby exposures of Tertiary material. All finer deposits are always clearly laminated, showing absolutely no disruption by ichnofossils (e.g. traces of plant rooting, such as reeds) or even more diffuse bioturbation.

2.6 All this material is of very obvious (certain) fluvial origin, with braided streams (individual shifting channels) in a wide meta-channel showing a periglacial environmental regime (fluctuating water supply, with more ‘torrential’ conditions during spring melt). The lack of major cross-bedding suggests that, within the probably quite short time interval represented and the very restricted valley length (effectively point location) observed, accretion usually dominated over erosion.

2.7 The upper part of the Pleistocene deposits (some 2.6 m thick in the current maximum exposure) comprises more or less homogised sandy gravels. There is little or no surviving bedding structure (and even then, only in the basal 0.6 m) but there is a range of turbation structures. The principal style is probably due to cryoturbation (ground-ice ‘heave’); since this material is never interstratified within the fluvial sequence, it is prudent to allocate at least the last phase of cryoturbation to the last (Devensian) glacial period. In Fig.5, convolutions have affected the deposits down to the 1.8 m level on the staff (arrowed); the turbated body contains many near-vertical clasts and a few deformed bodies of sand. No signs of ice-wedge casts were noted anywhere in the current exposures. Another style of turbation (cf. Fig.6) is due to tree-rooting (and possible
throw, in some cases), again due to lack of interstratification, probably all of Holocene age. The generally 'loose' nature of the turbated deposits (loss of original clay) and the horizons of manganese deposition within the underlying bedded gravels (probably formed at the top of the contemporary watertable) are also 'interglacial' pedogenic phenomena (probably Holocene).

3. **Conclusions**

3.1 So far, TVAS have not noted any flint artefacts from the gravels at Plumley Wood, and none were observed during the current visit. The Pleistocene gravels were laid down in strongly flowing water and there are no signs of significant emergence or even of 'backwater' stagnation. Any artefact that were to be found in these sorts of high-energy sediments would therefore be in secondary, perhaps tertiary (eroded from an earlier fluvial gravel with already derived archaeological material), context, carrying very little information value.

3.2 No Pleistocene organic matter (bone, shell or plant remains) was observed, nor is it likely that such remains would survive in these coarse, oxidised deposits.

3.3 Without any palaeontological or primary archaeological content (e.g. burnt flints in context), the only method of dating these deposits would be by optically stimulated luminescence assay on quartz grains. One of the most pressing technical issues in such cases is the matter of the efficiency of zeroing by sunlight, so that better sorted sand bodies are the best target (rather than individual grains within coarser sediment). In the present case, there are only a few cleaner sand lenses. Even in these cases, material derived from nearby Tertiary deposits is obviously included (cf. Fig.7), so that ancient ('bright') grains could be a problem if single-grain (or at least 'skinny aliquot') OSL determinations were not made. Given that the pressing question at the moment (significant archaeology not having been found) is the broad age of the 'PW Lower Terrace' as a whole, it would probably be best to wait until the sandier gravels higher in the sequence are reached, suggested by existing borehole logs as being present further to the northwest in the quarry; more re-working of sand and less contamination by Tertiary grains ought to provide more reliable dating samples.

3.4 It is noted, in passing, that the archaeological excavations uncovered a number of features of Roman date containing/incorporating medium-to-large slabs of 'ironstone'. This material is certainly not present within the immediately local substrate (the uppermost, turbated Pleistocene gravels). However, the extraction contractors report at least one reddish, indurated horizon low in the Poole Formation and it is therefore possible that at least some of the slabs were retrieved more or less at outcrop from the hillslope below to the east. However, the slabs still on site (in the eastern part of SL-1) during the present inspection showed quite a degree of variation (from red sands little harder than a podzolic pan to much denser true nodular ironstone with fewer sand grains), such that wider collection of slab material may have been practiced. There are certainly occurrences of such ironstone right across the region (easy assess to a wide range of different types being possible along the modern shorelines at Poole, Bournemouth and Hengistbury Head, for instance). Whist the ironstone slabs at Plumley Wood have obviously been used as a construction stone (Andy Taylor pers.comm.), the iron content of some of the denser material would probably be sufficient to constitute a usable ore. The uppermost Tertiary deposits may also have provided another raw material since, although clays of this period are not commonly suitable for pottery manufacture, they would be useful in the sealing of pits or channels, and possibly even in
daub/briquetage. Indeed, it may be that the location of any watering holes or actual wells may have been guided by the distribution and morphology of near-surface Tertiary clays.
Plumley Wood Quarry – location plan for Silt Lagoons 1-2 in Phase 1A (extract from Tarmac Drawing B58/290 Phase 1 Works; 100 m grid).

Figure 1
Typical Pleistocene fluvial gravels (transverse section at SU 12518 09874 ± 5 m, observer looking towards bearing 342°) (cf. Fig.3 for detail).
Figure 3

Detail of deposit in Fig.2, showing alternation between open-work and more massive units.
A rare example of cross-bedding (longitudinal section at SU 12470 09878 ± 5 m, bedding dip to bearing 340°).
Division (arrow) between the lower gravels (fluval bedding) and the upper gravels (turbated) (longitudinal section at SU 12474 09867 ± 4 m, observer looking towards bearing 080°).
Figure 6

Cast of a tree bole (longitudinal section at SU 12451 09954 ± 4 m, observer looking towards bearing 083°).
Figure 7

Detail of sand lens, 25 cm thick, 100 cm wide in exposure, cross-bedding dip to the southwest; note grey clay drapes with black lignite (the most prominent occurrence arrowed), derived from Tertiaries (longitudinal section at SU 12472 09874 ± 5 m, observer looking towards bearing 080°).
PLUMLEY WOOD QUARRY (TARMAC)
HARBRIDGE, RINGWOOD, HAMPSHIRE

PLEISTOCENE ISSUES
SITE INSPECTION 19 APRIL 2017

Produced by Oxford Archaeological Associates Limited
under the direction of

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Commissioned by
Thames Valley Archaeological Services Limited

April 2017
1. **Introduction**

1.1 In accordance with the Specification (20\textsuperscript{th} September 2010) concerning Middle Pleistocene archaeology, Dr. Simon Collcutt (OAA) visited the workings at Plumley Wood Quarry on the 19\textsuperscript{th} April 2017. Will Attard (TVAS) was present, both to explain fieldwork results to date and to consult over future watching techniques and priorities. Dr. Collcutt had previously visited the site in May 2011.

1.2 Pleistocene deposits have been largely removed from most of the eastern half of the site. The exposed quarry floor currently consists of either silt ponds or dry exposures of Tertiary sands. Nearly all margins are battered, in many cases in an additive rather than subtractive manner; whilst this is, of course, in accordance with proper safety standards, the site therefore presented very few opportunities for observations of potential archaeological relevance during this visit.

2. **Observations**

2.1 The nature of the Tertiary deposits was described in the earlier (2011) OAA report. Where now visible, these deposits (Poole Formation) continued to be dominated by marine sands. An exposure, surviving along a bank carrying an internal route and conveyor in the centre of Phase 2, is described here (Figs. 1-3) as reasonably typical of the unconformable boundary with the overlying Pleistocene deposits (gravels).

![Tertiary/Quaternary boundary at 1.1 m on the staff](image-url)
Fig. 2  Detail of Fig. 1 (Tertiary sands)
2.2 The Tertiary deposits show clear cross-bedding, in various directions, modes and scales (the largest forms being megaripples with >0.5 m relief). There are some strong and continuous clay interbeds (<0.01 m thick) but the dominant texture is well-rounded ('soft') fine to fine-medium sand, here completely lacking in gravel (or even grit) content. There are very few macroscopic ichnofossils and even background bioturbation appears to have been very low. Such characteristics would be consistent with a sediment-rich marine environment with strong switching currents, relatively minor slack water and no emergence, perhaps within a wide estuary or just seawards of such a setting. These sands, although usually loose at section, are extremely dense, resisting further compaction. Accordingly, the emplacement of the overlying gravels has caused only a little disruption in the top surviving c.0.2 m in this location. The erosive boundary of the Pleistocene is very sharp and there are beds (moderately wide lenses) of Tertiary material intercalated within the lowest gravels, probably disturbed from the temporary channel ‘banks’ as the heavily ‘tooled’ river cut quickly downwards into the vulnerable substrate; such derived material (with clay clasts and lacking cross-bedding) is shown in Fig.3. In the available restricted exposure, the boundary (unconformity) is relatively horizontal, with no basal channels, significant coarse lag, overprinted structures (save local Fe-Mn-clay impregnation) or other remarkable feature; the gravels themselves are of medium-textured angular flint, well bedded, with dominantly clast-support and secondary (largely intrusive) clayey sand matrix.

![Fig.3 Detail of Fig.1 (reworked Tertiary sands intercalated within Pleistocene gravel)](image)

2.3 Moving northwards along the western faces of Phases 2 and 3, similar minor exposures of basal gravel survive at extraction points currently being completed down to sand. During March of this year, Will Attard (TVAS) was able to observe sorted gravel reported to him as having been extracted from this area, gravel from which he recovered a flint object carrying suggestive mechanical scars on both faces (cf. photograph in his report). The object was kindly shown to SNC, who retains the following impressions: (a) almost two-thirds of the margins of the roughly triangular object are constituted by major breaks and massively battered areas; (b) what would have been the main ridges between ‘flake scars’ show extreme battering (as much as 2 mm wide in places) and the actual margins (including what could be interpreted as the principal ‘point’ of the triangle) are similarly worn; (c) there are a set of narrow parallel linear scars at one corner, with their ridges showing an intermediate level of battering; (d) concentrating upon the surviving main ‘flaking pattern’, whilst the geometry is necessarily
centripetal from the surviving margin, the scars do not suggest a ‘finished’ bifacial tool. It is a truism that, with mechanical gravel extraction, it has become much more difficult to find Palaeolithic tools; when extraction was by hand, it was rare for any relevant quarry in southern England not to produce some Middle Pleistocene artefacts. However, since it is obvious that this particular object has been rolled in at least two major flow phases (interrupted by what looks like pressure damage in a settling gravel bank), nothing useful could be said of any potential primary context or association. SNC feels that there is insufficient evidence to rule out the possibility that this is merely a ‘suggestive’ ecofact and, under the contextual circumstances, he prefers this unadventurous interpretation.

2.4 The only other exposure (2-3 m thick) of the Pleistocene gravels currently available is along the central route northwards, at the eastern margin of Phase 7. Here, relatively well-bedded, matrix-supported medium gravels (lying above the basal unconformity with the Tertiary deposits by an unknown amount, the latter not being exposed nearby) contain very large proportions (perhaps up to 60% in places) of fully rounded and surface-chattered flint pebbles, probably derived from a coarser Tertiary deposit (the nearest being the basal Tertiary immediately above the in situ Chalk, with outcrops now only well to the north).

2.5 Other than the lignite present in some of the upper beds of the Poole Formation, there continues to be no obvious organic matter (plant debris, bone, shell) in any of the available and well-oxidised exposures.

3. **Conclusions**

3.1 The conclusions reached in the 2011 OAA report remain valid. TVAS were particularly keen to seek an opinion as to the utility of OSL dating. SNC remains very wary of the obvious presence of Tertiary sands and the obvious lack of well-sorted Pleistocene sands, to date. It therefore seems best to repeat the earlier conclusions (original paragraph 3.3) on this topic:

> Without any palaeontological or primary archaeological content (e.g. burnt flints in context), the only method of dating these deposits would be by optically stimulated luminescence assay on quartz grains. One of the most pressing technical issues in such cases is the matter of the efficiency of zeroing by sunlight, so that better sorted sand bodies are the best target (rather than individual grains within coarser sediment). In the present case, there are only a few cleaner sand lenses. Even in these cases, material derived from nearby Tertiary deposits is obviously included [...] so that ancient (‘bright’) grains could be a problem if single-grain (or at least ‘skinny aliquot’) OSL determinations were not made. Given that the pressing question at the moment (significant archaeology not having been found) is the broad age of the ‘PW Lower Terrace’ as a whole, it would probably be best to wait until the sandier gravels higher in the sequence are reached, suggested by existing borehole logs as being present further to the northwest in the quarry; more re-working of sand and less contamination by Tertiary grains ought to provide more reliable dating samples.

3.2 Given these conclusions, it is recommended that future visits be co-ordinated with the quarry management so as to maximise available Pleistocene exposures for study, particularly at higher levels in the local fluvial sequence.
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